

Guidelines

FOR DESIGN AND CONSTRUCTION OF
Health Care Facilities

The Facility Guidelines Institute

2010 edition



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Standard 170-2008,
Ventilation of
Health Care Facilities



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Preface

The 2010 edition is the latest in the 63-year history of this Guidelines document to aid in the design and construction of health care facilities.

The original *General Standards* appeared in the *Federal Register* on February 14, 1947, as part of the implementing regulations for the Hill-Burton program. The standards were revised from time to time as needed. In 1974 the document was retitled *Minimum Requirements of Construction and Equipment for Hospital and Medical Facilities* to emphasize that the requirements were generally minimum, rather than ideal standards. The 1974 edition was the first for which public input and comment were requested. Requirements relating to the preparation of plans, specifications, and estimates and to site survey and soil investigation, which had been a part of all previous editions, were removed. The Department of Health, Education, and Welfare's (DHEW) Office of Facilities Engineering published these requirements in a document titled *Technical Manual on Facility Design and Construction*.

In 1984 the Department of Health and Human Services (DHHS) removed from regulation the requirements relating to minimum standards of construction, renovation, and equipment of hospitals and medical facilities, as cited in the *Minimum Requirements*, DHEW Publication No. (HRA) 81-14500. Since the federal grant and loan programs had expired, there was no need for the federal government to retain the guidelines in regulation format. To reflect its non-regulatory status, the title was changed to *Guidelines for Construction and Equipment of Hospital and Medical Facilities*. However, the document was, and still is, used by many state authorities having jurisdiction for licensure or registration. Further, DHHS staff members use the Guidelines to assess Department of Housing and Urban Development applications for hospital mortgage insurance and Indian Health Service construction projects. For these reasons, regulatory language has been retained. The 1983–84 edition of the Guidelines was the last one revised and published by the federal government; at the same time, DHHS published and distributed an addendum to the Guidelines titled *Energy Considerations for Hospital Construction and Equipment*.

At the conclusion of the revision cycle that resulted in the 1983–84 edition, DHHS asked the American Institute of Architects Committee on Architecture for Health (AIA/CAH) to form an advisory group to work with, and be funded by, the Public Health Service for the next revision. When the revisions to the document were complete, the federal government declined to publish it document. The AIA/CAH asked several nonprofit agencies and professional associations to publish and distribute the Guidelines, and an agreement was finally reached with the AIA to publish the 1987 edition. At this point, revision of the Guidelines would have ceased, or the document would have ceased to exist, if three people had not taken it upon themselves to approach the Public Health Service and the Health Care Financing Administration and request a federal grant to fund a revision cycle. These same three people, working with the AIA/CAH, put together the first Steering Committee, which in turn set up the first Health Guidelines Revision Committee (HGRC) not under the aegis of the federal government.

The members of this multidisciplinary group came from the federal and state governments and the private sector and offered expertise in design, operation, and construction of health care facilities. The 1992–93 edition of the Guidelines was published and distributed by the AIA. The Steering Committee from the 1992–93 cycle requested and received federal funding from DHHS for another cycle. Substantial funding was also provided by the American Hospital Association and the AIA/CAH. The consensus process was enhanced and the input base broadened by asking the public to propose changes to the Guidelines and then to comment on the proposed changes accepted by the HGRC. Approximately 2,000 proposals and comments were received and processed. Three HGRC meetings—one on the East Coast, one on the West Coast, and one in the middle of the country—were held to discuss the merits of all proposals and comments. More than 65 experts attended these sessions and reached a consensus on the content of the 1996–97 edition of the Guidelines. A letter ballot was sent to all eligible members of the HGRC and the document was approved by a unanimous vote. To better reflect its content, the title of the document was changed to

Guidelines for Design and Construction of Hospital and Health Care Facilities. It was during this revision cycle that the AIA Committee on Architecture for Health became the AIA Academy of Architecture for Health (AIA/AAH).

In an effort to create a more formal process and to keep the document current, the Facility Guidelines Institute (FGI) was founded as an independent, not-for-profit 501 (c)(3) corporation in 1998. The main objectives of FGI are (1) to see that the Guidelines are reviewed and revised on a regular cycle with a consensus process carried out by a multidisciplinary group of experts from the federal, state, and private sectors, (2) to stimulate research in support of evidence-based guidelines, and (3) to reinvest all of the net revenue derived from FGI's share from the sale of Guidelines documents in research and development for improved future editions of the Guidelines.

FGI is primarily interested in consensus methodology and in overseeing the Guidelines revision process. Specifically, FGI wants to make sure the Health Guidelines Revision Committee

- is properly funded,
- has a balance of stakeholder representation from individuals with expertise or jurisdiction,
- uses the consensus process,
- requests public input in the form of proposals for change and comments on proposed changes,
- reviews and revises the Guidelines on a timely basis to maintain a balance between minimum standards and the state of the art in health care design and construction, and
- operates under a formal set of bylaws governing its purpose, scope, membership, and goals that include standing rules governing voting procedures, recognized duties and responsibilities for committee members, and established rules regarding appointments, terms, and officers.

FGI monitors public requests for interpretation of the Guidelines text. Goals are to make sure that requests are answered in a timely manner, interpretations are rendered by the individuals best equipped to reflect the intent of the committee when the document was written, and interpretations are made available to the public.

The 2001 edition of the Guidelines resulted from the first revision cycle to be completed under the aegis

and direction of FGI. It received major funding from DHHS/Health Care Financing Administration and the AIA/AAH. The American Society for Healthcare Engineering (ASHE), the National Institutes of Health (NIH), and the AIA provided staff and technical support. The HGRC met in Washington, D.C., and reviewed the 1996–97 edition of the Guidelines line by line to ascertain issues that needed to be addressed, including infection control, safety, and environment of care. The membership for this revision cycle included an increased number of state authorities having jurisdiction (AHJs), consistent with the increasing number of states utilizing all or portions of the Guidelines as state regulation by adoption. The work of the HGRC was greatly enhanced by the attendance and participation of these AHJs.

At the beginning of the 2001 revision cycle, an announcement requesting proposals for change to the document was made in health care industry publications. The HGRC received and gave serious consideration to 539 proposals to modify the document. After the HGRC met in Irvine, California, a document containing proposed changes was made available for public comment. The HGRC received and gave careful consideration to 1,030 comments on the proposed changes. For the first time, the Internet was used extensively to distribute the draft of the document and to receive proposals and comments.

The 2001 Guidelines were the result of many hours spent at three meetings, each attended by 82 to 86 members of the 97-member HGRC. Committee members spent countless hours in subcommittee and focused task groups reviewing the proposals for change and comments on them. The text for the 2001 edition of the Guidelines formally adopted at the final HGRC meeting in Denver was sent to the HGRC members for letter ballot. The result was an overwhelming endorsement of the document. The adopted Guidelines were approved by FGI and turned over to the AIA for publication and distribution. A major change in format was adopted for this edition, placing appendix material at the foot of the relevant pages in the main text. A glossary of terms and a form to request an interpretation were added to the book.

The 2006 edition of the Guidelines also received major funding from DHHS/Centers for Medicaid and Medicare Services, ASHE, and NIH, and the AIA again provided staff and technical support. This edition was also the result of many hours of formal and informal meetings on the part of more than 107 HGRC members.

There were never fewer than 85 members present at the three “all-hands” meetings in Washington, D.C.; Austin, Texas; and Irvine, California; and 67 individuals faithfully attended every session. Committee members spent untold hours at “all-hands” meetings and subcommittee and focused task group meetings, as well as time outside the meetings, writing proposals and reviewing proposed changes and comments. They reviewed 797 proposals for change and 1,156 comments on proposed changes. The HGRC reached a consensus at its final meeting and unanimously endorsed the revised guidelines to be sent out for letter ballot. The result of the letter ballot was unanimous approval of the 2006 document.

The 2006 HGRC took on the challenge of two goals stated in the preface of the 2001 edition: to prepare more committee-generated changes to reflect the collective knowledge and experience of the members and to improve the format, readability, and indexing or searchability of the document to make it a more useful, user-friendly tool. The HGRC developed a number of work groups and added time to the revision cycle to draft proposals for new language. The committee also approved a complete reorganization to make the Guidelines more accessible to users. This time-intensive effort resulted in a book presented in four parts: one with information applicable to all health care facility types, one on hospitals, one on ambulatory care facilities, and one for other health care facilities.

The 2010 edition of the Guidelines also received funding from DHHS/Centers for Medicaid and Medicare Services, and ASHE provided staff and technical support. This edition was also the result of many hours of formal and informal meetings on the part of more than 116 HGRC members. There were never fewer than 91 members present at the three “all-hands” meetings in Baltimore, Maryland; San Diego, California; and St. Louis, Missouri. The voting process for 2010 was restructured to permit more time to debate the technical issues. More than 25 focus groups were formed in Baltimore to review specific sections of the 2006 document or to work on developing new sections for the 2010 edition. Two specialty subcommittees were formed to take on major projects on acoustic design and patient handling and movement. Expertise on these specialty subcommittees was bolstered by the contributions of outside technical and subject experts. HGRC members met for three week-long “all-hands” meetings that included time for subcommittee and focus group meetings and also spent time outside the meetings

writing proposals and reviewing proposed changes and comments. They reviewed 1,142 proposals for change and 1,688 comments on proposed changes. Voting on proposals and comments was conducted in the four part groups and only minority reports or items not reaching consensus were brought forward for the full HGRC to debate and vote. The HGRC reached a consensus at its final meeting and unanimously endorsed the revised guidelines to be sent out for letter ballot. The result of the letter ballot was unanimous approval of the 2010 document.

The 2010 HGRC took on numerous challenges to modernize the document and meet the needs of the enforcing, design and owner communities. Major new sections on acoustics, patient handling and movement, bariatric accommodations, cancer treatment/infusion therapy services, freestanding cancer treatment facilities, and telecommunications areas in hospitals were added by the committee, along with new material on wayfinding, patient safety assessments, and outpatient rehabilitation facilities. To make the usability of the Guidelines more consistent with other national standards, a further reorganization of the document was undertaken for the 2010 edition. Details about this appear in the essay on Major Additions and Revisions that follows the Acknowledgments section. The time-intensive reorganization effort has resulted in a book presented in six parts, including a common elements chapter at the beginning of Part 2 (Hospitals), Part 3 (Ambulatory Care Facilities), and Part 4 (Residential Care Facilities).

One monumental change in the 2010 edition is the incorporation of the 2008 edition of ANSI/ASHRAE/ASHE Standard 170: *Ventilation of Health Care Facilities* in the Guidelines. During the 2010 revision cycle, the HGRC voted to abandon the Guidelines ventilation table and partner with the American Society of Heating, Refrigerating and Air-Conditioning Engineers by adopting ASHRAE 170 along with all subsequently issued addenda as a part of the Guidelines document.

In 1999 ASHRAE identified the need for an ANSI-approved standard on the ventilation of health care facilities. The rationale was twofold—first, to keep its newly introduced HVAC health care design manual from becoming the de facto ASHRAE standard, and second, to generate a broader public review of new research and findings in the ventilation of health care facilities. In an effort to avoid having two standards addressing identical design issues, with real potential for significant conflict, the FGI Board of Directors approached ASHRAE in

2007 with a proposal to include Standard 170 as part of the Guidelines. Both organizations saw this as a great opportunity and have worked closely to make it a reality. As a result, Standard 170 is presented in its entirety as a new Part 6 of the Guidelines, making it the primary document on health care ventilation systems.

With any merger, the gain does not come without some interim adjustments. The 2010 Guidelines has retained all sections and paragraphs not covered by Standard 170, which may give some sections of the document an unfinished look. Further, Standard 170 has what ASHRAE terms “continuous maintenance” project status. A newly formed maintenance committee, comprising a mixture of HGRC and ASHRAE members to give it a broad expertise in health care environments, will take on the task of keeping 170 current with practice in the field. By having the standard under continuous maintenance, the committee can meet and develop proposed changes at any time rather than waiting for the end of the three-year revision cycle to issue a new document. The official addenda prepared by the committee will be published free of charge on the ASHRAE, ASHE, and FGI Web sites. It is the hope of the Standard 170 committee that state agencies will adopt these addenda as they are issued, as they represent the state-of-the-art thinking of the industry.

When possible, the Guidelines standards are performance oriented for desired results. Prescriptive measurements, when given, have been carefully considered relative to generally recognized standards. For example, experience has shown that it would be extremely difficult to design a patient bedroom smaller than the size suggested and still have space for the normally expected functions and procedures.

Authorities adopting the Guidelines should encourage design innovation and grant exceptions where the intent of the standard is met. These standards assume that appropriate architectural and engineering practice and compliance with applicable codes will be observed as part of normal professional service.

The Guidelines change to keep pace with evolving health care needs and in response to requests for up-to-date guidance from health care providers, designers, and regulators. It is recognized that many health care services may be provided in facilities not subject to licensure or regulation, and it is intended that these Guidelines be suitable for use by all health care providers. It is further intended that when used as regulation, some latitude be granted in complying with these Guidelines as long as

the health and safety of the facility’s occupants are not compromised.

The Guidelines and the methodology for revising them have been, and still are, evolving. When first published, the document comprised a set of regulations developed by a single department of the federal government as a condition for receiving a federal hospital construction grant under the Hill-Burton Act. Even in those early days, the document was highly respected and influential throughout the world. From the time it was first issued and enforced, U.S. hospitals have become the ideal and the goal to be achieved by those building hospitals in all nations.

Gradually, state hospital authorities and other federal agencies were added to the HGRC, then private, nongovernmental health care professional societies, practitioners, and designers. Educational programs and seminars were introduced in the 1980s to inform the public about the subjects addressed in the Guidelines and the reasons for inclusion of certain requirements. Very slowly, public input was requested by the committee in the form of comment on proposed changes. This has now exploded into the current avalanche of proposals and comments. In each succeeding cycle, the committee has been enlarged to increase the base of expertise and to allow more public representation. Further, the consensus procedure was adopted for all decision-making.

As the process became more complex, as the committee grew larger, as more and more public proactive and reactive input was requested and received, as the practice of health care delivery and the buildings that house it began to change at an ever faster rate, a more formal and expeditious process became mandatory. Adding to the complexity of the process is the expansion in the scope of the document from covering only acute care general hospitals to including nursing homes, rehabilitation facilities, ambulatory care facilities, psychiatric hospitals, mobile health care units, hospice care, assisted living, and so on.

It is the desire of the Health Guidelines Revision Committee to continue working with the Facility Guidelines Institute to make certain the Guidelines and the revision process continue. The HGRC does, however, wish to maintain its independence as an objective, multidisciplinary committee, operating without pressure from any organization and arriving at conclusions candidly, fairly, and knowledgeably through an open consensus process.

It is also the desire of the HGRC to see that the process continues to improve with each passing cycle. Some

PREFACE

ongoing goals follow:

- Seek public input from a wider base, not only from professionals but from patients and other consumers.
- Encourage and sponsor research projects to support the evidence-based decision-making process.
- Work constantly to improve the process and the content of the Guidelines to keep it a dynamic document that truly reflects the state of the art.
- Have the courage and wisdom to adopt requirements that are forward looking and address the needs of the future, looking backward only to discover what not to do.
- Strive for a document that is credible, reasonable, and knowledge-based and that will maintain the tradition of the American health care physical environment as the role model for other countries.
- Work with state agencies to adopt the most recent edition of the Guidelines so that health facility

projects are regulated using current industry concepts.

This publication supersedes the *Guidelines for Design and Construction of Health Care Facilities*, 2006 edition.

Inquiries or questions about the content of the Guidelines may be addressed to the Facility Guidelines Institute, as follows:

interpretations@fgiguidelines.org (if the text of the Guidelines is unclear)

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Questions about the Guidelines revision process, use of the document, or sale of the document may be addressed to info@fgiguidelines.org.

To order copies of the Guidelines, visit the Facility Guidelines Institute Web site at www.fgiguidelines.org for options and instructions.

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Development of a document such as the 2010 Guidelines doesn't just happen overnight. It takes a herculean effort by many talented professionals who give up weekends, evenings, and extensive time away from their place of business to attend three week-long meetings. For those of you who are unaware, all 116 health care experts on the 2010 Health Guidelines Revision Committee (HGRC) are volunteers and received no remuneration for the countless hours of work they donated to this national set of health care guidelines. Leading the HGRC is the Steering Committee, a group of 15 elected HGRC members who direct the activities of the revision process and have ultimate responsibility for issuing the Guidelines. Over the course of a four-year revision cycle, the Steering Committee meets at least 12 times and is in constant electronic communication. Without their governance, publication of this document would not have been possible. One HGRC member totaled up all the professional service hours spent producing the Guidelines and determined the in-kind cost of time donated by Revision and Steering committee members to be well over \$2.5 million.

Although the entire HGRC works extremely hard, and there are many members who could be singled out for their hard work and dedication, two members took a lead role during the 2010 revision cycle, providing a level of effort above and beyond all expectations. Very special thanks go out to:

Chris P. Rousseau, PE, Partner, Newcomb & Boyd.
Chris took the initiative to lead the editorial effort to

merge ASHRAE Standard 170 with the 2010 Guidelines—a daunting task.

James R. "Skip" Gregory, NCARB, Bureau Chief, Office of Plans and Construction, Florida Agency for Health Care Administration. Skip brought forward the idea of reorganizing the Guidelines to match the numbering layout of other national building and fire codes. He established a task group within his agency to provide guidance on making the document more user-friendly and spent countless hours figuring out how to enact their ideas.

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Without the effort of all involved, the Facility Guidelines Institute would not be able to offer this superb document to the health care industry.

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An undertaking such as the Guidelines also reaches out beyond the HGRC membership, drawing on the expertise of other specialists who also give freely of their time and expertise. For the 2010 revision cycle, there were five such specialty subcommittees—acoustic design, patient handling and movement, freestanding birth centers, oncology centers, and critical access hospitals.

Specialty Subcommittee on Acoustic Design

This committee—comprising the Joint Subcommittee on Speech Privacy of the Acoustical Society of America, the Institute of Noise Control Engineering, the National Council of Acoustical Consultants, and several HGRC members—undertook a six-year effort to prepare a white paper on sound and vibration for health care facilities and subsequently to develop recommended language on acoustic design for inclusion in the Guidelines. Special thanks to all those who worked on this committee:

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Specialty Subcommittee on Patient Handling and Movement

This committee was responsible for developing recommended language for addressing patient handling and movement issues in the Guidelines. The result is a new requirement to include a patient handling and movement assessment (PHAMA) as part of planning for health care facility construction and renovation projects. The group also spent countless hours pulling together a white paper explaining how to put together a PHAMA and presenting background information on the need for inclusion of this information in the planning process. The white paper has been published on the FGI Web site and is available to the public free of charge. Special thanks to all of the people who worked on this committee:

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Specialty Subcommittee on Surfaces

This committee thoroughly reviewed the 2006 Guidelines, locating all surfaces and furnishings text and comparing requirements in different sections, to come up with proposals to improve the language. The goal was to bring the Guidelines text in line with current evidence-based standards and to make material on surfaces and furnishings consistent throughout the document. A typical application chart was developed for use in considering surface choices for a health care facility, with plans to develop this further for the 2014 edition. Contributions to the committee's work were gratefully received from members of the American Academy of Healthcare Interior Designers (AAHID), the HGRC Focus Group on Infection Control, the HGRC Specialty Subcommittee on Patient Handling and Movement, and the Kaiser Permanente facility team through HGRC member John Kouletsis.

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Specialty Subcommittee on Oncology Treatment and Nursing Units

This committee was responsible for developing an interim guidelines white paper that served as the basis for two new sections in the General Hospital chapter in Part 2 and a new chapter on freestanding cancer treatment

centers in Part 3. Special thanks to all who worked on this committee:

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Specialty Subcommittee on Critical Access Hospitals

This committee was formed during the 2010 Guidelines process at the request of DHHS/Health Resources and Services Administration, the federal agency over the critical access program, to developing an interim guideline white paper on critical access hospitals. The white paper will become a proposal for a new chapter in the 2014 Guidelines. Within six months this specialty subcommittee had hundreds of hours worth of web conferences. A special thanks is extended to all the people who worked on this interim document and a very special thanks to its chair Chad Beebe for all the administrative effort to meet unreasonable deadlines and make this guideline happen.

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Specialty Subcommittee on Freestanding Birth Centers

The 2010 HGRC Focus Group on Obstetric Units/Birth Centers worked with representatives of the American Association of Birth Centers to revise and correlate the Guidelines chapter on freestanding birth centers with current practices in the field.

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Major Additions and Revisions

On picking up the 2010 edition, users of previous editions of the Guidelines will notice a new organization to the content. This edition has been reorganized to reflect the numbering system of other national codes and standards that design professionals and owners use every day. In addition, for clarity, full paragraph references are used in the text, including the chapter number followed by a hyphen and a sequenced number for each paragraph.

What will also be very noticeable is the new Part 6. For the 2010 edition, the Facility Guidelines Institute has partnered with the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., by adopting ANSI/ASHRAE/ASHE Standard 170: *Ventilation of Health Care Facilities* as the principal standard for ventilation systems in health care facilities. The 2010 edition of the Guidelines incorporates as Part 6 the 2008 edition of Standard 170, plus all addenda, present and future, issued by ASHRAE. Users can find an explanation of the relationship between ventilation information in the Guidelines text and in Standard 170, as well as information for accessing the Standard 170 addenda, at the beginning of Part 6.

The content of this edition is arranged in six Parts, grouping similar facility types together:

- Part 1 (General) provides information applicable to all health care projects and facility types.
- Part 2 (Hospitals) contains all of the chapters on hospitals.
- Part 3 (Ambulatory Care Facilities) contains chapters on a wide variety of outpatient facility types.
- Part 4 (Residential Health Care Facilities) includes chapters on residential care facilities—nursing, hospice, and assisted living.
- Part 5 (Other Health Care Facilities) contains chapters on other health care facility types that do not fall into the categories of Parts 2, 3, or 4. In this edition they are mobile, transportable, and relocatable units; freestanding birth centers; and adult day health care facilities.
- Part 6 (Ventilation of Health Care Facilities)

contains ANSI/ASHRAE/ASHE Standard 170, as discussed above.

The content of the chapters in Parts 2, 3, and 4 of the 2010 edition is also presented differently than in the 2006 edition. Requirements that apply to more than one facility chapter in a Part have been brought forward into a common elements chapter to avoid repetition of the same material in different chapters, which in the past has caused identical material to be updated in one chapter and not in another. Specific requirements for different facility types are included in subsequent chapters in the Part. Each specific chapter refers readers back to the required common elements chapter.

While the major revision of the 2006 Guidelines was instigated by a study of the Guidelines document commissioned by the Facility Guidelines Institute (FGI) in 2003, the reorganization of the 2010 Guidelines was initiated by the State of Florida, one of the first users of the 2006 edition. After three years of intensive document use, state employees found the 2006 edition difficult to navigate and proposed a second major reorganization in which the text would follow common numbering formats found in other national codes and standards. The primary benefit of this numbering scheme is that material in the book will appear with identical or very similar numbering throughout the document.

In addition to the reorganization and renumbering of the Guidelines text, which was a monumental editorial effort, the 2010 edition provides an updated version of the content, including both completely new material and revisions to the text of the 2006 edition. As explained in the preface, the Health Guidelines Revision Committee (HGRC) is the body responsible for considering public proposals to change the 2006 document as well as for generating proposals based on their multidisciplinary discussions. After the draft 2010 edition was posted for public comment, the HGRC reviewed all comments and finalized the text.

The major additions and revisions that resulted from the 2010 revision cycle are outlined below. As in past editions, significant changes are marked throughout the book with a vertical line beside the text.

Glossary

The glossary, which first appeared in the 2001 edition, continues to be expanded to assist Guidelines users. Definitions of commonly used terms that appear throughout the Guidelines have been added to facilitate understanding, clarify issues, and help maintain consistency in the document. For the 2010 edition, the glossary has been moved to the front of the book to make it more accessible.

Part 1: General

Chapter 1.1 provides a useful introduction to the document, including information about how to use the Guidelines and request interpretations of its recommendations. It further explains how the Guidelines are applied to renovation projects and outlines federal requirements for protecting patient privacy. A list of publications referenced in the Guidelines concludes the chapter.

Chapters 1.2 (Environment of Care) and 1.5 (Planning, Design, and Construction) from the 2006 edition have been combined into a new Chapter 1.2 (Planning, Design, Construction, and Commissioning). Text on the functional program—a key document used to identify a provider's goals and objectives for the environment of care—has been expanded, including text on projected operational use and demand and on short- and long-term planning considerations.

A new appendix section (A1.2-4) on performing a patient safety risk assessment of a project's design elements has been added as well as a new section (1.2-5) requiring a patient handling and movement assessment. The PHAMA will be a major element of all new designs as more and more portable and permanent patient handling and movement equipment is being added to the health care environment. A new section (1.2-6.1) has been added on acoustic design as a result of six years of development and the issuance of a white paper. This text and appendix language provides design guidance for addressing exterior environmental noise and interior sound. The text on commissioning continues to be expanded, with sections on newly installed or modified HVAC and fire alarm systems in patient care areas added.

Chapter 1.6 has been eliminated and all of its content moved to the common elements chapters in Parts 2 through 4.

Part 2: Hospitals

Part 2 contains chapters on general hospitals, small primary care hospitals, psychiatric hospitals, and rehabilitation facilities, in addition to the new Chapter 2.1 (Common Elements for Hospitals).

New and significantly revised material that appears in Chapter 2.1 as common elements includes:

- New section on self-contained medication dispensing units
- New language on soiled holding rooms
- Windows in patient rooms to be at least 8 percent of the clear floor area of the room
- New language on hand-washing station and sink design
- New section on furnishings
- New language on ventilation for airborne infection isolation rooms, protective environment rooms, and combination AII/PE rooms
- Revised section on nurse call systems
- New section on technology and medical communication systems

The text of Chapter 2.2 (General Hospitals) includes the following completely new and significantly revised material:

- Patient bathing facilities need to be assessed for meeting the needs of mechanical lifting devices
- Protective environment section has been rewritten to include:
 - Combination airborne infection isolation/protective environment room
 - A new section on bone marrow/stem cell transplant units
- New sections on oncology nursing units and cancer treatment/infusion therapy services
- Revised language for NICU noise control
- New section on bariatric nursing units
- Emergency services section has been updated to include:
 - New language on emergency services reception, triage, and control stations

MAJOR ADDITIONS AND REVISIONS

- New language on emergency services examination/treatment rooms or areas
- Updated language on emergency services observation units
- New section on fast-track areas
- New dimension requirements for pre- and post-operative patient care areas
- Revised language on MRI and PET suites

Chapter 2.5 (Special Requirements for Psychiatric Hospitals) includes a new section on psychiatric hospital perimeter security and updates to other material. For the most part, changes in Chapter 2.2 (Specific Requirements for Small Primary Care Hospitals) and Chapter 2.6 (Specific Requirements for Rehabilitation Hospitals and Other Facilities) were made to correlate them with changes in Chapters 2.1 and 2.2. Chapter 2.4 is a placeholder for a chapter on critical access hospitals, which was developed too late to be included in the 2010 edition (see the section on research and white papers below for more information).

Part 3: Ambulatory Care Facilities

The significant changes to Part 3 occurred during the reorganization of the 2006 edition, when individual facility information was pulled out of the general outpatient facility chapter and placed in separate chapters, leaving the common elements in Chapter 3.1. For the 2010 edition, the chapters on Mobile, Transportable, and Relocatable Units and Freestanding Birth Centers have been relocated to Part 5 (Other Health Care Facilities).

The text of the chapters in Part 3 (Ambulatory Care Facilities) includes the following completely new and significantly revised material:

- New language for hand-washing stations and sink design
- Revised section on flooring
- New section on waste management
- Revised section on medical waste disposal
- Clarified use for unrestricted, semi-restricted, and restricted areas in outpatient surgical facilities
- Added language on levels of sedation to the appendix for outpatient surgical facilities

- Revised the language for pre- and post-operative holding areas in both outpatient surgical and endoscopy facilities

New chapters in this part of the book cover cancer treatment facilities and outpatient rehabilitation facilities.

Part 4: Residential Care Facilities

Part 4 includes chapters on health care facilities that provide a residential environment—nursing facilities, hospice facilities, and assisted living facilities. The chapter on adult day health care facilities has been moved to Part 5.

Chapter 4.1 on Nursing Facilities was not extensively revised, but some significant changes include:

- A new “household” or “home” resident room layout concept
- Revised resident room space requirements
- New section on resident food areas
- New language on dining and recreation areas
- Revised and new language on flooring
- New section on furniture

No major changes were made to the chapters on hospice or assisted living facilities.

Part 5: Other Health Care Facilities

This new Part includes facilities where the length of stay is generally less than 24 hours but cannot be characterized as outpatient care because of the services being provided. Included are adult day health care facilities and freestanding birth centers. Mobile, transportable, and relocatable units are also included in this Part because the requirements in the chapter relate more to the type of unit than to specific medical services provided.

Significant changes were made to Chapter 5.1 (Mobile, Transportable, and Relocatable Units). These include:

- New section on factors that affect the location of the unit
- Revised language on MRI unit site considerations
- New section on support areas

- New section on exterior finish materials
- New language on air-handling units
- New section on emergency electrical service

Significant changes were made to Chapter 5.2 (Freestanding Birth Centers). Those changes include:

- Further defined in the functional program
 - Size and layout
 - Transfer and service affiliations
 - Proximity to hospitals
- Revised language on capacity and size of rooms
- New language on support areas for staff, mothers, and newborns
- New sections on:
 - Medication preparation locations
 - Soiled and clean workrooms
 - Service areas
- Use of portable medical gas equipment is permitted

Very minor updates were made to Chapter 5.3 (Adult Day Health Care Facilities).

Part 6: Ventilation of Health Care Facilities

As a result of the merger of the 2010 Guidelines and ANSI/ASHRAE/ASHE Standard 170: *Ventilation of Health Care Facilities*, some minor language differences needed to be worked out. In the process of considering the merger, these differences have been vetted and, in most cases, resolved by the ASHRAE committee that produced the 2008 edition of Standard 170 and the 2010 HGRC Focus Group on Engineering.

Significant changes in ventilation from the 2006 edition of the Guidelines are as follows:

- Ventilation for Class B and C operating rooms has increased to a total of 20 ach and 4 outside ach
- If the total cooling capacity for the facility is greater than 400 tons, reserve cooling capacity is required to meet the “facility’s operational plan”
- Single filter bank for Class A operating rooms (ambulatory surgery)
- VAV permitted for airborne infection isolation and protective environment rooms (pressure differential must be maintained)
- Newly installed ductwork will need to be cleaned before space is occupied

Coming Up: More Research and White Papers

As a not-for-profit, 501 (c)(3) corporation, the Facility Guidelines Institute is dedicated to reinvesting its share of the net proceeds derived from the sale of Guidelines documents into the Guidelines itself, particularly into research and development projects that can help produce improved editions of the document. One such major research effort instigated, organized, and funded by FGI that informed significant changes in the 2010 Guidelines was a study by the University of Minnesota that led to many of the recommended changes to the nursing facilities chapter in Part 4. Additional research completed by Texas A&M on the definitions of new construction vs. renovation vs. cosmetic upgrades will be used in developing the 2014 Guidelines and will also lead to recommendations for a national position to be promoted in other building codes and standards. The HGRC Research and Development Committee plans more studies that are anticipated to contribute to the development of the 2014 Guidelines. Under consideration are subjects that play a vital role in health facility design and construction, including those listed just below. (For further information and to access published white papers, visit the Facility Guidelines Institute Web site at www.fgiguideelines.org.)

- Use of natural lighting and window size
- Operable windows and ventilation issues
- Use of patient lifts, patient and caregiver safety
- Impact of healing designs on clinical outcomes
- Interventional imaging and satellite procedure units
- Standards related to space heating and air conditioning and standby power requirements
- Nursing station design, acoustical and HIPAA issues
- Controlled humidification in nursing facilities
- Single vs. variable acuity rooms
- Sustainable health care design (LEED and other green concepts)

In addition, during the public review and comment period for the first draft of the 2010 edition, some new proposals were received that could not be processed so late in the revision cycle. Many of these comments will be held over for review during the 2014 revision cycle; however, one of them was a subject of critical interest to many health facility providers, designers, and regulators—critical access hospitals. Guidelines for these facilities that provide health care in many underserved parts of the United States were needed sooner than 2014.

Recognizing that both the public and the HGRC need a minimum of four years to use, digest, critique, and develop true consensus recommendations for modifications to each new edition of the Guidelines, and that the industry probably cannot afford to wait another four years to receive useful guidance on some emergent issues, FGI organized a task group to develop draft guidelines for critical access hospitals. These draft guidelines will be reviewed at the first full meeting of the 2014 HGRC. After due consideration and modification at that meeting, FGI plans to issue the draft documents for public consideration and proposals for change along with the 2010 document. Although the draft guidelines will be published for informational purposes only, individual state authorities having jurisdiction (AHJs) may adopt or refer to them before the draft recommendations have moved through the complete consensus development process.

The development of the draft critical access hospital guidelines is one model for development and dissemination of new material between the four-year release dates of

new editions of the Guidelines. Development and publication of white papers is another approach, one which has already served the Guidelines well in the development of new acoustic design guidelines and guidelines for design of oncology nursing units and cancer treatment/infusion therapy facilities (as explained in the acknowledgments section of this edition).

Since draft guidelines and white papers may be published at least two years ahead of the next edition of the Guidelines, they may serve other beneficial purposes, including the following:

- Stimulation of early action, research, development, and dissemination of information for consideration and discussion
- Provision of drafts on subjects for which very little other information may be available
- Receipt of feedback that can assist in developing the next edition of the Guidelines

To prepare for the issuance of such white papers and draft guidelines, and to give purchasers of the 2010 Guidelines a place to access them when they are published, FGI has developed a Guidelines Web site (fgiguideguidelines.org). It is the authors' and FGI's mutual intent to offer such papers free of charge to all users of the Guidelines by making them available for download from the FGI Web site. It is also FGI's intention to develop a feedback mechanism for use as the papers become available.

Glossary

Specific terms and definitions are provided below to facilitate consistency in the interpretation and application of the Guidelines.

Adjacent: Not distant, nearby (close at hand).

Administrative areas: Designated spaces such as offices and meeting rooms that accommodate admission and discharge processes, medical records storage, medical and nursing administration, business management and financial services, human resources, purchasing, community services, education, and public relations.

Airborne infection isolation (AII) room: A room designated for persons having or suspected of having an infection that is spread through coughing or other ways of suspending droplets of pathogens into the air (e.g., tuberculosis, smallpox).

Ambulatory care: A defined health care encounter of less than 24 hours in duration that requires direct professional health care support within a specific facility.

Ambulatory surgical facility: Any surgical facility organized for the purpose of providing invasive surgical care to patients with the expectation that they will be recovered sufficiently to be discharged in less than 24 hours.

Angiography: The radiographic visualization of blood vessels following introduction of contrast material for purposes of diagnosis.

Area: A particular extent of space or surface serving a defined function.

Authority having jurisdiction (AHJ): An individual or organization designated by a state or government agency to enforce building codes and other regulations related to construction projects.

Bariatric patient: A patient admitted specifically for bariatric care or a patient who is morbidly obese. For more information, see appendix items A1.2-5b and A1.2-6.4a in Chapter 1.2.

Bed size: Minimum rectangular dimensions for planning minimum clearances around beds—40 inches (101.6 centimeters) wide by 96 inches (2.43 meters) long.

Biological waste: Waste that contains or has come into contact with bacteria or other pathogens, blood, or body fluids.

Bioterrorism: The use, or threat of use, of biological agents to intimidate a political entity or population group.

Cardiac catheterization: Passage of a catheter through a vessel into the heart to inject contrast material, measure intracardiac pressures, and obtain blood samples. This is a diagnostic procedure and is a form of angiography as defined above.

Chemical waste: Waste that contains toxic, caustic, or otherwise dangerous chemicals.

Clear floor area: The floor area of a defined space that is available for functional use exclusive of toilet rooms, closets, lockers, wardrobes, alcoves, vestibules, anterooms, general circulation, and auxiliary work areas. Floor space below sinks, counters, cabinets, modular units, or other wall-hung equipment mounted to provide usable floor space counts toward “clear floor area.”

Client: A psychiatric patient or resident. For purposes of this document, “psychiatric patient” will refer to a psychiatric client in an inpatient or outpatient facility and “psychiatric resident” will refer to a psychiatric patient in a long term-care facility.

Clinical sink: A flushing-rim sink or “hopper” used for disposal of blood or body fluids (e.g., bedpan washing, drainage of suction canisters). This is not the same as a hand-washing sink or an instrument-cleaning sink (single- or double-sink type).

Continuing care nursery: A unit that provides care to children under one year of age, excluding neonates.

Cubicle: A space intended for human occupancy enclosed on multiple sides with full height or partial

partitions or curtains, with at least one opening and no door.

Differential pressure: A measurable difference in air pressure that creates a directional airflow between adjacent spaces.

Directly accessible: Adjacent with a doorway, pass-through, or other opening connecting two spaces.

Documentation area: A work area associated with or near a patient care area where information specific to patients is recorded, stored, and reviewed to facilitate ready access by authorized individuals.

Emergency call system: Devices that are activated to indicate the need for staff assistance. Such devices produce an audible or visual indication (or both) or may be connected or transmit to an area alert monitor.

Environmental services (housekeeping): Services anywhere within a health care facility that provide general cleaning and tidying and supply identified cleaning materials (e.g., soaps, towels). (While routine disinfection protocols can be included in such a definition, the definition is not intended to include complex, non-routine disinfection procedures nor the non-routine disposition of hazardous materials such as potentially toxic drugs or other chemicals and radioactive wastes.)

Environment of care: Those features in a built health care facility that are created, structured, and maintained to support and enhance quality health care.

Examination/treatment room: A room with a bed, stretcher, or examination table and capability for periodic monitoring (e.g., measurement of blood pressure or pulse oximetry) in which procedures that do not require a specialized suite can be performed (e.g., pelvic examination, blood transfusion).

Facility: A discrete physical entity composed of various functional units as described within these Guidelines.

Hand sanitation dispenser: A unit that contains alcohol-based hand-washing rub (ABHR) or other FDA-approved solutions used for hand hygiene.

Hand-washing station: An area that provides a sink with hot and cold water supply and a faucet that facilitates easy on/off/mixing capabilities. The

station also provides cleansing agents and means for drying hands.

Health care facility: Any facility type listed in the table of contents of this book.

Immediately accessible: Available within the same unit.

Infection control risk assessment: A multidisciplinary organizational process that focuses on reducing risk from infection throughout facility planning, design, and construction (including renovation) activities. The environment, infectious agents, and human factors and the impact of the proposed project are considered by a multidisciplinary team that includes, at minimum, those with expertise in infectious disease, infection control, patient care, epidemiology, facility design, engineering, construction, and safety, as circumstances dictate.

Interventional catheterization: The use of dilating balloons and the placement of stents to treat occluded or narrowed blood vessels; procedures done to treat vascular disease that require radiographic imaging.

Interventional imaging: Therapeutic procedures that require radiographic visualization.

Invasive procedure: For the purposes of this document, any procedure that penetrates the protective surfaces of a patient's body (i.e., skin, mucous membrane, cornea) and that is performed within an aseptic field (procedural site). Not included in this category are placement of peripheral intravenous needles or catheters, dialysis, bronchoscopy, endoscopy (e.g., sigmoidoscopy), insertion of urethral catheters, and similar procedures.

Low birth weight baby: A child born weighing less than 5.5 lbs. (2,500 gms.), regardless of gestational age.

Minimum clearance: The shortest unencumbered distance between the outermost dimensions of a specified object (often a patient bed) and specified, fixed reference points (e.g., walls, cabinets, sinks, and doors).

Monolithic ceiling: A ceiling constructed with a surface free of fissures, cracks, and crevices. Any penetrations such as lights, diffusers, and access panels shall be sealed or gasketed. ("Lay-in" ceilings are not considered "monolithic.")

- Newborn intensive care unit (NICU):** A unit that provides care for medically unstable or critically ill newborns who require intensive interventions.
- Nursing locations:** Departments, units, rooms, spaces, or areas in which patient observation, nursing care, and treatment services rendered involve direct contact between patients/residents and staff.
- Observation unit:** An area usually associated with an emergency department where one or more patients can be clinically monitored, assessed, and treated by staff for up to 24 hours.
- Obstetrical suite:** This term will be used synonymously with “labor and delivery area.” It includes areas outside of the surgery suite where cesarean deliveries can be performed.
- Operating room:** A room designated and equipped for performing surgical operations that requires a restricted environment.
- Patient:** A person receiving medical, surgical, or psychiatric care in an inpatient or outpatient facility.
- Patient care area:** An area used primarily for the provision of clinical care to patients. Such care includes monitoring, evaluation, and treatment services.
- Perioperative:** Referring to patient care and other related support activities immediately before, during, or after an operative procedure.
- PHAMA:** patient handling and movement assessment.
- Premature baby:** A child who is born prior to 37 weeks of gestation.
- Procedure room:** A room designated for the performance of special procedures that do not require a restricted environment but may use sterile instruments or equipment (e.g., endoscopy, cystoscopy, laser procedures).
- Protective environment (PE):** A room or unit used to protect the profoundly immunosuppressed patient with prolonged neutropenia (i.e., a patient undergoing an allogeneic or autologous bone marrow/stem cell transplant) from common environmental airborne infectious microbes (e.g., *Aspergillus* spores). The differentiating factors between protective environment rooms and other patient rooms are the requirements for filtration and positive air pressure relative to adjoining spaces.
- Provisions for drinking water:** Availability of readily accessible potable water for patient, staff, and visitor needs. This may be provided in a variety of ways, including fountains and bottled water.
- Public areas:** Designated spaces freely accessible to the public. These include parking areas, secured entrances and areas, entrance lobbies, reception and waiting areas, public toilets, snack bars, cafeterias, vending areas, gift shops and other retail locations, health education libraries and meeting rooms, chapels, and gardens.
- Radioactive waste:** Waste containing radioactive materials.
- Readily accessible:** Available on the same floor.
- Regulated waste:** Waste regulated by federal, state, or local governments that requires special handling and disposal, including biological, chemical, or radioactive wastes.
- Resident:** A person living and receiving chronic or sub-acute care in an assisted living facility, skilled nursing facility, nursing home, or rehabilitation facility.
- Restricted area:** A designated space with limited access eligibility. Such space has one or more of the following attributes: specific signage; physical barriers; security controls and protocols that delineate requirements for monitoring, maintenance, attire, and use. (The term is often applied to operating rooms and suites.)
- Room:** A space enclosed by hard walls and having a door.
- Sealed (tight) room:** A room that meets specific ventilation requirements and has minimum air leakage to achieve a particular designed air quality, airflow direction, and pressure differential.
- Service areas:** Designated spaces that house auxiliary functions that do not routinely involve contact with patients, residents, clients, or the public (e.g., supply, processing, storage, and maintenance services such as pharmacy, dietary, bulk sterile processing, laundry processing and storage, housekeeping, engineering operations, and waste storage/holding facilities).

Special purpose room: Any room with a designated special purpose. The term is more general than “treatment room” and should not be used synonymously.

Subacute care: A category of care requiring less intensity of care/resources than acute care. It falls within a continuum of care determined by patient acuity, clinical stability, and resource needs.

Support areas (general): Where the word “room” or “office” is used, a separate, enclosed space for the one named function is intended. Otherwise, the described area is permitted to be a specific space in another room or common area.

Support areas (nursing units, diagnostic and treatment areas, etc.): Designated spaces or areas in which staff members perform auxiliary functions that support the main purpose of the unit or other location.

Support areas (patient/resident, families, and/or visitors): Designated spaces for the use of patients, residents, clients, registrants, or visitors (e.g., clothing change areas, dining rooms, toilet rooms, lounges) or families and visitors (e.g., waiting areas and lounges, children’s play areas, toilet rooms).

Support areas (staff): Designated spaces for the personal use of staff personnel (e.g., clothing change areas, toilets, showers, lounges, dining areas).

Surgical suite: A space that includes an operating room(s) and support areas.

Sustainability: A means of configuring civilization and human activity so that society, its members, and its economies are able to meet their needs and express their greatest potential in the present, while preserving biodiversity and natural ecosystems in the long term; improving the quality of human life while living within the carrying capacity of supporting ecosystems.

Sustainable design: The art of designing physical objects, the built environment, and services to comply with principles of economic, social, and ecological sustainability.

Swing bed: A patient bed that may be used for varying levels of clinical acuity. The built environment for such a bed must be consistent with the highest level of care acuity planned or provided.

Unit: An area or space usually dedicated to a single defined organizational function.

List of Acronyms

AAMI —Association for the Advancement of Medical Instrumentation	HICPAC —Healthcare Infection Control Practices Advisory Committee
ACGIH [®] —American Conference of Governmental Industrial Hygienists	HIV —human immunodeficiency virus
ACH —air changes per hour	HSCT —hematopoietic stem cell transplant
ADA —Americans with Disabilities Act	HVAC —heating, ventilation, and air conditioning
AFB —acid-fast bacilli	ICRA —infection control risk assessment
AHA —American Hospital Association	ICU —intensive care unit
AHJ —authority having jurisdiction	MDRO —multiple-drug resistant organism
AIA —American Institute of Architects	MMWR —“Morbidity and Mortality Weekly Report”
AII —airborne infection isolation	MRS —methicillin-resistant <i>Staphylococcus aureus</i>
ANSI —American National Standards Institute	MSDS —material safety data sheet
AORN —Association of periOperative Registered Nurses	NCID —National Center for Infectious Diseases
ASA —Acoustical Society of America	NCCDPHP —National Center for Chronic Disease Prevention and Health Promotion
ASHE —American Society for Healthcare Engineering	NCCLS —National Committee for Clinical Laboratory Standards
ASHRAE —American Society of Heating, Refrigerating, and Air-Conditioning Engineers	NICU —neonatal intensive care unit
BMBL —CDC/NIH publication “Biosafety in Microbiological and Biomedical Laboratories”	NIH —U.S. National Institutes of Health
BSL —biosafety level	NIOSH —National Institute for Occupational Safety and Health
C —Centigrade	OSHA —U.S. Occupational Safety and Health Administration
CDC —U.S. Centers for Disease Control and Prevention	Pa —Pascal
CFR —Code of Federal Regulations	PE —protective environment
CFU —colony-forming unit	PEL —permissible exposure limit
CMS —U.S. Centers for Medicare and Medicaid Services	PHAMA —patient handling and movement assessment
CPL —compliance document (OSHA)	PPE —personal protective equipment
DHHS —U.S. Department of Health and Human Services	ppm —parts per million
DOP —dioctylphthalate	PSRA —patient safety risk assessment
EC —environment of care (Joint Commission)	PVC —polyvinylchloride
EPA —U.S. Environmental Protection Agency	RO —reverse osmosis
ESRD —end-stage renal disease	SSI —surgical site infection
F —Fahrenheit	TB —tuberculosis
FDA —U.S. Food and Drug Administration	TLV[®]-TWA —threshold limit value-time weighted average
FRC —free residual chlorine	USDA —U.S. Department of Agriculture
FTC —U.S. Federal Trade Commission	UV —ultraviolet
HEPA —high-efficiency particulate air	UVGI —ultraviolet germicidal irradiation
	VAV —variable air volume

General

1

1.1 Introduction

■ 1.1-1 General

1.1-1.1 Application

1.1-1.1.1 The provisions of this chapter shall apply to all health care facility projects.

1.1-1.1.2 This document covers health care facilities common to communities in the United States.

1.1-1.1.3 Facilities with unique services will require special consideration. However, sections herein may be applicable for parts of any facility and may be used where appropriate.

1.1-1.2 About This Document

The *Guidelines for Design and Construction of Health Care Facilities* (Guidelines) is developed through a consensus process similar to one approved by the American National Standards Institute (ANSI). This process brings together the members of the Health Guidelines Revision Committee (HGRC) of the Facility Guidelines Institute, Inc. (FGI). The HGRC is a balanced group of volunteers representing varied viewpoints and interests in health care facility planning, design, and construction. It considers proposals for change received from the public; achieves consensus on health care facility planning, design, and construction issues; and develops proposed revisions to the previous edition of these Guidelines. The proposed revisions are then published for public comment and revised by the HGRC, as needed, in response to those comments. The product of this revision process is then compiled and published as a new edition of the Guidelines. The publisher of the 2010 edition is the American Society for Healthcare Engineering (ASHE) of the American Hospital Association.

1.1-1.2.1 Uses of This Document

These Guidelines are made available for a wide variety of public and private uses. These include reference in laws, codes, rules, and regulations, as well as use in

private self-regulation and standardization of space and equipment requirements and the promotion of safe practices and methods in planning, design, and construction for various types of health care facilities.

1.1-1.2.1.1 Regulatory use. Use of these Guidelines or any portion thereof for regulatory purposes should be accomplished through adoption by reference. The term “adoption by reference” means the citing of title, edition, and publishing information only.

- (1) Any deletions, additions, and changes desired by the adopting authority should be noted separately in the adopting instrument.
- (2) To help FGI follow the uses made of this document, adopting authorities are requested to notify FGI at info@fgiguideines.org when they adopt these Guidelines or use them in any other regulatory fashion.

1.1-1.2.2 Disclaimers

1.1-1.2.2.1 While FGI administers the process and establishes rules to promote fairness in the development of consensus, it does not independently test, evaluate, or verify the accuracy of any information or the soundness of any judgments or advice contained in these Guidelines.

1.1-1.2.2.2 FGI endeavors to develop performance-oriented minimum requirements as suggested standards for American health care facility design, without prescribing design solutions. FGI disclaims liability for any personal injury or property or other damages of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, or reliance on this document. FGI also makes no guaranty or warranty as to the accuracy or completeness of any information published herein.

1.1-1.2.2.3 In issuing and making this document available, FGI and ASHE are not undertaking to

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render professional or other services for or on behalf of any person or entity. Nor are FGI and ASHE undertaking to perform any duty owed by any person or entity to someone else.

1.1-1.2.2.4 Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstance.

1.1-1.2.2.5 Neither FGI nor ASHE has any power, nor do they undertake, to police or enforce compliance with the contents of this document. Nor do FGI or ASHE list, certify, test, or inspect designs or construction for compliance with this document.

1.1-1.2.2.6 Any certification or other statement of compliance with the requirements of this document shall not be attributable to FGI or ASHE and is solely the responsibility of the certifier or maker of the statement.

1.1-1.2.3 Copyright

The content of this document, in both book and electronic form, is copyrighted by the Facility Guidelines Institute, Inc. By making this document available for use and adoption by public authorities and private users, FGI does not waive any rights in copyright to this document.

1.1-1.3 How to Use These Guidelines

1.1-1.3.1 Basic Organization

1.1-1.3.1.1 Main body. The main body of this document comprises four parts:

- (1) Part 1 contains chapters that address considerations applicable to all health care facilities, except as noted or modified in specific facility chapters in the remaining parts.
- (2) Part 2 addresses facilities where inpatient care is provided, with chapters devoted to general hospitals, small primary care hospitals, psychiatric hospitals, and rehabilitation facilities.
- (3) Part 3 addresses facilities where outpatient care is provided.
- (4) Part 4 addresses residential health care settings.

Chapters are devoted to nursing facilities, hospice care, and assisted living.

- (5) Part 5 contains chapters on health care facilities that do not fall into the categories of Parts 2, 3, or 4. In this edition, adult day health care facilities; birth centers; and mobile, transportable, and relocatable units appear in Part 5.
- (6) Part 6 contains the full text of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 170-2008: *Ventilation of Health Care Facilities*. This ANSI/ASHRAE/ASHE standard has been incorporated directly into the Guidelines as minimum requirements for ventilation systems.

1.1-1.3.1.2 Appendix. An appendix is associated with most chapters in the main body of the text.

- (1) An asterisk (*) preceding a paragraph number indicates that explanatory or educational material can be found in an appendix item located at the bottom of the page.
- (2) Appendix items are identified by the letter “A” preceding the paragraph number in the main text to which they relate.

1.1-1.3.1.3 Front and back matter

- (1) Informative introductory sections, including a preface, a summary of major additions and revisions to the previous edition, acknowledgments, and the table of contents precede the main body of the document.
- (2) A glossary of terms appears before the main body of the text, and following the text is a detailed index and forms for use in submitting requests for formal interpretations and proposals to change these Guidelines. For Guidelines 2010, a “where to find it” matrix of relocated information has been produced to help readers familiar with previous editions of these Guidelines find information that has been moved to a different location in the 2010 edition. This matrix is available on the FGI Web site at www.fgiguideelines.org.

1.1-1.3.2 Minimum Standards for New Facilities

Each chapter in this document contains information intended as minimum standards for designing and constructing new health care facility projects.

1.1-1.3.2.1 Standards set forth in these Guidelines shall be considered as minimum.

1.1-1.3.2.2 These standards relate to desired performance or results or both.

1.1-1.3.3 Code Language in the Guidelines

For brevity and convenience, these standards are presented in “code language.”

1.1-1.3.3.1 Use of words such as “shall” indicates mandatory language only where the text is applied by an adopting authority having jurisdiction (AHJ). However, when adopted by an AHJ, design and construction shall conform to the requirements of these Guidelines.

1.1-1.3.3.2 The word “Reserved” is used to help standardize numbering of the text and is not necessarily a placeholder for specific requirements.

1.1-1.3.3.3 Cross-references are sometimes used to include language from another chapter in these Guidelines in the chapter where the cross-reference appears. Such references include the section as identified by number and title and all its subsections, unless otherwise noted. (Cross-references only include the title when it is different from that of the paragraph where the reference appears.)

1.1-1.3.4 Use with Other Codes

These Guidelines address certain details of construction and engineering that are important for health care facility design and construction, but they are not intended to be all-inclusive, nor shall they be used to the exclusion of other guidance. When applicable, other details of construction and engineering that are part of good design practice and building regulation shall be consulted in addition to these Guidelines.

1.1-1.3.4.1 Local codes. For aspects of design and construction not included in these Guidelines, local governing building codes shall apply.

1.1-1.3.4.2 Model codes. Where there is no local governing building code, the prevailing model code used in the relevant geographic area is hereby specified for all requirements not otherwise specified in these Guidelines.

1.1-1.3.4.3 Authority having jurisdiction (AHJ) verification. Some projects may be subject to the regulations of several different jurisdictions, including local, state, and federal authorities. While coordination efforts have been made, these Guidelines may not always be consistent with all applicable codes, rules, and regulations. Therefore, it is essential that individual project requirements be verified as appropriate with all authorities having jurisdiction. Should requirements be conflicting or contradictory, the AHJ having primary responsibility for resolution should be consulted.

1.1-1.3.5 Deviations from the Guidelines

These Guidelines are not intended to restrict innovations and improvements in design or construction techniques. Accordingly, authorities adopting these standards as codes may approve plans and specifications that contain deviations if it is determined that the applicable intent or objective has been met. For more information, see 1.1-3.1.1 (Exceptions) and 1.1-5.3 (Equivalency). Final implementation of these Guidelines may be subject to requirements of the authority having jurisdiction.

1.1-2 Interpretations of Requirements

1.1-2.1 Purpose of Interpretation

1.1-2.1.1 Interpretations of the language in the document are intended to provide clarification; a summary of any background and previous discussion, if appropriate; and a rationale for the interpretation rendered.

1.1-2.1.2 It is understood that any such interpretation is advisory in nature, intended to assist the user and adopting authority having jurisdiction to maximize the value of these Guidelines.

1.1-2.2 Requesting an Interpretation

1.1-2.2.1 The interpretation of a specific standard contained in these Guidelines may be requested from the Facility Guidelines Institute (FGI) with a detailed request.

1.1-2.2.2 Requests for interpretation should be submitted to FGI in an e-mail message to interpretations@fgi-guidelines.org. See the FGI Web site (fgiguidelines.org) for more information.

■ 1.1-3 Renovation

1.1-3.1 Compliance Requirements

Where renovation or replacement work is done within an existing facility, all new work or additions or both shall comply both with applicable sections of these Guidelines and with the applicable occupancy chapter of NFPA 101: *Life Safety Code*®.

1.1-3.1.1 Exceptions

Where major structural elements make total compliance impractical or impossible, exceptions shall be considered.

1.1-3.1.1.1 This recommendation does not guarantee that an exception will be granted, but does attempt to minimize restrictions on those improvements where total compliance would not substantially improve safety but would create an unreasonable hardship.

1.1-3.1.1.2 These standards shall not be construed as prohibiting a single phase of improvement. (For example, a facility may plan to replace a flammable ceiling with noncombustible material but lack funds to do other corrective work.) However, they are not intended as encouragement to ignore deficiencies when resources are available to correct life-threatening problems. See 1.1-5.3 (Equivalency).

1.1-3.1.2 Temporary Waivers

When parts of an existing facility essential to continued overall facility operation cannot comply with particular standards, those standards may be temporarily waived if patient care and safety are not jeopardized.

1.1-3.2 Affected Areas

In renovation projects and additions to existing facilities, only that portion of the total facility affected by the project shall be required to comply with applicable sections of these Guidelines.

1.1-3.3 Unaffected Areas

Those existing portions of the facility and its associated

building systems that are not included in the renovation but are essential to the functionality or code compliance of the renovated spaces shall, at minimum, comply with the applicable occupancy chapter of NFPA 101: *Life Safety Code*.

1.1-3.4 Functional Requirements and Safety

When construction is complete, the facility shall satisfy functional requirements for the appropriate classification (general hospital, skilled nursing facility, etc.) in an environment that will provide acceptable care and safety to all occupants.

1.1-3.5 Conversion

When a building is converted from one occupancy to another, it shall comply with the new occupancy requirements.

1.1-3.6 Undiminished Safety

Renovations, including new additions, shall not diminish the safety level that existed prior to the start of the work; however, safety in excess of that required for new facilities is not required.

1.1-3.7 Long-Range Improvement

1.1-3.7.1 Nothing in these Guidelines shall be construed as restrictive to a facility that chooses to do work or alterations as part of a phased long-range safety improvement plan.

1.1-3.7.2 All hazards to life and safety and all areas of noncompliance with applicable codes and regulations shall be corrected as soon as possible in accordance with a plan of correction.

■ 1.1-4 Government Regulations

1.1-4.1 Design Standards for the Disabled

1.1-4.1.1 Federal Standards

1.1-4.1.1.1 Regulations

- (1) The Americans with Disabilities Act (ADA), which became law in 1990, extends comprehensive civil rights protection to individuals with disabilities. Under Titles II and III of the ADA, public, private, and public service hospitals and other health care

facilities are required to comply with the *Accessibility Guidelines for Buildings and Facilities* (ADAAG) for alterations and new construction.

- (2) The *Uniform Federal Accessibility Standards* (UFAS) also provides criteria for the disabled.

1.1-4.1.1.2 Implementation. Implementation of UFAS and ADAAG for federal facilities is handled in the following ways:

- (1) Compliance with UFAS
- (2) Compliance with ADAAG
- (3) Compliance with a combination of UFAS and ADAAG using the most stringent criteria

1.1-4.1.1.3 Applicability. Individual federal agencies will provide direction on applicable criteria to be used for the design of federal facilities.

1.1-4.1.2 State and Local Standards

1.1-4.1.2.1 Many state and local jurisdictions have adopted ICC/ANSI A117.1: *Accessible and Usable Buildings and Facilities*, which is also available for use in providing quality design for the disabled.

1.1-4.1.2.2 State and local standards for accessibility and usability may be more stringent than ADA, UFAS, or ANSI A117.1. Designers and owners, therefore, must assume responsibility for verification of all applicable requirements.

1.1-4.1.3 Special Needs in Health Care Facilities

Users of health care facilities often have very different accessibility needs than the typical adult individual with disabilities addressed by the model standards and guidelines mentioned above. Hospital patients, and especially nursing facility residents, due to their stature, reach, and strength characteristics, typically require the assistance of caregivers during transfer maneuvers. Many prescriptive requirements of model accessibility standards place both older persons and caregivers at greater risk of injury than do facilities that would be considered noncompliant. Thus, flexibility may be permitted for the use of assistive configurations that address considerations for transfer assistance.

1.1-4.2 Regulations for Wind- and Earthquake-Resistant Design for New Buildings

1.1-4.2.1 ASCE/SEI 7

The seismic provisions in ASCE/SEI 7: *Minimum Design Loads for Buildings and Other Structures* are based on the National Earthquake Hazards Reduction Program (NEHRP) provisions developed by the Building Seismic Safety Council (BSSC) for the Federal Emergency Management Agency (FEMA).

1.1-4.2.2 Other Seismic Standards

The following seismic standards are essentially equivalent to the ASCE/SEI 7 provisions:

- (1) NEHRP *Recommended Provisions for Seismic Regulations for New Buildings*
- (2) *International Building Code*

1.1-4.3 Flood Protection

Executive Order 11988, Flood Protection, dated May 24, 1977, was issued to minimize financial loss from flood damage to facilities constructed with federal assistance.

1.1-4.4 National Standards for the Protection of Patient Health Information

1.1-4.4.1 HIPAA

The Health Insurance Portability and Accountability Act (HIPAA) became law in 1996. HIPAA consists of three major parts: the Privacy Rule, Transaction and Code Sets, and the Security Rule.

1.1-4.4.1.1 The U.S. Department of Health and Human Services (HHS) issued the Privacy Rule to implement the requirement of HIPAA. Within HHS, the Office of Civil Rights (OCR) has responsibility for enforcement of the HIPAA regulations. HHS may provide direction and clarification on the Privacy Rule and Security Rule.

1.1-4.4.1.2 HIPAA does not preempt or override laws that grant individuals even greater privacy protection. Additionally, covered entities are free to retain or adopt more protective policies or practices.

1.1-4.4.1.3 HIPAA provides for civil and even criminal penalties for violations.

1.1-4.4.1.4 Ultimately, designers and owners must assume responsibility in developing policies and procedures for verification of all applicable requirements that appropriately limit access to personal health information without sacrificing the quality of health care.

1.1-4.5 Environmental Regulations

1.1-4.5.1 Federal Environmental Regulations

The principal federal environmental statutes likely to be applied to health care facilities include, most notably, the following:

1.1-4.5.1.1 Clean Air Act (CAA)

1.1-4.5.1.2 National Environmental Policy Act (NEPA)

1.1-4.5.1.3 Occupational Safety and Health Act (OSHA)

1.1-4.5.1.4 Resource Conservation and Recovery Act (RCRA)

1.1-4.5.1.5 Safe Drinking Water Act (SDWA)

1.1-4.5.1.6 Superfund Amendments and Reauthorization Act (SARA)

1.1-4.5.2 State and Local Environmental Regulations

U.S. Department of Health and Human Services (DHHS) and U.S. Environmental Protection Agency (EPA) regional offices as well as other federal, state, or local authorities having jurisdiction can provide information regarding the latest state and local regulations pertaining to environmental pollution that may affect the design, construction, or operation of health care facilities, including management of industrial chemicals, pharmaceuticals, radionuclides, and wastes as well as trash, noise, and traffic (including air traffic).

1.1-5 Building Codes and Standards

1.1-5.1 Safe Environment

Every health care facility shall provide and maintain a safe environment for patients, personnel, and the public.

1.1-5.2 Code Compliance

In the absence of state or local requirements, the project shall comply with approved nationally recognized building codes except as modified in the latest edition of NFPA 101 and/or herein.

1.1-5.2.1 References made in these Guidelines to appropriate model codes and standards do not, generally, duplicate wording of the referenced codes.

1.1-5.2.2 National Fire Protection Association (NFPA) standards are the basic standards of reference, but other codes and/or standards may be included as part of these Guidelines. See Section 1.1-5.5 (Referenced Codes and Standards).

1.1-5.2.3 Referenced code material is contained in the issue current at the time of this publication.

1.1-5.2.4 The latest revision of code material is usually a clarification of intent and/or general improvement in safety concepts and may be used as an explanatory document for earlier code editions.

1.1-5.2.5 Questions of applicability should be addressed as the need occurs. The actual version of a code adopted by a jurisdiction may be different. Confirm the version adopted in a specific location with the authority having jurisdiction.

1.1-5.3 Equivalency

1.1-5.3.1 Performance Standards

The minimum standards in these Guidelines have been established to obtain a desired performance result.

1.1-5.3.2 Prescriptive Standards

Prescriptive limitations (such as exact minimum dimensions or quantities), when given, describe a condition that is commonly recognized as a practical

standard for normal operation. For example, reference to a room or area by the patient, equipment, or staff activity that identifies its use avoids the need for complex descriptions of procedures for appropriate functional programming.

1.1-5.3.3 Technical Standards

1.1-5.3.3.1 NFPA 101A is a technical standard for evaluating equivalency to certain requirements of NFPA 101: *Life Safety Code*.

1.1-5.3.3.2 The Fire Safety Evaluation System (FSES) has become widely recognized as a method for establishing a safety level equivalent to that of the *Life Safety Code*. It may be useful for evaluating compliance with the *Life Safety Code* in renovations of existing facilities and in new facility designs. For purposes of these Guidelines, use of the FSES is permitted, subject to AHJ approval, for new construction and renovation projects. (The FSES is intended as an evaluation tool for fire safety only.)

1.1-5.3.4 Equivalency Concepts

While these Guidelines are adopted as a regulatory standard by many jurisdictions, it is the intent of the document to permit and promote equivalency concepts.

1.1-5.3.4.1 When contemplating equivalency allowances, the authority having jurisdiction may use a variety of expert sources to make equivalency findings and may document the reasons for approval or denial of equivalency to the requester.

1.1-5.3.4.2 Alternate methods, procedures, design criteria, and functional variations from these Guidelines, because of extraordinary circumstances, new programs, or unusual conditions, may be approved by the authority having jurisdiction when the facility can effectively demonstrate that the intent of the Guidelines is met and that the variation does not reduce the safety or operational effectiveness of the facility below that required by the exact language of the Guidelines.

1.1-5.3.4.3 In all cases where specific limits are described, equivalent solutions will be acceptable if the authority having jurisdiction approves them as meeting the intent of these standards.

1.1-5.3.4.4 Nothing in this document shall be construed as restricting innovations that provide an equivalent level of performance with these standards in a manner other than that which is prescribed by this document, provided that no other safety element or system is compromised in order to establish equivalency.

1.1-5.4 English/Metric Measurements

1.1-5.4.1 Where measurements are a part of this document, the English units given constitute the basic requirement. Approximately equivalent metric units are provided in parentheses after the English units.

1.1-5.4.2 Either method shall be consistently used throughout a given design.

1.1-5.5 Referenced Codes and Standards

1.1-5.5.1 Codes and standards that have been referenced in whole or in part in the various sections of this document and documents from which Guidelines concepts have been adopted are listed in this section.

1.1-5.5.2 Users of these Guidelines are encouraged to use these publications for further information as may be necessary to achieve the final product. The issues available at the time of publication are cited. Later issues will normally be acceptable where requirements for function and safety are not reduced; however, editions of different dates may have portions renumbered or retitled. Care must be taken to ensure that appropriate sections are used.

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Standard 55-2004, *Thermal Environmental Conditions for Human Occupancy*.
Standard 62-1999, *Ventilation for Acceptable Indoor Air Quality*.
Standard 90.1, *Energy Standard for Buildings Except Low-Rise Residential Buildings*.
Standard 154-2003, *Ventilation for Commercial Cooking Operations*.

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ANSI/ASME A17.1, *Safety Code for Elevators and Escalators*, 2000.
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C1028-07, *Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method*
C1071-05, *Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material)*.
E1130-08, *Standard Test Method for Objective Measurement of Speech Privacy in Open Plan Spaces Using Articulation Index*.
ASTM E1886-05, *Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials*
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1.1 INTRODUCTION

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1.2 Planning, Design, Construction, and Commissioning

Appendix material, which appears in shaded boxes at the bottom of the page, is advisory only.

■ 1.2-1 General

1.2-1.1 Application

The provisions of this chapter shall apply to all health care facility projects.

*1.2-1.2 Planning, Design, and Implementation Process

Multidisciplinary groups/persons (stakeholders) affected by and integral to the design shall be included in the project planning and implementation process. The multidisciplinary team shall include, at minimum, administrators, clinicians, infection preventionists, design professionals, architects, facility managers, safety officers, users of equipment, and support staff relevant to the areas affected by the project as well as those with knowledge of the organization's functional goal for the project. The scope and nature of the project shall dictate others involved.

1.2-1.3 Environment of Care and Facility Function Considerations

Described in the functional program section of this chapter are environment of care components (includ-

ing key elements of the physical environment) and functional facility requirements that directly affect the experience of all people who spend time in health care facilities. How these components and requirements are addressed in health care facility design influences patient care outcomes and patient satisfaction, dignity, privacy, confidentiality, and safety as well as the incidence of medical errors, patient and staff stress, and facility operations.

In addition to the text in this chapter, which applies to all health care facilities, specific elements of the environment of care are described in individual chapters where the demonstrated value and necessity of such features are unique to a particular facility type.

*1.2-1.3.1 Framework for Health Facility Design

1.2-1.3.1.1 Because the built environment has a profound effect on health, productivity, and the natural environment, health care facilities shall be designed within a framework that recognizes the primary mission of health care (including “first, do no harm”) and that considers the larger context of enhanced patient

APPENDIX

A1.2-1.2 Planning, Design, and Implementation Process

- a. To meet the objectives of this chapter, health care organizations should develop an interdisciplinary design process to guide facility design. The intent of an interdisciplinary design process is to improve building performance by integrating sustainable design considerations from project inception. (Also see Section A1.2-6.2.)
- b. An interdisciplinary design team should be assembled as early as possible in the design process. The design team should include but not be limited to facility administrators, clinicians, infection preventionists, safety officers, support staff, patient advocates/consumers, A/E consultants, and construction specialists. (Also see Section A1.2-2.2.2.6.)

A1.2-1.3.1 Framework for Health Facility Design

The care environment is constituted by those features in a built health care facility that are created, structured, and maintained to support quality health care.

As patients and their families have become more involved in the course of care, health care organizations need to respond to the changing requirements for accommodations.

- a. The health care environment should enhance the dignity of the patient through features that permit privacy and confidentiality.
- b. Stress can be a major detriment to the course of a patient's care. The facility should be designed to reduce patient, family, and staff stress wherever possible. Research- and evidence-based materials are available to support these goals and should be referred to during design.
- c. As technology changes, flexibility is in the best interests of quality care.
- d. As health care economics apply pressure to management, design should make every effort to enhance the performance, productivity, and satisfaction of the staff in order to promote a safe environment of care.
- e. Creativity should be encouraged in the design process to enhance the environment of care.

environment, employee effectiveness, and resource stewardship.

1.2-1.3.1.2 Facility construction, whether for free-standing buildings, expansion, or renovation of existing buildings, can create conditions that are harmful to patients and staff. Thus, new health care buildings and renovations need to be designed and constructed to facilitate ongoing cleanliness and mitigate infection control concerns. For these reasons, health care facility planning, design, construction, and commissioning activities shall include—in addition to consideration of space and operational needs—consideration of provisions for infection control, patient safety, patient handling and movement, life safety, and protection of occupants during construction.

■ 1.2-2 Functional Program

1.2-2.1 Functional Program Requirement

The health care provider shall supply a functional program for each facility project. (Activities such as projects that only involve equipment replacement, fire safety upgrades, or minor renovations that will not change the facility’s function or character shall not require a functional program.)

1.2-2.2 Functional Program Outline

A functional program for the facility shall describe the following:

1.2-2.2.1 Purpose of the Project

1.2-2.2.1.1 Required services. A description of those services necessary for the complete operation of the facility shall be provided in the functional program.

1.2-2.2.2 Environment of Care Components

The relationships between the following environment of care components (including key elements of the physical environment) and the functional requirements shall be addressed in the functional program:

*1.2-2.2.2.1 Delivery of care model (concepts)

- (1) The delivery of care model shall be defined in the functional program.
- (2) The functional program shall support the delivery of care model to allow the design of the physical environment to respond appropriately.

1.2-2.2.2.2 Facility and service users (people). The physical environment shall support the facility and service users in their effort to administer the delivery of care model.

***1.2-2.2.2.3 Systems design.** The physical environment shall support organizational, technological, and building systems designed for the intended delivery of care model.

***1.2-2.2.2.4 Layout/operational planning.** The layout and design of the physical environment shall enhance operational efficiencies and the satisfaction of patients or residents, families, and staff.

1.2-2.2.2.5 Physical environment. The physical environment shall be designed to support the intended delivery of care model and address the key elements listed below:

- * (1) Light and views. Use and availability of natural light, illumination, and views shall be considered in the design of the physical environment.

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A1.2-2.2.2.1 Delivery of care model (concepts). Examples of delivery of care models include patient-focused care, family-centered care, and community-centered care.

A1.2-2.2.2.3 Systems design. Physical relationships between services or new aggregations of services should be clearly defined and supported. Clustering of related services affects the criteria for design of the physical environment.

Information technology, medical technology, and/or staff utilization and cross training are issues that should be addressed.

A1.2-2.2.2.4 Layout/operational planning. Criteria for evaluation of the layouts should be consistent with the delivery of care model to allow each optional layout and operational plan to be reviewed appropriately.

A1.2-2.2.2.5 (1) Light and views. Natural light, views of nature, and access to the outdoors should be considered in the design of the physical environment wherever possible.

- a. Access to natural light should be provided no farther than 50 feet from any patient activity area, visitor space, or staff work area. To the

- * (2) Clarity of access (wayfinding). Clarity of access shall be addressed in the overall planning of the facility, individual departments, and clinical areas.
- * (3) Control of environment. Patient/resident/ staff ability to control their environment shall be addressed in the overall planning of the facility consistent with the functional program.
- * (4) Privacy and confidentiality. The level of patient or resident privacy and confidentiality shall be addressed in the overall planning of the facility consistent with the functional program.
- * (5) Safety and security. The safety and security of patients or residents, staff, and visitors shall be addressed in the overall planning of the facility consistent with the functional program.

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highest extent possible, the source of such natural light should also provide opportunities for exterior views.

- b. Siting and organization of the building should respond to and prioritize unique natural views and other natural site features.
- c. Access to natural light should be achieved without going into private spaces (i.e., staff should not have to enter a patient/resident room to have access to natural light). Examples include windows at the ends of corridors, skylights into deep areas of the building in highly trafficked areas, transoms, and door sidelights.
- d. In residential health care occupancies, dining areas, lounges, and activity areas should be designed to include natural light.
- e. Hospitals and long-term care facilities should provide a garden or other controlled exterior space that is accessible to building occupants. Consider specifically designed therapeutic and restorative gardens for patients and/or caregivers as a component of the functional program, as appropriate. Exterior spaces should be located to accommodate staff observation.
- f. Artificial lighting strategies. The Illuminating Engineering Society of North America (IESNA) has developed two publications that apply to health care facilities; both are American National Standards Institute (ANSI) standards. ANSI/IESNA RP-29: *Recommended Practices for Lighting for Hospitals and Health Care Facilities* addresses lighting for the general population and special lighting for medical procedures. ANSI/IESNA RP-28: *Recommended Practices for Lighting and the Visual Environment for Senior Living* addresses the special lighting needs of older adults.
- g. Color rendering properties should be addressed in lamp selection.
- h. Finish selection should address light reflectance values (LRV) in conjunction with lamp selection.
- i. Indirect lighting should be considered to reduce glare.

A1.2-2.2.2.5 (2) Clarity of access (wayfinding)

- a. Entry points to all health care and residential living facilities should be clearly defined from all major exterior circulation modes (roadways, bus stops, vehicular parking).
- b. Clearly visible and understandable signage, icons, symbols, visual landmarks (including views to the outside), and/or cues for orientation should be provided.
- c. Boundaries between public and private areas should be well marked or implied and clearly distinguished.
- d. A system of interior “landmarks” should be developed to aid occupants in cognitive understanding of destinations. These may include

water features, major art, distinctive color, or decorative treatments at major decision points in the building. These features should attempt to involve tactile, auditory and language cues, as well as visual recognition.

- e. Signage systems should be flexible, expandable, adaptable, and easy to maintain.

A1.2-2.2.2.5 (3) Control of environment

- a. Every effort should be made to allow individual control over as many elements of the environment as possible and reasonable, including but not limited to temperature, lighting, sound, and privacy.
- b. Lighting in patient and staff areas should allow for individual control and provide variety in lighting types and levels.
- c. Building design should address individual control over the thermal environment through carefully considered zoning of mechanical systems.
- d. Noise has been proven to be a negative environmental stressor for patients, families, and staff. Noise should be minimized by the design of the physical environment and the selection of operational systems and equipment.

A1.2-2.2.2.5 (4) Privacy and confidentiality

- a. Public circulation and staff/patient circulation should be separated wherever possible.
- b. Waiting areas for patients on stretchers or in gowns should be located in a private zone within the plan, out of view of the public circulation system.
- c. Private alcoves or rooms should be provided for all communication concerning personal information relative to patient illness, care plans, and insurance and financial matters.
- d. In facilities with multi-bed rooms, family consultation rooms, grieving rooms, and/or private alcoves in addition to family lounges should be provided to permit patients and families to communicate privately.

A1.2-2.2.2.5 (5) Safety and security

- a. Attention should be given to balancing readily accessible and visible external access points to the facility with the ability to control and secure all access points in the event of an emergency. Factors such as adequate exterior lighting in parking lots and entry points to the facility and appropriate reception/security services are essential to ensuring a safe environment.

- * (6) Finishes. The effect of materials, colors, textures, and patterns on patients or residents, staff, and visitors shall be considered in the overall planning and design of the facility. Maintenance and performance shall be considered when selecting these items.
- * (7) Cultural responsiveness. The culture of patients or residents, staff, and visitors shall be considered in the overall planning of the facility.
- * (8) Water features. Where provided, open water features shall be equipped to safely manage water quality to protect occupants from infectious or irritating aerosols.

***1.2-2.2.2.6 Design process and implementation.**

Groups (stakeholders) affected by and integral to the design shall be included in the planning and implementation process.

1.2-2.2.3 Functional Requirements

The facility shall incorporate functional requirements and other basic information related to fulfillment of the institution’s objectives into the functional program commensurate with the scope and purpose of the project. Explanation of the functional requirements shall cover, but not be limited to, the following subjects:

1.2-2.2.3.1 Projected operational use and demand

1.2-2.2.3.2 Relevant operational circulation patterns. These shall include staffing, family/visitor, and materials movement circulation patterns.

1.2-2.2.3.3 Departmental operational relationships

1.2-2.2.3.4 Patient/resident, staff, and family/visitor needs

1.2-2.2.3.5 Communication and information operational needs

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- b. Since the strict control of access to a health care facility is neither possible nor appropriate, safety within the facility should also be addressed through the design of circulation paths and functional relationships.
- c. Provisions for securing the personal belongings of staff, visitors, and patients or residents should be addressed.
- d. The physical environment should be designed to support the overall safety and security policies and protocols of the institution.
- e. Safety and security monitoring, when provided, should respect patient privacy and dignity.

A1.2-2.2.2.5 (6) Finishes

- a. In any design project, the selection of a color palette should be based upon many factors, including the building population, anticipated behavior in the space, time of encounter, and level of stress. The color palette selected should be suitable and appropriate for the specific environment, taking into account the specific activities conducted in that environment.
- b. Finishes and color palettes should respond to the geographic location of the health care facility, taking into account climate and light, regional responses to color, and the cultural characteristics of the community served.

A1.2-2.2.2.5 (7) Cultural responsiveness

- a. Organizational culture is defined by the history of the organization, leadership philosophy, management style, and caregivers’ dispositions.
- b. Regional culture is defined by the physical location and demograph-

ics (including age, nationality, religion, and economics) of the communities served.

A1.2-2.2.2.5 (8) Water features. Fountains and other open decorative water features may represent a reservoir for opportunistic human pathogens; thus, they are not recommended for installation within any enclosed spaces in health care environments.

- a. If a water feature is provided, the design should limit human contact with the water and/or allow for the application of water disinfection systems. Materials used to fabricate the water feature should be resistant to chemical corrosion. Water features should be designed and constructed to minimize water droplet production. Exhaust ventilation should be provided directly above the water feature.
- b. If aquariums are used, they should be enclosed to prevent patient or visitor contact with the water. Aquariums are not subject to exhaust ventilation recommendations.

A1.2-2.2.2.6 Design process and implementation.

An interdisciplinary design team should be assembled as early as possible in the design process. The design team should include but not be limited to administrators, clinicians, infection preventionists, safety officers, support staff, patient advocates/consumers, A/E consultants, and construction specialists. For long-term care and related physical environments, residents, family members, activity/lifestyles staff, dining services staff, and other appropriate stakeholders should be included as part of the design team listed above. (Also see Section A1.2–1.2.)

1.2-2.2.3.6 Space and equipment needs

- (1) Size and function of each space and any other design feature
 - (a) Include the projected occupant load, numbers and types of staff, patients, residents, visitors, and vendors.
 - (b) Describe the types and projected numbers of procedures for treatment areas.
 - (c) Identify required adjacencies for each space.
 - (d) Include space for dedicated storage.
- (2) Furnishings, fixtures, and equipment requirements
 - (a) Describe building service equipment.
 - (b) Describe fixed and movable equipment.
 - (c) Describe the furnishings and fixtures.
 - (d) Include storage requirements.
- (3) Circulation patterns
 - (a) Describe the circulation patterns for staff, patients or residents, and the public.
 - (b) Describe the circulation patterns for equipment and clean and soiled materials.
 - (c) Where circulation patterns are a function of infection control requirements, note these features.

1.2-2.2.3.7 Short and long-term planning considerations, including the following:

- (1) Future growth
- (2) Impact on existing adjacent facilities
- (3) Impact on existing operations and departments
- (4) Flexibility
- (5) Technology and equipment

1.2-2.3 Nomenclature

1.2-2.3.1 Use the same names for spaces and departments as used in these Guidelines. If acronyms are used, they shall be clearly defined.

1.2-2.3.2 The names and spaces indicated in the functional program shall be consistent with the submitted floor plans.

1.2-2.4 Use

1.2-2.4.1 Following approval, the functional program shall be made available for use in the development of project design and construction documents.

1.2-2.4.2 The facility shall retain the functional program with other design data to facilitate future alterations, additions, and program changes.

■ 1.2-3 Infection Control Risk Assessment (ICRA)

The infection control risk assessment is a multidisciplinary, documented assessment process intended to proactively identify and mitigate risks from infection that could occur during construction activities. This process identifies and takes into account the patient population at risk, the nature and scope of the project, and the functional program of the health care facility. The ICRA determines the potential risk of transmission of various air- and waterborne biological contaminants in the facility.

1.2-3.1 General**1.2-3.1.1 ICRA Requirement**

For a health care facility project to support safe designs, finishes, surfaces, and HVAC/plumbing systems, an infection control risk assessment shall be a part of integrated facility planning, design, construction, and commissioning activities.

1.2-3.1.2 ICRA Timing

An ICRA shall be conducted during the early planning phase of a project, before construction begins, and continue through project construction and commissioning.

1.2-3.1.3 ICRA Team

At minimum, an ICRA shall be conducted by a team with expertise in infection prevention and control, direct patient care (clinical use of relevant areas), facility design, construction, and HVAC and plumbing systems when these systems are involved. The scope and nature of the project shall dictate others to be involved.

1.2-3.1.4 ICRA Recommendations

Based on the results of the initial stage of the ICRA, the owner shall provide the following recommendations for incorporation into the functional program:

- (1) Design recommendations generated by the ICRA
- (2) Infection control risk mitigation recommendations (ICRMRs)

1.2-3.2 ICRA Considerations

The ICRA shall address, but not be limited to covering, the following:

1.2-3.2.1 Design Elements

1.2-3.2.1.1 Number, location, and type of airborne infection isolation and protective environment rooms

1.2-3.2.1.2 Number, location, and type of plumbed hand-washing stations, hand sanitation dispensers, and emergency first-aid equipment (eyewash stations and deluge showers). For design requirements, see the common requirements chapter in each Part of these Guidelines.

(1) The number and location of hand-washing stations and hand sanitation dispensers shall be determined by the functional program and the ICRA.

(2) Hand-washing stations shall be convenient and accessible for health care personnel and other users.

***1.2-3.2.1.3** Special HVAC needs to meet the functional program and accommodate the services (e.g., surgical services, airborne infection isolation and protective environment rooms, laboratories, pharmacies, local exhaust systems for hazardous agents, and other special areas) included in or affected by the project

1.2-3.2.1.4 Water systems to limit *Legionella* sp. and waterborne opportunistic pathogens

***1.2-3.2.1.5 Surfaces and furnishings**

1.2-3.2.2 Construction Elements

When conducting the ICRA and developing the infection control risk mitigation requirements for building and site areas anticipated to be affected by construction, the following shall be addressed:

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A1.2-3.2.1.3 Airborne contamination can result when HVAC systems are improperly designed, built, or maintained. In addition to providing comfort and minimizing exposure to chemical pollution, ventilation systems are an important means for preventing infection. An HVAC system expert, whether an independent engineer or an employee of the owner, should consider the following to determine what HVAC design considerations should be covered in the ICRA:

- a. Characteristics of overall HVAC system design as well as design for specific sensitive areas, including components, capacity, filtration, air changes, pressure relationships, and directional flow
- b. Ease of access for HVAC system maintenance
- c. Ease of general maintenance activities and system cleaning
- d. Selection of air distribution devices that allow for minimal or easy cleaning
- e. Location of air intakes and exhaust outlets to prevent cross-contamination
- f. Redundancy in equipment and systems
- g. Plan for HVAC system outages or maintenance (both planned and unplanned)

A1.2-3.2.1.5 Surface selection characteristics and

criteria. Testing standards can verify whether a product provides specific characteristics. When selecting surfaces and furnishings, verification of third-party independent testing is expected to ensure that surfaces meet necessary code requirements. It is understood that in certain areas of the

health care facility it will not be possible to use products with all of these characteristics; however, the goal is to strive to choose products with as many of these characteristics as possible.

Preferred surface characteristics (of the ideal product) include the following:

- a. Easy to maintain, repair, and clean
- b. Does not support microbial growth
- c. Nonporous and smooth
- d. Has acoustic properties (e.g., sound absorption), where applicable
- e. Inflammable—Class I fire rating, low smoke toxicity
- f. Durable
- g. Sustainable
- h. Low-VOC (no off-gassing)
- i. Cost-effective (initial and life-cycle cost-effectiveness)
- j. Slip-resistant (appropriate coefficient of friction)
- k. Easy to install, demolish, and replace
- l. Has compatible substrate and materials for surface assemblies
- m. Seamless
- n. Resilient, impact-resistant
- o. Controls reflectivity/glare
- p. Has options for color, pattern, and texture
- q. Made of non-toxic/non-allergenic materials

1.2-3.2.2.1 The impact of disrupting essential services to patients and employees

***1.2-3.2.2.2** Determination of the specific hazards and protection levels for each designated area

1.2-3.2.2.3 Location of patients according to their susceptibility to infection and the definition of risks to each

1.2-3.2.2.4 Impact of movement of debris, traffic flow, spill cleanup, and testing and certification of installed systems

1.2-3.2.2.5 Assessment of external as well as internal construction activities

1.2-3.2.2.6 Location of known hazards

1.2-3.3 Compliance Elements

1.2-3.3.1 ICRA Documentation

This written record shall remain an active part of the project documents for the duration of the construction project and through commissioning.

***1.2-3.3.2** ICRMRs

These written plans shall describe the specific methods by which transmission of air- and waterborne biological contaminants will be avoided during construction as well as during commissioning, when HVAC and plumbing systems and equipment (e.g., ice machines, steam sterilization systems) are started/restarted.

***1.2-3.3.3** Monitoring Plan and Procedures

- (1) The owner shall provide monitoring plans for effective application of ICRMRs during the course of the project.
- (2) Provisions for monitoring shall include written procedures for emergency suspension of work and protective measures indicating the responsibilities and limitations of each party (owner, designer, contractor, and monitor).

1.2-3.3.4 Communication

- (1) Updates on ICRA compliance shall be provided by the ICRA team.
- (2) Changes to the original design plans shall be documented, updated, and continuously shared between the ICRA team and the designers/architects/planners, owner, and contractor.

1.2-3.4 Infection Control Risk Mitigation

1.2-3.4.1 ICRMR Planning

Infection control risk mitigation recommendations (ICRMRs) shall be prepared by the ICRA team and shall, at minimum, address the following:

1.2-3.4.1.1 Patient placement and relocation

***1.2-3.4.1.2** Standards for barriers and other protective measures required to protect adjacent areas and susceptible patients from airborne contaminants

1.2-3.4.1.3 Temporary provisions or phasing for construction or modification of HVAC and water supply systems

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A1.2-3.2.2.2 Specific hazards that are likely in the event of different types of essential service disruptions should be proactively determined. A plan should be developed to ensure continued provision of service in the event of planned and unplanned disruptions.

A1.2-3.3.2 Responsibilities of persons and groups for procedures and activities to be performed to mitigate risk should be included in infection control risk mitigation plans to ensure the proper actions are taken at the proper time.

A1.2-3.3.3 Monitoring efforts will be determined by the owner and may be conducted by the owner's infection preventionist(s), epidemiologist, construction coordinators, and/or safety staff or by independent outside consultants.

A1.2-3.4.1.2 Ventilation of the construction zone

- a. Airflow into the construction zone from occupied spaces should be maintained by means of a dedicated ventilation/exhaust system for the construction area.
- b. Locations of exhaust discharge relative to existing fresh air intakes and filters, as well as the disconnection and sealing of existing air ducts, should be reviewed as required by the ICRA.
- c. If the existing building system or a portion thereof is used to achieve this requirement, the system should be thoroughly cleaned prior to occupancy of the construction area.
- d. Hospital construction barriers for projects in high-risk areas should be maintained at a pressure differential of at least 0.03 inch water gauge (7.0 Pascals), with airflow from hospital clean areas to construction

1.2-3.4.1.4 Protection from demolition

1.2-3.4.1.5 Measures to be taken to train hospital staff, visitors, and construction personnel

*1.2-3.4.1.6 The impact of potential utility outages or emergencies, including protection of patients during planned and unplanned utility outages

1.2-3.4.1.7 The impact of movement of debris, traffic flow, cleanup, elevator use for construction materials and construction workers, and construction worker routes

1.2-3.4.1.8 Provision for use of bathroom and food facilities by construction workers

*1.2-3.4.1.9 Installation of clean materials (particularly ductwork, drywall, and wood/paper/fabric materials) that have not been damaged by water

■ *1.2-4 Patient Safety Risk Assessment

■ *1.2-5 Patient Handling and Movement Assessment

A patient handling and movement assessment (PHAMA) is conducted to direct/assist the design team in incorporating appropriate patient handling and movement equipment into the health care environment. The purpose of this equipment is to

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dirty areas. Construction barriers in high-risk areas should have visual display of airflow direction. (High-risk areas include critical care units, emergency rooms, labor and delivery facilities, newborn nurseries, outpatient surgery facilities, areas serving pediatric patients, pharmacies, surgical units, post-anesthetic care units, areas serving immunocompromised patients, burn units, cardiac catheterization labs, central sterile supply, airborne infection isolation rooms, protective environment rooms, oncology units, operating rooms, and cesarean delivery rooms.)

A1.2-3.4.1.6 Disaster plans for water supply and ventilation emergencies

- a. The owner should provide a written plan for what will happen in the event of a water outage. This should include where supplies are, who is responsible for what, and who is to be notified.
- b. The owner should provide a written plan for what will happen in the event of an air shutdown. This should include who is responsible for what and who is to be notified.
- c. The owner should provide a written plan for what will happen in the event of a water leak. This should include who is to be notified.

A1.2-3.4.1.9 Protection of building materials

- a. Construction materials should be kept clean and dry, as appropriate.
- b. Ductwork should be kept capped/clean during demolition and dust-generating construction.
- c. Drywall installation should not proceed until exterior protection against rain damage has been installed.

A1.2-4 Patient Safety Risk Assessment

- a. Every new or renovated health care building should be designed to facilitate the safe delivery of care.
- b. Definitions

Hazard: Anything that has the potential to cause harm.

Risk: The likelihood that somebody or something will be harmed by a hazard, multiplied by the severity of the potential harm.

- c. During the functional programming phase of a project, the owner should provide an assessment of the potential risks to patients inherent in each space and building component that is to be part of the project. For each space or component, this patient safety risk assessment (PSRA) should identify the specific hazards, the likelihood of their occurrence based on historical data, and the degree of potential harm to patients from the hazards.

Hazards to be assessed include harmful or stress-inducing agents (e.g., noise; vibration; visual distraction; light type, quality, and quantity; surfaces characteristics; indoor air characteristics; ergonomics; space requirement; visual disorganization of space; lack of visibility).

- d. The PSRA should be conducted by an interdisciplinary panel appointed by the owner that is made up of representatives from clinical departments that are part of the project or could be affected by the project, safety specialist(s), medical staff, infection preventionists, architects, engineers, and other appropriate individuals. The PSRA panel should produce a report that identifies known hazards and specifies design features to be included in the project design that are intended to reduce or eliminate those risks. The report should be coordinated with the ICRA to avoid overlapping recommendations.

A1.2-5 Patient Handling and Movement Assessment (PHAMA)

Information and guidance for conducting a PHAMA can be found in the white paper entitled "Patient Handling and Movement Assessment: A White Paper," prepared by the 2010 Health Guidelines Revision Committee Specialty Subcommittee on Patient Movement and posted at www.fgiguideelines.org. The white paper also explains the rationale for considering patient handling equipment during the health care design and

increase or maintain patient mobility, independent functioning, and strength as well as to provide a safe environment for staff and patients during performance of high-risk patient handling tasks.

The PHAMA has two distinct yet interdependent phases. The first phase includes a patient handling needs assessment to identify appropriate patient handling and patient movement equipment for each service area in which patient handling and movement occurs. The second phase includes definition of space requirements and structural and other design considerations to accommodate incorporation of such patient handling and movement equipment.

1.2-5.1 General

1.2-5.1.1 Design Recommendations

1.2-5.1.1.1 The findings and recommendations of the PHAMA shall include consideration of both bariatric and non-bariatric patient care requirements.

1.2-5.1.1.2 The findings and recommendations of the PHAMA shall be incorporated into the functional program.

*1.2-5.1.2 Responsibility

The health care organization shall provide both the PHAMA and the functional program to the design team.

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construction process; information (including illustrations) about various types of patient handling equipment, the business case for implementing patient handling and movement programs, and strategies for implementing such programs.

Increasing evidence shows that early and frequent patient mobilization and movement is vital to the health of patients and is as integral to good quality care as other procedurally driven patient handling tasks. Under the best of circumstances, caregivers repositioning and transferring patients cannot lift more than 35 pounds manually without putting themselves at risk for back injuries. As a consequence, caregivers are one of the groups at highest risk for injury of any industry, and manual patient handling and moving are the primary causes. If caregivers are not safely equipped to perform these necessary physical tasks, patients may not receive adequate care.

Equipment is now available to facilitate necessary clinical work while significantly reducing the risk of injury to caregivers and patients from patient handling, moving, and mobilization activities. By better supporting appropriate levels of care and reducing risk of injury to caregivers, use of such equipment and related architectural accommodations will reduce the overall cost of care.

The following definitions apply to text in Sections 1.2-5 and A1.2-5:

- a. Whenever the term “equipment” is used, it refers to patient handling and movement equipment.
- b. “Patient” is intended to include both patients and residents in health care facilities and refers to both bariatric and non-bariatric patients/residents.
- c. “Bariatric” is the term used to refer to morbidly obese patients and is defined by the World Health Organization as those with a body mass index (BMI) of greater than 40. Others define bariatric patients as those who are 100–200 pounds over their ideal body weight and as those who weigh in excess of 300 pounds.
- d. “Health care provider” refers to the operating organization.
- e. “Caregiver” refers to any person who performs direct patient care and/or patient handling and movement and includes nurses, nurse assistants, lift team members, therapists, radiology staff, morgue technicians, etc.
- f. “Fixed” equipment refers to equipment with track systems attached at some point within the room. Fixed equipment includes ceiling-mounted or overhead lifts, wall-mounted lifts, and other lifting devices with fixed tracking. An alternative would be a demountable track that may be fully or partially disassembled and removed from the space.
- g. “Portable” or “mobile” equipment is floor-based equipment that moves on the floor surface, such as floor-based sling lifts and sit-to-stand lifts. These may be moved horizontally manually or with the assistance of motorized wheels. When the term “portable” is used in connection with ceiling lifts, it may also refer to a lift motor and hoist that can be removed from the track system in one room and attached to the track system in another room.
- h. “Movement” refers to staff-assisted transfers of a dependent patient (e.g., from a bed to a chair or toilet, or from a room to another location). “Movement” can also include repositioning a dependent patient in a bed or chair, and moving an immobilized patient’s limb from one position to another (as opposed to lifting, raising, or holding a limb [or prosthesis, or organ], in position, as when on an operating table). “Mobilization” refers to patient auto-movement, exercise, or ambulation, with or without staff assistance.

A1.2-5.1.2 The PHAMA is usually conducted by an interdisciplinary team and should include the unit/area nurse manager/supervisor; front-line staff; those with expertise in risk management, safety, and/or ergonomics; and staff responsible for facility design and construction. Staff members with expertise in therapy, infection prevention, housekeeping, and maintenance and a design team representative may also participate on the team.

1.2-5.1.3 Schedule for Completion

The PHAMA shall be completed as part of the pre-design phase development of the functional program.

1.2-5.1.4 Notification of Modification

During the design and construction process, if significant changes in patient characteristics or operational needs are identified, the provider shall update the PHAMA and supply the revised edition to the design team as soon as possible.

***1.2-5.1.5 Areas for Inclusion**

A PHAMA shall be completed and shall address the specific needs of all areas affected by the project where patient handling and movement occur.

***1.2-5.1.6 Unit of Evaluation**

PHAMA results/recommendations shall be specific to each clinical unit, residential living space, procedure area, diagnostic area, and any other area where patient handling and movement occur.

1.2-5.2 PHAMA Process**1.2-5.2.1 Phase 1: Patient Handling and Movement Needs Assessment**

Evaluation of patient/resident-handling and movement needs shall include, but not be limited to, the following considerations:

1.2-5.2.1.1 Patient handling and movement equipment recommendations, based on the following:*APPENDIX**

A1.2-5.1.5 Examples of areas to be covered in the PHAMA include, but are not limited to, clinical units and residential living spaces, including associated toileting, bathing, and showering areas; procedure areas; diagnostic areas; surgery suite intake and recovery units; treatment areas; the morgue; ambulance bays; and dining and recreation areas.

A1.2-5.1.6 Because each residential unit, clinical unit, treatment area, diagnostic area, etc. includes patient populations with varying characteristics, equipment recommendations will also vary. For this reason, recommendations must be developed for each unit/area included in new construction and renovations. The objective is to ensure the correct type, size, weight capacity, and quantity of equipment is available on each unit and that sufficient storage is allocated for this equipment.

A1.2-5.2.1.1. Patient handling and movement equipment recommendations are also based on the following.

- a. Patient dependency levels are critical in determining patient handling and movement needs. To simplify this determination, patients are usually grouped into categories based on physical limitations (not clinical acuity). Recommended categories include total dependence/extensive assistance, partial assistance, and independent.
- b. Consideration of obese/bariatric patient weight and size is important to ensure appropriate equipment capacities.
- c. High-risk patient handling and movement tasks for which equipment is used to minimize risk include the following:
 - Vertical transfers (from/to a bed, chair, commode, toilet, or wheelchair)
 - Lateral transfers (from/to a bed, stretcher, gurney, or trolley)
 - Positioning/repositioning in bed (side to side, up to the head of the bed, raise or lower head or feet)
 - Repositioning in chair
 - Showering/bathing

- Lifting appendages
- Transporting patients
- Assisting patient ambulation
- Weighing patients on bed scales

d. To correctly identify all high-risk tasks on a unit/area, interview front-line staff, analyze unit injuries for common task involvement, and/or survey front-line staff for their perceptions of high-risk tasks.

e. Many types of patient handling and movement equipment are available, but only those that affect building design need be considered in a PHAMA. New equipment designs will need to be evaluated for building design impact as they become available. Presently, equipment that significantly influences design includes, but is not limited to, bathing/shower chairs, beds/stretchers/trolleys/gurneys, wheelchairs, and lateral transfer devices. Fixed patient lifts such as ceiling and wall-mounted lifts and portable patient lifts such as the sit-to-stand lift and floor-based sling lifts are further described below, as their design impact may be significant. Other transfer devices and accessories to the abovementioned devices (e.g., slings, transfer sheets and boards, and trapezes) influence design to the extent that storage is required.

- Sit-to-stand lifts are used to assist a patient who requires partial assistance and who possesses some weight-bearing ability. Sit-to-stand lifts assist in vertical transfers, toileting, dressing, pericare, and ambulation.
- Both floor-based sling lifts and ceiling-mounted lifts are used for patients who are completely or substantially unable to assist caregivers. Patients requiring these levels of care are often described as “dependent” or requiring “extensive assistance.” The utility of these lifts for this population includes—but is not limited to—vertical transfers, lateral transfers, repositioning in bed and chair, lifting appendages, and lifting patients from the floor. These lifts can also be used for assistance with ambulation

- (1) Characteristics of projected patient populations
- (2) Types of high-risk patient handling and movement tasks to be performed and accommodated
- (3) Knowledge of specific technology appropriate to reduce risk for each high-risk task

***1.2-5.2.1.2** Types of patient handling and movement equipment to be utilized (manual or power-assisted fixed ceiling or wall-mounted lifts, manual or power-assisted portable/floor-mounted lifts, electric height-adjustable beds, or a combination thereof)

***1.2-5.2.1.3** Quantity of each type of patient handling and movement equipment needed for each area under consideration

***1.2-5.2.1.4** Required weight-carrying capacities

***1.2-5.2.1.5** Locations/rooms/areas for use with installation requirements (if fixed) and/or storage requirements

1.2-5.2.2 Phase 2: Design Considerations

The impact of patient handling and movement needs on building design shall be addressed in the PHAMA, including consideration of both bariatric and non-bariatric patient care needs. These design considerations shall incorporate results from Phase 1 and shall include, but are not limited to, the following:

1.2-5.2.2.1 Structural considerations to accommodate current and/or future use of patient handling and movement equipment

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rehabilitation or mobilization of patients with some weight-bearing capability.

A1.2-5.2.1.2 Direct patient care providers who are familiar with the characteristics of their unique patient populations should be included in the equipment selection process to ensure appropriate equipment decisions are made.

When completing the equipment needs assessment, be sure to factor in any existing equipment that will be used on the unit. Preparation of a log for each unit is suggested to relay information on existing equipment, the percentage of time it is used and, if this is not 100 percent, reasons for the percentage of time actually used.

A1.2-5.2.1.3 The dependency level of the patients should determine the quantity of lifts required.

- a. The average percentage of “dependent/extensive assistance” patients should be used to determine the number and placement of fixed lift systems and/or the quantity of floor-based full body sling lifts. When only floor-based lifts are used, one lift per 8–10 patients is a typical planning ratio. When fixed lift systems are used, the location and configuration of track systems will determine potential coverage options. (For example, if 70 percent of patients are dependent or require extensive assistance and there are 30 patients on the unit (70% x 30 pts), fixed lift coverage will be needed for 21 patients. If the patient rooms are private, 21 rooms will need fixed lifts. If the patient rooms are semi-private, 10–11 rooms will need fixed lifts. Installation of fixed lift systems will reduce, but not entirely eliminate, the need for floor-based lifts since most fixed lift systems do not provide complete coverage of patient use areas.
- b. The number of partial assistance patients should be used to determine the number of sit-to-stand lifts needed. A similar ratio of one lift per 8–10 patients may be used.

c. Peak patient handling times may increase the quantity of lifts required.

A1.2-5.2.1.4 Lift weight capacities range from approximately 400 lbs. (xx kg) to bariatric expanded capacity lifts of 1,000 lbs. (xx kg) or more. Specification of lifts with a capacity of 500–600 lb. (xx–xx kg) will accommodate the greatest range of all patients. If bariatric admissions warrant, a minimum of one expanded capacity/bariatric lift (preferably fixed, ceiling-mounted) per unit should be included, in addition to the lower weight capacity lifts.

A1.2-5.2.1.5 Unit staff will be the best resource for determining rooms for fixed lift installations as well as storage locations for portable lifts.

Note: Safe patient handling equipment data collection tools and links to patient handling technology can be found in the “Patient Care Ergonomic Resource Guide” and “Technology Resource Guide” at www.visn8.med.va.gov/patientsafetycenter/safePtHandling/default.asp. However, these guides do not provide direction for conducting a full patient care ergonomic (PCE) evaluation. Such a comprehensive evaluation is important to determine the patient handling technology required to implement a “minimal lift” policy. Organizations should understand that the information provided here focuses only on design and storage requirements and only for fixed and portable lifting equipment. It is highly recommended that health care organizations conduct a thorough PCE evaluation, which will provide recommendations for other patient handling technology and programmatic issues related to safe patient handling. Information about how to conduct a PCE evaluation as well as a PHAMA can be found in the white paper entitled “Patient Handling and Movement Assessment: A White Paper” at www.fgguidelines.org.

*1.2-5.2.2.2 Electrical and mechanical considerations for current and/or future use of patient handling and movement equipment and associated storage and charging areas

1.2-5.2.2.3 Adequate space for providing patient care and for maneuvering within and around areas where staff will use patient handling or movement equipment

*1.2-5.2.2.4. Destination points for patient transfers and movement

1.2-5.2.2.5 Sizes and types of door openings through which patient handling and movement equipment and accompanying staff must pass

1.2-5.2.2.6 Types of floor finishes, surfaces, and transitions needed to facilitate safe and effective use of patient handling and movement equipment

1.2-5.2.2.7 Coordination of patient handling and movement equipment installations with building mechanical, electrical, and life safety systems

*1.2-5.2.2.8 Storage space requirements and locations available or to be provided

1.2-5.2.2.9 Impact of the installation and use of patient handling and movement equipment on environmental characteristics of the environment of care

*1.2-5.2.2.10 Impact of the installation and use of patient handling and movement equipment on the aesthetics of the patient care space

*1.2-5.2.2.11 Infection control risk mitigation requirements

■ 1.2-6 Design Considerations and Requirements

1.2-6.1 Acoustic Design

*1.2-6.1.1 General

The planning and design of new health care facilities and the retrofitting of existing health care facilities

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A1.2-5.2.2.2 Battery-charging areas and electrical services for the battery-charging areas should be included in storage rooms for portable, floor-based lifts. Access to both electrical power and control services should be provided for fixed lifts.

A1.2-5.2.2.4 Consider various destinations for patient transport using patient handling equipment (i.e., locations to and from which patient movement is to be accomplished, such as within patient room—bed, chair, commode, etc.—and into associated toilet room or toilet/shower room). Such considerations will aid in designing the room to accommodate portable equipment and the caregivers using it as well as in designing an appropriate fixed-lift track system.

A1.2-5.2.2.8 Accessibility of patient handling equipment is critical to ensuring its appropriate use.

a. Suggested storage alternatives:

- For small units, provide a centrally located storage area.
- For large or small units, provide storage in alcoves or storage areas interspersed throughout the unit.

b. Storage will be needed for patient handling equipment accessories such as lift slings, hanger bars, and trapezes as well as other patient handling equipment.

- Store sling surplus in the same location as portable lifts.
- In storage areas, install large hooks for hanging slings or provide shelving for storage of folded slings.
- Slings assigned to a specific patient should be stored in the

patient room, for instance, on a hook on the outside of the patient's closet, bedside, or somewhere near the entry door to provide instant accessibility and ensure compliance.

- Standard shelving is needed for storage of an assortment of slings for lifts, extra lift hanger bars, and other patient handling equipment, such as friction-reducing devices and air-assisted lateral transfer aids with motor(s).

A1.2-5.2.2.10 When installing fixed-lift systems, care should be taken to minimize the visual impact of fixed tracks, slings, hanger bars, and motors on the aesthetics of the physical environment, especially in nursing home and other long-term care settings where a home-like environment is essential. Use of recessed tracks is suggested, as well as curving the track away from the center of the resident room. Other suggestions include enclosing lift motors in decorative cabinets and concealing or masking wall-mounted rails for traveling gantry lifts with crown molding or indirect ceiling light coves.

A1.2-5.2.2.11 For effective infection control risk mitigation, consult with an infection preventionist during development of the PHAMA and abide by the facility's infection control guidelines as well as the manufacturer's cleaning instructions. Use of lifts in certain areas, such as a surgical suite, may have to satisfy more stringent requirements.

A1.2-6.1.1 Acoustic Design

a. The definitions of acoustics terms used in this publication are most

shall conform to these Guidelines and all applicable codes and regulations with respect to exterior environmental sound and interior sound within all occupied building spaces.

*1.2-6.1.2 Site Exterior Noise

This section provides design guidance on how to address environmental noise at a facility site over which the facility may or may not have administrative or operational control. This section is meant to provide a means for screening sites to help determine which exterior wall/window assemblies are suitable to address site noise; it is not intended to be used as a means to qualify the suitability of a site with respect to environmental noise exposure.

***1.2-6.1.2.1 Existing exterior noise sources.** Planning and design of new facilities and retrofitting of existing facilities shall include due consideration of all existing exterior noise sources that may be transmitted from outside a building to its interior through the exterior shell (exterior walls, windows, doors, roofs, ventilation openings, and other shell penetrations).

1.2-6.1.2.2 Facility noise source emissions. Planning and design shall include due consideration of sound emissions from health care facility noise sources that reach nearby residences and other sensitive receptors. Sound from exterior facility equipment can be controlled to achieve acceptable sound levels inside health care facility spaces and at neighboring receptors by siting noise sources and receptors to take advantage of distance, orientation, and shielding. Sound from exterior facility equipment can also be controlled by selecting quiet equipment and making use of noise control equipment such as silencers and barriers.

***1.2-6.1.2.3 Exterior noise classifications.** Exterior noise classifications identify exterior noise exposure that is not produced by the facility. Site noise exposure shall be classified into one of four categories of noise exposure: A (minimal), B (moderate), C (significant), or D (extreme). Building facade sound isolation performance shall depend on the site classification and shall be as required to provide acceptable interior sound levels.

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often based on ANSI S1.1: *Acoustical Terminology*. See “Sound and Vibration Design for Health Care Facilities,” a white paper coordinated with the 2010 edition of these Guidelines, for the glossary of acoustic terminology used in this document (posted at www.fgiguilines.org).

- b. Limits set by codes often are expressed as maximum A-weighted sound levels in dBA. Separate limits are typically set for day and night periods, with the nighttime limit typically 5 to 10 dBA lower than the daytime limit. Daytime limits typically vary between 55 and 65 dBA.
- c. Following are some acoustic design codes, regulations, and guidelines that should prove useful for health care facilities:
 - U.S. Department of Health and Human Services regulations (including HIPAA)
 - Federal Aviation Administration (FAA) guidelines for helipad design, construction, and operation
 - Guidelines for noise in NICUs in Section 2.2-2.10.9.3 (Noise control)
 - Building code used by the local or state jurisdiction
 - Local and state limits on environmental sound
 - Occupational Safety and Health Administration (OSHA) regulations for worker noise exposure in areas where sound levels exceed 85 dBA
 - Professional society design guidelines for noise (e.g., American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) guidelines for mechanical system sound and vibration control)

- American National Standards Institute (ANSI) guidelines for sound in building spaces and special spaces (e.g., booths for measuring hearing threshold)
- Manufacturers’ guidelines for medical equipment that is sensitive to sound and vibration or equipment that produces sound and/or vibration

A1.2-6.1.2 Site Exterior Noise

Examples of noise sources a facility should control include the power plant, HVAC equipment, and emergency generators that are part of the health care facility. An on-site noise source over which the facility may have limited control is helipads. The location and operation of helipads are subject to federal regulation and other safety and environmental considerations. Examples of noise sources a facility cannot control include highways, rail lines, airports, and general urban, industrial, and public service equipment and activities.

A1.2-6.1.2.1 Health care facility design should consider future noise source development, such as the construction of highways, airports, or rail lines in the vicinity of the project.

A1.2-6.1.2.3 Exterior noise classifications. By means of exterior site observations and/or a sound-level monitoring survey, the facility site should be classified into one of the noise exposure categories in Table A1.2-a (Categorization of Health Care Facility Sites by Exterior Ambient Sound).

1.2-6.1.3 Design Criteria for Acoustic Finishes

All normally occupied health care facility spaces shall incorporate acoustic finishes to achieve design room average sound absorption coefficients as indicated in Table 1.2-1 (Design Room Sound Absorption Coefficients).

***1.2-6.1.4 Design Criteria for Room Noise Levels**

- (1) Room noise levels shall fall within the sound level ranges shown for the chosen rating system in Table 1.2-2 (Minimum–Maximum Design Criteria for Noise in Interior Spaces).
- (2) Room noise levels shall be determined for the

unoccupied room (i.e., without operating medical equipment).

1.2-6.1.5 Design Criteria for Performance of Interior Wall and Floor/Ceiling Constructions

1.2-6.1.5.1 Sound isolation shall be considered for all demising construction separating occupied spaces.

***1.2-6.1.5.2** The composite sound transmission class (STC_c) rating of demising wall assemblies shall not be less than the ratings indicated in Table 1.2-3 (Design Criteria for Minimum Sound Isolation Performance Between Enclosed Rooms).

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- a. The sound levels provided in Table A1.2-a for noise exposure categories A through D should be used for the evaluation of required health care building envelope sound isolation and may differ from other such categorizations of community noise made elsewhere in this document.

Category A—Minimal environmental sound. As typified by a rural or quiet suburban neighborhood with ambient sound suitable for single-family residences, where sound produced by transportation (highways, aircraft, and trains) or industrial activity may occasionally be audible but is only a minor feature of the acoustical environment.

Category B—Moderate environmental sound. As typified by a busy suburban neighborhood with ambient sound suitable for multifamily residences, where sound produced by transportation or industrial activity is clearly audible and may at times dominate the environment but is not loud enough to interfere with normal conversation outdoors.

Category C—Significant environmental sound. As typified by a commercial urban location, possibly with some large apartment buildings, where sound produced by transportation or industrial activity dominates the environment and often interferes with normal conversation outdoors.

Category D—Extreme environmental sound. As typified by a commercial urban location immediately adjacent to transportation or industrial activities, where sound nearly always interferes with normal conversation outdoors.

- b. Environmental noise on Category B, C, and D sites may be evaluated generally using the methods given for documenting site ambient sound levels using continuous sound monitoring over a minimum one-week period in ANSI/ASA S12.9, *Quantities and Procedures for Description and Measurement of Environmental Sound*, Part 2: “Measurement of Long-Term, Wide-Area Sound.” This information should be used to determine detailed environmental noise control requirements for building design. Sites where ambient sound is influenced by airport operations may require additional monitoring as suggested in the ANSI standard to account for weather-related variations in

aircraft sound exposure on site. In lieu of performing such additional monitoring, aircraft sound level contours available from the airport (if available) should be used to determine the day–night average sound level on site produced by nearby aircraft operations. Sound-level monitoring on site will still be needed to determine sound levels produced by other sources.

- c. Table A1.2-a (Categorization of Health Care Facility Sites by Exterior Ambient Sound) presents general descriptions for exterior sound exposure categories A through D, including distance from major transportation noise sources, ambient sound levels produced by other sound sources, and corresponding design goals for the sound isolation performance of the exterior building shell.

The outdoor sound levels, expressed as A-weighted day–night average sound levels, are provided in the context of exterior building shell design. Outdoor patient areas may require lower sound levels, typically not exceeding a day–night average level of 50 dB. To achieve this may require accommodations such as exterior noise barriers or location of outdoor patient areas where the building structures provide shielding from noise sources.

A1.2-6.1.4 Room noise levels in operating rooms. The recommended range for sound in operating rooms is NC/RC(N)/RNC 35–45 (40–50 dBA). However, current ventilation system technologies and devices required for sanitary purposes often result in sound levels higher than these. Thus, achieving the recommended design ranges for sound levels in operating rooms requires extraordinary system design and construction.

A1.2-6.1.5.2 According to the glossary in the *Recommended Standards for Newborn ICU Design*, a “demising wall assembly” is one that “separates the space of one occupant or department from that of another, or from a corridor. Partitions within an occupant or department space are non-demising partitions. For example, the wall between two patient rooms is demising, but the partition within a patient room that encloses the bathroom for that room is non-demising.”

***1.2-6.1.6 Design Guidelines for Speech Privacy**

***1.2-6.1.6.1** Spaces shall be designed to meet speech privacy goals using one of the four speech privacy rating methods as shown in Table 1.2-4 (Design Criteria for Speech Privacy for Enclosed Rooms and Open-Plan Spaces).

1.2-6.1.6.2 Speech privacy in open-plan spaces**1.2-6.1.7 Design Criteria for Building Vibration**

1.2-6.1.7.1 General. Seismic restraint is covered elsewhere in this document. Seismic restraint shall be compatible with vibration isolation methods covered in this section.

1.2-6.1.7.2 Vibration control and isolation.

Vibration levels in the building shall not exceed applicable guidelines and limits outlined in this section.

- (1) Mechanical, electrical, and plumbing equipment vibration
 - (a) All fixed building equipment that rotates or vibrates shall be considered for vibration isolation.
 - (b) Bases and supports shall be provided as needed to facilitate attachment of vibration isolators

to equipment items. The types of isolators and isolator static deflections shall be as recommended in the edition of the *ASHRAE Handbook—HVAC Applications* current at the time of design.

(2) Structural vibration

- (a) Footfall vibration in the building structure shall be evaluated using American Institute of Steel Construction (AISC) Design Guide 11: *Floor Vibrations Due to Human Activity*.
- (b) The structural floor shall be designed to avoid footfall vibration levels not to exceed the peak vibration velocities in Table 1.2-5 (Maximum Limits on Footfall Vibration in Health Care Facilities).
- (c) More stringent vibration criteria shall be considered for medical and laboratory instrumentation where applicable.

(3) Structure-borne sound

- (a) Structure-borne transmitted sound shall not exceed the limits for airborne sound presented in 1.2-6.1.4 (Design Criteria for Room Noise Levels).
- (b) Where necessary, vibration isolators shall be used to control potential sources of structure-borne sound.

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1.2-6.1.6 Speech privacy. Federal legislation requires that facilities guard patient information privacy. This includes speech privacy in all health care venues or wherever patient health information is discussed, either between staff, on the telephone, or during dictation.

A1.2-6.1.6.1 Methods for determining speech privacy

- a. Privacy Index (PI) criteria are defined in ASTM standard E1130, *Standard Test Method for Objective Measurement of Speech Privacy in Open Plan Spaces Using Articulation Index*. ASTM E2638, *Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room*, provides a method for evaluating the speech privacy provided by a closed room.
- b. The Speech Intelligibility Index (SII), defined in ANSI Standard S3.5-1997, replaces the Articulation Index (AI) of ANSI Standard S3.5-1969. SII criteria may be used in the design of open office space; they may also be used to quantitatively assess field conditions; more extensive calculations are required to determine the results.
- c. The Speech Transmission Index (STI) is defined in IEC 60268-16. The

STI metric is a relatively easily measured criterion, which may be determined by several commercially available instruments.

A1.2-6.1.6.2 People working in open-plan spaces are most productive when there is a minimum of distraction from voices, equipment, etc. Therefore, the acoustical environment should be designed to minimize such distractions. Options for achieving confidential speech privacy in open-plan spaces include provision of a separate room where confidential conversations may take place in private.

A1.2-6.1.7 Building Vibration

- a. Building vibration refers to vibration produced by building equipment and activities, not vibration produced by earthquakes.
- b. Vibration levels to which occupants are exposed should not exceed those in ANSI S2.71, *Guide to the Evaluation of Human Exposure to Vibration in Buildings*.
- c. Vibration produced by building mechanical equipment, plumbing, electrical equipment, footfall, road and/or rail traffic, and medical equipment should be considered in the design of a health care facility.

***1.2-6.2 Sustainable Design**

Sustainable design, construction, and maintenance practices to improve building performance shall be considered in the design and renovation of health care facilities.

1.2-6.2.1 Components

The basic components of sustainable design to be considered shall include:

***1.2-6.2.1.1 Site selection and development**

- (1) Develop design to minimize negative environmental impacts associated with buildings and related site development.
- (2) Evaluate the orientation of buildings on the site to minimize energy consumption by taking advantage of solar and wind effects.

***1.2-6.2.1.2 Waste minimization.** Design to support the minimization of waste in construction and operation and allocate adequate space for recycling activities.

***1.2-6.2.1.3 Potable water quality and conservation**

- (1) Evaluate potable water quality and conservation strategies in all phases of facility development or renovation.
- (2) Design for water conservation shall not adversely affect patient health, safety, or infection control.

***1.2-6.2.1.4 Energy efficiency.** Efficient mechanical and electrical systems shall be selected and sized to meet loads, efficiently utilize space, and consider climate characteristics, daylighting, and building orientation to significantly reduce overall energy demand and consumption.

- (1) Energy efficiency goals shall be considered in all phases of facility development or renovation. Architectural elements that reduce energy consumption shall be considered as part of facility design.
- (2) The quality of the health care facility environment shall be supportive of the occupants and function served. Therefore, design for energy efficiency shall

APPENDIX**A1.2-6.2 Sustainable Design**

A growing body of knowledge is available to assist design professionals and health care organizations in understanding how buildings affect human health and the environment and how these effects can be mitigated through a variety of strategies.

The U.S. Green Building Council's LEED® Green Building Rating System (www.usgbc.org) has established a third-party certification framework for the design of sustainable buildings. The Green Guide for Health Care™ (www.gghc.org) is a voluntary self-certification metric tool that specifically addresses the health care sector. The Green Building Initiative's (www.thegbi.org) Green Globes™ assessment and rating system is a Web-enabled interactive green building design tool that incorporates an integrated project management approach and includes third-party certification; GBI has been accredited as a standards developer by the American National Standard Institute (ANSI) with the goal of developing Green Globes as an ANSI-certified document. An increasing number of states and municipalities have individual high performance guidelines or standards. These tools establish "best practice" criteria for site design, water and energy usage, materials, and indoor environmental quality.

To meet these objectives, health care organizations should use an integrated project delivery process and develop an interdisciplinary design team to guide facility design. The intent of integrated project delivery is to improve building performance by including design and construction considerations from project inception.

A1.2-6.2.1.1 Site selection and development. Site development considerations include land use, storm water management, habitat preservation, landscape design and irrigation systems, shading, natural ventilation, renewable energy use, and effects from heat islands.

A1.2-6.2.1.2 Waste minimization. A 1998 memorandum of understanding between the Environmental Protection Agency (EPA) and the American Hospital Association (AHA) targeted a 33 percent reduction in solid waste by 2005, 50 percent by 2010. As hospitals develop environmentally preferable purchasing standards and implement significant recycling programs to achieve this goal, facilities should consider the space needs associated with these activities.

A1.2-6.2.1.3 Water quality and conservation. Potable water consumption reductions may be achieved through the use of low consumption fixtures and controls, landscape design (xeriscaping) and irrigation systems, and replacement of potable water sources for items such as water-cooled pumps and compressors, with non-potable sources or non-evaporative heat rejection equipment (air cooled or ground source).

A1.2-6.2.1.4 Energy efficiency. Health care facilities should set energy efficiency goals (e.g., application of ASHRAE 90.1, *Energy Standard for Buildings Except Low-Rise Residential Buildings*; design to earn the EnergyStar or a number of LEED energy points) and consider energy efficiency strategies that include (but are not limited to) the following examples:

enhance and not adversely affect patient health, safety, or accepted personal comfort levels.

***1.2-6.2.1.5. Indoor environmental quality**

- (1) The impact of building design and construction on indoor environmental quality shall be addressed.
- (2) Impact from both exterior and interior air-contamination sources shall be minimized.

1.2-6.2.1.6 Environmental impact of selected building materials. The environmental impacts associ-

ated with the life cycle of building materials shall be addressed.

***1.2-6.2.1.7 Reduction of greenhouse gas.** Strategies to reduce the effects of climate change through reduction of greenhouse gas emissions (primarily carbon dioxide) shall be considered in building design and selection of mechanical equipment.

***1.2-6.3 Wayfinding**

1.2-6.3.1 An organized approach to wayfinding about the entire campus and facility shall be provided.

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1. On major new projects, consider the use of computer modeling early in schematic design to assist in developing and assessing energy efficiency strategies and opportunities.
2. Reduce overall energy demand. Sample strategies for this purpose include using a high-efficiency building envelope; passive and low-energy sources of lighting (including daylighting); advanced lighting controls integrated with daylighting strategies; high-efficiency equipment, both as part of building mechanical and electrical systems (e.g., chillers, air handlers) and for plug loads (e.g., EnergyStar copiers, computers, medical equipment, and appliances); and heat recovery and natural ventilation.
3. Optimize energy efficiency. Mechanical/electrical control systems should optimize consumption to the minimum actual needs of the building. Consider using multiple modular HVAC equipment units or variable-speed drives for variable loads. Consider co-generation systems for converting natural gas to both heat (or cooling) and electricity. Select equipment with improved energy efficiency ratings.
4. Reduce environmental impacts associated with combustion of fossil fuels and refrigerant selection. Consider various renewable sources of energy generation, including purchase of green power, solar and wind energy, or geothermal/ground source heat pumps.

A1.2-6.2.1.5 Indoor environmental quality. Design for a healthy and productive indoor environment should be accomplished through measures such as the use of adequate ventilation, low VOC finishes and furnishings, reduced moisture entrapment, daylighting, and acoustical design measures. Such measures should not conflict with health care safety and infection control codes and standards.

Carpeting, upholstery, paint, adhesives, and manufactured wood products may emit volatile organic compounds (VOCs), including formaldehyde and benzene. Substitute low or zero VOC paints, stains, adhesives, sealants, and other construction materials, where practical, for building products that emit formaldehyde and other known carcinogens and irritants.

Materials or construction systems that trap moisture may promote microbial growth. All permeable building materials should be protected from exposure to moisture prior to and during construction. Perme-

able materials exposed to moisture should be dried within 72 hours or removed.

High-volume photocopiers, portable sterilizing equipment, and aerosolized medications have been identified as important sources of indoor air pollution in health care settings. Dedicated exhaust ventilation may be necessary for specialty areas such as housekeeping, copying rooms, sterilization areas, etc., in which such chemical use occurs.

A1.2-6.2.1.7 Reduction of greenhouse gas. New and renovated health care facilities should be designed to comply with the carbon reduction goals outlined in the Architecture 2030 Challenge (architecture2030.org). Strategies that contribute to reduced energy demand also contribute to the reduction of greenhouse gas emissions. In addition, the use of renewable energy sources and the purchase of green energy reduce carbon dioxide emissions.

1.2-6.3 Wayfinding

- a. During the functional programming process, input from staff, visitors, families, and patients should be sought regarding wayfinding. Consideration should be given to the following:
 - Need for multi-lingual signs
 - Stress experienced by patients and families while finding their way to unfamiliar areas in the facility
 - Populations served (e.g., the elderly, children, and other particularly vulnerable populations)
 - The needs of first-time users
 - Use of landmarks (e.g., design elements such as color, artwork, texture, change in architecture, plants)
- b. Input from staff, visitors, families, and patients as described in 1.2-1.2 (Functional Program) should be integrated into the development of a systematic approach to wayfinding. Planning for wayfinding should begin with the concept that the average visitor or staff member will be able to easily find his or her way throughout the facility. Outside wayfinding should be considered for both those walking and those driving to the facility. If public transportation is available, directions and signage to and from transportation sites should be provided.
- c. General sign recommendations:
 - Terminology should be understandable to the general public, and

1.2-6.3.2 Signage shall be consistent with the regulations of the Americans with Disabilities Act.

***1.2-6.4 Bariatric-Specific Design Considerations**

When the functional program has determined a facility will need to accommodate bariatric patients,

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signs should generally be written at a sixth grade level.

—Design of signs should be consistent.

—Each sign should be accurate, legible, and functional.

- Letters should contrast with the background by a minimum of 70 percent. For signs in areas that house primarily the elderly, letters should contrast with the background by a minimum of 90 percent.
- Colors used should be recognizable to those who are color-blind.
- When used, symbols and pictographs should be recognizable to the general public.
- The number of symbols used on a single sign should be limited.

d. You are here (YAH) map recommendations

—YAH maps should be oriented so that forward is up.

—It is preferable to use a perspective view.

—Inset maps should be used to locate details within the overall map when appropriate.

e. Exterior signage (general)

—Directional signs should be easily visible from the street and located and sized so that drivers can easily read them when traveling at the local speed limit.

—Consistency should be used in the nomenclature of buildings.

—Directions should be clear to all users.

—Signage should be within an individual's 60-degree "cone of vision," whether the person is walking or driving.

—Exterior directional signs should be visible at night.

—Signage should be located where it may easily be seen.

f. Exterior signage (parking)

—Directions should be provided from the parking structure to the entrance of the facility.

—Signage should clearly indicate short-term and long-term parking rates if applicable.

—Valet parking, if provided, should be clearly marked.

—Directional signage should be provided for automobile and pedestrian traffic.

—Floor numbers or sections should be clearly marked as appropriate.

g. Interior signage (entrance and exit)

—A well-designed and located set of interior signs and clearly labeled directional maps should be located near the entrance.

—There should be adequate signs to identify all publicly accessible functional areas of the facility.

—There should be adequate signs to direct people out of the facility back to parking and public transportation.

h. Interior wayfinding (room numbering)

—Room numbering should be of a consistent nature from floor to floor and area to area.

—The numbering system should be simple and continuous.

—Design of the numbering system should be flexible to allow for future expansion and renovation.

—Signs should differentiate between those spaces used by patients/visitors and those used by staff

i. Interior wayfinding (sign placement)

—Signs providing directions should be placed at major decision points, including the following:

- Major intersections
- Major destinations
- Changes in buildings

—If there are no major decision points, reassurance signs should be placed approximately every 250 feet (76 meters).

j. Interior wayfinding (signage maintenance). Fabrication should be in a manner that allows messages to be changed.

A1.2-6.4 Bariatric-specific design considerations

a. The most commonly accepted method for identifying bariatric patients is the body mass index (BMI), a formula currently accepted by the U.S. Department of Health and Human Services (DHHS). According to the BMI, being overweight is defined as having a BMI of 25.0 to 29.9. Obesity is defined as having a BMI of 30 or higher. Morbid obesity is typically defined as being 100 pounds or more over the ideal body weight or having a BMI of 40 or higher. The BMI is a simple calculation of the height of an individual divided by his or her weight.

b. Creating health care environments that can accommodate bariatric patients requires attention to issues that significantly affect design. To determine the percentage of beds per specific unit that should be able to accommodate the morbidly obese population, the design team should take into consideration bariatric design issues as well as an analysis of factors such as patient volume, expected length of stay, the nature of the unit, current codes, and local regulations.

c. Accommodations for obese patients and the equipment needed to care for them require more operational space and more storage space than a traditional patient care environment. These needs could require a larger square footage for both operational space and storage.

Size increases will be determined by the space needs of bariatric-specific portable equipment (e.g., beds, wheelchairs, patient lifts) and fixed equipment (e.g., large bore MRI/CT equipment, larger surgical tables and exam tables).

Any environment sized to accommodate a bariatric patient will most likely be the largest patient care environment in a facility. If so, all other patient types will become subsets of design parameters established for this environment. During a hospital stay, many types of patients may need enlarged facilities to accommodate their "temporary

those areas of the facility designated for said accommodation, and the associated path of egress to arrive at these areas, shall be designed with appropriate support and clearances. Other bariatric requirements

are contained in the facility chapters in other parts of this document.

*1.2-6.5 Provisions for Disasters

APPENDIX (continued)

handicaps." These patient types would include patients requiring temporary transfer and toilet assistance and otherwise healthy patients who are using walkers/crutches/braces as transitional support stemming from recent medical procedures. As these patients improve, they will evolve from such "temporary handicaps" to being able to use facilities of standard design. Bathrooms change the most. Toilet fixtures need to be floor-mounted instead of wall-mounted. Sinks also need to be floor mounted, as people usually lean on a sink and its surrounds while using the bathroom. As a caregiver is usually present, clearance should be provided to either side of the sink. Adequate clearance should be provided to either side of the fixture to accommodate a caregiver who is assisting the patient. It is also good practice to provide a handrail adjacent to the sink to give the patient a means of support other than the sink and its surrounds.

Obese patient maneuvering is an issue designers must take special note of. If a patient is able to walk, he or she will likely need to use a handrail for support or balance. Such handrails should be designed to support at least 400 lbs.

Another primary space driver is the staffing-per-patient ratio and associated maneuverability needed in bariatric environments. In some instances, additional caregivers are recommended for patient handling.

d. Other bariatric-specific design issues to consider include ingress/egress to primary treatment and service areas. The rooms and/or destinations at the ends of these traverses also need special consideration to accommodate the obese patient:

- Surgical suites. The design needs to address issues that relate to patient transfer, such as proper and comfortable positioning and the most efficient positioning for the implementation of surgical processes.
- Imaging suites. Many of the same issues found in a surgical environment, especially patient transfer and positioning, are also present in the imaging environment. It should be noted that much of the equipment associated with imaging is not designed for heavier patients. Careful evaluation to ensure selection of appropriate imaging equipment needs to be exercised.
- Exam rooms. Exam rooms need to be programmed and sized to accommodate the patient and the associated care team.
- Intensive care units. ICUs need to be programmed and sized to accommodate the patient and the associated care team.
- Waiting rooms. Appropriately sized elements with capacity adequate for the obese patient should be interspersed with more traditional furnishings to avoid confining bariatric patients to specific areas of the waiting environment.
- Additional staff/patient interaction areas. These areas include

cashier/registration, patient assessment, food service, physical rehabilitation, and family interaction areas.

A1.2-6.5 Provisions for Disasters

- a. Design for continued operation. For those facilities that must remain operational in the aftermath of a disaster, special design is required to protect systems and essential building services such as power, water, medical gas systems, and, in certain areas, air conditioning. In addition, special consideration must be given to the likelihood of temporary loss of externally supplied power, gas, water, and communications.
- b. Wind- and earthquake-resistant design for new buildings
 - Facilities should be designed to meet the requirements of ASCE/SEI 7-05 or the building codes specified in Section 1.1-7.5.1, provided their requirements are substantially equivalent to ASCE/SEI 7.
 - Seismic construction inspection. The owner should provide special inspection during construction of seismic systems described in Section 11A.1.3 and testing described in Section 11A.2 of ASCE/SEI 7-05.
 - Roof considerations
 - Roof coverings and mechanical equipment should be securely fastened or ballasted to the supporting roof construction and should provide weather protection for the building at the roof. If ballast is used, it should be designed so as not to become a projectile.
 - In addition to the wind force design and construction requirements specified, particular attention should be given to roofing, entryways, glazing, and flashing design to minimize uplift, impact damage, and other damage that could seriously impair functioning of the building.
- c. Flood protection. In accordance with Executive Order 11988:
 - Possible flood effects should be considered when selecting and developing the site.
 - Insofar as possible, new facilities should not be located on designated floodplains.
 - Where locating a facility on a floodplain is unavoidable, consult the Corps of Engineers' regional office for the latest applicable regulations pertaining to required flood insurance and protection measures.
 - Hospital helipads should be located a minimum of 3 feet above the 100-year-flood elevation on campuses constructed on designated floodplains. A path of travel above 100-year-flood elevation should be provided between hospital acute care facilities and the helipad to facilitate evacuation.
- d. Emergency supply storage

***1.2-6.5.1 Needs Assessment**

In locations where there is recognized potential for hurricanes, tornadoes, flooding, earthquake, or other regional disasters, planning and design shall consider the need to protect the life safety of all health care facility occupants and the potential need for continuing services following such a disaster.

1.2-7 Renovation**1.2-7.1 Phasing**

Projects involving renovation of existing buildings shall include phasing to minimize disruption of existing patient services. This phasing is essential to ensure a safe environment in patient care areas.

1.2-7.1.1 Phasing Provisions

Phasing provisions shall include assurance for clean to dirty airflow, emergency procedures, criteria for interruption of protection, construction of roof surfaces, written notification of interruptions, and communication authority.

1.2-7.1.2 Noise and Vibration

Phasing plans shall include considerations of noise and vibration control that result from construction activities.

1.2-7.2 Isolation

During construction, renovation areas shall be isolated from occupied areas based on the ICRA.

1.2-7.3 Maintenance of Air Quality and Utilities

Existing air quality requirements and other utility requirements for occupied areas shall be maintained during any renovation or construction.

1.2-7.4 Nonconforming Conditions

It is not always financially feasible to renovate an entire existing structure in accordance with these Guidelines. Therefore, authorities having jurisdiction shall be permitted to grant approval to renovate portions of a structure if facility operation and patient safety in the renovated areas are not jeopardized by existing features of sections retained without complete corrective measures.

***1.2-7.5 Existing Conditions**

Existing conditions and operations shall be documented prior to initiation of renovation and/or new construction projects. This shall include documentation of existing mechanical/electrical/structural capacities and quantities.

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- Required supplies. Should normal operations be disrupted, the facility should provide adequate storage capacity for, or a functional program contingency plan to obtain, the following supplies: food, sterile supplies, pharmacy supplies, linen, and water for sanitation.
- Storage capacity. Such storage capacity or plans should be sufficient for at least four continuous days of operation.

A1.2-6.5.1 Needs Assessment for Disasters

- a. Facility assessment. Owners of existing facilities should undertake an assessment of their facility with respect to its ability to withstand the effects of regional natural disasters. The assessment should consider performance of structural and critical nonstructural building systems and the likelihood of loss of externally supplied power, gas, water, and communications under such conditions.
- b. Facility planning. Facility master planning should consider mitigation measures required to address conditions that may be hazardous to patients and conditions that may compromise the ability of the facility to fulfill its planned post-emergency medical response.

- c. Seismic considerations. Particular attention should be paid to seismic considerations in areas where the seismic design classification of a building would fall into Seismic Design Categories C, D, E, or F as described in American Society of Civil Engineers/Structural Engineering Institute (ASCE/SEI) 7-05: "Minimum Design Loads for Buildings and Other Structures."

A1.2-7.5 Existing Conditions

Documentation of existing conditions should include the following:

- a. Subsurface conditions (including soil testing reports, soil types, known water table information, active/abandoned utility locations)
- b. Foundation and superstructure information (including the ability of the structure and equipment (elevator) to handle the movement of heavy and/or large loads from one location to another)
- c. Fire suppression, detection, and alarm systems and construction type (including whether the building is fully sprinklered)
- d. Various communications systems (including telephone, nurse call, overhead paging, telemetry, dictation, electronic imaging)
- e. Various plumbing systems (including domestic water, treated water,

■ *1.2-8 Commissioning

Commissioning is a quality process used to achieve, validate, and document that facilities and component infrastructure systems are planned, constructed, installed, tested, and are capable of being operated and maintained in conformity with the design intent or performance expectations.

*1.2-8.1 HVAC Systems

Acceptance criteria for mechanical systems shall be specified. See Part 6 (ASHRAE 170) for further information.

1.2-8.1.1 Crucial ventilation specifications for air balance and filtration shall be verified before owner acceptance.

1.2-8.1.2 Areas requiring special ventilation (such as surgical services, protective environments, airborne infection isolation rooms, laboratories, and local exhaust systems for hazardous agents) shall be recognized as requiring mechanical systems that ensure infection control. Ventilation deficiencies shall not be accepted.

1.2-8.1.3 Acceptance criteria for local exhaust systems dealing with hazardous agents shall be specified and verified.

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wastewater, pneumatic tube, pneumatic controls, medical gases/vacuum)

- f. Existing airflow of affected areas
- g. Main electrical service and electrical service affected by construction (including rating and actual load/peak and feeder sizes as applicable and power factor)
- h. Emergency power system (including rating and actual load/peak and feeder sizes, as applicable, for life safety, emergency/critical, and equipment branches)

A1.2-8 Commissioning

- a. The commissioning process extends through all phases of a new construction or renovation project from conceptual design to occupancy and operations. Checks at each stage of the process should be made to ensure validation of performance to meet the owner's design requirements.
- b. Commissioning should be performed by an entity that is independent from the installing contractor. Health care facility personnel responsible for maintenance should be included in the commissioning process.
- c. Total building commissioning. Historically, the term "commissioning" has referred to the process by which the heating, ventilation, and air conditioning (HVAC) system of a building was tested and balanced according to established standards prior to acceptance by the building owner. The HVAC commissioning did not include other building components that did not directly affect the performance of the HVAC systems. Today, the definition of commissioning is being expanded to total building commissioning (TBC). The fundamental objective of TBC is to create a process whereby the owner will be assured that all building and system components, not just the HVAC system, will function according to design intent, specifications, equipment manufacturers' data sheets, and operational criteria. Because all building systems are integrated and validated, the owner can expect benefits

to include improved occupant comfort, energy savings, environmental conditions, system and equipment function, building operation and maintenance, and building occupants' productivity.

The TBC process should include a feedback mechanism that can be incorporated into the owner's postoccupancy evaluation process to enhance future facility designs.

Facility acceptance criteria should be based on the commissioning requirements specified in the contract documents. These criteria specify the tests, training, and reporting requirements necessary for the owner to validate that each building system complies with the performance standards of the basis of design and for final acceptance of the facility.

- d. Systems and components to be included in TBC. Key systems and components that need to be tested and validated, at a minimum, during the TBC process include the design and operations of the HVAC, plumbing, electrical, emergency power, fire protection/suppression, telecommunications, nurse call, intrusion and other alarm devices, and medical gas systems, as well as specialty equipment.

Air balancing, pressure relationships, and exhaust criteria for mechanical systems should be clearly described and tested to create an environment of care that provides for infection control.

Areas requiring emergency power should be specified and tested.

Special plumbing systems should be certified to support the chemicals scheduled for use in them.

- e. Areas to be included in commissioning. While all areas of the health care facility are included in the commissioning process, the following areas are of particular concern: critical and intensive care areas; surgical services; isolation rooms, including those used for airborne infection/pathogens; pharmacies, and other areas potentially containing hazardous substances.
- f. A reference source for an existing HVAC commissioning process is ASHRAE Guideline 1, *The HVAC Commissioning Process*.

1.2-8.1.4 Commissioning Requirements

On projects involving installation of new or modification to existing HVAC or fire alarm systems in patient care areas, the following commissioning activities shall be completed, at minimum:

1.2-8.1.4.1 Describe the basis of design (BOD).

This narrative shall be prepared by the design team and shall include a written description of the design intent that includes, but is not limited to, the following:

- (1) Diversity and safety factors used in sizing
- (2) Classes of systems and components (duct class, clean room class, etc.)
- (3) Level of redundancy
- (4) Occupant density
- (5) Limitations and restrictions of systems and assemblies
- (6) Indoor and outside conditions assumed (space temperature, relative humidity, lighting power density, glazing fraction, U-value and shading coefficient,

wall and ceiling R-values, ventilation and infiltration rates, etc.)

***1.2-8.1.4.2 Prepare pre-functional checklists.**

Included on these checklists are inspections and elementary component tests to verify proper functioning of equipment that has been installed or modified. The checklists shall be prepared by the commissioning agent, design engineer or owner. Inspections and testing shall be performed and documented by the installing contractor, commissioning agent, or other agent designated by the owner.

***1.2-8.1.4.3 Undertake functional performance tests.**

Dynamic tests of the function and operation of the systems (rather than just components) under full operation shall be performed. Systems shall be tested in various modes and run through all of the control system sequences of operation. These tests shall be performed and documented by the installing contractor, commissioning agent, or other agent designated by the owner and witnessed by the commissioning agent, design engineer, or owner.

1.2-8.2 Plumbing Systems*APPENDIX**

A1.2-8.1.4.2 Pre-functional checklist. The commissioning agent provides subcontractors with a list of items to inspect and elementary component tests to conduct to verify proper installation of equipment. Items on pre-functional checklists are primarily static inspections and procedures to prepare the equipment or system for initial operation (e.g., belt tension, oil levels, labels affixed, gauges in place, sensors calibrated, etc.). However, some pre-functional checklist items entail simple testing of the function of a component, a piece of equipment, or system (such as measuring the voltage imbalance of a three phase pump motor in a chiller system). Pre-functional checklists augment and are combined with the manufacturer's startup checklist. Even without a commissioning process, contractors typically perform some, if not all, of the pre-functional checklist items on their own. The commissioning agent only requires that the procedures be documented in writing and does not necessarily witness much of the pre-functional testing, except for larger or more critical pieces or when desired by the owner.

A1.2-8.1.4.3 Functional performance test. Functional testing is a test of the dynamic function and operation of equipment and systems (rather than components) under full operation using manual (direct observation) or monitoring methods. (For example, the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure set-

point.) Systems are tested in various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied conditions, varying outside air temperatures, fire alarm activation, power failure, etc. The systems are run through all the control system's sequences of operation, and the responses of components are verified to ensure they match what the sequences state.

Traditional air or water testing and balancing (TAB) is not functional testing. The primary purpose of TAB is setting up the system flows and pressures as specified; functional testing, on the other hand, is used to verify the performance of that which has already been set up.

The commissioning agent develops the functional test procedures in a sequential written form then coordinates, oversees, and documents the actual testing, which is usually performed by the installing contractor or vendor. Functional tests are performed after items on the pre-functional checklists and startup are complete.

A1.2-8.2 Plumbing Systems

Water lines, taps, showers, and ice machines that have been disrupted or stagnant should be flushed before use by building occupants.

- a. When commissioning ice machines, steps should be taken into to prevent the use of stagnant ice or water.
- b. Written procedures for flushing plumbing systems before owner use should be utilized.

1.2-9 Record Drawings and Manuals

1.2-9.1 Drawings

1.2-9.1.1 Upon occupancy of the building or portion thereof, the owner shall be provided with a complete set of record documents that shows construction, fixed equipment, and mechanical and electrical systems and reflects known deviations from the construction documents.

1.2-9.1.2 Drawings shall include a life safety plan for each floor reflecting NFPA 101 requirements.

1.2-9.2 Equipment Manuals

1.2-9.2.1 Upon completion of the contract, the owner shall be furnished with the following:

1.2-9.2.1.1 Equipment instructions. A complete set of manufacturers’ operating, maintenance, and preventive maintenance instructions shall be provided.

1.2-9.2.1.2 Parts lists

1.2-9.2.1.3 Procurement information with numbers and a description for each piece of equipment

1.2-9.2.2 Operating staff shall be provided with instructions on how to properly operate systems and equipment.

1.2-9.2.3 Required information shall include energy

Table 1.2-1

Design Room Sound Absorption Coefficients ($\bar{\alpha}$)

Space ¹	Design Coefficient ²	Subjective Description
Private patient room	0.15	“Average” room
Multi-bed patient room	0.15	“Average” room
Corridor	0.15	“Average” room
Waiting area room	0.25	“Medium-dry”
Atrium	0.10	“Medium live” room
Physician’s office	0.15	“Average” room
Treatment room	0.15	“Average” room

¹ Additional spaces shall be added based on the functional program.

² Use the noise reduction coefficient (NRC) rating for estimating the design room-average sound absorption coefficient when using this table.

ratings as needed for future conservation calculations.

1.2-9.3 Design Data

1.2-9.3.1 The owner shall be provided with complete design data for the facility, including the following:

1.2-9.3.1.1 Structural design loadings

1.2-9.3.1.2 Summary of heat loss assumption and calculations

1.2-9.3.1.3 Estimated water consumption

1.2-9.3.1.4 Medical gas outlet listing

1.2-9.3.1.5 List of applicable codes

1.2-9.3.1.6 Electric power requirements of installed equipment

1.2-9.3.2 All such data shall be supplied to facilitate future alterations, additions, and changes, including, but not limited to, energy audits and retrofit for energy conservation.

Table 1.2-2

Minimum–Maximum Design Criteria for Noise in Interior Spaces

Room Type	NC / RC(N) / RNC ^{3,4}	dB(A)
Patient rooms	30–40	35–45
Multiple occupant patient care areas	35–45	40–50
NICU ¹	25–35	30–40
Operating rooms ²		
Corridors and public spaces	35–45	40–50
Testing/research lab, minimal speech ²	45–55	50–60
Research lab, extensive speech ²	40–50	45–55
Group teaching lab	35–45	40–50
Doctor’s offices, exam rooms	30–40	35–45
Conference rooms	25–35	30–40
Teleconferencing rooms	25 (max)	30 (max)
Auditoriums, large lecture rooms	25–30	30–35

¹ NICU building mechanical noise levels were set for compliance with Guidelines requirements when added to NICU activity noise.

² See A1.2-6.1.4 for recommended ranges for operating rooms.

³ See the white paper “Sound and Vibration Design Guidelines for Health Care Facilities” (January 1, 2010) posted at www.fgiguilines.org for a discussion of room noise rating criteria. Also see A1.2-6.1.4 (Room noise levels in operating rooms).

⁴ One rating system shall be chosen to evaluate room noise levels, and noise from building mechanical systems shall be evaluated using that single rating system.

Table 1.2-3

Design Criteria for Minimum Sound Isolation Performance Between Enclosed Rooms

Adjacency combination		STC _c ¹
Patient room	Patient room (wall–same floor)	45 ²
Patient room	Patient room (floor–to–floor)	50
Patient room	Corridor (with entrance)	35 ³
Patient room	Public space	50
Patient room	Service area	60 ⁴
NICU room	Patient room	50
NICU	Corridor	50
Exam room	Corridor (with entrance)	35 ³
Exam room	Public space	50
Treatment room	Room	50
Treatment room	Corridor	35
Toilet room	Public space	45
Consultation room	Public space	50
Consultation room	Patient rooms	50
Consultation room	Corridor (with entrance)	35 ³
Patient room	MRI room	60 ⁴
Exam room	MRI room	60 ⁴
Exam room	Exam room (no electronic masking)	50
Exam room	Exam room (with electronic masking)	40 ⁵
Public space	MRI room	50

¹STC values stated are between rooms (not spaces).

²In cases where greater speech privacy is required when both patient doors on either side of a patient room wall are closed, the wall performance requirement shall be STC 50.

³The performance of this construction assumes a closed door.

⁴Relaxation of STC 60 ratings shall be permitted if compliance with room noise requirements is achieved with lower performance constructions. See Table 1.2-2 (Minimum–Maximum Criteria for Noise in Interior Spaces).

⁵Electronic masking shall provide a maximum background level of 48 dBA.

Table 1.2-4

Design Criteria for Speech Privacy for Enclosed Rooms and Open-Plan Spaces¹

Speech Privacy Goal	PI	AI	STI	SII
<i>Enclosed rooms</i>				
Normal	≥85%	≤0.15	≤0.19	≤0.20
Confidential	≥95%	≤0.05	≤0.12	≤0.10
Secure	Special consideration required.			
<i>Open-plan spaces</i>				
Normal (non-intrusive)	≥80%	≤0.20	≤0.23	≤0.25
Confidential ²	Special consideration required.			

¹The indicated AI, STI, and SII values shall be considered the maximum accepted values. The indicated PI values shall be considered the minimum accepted values.

²Confidential speech privacy is not readily achievable in open-plan spaces due to the lack of barriers, low ambient sound levels, and typical voice effort.

Table 1.2-5

Maximum Limits on Footfall Vibration in Health Care Facilities

Space Type	Footfall Vibration Peak Velocity (micro-in/s)
Patient rooms and other patient areas	4000
Operating and other treatment rooms	4000
Administrative areas	8000
Public circulation areas	8000

APPENDIX

Table A1.2-a
Categorization of Health Care Facility Sites by Exterior Ambient Sound

Exterior Site Noise Exposure Category	A	B	C	D
General description	Minimal	Moderate	Significant	Extreme
Day–night average sound level (Ldn) (dB)	< 65	65–70	70–75	> 75
Average hourly nominal maximum sound level (L01) (dBA)	< 75	75–80	80–85	> 85
Distance from nearest highway (ft)	1000	250–1000	60–250	< 60
Slant distance from nearest aircraft flight track 1 (ft)	> 7000	3500–7000	1800–3500	< 1800
	4000	2000–4000	1000–2000	1000
Distance from nearest rail line (ft)	1500	500–1500	100–500	< 100
Exterior shell composite STC rating (STC _c) ¹	35	40	45	50
Design goal for facility nighttime exterior equipment sound (dBA) ²	45	50	55	60
Exterior patient seating areas	Generally acceptable noise level	Some shielding of principal	Generally not acceptable without special acoustical consideration	Generally not acceptable noise required

¹The exterior shell composite STC ratings are for closed windows. Opening windows effectively reduces shell composite STC ratings to 10 to 15, depending on the amount windows are opened. Consideration should be given to whether windows would be opened and for how long and under what circumstances, and the potential impact of open windows should be identified in the design.

²This is a design goal for acceptable emission of equipment sound to adjacent residential receptors in the absence of a local code. For equipment operating only during the daytime, levels may be increased by 5 dBA.

1.3 Site

Appendix material, which appears in boxes at the bottom of the page, is advisory only.

■ 1.3-1 General

1.3-1.1 Application

The provisions of this chapter shall apply to all health facility projects.

■ 1.3-2 Location

1.3-2.1 Access

The site of any health care facility shall be convenient both to the community and to service vehicles, including fire protection apparatus, etc.

*1.3-2.2 Availability of Transportation

Site design shall integrate building and parking locations, adjacencies, and access points with on-site and off-site vehicular and pedestrian patterns and transportation services.

1.3-2.3 Security

Health facilities shall have security measures for patients, families, personnel, and the public that are consistent with the conditions and risks inherent in the location of the facility.

1.3-2.4 Availability of Utilities

Facilities shall be provided with reliable utilities (water, gas, sewer, electricity) in compliance with requirements outlined in the facility chapters in this document.

1.3-2.4.1 Water Supply

The water supply shall have the capacity to provide for normal usage and to meet fire-fighting requirements.

1.3-2.4.2 Electricity

The electricity shall be of stable voltage and frequency.

■ 1.3-3 Site Features

1.3-3.1 Roads

Paved roads shall be provided within the property for access to all entrances and to loading and unloading docks (for delivery trucks).

1.3-3.1.1 Signage

Site signage shall be provided to direct people unfamiliar with the facility to parking areas and entrances.

*1.3-3.1.2 Lighting

Site lighting shall be provided on roads, parking lots, and pedestrian walkways.

1.3-3.2 Pedestrian Walkways

Paved walkways shall be provided for pedestrian traffic.

1.3-3.3 Parking

1.3-3.3.1 Health care facilities shall provide sufficient parking capacity to satisfy the needs of patients, personnel, and the public. Parking needs shall be evaluated for each new facility, major addition, or major change in function.

facilities, alternative vehicle fueling stations, and nearby transit access.

A1.3-3.1.2 Exterior lighting should be designed to minimize night-sky pollution. Lighting controls should permit zoned operation, allowing facilities to provide multiple lighting levels or to designate night parking nearer the building. Lighting design for the site, roadway, and parking lots should control glare and light pollution.

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A1.3-2.2 Availability of Transportation

Facilities should be located so they are convenient to public transportation where available, unless acceptable alternate methods of transportation to public facilities and services are provided. The transportation plan should support alternatives to fossil-fueled single-occupancy vehicles, including preferred van/carpool parking, bike parking and changing

1.3-3.3.2 In the absence of local parking standards or ordinances, refer to individual chapters governing specific facility types for required parking capacity. In all instances, review individual chapters for requirements for dedicated emergency, patient transfer, or service parking.

1.3-3.3.3 Unless otherwise prohibited by individual chapters, reduction of parking requirements shall be permitted, as acceptable to local authorities having jurisdiction, in locations convenient to pedestrians, public transportation, or public parking facilities or where carpool, shuttle bus, or other alternative transportation arrangements have been developed.

*1.3-3.4 Emergency Access

1.3-3.4.1 Hospitals with an organized emergency service shall have the emergency access well marked to facilitate entry from public roads or streets serving the site.

1.3-3.4.2 Access to emergency services shall be located to incur minimal damage from floods and other natural disasters.

1.3-3.5 Landscape Design Features

1.3-3.5.1 Outdoor Water Features

Where provided, open water features shall be equipped to safely manage water quality to protect the public from infectious or irritating aerosols.

*1.3-3.5.2 Landscape and Gardens

1.3-3.6 Transfer Support Features

1.3-3.6.1 Ambulance Bays

If required by these guidelines or the functional program, ambulance bays shall be located convenient to emergency suites or related transport destinations.

1.3-3.6.2 Helipads

If required by these guidelines or the functional program, helipads shall be located convenient to emergency suites or related transport destinations.

1.3-3.6.2.1 Helicopter landing pads and flight approach paths shall comply with applicable regulations governing placement, safety features, lighting, fencing, and other site elements to accommodate safe and secure transport services.

***1.3-3.6.2.2** Facilities with helipads shall incorporate noise mitigation strategies to meet the acoustic requirements outlined in these guidelines.

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A1.3-3.4 Other vehicular or pedestrian traffic should not conflict with access to the emergency station.

A1.3-3.5.2 Subject to site constraints, health care organizations may consider opportunities to promote physical activity and/or outdoor uses for staff and visitors.

Therapeutic uses of landscape elements such as healing gardens or natural landscapes should be integrated into health care facilities wherever possible. Consider a range of uses, including roof gardens, horticulture therapy gardens, walking trails, etc., that provide diverse outdoor experiences.

Provide indigenous and low maintenance landscape materials and plants to reduce the use of water for irrigation and the life cycle costs of maintenance.

A1.3-3.6.2.2 Noise considerations for heliports. The location of heliports on a hospital site should be evaluated for noise impacts on the facility and community. Helipads can be located at ground level on the hospital site or on a hospital building roof. Helicopter

noise at nearest residences and at hospital buildings requires special consideration under the following conditions:

- a. When helicopter sound levels exceed 80 dBA at nearby residences (This generally occurs when the slant distance from the helicopter to the residence is 700 feet (213.36 meters) or less. Slant distance is the minimum distance in feet directly between a residence and a helicopter at its closest approach. Patient transport agencies expecting to use the heliport can provide guidance on slant distances for various helicopter approaches. Helicopter approaches to a helipad are influenced by wind direction and locations of nearby buildings.)
- b. When the number of helicopter operations exceeds three per day
- c. When there are likely to be more than two helicopter flights per week between the hours of 10:00 P.M. and 7:00 A.M.
- d. When the slant distance to the nearest residence is 1,000 feet (304.80 meters) or less
- e. When the helipad is atop a hospital building (Special attention to the design of building windows is required when helicopters will land on the building. Sound levels at windows directly below the flight

■ *1.3-4 Environmental Pollution Control

The design, construction, renovation, expansion, equipment, and operation of health care facilities shall meet the provisions of applicable government environmental pollution control laws and associated agency regulations.

APPENDIX (continued)

path to the roof can exceed 90 dBA and may require special acoustical glazing.)

- f. When the helipad is located on the ground and is situated so that helicopters will approach within 500 feet (152.40 meters) of hospital buildings
- g. When military helicopters, which are often larger than civilian medevac helicopters, are expected to use the helipad more than once per week.

Helicopters, particularly military helicopters and large civilian helicopters, can induce low frequency vibration in building windows and facades that can vibrate building fixtures and furnishings. Such vibration is generally not acceptable; however, it can be difficult to predict. As a guide, unacceptable vibration can occur when low frequency sound levels (16–31 Hz) exceed 75 dB and when helicopters are within 500 feet (152.40 meters) of buildings.

A1.3-4 Environmental Pollution Control

The design, construction, renovation, expansion, equipment, and operation of health care facilities are all subject to provisions of several federal environmental pollution control laws and associated agency regulations. In addition, many states have enacted statutes and regulations that are substantially equivalent to or more stringent than federal regulations, thereby implementing national priorities under local jurisdiction as well as incorporating local priorities (e.g., air quality related to incinerators and gas sterilizers; underground storage tanks; hazardous materials and waste storage, handling, and disposal; storm water control; medical waste storage and disposal; and asbestos in building materials). Consult the appropriate U.S. Department of Health and Human Services (DHHS) and U.S. Environmental Protection Agency (EPA) regional offices and any other federal, state, or local authorities having jurisdiction for the latest applicable state and local regulations pertaining to environmental pollution that may affect the design, construction, or operation of the health care facility, including management of industrial chemicals, pharmaceuticals, radionuclides, and wastes from the facility, as well as trash, noise, and traffic (including air traffic).

- a. **Permits.** Health care facilities regulated under federal, state, and local environmental pollution laws may be required to support

permit applications with appropriate documentation of proposed impacts and mitigations.

Such documentation is typically reported in an environmental impact statement (EIS) with respect to potential effects on the environment and in a health risk assessment (HRA) with respect to potential impacts on public health. The HRA may constitute a part or an appendix of the EIS. The scope of the EIS and the HRA is typically determined in consultation with appropriate regulatory agency personnel and, if required, includes a meeting to which members of the interested public are invited to express their concerns.

Once the EIS and/or HRA scope has been established, a protocol document should be prepared for agency approval.

- The protocol should describe the scope and procedures to be used to conduct the assessment(s).

- The EIS and/or HRA should be prepared in accordance with a final protocol approved by the appropriate agency or agencies. Approval is most likely to be obtained in a timely manner and with minimum revisions if standard methods are initially proposed for use in the EIS and/or HRA. Standard methods suitable for specific assessment tasks are set forth in EPA documents.

- b. **Mercury elimination.** Health care facilities should collect and properly store, recycle, or dispose of mercury encountered during construction or demolition (such as mercury accumulated in P-traps, air-handling units, sumps, etc.).

Many states and municipalities have enacted bans on the sale of mercury-containing devices and equipment. Health care facility projects should comply with local codes and standards.

In new construction, health care facilities should not use mercury-containing equipment, including thermostats, switching devices, and other building system sources.

For renovation, health care facilities should develop a plan to phase out mercury-containing sources and upgrade current mercury-containing lamps to low or no mercury lamp technology.

- c. **Release of toxic substances from equipment.** Equipment should minimize the release of chlorofluorocarbons (CFCs) and any potentially toxic substances that may be used in their place. For example, the design of air-conditioning systems should specify CFC alternatives and recovery systems as may be practicable.

1.4 Equipment

Appendix material, which appears in shaded boxes at the bottom of the page, is advisory only.

■ 1.4-1 General

Equipment will vary to suit individual construction projects and therefore will require careful planning.

1.4-1.1 Application

The provisions of this chapter shall apply to all health facility projects.

1.4-1.2 Equipment List

An equipment list shall be included in the contract documents to assist in overall coordination of the acquisition, installation, and relocation of equipment.

1.4-1.2.1 The equipment list shall show all items of equipment necessary to operate the facility.

1.4-1.2.2 The equipment list shall include the classifications identified in 1.4-2 (Equipment Classification).

1.4-1.2.3 The equipment list shall specify whether the items are new, existing to be relocated, owner provided, or not-in-contract.

1.4-1.3 Drawing Requirements

*1.4-1.3.1 Provisions for Equipment

1.4-1.3.1.1 The drawings shall indicate provisions for the installation of fixed or movable equipment that requires dedicated building services or special structures and illustrate how the major equipment will function in the space.

1.4-1.3.1.2 An equipment utility location drawing shall be produced to locate all services for equipment that requires floor space and mechanical connections.

*1.4-1.3.2 Not-in-Contract (NIC) Equipment

1.4-1.3.2.1 Design development documents. Equipment that is not included in the construction contract but requires mechanical or electrical service connections or construction modifications shall, insofar as practical, be identified on the design development documents to provide coordination with the architectural, mechanical, and electrical phases of construction.

1.4-1.3.2.2 Construction documents. Such equipment shall be shown in the construction documents as owner-provided or not-in-contract for purposes of coordination.

1.4-1.3.3 Final Equipment Selections

Adjustments shall be made to the construction documents when final selections are made.

■ 1.4-2 Equipment Classification

Equipment to be used in projects shall be classified as building service equipment, fixed equipment, or movable equipment.

1.4-2.1 Building Service Equipment

Building service equipment shall include items such as heating, ventilation, and air-conditioning equipment; electrical power distribution equipment; emergency power generation equipment; energy/utility management systems; conveying systems; and other equipment with a primary function of building service (e.g., humidification equipment, filtration equipment, chillers, boilers, fire pumps, etc.).

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A1.4-1.3.1 Design should consider the placement of cables from receptacles and portable equipment so that circulation and safety are maintained.

A1.4-1.3.2 Some equipment may not be included in the construction contract but may require coordination during construction.

*1.4-2.2 Fixed Equipment

Fixed equipment shall include items that are permanently affixed to the building or permanently connected to a service distribution system that is designed and installed for the specific use of the equipment.

1.4-2.2.1 Fixed Medical Equipment

This shall include, but is not limited to items such as fume hoods, sterilizers, communication systems, built-in casework, imaging equipment, radiotherapy equipment, lithotripters, hydrotherapy tanks, audiometry testing chambers, surgical and special procedure lights, and ceiling-mounted mechanical patient lifting devices.

1.4-2.2.2 Fixed Nonmedical Equipment

This shall include, but is not limited to, items such as walk-in refrigerators, kitchen cooking equipment, serving lines, conveyors, mainframe computers, laundry, and similar equipment.

*1.4-2.3 Movable Equipment

Movable equipment shall include items that require floor space or electrical and/or mechanical connections but are portable, such as wheeled items (e.g., beds), beds, portable items, office-type furnishings, and diagnostic or monitoring equipment.

1.4-2.3.1 Movable Medical Equipment

This shall include, but is not limited to, portable X-ray, electroencephalogram (EEG), electrocardiogram (EKG), treadmill and exercise equipment, pulmonary function equipment, operating tables, laboratory centrifuges, examination and treatment tables, and similar equipment.

1.4-2.3.2 Movable Nonmedical Equipment

This shall include, but is not limited to, personal computer stations, patient room furnishings, food service trucks, case carts and distribution carts, and other portable equipment.

■ 1.4-3 Equipment Requirements

*1.4-3.1 Major Technical Equipment

Major technical equipment shall include specialized equipment (medical or nonmedical) that is customarily installed by the manufacturer or vendor. Close coordination between owner, building designer, installer, construction contractors, and others shall be required.

1.4-3.2 Electronic Equipment

1.4-3.2.1 Protection

Special consideration shall be given to protecting computerized equipment such as multiphasic laboratory testing units, as well as computers, from power surges and spikes that might damage the equipment or programs.

1.4-3.2.2 Constant Power

Consideration shall also be given to the addition of an uninterruptible power supply where loss of data input might compromise patient care.

■ 1.4-4 Space Requirements for Equipment

1.4-4.1 Fixed and Building Service Equipment

Space for accessing and servicing fixed and building service equipment shall be provided.

1.4-4.2 Movable Equipment

Facility planning and design shall consider the convenient and dedicated placement of equipment requiring floor space and mechanical connections and the voltage required for electrical connections where portable equipment is expected to be used. (See 1.4-1.3.1.2 for drawing requirements.)

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A1.4-2.2 Fixed equipment may require special structural designs, mechanical and electrical provisions, shielding, or other considerations.

A1.4-2.3 Movable equipment may require special structural design or access, mechanical and electrical connections, shielding, or other considerations.

A1.4-3.1 Examples of major technical equipment are X-ray and other imaging equipment, radiation therapy equipment, lithotripters, audiometry testing chambers, laundry equipment, computers, and similar items. Major technical equipment may require special structural designs, mechanical and electrical provisions, or other considerations. The facility design should accommodate paths of travel for easy removal and replacement of large equipment such as CT scan and MRI equipment.

Hospitals **2**

2.1 Common Elements for Hospitals

Appendix material, shown in shaded boxes at the bottom of the page, is advisory only.

■ 2.1-1 General

2.1-1.1 Application

2.1-1.1.1 This chapter contains elements that are common to most types of hospitals. The elements are required only when referenced in a specific hospital facility chapter.

2.1-1.1.2 Additional specific requirements are located in the facility chapters of Part 2 (facility chapters are listed below). Consult the facility chapters to determine if elements in this chapter are required.

- General hospitals (Chapter 2.2)
- Small primary care hospitals (Chapter 2.3)
- Critical access hospitals (Chapter 2.4)—Reserved
- Psychiatric hospitals (Chapter 2.5)
- Rehabilitation hospitals and other facilities (Chapter 2.6)

2.1-1.1.3 Language from other chapters in these Guidelines is included in the criteria given in this Part when reference is made to a specific section. Such references include the section as identified by number and heading and all its subsections, unless otherwise noted.

2.1-1.2 Functional Program

For each project, there shall be a functional program for the facility. For requirements, see 1.2-2.

2.1-1.2.1 Size and Layout

Department size and clear floor area requirements shall depend on program requirements and organization of services within the hospital. Combination or sharing of some functions shall be permitted provided the layout does not compromise safety standards and medical and nursing practices.

2.1-1.3 Site

2.1-1.3.1 Parking

Parking provided shall comply with the general requirements in 1.3-3.3 and the specific requirements in each chapter in this Part of the Guidelines.

■ 2.1-2 Nursing Units and Other Patient Care Areas

2.1-2.1 General

The patient room or care area requirements included in this section are common to most hospitals. For requirements specific to a facility type, see the applicable hospital facility chapter in Part 2.

2.1-2.2 Patient Room

2.1-2.2.1 Capacity

For specific requirements, see facility chapters.

2.1-2.2.2 Space Requirements

2.1-2.2.2.1 Minor encroachments, including columns and hand-washing stations, that do not interfere with functions may be ignored when determining space requirements for patient rooms.

2.1-2.2.2.2 For specific requirements, see facility chapters.

2.1-2.2.3 Windows

For specific requirements, see facility chapters.

2.1-2.2.4 Patient Privacy

In multiple-bed rooms, visual privacy from casual observation by other patients and visitors shall be provided for each patient. The design for privacy shall not restrict patient access to the entrance, hand-washing station, or toilet.

2.1-2.2.5 Hand-Washing Stations

2.1-2.2.5.1 Location. For specific requirements, see facility chapters.

2.1-2.2.5.2 Design requirements

- (1) For hand-washing station design details, see 2.1-7.2.2.8 (Hand-washing stations).
- (2) For sinks, see 2.1-8.4.3.2 (Hand-washing stations).
- (3) For electrical requirements, see 2.1-8.3.5.2 (Hand-washing stations and scrub sinks).

2.1-2.2.6 Patient Toilet Room

2.1-2.2.6.1 General

- (1) Where required by other sections of the Guidelines, each patient shall have access to a toilet room without having to enter a corridor.
- (2) Unless located in a toilet room, bedpan-washing fixtures shall be installed in dedicated rooms, separate from patient care areas. For requirements, see 2.1-2.6.10 (Soiled Workroom or Soiled Holding Room).

2.1-2.2.6.2 The toilet room shall serve no more than two patient rooms and no more than four beds.

2.1-2.2.6.3 The toilet room shall contain a toilet and a hand-washing station.

***2.1-2.2.6.4 Toilet room doors.** For requirements specific to a particular hospital type, see the relevant hospital facility chapter elsewhere in Part 2.

- (1) Toilet room doors shall swing outward or be equipped with emergency rescue hardware.

- (2) Where local requirements permit, use of wall-hung sliding doors mounted on the outside of the toilet room shall be permitted, provided adequate provisions are made for emergency access from outside the room, for routine cleaning of the sliding mechanism, and for acoustical and visual privacy.
- (3) Doors shall have either an undercut or a louver designed to allow for free flow of air into the bathroom.

2.1-2.2.7 Patient Bathing Facilities

For requirements, see specific facility chapters.

2.1-2.2.8 Patient Storage

For requirements, see specific facility chapters.

2.1-2.3 Reserved

2.1-2.4 Special Patient Care Rooms

2.1-2.4.1 General

The special patient care area requirements in this section shall apply to all facilities that include these areas. See facility chapters in Part 2 for specific requirements. Requirements for other types of special patient care rooms are also located in the facility chapters.

***2.1-2.4.2 Airborne Infection Isolation (All) Room**

2.1-2.4.2.1 General

- (1) The AII room requirements contained in these Guidelines for particular areas throughout a facility shall be:
 - (a) Predicated on an ICRA and designated by the functional program.
 - (b) Based on the needs of specific community and patient populations served by an individual

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A2.1-2.2.6.4 To prevent blockage of the door and ensure quick access from outside the room, doors to toilet rooms are required to swing outward or be equipped with emergency rescue hardware that permits quick access from outside the room. Sliding doors may be permitted if they are not in conflict with other requirements, such as handicapped accessibility, and cannot be blocked from the inside. A pocket type of sliding door would not meet this requirement because weight pushed up against this type of door prevents the door from opening for access from outside the room.

A2.1-2.4.2 For additional information, refer to the Centers for Disease Control and Prevention (CDC) "Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-Care Settings," December 2005, and "Guidelines for Environmental Infection Control in Health-Care Facilities," December 2003, both published in *MMWR* and available on the CDC Web site.

- health care organization (see Glossary and 1.2–3.4 [Infection Control Risk Mitigation]).
- (c) Applied to patients who require an AII room but do not need a protective environment (PE) room.

(2) Number. For specific requirements, see facility chapters.

(3) Location. AII rooms shall be located within individual nursing units or grouped as a separate isolation nursing unit. When not required for patients with airborne infectious diseases, use of these rooms for normal acute care patients shall be permitted.

2.1-2.4.2.2 AII room requirements. Each airborne infection isolation room shall comply with the requirements in 2.2-2.2.2 (Medical/Surgical Patient Room) as well as the following requirements:

(1) Capacity. Each patient room shall contain only one bed.

(2) A hand-washing station shall be located in each patient room. Placement of an additional hand-washing station outside the room entrance shall be permitted.

(3) An area for gowning and storage of clean and soiled materials shall be located either directly outside or inside the entry door to the patient room.

(4) A separate room with a toilet, bathtub (or shower), and hand-washing station shall be provided for each airborne infection isolation room.

2.1-2.4.2.3 Anteroom. An anteroom is not required; however, if an anteroom is part of the design concept, it shall meet the following requirements:

- *(1) The anteroom shall provide space for persons to don personal protective equipment before entering the patient room.

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A2.1-2.4.2.3 (1) The anteroom may be used for hand hygiene and for storage of personal protective equipment (PPE) (e.g., respirators, gowns, gloves) and clean equipment.

2.1-2.4.2.4 (2) Window shades should be a neutral color to maintain true coloration of patient skin.

- (2) All doors to the anteroom shall have self-closing devices.

2.1-2.4.2.4 Special design elements

(1) Architectural details

- (a) AII room perimeter walls, ceiling, and floor, including penetrations, shall be sealed tightly so that air does not infiltrate the environment from the outside or from other spaces.
- (b) Airborne infection isolation room(s) shall have self-closing devices on all room exit doors.
- (c) Doors shall have edge seals.

*(2) Window treatments and privacy curtains. In addition to the requirements below, see 2.1-7.2.4.3 (Window treatments).

- (a) Window treatments shall be selected for ease of cleaning. Smooth-surfaced, easy-to-clean, wipeable, nonpleated window treatments shall be used.
- (b) Fabric drapes and curtains shall not be used for window treatments.
- (c) Use of fabric privacy curtains shall be permitted if they are washable. A wipeable fabric with a smooth surface is preferable.

(3) For HVAC requirements, see 2.1-8.2.2.1 (Airborne infection isolation rooms).

2.1-2.4.3 Seclusion Treatment Room

The seclusion treatment room is intended for short-term occupancy. Within the psychiatric nursing unit, this space provides for patients requiring security and protection.

2.1-2.4.3.1 Capacity

- (1) Each room shall be for only one patient.
- (2) There shall be at least one seclusion room for each 24 beds or fewer and for each major fraction thereof on each psychiatric unit.
- (3) If a facility has more than one psychiatric nursing unit, the number of seclusion rooms shall be a function of the total number of psychiatric beds in the facility.

2.1 COMMON ELEMENTS FOR HOSPITALS

2.1-2.4.3.2 Location

- (1) The room(s) shall be located to provide convenient access from the nursing station.
- (2) Seclusion rooms may be grouped together.

2.1-2.4.3.3 Space requirements

- (1) Seclusion treatment rooms shall have a minimum clear floor area of 60 square feet (5.57 square meters) with a minimum wall length of 7 feet (2.13 meters) and a maximum wall length of 11 feet (3.35 meters).
- (2) Where restraint beds are required by the functional program, a minimum clear floor area of 80 square feet (7.43 square meters) shall be required.

2.1-2.4.3.4 Layout. Seclusion treatment rooms shall be accessed by an anteroom or vestibule that also provides access to a toilet room. The door openings to the anteroom and the toilet room shall have a minimum clear width of 3 feet 8 inches (1.12 meters).

2.1-2.4.3.5 Architectural details and building system equipment. Seclusion treatment rooms shall be constructed to prevent patient hiding, escape, injury, or suicide.

- (1) The walls, ceiling, and floor of the seclusion room shall be designed to withstand direct and forceful impact. If padded materials are used inside the room, they shall meet a Class A or Class B interior finish as defined by NFPA 101.
- (2) Seclusion treatment rooms shall not contain outside corners or edges.
- (3) Doors
 - (a) The entrance door to the seclusion room shall swing out.
 - (b) Door openings shall have a minimum clear width of 3 feet 8 inches (1.12 meters) and shall permit staff observation of the patient through a vision panel, while also maintaining provisions for patient privacy.
- (4) Minimum ceiling height shall be 9 feet (2.74 meters).
- (5) All items that may be in the room (e.g., a lighting fixture, sprinkler head, HVAC grille, or sur-

veillance camera) shall be tamper resistant and designed to prevent injury to the patient.

- (6) Electrical switches and receptacles are prohibited within the seclusion room.

2.1-2.5 Support Areas for Patient Care—General

Identifiable spaces shall be provided for each function indicated in all sections with requirements for support areas. Where the word “room” or “office” is used, a separate, enclosed space for the one named function is intended. Otherwise, the described area shall be permitted to be a specific space in another room or common area.

2.1-2.6 Support Areas for Nursing Units and Other Patient Care Areas

2.1-2.6.1 Administrative Center or Nurse Station

2.1-2.6.1.1 This area shall provide the following:

- (1) Space for counters
- (2) Space for storage
- (3) Convenient access to hand-washing stations

2.1-2.6.1.2 This area shall be permitted to be combined with or include centers for reception and communication.

2.1-2.6.2 Documentation Area

Charting facilities shall have sufficient work surface to ensure that staff and physicians can simultaneously chart and access information and communication systems.

2.1-2.6.3 Nurse or Supervisor Office

For specific requirements, see facility chapters.

2.1-2.6.4 Multipurpose Room

At least one multipurpose room for each facility shall be provided for staff, patients, and patients’ families for patient conferences, reports, education, training sessions, and consultation.

2.1-2.6.4.1 This room shall be accessible to each nursing unit and shall be permitted to serve several nursing units and/or departments.

2.1-2.6.4.2 The need for additional room(s) shall be determined by the requirements of the nursing unit or the functional program.

2.1-2.6.5 Hand-Washing Station

2.1-2.6.5.1 For location and number requirements, see specific facility chapters.

2.1-2.6.5.2 For design and plumbing fixture details, see 2.1-7.2.2.8 and 2.1-8.4.3.2.

2.1-2.6.6 Medication Dispensing Location

Medication shall be distributed from a medicine preparation room, a self-contained medication dispensing unit, an automated medication-dispensing station, or another system approved by the AHJ.

2.1-2.6.6.1 Medicine preparation room. The medicine preparation room shall meet the following requirements:

- (1) This room shall be under visual control of the nursing staff.
- (2) This room shall contain the following:
 - (a) A work counter
 - (b) A hand-washing station
 - (c) A lockable refrigerator
 - (d) Locked storage for controlled drugs
 - (e) Task illumination as described by the Illuminating Engineering Society of North America for safe identification of medication
- (3) When a medicine preparation room is to be used to store one or more self-contained medication-dispensing units, the room shall be designed with adequate space to prepare medicines with the self-contained medicine-dispensing unit(s) present.

2.1-2.6.6.2 Self-contained medication dispensing unit, automated medication-dispensing station, or another system approved by the AHJ

- (1) Location of a self-contained medication dispensing unit, automated medication-dispensing station, or another system approved by the AHJ shall be permitted at the nurse station, in the clean workroom, or in an alcove, provided the following requirements are met:

- (a) The unit is locked for the security of controlled drugs.
- (b) Task illumination as described by the Illuminating Engineering Society of North America for safe identification of medication.
- (c) If the unit is located in either the clean workroom or an alcove, it shall comply with the visual control set forth in Section 2.1-2.6.6.1.

- (2) A hand-washing station shall be located adjacent to the stationary medication dispensing unit. (Standard cup-sinks provided in many self-contained units shall not be considered adequate for hand-washing.)

2.1-2.6.7 Nourishment Area or Room

Each nursing unit shall have facilities for patient nourishment.

2.1-2.6.7.1 Patient nourishment facilities shall be permitted to be located in either an area or a room.

2.1-2.6.7.2 The nourishment area or room shall have the following:

- (1) Sink
- (2) Work counter
- (3) Refrigerator
- (4) Storage cabinets
- (5) Equipment for hot and cold nourishment between scheduled meals
- (6) Space for trays and dishes used for nonscheduled meal service

2.1-2.6.7.3 A hand-washing station shall be located in the nourishment room or adjacent to the nourishment area.

2.1-2.6.7.4 Provisions and space shall be included for separate temporary storage of unused and soiled dietary trays not picked up at mealtime.

2.1-2.6.8 Ice-Making Equipment

2.1-2.6.8.1 Location of ice-making equipment shall be permitted in the clean workroom, in the clean supply room, or in the nourishment area or room.

2.1-2.6.8.2 Ice-making equipment type

- (1) In public areas, all ice-making equipment shall be of the self-dispensing type.
- (2) In areas restricted to staff only, use of storage bin-type equipment for making and dispensing ice shall be permitted.

2.1-2.6.9 Clean Workroom or Clean Supply Room

The clean workroom or clean supply room shall be separate from and have no direct connection with the soiled workroom or soiled holding room.

2.1-2.6.9.1 Clean workroom. If the room is used for preparing patient care items, it shall contain the following:

- (1) A work counter
- (2) A hand-washing station
- (3) Storage facilities for clean and sterile supplies

2.1-2.6.9.2 Clean supply room. If the room is used only for storage and holding as part of a system for distribution of clean and sterile materials, omission of the work counter and hand-washing station shall be permitted.

2.1-2.6.10 Soiled Workroom or Soiled Holding Room

Such rooms shall be separate from and have no direct connection with clean workrooms or clean supply rooms.

2.1-2.6.10.1 Soiled workroom. This room shall contain the following:

- (1) A flushing rim clinical service sink with a bedpan rinsing device and a separate hand-washing station. Both fixtures shall have a hot and cold mixing faucet.
- (2) A work counter
- (3) Space for separate covered containers used for soiled linen and a variety of waste types

2.1-2.6.10.2 Soiled holding room

- (1) Omission of the flushing-rim clinical service sink and work counter shall be permitted in this room

when it is used only for temporary holding of soiled material.

- (2) If a flushing-rim clinical service sink is not provided in the soiled holding room, such a sink or an acceptable alternative (e.g., a water closet with bedpan-rinsing device located in a patient toilet room) shall be provided elsewhere on the nursing unit for the cleaning of bedpans.

2.1-2.6.11 Equipment and Supply Storage

2.1-2.6.11.1 Clean linen storage. This storage shall meet the following requirements:

- (1) Clean linen shall be permitted to be stored in a designated area within the clean workroom, in a separate closet, or using an approved covered cart distribution system on each floor.
- (2) If a covered cart distribution system is used, storage of clean linen carts in an alcove shall be permitted.

2.1-2.6.11.2 Equipment and supply storage room or alcove

- (1) Appropriate room(s) or alcove(s)—sized to provide a minimum of 10 square feet (0.93 square meter) per patient bed—shall be provided on the nursing unit floor for storage of equipment and supplies necessary for patient care and as required by the functional program.
- (2) Each nursing unit floor shall have sufficient storage room(s) or alcove(s) to keep corridors free of all equipment and supplies.

2.1-2.6.11.3 Storage space for stretchers and wheelchairs. On each nursing unit, space for storage of stretchers and wheelchairs shall be provided out of corridors.

2.1-2.6.11.4 Emergency equipment storage

- (1) Space under direct control of the nursing staff shall be provided on each nursing unit floor for emergency equipment such as a cardiopulmonary resuscitation (CPR) cart(s).
- (2) This space shall be located in an area appropriate to the functional program but out of corridors.

2.1-2.6.12 Environmental Services Room

2.1-2.6.12.1 An environmental services room shall be readily accessible to the unit or floor it serves and may serve more than one nursing unit on a floor.

2.1-2.6.12.2 In nursing locations, at least one environmental services room per floor shall contain the following:

- (1) A service sink or floor receptor
- (2) Provisions for storage of supplies and housekeeping equipment

2.1-2.7 Support Areas for Staff

2.1-2.7.1 Staff Lounge Facilities

Lounge facilities shall be sized per the functional program but shall not be less than 100 square feet (9.29 square meters).

2.1-2.7.2 Staff Toilet Room(s)

2.1-2.7.2.1 A staff toilet room shall be readily accessible to each nursing unit for staff use.

2.1-2.7.2.2 Each staff toilet room shall contain a toilet and a hand-washing station.

2.1-2.7.2.3 Each staff toilet room shall be permitted to be unisex.

2.1-2.7.3 Staff Storage Facilities

2.1-2.7.3.1 Securable closets or cabinet compartments for the personal articles of nursing personnel shall be located in or near the nurse station. At a minimum, they shall be large enough for purses and billfolds.

2.1-2.7.3.2 If coat storage is provided, storage of coats in closets or cabinets on each floor or in a central staff locker area shall be permitted.

2.1-2.7.4 Staff Rest Areas

For requirements, see facility chapters.

2.1-2.8 Support Areas for Families, Patients, and/or Visitors

For requirements, see facility chapters.

■ 2.1-3 Diagnostic and Treatment Locations

2.1-3.1 Reserved

2.1-3.2 Examination/Treatment Room or Area

An examination/treatment room or area may be required in many locations in a health care facility. When this room or area is required by the functional program, it shall meet the following requirements:

2.1-3.2.1 Single-Bed Examination/Treatment Room or Area

2.1-3.2.1.1 Each single-patient examination/treatment room shall have a minimum clear floor area of 120 square feet (11.15 square meters).

2.1-3.2.1.2 Provision shall be made to preserve patient privacy from observation from outside the examination/treatment room through an open door.

2.1-3.2.1.3 The examination/treatment room shall contain the following:

- (1) An examination light
- (2) A hand-washing station
- (3) Storage facilities for supplies
- (4) A desk, counter, or shelf space for writing or electronic documentation

2.1-3.2.2 Multiple-Bed Examination/Treatment Room or Area

2.1-3.2.2.1 Multiple-bed examination/treatment rooms shall have separate patient cubicles with a minimum clear floor area of 80 square feet (7.43 square meters) per cubicle.

2.1-3.2.2.2 The cubicle shall contain the following:

- (1) An examination light
- (2) Storage facilities for supplies
- (3) A desk, counter, or shelf space for writing or electronic documentation

2.1-3.2.2.3 In a multiple-bed examination/treatment room, a hand-washing station shall be provided in the room for each three or fewer patient cubicles.

■ 2.1-4 Patient Support Services

For requirements, see specific facility chapters.

■ 2.1-5 General Support Services and Facilities

2.1-5.1 Central Services

For requirements, see specific facility chapters.

2.1-5.2 Linen Services

For requirements, see specific facility chapters.

2.1-5.3 Materials Management Facilities

For requirements, see specific facility chapters.

2.1-5.4 Waste Management Facilities

*2.1-5.4.1 Waste Collection and Storage

2.1-5.4.1.1 General

(1) Location

- (a) Waste collection and storage locations shall be determined by the facility as a component of the functional program.
- (b) The location of compactors, balers, sharps

containers, and recycling container staging at docks or other waste removal areas shall be stipulated by the functional program.

- (c) Red bag waste shall be staged in enclosed and secured areas. Biohazardous and environmentally hazardous materials, including mercury, nuclear reagent waste, and other regulated waste types, shall be segregated and secured.

2.1-5.4.1.2 Space requirements

- (1) The functional program shall stipulate the categories and volumes of waste for disposal and the methods of handling and disposal of waste.
- (2) The functional program shall outline the space requirements, including centralized waste collection and storage spaces. Size of spaces shall be based on the volume of projected waste and length of anticipated storage.

2.1-5.4.1.3 Regulated waste storage spaces

- (1) If provided, regulated medical waste or infectious waste storage spaces shall have a floor drain, cleanable floor and wall surfaces, lighting, and exhaust ventilation, and should be safe from weather, animals and unauthorized entry.
- (2) Refrigeration requirements for such storage facilities shall comply with state and/or local regulations.

2.1-5.4.1.4 Refuse chutes. If provided, these shall meet or exceed the following standards:

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A2.1-5.4.1 Waste collection and storage. The underlying framework of waste management comprises waste minimization and segregation. Facilities should seek both to minimize all components of each waste stream and to separate different components of the total waste stream. At a minimum, the functional program should include consideration of regular trash, medical/infectious waste, hazardous waste, and low-level radioactive waste.

The program should address the development of effective collection, transport, pest control, and storage systems; waste management and contingency planning; protection of the health and safety of workers; and proper siting of all on-site waste treatment technologies.

Optimizing waste management has programmatic and space impacts throughout the facility at points where waste is generated, collected, and staged for disposal. For facilities or municipalities with recycling programs in place, particular consideration should be given

to sorting and staging areas. The following elements are examples that may be considered:

- a. Building should include adequate space to accommodate bins/carts for appropriate waste segregation such as recyclables, infectious waste, sharps, etc. Corridors and materials handling systems should be designed to achieve an efficient movement of waste from points of generation to storage or treatment while minimizing the risk to personnel.
- b. Dedicated storage and flow space and cleaning/sanitation facilities should facilitate reuse of items such as medical products, food service items, and the like to eliminate disposables and reduce waste.
- c. Space should be included for autoclaves, shredders, and other technologies for processing medical waste prior to removals to landfill. Secure storage should be provided for staging fluorescent lamps for recycling.

- (1) Chutes shall meet the provisions described in NFPA 82.
- (2) Service openings to chutes shall comply with NFPA 101.
- (3) Chute discharge into collection rooms shall comply with NFPA 101.
- (4) The minimum cross-sectional dimension of gravity chutes shall be 2 feet (60.96 centimeters).

2.1-5.4.2 Waste Treatment and Disposal

***2.1-5.4.2.1 Incineration.** On-site hospital incinerators shall comply with federal, state, and local regulatory and environmental requirements. The design and construction of incinerators shall comply with NFPA 82: *Standard on Incinerators and Waste and Linen Handling Systems and Equipment*.

2.1-5.4.2.2 Other waste treatment technologies.

Types of non-incineration technology(ies) shall be determined by the facility in conjunction with environmental, economic, and regulatory considerations. The functional program shall describe waste treatment technology components.

- (1) Location
 - (a) Safe transfer routes, distances from waste sources, temporary storage requirements, and space requirements for treatment equipment shall be considered in determining the location for a non-incineration technology.
 - (b) The location of the technology shall not cause traffic problems as waste is brought in and out.
 - (c) Odor, noise, and the visual impact of medical waste operations on patients, visitors, public access, and security shall be considered.

- (2) Space requirements for such technologies shall be determined by equipment requirements, including associated area(s) for opening waste entry doors, access to control panels, space for hydraulic lifts, conveyors, and operational clearances.
- (3) Reserved
- (4) Use of mobile or portable units, trailer-mounted units, underground installations, or all-weather enclosed shelters at an outdoor site shall be permitted, subject to local regulatory approvals.
- (5) Ventilation
 - (a) Exhaust vents, if any, from the treatment technology shall be located a minimum of 25 feet (7.62 meters) from inlets to HVAC systems.
 - (b) If the technology involves heat dissipation, sufficient cooling and ventilation shall be provided.

2.1-5.5 Environmental Services

For requirements, see specific facility chapters.

2.1-5.6 Engineering and Maintenance Services

For requirements, see specific facility chapters.

■ 2.1-6 Public and Administrative Areas

2.1-6.1 Public Areas

The following shall be provided. For other requirements, see specific facility chapters.

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A2.1-5.4.2.1 The EPA has identified medical waste incineration as a significant contributor to air pollution worldwide.

- a. Health care facilities should seek to minimize incineration of medical waste, consistent with local and state regulations and public health goals.
- b. When incinerators are used, consideration should be given to the recovery of waste heat from on-site incinerators used to dispose of large amounts of waste materials. Incinerators should be designed in a manner fully consistent with protection of public and environmental health, both on-site and off-site, and in compliance with federal,

state, and local statutes and regulations. Toward this end, permit applications for incinerators and modifications thereof should be supported by Environmental Assessments and/or Environmental Impact Statements (EISs) and/or Health Risk Assessments (HRAs) as may be required by regulatory agencies. Except as noted below, such assessments should utilize standard U.S. EPA methods, specifically those set forth in U.S. EPA guidelines, and should be fully consistent with U.S. EPA guidelines for health risk assessment. Under some circumstances, however, regulatory agencies having jurisdiction over a particular project may require use of alternative methods.

2.1-6.1.1 Vehicular Drop-Off and Pedestrian Entrance

This shall be at grade level, sheltered from inclement weather, and accessible to the disabled.

2.1-6.1.2 Lobby

This shall include the following:

2.1-6.1.2.1 A counter or desk for reception and information

2.1-6.1.2.2 Public waiting area(s)

2.1-6.1.2.3 Public toilet facilities

2.1-6.1.2.4 Access to make local phone calls

2.1-6.1.2.5 Provision for drinking water

2.1-6.2 Administrative Areas

The following shall be provided:

2.1-6.2.1 Reserved

2.1-6.2.2 Interview Space

Spaces shall be provided for private interviews related to social service, credit, and admissions.

2.1-6.2.3 General or Individual Office

Office(s) shall be provided for business transactions, medical and financial records, and administrative and professional staff.

2.1-6.2.4 Multipurpose Room

For requirements, see specific facility chapters.

2.1-6.2.5 Reserved

2.1-6.2.6 Equipment and Supply Storage

For requirements, see specific facility chapters.

2.1-6.3 Support Areas for Employees and Volunteers

For requirements, see specific facility chapters.

2.1-7 Design and Construction Requirements

2.1-7.1 Building Codes and Standards

2.1-7.1.1 Building Codes

2.1-7.1.1.1 Every building and portion thereof shall be designed and constructed to sustain all live and dead loads, including seismic and other environmental forces, in accordance with accepted engineering practices and standards as prescribed by local jurisdiction or the International Building Code. (For more information, see 1.1-1.3.2 through 1.1-1.3.4.)

2.1-7.1.1.2 Freestanding buildings. Separate freestanding buildings for nonpatient contact areas (e.g., the boiler plant, laundry, shops, and general storage) shall be built in accordance with applicable building codes for such occupancies.

2.1-7.1.2 Construction Requirements

***2.1-7.1.2.1 General.** Construction shall comply with the applicable requirements of NFPA 101, the requirements contained herein, and the requirements of authorities having jurisdiction. If there are no applicable local codes, the International Building Code or NFPA 5000 shall be used; for more information, see 1.1-5 (Building Codes and Standards).

***2.1-7.1.2.2 Fire prevention/protection measures.** Compartmentation, exits, fire alarms, automatic extinguishing systems, and other fire prevention and fire protection measures, including those within existing facilities, shall comply with NFPA 101, with the following stipulation. Use of the Fire-Safety Evaluation

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A2.1-7.1.2.1 NFPA 101 generally covers fire/safety requirements only, whereas the building codes also apply to structural elements. The fire/safety items of NFPA 101 would take precedence over other codes in case of conflict. Appropriate application of each would minimize problems.

A2.1-7.1.2.2 For most projects it is essential that third-party reimbursement requirements also be followed. Verify where these may be in excess of standards in these Guidelines.

System (FSES) is permitted, subject to AHJ approval, in new construction and renovation. (The FSES is intended as an evaluation tool for fire safety only.) See 1.1-5 (Building Codes and Standards) for exceptions.

2.1-7.1.2.3 Interior finishes. Interior finish materials shall comply with the flame-spread limitations and smoke-production limitations in NFPA 101. This requirement does not apply to minor quantities of wood or other trim (see NFPA 101) or to wall coverings less than 4 millimeters thick applied over a noncombustible base.

2.1-7.1.2.4 Insulation materials. Building insulation materials, unless sealed on all sides and edges with noncombustible material, shall have a flame-spread rating of 25 or less and a smoke-developed rating of 150 or less when tested in accordance with NFPA 255.

2.1-7.1.3 Provisions for Disasters

For further requirements, see 1.2-6.5.

2.1-7.1.3.1 General

- (1) Unless specifically approved, hospitals shall not be built in areas subject to damage or inaccessibility due to natural floods.
- (2) Where facilities may be subject to wind or water hazards, provision shall be made to ensure continuous operation.

2.1-7.1.3.2 Emergency communication system. An emergency-radio communication system shall be provided in each facility.

- (1) This system shall operate independently of the building's service and emergency power systems during emergencies.
- (2) The system shall have frequency capabilities to communicate with state emergency communication networks.
- (3) Additional communication capabilities are required of facilities containing a formal community emergency-trauma service or other specialty services (such as regional pediatric critical care units) that utilize staffed patient transport units.

2.1-7.2 Architectural Details, Surfaces, and Furnishings

2.1-7.2.1 General

2.1-7.2.1.1 New construction. Details and surfaces in new construction projects, including additions and alterations, shall comply with the requirements for architectural details, surfaces, and furnishings herein. (See 1.1-3 concerning existing facilities where total compliance is structurally impractical.)

***2.1-7.2.1.2 Renovation.** If approved by authorities having jurisdiction, retained portions of existing facilities that are not required to be totally modernized shall be permitted, at a minimum, to comply with applicable requirements of the Existing Health Care Occupancies section of NFPA 101.

2.1-7.2.2 Architectural Details

2.1-7.2.2.1 Corridor width

- (1) In outpatient suites and in areas not commonly used for patient bed or stretcher transportation, reduction of corridor width to 5 feet (1.52 meters) shall be permitted.
- (2) Location of items such as drinking fountains, telephone booths, vending machines, and portable equipment shall not restrict corridor traffic or reduce the corridor width below the minimum standard.

2.1-7.2.2.2 Ceiling height. The minimum ceiling height shall be 7 feet 10 inches (2.39 meters), with the following exceptions:

- (1) Corridors, storage rooms, toilet rooms, etc. Ceilings in these spaces shall be not less than 7 feet 8 inches (2.34 meters) in height. Ceiling heights in small, normally unoccupied spaces may be reduced.
- (2) Rooms with ceiling-mounted equipment/light fixtures. Ceilings in radiographic, operating,

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A2.1-7.2.1.2 A plan of correction for these portions of existing facilities should be developed and implemented.

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and delivery rooms, and other rooms containing ceiling-mounted equipment or ceiling-mounted surgical light fixtures shall be of sufficient height to accommodate the equipment or fixtures and their normal movement.

(3) Seclusion treatment rooms. These rooms shall have a minimum ceiling height of 9 feet (2.74 meters).

(4) Clearances

(a) Suspended tracks, rails, and pipes located in the traffic path for patients in beds and/or on stretchers, including those in inpatient service areas, shall be not less than 7 feet (2.13 meters) above the floor.

(b) In areas other than those designated in 2.1-7.2.2.2 (4)(a), clearances of 6 feet 8 inches (2.03 meters) shall be permitted.

2.1-7.2.2.3 Doors and door hardware

(1) Door type

(a) All doors between corridors, rooms, or spaces subject to occupancy shall be of the swing type or shall be sliding doors as noted in 2.1-7.2.2.3 (1)(b) below.

(b) Manual or automatic sliding doors with tracks and hardware that can easily be cleaned shall be permitted where fire and other emergency exiting requirements are not compromised and where cleanliness of surfaces can be maintained.

(2) Door openings. In these Guidelines, the door openings given are the nominal dimension of each door opening. The clear width needed to accommodate access by patients and patient equipment has been taken into consideration in calculating the door opening dimensions given. Door opening dimensions shall permit the use of a standard-size door leaf where only one door is required.

(a) Inpatient bedrooms

(i) New construction. To provide clearance for movement of beds and other equipment, the door opening to inpatient bedrooms shall have a minimum clear width of 3 feet 8 inches (1.12 meters) with a frame that is 7 feet (2.13 meters) high.

(ii) Renovation. Existing door openings with a minimum clear width of 2 feet 10 inches (86.36 centimeters) may be considered for acceptance where patient safety or access to the area is not adversely affected.

(b) Access for stretchers/wheelchairs. Door openings to other rooms used for stretchers (including hospital wheeled-bed stretchers) and/or wheelchairs shall have a minimum clear width of 2 feet 10 inches (86.36 centimeters).

(3) Door swing. Doors, except those in behavioral health units and to spaces such as small closets not subject to occupancy, shall not swing into corridors in a manner that might obstruct traffic flow or reduce the required corridor width. (Large walk-in-type closets are considered inhabitable spaces.)

(4) Door hardware

(a) Door hardware shall comply with the Americans with Disabilities Act Guidelines.

(b) Lever hardware shall be selected for ease of use.

(c) Door protection shall be used as outlined in the functional program.

(5) Door and door hardware finishes. Door and hardware finishes shall be selected to withstand cleaning and impact damage.

(6) Patient bathing/toilet facilities

(a) Rooms that contain bathtubs, sitz baths, showers, and/or water closets for patient use shall either have two separate doors, a door that swings outward, or a door equipped with emergency rescue hardware.

(b) Where the room opens onto a public area or corridor, visual privacy shall be maintained when emergency rescue hardware is used.

(c) If required by the functional program, design of door hardware on patient toilet rooms in psychiatric nursing units shall be permitted to allow staff to control access.

2.1-7.2.2.4 Thresholds and expansion joints

(1) Thresholds and expansion joint covers shall be flush with the floor surface to facilitate the use of wheelchairs and carts.

- (2) Expansion and seismic joints shall be constructed to restrict the passage of smoke.

2.1-7.2.2.5 Windows

- (1) Operable windows are not required in patient rooms. If operable windows are provided in patient rooms or suites, operation of such windows shall be restricted to inhibit possible escape or suicide.
- (2) When a window is required, the minimum net glazed area shall be no less than 8 percent of the floor area of the room served.

2.1-7.2.2.6 Insect screens. Windows and outer doors that frequently may be left open shall be equipped with insect screens.

2.1-7.2.2.7 Glazing materials. Provisions of this section concern safety from hazards of breakage. NFPA 101 contains additional requirements for glazing in exit corridors, etc., especially in buildings without sprinkler systems.

- (1) Safety glass; wired glass; or plastic, break-resistant material that creates no dangerous cutting edges when broken shall be used in the following:
- (a) Glass doors, lights, sidelights, borrowed lights, and windows located within 12 inches (30.48 centimeters) of a door jamb (with a bottom-frame height of less than 5 feet [1.52 meters] above the finished floor)
 - (b) Wall openings in active areas such as recreation and exercise rooms, unless otherwise required for fire safety
- (2) Safety glass—tempered or plastic glazing materials shall be used for the following:
- (a) Shower doors and bath enclosures
 - (b) Interior windows and doors, including those in pediatric and psychiatric unit corridors
- (3) Flame-spread ratings. Plastic and similar materials used for glazing shall comply with the flame-spread ratings of NFPA 101.
- (4) Renovation. In renovation projects, only glazing within 1 foot 6 inches (45.72 centimeters) of the floor must be changed to safety glass, wire glass, or plastic, break-resistant material.

*2.1-7.2.2.8 Hand-washing stations

- (1) General
- (a) Hand sanitation dispensers shall be provided in addition to hand-washing stations.
 - (b) The number and placement of both hand-washing stations and hand sanitation dispensers shall be determined by the ICRA. More information about the number and placement of hand-washing stations and hand sanitation dispensers can be found in Section 1.2-3.2.1.2 (ICRA Considerations—Design elements); in the common elements chapters in Parts 2, 3, and 4 of these Guidelines; and in facility type chapters in Part 5.
- (2) Sinks. For these requirements, see 2.1-8.4.3.2 (Hand-washing stations).
- (3) Anchoring. Lavatories and hand-washing stations shall be securely anchored to withstand an applied vertical load of not less than 250 pounds (113.4 kilograms) on the fixture front.
- (4) Fittings
- (a) General hand-washing stations used by medical and nursing staff, patients, and food handlers shall be trimmed with valves that can be operated without hands.
 - (i) Single-lever or wrist blade devices shall be permitted.
 - (ii) Blade handles used for this purpose shall be at least 4 inches (10.2 centimeters) in length.
 - (iii) Care shall be taken in location and arrangement of fittings to provide the clearance required for operation of blade-type handles.
 - (b) Sensor-regulated water fixtures shall meet user need for temperature and length of time the water flows. Electronic faucets shall be capable of functioning during loss of normal power.
 - (c) Sensor-regulated faucets with manual temperature control shall be permitted.

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A2.1-7.2.2.8 Consideration should be given to electrical devices (space needed for work flow and placement away from the sink).

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- (5) Provisions for drying hands. Provisions for hand drying shall be required at all hand-washing stations except scrub sinks.
 - (a) Hand-washing stations shall include a hand-drying device that does not require hands to contact the dispenser.
 - (b) These provisions shall be paper or cloth units enclosed to protect against dust or soil and to ensure single-unit dispensing. Hot air dryers shall be permitted provided that installation precludes possible contamination by recirculation of air.
 - (c) If provided, hand towels shall be directly accessible to sinks.
- (6) Cleansing agent. Hand-washing stations shall include liquid or foam soap dispensers.
- (7) Mirror. Mirrors shall not be installed at hand-washing stations in food preparation areas, nurseries, clean and sterile supply areas, scrub sinks, or other areas where asepsis control would be lessened by hair combing.

*2.1-7.2.2.9 Grab bars

- (1) Grab bars in all areas required to comply with the Americans with Disabilities Act shall comply with the Americans with Disabilities Act Guidelines.
- * (2) Grab bars shall be provided in all patient toilets, showers, bathtubs, and sitz baths at a wall clearance of 1.5 inches (3.81 centimeters).
- (3) Grab bars, including those that are part of such fixtures as soap dishes, shall be sufficiently anchored to sustain a concentrated load of 250 pounds (113.40 kilograms). Grab bars installed in areas intended for use by bariatric patients (as described in the functional program) shall be designed and

installed to sustain a concentrated load of 1,000 pounds (453.59 kilograms).

2.1-7.2.2.10 Handrails

- (1) Handrails shall comply with the Americans with Disabilities Act (ADA) Guidelines.
- (2) As determined by the functional program, handrails shall be provided to assist mobility-impaired persons. Rail ends shall return to the wall.
- (3) Handrails or lean rails and fasteners shall be completely smooth and free of rough edges.
- (4) Handrails or lean rails shall have eased edges and corners if a mitered corner condition exists.

2.1-7.2.2.11 Radiation protection

- (1) Radiation protection requirements for x-ray and gamma-ray installations shall conform with National Council on Radiation Protection & Measurements (NCRP) reports 102, 147, and 151 and all applicable local requirements. Testing is to be coordinated with local authorities to prevent duplication of test observations or construction inspections.
- (2) Provision shall be made for testing completed installations before use. All defects shall be corrected before approval.

2.1-7.2.2.12 Noise control

- (1) Recreation rooms, exercise rooms, equipment rooms, and similar spaces where impact noises may be generated shall not be located directly over patient bed areas or delivery and operating suites, unless special provisions are made to minimize such noise.
- (2) The noise reduction criteria shown in Table 1.2-3 (Design Criteria for Minimum Sound Isolation Performance Between Enclosed Rooms) shall apply

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A2.1-7.2.2.9 Grab bars should have a finish that contrasts with the adjacent wall surface.

A2.1-7.2.2.9 (2) Grab bars in bathrooms

- a. Grab bars in bathrooms should allow patients to be as safe and independent as possible. This includes using dropdown grab bars when needed, with or without integral toilet paper holder.
- b. Grab bars in bathrooms should allow staff to complete a double

transfer as required for patient care. This includes evaluation of the toilet in relation to the wall and the grab bars provided. Clearance is required on both sides of the toilet for a double transfer to occur.

- c. When bathroom entrances are located on the same wall as the headwall, fewer steps are needed for the patient and the room is more visible to the patient, facilitating independence. If this arrangement is provided, continuous handrails should also be installed to assist with mobility and safety.

to partitions, floors, and ceiling construction in patient areas.

2.1-7.2.2.13 Protection from heat-producing equipment.

Rooms containing heat-producing equipment, such as boiler or heater rooms or laundries, shall be insulated to prevent the floor surface above and/or the adjacent walls of occupied areas from exceeding a temperature of 10°F (6°C) above ambient room temperature.

2.1-7.2.3 Surfaces

2.1-7.2.3.1 Surface selection characteristics and criteria

- (1) See A1.2-3.2.1.5 for information on recommendations and code requirements for surface selection.
- (2) See Table 2.1-1 for a list of surfaces and furnishings categories in typical hospital nursing units.

2.1-7.2.3.2 Flooring

- * (1) Selected flooring surfaces shall be easily maintained, readily cleanable, and appropriately wear-resistant for the location.
- * (2) Flooring surfaces shall allow for ease of ambulation and self-propulsion.
- (3) All flooring surfaces shall allow easy movement of all wheeled equipment required by the functional program.
- * (4) Flooring surfaces shall provide smooth transitions between different flooring materials.
- * (5) Flooring surfaces that are to be slip-resistant shall

be in accordance with ASTM C1028.

- (6) Slip-resistant flooring products shall be used for flooring surfaces in wet areas (e.g., kitchens, shower and bath areas), ramps, stairways, entries from exterior to interior space, and other areas as determined by the functional program.
- (7) Food preparation areas
 - (a) Floors in areas used for food preparation and assembly shall be water-resistant.
 - (b) Floor surfaces, including tile joints, shall be resistant to food acids.
 - (c) Floor construction in dietary and food preparation areas shall be free of spaces that can harbor pests.
- (8) In all areas subject to frequent wet-cleaning methods, flooring materials shall not be physically affected by germicidal or other types of cleaning solutions.
- * (9) Highly polished flooring or flooring finishes that create glare shall be avoided.
- (10) Carpet and carpet with padding in patient areas shall be glued down or stretched taut and free of loose edges or wrinkles that might create hazards or interfere with the operation of lifts, wheelchairs, walkers, wheeled carts, or residents utilizing orthotic devices.
- (11) Joints for floor openings for pipes, ducts, and conduits shall be tightly sealed. Joints of structural elements shall be similarly sealed.
- (12) In new construction or major renovation work, the floors and wall bases of all operating rooms; interventional imaging rooms; cesarean delivery rooms;

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A2.1-7.2.3.2 (1) Portable lifting equipment without powered wheels may require more exertion by staff than ceiling-mounted equipment to move an elevated resident around and through a space. The exertion required by staff may increase with the use of carpet; however, different types and brands of carpet may have significantly different levels of resistance to wheeled devices. Installation of a mock-up to test flooring materials in relationship to wheeled equipment and devices used in a facility is recommended. Carpet should not be automatically discounted as inappropriate due to this challenge, as it has major advantages over hard-surface flooring in terms of noise reduction, acoustics, and residential appearance, all of which are important in creating a comfortable, attractive living environment for patients.

A2.1-7.2.3.2 (2) Color contrast between walls and floors and minimized transitions between different types of flooring may reduce falling risk.

A2.1-7.2.3.2 (4) Flush thresholds should be used to reduce tripping.

A2.1-7.2.3.2 (5) Soft flooring (carpet, cushioned flooring, etc.) can be used to reduce the risk of falls and impact of associated injuries.

A2.1-7.2.3.2 (9) The selection of non-wax flooring eliminates finish glare. Where a finish coat is required, smooth flooring surfaces should be sealed with a matte finish to reduce surface glare.

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cardiac cath labs; endoscopy procedure rooms; and cystoscopy, urological, and minor surgical procedure rooms shall be monolithic and joint free.

- (13) Airborne infection isolation and protective environment rooms. These rooms and anterooms (where provided) shall have seamless flooring with integral coved base.
- (14) The floors and wall bases of kitchens, soiled workrooms, and other areas subject to frequent wet cleaning shall also be homogenous, but may have tightly sealed joints.
- (15) Floors in areas and rooms in which flammable anesthetic agents are stored or administered shall comply with NFPA 99.

2.1-7.2.3.3 Walls, wall bases, and wall protection

(1) Wall finishes

- (a) Wall finishes shall be washable. In the vicinity of plumbing fixtures, wall finishes shall be smooth, scrubbable, and water-resistant.
 - (b) Wall finishes in operating rooms, cesarean delivery rooms, isolation rooms, and sterile processing rooms shall be free of fissures, open joints, or crevices that may retain or permit passage of dirt particles.
- (2) Dietary and food preparation areas. In these areas, wall construction, finish, and trim, including the joints between the walls and the floors, shall be free of insect- and rodent-harboring spaces.
 - (a) Wall surfaces in wet areas (e.g., kitchens, environmental services closets) shall be monolithic and all seams shall be covered and/or sealed.
 - (b) Wall bases in areas that require frequent wet cleaning (e.g., kitchens, soiled and clean utility rooms, environmental services rooms with mop sinks, public bathrooms) shall be monolithic and coved with the floor, tightly sealed to the wall, and constructed without voids.

- (c) Sharp, protruding corners shall be avoided.
- (d) Wall protection devices and corner guards shall be durable and scrubbable.

2.1-7.2.3.4 Ceilings

- (1) Ceilings shall be provided in areas occupied by patients and in rooms/areas used for clean utility/supply/linen, soiled utility/holding, nourishment, dietary facilities, pharmacy, central services, and laboratories and shall be cleanable with routine housekeeping equipment. Acoustic and lay-in ceiling, where used, shall not create ledges or crevices.
- (2) Semirestricted areas
 - (a) Ceiling finishes in semirestricted areas (e.g., airborne infection isolation rooms, protective environment rooms, clean corridors, central sterile supply spaces, specialized radiographic rooms, and minor surgical procedure rooms) shall be smooth, scrubbable, nonabsorptive, nonperforated, capable of withstanding cleaning with chemicals, and without crevices that can harbor mold and bacterial growth.
 - (b) If a lay-in ceiling is provided, it shall be gasketed or each ceiling tile shall weigh at least one pound per square foot to prevent the passage of particles from the cavity above the ceiling plane into the semirestricted environment. Perforated, tegular, serrated cut, or highly textured tiles are not acceptable.

* (3) Restricted areas

- (a) Ceilings in restricted areas (e.g., operating rooms) shall be of monolithic construction. Cracks or perforations in these ceilings shall not be permitted.
- (b) Ceiling finishes shall be scrubbable and capable of withstanding cleaning and/or disinfecting chemicals.
- (c) All access openings in these ceilings shall be gasketed.

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A2.1-7.2.3.4 (3) Ceilings in restricted areas

- a. The central diffuser array, which supplies the ventilation air (e.g., for an operating room) is not considered part of the monolithic ceiling.
- b. A central diffuser array consisting of unidirectional flow diffusers and/or architectural fill-in panels should form a single assembly in the ceiling. The array should be gasketed between the diffuser array

system and the ceiling and also between the system framing and the individual diffusers. Where booms and other equipment are located within the central diffuser array, the array should be provided with fill-in panels cut to accommodate the booms or other equipment. Fill-in panels are to be gasketed at the framing and at the perimeter of any cuts made to accommodate the equipment.

(4) Dietary and laundry areas

- (a) Either a sealed monolithic and scubbable gypsum board ceiling or a lay-in ceiling shall be provided.
- (b) If a lay-in ceiling is provided, it shall include the following:
 - (i) A rust-free grid
 - (ii) Ceiling tiles that weigh at least one pound per square foot and are smooth, scrubbable, nonabsorptive, nonperforated, and capable of withstanding cleaning with chemicals

2.1-7.2.3.5 Penetrations. Floors and walls penetrated by pipes, ducts, and conduits shall be tightly sealed to minimize entry of rodents and insects. Joints of structural elements shall be similarly sealed.

2.1-7.2.3.6 Psychiatric patient locations. In psychiatric patient rooms, toilets, and seclusion rooms, the ceiling and air distribution devices, lighting fixtures, sprinkler heads, and other appurtenances shall be of a tamper-resistant type.

2.1-7.2.4 Furnishings**2.1-7.2.4.1 Casework, millwork, and built-ins**

- (1) Cabinetry door hardware shall comply with Americans with Disabilities Act (ADA) Guidelines.
- (2) Hand-washing basins/countertops
 - (a) Hand-washing basins/countertops shall be made of porcelain, stainless steel, or solid-surface materials.
 - * (b) If hand-washing basins are set into plastic laminate countertops, at a minimum the sub-

strate shall be marine-grade plywood, or an equivalent material, with an impervious seal.

***2.1-7.2.4.2 Furniture and equipment**

- (1) Furniture shall be upholstered with impervious materials according to the functional program and an ICRA.
- * (2) Furniture and equipment in clinical areas that is not easily moved by environmental services personnel, and where sufficient access is not provided to permit cleaning under and behind the unit, shall be sealed against floors and adjoining walls.
- (3) Equipment such as refrigerators, medicine and clean supply dispensing units, kitchen equipment and similar types of furnishings shall be installed so they can be routinely moved for cleaning.

2.1-7.2.4.3 Window treatments

- (1) Blinds, sheers, or other patient-controlled window treatments shall be provided within patient rooms to control light levels and glare.
- (2) Window treatments shall not compromise patient safety and shall be easy for patients and staff to operate.

■ 2.1-8 Building Systems**2.1-8.1 Reserved****2.1-8.2 Heating, Ventilation, and Air-Conditioning (HVAC) Systems****APPENDIX**

A2.1-7.2.4.1 (2)(b) The presence of water around hand-washing sinks has consistently proven to encourage the presence of opportunistic fungi and molds in the substrate materials if the countertops are not properly sealed and maintained. Integral backsplashes eliminate intersections that need to be caulked.

A2.1-7.2.4.2 Furniture and equipment

- a. Furniture guidelines for seating include 18–19-in. (45.72–48.26-cm) seat height and 24–26-in. (60.96–66.04-cm) arm height. Final furniture selection should be completed per the functional program.
- b. Furniture and equipment in the patient room should be placed to

maximize clear floor area for patient ambulation safety.

- c. A patient chair should be located near the patient bed with clear floor access for ease of transfer to reduce falling.
- d. Furniture used in patient areas should be sturdy and stable to safely support patient transfer and weight-bearing requirements.
- e. Rolling furniture or equipment in patient areas should have locking rollers/casters for safety.

A2.1-7.2.4.2 (2) Examples of these items are file cabinets, work counters, wardrobes, desks, ventilating hoods in laboratories and pharmacies, and storage cabinets.

***2.1-8.2.1 General**

Basic HVAC system requirements are defined in Part 6, ANSI/ASHRAE/ASHE Standard 170-2008: *Ventilation of Health Care Facilities*. This section of the Guidelines includes additional requirements.

***2.1-8.2.1.1 Mechanical system design**

(1) Efficiency. The mechanical system shall be designed for overall efficiency and appropriate life-cycle cost. Details for cost-effective implementation of design features are interrelated and too numerous (as well as too basic) to list individually.

- (a) Recognized engineering procedures shall be followed for the most economical and effective results. A well-designed system can generally achieve energy efficiency at minimal additional cost and simultaneously provide improved patient comfort. Different geographic areas may have climatic and use conditions that favor one system over another in terms of overall cost and efficiency.
- (b) In no case shall patient care or safety be sacrificed for energy conservation.
- (c) Use of recognized energy-saving mechanisms such as variable-air-volume (VAV) systems, load shedding, programmed controls for unoccupied periods (nights and weekends, etc.), and natural ventilation shall be considered, site and climatic conditions permitting.
- (d) Facility design considerations shall include site, building mass, orientation, configuration, fenestration, and other features relative to passive and active energy systems.

(e) Air-handling systems shall be designed with an economizer cycle where appropriate to use outside air. (Use of mechanically circulated outside air does not reduce the need for filtration.)

(f) VAV systems. The energy-saving potential of variable-air-volume systems is recognized, and the requirements herein are intended to maximize appropriate use of those systems. Any system used for occupied areas shall include provisions to avoid air stagnation in interior spaces where thermostat demands are met by temperatures of surrounding areas.

(2) Air-handling systems with unitary equipment that serves only one room. These units shall be permitted for use as recirculating units only. All outdoor air shall be provided by a separate central air-handling system with proper filtration, as noted in 2.1-8.2.5.1 (Filter efficiencies).

(3) Vibration isolators. Mechanical equipment, ductwork, and piping shall be mounted on vibration isolators as required to prevent unacceptable structure-borne vibration.

(4) System valves. Supply and return mains and risers for cooling, heating, and steam systems shall be equipped with valves to isolate the various sections of each system. Each piece of equipment shall have valves at the supply and return ends.

(5) Renovation. If system modifications affect greater than 10 percent of the system capacity, designers shall utilize pre-renovation water/air flow rate measurements in the affected zones to verify that sufficient capacity is available and that renovations have not adversely affected flow rates in non-renovated areas.

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A2.1-8.2.1 Remodeling and work in existing facilities may present special problems. As practicality and funding permit, existing insulation, weather stripping, etc., should be brought up to standard for maximum economy and efficiency. Consideration should be given to additional work that may be needed to achieve this.

A2.1-8.2.1.1 Protection of HVAC systems against chemical, biological, and radiological attack should be considered. System design features that should be evaluated include protection of outside air intakes, location of return air grilles, and types of filtration. The following documents provide additional information regarding these issues:

- a. *Guidance for Protecting Building Environments from Airborne Chemical, Biological, or Radiological Attacks*, Department of Health and Human Services/Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health, May 2002.
- b. "Protecting Buildings and their Occupants from Airborne Hazards" (draft), Army Corps of Engineers, TI 853-01, October 2001.

A2.1-8.2.1.1 (1) Insofar as practical, the facility should include provisions for recovery of waste cooling and heating energy.

A2.1-8.2.1.1 (1)(e) It may be practical in many areas to reduce or shut down mechanical ventilation under appropriate climatic and patient care conditions and to use open windows for ventilation.

(6) Acoustic considerations

- ***(a)** Outdoor mechanical equipment shall not produce sound that exceeds 65 dBA at the hospital façade, unless special consideration is given to façade sound isolation design in impinged areas.
- ***(b)** Outdoor mechanical equipment shall not produce sound that exceeds daytime and nighttime noise limits at neighboring properties as required by local ordinance.

***2.1-8.2.1.2 Ventilation and space-conditioning requirements.** All rooms and areas used for patient care shall have provisions for ventilation. See Part 6 (ASHRAE 170) for further requirements.

- (1) Although natural ventilation for nonsensitive areas and patient rooms (via operable windows) shall be permitted, mechanical ventilation shall be provided for all rooms and areas in the facility in accordance with Part 6, Table 7-1.

2.1-8.2.2 HVAC Requirements for Specific Locations

The requirements in this section apply when a specific hospital facility includes these patient care areas.

2.1-8.2.2.1 Airborne infection isolation (AII) rooms. The AII room is used for isolating the airborne spread of infectious diseases (e.g., measles, varicella, tuberculosis).

- (1) Use of AII rooms for routine patient care during periods not requiring isolation precautions shall be permitted. Differential pressure requirements shall remain unchanged when the AII room is used for routine patient care.
- (2) Each AII room shall have a permanently installed visual mechanism to constantly monitor the pres-

sure status of the room when occupied by patients with an airborne infectious disease. The mechanism shall monitor the pressure differential between the AII room and the corridor, whether or not there is an anteroom between the corridor and the AII room.

- (3) When an anteroom is provided, airflow shall be from the corridor into the anteroom and from the anteroom into the patient room.
- (4) See Part 6 (ASHRAE 170) for additional ventilation requirements.

2.1-8.2.2.2 Reserved

2.1-8.2.2.3 Reserved

2.1-8.2.2.4 Psychiatric patient areas. Special consideration shall be given to the type of heating and cooling units, ventilation outlets, and appurtenances installed in patient-occupied areas of psychiatric units and psychiatric hospitals. The following shall apply:

- (1) All convector or HVAC enclosures exposed in the room shall be constructed with rounded corners and shall have enclosures fastened with tamper-resistant screws.
- (2) HVAC equipment shall be of a type that minimizes the need for maintenance within the room.

2.1-8.2.2.5 Operating and delivery rooms

- (1) Air supply
 - (a) In new construction and major renovation work, air supply for cesarean delivery rooms shall be in accordance with Section 7.4.1 (Class B and C Operating Rooms) of Part 6 (ASHRAE 170).
 - (b) In addition to the required low return (or exhaust) air grilles, such grilles placed high on the walls shall be permitted.

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A2.1-8.2.1.1 (6)(a) and (b) Outdoor mechanical equipment includes cooling towers, rooftop air handlers, exhaust fans, and fans located inside buildings with openings on the outside of the building. Noise that these and other outdoor equipment produce may impinge on hospital buildings and may require special consideration of the hospital building shell in these areas, or may impinge on adjacent properties where jurisdictional noise limits and/or owner land uses must be considered.

A2.1-8.2.1.2 Ventilation and space conditioning requirements. Owing to potential operational problems for the ultraviolet germicidal irradiation (UVGI) lamps, and the fact that the effectiveness of UVGI is dependent on the airflow pattern in the room, use of UVGI may be considered as a supplement to the ventilation system design, rather than the main control mechanism. The ACH of the room should therefore be set as if no UVGI system is installed.

2.1 COMMON ELEMENTS FOR HOSPITALS

(2) Ventilation rates

- *(a) Operating and delivery room ventilation systems shall operate at all times, except during maintenance and conditions requiring shut-down by the building's fire alarm system.
 - (b) During unoccupied hours, operating and delivery room air change rates may be reduced, provided the positive room pressure is maintained as required in Part 6.
- (3) Standards for special procedures. Where extraordinary procedures, such as organ transplants, justify special designs, installation shall properly meet performance needs as determined by applicable standards. These special designs should be reviewed on a case-by-case basis.
- (4) See Part 6 (ASHRAE 170) for additional ventilation requirements.

2.1-8.2.2.6 Bronchoscopy rooms

- (1) Differential pressure shall be a minimum of 0.01" water gauge (2.5 Pa).
- (2) Local exhaust shall be provided.

2.1-8.2.2.7 Emergency and radiology waiting areas.

When these areas are not enclosed, the exhaust air change rate shall be based on the general volume of the space.

2.1-8.2.2.8 Anesthesia storage rooms. The ventilation system for inhalation anesthesia storage rooms shall conform to the requirements for medical gas storage or transfilling as described in NFPA 99.

2.1-8.2.2.9 ETO sterilizer space. The ventilation system for the space that houses ethylene oxide (ETO) sterilizers shall be designed as follows:

- (1) A dedicated exhaust system (i.e., an exhaust system not connected to a return air or another exhaust system) shall be provided. (Refer to 29 CFR

1910.1047: *Ethylene Oxide (EtO) Standard.*) The exhaust outlet to the outside shall be at least 25 feet (7.62 meters) away from any air intake.

- (2) All source areas shall be exhausted, including the sterilizer equipment room, service/aeration areas, and the space above the sterilizer door, as well as the aerator.
 - (a) If the ETO cylinders are not located in a well-ventilated, unoccupied equipment space, an exhaust hood shall be provided over the cylinders.
 - (b) The relief valve shall be terminated in a well-ventilated, unoccupied equipment space or outside the building.
 - (c) If the floor drain to which the sterilizer(s) discharges is not located in a well-ventilated, unoccupied equipment space, an exhaust drain cap shall be provided (coordinate with local codes).
- (3) General airflow shall be away from the sterilizer operator(s).
- (4) An audible and visual alarm shall activate in the sterilizer work area, and in a 24-hour staffed location, upon loss of airflow in the exhaust system.

2.1-8.2.2.10 Food preparation centers

- (1) Exhaust hoods handling grease-laden vapors in food preparation centers shall comply with NFPA 96.
- (2) All hoods over cooking ranges shall be equipped with grease filters, fire-extinguishing systems, and heat-actuated fan controls.
- (3) Cleanout openings shall be provided every 20 feet (6.10 meters) and at changes in direction in the horizontal exhaust duct systems serving these hoods. Horizontal runs of ducts serving range hoods shall be kept to a minimum.
- (4) Food preparation centers shall have ventilation systems whose air supply mechanisms are

ventilation system is shut down. For example, airflow from a less clean space such as the corridor can occur, and standing water can accumulate in the ventilation system (near humidifiers or cooling coils).

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A2.1-8.2.2.5 (2)(a) Operating and delivery room ventilation rates. The operating and delivery room ventilation systems should operate at all times to maintain the air movement relationship to adjacent areas. The cleanliness of the spaces is compromised when the

interfaced appropriately with exhaust hood controls or relief vents so that exfiltration or infiltration to or from exit corridors does not compromise the exit corridor restrictions of NFPA 90A or the pressure requirements of NFPA 96.

2.1-8.2.2.11 Fuel-fired equipment rooms. Rooms with fuel-fired equipment shall be provided with sufficient outdoor air to maintain equipment combustion rates and to limit workstation temperatures.

2.1-8.2.3 Thermal Insulation and Acoustical Provisions

2.1-8.2.3.1 General. Insulation shall be provided within the building to conserve energy, protect personnel, prevent vapor condensation, and reduce noise.

- (1) Vapor barrier. Insulation on cold surfaces shall include an exterior vapor barrier. (Material that will not absorb or transmit moisture will not require a separate vapor barrier.)
- (2) Flame-spread rating. Insulation, including finishes and adhesives on the exterior surfaces of ducts, piping, and equipment, shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less as determined by an independent testing laboratory in accordance with NFPA 255.
- (3) Renovation. Existing accessible insulation within areas of facilities to be modernized shall be inspected, repaired, and/or replaced, as appropriate.

2.1-8.2.3.2 Duct linings

- (1) Duct linings exposed to air movement shall not be used in ducts serving operating rooms, delivery rooms, LDR rooms, nurseries, protective environment rooms, and critical care units. This requirement shall not apply to mixing boxes and sound attenuators that have special coverings over such lining.

- (2) Duct lining shall not be installed within 15 feet (4.57 meters) downstream of humidifiers.
- (3) Renovation. If existing lined ductwork is reworked in a renovation project, the liner seams and punctures shall be resealed.

2.1-8.2.4 HVAC Air Distribution

2.1-8.2.4.1 Return air systems. For patient care areas, return air shall be via ducted systems.

2.1-8.2.4.2 HVAC ductwork

- (1) General. When smoke partitions are required, heating, ventilating, and air conditioning zones shall be coordinated with compartmentation insofar as practical to minimize the need to penetrate fire and smoke partitions.
- * (2) Duct humidifiers
 - (a) If duct humidifiers are located upstream of the final filters, they shall be at least twice the rated distance for full moisture absorption upstream of the final filters.
 - (b) Ductwork with duct-mounted humidifiers shall have a means of water removal.
 - (c) Humidifiers shall be connected to airflow proving switches that prevent humidification unless the required volume of airflow is present or high-limit humidistats are provided.
 - (d) All duct takeoffs shall be sufficiently downstream of the humidifier to ensure complete moisture absorption.
 - (e) Steam humidifiers shall be used. Reservoir-type water spray or evaporative pan humidifiers shall not be used.
- (3) Fire and smoke dampers
 - (a) Fire and smoke dampers shall be constructed, located, and installed in accordance with the requirements of NFPA 101, 90A, and the specific damper's listing requirements.

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A2.1-8.2.4.2 (2) One way to achieve basic humidification may be by a steam-jacketed manifold-type humidifier with a condensate separator that delivers high-quality steam. Additional booster humidification (if required) should be provided by steam-jacketed humidifiers for each

individually controlled area. Steam to be used for humidification may be generated in a separate steam generator. The steam generator feedwater may be supplied either from soft or reverse osmosis water. Provisions should be made for periodic cleaning.

2.1 COMMON ELEMENTS FOR HOSPITALS

- (b) Fans, dampers, and detectors shall be interconnected so that damper activation will not damage ducts.
 - (c) Maintenance access shall be provided at all dampers.
 - (d) All damper locations shall be shown on design drawings.
 - (e) Dampers shall be activated in accordance with NFPA 90A. Installation of switching systems for restarting fans shall be permitted for fire department use in venting smoke after a fire has been controlled. Provisions to avoid possible damage to the system due to closed dampers shall be permitted.
- (4) Construction requirements. Ducts that penetrate construction intended to protect against x-ray, magnetic, RFI, or other radiation shall not impair the effectiveness of the protection.

2.1-8.2.4.3 Exhaust systems

(1) General

- (a) To enhance the efficiency of recovery devices required for energy conservation, combined exhaust systems shall be permitted.
- (b) Local exhaust systems shall be used whenever possible in place of dilution ventilation to reduce exposure to hazardous gases, vapors, fumes, or mists.
- (c) Fans serving exhaust systems shall be located at the discharge end and shall be readily serviceable.
- (d) Airborne infection isolation rooms shall not be served by exhaust systems incorporating a heat wheel.

* (2) Anesthesia scavenging systems

- (a) Each space routinely used for administering inhalation anesthesia and inhalation analgesia shall be served by a scavenging system to vent waste gases.

- (b) When anesthesia scavenging systems are required, air supply shall be at or near the ceiling. Return or exhaust air inlets shall be near the floor level.
- (c) If a vacuum system is used, the gas-collecting system shall be arranged so it does not disturb patients' respiratory systems.
- (d) Gases from the scavenging system shall be exhausted directly to the outside. The anesthesia evacuation system may be combined with the room exhaust system, provided the part used for anesthesia gas scavenging exhausts directly to the outside and is not part of the recirculation system.
- (e) Scavenging systems are not required for areas where gases are used only occasionally, such as the emergency department, offices for routine dental work, etc.

2.1-8.2.4.4 Ventilation hoods

(1) Exhaust hoods and safety cabinets

- (a) Hoods and safety cabinets may be used for normal exhaust of a space providing minimum air change rates are maintained and the performance of the hood is not impaired.
- (b) If air change standards in Part 6 (ASHRAE 170) do not provide sufficient air for proper operation of exhaust hoods and safety cabinets (when in use), supplementary makeup air (filtered and preheated) shall be provided around these units to maintain the required airflow direction and exhaust velocity. Use of makeup air will avoid dependence upon infiltration from outdoor and/or from contaminated areas.
- (c) Makeup systems for hoods shall be arranged to minimize "short circuiting" of air and to avoid reduction in air velocity at the point of contaminant capture.

(2) Laboratory fume hoods. Laboratory fume hoods shall meet the following standards:

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A2.1-8.2.4.3 (2) Acceptable concentrations of anesthetizing agents are unknown at this time. The absence of specific data makes it difficult to set specific standards. However, any scavenging system should be designed to remove as much of the gas as possible from the room environment. It is assumed that anesthetizing equipment will be selected

and maintained to minimize leakage and contamination of room air. See *Industrial Ventilation: A Manual of Recommended Practice*, published by the American Conference of Governmental Industrial Hygienists (www.acgih.org), for additional information.

- (a) General standards
 - (i) An average face velocity of at least 75 feet per minute (0.38 meters per second)
 - (ii) Connection to an exhaust system to the outside that is separate from the building exhaust system
 - (iii) Location of an exhaust fan at the discharge end of the system
 - (iv) Inclusion of an exhaust duct system of noncombustible corrosion-resistant material as needed to meet the planned usage of the hood
- (b) Special standards for use with strong oxidants
 - (i) Fume hoods and their associated equipment in the air stream intended for use with perchloric acid and other strong oxidants shall be constructed of stainless steel or other material consistent with special exposures.
 - (ii) These hoods and equipment shall be provided with a water wash and drain system to permit periodic flushing of duct and hood.
 - (iii) Electrical equipment intended for installation within such ducts shall be designed and constructed to resist penetration by water. Lubricants and seals shall not contain organic materials.
 - (iv) When perchloric acid or other strong oxidants are only transferred from one container to another, standard laboratory fume hoods and the associated equipment may be used in lieu of stainless steel construction.
- (c) Special standards for use with infectious or radioactive materials. In new construction and major renovation work, each hood used to process infectious or radioactive materials shall meet the following requirements:
 - (i) Each hood shall have a minimum face velocity of 90 to 110 feet per minute (0.45 to 0.56 meters per second) with suitable pressure-independent air-modulating devices and alarms to alert staff of fan shutdown or loss of airflow.
 - (ii) Each shall also have filters with a 99.97

percent efficiency (based on the DOP test method) in the exhaust stream and be designed and equipped to permit the safe removal, disposal, and replacement of contaminated filters. Filters shall be located within 10 feet of the hood to minimize duct contamination.

- (iii) Fume hoods intended for use with radioactive isotopes shall be constructed of stainless steel or other material suitable for the particular exposure and shall comply with NFPA 801, *Facilities for Handling Radioactive Materials*. **Note:** Radioactive isotopes used for injections, etc., without probability of airborne particulates or gases may be processed in a clean-workbench-type hood where acceptable to the Nuclear Regulatory Commission.

2.1-8.2.5 HVAC Filters

See Part 6 (ASHRAE 170) for further filter requirements.

2.1-8.2.5.1 Filter efficiencies. Noncentral air-handling systems shall be equipped with permanent (cleanable) or replaceable filters with a minimum efficiency of MERV 6.

2.1-8.2.5.2 Filter frames. Filter frames shall be durable and proportioned to provide an airtight fit with the enclosing ductwork. All joints between filter segments and enclosing ductwork shall have gaskets or seals to provide a positive seal against air leakage.

2.1-8.2.6 Heating Systems and Equipment

2.1-8.2.6.1 Boilers

- (1) Capacity. For requirements, see Section 6.1.2.1 of Part 6 (ASHRAE 170). In addition, domestic hot water for clinical, dietary, and patient/resident use shall be included in the reserve capacity to be served by the remaining sources.
- (2) Fuel sufficient to meet demand loads for the same length of time required for emergency generators shall be provided on site.

2.1-8.2.6.2 Boiler plant accessories. Major supporting components of the heating plant, including

feedwater pumps, fuel pumps, and condensate transfer pumps, shall be provided with redundancy that makes it possible to meet the heating capacity of the plant required in Section 2.1-8.2.6.1 (Boilers—Capacity) when any one of these components is out of service due to failure or routine maintenance.

2.1-8.2.6.3 Temperature control

- (1) Rooms containing heat-producing equipment, such as boiler or heater rooms or laundries, shall be ventilated to prevent the floor surface above and/or the adjacent walls of occupied areas from exceeding a temperature of 10°F (6°C) above ambient room temperature.
- (2) Heating units shall have a maximum surface temperature of 125°F (52°C) or shall be protected from occupant contact.

2.1-8.3 Electrical Systems

2.1-8.3.1 General

2.1-8.3.1.1 Applicable standards

- (1) All electrical material and equipment, including conductors, controls, and signaling devices, shall be installed in compliance with applicable sections of NFPA 70 and NFPA 99.
- (2) All electrical material and equipment shall be listed as complying with available standards of listing agencies or other similar established standards where such standards are required.

2.1-8.3.1.2 Testing and documentation. Electrical installations, including alarm, nurse call, staff emergency signal, and communications systems shall be tested to demonstrate that equipment installation and operation is appropriate and functional. A written record of performance tests on special electrical systems and equipment shall show compliance with applicable codes and standards.

***2.1-8.3.1.3 Acoustics considerations.** Electro-acoustic systems can affect the acoustical environment of health care facilities, and the acoustical environment can affect the perception of these systems. Patient safety and comfort as well as staff comfort and productivity are considerations in the configuration of these systems:

* (1) Paging and call systems

- (a) Voice paging and call systems shall be designed to achieve a minimum Speech Transmission Index (STI) of 0.50 or a Common Intelligibility Scale (CIS) rating of 0.70 at representative points within the area of coverage to provide acceptable intelligibility from the system.
- (b) Performance of the system shall achieve the following:
 - (i) 70 dBA minimum sound level or 10 dBA above background noise levels (whichever is higher)
 - (ii) Coverage within +/- 4 dB at the 2000 Hz octave band throughout corridors, open treatment areas and public spaces

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A2.1-8.3.1.3 Acoustics considerations

- a. The 2002 edition of NFPA 72: *National Fire Alarm Code*, provides a method for measuring the audibility of narrow band tonal alarms using the techniques in ISO 7731. These techniques use the favorable audibility of tonal sounds versus broadband sounds in the midst of competing noise, based on staff training.
- b. Where possible, clinical alarms should be assessed to confirm whether sound levels can be reduced for patient comfort.
- c. Clinical alarms should be audible according to ISO 7731: *Danger Signals for Work Places—Auditory Danger Signals*.

A2.1-8.3.1.3 (1) Paging and call systems

- a. Wireless communication devices such as Internet Protocol (IP)

phones, wearable communication badges, and vibrating beepers should be considered as options to communicate with clinical staff and reduce the use of overhead paging systems.

- b. Wireless asset tracking technologies such as RFID and infrared should be considered as options for staff, patient, and equipment location to reduce the use of overhead paging systems.
- c. Integration of call systems with these wireless communication and location devices should also be considered.

A2.1-8.3.1.3 (1)(a) The conversion between CIS and other scales of intelligibility is available from Annexes A and B of IEC 60489: Sound Systems for Emergency Purposes (NFPA 72-2002).

(2) Masking systems

- (a) Masking systems shall be designed for levels that do not exceed 48 dBA.
- (b) Loudspeaker coverage shall provide for uniformity of +/- 2 dBA.
- *(c) Masking system spectra shall be designed to comply with Table 1.2-4 (Design Criteria for Speech Privacy for Enclosed Rooms and Open-Plan Spaces).

2.1-8.3.2 Electrical Distribution and Transmission**2.1-8.3.2.1 Switchboards**

(1) Location

- (a) Main switchboards shall be located in an area separate from plumbing and mechanical equipment and shall be accessible to authorized persons only.
- (b) Switchboards shall be convenient for use, readily accessible for maintenance, and away from traffic lanes.
- (c) Switchboards shall be located in a dry, ventilated space free of corrosive or explosive fumes, gases, or any flammable material.

- (2) Overload protective devices shall operate properly in ambient room temperatures.

2.1-8.3.2.2 Panelboards

- (1) Panelboards serving life safety branch circuits shall be permitted to also serve floors above and/or below.
- (2) Panelboards serving emergency branch circuits shall be permitted to also serve floors above and/or below.
- (3) New panelboards shall not be located in the required means of egress.

2.1-8.3.2.3 Ground-fault circuit interrupters

- (1) Ground-fault circuit interrupters (GFCIs) shall comply with NFPA 70: *National Electrical Code*.
- (2) When GFCIs are used in critical care areas, provisions shall be made to ensure that other essential equipment is not affected by activation of one interrupter.

2.1-8.3.3 Power Generating and Storing Equipment**2.1-8.3.3.1 Emergency electrical service**

- (1) Emergency power shall be provided for in accordance with NFPA 99, NFPA 101, and NFPA 110.
- (2) Where stored fuel is required, storage capacity shall permit continuous operation for at least 24 hours.
- (3) Acoustic considerations for emergency generators
 - (a) Generators shall meet the following criteria and be placed in a sound reduction enclosure if necessary to meet the criteria.
 - *(i) Interior and exterior generators shall be designed to limit sound levels at nearest hospital building facades to a level not exceeding 70 dBA and not to exceed the applicable community noise code for the period of day when maintenance operations occur.
 - (ii) An engine exhaust muffler shall be provided for the emergency generator.
 - (b) Interior noise levels shall meet those specified in Tables 1.2-2 (Minimum–Maximum Design Criteria for Noise in Interior Spaces) and 1.2-3 (Design Criteria for Minimum Sound Isolation Performance Between Enclosed Rooms).

2.1-8.3.4 Lighting*APPENDIX**

A2.1-8.3.1.3 (2)(c) Speech-masking spectra. For information about designing spectra to effectively mask speech, see J. A. Veitch et al., "Masking Speech in Open-plan Offices with Simulated Ventilation Noise: Noise Level and Spectral Composition Effects on Acoustic Satisfaction," IRC-IR-846 (National Research Council Canada, April 2002).

A2.1-8.3.3.1 (3)(a)(i) Meeting the applicable community noise

code often translates into an emergency generator enclosure rated to provide a 30 to 35 dBA noise reduction.

A2.1-8.3.4 Required levels for artificial illumination in health care facilities should comply with Illuminating Engineering Society of North America (IES) publication ANSI/IESNA RP-29: *Recommended Practices for Lighting for Hospitals and Health Care Facilities*. Light intensity for

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***2.1-8.3.4.1** As required by the functional program, special needs of the elderly shall be incorporated into the lighting design.

2.1-8.3.4.2 Light fixtures. Light fixtures in wet areas (e.g., kitchens, showers) shall have smooth, cleanable, shatter-resistant lenses and no exposed lamps.

2.1-8.3.4.3 Lighting for specific locations in the hospital

- (1) Patient rooms. Patient rooms shall have general lighting and night lighting.
 - (a) A reading light shall be provided for each patient.
 - (i) Reading light controls shall be accessible to the patient(s) without the patient having to get out of bed.
 - (ii) Incandescent and halogen light sources that produce heat shall be avoided to prevent burns to the patient and/or bed linen.
 - (iii) Unless the light source is specifically designed to protect the space below, the light source shall be covered by a diffuser or lens.
 - (iv) Flexible light arms, if used, shall be mechanically controlled to prevent the lamp from contacting the bed linen.
 - (b) At least one night-light fixture shall be located in each patient room. This requirement does not apply to intensive care patient rooms where view panels are provided to the corridor.
 - (i) The night-light shall be controlled at the room entrance.
 - (ii) The night-light shall be mounted on the wall near the floor (to avoid disturbing the patient).

- (iii) The night-light shall be located for staff and patient use (between bed and toilet).
 - *(iv)** The night-light shall illuminate the path of travel from bed to corridor door and toilet without glare.

(c) Lighting for coronary and intensive care bed areas shall permit staff observation of the patient while minimizing glare.

- (2) Nursing unit corridors. Corridors in nursing units shall have general illumination with provisions for reducing light levels at night.
- (3) Exam/treatment/trauma rooms. A portable or fixed examination light shall be provided for examination, treatment, and trauma rooms.
- (4) Operating and delivery rooms. Operating and delivery rooms shall have general lighting in addition to special lighting units provided at surgical and obstetrical tables. General lighting and special lighting shall be on separate circuits.

2.1-8.3.5 Electrical Equipment

2.1-8.3.5.1 Special electrical equipment. For requirements, see facility chapters in Part 2.

***2.1-8.3.5.2 Hand-washing stations and scrub sinks.** If operation of a scrub sink or a hand-washing station in critical care areas, emergency departments, labor and delivery, and surgical suites is dependent on the building electrical service, it shall be connected to the essential electrical system.

2.1-8.3.6 Receptacles

2.1-8.3.6.1 Receptacles in corridors

- (1) Duplex-grounded receptacles for general use shall be installed approximately 50 feet (15.24 meters)

APPENDIX (continued)

staff and patient needs should generally comply with these IES guidelines. Consideration should be given to controlling intensity and/or wavelength to prevent harm to the patient's eyes (i.e., retina damage to premature infants and cataracts due to ultraviolet light).

Many procedures are available to satisfy lighting requirements, but the design should consider light quality as well as quantity for effectiveness and efficiency. While light levels in the IES publications are referenced herein, those publications include other useful guidance and recommendations which the designer is encouraged to follow.

A2.1-8.3.4.1 Refer to IES publication ANSI/IESNA RP-28: *Recommended Practices for Lighting and the Visual Environment for Senior Living*.

A2.1-8.3.4.3 (1)(b)(iv) Indirect lighting should be provided to reduce glare on surfaces to accommodate vision issues for patient comfort.

A2.1-8.3.5.2 Refer to NFPA 99 for a description of the essential electrical system.

apart in all corridors and within 25 feet (7.62 meters) of corridor ends.

- (2) Receptacles in pediatric and psychiatric unit corridors shall be of the tamper-resistant type.

2.1-8.3.6.2 Receptacles in patient care areas

- (1) Patient rooms. Each patient room shall have duplex-grounded receptacles.
 - (a) There shall be one at each side of the head of each bed; one for television, if used; one on every other wall; and one for each motorized bed.
 - (b) Receptacles may be omitted from exterior walls where construction or room configuration makes installation impractical.
- (2) Receptacles shall be provided as per Table 2.1-3 (Electrical Convenience Receptacle Requirements for Clinical Areas).

2.1-8.3.6.3 Emergency system receptacles. Electrical receptacle cover plates or electrical receptacles supplied from the emergency systems shall be distinctively colored or marked for identification. If color is used for identification purposes, the same color shall be used throughout the facility.

2.1-8.3.7 Call Systems

Hospital signaling and nurse call equipment includes four types of call stations: patient stations, bath stations, staff emergency stations, and code call stations.

2.1-8.3.7.1 General

- (1) Call station locations shall be as required in Table 2.1-4 (Location of Nurse and Staff Call Devices).
- (2) Call stations shall report to an attended location with electronically supervised visual and audible annunciation as described in the functional program and in Table 2.1-4.
- (3) Where provided, nurse master stations shall

provide audible/visual prompting and display all pending calls. If display capabilities are limited, the system shall display the highest priority calls as described in the functional program.

- (4) The call system shall include a priority hierarchy to account for the needs of specific patient (e.g., non-verbalizing patients or patients with a high risk of falling).
- * (5) Alternate technologies that meet the requirements of UL 1069: *Standard for Hospital Signaling and Nurse Call Equipment*, including radio frequency systems, shall be permitted for call systems.
- (6) In addition to these guidelines, call systems shall meet the requirements of UL 1069: *Standard for Hospital Signaling and Nurse Call Equipment* and state and local requirements.

2.1-8.3.7.2 Patient stations. A patient station shall be provided to allow each patient to summon assistance from the nursing staff.

- (1) Each patient sleeping bed, except nursery beds, shall be provided with a patient station equipped for two-way voice communication. Use of a dual call station shall be permitted when beds are located adjacent to each other.
- (2) The patient station shall be equipped with the following:
 - (a) A visible signal once it has been activated. An indicator light or call assurance lamp that remains lighted as long as the voice circuit is operating shall be provided. In rooms containing two or more patient stations, call assurance lamps shall be provided at each station.
 - (b) A reset switch for canceling a call
- (3) The patient station shall activate signals as follows:
 - (a) A visible signal in the corridor at the patient's door. In multi-corridor nursing units or patient care areas, additional visible signals shall be installed at corridor intersections.

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A2.1-8.3.7.1 (5) Nurse and emergency call systems should be tested and listed by a laboratory recognized by OSHA's Nationally Recognized Testing Laboratory (NRTL) Program in accordance with a standard appli-

cable to health care environments. Consideration should also be given to coordinating radio call systems with existing hospital radio systems.

- (b) A visible and audible signal at nurse call duty stations in the locations listed below. The audible signal may be temporarily silenced provided subsequent calls automatically reactivate the audible signal.
- (i) Clean workroom
 - (ii) Soiled workroom
 - (iii) Medication preparation room
 - (iv) Documentation area or other charting facilities
 - (v) Nourishment area
 - (vi) Nurse master station of the nursing unit or patient care area
- (4) Diagnostic and treatment areas. A nurse call system shall be provided in each diagnostic and treatment area (including labor rooms, LDR rooms, emergency examination/treatment rooms or cubicles, and preoperative rooms or cubicles) as required by other sections of the Guidelines or the functional program.

2.1-8.3.7.3 Bath stations. A bath station that can be activated by a patient lying on the floor shall be provided at each room containing a patient water closet, bathtub, sitz bath, or shower stall.

- (1) An alarm in these areas shall be able to be turned off only at the bath station where it was initiated.
- (2) Bath stations in shower stalls and tubs shall be located 5 to 6 feet (1.52 to 1.83 meters) above the floor, within normal view of the user and within reach of staff without the need to step into the stall or tub.
- (3) Bath stations shall be located to the side of toilets, within 12 inches (30.48 centimeters) of the front of the toilet bowl and 3 to 4 feet (.91 meter to 1.22 meters) above the floor. A bath station shall be permitted to serve both a toilet and a shower or other fixture if it is accessible to both.

2.1-8.3.7.4 Staff emergency stations. Staff emergency stations for summoning additional local staff assistance for non-life-threatening situations shall be provided in each patient care location.

2.1-8.3.7.5 Code call stations. Commonly referred to as a “Code Blue,” code call stations are meant for use

during a life-threatening situation to summon assistance from outside the unit or department.

- (1) Code call stations shall be provided per the functional program.
- (2) The code call station shall be equipped with a continuous audible or visual confirmation to the person who initiated the code call.

2.1-8.3.7.6 Alarm in psychiatric nursing units. A nurse call is not required in psychiatric units, but if one is included the following shall apply:

- (1) Provisions shall be made for easy removal or for covering of call button outlets.
- (2) All hardware shall have tamper-resistant fasteners.

2.1-8.4 Plumbing Systems

2.1-8.4.1 General

In the absence of local and state plumbing codes, all plumbing systems shall be designed and installed in accordance with the *International Plumbing Code*.

2.1-8.4.2 Plumbing and Other Piping Systems

2.1-8.4.2.1 General piping and valves

- (1) All piping, except control-line tubing, shall be identified.
- (2) All valves shall be tagged, and a valve schedule shall be provided to the facility owner for permanent record and reference.
- (3) No plumbing piping shall be exposed overhead or on walls where possible accumulation of dust or soil may create a cleaning problem or where leaks would create a potential for food contamination.

*2.1-8.4.2.2 Hemodialysis/hemoperfusion piping

- (1) In new construction and renovation in any hospital where hemodialysis or hemoperfusion is routinely performed, a separate water supply and a drainage

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A2.1-8.4.2.2 Design consideration should be given to the disposal of liquid waste from the dialyzing process to prevent odor and backflow.

facility that does not interfere with hand-washing shall be provided.

- (2) When the functional program includes hemodialysis, continuously circulated filtered cold water shall be provided.
 - (a) Piping shall be in accordance with AAMI RD62.
 - (b) If the dialysis equipment includes sufficient water treatment provisions, use of domestic cold water without special piping requirements shall be permitted.
- (3) All reverse osmosis water and dialysis solution piping shall be accessible.

2.1-8.4.2.3 Potable water supply systems

- (1) Capacity. Systems shall be designed to supply water at sufficient pressure to operate all fixtures and equipment during maximum demand. Supply capacity for hot- and cold-water piping shall be determined on the basis of fixture units, using recognized engineering standards. When the ratio of plumbing fixtures to occupants is proportionally more than required by the building occupancy and is in excess of 1,000 plumbing fixture units, a diversity factor shall be permitted.
- (2) Valves. Each water service main, branch main, riser, and branch to a group of fixtures shall have valves.
 - (a) Stop valves shall be provided for each fixture.
 - (b) Appropriate panels for access shall be provided at all valves where required.
- (3) Backflow prevention
 - (a) Systems shall be protected against cross-connection in accordance with American Water Works Association (AWWA) *Recommended*

Practice for Backflow Prevention and Cross-Connection Control.

- (b) Vacuum breakers or backflow prevention devices shall be installed on hose bibs and supply nozzles used for connection of hoses or tubing in laboratories, housekeeping sinks, bedpan-flushing attachments, autopsy tables, etc.
- (4) Bedpan-flushing devices. Bedpan-flushing devices (may be cold water) shall be provided in each inpatient toilet room; however, installation is optional in psychiatric and alcohol-abuse units where patients are ambulatory.
- (5) Potable water storage. Potable water storage vessels (hot and cold) not intended for constant use shall not be installed, except as required for disaster preparedness or similar emergency supply use.
- (6) Emergency eyewash and showers shall comply with ANSI Z358.1.

*2.1-8.4.2.4 Non-potable water supply systems.

Any non-potable water system piping shall be clearly marked “non-potable.”

2.1-8.4.2.5 Hot water systems. The following standards shall apply to hot water systems:

- * (1) The water-heating system shall have sufficient supply capacity at the temperatures and amounts indicated in the applicable table. Storage of water at higher temperatures shall be permitted.
- (2) Hot water distribution systems serving patient/resident care areas shall be under constant recirculation to provide continuous hot water at each hot water outlet. Non-recirculated fixture branch piping shall not exceed 25 feet (7.62 meters) in length.

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A2.1-8.4.2.4 Non-potable water supply systems.

Non-potable water supply systems are defined as rainwater supply, recaptured condensate water, graywater, and municipal reclaimed water systems.

- a. Captured rainwater systems may be used for irrigation or closed-loop process applications where permitted by local authorities having jurisdiction (AHJs).

- b. Municipal recycled or reclaimed water systems may be used for drip irrigation or closed-loop process applications where required or permitted by local AHJs.
- c. Closed-loop process applications include cooling tower makeup, ground source heat pump loops, and cooling of heat-rejection equipment (e.g., vacuum pumps, refrigeration equipment, and the like).

A2.1-8.4.2.5 (1) Water temperature is measured at the point of use or inlet to the equipment.

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(3) Dead-end piping (risers with no flow, branches with no fixture) shall not be installed. In renovation projects, dead-end piping shall be removed. Empty risers, mains, and branches installed for future use shall be permitted.

* (4) Provisions shall be included in the domestic hot water system to limit the amount of *Legionella* bacteria and opportunistic waterborne pathogens.

2.1-8.4.2.6 Drainage systems

(1) Piping. Where drainage piping is installed above the ceiling of, or exposed in, operating and delivery rooms, nurseries, food preparation centers, food-serving facilities, food storage areas, central services, electronic data processing areas, or electric closets, the piping shall have special provisions (e.g., double wall containment piping, oversized drip pans) to protect the space below from leakage, condensation, or dust particles.

(2) Floor drains

(a) Floor drains shall not be installed in operating and delivery rooms.

* (b) If a floor drain is installed in cystoscopy, it shall contain a nonsplash, horizontal-flow flushing bowl beneath the drain plate.

(c) Dietary area floor drains and/or floor sinks

(i) Type. These shall be of a type that can be easily cleaned by removing the cover. Removable stainless steel mesh shall be

provided in addition to grilled drain covers to prevent entry of large particles of waste that might cause stoppages.

(ii) Location. Floor drains or floor sinks shall be provided at all “wet” equipment (as ice machines) and as required for wet cleaning of floors. Location of floor drains and floor sinks shall be coordinated to avoid conditions where locations of equipment make removal of covers for cleaning difficult.

(3) Sewers. Building sewers shall discharge into community sewerage. Where such a system is not available, the facility shall treat its sewage in accordance with local and state regulations.

(4) Kitchen grease traps

(a) Grease traps shall be of capacity required.

(b) Grease traps shall be located and arranged to permit easy access without the need to enter food preparation or storage areas.

(c) Grease traps shall be accessible from outside the building without need to interrupt any services.

(6) Plaster traps. Where plaster traps are used, provisions shall be made for appropriate access and cleaning.

(7) Autopsy table drain systems. Drain systems for autopsy tables shall be designed to positively avoid splatter or overflow onto floors or back siphonage and for easy cleaning and trap flushing.

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A2.1-8.4.2.5 (4) There are several ways to treat domestic water systems to kill *Legionella* and opportunistic waterborne pathogens. Complete removal of these organisms is not feasible, but methods to reduce the amount include hyperchlorination (free chlorine, chlorine dioxide, monochloramine), elevated hot water temperature, ozone injection, silver/copper ions, and ultraviolet light. Each of these options has advantages and disadvantages. While increasing the hot water supply temperature to 140°F (60°C) is typically considered the easiest option, the risk of scalding, especially to youth and the elderly, is significant. Additional consideration should be given to domestic water used in bone marrow transplant units. See CDC and ASHRAE Guideline 12, “Minimizing the Risk of Legionellosis Associated with Building Water Systems,” for additional information. Another reference on this topic is “*Legionella* Control in Health Care Facilities,” available from the American Society of Plumbing Engineers.

A2.1-8.4.2.6 (2)(b) Floor drains in cystoscopy operating rooms have been shown to disseminate a heavily contaminated spray during flushing. Unless flushed regularly with large amounts of fluid, the trap tends to dry out and permit passage of gases, vapors, odors, insects, and vermin directly into the operating room.

For new construction, if the users insist on a floor drain, the drain plate should be located away from the operative site, and should be over a frequently flushed nonsplash, horizontal-flow type of bowl, preferably with a closed system of drainage. Alternative methods include (a) an aspirator/trap installed in a wall connected to the collecting trough of the operating table by a closed, disposable tube system, or (b) a closed system using portable collecting vessels. (See NFPA 99.)

2.1-8.4.2.7 Condensate drains

- (1) Condensate drains for cooling coils shall be a type that may be cleaned as needed without disassembly.
- (2) An air gap shall be provided where condensate drains empty into building drains.
- (3) Heater elements shall be provided for condensate lines in freezers or other areas where freezing may be a problem.

2.1-8.4.3 Plumbing Fixtures**2.1-8.4.3.1 General**

- (1) Materials. The material used for plumbing fixtures shall be nonabsorptive and acid-resistant.
- (2) Clearances. Water spouts used in lavatories and sinks shall have clearances adequate to avoid contaminating utensils and the contents of carafes, etc.

***2.1-8.4.3.2 Hand-washing stations**

- (1) General. For further requirements regarding hand-washing stations, see 1.2-3.2.1.2 (ICRA considerations—Design elements), 2.1-7.2.2.8 and 2.1-8.3.5.2 (Hand-washing stations and scrub sinks).
- (2) Sinks
 - *(a) Sinks in hand-washing stations shall be designed with deep basins to prevent splashing to areas where direct patient care is provided, particularly those surfaces where sterile procedures are performed and medications are prepared.
 - (b) The area of the basin shall not be less than 144 square inches (365.76 square millimeters), with a minimum 9-inch (22.86-mm) width or length.
 - (c) Hand-washing basins/countertops shall be

- made of porcelain, stainless steel, or solid surface materials. Basins shall be permitted to be set into plastic laminate countertops if, at a minimum, the substrate is marine-grade plywood (or equivalent) with an impervious seal.
- (d) Sinks shall have well-fitted and sealed basins to prevent water leaks onto or into cabinetry and wall spaces.
- (e) The discharge point of hand-washing sinks shall be at least 10 inches (25.40 centimeters) above the bottom of the basin.
- (f) The water pressure at the fixture shall be regulated.
- (g) Design of sinks shall not permit storage beneath the sink basin.

2.1-8.4.3.3 Showers and tubs

- (1) Showers and tubs shall have nonslip walking surfaces.
- (2) If provided, soap dishes shall be recessed.

2.1-8.4.3.4 Ice machines. Copper tubing shall be provided for supply connections to ice machines.

2.1-8.4.3.5 Clinical sinks

- (1) Clinical sinks shall be trimmed with valves that can be operated without hands. Single-lever or wrist blade devices shall be permitted. Handles on clinical sinks shall be at least 6 inches (15.24 centimeters) long.
- (2) Clinical sinks shall have an integral trap wherein the upper portion of the water trap provides a visible seal.

2.1-8.4.3.6 Scrub sinks. Freestanding scrub sinks and lavatories used for scrubbing in procedure rooms shall be trimmed with foot, knee, or ultrasonic controls; single-lever wrist blades are not permitted.

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A2.1-8.4.3.2 Plumbing lines under hand-washing stations should be protected for use by residents using wheelchairs.

A2.1-8.4.3.2 (2)(a) Recommendations for minimizing splashing through hand-washing station design and sink style:

- a. Faucets should not discharge directly above the drain as this causes splashing (i.e., water should be angled away from the drain).

- b. Sink size and depth should follow ANSI standards for sink design.
- c. Water pressure should be adjusted to reduce forceful discharge into the sink at maximum flow.
- d. Design of sinks should accommodate ADA requirements for clearance under the sink basin.

2.1-8.4.4 Medical Gas and Vacuum Systems

Station outlets shall be provided consistent with need established by the functional program. (See Table 2.1-6 for station outlet requirements.)

2.1-8.4.4.1 Medical gas systems. The installation, testing, and certification of nonflammable medical gas and air systems shall comply with the requirements of NFPA 99.

2.1-8.4.4.2 Vacuum systems

- (1) Clinical vacuum system installations shall be in accordance with NFPA 99.
- (2) The vacuum discharge shall be located at least 25 feet (7.62 meters) from all outside air intakes, doors, and operable windows.

***2.1-8.5 Communications Systems**

Technology and medical communication rooms typically include space for data and voice communication, patient monitoring and alarm, nurse call, hospital information, digital imaging (PACS), security, building automation, fire and life safety, and telemedicine/teleconferencing systems equipment.

***2.1-8.5.1 Telecommunications Service Entrance Room**

The telecommunications service entrance room (TSER) houses the point at which data and voice circuits and services enter the facility and outdoor cabling interfaces with the building infrastructure.

2.1-8.5.1.1 Number. Each hospital shall have at least one TSER that is dedicated to the telecommunications

function and related support facilities and meets all of the requirements of this section.

2.1-8.5.1.2 Size. The TSER shall have minimum dimensions of 12 feet by 14 feet (3.66 meters by 4.27 meters).

2.1-8.5.1.3 Location and access requirements

- (1) The TSER shall be located in a dry area not subject to flooding, as close as practicable to the building entrance point, and next to the electrical service room to reduce the length of bonding conductor to the electrical grounding system.
- (2) Access to the TSER shall be restricted and controlled by an access control system.
- (3) Combination of the TSER and the technology equipment center shall be permitted.

***2.1-8.5.1.4 Building system requirements**

- (1) Mechanical and electrical equipment and fixtures that are not directly related to the support of the TSER shall not be installed in, pass through, or enter the TSER.
- (2) Temperature and humidity in the TSER shall be controlled to the operating range of 64 to 75 degrees F (18 to 24 degrees C) with 30 to 55 percent relative humidity. Reliable cooling and heating shall be provided on a 24-hour-per-day, 365-day-per-year basis.
- (3) HVAC systems serving the TSER shall be connected to the hospital's emergency power systems.

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A2.1-8.5 This section establishes the minimum space, environmental, pathway, and reliability requirements for the technology and medical communication systems of an acute care hospital. Today's health care facilities rely on data, voice, and other medical communication technologies and are now dependent on these systems to provide patient care. These systems are an essential, "life critical" utility for hospitals.

The convergence of these communication systems continues to increase the demand and need for well-designed systems and adequate space to accommodate them. The small communications "closets" of the past no longer support the systems and equipment.

A2.1-8.5.1 All elements of the design for the TSER should be coordinated with the service provider throughout the design, procurement, and installation of telecommunications services to ensure that adequate space, cooling, and electrical requirements are met.

A2.1-8.5.1.4 A dry pipe, pre-action, fire suppression system is recommended in all telecommunications service entrance room (TSER) spaces.

***2.1-8.5.2 Technology Equipment Center**

The technology equipment center (TEC) houses the main networking equipment and the application servers and data storage devices that serve the building.

2.1-8.5.2.1 Number. Each hospital shall have at least one TEC space that is not used for any purposes other than data storage, processing, and networking and that meets the minimum requirements of this section.

***2.1-8.5.2.2 Size.** The TEC shall be a size adequate to provide proper space to meet service requirements for the equipment that will be housed there.

***2.1-8.5.2.3 Location and access requirements**

- (1) The TEC shall be located above any floodplains and below the top level of the facility to deter water damage to the equipment from outside sources (e.g., leaks from the roof or flood damage). In areas prone to hurricanes or tornados, the TEC shall be located away from exterior curtain walls to prevent wind and water damage.
- (2) The TEC shall be located a minimum of 12 feet (3.66 meters) from any transformer, motors, x-ray, induction heaters, arc welders, radio and radar systems, or other sources of electromagnetic interference.

- (3) Access to the TEC shall be restricted and controlled by an access control system.
- (4) Combination of the TEC and the telecommunications service entrance room shall be permitted.

2.1-8.5.2.4 Facility requirements

- (1) Mechanical and electrical equipment or fixtures that are not directly related to the support of the TEC shall not be installed in, pass through, or enter the TEC.
- (2) All computer and networking equipment within the TEC shall be served by UPS power.
- (3) All circuits serving the TEC and the equipment within it shall be dedicated to serving the TEC.
- (4) Reliable cooling and heating shall be provided on a 24-hour-per-day, 365-day-per-year basis.
- (5) Temperature and humidity in the TEC shall be controlled to an operating range of 64 to 75 degrees F (18 to 24 degrees C) with 30 to 55 percent relative humidity.

***2.1-8.5.3 Technology Distribution Room**

Technology distribution rooms (TDRs) provide a secure, flexible, and easily managed location for the structured wiring systems, network electronics, clinical systems, nurse call systems, and other technology and communications equipment throughout the build-

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A2.1-8.5.2 The technology equipment center (TEC) is the heart of the information and technology and communications systems for the hospital. Sometimes referred to as a main distribution frame (MDF), the TEC must be a sufficiently sized, environmentally controlled, power conditioned, fire protected, secure space with limited access that is located strategically to avoid any floodplain or other known hazard.

A2.1-8.5.2.2 The actual size requirements for a TEC space can be difficult to determine, particularly if the contents of the rooms have not been clearly defined, but may be dramatically larger than such spaces have been in the past.

A2.1-8.5.2.3 TEC location and access requirements

- a. The TEC should be located a safe distance from any transformers, motors, x-ray equipment, induction heaters, arc welders, radio and radar systems, or other sources of electromagnetic interference.
- b. The TEC should be located or designed to avoid vibration from mechanical equipment or other sources.

- c. Locations that are restricted by building components that limit future expansion (e.g., elevators, building structural elements, kitchens, central energy plants, outside walls, or other fixed building walls) should be avoided.
- d. Accessibility should be provided for the delivery of supplies and equipment to the space.

A2.1-8.5.3 Typical systems and equipment located in technology distribution rooms (TDRs) include the following:

- a. Data network and voice communication equipment and cabling
- b. Fire alarm system components
- c. Building automation system (BAS) components and equipment
- d. Security components and associated equipment/closed-circuit television (CCTV)
- e. Nurse call system components and equipment
- f. Distributed antenna system (DAS) components and equipment
- g. Music and video entertainment components and equipment

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ing. TDRs house a variety of technology systems and system components.

2.1-8.5.3.1 Number

- (1) There shall be a minimum of one TDR on each floor of the facility.
- (2) TDRs shall be provided throughout the facility as necessary to meet the 292-foot (90-meter) maximum cable distance required for Ethernet cables from the termination point in the TDR to each wall outlet.

***2.1-8.5.3.2 Size.** All TDRs shall have minimum inside dimensions of 12 feet by 14 feet (3.66 meters by 4.27 meters).

*2.1-8.5.3.3 Location and access requirements

- (1) The TDR shall be located in an accessible, non-sterile area on each floor.
- (2) Access to the TDR shall be directly off a corridor and not through another space, such as an electrical room or mechanical room.
- (3) Access to a TDR shall be restricted and controlled by an access control system.

2.1-8.5.3.4 Facility requirements

- (1) Mechanical and electrical equipment or fixtures not directly related to the support of the TDR shall not be installed in, pass through, or enter the TDR.

- (2) Each TDR shall be connected to the technology equipment center to provide a building-wide network and communications system.
- (3) All circuits serving the TDR and the equipment within it shall be dedicated to serving the TDR.
- (4) Reliable cooling and heating shall be provided on a 24-hour-per-day, 365-day-per-year basis.
- (5) Temperature and humidity in the TDR shall be controlled to an operating range of 64 to 75 degrees F (18 to 24 degrees C) with 30 to 55 percent relative humidity.

2.1-8.5.4 Grounding for Telecommunication Spaces

2.1-8.5.4.1 Grounding, bonding, and electrical protection shall meet the requirements of the latest version of NEC and J-STD-607-A.

2.1-8.5.4.2 TGB bar

- (1) The ground bar shall be drilled with holes according to NEMA standard to accommodate bolted compression fittings.
- (2) All racks, cabinets, sections of cable tray, and metal components of the technology system that do not carry electrical current shall be grounded to this bus bar.
- (3) TGB bars shall be connected by a backbone of insulated, #6 (minimum) to 3/0 AWG stranded copper cable between all technology rooms.

APPENDIX (continued)

- h. Paging equipment
- i. Medical gas monitoring equipment
- j. Lighting control panels
- k. Cable access television (CATV) components and equipment
- l. Patient and equipment tracking systems equipment and components
- m. Smart OR/IT and video switching equipment
- n. Physiological monitoring and medical telemetry components and equipment
- o. Audiovisual systems and components
- p. Telemedicine
- q. Picture archiving and communications systems (PACS)
- r. Cellular amplification systems
- s. Digital signage system components

A2.1-8.5.3.2 An inside dimension of 12 by 16 feet (3.66 by 4.88 meters) is recommended for TDRs. A TDR of this size will allow for future growth and the potential for an additional row of equipment racks.

A2.1-8.5.3.3 Technology distribution rooms (TDRs)

- a. TDRs should be located to avoid large ducts, beams, and other building elements that may interfere with proper cable routing and may limit future access to the cable tray and cabling.
- b. TDRs should be located as close as practicable to the center of the area served and preferably in the core area.
- c. In a multi-story facility, TDRs should be stacked vertically so the entire footprint of each TDR is directly above or below the TDRs on other floors.

2.1-8.5.4.3 TMGB bar. TGB bars shall be connected back to the telecommunications main grounding bus (TMGB) bar in the telecommunications service entrance room. The main grounding bar shall then be connected back to the building main electrical service ground.

- (1) The TMGB shall not be bonded to anything other than the building's main electrical service ground.
- (2) Bonding conductor cabling shall be colored green or labeled appropriately.

2.1-8.5.5 Cabling Pathways and Raceway Requirements

***2.1-8.5.5.1** Outside plant infrastructure consists of the conduits, vaults, and other pathways and cabling used to connect buildings on a campus and to provide services from off-campus service providers.

2.1-8.5.5.2 Pathways and raceways distributing cabling between telecommunications service entrance rooms and technology distribution rooms shall be installed in conduit and in a manner that provides physical security from damage.

2.1-8.6 Electronic Safety and Security Systems

2.1-8.6.1 Fire Alarm System

All health care facilities shall be provided with a fire alarm system in accordance with NFPA 101 and NFPA 72.

2.1-8.6.2 Electronic Surveillance Systems

Electronic surveillance systems include but are not limited to patient elopement systems, door access/control systems, video/audio monitoring systems, patient location systems, and infant abduction prevention systems.

2.1-8.6.2.1 Electronic surveillance systems are not required, but if provided for the safety of the patients, any devices in patient areas shall be mounted in a tamper-resistant enclosure that is unobtrusive.

2.1-8.6.2.2 Electronic surveillance system monitoring devices shall be located so they are not readily observable by the general public or patients.

2.1-8.6.2.3 If installed, electronic surveillance systems shall receive power from the emergency electrical system in the event of a disruption of normal electrical power.

2.1-8.7 Special Systems

2.1-8.7.1 General

2.1-8.7.1.1 Testing

- (1) Prior to acceptance of the facility, all special systems shall be tested and operated to demonstrate to the owner or his designated representative that the installation and performance of these systems conform to design intent.
- (2) Test results shall be documented for maintenance files.

2.1-8.7.1.2 Documentation

- (1) Upon completion of the special systems equipment installation contract, the owner shall be furnished with a complete set of manufacturers' operating, maintenance, and preventive maintenance instructions, a parts lists, and complete procurement information including equipment numbers and descriptions.
- (2) Operating staff persons shall also be provided with written instructions for proper operation of systems and equipment. Required information shall include all safety or code ratings as needed.

2.1-8.7.1.3 Insulation. Insulation shall be provided surrounding special system equipment to conserve energy, protect personnel, and reduce noise.

2.1-8.7.2 Elevators

2.1-8.7.2.1 General. All hospitals having patient facilities (such as bedrooms, dining rooms, or recreation areas) or critical services (e.g., operating, delivery, diagnostic, or therapeutic areas) located on other than the grade-level entrance floor shall have electric or hydraulic elevators.

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A2.1-8.5.5.1 Consider redundant outside pathways for increased reliability of service.

2.1 COMMON ELEMENTS FOR HOSPITALS

2.1-8.7.2.2 Number. In the absence of an engineered traffic study, the following guidelines for number of elevators shall apply to all facility types in this chapter except psychiatric hospitals:

- (1) At least two hospital-type elevators shall be installed where 1 to 59 patient beds are located on any floor other than the main entrance floor.
- (2) At least two hospital-type elevators shall be installed where 60 to 200 patient beds are located on floors other than the main entrance floor, or where the major inpatient services are located on a floor other than those containing patient beds. (Reduction in elevator service shall be permitted for those floors providing only partial inpatient services.)
- (3) At least three hospital-type elevators shall be installed where 201 to 350 patient beds are located on floors other than the main entrance floor, or where the major inpatient services are located on a floor other than those containing patient beds. (Reduction in elevator service shall be permitted for those floors providing only partial inpatient services.)
- (4) For hospitals with more than 350 beds, the number of elevators shall be determined from a study of the hospital plan and the expected vertical transportation requirements.

2.1-8.7.2.3 Dimensions and clearances. This section shall apply to all facility types in this chapter except psychiatric hospitals.

- (1) Hospital-type elevator cars shall have inside dimensions that accommodate a patient bed with attendants. Cars shall be at least 5 feet 8 inches (1.73 meters) wide by 9 feet (2.74 meters) deep.
- * (2) Car doors shall have a clear opening of not less than 4 feet (1.22 meters) wide and 7 feet (2.13 meters) high.

- (3) In renovations, an increase in the size of existing elevators shall not be required if the elevators can accommodate patient beds used in the facility.
- (4) Additional elevators installed for visitors and material handling shall be permitted to be smaller than noted above, within restrictions set by standards for disabled access.

2.1-8.7.2.4 Leveling device. Elevators shall be equipped with a two-way automatic level-maintaining device with an accuracy of $\pm 1/4$ inch (± 6.35 millimeters).

2.1-8.7.2.5 Elevator controls

- (1) Each elevator, except those for material handling, shall be equipped with an independent keyed switch for staff use for bypassing all landing button calls and responding to car button calls only.
- * (2) Elevator call buttons and controls shall not be activated by heat or smoke. Light beams, if used for operating door reopening devices without touch, shall be used in combination with door-edge safety devices and shall be interconnected with a system of smoke detectors.

2.1-8.7.2.6 Installation and testing

- (1) Standards. Installation and testing of elevators shall comply with ANSI/ASME A17.1 for new construction and ANSI/ASME A17.3 for existing facilities. (See ASCE/SEI 7 for seismic design and control systems requirements for elevators.)
- (2) Documentation. Field inspections and tests shall be made and the owner shall be furnished with written certification stating that the installation meets the requirements set forth in this section as well as all applicable safety regulations and codes.

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A2.1-8.7.2.3 (2) Elevator car doors should have a clear opening of not less than 4.5 feet (1.37 meters).

A2.1-8.7.2.5 (2) This is so the light control feature will be overridden or disengaged should it encounter smoke at any landing.

Table 2.1-1

Surfaces and Furnishings Requirements for a Typical Nursing Unit in a General Hospital

List performance characteristics in each column for each room or area.

Room or Area	Floor	Walls	Wall Base	Ceiling	Lighting	Doors and Hardware	Grab Bars	Handrails	Casework & Built-ins	Furniture	Window Treatments	Signage
Patient room												
Patient toilet room or bathing facility												
Patient bathing room												
Newborn nursery												
Airborne infection isolation room												
Protective environment room												
Patient corridor												
Examination room												
Treatment room												
Patient changing and dressing room												
Nourishment area or room												
Clinical area workstation												
Environmental services room												
Equipment and supply storage												
Clean workroom												
Soiled workroom												
Waste management area												
Public lobby and waiting areas												
Patient/family support areas												
Public restrooms												

Table 2.1-2**Ventilation Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities¹**

Area designation	Air movement relationship to adjacent area	Minimum air changes of outdoor air per hour	Minimum total air changes per hour	All air exhausted directly to outdoors ^j	Recirculated by means of room units ^a	Relative humidity ^k (%)	Design temperature ^l (degrees F/C)
KEY: NR—no requirement, N—negative, P—positive							
NURSING UNITS							
Combination All/PE room ²	P	2	12	Yes	No	NR	75 (24)
Anteroom ²	N/P	NR	10	NR	No	NR	NR
DIAGNOSTIC AND TREATMENT AREAS							
Dialysis treatment area	NR	2	6	NR	NR	30–60	72–78 (22–26)
Dialyzer reprocessing room	N	NR	10	Yes	No	NR	NR
Imaging							
Nuclear medicine hot lab	N	NR	6	Yes	No	NR	75 (24)
Nuclear medicine treatment room	N	NR	6	Yes	NR	NR	70–75 (21–24)

Note: Lettered footnotes refer to footnotes in Part 6, Table 7-1.

¹ Additional ventilation requirements can be found in Table 7-1 of Part 6 (ANSI/ASHRAE/ASHE 170: Ventilation of Health Care Facilities).

² Differential pressure shall be a minimum of 0.01" water gauge (2.5 Pa). If alarms are installed, allowances shall be made to prevent nuisance alarms of monitoring devices.

Table 2.1-3**Electrical Convenience Receptacle Requirements for Clinical Areas**

Area Designation	Number	Locations
PATIENT BED LOCATIONS		
Medical, surgical, pediatric, postpartum, physical rehabilitation units	12	Convenient to head of bed with one on each wall
Critical care unit, neonatal ICU, pediatric ICU (and associated exam/treatment)	16	Convenient to head of bed with one on each wall
Psychiatric, substance abuse units	No minimum	
LDR/LDRP rooms	16	8 convenient to head of mother's bed and 4 convenient to each bassinet with one on each wall
Newborn nursery	4	Convenient to each bassinet
Continuing care nursery	5	Convenient to head of each bed, crib, or bassinet (At least 50% of these outlets shall be connected to emergency system power and be so labeled.)
Special care nursery	8	Convenient to each bassinet
DIAGNOSTIC AND TREATMENT LOCATIONS		
General examination/treatment rooms	8	4 convenient to head of stretcher or bed
Emergency care—general	12	Convenient to head of stretcher or bed
Triage rooms or areas in the emergency department	6	Convenient to head of stretcher or bed (At least 50 percent of these outlets shall be connected to emergency system power and be so labeled.)
Trauma/resuscitation emergency room	16	Convenient to head of stretcher or bed
Minor (no general anesthesia) surgical room	16	Convenient to head of stretcher or bed
Operating rooms, cesarean delivery rooms	24	16 convenient to table placement with two on each wall
Cardiac catheterization, interventional radiology, angiography rooms	12	8 convenient to table placement with one on each wall
Endoscopy, bronchoscopy, non-surgical cystoscopy, lithotripsy, urology procedure rooms	8	
Renal dialysis patient care locations	8	4 on each side of a patient bed or lounge chair (Two receptacles on each side of the bed shall be connected to emergency power.)
POST-ANESTHESIA CARE		
PACU	8	Convenient to head of stretcher or bed
Phase II recovery	4	Convenient to stretcher or chair

Notes

1. Single or duplex receptacles or a combination of both shall be permitted.
2. Consideration shall be given to providing some outlets on emergency power and some on normal power at the head of patient beds and in operating rooms, cesarean delivery rooms, and trauma/resuscitation emergency rooms in case of transfer switch failure.
3. Each patient bed location or procedure room shall be supplied by at least two branch circuits, one from the emergency system and one or more from the normal system. Critical care locations served from two separate transfer switches on the emergency system shall not be required to have separate circuits from the normal system.
4. Branch circuits serving only special purpose receptacles or equipment in critical care areas shall be permitted to be served by other panel boards.
5. An additional outlet shall be provided for a television if one is furnished in the room.
6. A minimum of one dedicated circuit shall be provided to each critical care patient location.
7. Open heart post-anesthesia recovery spaces require outlets beyond those specified in Table 2.1-3 based on the functional program.

Table 2.1-4

Location of Nurse Call Devices

KEY: ● Required □ Optional							
Area Designation	Patient Station	Bath Station	Staff Emergency Station	Code Call Station	Nurse Master Station	Duty Station	Note
Nursing Units							
Inpatient bed location	●	●	□				1, 2, 3, 4
Patient toilets, showers, and baths		●					2
Nurse/control station					●		
Clean workroom						●	
Clean supply room						□	
Soiled workroom						●	
Soiled holding room						□	
Medication preparation room						●	
Examination/treatment room	□		●			●	
Staff lounge						●	
Clean linen storage						□	
Nourishment area or room						□	
Equipment storage room						□	
Multipurpose room						□	
Other Clinical Areas							
Operating and cesarean delivery rooms			●	□			2
Procedure rooms			●	□			2
LDR/LDRP rooms	●		●	●			1, 2, 3, 4
Recovery—PACU	□		●	●	□		2, 4
Recovery—Phase 2	●		●	□	□		1, 2
Emergency exam, treatment, triage rooms	●		●	●	□		1, 2, 4
Patient preparation and holding areas	●		●	□	□		1, 2
Critical care bed locations, including NICU	●		●	●	□		1, 2, 4, 5
Newborn and special care nurseries			●		□		
Cardiac catheterization, interventional radiology, angiography	□		●	●	□		
MRI, CT, stress testing areas	□		●	●			2, 4
Outpatient examination areas	□			□			
Outpatient waiting and changing areas	□						2
Psychiatric seclusion ante/exam rooms			●				
Outpatient toilet rooms, showers, and baths		□					2
Psychiatric patient room	□						2

Notes

1. One device shall be permitted to accommodate both patient station and emergency staff assistance station functionality.
2. A visible signal shall be activated in the corridor at the patient’s door, at the nurse/control station, and at all duty stations. In multi-corridor nursing units, additional visible signals shall be installed at corridor intersections.
3. Two-way voice communication shall be provided with the nurse/control station.
4. One device shall be permitted to accommodate both emergency staff assistance and code call station functionality.
5. A patient station shall not be required in the NICU.

Table 2.1-5**Hot Water Use—General Hospital**

	Clinical	Dietary	Laundry
Liters per hour per bed ¹	11.9	7.2	7.6
Gallons per hour per bed ¹	3	2	2
Temperature (°C)	41–49 ²	49 ³	71 ⁴
Temperature (°F)	105–120 ²	120 ³	160 ⁴

Notes

¹ Quantities indicated for design demand of hot water are for general reference minimums and shall not substitute for accepted engineering design procedures using actual number and types of fixtures to be installed. Design will also be affected by temperatures of cold water used for mixing, length of run and insulation relative to heat loss, etc. As an example, total quantity of hot water needed will be less when temperature available at the outlet is very nearly that of the source tank and the cold water used for tempering is relatively warm.

² The range represents the maximum and minimum allowable temperatures.

³ Provisions shall be made to provide 180°F (82°C) rinse water at warewasher (may be by separate booster) unless a chemical rinse is provided.

⁴ Provisions shall be made to provide 160°F (71°C) hot water at the laundry equipment when needed. (This may be by steam jet or separate booster heater.) However, it is emphasized that this does not imply that all water used would be at this temperature. Water temperatures required for acceptable laundry results will vary according to type of cycle, time of operation, and formula of soap and bleach as well as type and degree of soil. Lower temperatures may be adequate for most procedures in many facilities, but the higher 160°F (71°C) should be available when needed for special conditions.

APPENDIX**Table A2.1-a****Sound Transmission Loss or Attenuation Through Horizontal and Vertical Barriers in NICUs**

Adjacency combination	STC _c
NICU Pedestrian-only corridor	45
NICU Equipment corridor	55
NICU Infant area	40
NICU Reception	55
NICU Meeting room with amplified sound	55
NICU Staff work area	55
NICU Administrative office, conference	45
NICU Non-related area	50
NICU Mechanical area	60–65
NICU Electrical area	50–55

Adapted from J. B. Evans and M. K. Philbin, "Facility and operations planning for quiet hospital nurseries" in *Journal of Perinatology* 2000; 20(8):S105-12. Used with permission.

Table 2.1-6**Station Outlets for Oxygen, Vacuum (Suction), and Medical Air Systems in Hospitals¹**

Section	Location	Oxygen	Vacuum	Medical Air	WAGD ²
2.1-2.4.2	Airborne infection isolation rooms	1/bed	1/bed	--	--
2.1-2.4.3	Seclusion rooms (medical/surgical and postpartum)	1/bed	1/bed	--	--
2.1-3.2	Examination/treatment rooms (medical/surgical and postpartum care)	1/room	1/room	--	--
*2.2-2.2.2	Patient rooms (medical/surgical)	1/bed	1/bed	--	--
2.2-2.2.4.4	Protective environment rooms	1/bed	1/bed	--	--
2.2-2.5	Intermediate care	2/bed	2/bed	1/bed	--
2.2-2.6	Critical care (general)	3/bed	3/bed	1/bed	--
2.2-2.6.4.2	Airborne infection isolation (critical care)	3/bed	3/bed	1/bed	--
2.2-2.7	Coronary critical care	3/bed	2/bed	1/bed	--
2.2-2.13	Pediatric critical care	3/bed	3/bed	1/bed	--
2.2-2.10	Newborn intensive care	3/bassinet	3/bassinet	3/bassinet	--
2.2-2.11.2.2	Postpartum room	1/bed	1/bed	--	--
2.2-2.11.3	Labor/delivery/recovery (LDR)	1/bed	1/bed	--	--
2.2-2.11.3	Labor/delivery/recovery/postpartum (LDRP)	1/bed	1/bed	--	--
2.2-2.11.9.1	Cesarean delivery room	2/room	4/room	1/room	1/room
2.2-2.11.9.2 (2)	Infant resuscitation space ³	3/bassinet	3/bassinet	3/bassinet	--
2.2-2.11.13	OB recovery room	1/bed	3/bed	1/room	--
2.2-2.12.3.1	Newborn nursery (full-term)	1/bassinet ⁴	1/bassinet ⁴	1/bassinet ⁴	--
2.2-2.12.3.3	Continuing care nursery	1/bassinet	1/bassinet	1/bassinet	--
2.2-2.13	Pediatric and adolescent	1/bed	1/bed	1/bed	--
2.2-2.14.2	Psychiatric patient rooms	--	--	--	--
2.2-2.14.4.2	Seclusion treatment room (psychiatric unit)	--	--	--	--
2.2-3.1.2	Initial emergency management	1/bed	1/bed	--	--
2.2-3.1.3.3	Triage area (definitive emergency care)	1/station	1/station	--	--
2.2-3.1.3.6	Definitive emergency care exam/treatment rooms	1/bed	1/bed	1/bed	--
2.2-3.1.3.6 (6)	Trauma/resuscitation room(s)	2/bed	3/bed	1/bed	--
2.2-3.1.3.6 (7)	Orthopedic and cast room	1/room	1/room	--	--
2.2-3.1.4.3	Definitive emergency care observation unit	1/bed	1/bed	--	--
2.2-3.3.2.1	General operating room	2/room	4/room	1/room	1/room
2.2-3.3.2.2	Cardiac, transplant, neurology operating room	2/room	5/room	1/room	1/room
2.2-3.3.2.3	Orthopedic surgery	2/room	4/room	1/room	1/room
2.2-3.3.2.4	Surgical cystoscopic and endourologic	2/room	3/room	1/room	1/room
2.2-5.3.3.3	Post-anesthesia care unit (PACU)	2/bed	3/bed	1/bed	--
2.2-3.3.3.4	Phase II recovery	1/bed	3/bed ⁵	--	--
2.2-3.3.6.15	Anesthesia workroom	1 per workstation	--	1 per workstation	--
2.2-3.4.4	MRI	1/room	1/room	1/room	--
2.2-3.5.2	Cardiac catheterization lab	2/bed	2/bed	1/bed	--
2.2-5.7.2.2	Autopsy room	--	1 per workstation	--	--

¹ For any area or room not described above, the facility clinical staff shall determine outlet requirements after consultation with the authority having jurisdiction.

² WAGD stands for "waste anesthesia gas disposal" system.

³ When infant resuscitation takes place in a room such as a cesarean delivery room or an LDRP room, infant resuscitation services must be provided in that room in addition to the minimum service required for the mother.

⁴ Four bassinets may share one outlet that is accessible to each bassinet.

⁵ If the Phase II recovery area is a separate area from the PACU, only one vacuum per bed or station shall be required.

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A2.2-2.2.2 Medical air outlets shall be provided in patient rooms when indicated by the functional program.

2.2 Specific Requirements for General Hospitals

Appendix material, shown in shaded boxes at the bottom of the page, is advisory only.

■ 2.2-1 General

2.2-1.1 Application

This chapter contains specific requirements for general acute care hospitals. The requirements described in Chapter 2.1, Common Elements for Hospitals, shall also apply to general acute care hospitals as referenced in this chapter.

2.2-1.2 Functional Program

For requirements, see 2.1-1.2 and 1.2-2.

2.2-1.3 Site

*2.2-1.3.1 Parking Capacity

2.2-1.3.1.1 Parking for general hospitals shall comply with the general requirements in 1.3-3.3 (Parking) and the specific requirements in this section.

***2.2-1.3.1.2** In the absence of local requirements governing parking, the following shall be provided:

- (1) One space for each bed plus one space for each employee normally present on any single weekday shift. Reduction of this ratio shall be permitted in compliance with Section 1.3-3.3.
- (2) Separate and additional space for service delivery vehicles and vehicles used for emergency patients

2.2-1.3.2 Transfer Support Features

For requirements, see 1.3-3.6.

■ 2.2-2 Nursing Units

*2.2-2.1 General

2.2-2.1.1 New Construction

Nursing units in general hospitals shall meet the minimum design requirements described in Section 2.2-2.2 as applicable.

2.2-2.1.2 Renovation

For renovation of nursing units in existing hospitals, see 1.1-3 for further guidance when compliance with these guidelines is impractical.

2.2-2.2 Medical/Surgical Nursing Unit

2.2-2.2.1 Reserved

2.2-2.2.2 Patient Room

2.2-2.2.2.1 Capacity

- (1) The maximum number of beds per room shall be one unless the functional program demonstrates the necessity of a two-bed arrangement. Approval of a two-bed arrangement shall be obtained from the licensing authority.
- (2) Where renovation work is undertaken and the present capacity is more than one patient, maximum room capacity shall be no more than the present capacity, with a maximum of four patients.

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A2.2-1.3.1 Parking

A formal parking/traffic study should be conducted to ensure that adequate parking and traffic flow is provided to accommodate inpatients, outpatients, staff, and visitors.

A2.2-1.3.1.2 Additional parking may be required to accommodate outpatient and other services.

A2.2-2.1 Most acute care hospitals are composed of some combination of the following units: medical/surgical unit, intermediate care unit, critical care unit, obstetrical unit, nursery, pediatric and adolescent unit, psychiatric unit, and in-hospital skilled nursing unit.

2.2 SPECIFIC REQUIREMENTS FOR GENERAL HOSPITALS

2.2-2.2.2.2 Space requirements

*(1) Area

- (a) Patient rooms shall be constructed to meet the needs of the functional program.
 - (b) Patient rooms shall have a minimum clear floor area of 120 square feet (11.15 square meters) in single-bed rooms and 100 square feet (9.29 square meters) per bed in multiple-bed rooms.
- (2) Clearances (See “bed size” in the glossary.)
- (a) The dimensions and arrangement of rooms shall be such that there is a minimum clear dimension of 3 feet (91.44 centimeters) between the sides and foot of the bed and any wall or any other fixed obstruction.
 - (b) In multiple-bed rooms, a minimum clear dimension of 4 feet (1.22 meters) shall be available at the foot of each bed to permit the passage of equipment and beds.
- (3) Where renovation work is undertaken, every effort shall be made to meet the above minimum standards. If it is not possible to meet the above minimum standards, authorities having jurisdiction shall be permitted to grant approval to deviate from this requirement. In such cases, patient rooms shall have a minimum clear floor area of 100 square feet (9.29 square meters) in single-bed rooms and 80 square feet (7.43 square meters) per bed in multiple-bed areas.

***2.2-2.2.2.3 Windows.** Each patient room shall be provided with natural light by means of a window to the outside. For further requirements, see 2.1-7.2.2.5.

2.2-2.2.2.4 Patient privacy. For requirements, see 2.1-2.2.4

*2.2-2.2.2.5 Hand-washing stations

(1) Location

- (a) A hand-washing station shall be provided in the toilet room.
- (b) A hand-washing station shall be provided in the patient room in addition to that in the toilet room.
 - (i) This hand-washing station shall be convenient for use by health care personnel and others entering and leaving the room.
 - (ii) When multi-patient rooms are permitted, this station shall be located outside the patients’ cubicle curtains.

(2) Design requirements

- (a) For hand-washing station design details, see 2.1-7.2.2.8.
- (b) For sinks, see 2.1-8.4.3.2 (Hand-washing stations).

- (3) In renovations of existing facilities, a hand sanitation dispenser shall be permitted in patient rooms where existing conditions prohibit installation of an additional hand-washing station.

2.2-2.2.2.6 Patient toilet room. For requirements, see 2.1-2.2.6.

2.2-2.2.2.7 Patient bathing facilities

- (1) Access shall be provided to bathing facilities in the toilet room directly accessed from each patient room or in a central bathing facility.

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A2.2-2.2.2.2 (1) In new construction, single patient rooms should be at least 12 feet (3.66 meters) wide by 13 feet (3.96 meters) deep (or approximately 160 square feet, or 14.86 square meters) exclusive of toilet rooms, closets, lockers, wardrobes, alcoves, or vestibules. These spaces should accommodate comfortable furniture for family members (one or two) without blocking access of staff members to patients. Efforts should be made to provide the patient with some control of the room environment.

A2.2-2.2.2.3 A window in each patient room, the views from it, and the diurnal cycle of natural light afforded by it are important for

the psychological well-being of all patients, as well as for meeting fire safety and building code requirements. When designed to be operable, a window in the patient room may also be important for continued use of the area in the event of mechanical ventilation system failure.

A2.2-2.2.2.5 Where renovation work is undertaken, every effort should be made to meet this requirement. Where space does not permit the installation of an additional hand-washing station in the patient room, or where it is technically infeasible, the authority having jurisdiction may grant approval of alternative forms of hand cleansing.

(2) Central bathing facilities

(a) Number

- (i) Where individual bathing facilities are not provided in toilet rooms directly accessed from patient rooms, at least one shower or bathtub shall be provided for each 12 beds without such facilities.
- (ii) If required by the functional program, at least one special bathing facility, including space for an attendant, shall be provided for patients on stretchers, carts, and wheelchairs.

(b) Location

- (i) Each bathtub or shower shall be in an individual room or enclosure that provides privacy for bathing, drying, and dressing.
- (ii) If convenient for use, special bathing facilities may be located on a floor separate from the nursing unit.
- (c) Toilet. A toilet in a separate enclosure, a hand-washing station, and storage for soap and towels shall be provided within each central bathing facility or directly accessible to it without the need to enter the corridor.

(3) As required by the functional program, the following requirements shall be met:

- (i) Doorways shall be designed to allow entry of portable/mobile mechanical lifts and shower gurney devices.
- (ii) Thresholds shall be designed to facilitate use and prevent tipping of wheelchairs and other portable wheeled equipment.
- (iii) Patient shower rooms shall be designed to allow entry of portable/mobile mechanical lifts and shower gurney devices.

- (iv) Floor drain grates shall be designed to facilitate use and prevent tipping of wheelchairs and other portable wheeled equipment used by patients and staff.

2.2-2.2.2.8 Patient storage. Each patient shall have within his or her room a separate wardrobe, locker, or closet suitable for hanging full-length garments and for storing personal effects.

2.2-2.2.3 Patient/Family-Centered Care Rooms*2.2-2.2.4 Special Patient Care Rooms****2.2-2.2.4.1 Reserved****2.2-2.2.4.2 Airborne infection isolation (AII) room**

(1) Number

- (a) At least one AII room shall be provided in the hospital and in any other specific areas requiring an AII room as identified in the Guidelines.
- (b) The number of additional AII rooms for individual nursing units shall be increased based on an ICRA.

(2) For general requirements, see 2.1-2.4.2.

2.2-2.2.4.3 Reserved**2.2-2.2.4.4 Protective environment (PE) room(s).**

The protective environment room is used to protect the profoundly immunosuppressed patient with prolonged neutropenia (i.e., a patient undergoing an allogeneic or autologous bone marrow/stem cell transplant) from common environmental airborne infectious microbes (e.g., *Aspergillus* spores). The differentiating factors between protective environment rooms and other patient rooms are the requirements

APPENDIX**A2.2-2.2.3 Patient/Family-Centered Care Rooms**

Where a facility chooses to provide a patient/family-centered care room, the room should be designed to meet the needs of the functional program and the following requirements.

- a. Capacity. The patient/family-centered room should be a single-bed room.
- b. Area and dimensions. A patient/family-centered room should have a minimum clear floor area of 250 square feet (23.22 square meters)

with a minimum clear dimension of 15 feet (4.57 meters).

- c. Additional area. Additional area should be provided at a minimum clear floor area of 30 square feet (2.79 square meters) per family member (permitted by the facility).
- d. Environment of care. Consideration for a homelike atmosphere, furniture arrangements, and orientation to the patient bed and room windows should reflect the needs of the functional program.

2.2 SPECIFIC REQUIREMENTS FOR GENERAL HOSPITALS

for filtration and positive air pressure relative to adjoining spaces.

- (1) General. When determined by an ICRA or the functional program, special design considerations and ventilation to ensure the protection of patients who are highly susceptible to infection shall be required.
- (2) Number. The number of PE rooms shall be as required by the ICRA.
- (3) Location. The appropriate location of PE rooms shall be as required by the ICRA.
- (4) Each PE room shall comply with Section 2.1-2.4.2 (Airborne Infection Isolation Room) as well as the requirements in this section (2.2-2.2.4.4).
- (5) Architectural details
 - (a) The ceiling shall be monolithic.
 - (b) The floor shall be smooth, with sealed seams.
- (6) Surfaces and furnishings. All surfaces (e.g., floors, walls, ceilings, doors, and windows) shall be cleanable.
- (7) Building systems
 - (a) See 2.2-8.2.2.2 for HVAC requirements for PE rooms.
 - (b) Lighting fixtures shall have lenses and shall be sealed.

2.2-2.2.4.5 Combination airborne infection isolation/protective environment (AII/PE) room

This type of room is for profoundly immunosuppressed patients with prolonged neutropenia (i.e.,

patients undergoing allogeneic or autologous bone marrow/stem cell transplants) who require a protective environment and have an airborne infectious disease.

- (1) Number. Hospitals with PE rooms shall include at least one combination AII/PE room.
- (2) Each combination AII/PE room shall comply with the requirements in 2.2-2.2.4.4 (Protective environment room) as well as the requirements in this section.
- (3) Anteroom. Combination AII/PE rooms shall be equipped with an anteroom that meets the following requirements:
 - *(a) The anteroom shall provide space for persons to don personal protective equipment before entering the patient room.
 - (b) All doors to the anteroom shall have self-closing devices.
- (4) See 2.2-8.2.2.3 for HVAC requirements for combination AII/PE rooms.

*2.2-2.2.4.6 Bone marrow/stem cell transplant units

- (1) Location. Bone marrow transplant rooms shall be located to have close access to out-of-unit diagnostic and treatment equipment, particularly diagnostic imaging and radiation therapy equipment.
- (2) Patient rooms in allogeneic/autologous bone marrow/stem cell transplant units shall meet the requirements of 2.2-2.2.4.4 (Protective environment room) as well as the requirements in this section.

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A2.2-2.2.4.4 (1) Many facilities care for patients with an extreme susceptibility to infection (immunosuppressed patients with prolonged granulocytopenia, most notably bone marrow recipients and patients with hematological malignancies who are receiving chemotherapy and are severely granulocytopenic). These rooms are not intended for use with patients diagnosed with HIV infection or AIDS unless they are also severely granulocytopenic. Generally, protective environments are not needed in community hospitals unless these facilities take care of these types of patients.

A2.2-2.2.4.5 (3)(a) The anteroom may be used for hand hygiene and for storage of personal protective equipment (PPE) (e.g., respirators, gowns, gloves) and clean equipment.

A2.2-2.2.4.6 Bone marrow transplant facilities. General space and staffing requirements are critical for bone marrow transplant facilities. Patients in these units may be acutely aware of the surrounding environment, which is their life support system during the many weeks they are confined in an immunosuppressed condition. Means of controlling unnecessary noise are important. At times, each patient may require individual privacy, although each is required to be under close staff supervision.

If the functional program requires serving bone marrow/stem cell transplant patients who are not allogeneic transplants as well as allograft transplants, these guidelines apply as well.

- (3) At least one patient room in these units shall meet the requirements of Section 2.2-2.2.4.5 (Combination AII/PE room).
- (4) Architectural details
 - *(a) All windows in the room shall have fixed sash and be sealed to eliminate infiltration.
 - *(b) Viewing panels shall be provided in doors or walls for nursing staff observation.
- (5) Surfaces and furnishings. Curtains or other means shall be provided to cover windows and viewing panels when a patient requires visual privacy.

2.2-2.2.4.7 Medical psychiatric room(s)

- (1) Number. If indicated by the functional program, the hospital shall provide one or more single-bed rooms for medical care of psychiatric patients needing close supervision.
- (2) Location. These rooms shall be permitted to be part of the psychiatric unit described in 2.2-2.14.
- (3) If the room is part of a medical/surgical nursing unit, the provisions of 2.1-2.2.2 (Patient Room) shall apply, with the following exceptions:
 - (a) Each room shall be for single patient occupancy.
 - (b) Each room shall be located to permit staff observation of the entrance.

- (c) Each room shall be designed to minimize the potential for escape, concealment, injury, or suicide.
- (d) If vision panels are used for observation of patients, the arrangement shall provide patient privacy and minimize casual observation by visitors and other patients.

2.2-2.2.5 Support Areas for Patient Care—General

2.2-2.2.5.1 For general requirements, see 2.1-2.5.

2.2-2.2.5.2 Application. The size of each support area shall depend on the numbers and types of beds served.

2.2-2.2.5.3 Location

- (1) Provision for the support areas listed shall be in or readily accessible to each nursing unit.
- (2) The location of each support area shall depend on the numbers and types of beds served.
- (3) Each support area shall be permitted to be arranged and located to serve more than one nursing unit. However, unless otherwise noted, at least one such support area shall be provided on each nursing floor.

APPENDIX (continued)

- a. A countertop with scrub sink and space for high-level disinfection procedures should be available outside the entrance to each patient room when located within the nursing unit or at each entrance to a dedicated bone marrow transplant room. A hand-washing station should be accessible near the entrance to each patient room within a dedicated bone marrow transplant unit.
 - b. Toilet and bathing facilities. Each bone marrow transplant patient room should have a private toilet room, which contains a water closet and a bathing facility, for the exclusive use of the patient. The patient should be able to enter the room directly without leaving the patient room or passing through the vestibule. The patient should also have a lavatory for the patient's exclusive use, located in the patient room or the private toilet room.
 - c. Nurse and emergency call systems. Each patient room should be provided with a nurse call system accessible at the bed, sitting area, and patient toilet room. An emergency call system should also be provided at each patient bed and toilet room to summon additional personnel from on-call rooms, consultation rooms, and staff lounges.
 - d. Facilities for administration of suction, compressed air, and oxygen should be provided at the bed.
 - e. Staff and visitor support areas. Each geographically distinct unit should provide appropriate space to support nurses' administrative activities, report/conference room activities, doctors' consultation, drug preparation and distribution, emergency equipment storage, and closed accessible waiting for family members.
- A2.2-2.2.4.6 (4)(a)** Windows should be provided so that each patient may be cognizant of the outdoor environment. Window sill height should not exceed 3 feet (0.91 meter) above the floor and should be above grade.
- A2.2-2.2.4.6 (4)(b)** Glazing should be safety glass, wire glass, or tempered clear plastic to reduce hazards from accidental breakage.

2.2 SPECIFIC REQUIREMENTS FOR GENERAL HOSPITALS

2.2-2.2.6 Support Areas for Medical/Surgical Nursing Units

***2.2-2.2.6.1 Administrative center(s) or nurse station(s).** For requirements, see 2.1-2.6.1.

2.2-2.2.6.2 Documentation area. For requirements, see 2.1-2.6.2.

2.2-2.2.6.3 Nurse or supervisor office. A nurse or supervisor office shall be provided in or readily accessible to each nursing unit.

***2.2-2.2.6.4 Multipurpose room(s).** At least one room shall be provided in accordance with Section 2.1-2.6.4.

2.2-2.2.6.5 Hand-washing stations. For design requirements, see 2.1-2.6.5.

- (1) Hand-washing stations shall be conveniently accessible to the medication station and nourishment area.
- (2) If it is convenient to each area, one hand-washing station shall be permitted to serve several areas.

2.2-2.2.6.6 Medication dispensing location. Provision shall be made for distribution of medications in accordance with Section 2.1-2.6.6.

2.2-2.2.6.7 Nourishment area or room. A nourishment area or room shall be provided in each nursing unit in accordance with Section 2.1-2.6.7.

2.2-2.2.6.8 Ice machine. Each nursing unit shall have equipment to provide ice for treatments and nourishment. Ice-making equipment shall be provided in accordance with Section 2.1-2.6.8.

2.2-2.2.6.9 Clean workroom or clean supply room.

A clean workroom or clean supply room shall be provided in accordance with Section 2.1-2.6.9.

2.2-2.2.6.10 Soiled workroom or soiled holding room. A soiled workroom or soiled holding room shall be provided in accordance with Section 2.1-2.6.10.

2.2-2.2.6.11 Equipment and supply storage

- (1) Clean linen storage. Each nursing unit shall contain a designated area for clean linen storage in accordance with Section 2.1-2.6.11.1.
- (2) Equipment storage room or alcove. Appropriate room(s) or alcove(s) shall be provided in accordance with Section 2.1-2.6.11.2.
- (3) Storage space for stretchers and wheelchairs. Space shall be provided in accordance with Section 2.1-2.6.11.3.
- (4) Emergency equipment storage. Storage shall be provided for emergency equipment in accordance with Section 2.1-2.6.11.4.

***2.2-2.2.6.12 Environmental services room.** One environmental services room shall be provided for each nursing unit or nursing floor in accordance with Section 2.1-2.6.12.

2.2-2.2.6.13 Examination/treatment room. This room shall be provided in accordance with the requirements of Section 2.1-3.2.

- (1) Omission of the examination/treatment room shall be permitted if all patient rooms in the nursing unit are single-bed rooms.
- (2) Centrally located examination/treatment room(s) shall be permitted to serve more than one nursing unit on the same floor.

2.2-2.2.7 Support Areas for Staff

2.2-2.2.7.1 Staff lounge facilities. Lounge facilities shall be provided in accordance with Section 2.1-2.7.1.

2.2-2.2.7.2 Staff toilet room. Each staff toilet room(s) shall be provided in accordance with Section 2.1-2.7.2.

APPENDIX

A2.2-2.2.6.1 The station should permit visual observation of all traffic into the unit.

A2.2-2.2.6.4 Multipurpose rooms are used primarily for staff purposes and generally are not available for family or visitors. A waiting room convenient to the unit should be provided.

A2.2-2.2.6.12 A storage or bin space should be included for recyclable materials: white paper, mixed paper, cans, bottles, and cardboard.

2.2-2.2.7.3 Staff storage facilities. Storage facilities for the personal use of staff shall be provided in accordance with Section 2.1-2.7.3.

***2.2-2.2.7.4 Staff rest areas**

2.2-2.2.8 Support Areas for Families and Visitors

2.2-2.2.8.1 Visitor lounge. Each nursing unit shall have access to a lounge for visitors and family.

- (1) The size of this lounge shall be based on the number of beds served per the functional program.
- (2) This lounge shall be permitted to serve more than one nursing unit and shall be conveniently located for the nursing unit(s) served.
- (3) This lounge shall be designed to minimize the impact of noise and activity on patient rooms and staff functions.

2.2-2.2.8.2 Toilet room. A toilet room(s) with hand-washing station shall be located convenient to multi-purpose room(s).

- (1) Patient use. If the functional program calls for the toilet rooms(s) to be for patient use, it shall be designed/equipped for patient use in accordance with Sections 2.1-2.2.6.3 and 2.1-2.2.6.4.
- (2) Public use. If called out in the functional program, designation of the toilet room(s) serving the multi-purpose rooms(s) for public use shall be permitted.

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A2.2-2.2.7.4 Staff rest areas. Staff rest areas should be provided for every unit that has overnight patient care activities. These rest areas should be independent from staff on-call rooms, located proximate to the work unit, and meet the requirements in paragraphs a-g below.

- a. Staff rest areas should be quiet areas. Any audible background noise should be of a constant tone and pitch.
- b. Staff rest areas should be free of vibrations.
- c. Light levels in staff rest areas should be capable of being controlled by the occupant.
- d. Staff rest areas should be provided with independent temperature controls.
- e. Staff rest areas should be single-occupancy rooms.

2.2-2.3 Oncology Nursing Unit

2.2-2.3.1 Reserved

***2.2-2.3.2 Patient Room**

2.2-2.3.2.1 Patient rooms in a cancer nursing unit shall comply with the requirements of Section 2.2-2.2.2 (Patient Room).

2.2-2.3.2.2 Additional requirements in Section 2.2-2.2.4.4 (Protective environment room) shall be met for patient rooms in a cancer nursing unit that will be used for hematopoietic cell transplantation (HCT) patients. The number of these rooms shall be determined by the services to be provided as described in the functional program and an infection control risk assessment.

2.2-2.3.3 Reserved

2.2-2.3.4 Reserved

2.2-2.3.5 Support Areas for Patient Care—General

2.2-2.3.5.1 For general requirements, see 2.1-2.5.

2.2-2.3.5.2 The support areas for medical/surgical units described in 2.2-2.2.6 through 2.2-2.2.8, the requirements in 2.2-2.3.6 through 2.2-2.3.8 shall apply to oncology units.

2.2-2.3.6 Support Areas for the Oncology Unit

2.2-2.3.6.1 Diagnostic and treatment areas. The following diagnostic and treatment locations shall

- f. Doors to staff rest areas should be capable of being locked from the inside using hardware that does not require the use of a special key or tool to exit the space.
- g. Staff rest areas should be provided with a telephone (hard wire or cellular) or other suitable means for summoning the occupant. A speaker connected into the overhead paging system should not be installed.

A2.2-2.3.2 Cancer nursing unit patient rooms should be designed to prevent environmental transmission of communicable microorganisms in a hospital/patient facility setting and to promote a safe healing environment. As well, patient rooms should be designed to facilitate optimal function of the health care giver.

be provided in accordance with 2.2-3 (Diagnostic and Treatment Locations) and as required by the functional program. Provision of these services from central departments or from satellite facilities shall be permitted.

(1) Cancer treatment/infusion therapy unit

* (2) Imaging facilities

(3) Radiotherapy facilities

(a) Storage space for radiation body casts shall be provided for cleanliness and protection.

2.2-2.3.7 Support Areas for Staff

***2.2-2.3.8 Support Areas for Families, Patients, and Visitors**

2.2-2.3.8.1 Some portion of the occupied space shall permit privacy for visitors.

2.2-2.3.8.2 Space for visitor privacy shall include the following to promote interaction and resource availability:

- (1) Area for communications (e.g., cell phones, computers, wireless Internet access)
- (2) Patient-family information stations
- (3) Access to beverages and nourishment

2.2-2.3.9 Special Design Elements

2.2-2.3.9.1 Architectural details

* (1) Decorative water features shall not be placed inside an oncology nursing unit.

(2) Fish tanks shall not be installed in oncology nursing units.

* (3) Decorative plant boxes or containers with live plants, dirt, or dried flowers shall not be built inside or immediately adjacent to an oncology nursing unit.

2.2-2.3.9.2 Surfaces and furnishings

* (1) Frequently touched surfaces in the patient's environment of care shall be planned and designed to facilitate cleaning and disinfection.

(2) Cabinetry, casework, and countertops shall have flush surfaces that are smooth, nonporous, cleanable, wipeable, and durable and that do not scratch easily.

* (3) Window treatments and privacy curtains. In addition to the requirements below, see requirements in 2.1-7.2.4.3 (Window treatments).

(a) Window treatments shall be selected for ease of cleaning. Smooth-surfaced, easy-to-clean, wipeable, nonpleated window treatments shall be used.

(b) Use of fabric privacy curtains shall be permitted if they are washable. A wipeable fabric with a smooth surface is preferable.

2.2-2.3.9.3 Lighting

(1) Light coves, non-flush surfaces, and areas that collect dust shall not be used.

(2) Lighting shall be adjustable to meet standards for high visibility during procedures and still provide for the sleep and comfort of the patient.

(3) Natural lighting shall be provided for patient rooms through windows.

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A2.2-2.3.6.1 (2) In imaging facilities used to diagnose cancer, ceiling images should be provided above radiation equipment for patient relaxation.

A2.2-2.3.8 Place for meditation/prayer. A private space or room should be provided to give patients and families/visitors a place for meditation, bereavement, and prayer.

A2.2-2.3.9.1 (1) Design of lighting for fountains should be carefully considered to prevent water temperatures conducive to Legionella growth.

A2.2-2.3.9.1 (3) Silk or plastic flowers or plants that are easy to clean and are cleaned regularly can be used.

A2.2-2.3.9.2 (1) Architectural hardware. Surface treatments or polymers for which health claims are made based on antimicrobial properties should not be selected for environmental surfaces or furnishings since materials or surfaces impregnated with antimicrobials, including some selected metals, have not demonstrated a reduction in actual infections. For this reason, any such claims are not permitted by the Environmental Protection Agency.

A2.2-2.3.9.2 (3) Window shades should be a neutral color to maintain true coloration of patient skin.

2.2-2.4 Pediatric and Adolescent Oncology Nursing Unit

2.2-2.4.1 General

Rooms and spaces in the pediatric and adolescent oncology nursing unit shall be in accordance with 2.2-2.3 (Oncology Nursing Unit) and shall meet the additional requirements in this section.

2.2-2.4.2 Patient Room

2.2-2.4.2.1 Pediatric patient rooms shall include provisions for family support (hygiene, sleeping, and personal belongings).

2.2-2.4.2.2 Unless otherwise stated in the functional program, pediatric patient rooms shall be separated from units serving adult populations.

2.2-2.4.3 Reserved

2.2-2.4.4 Special Patient Care Rooms

At least one combination AII/PE room shall be provided for each pediatric unit. For requirements, see 2.2-2.2.4.5.

*2.2-2.4.5 Patient Support Areas

2.2-2.4.5.1 Patient play areas. If provided, play areas shall be constructed of surfaces and materials that are easy to clean and durable (nonporous and smooth).

2.2-2.5 Intermediate Care Unit

Intermediate care units, sometimes referred to as stepdown units, are routinely utilized in acute care hospitals for patients who require frequent monitoring of vital signs and/or nursing intervention that exceeds the level needed in a regular medical/surgical unit but is less than that provided in a critical care unit. Intermediate care units can be progressive care units or specialty units such as cardiac, surgical (e.g., thoracic, vascular), neurosurgical/neurological monitoring, or chronic ventilator respiratory care units.

2.2-2.5.1 General

2.2-2.5.1.1 Application. These standards shall apply to adult beds designated to provide intermediate care, but not pediatric or neonatal intermediate care.

2.2-2.5.1.2 Location. In hospitals that provide intermediate care, beds shall be designated for this purpose. These beds shall be permitted to constitute a separate unit or be a designated part of another unit.

2.2-2.5.1.3 Nurse management space. There shall be a separate physical area devoted to nursing management for the care of the intermediate patient.

2.2-2.5.2 Patient Room

The following shall apply to all intermediate care units unless otherwise noted.

2.2-2.5.2.1 Capacity. Maximum room capacity shall be four patients.

2.2-2.5.2.2 Space requirements. Minor encroachments, including columns and hand-washing stations, that do not interfere with functions may be ignored when determining space requirements for patient rooms.

- (1) Area. In new construction, patient rooms shall be constructed to meet the needs of the functional program and have a minimum clear floor area of 120 square feet (11.15 square meters) per bed in multiple-bed rooms and 150 square feet (13.94 square meters) for single-bed rooms.
- (2) Clearances. In new construction, the dimensions and arrangement of rooms shall be such that there is a minimum clearance of 4 feet (1.22 meters) between the sides of the beds and other beds, walls, or fixed obstructions. A minimum clearance of 4 feet (1.22 meters) shall be available at the foot of each bed to permit the passage of equipment and beds.

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A2.2-2.4.5 Pediatric oncology unit

a. A multipurpose room/space should be provided for dining and classroom space.

b. Space should be provided to accommodate a washing machine/dryer and a dishwasher for the purpose of laundering and/or washing plush toys and hard plastic toys respectively.

2.2 SPECIFIC REQUIREMENTS FOR GENERAL HOSPITALS

(3) Renovation. Where renovation work is undertaken, every effort shall be made to meet these standards. If it is not possible to meet these minimum standards, the authorities having jurisdiction may grant approval to deviate from this requirement. In such cases, patient rooms shall have a clear floor area of no less than 100 square feet (9.29 square meters) per bed in multiple-bed rooms and 120 square feet (11.15 square meters) in single-bed rooms.

2.2-2.5.2.3 Windows. Each patient room shall be provided with natural light by means of a window in accordance with Section 2.1-7.2.2.5. (See A2.2-2.2.2.3 for additional information.)

2.2-2.5.2.4 Patient privacy. For general requirements, see 2.1-2.2.4. In addition, the design for privacy shall not restrict patient access to room windows.

2.2-2.5.2.5 Hand-washing stations. A hand-washing station(s) shall be provided to serve each patient room in accordance with Section 2.2-2.2.2.5. (See A2.2-2.2.2.5 for additional information.)

2.2-2.5.2.6 Toilet rooms. Toilet rooms shall be provided in accordance with Section 2.1-2.2.6.

2.2-2.5.2.7 Bathing facilities. Patient bathing facilities shall be provided in accordance with Section 2.2-2.2.2.7 (Patient bathing facilities).

2.2-2.5.2.8 Patient storage. Each patient shall have within his or her room a separate wardrobe, locker, or closet suitable for hanging full-length garments and for storing personal effects.

2.2-2.5.3 Reserved

2.2-2.5.4 Special Patient Care Rooms

2.2-2.5.4.1 Reserved

2.2-2.5.4.2 Airborne infection isolation room

- (1) Access to at least one airborne infection isolation room shall be provided unless provided elsewhere in the facility.
- (2) The number of airborne infection isolation rooms shall be determined on the basis of an ICRA.

- (3) Each room shall comply with the requirements of 2.1-2.4.2.

2.2-2.5.5 Support Areas for Patient Care— General

2.2-2.5.5.1 For general requirements, see 2.1-2.5.

2.2-2.5.5.2 Application. The size of each support area shall depend on the numbers and types of beds served.

2.2-2.5.5.3 Location

- (1) The location of each support area shall depend on the numbers and types of beds served.
- (2) Provision for the support areas listed in this section shall be in or readily available to each intermediate care unit.
- (3) Services shared with adjacent units shall be permitted.

2.2-2.5.6 Support Areas for the Intermediate Care Unit

2.2-2.5.6.1 Administrative center or nurse station

- (1) An administrative center or nurse station shall be provided in accordance with 2.1-2.6.1.
- (2) There shall be direct or remote visual observation between the administrative center or nurse station, staffed documentation areas, and all patient beds in the unit.

2.2-2.5.6.2 Documentation area. This area shall be provided within the patient unit in accordance with 2.1-2.6.2.

2.2-2.5.6.3 Reserved

2.2-2.5.6.4 Reserved

2.2-2.5.6.5 Hand-washing stations. Hand-washing stations shall be provided in accordance with Section 2.2-2.2.2.5.

2.2-2.5.6.6 Medication station. Provision shall be made for 24-hour distribution of medications in accordance with 2.1-2.6.6.

2.2-2.5.6.7 Nourishment area. A nourishment area shall be provided in accordance with Section 2.1-2.6.7.

2.2-2.5.6.8 Ice making-equipment. An ice machine shall be provided in accordance with Section 2.1-2.6.8.

2.2-2.5.6.9 Clean workroom or clean supply room. A clean workroom or clean supply room shall be provided in accordance with 2.1-2.6.9.

2.2-2.5.6.10 Soiled workroom or soiled holding room. A soiled workroom or soiled holding room shall be provided in accordance with 2.1-2.6.10.

2.2-2.5.6.11 Equipment and supply storage

(1) A storage room for equipment and supplies shall be provided in accordance with 2.1-2.6.11.2 (Equipment storage room or alcove), except it shall not be less than 20 square feet (1.86 square meters) per patient bed.

(2) Storage for emergency equipment shall be provided in accordance with Section 2.1-2.6.11.4.

2.2-2.5.6.12 Environmental services room. An environmental services room shall be provided in accordance with Section 2.1-2.6.12.

2.2-2.5.7 Support Areas for Staff

2.2-2.5.7.1 Staff lounge facilities. Staff lounge facilities shall be provided in accordance with Section 2.1-2.7.1.

(1) The location of these facilities shall be convenient to the intermediate care unit.

(2) These facilities shall be permitted to serve more than one nursing unit.

2.2-2.5.7.2 Staff toilet room(s). Staff toilet room(s) shall be provided in accordance with Section 2.1-2.7.2.

2.2-2.5.7.3 Staff storage facilities. Storage facilities for personal use of the staff shall be provided in accordance with Section 2.1-2.7.3.

2.2-2.6 Critical Care Unit

Critical care units require special space and equipment considerations for safe and effective patient care, staff

functions, and family participation. Families and visitors to critical care units often wait for long periods, including overnight, under highly stressful situations. They tend to congregate at unit entries to be readily accessible to staff interaction. Clinical personnel perform in continuously stressful circumstances over long hours. Often they cannot leave the critical care unit, necessitating space and services to accommodate their personal and staff group needs in close proximity to the unit.

2.2-2.6.1 General

2.2-2.6.1.1 Application. Not every hospital will provide all types of critical care. Some hospitals may have a small combined unit; others may have separate, sophisticated units for highly specialized treatments.

(1) The following requirements are intended for typical critical care services. Design of critical care units shall comply with these requirements and shall be appropriate in size, number, and type to the needs of the functional program.

(2) Where specialized services are required, additions and/or modifications shall be made as necessary for efficient, safe, and effective patient care.

(3) Design shall address such issues as privacy, ambience, and aesthetics for all involved in the care and comfort of patients in critical care units.

(4) The following shall be available. Provision of these services from central departments or from satellite facilities shall be permitted as required by the functional program.

(a) Imaging facilities

(b) Respiratory therapy services

(c) Laboratory services

(d) Pharmacy services

2.2-2.6.1.2 Location. The following shall apply to all types of critical care units unless otherwise noted.

(1) The location shall offer convenient access from the emergency, respiratory therapy, laboratory, radiology, surgery, and other essential departments and services as defined by the functional program.

(2) The unit shall be located so that medical emergency resuscitation teams can respond promptly to emergency calls with minimum travel time.

2.2 SPECIFIC REQUIREMENTS FOR GENERAL HOSPITALS

- (3) Space arrangement shall include provisions for access to emergency equipment.
- (4) The location shall be arranged to eliminate the need for through traffic.

***2.2-2.6.1.3 Elevator considerations.** In new construction, where elevator transport is required to move critically ill patients, the size of the cab, width of the door opening, and mechanisms and controls shall meet the specialized needs.

***2.2-2.6.2 Critical Care Patient Care Rooms and Areas**

2.2-2.6.2.1 General. The following shall apply to all types of critical care units unless otherwise noted.

***2.2-2.6.2.2 Space requirements**

- (1) Area. Each patient space (whether separate rooms, cubicles, or multiple-bed space) shall have a minimum clear floor area of 200 square feet (18.58 square meters) with a minimum headwall width of 13 feet (3.96 meters) per bed.
- (2) Clearances. All adult and pediatric units shall have a minimum clear dimension of 1 foot (30.48 centimeters) from the head of the bed to the wall, 5 feet (1.52 meters) from the foot of the bed to the wall, 5 feet (1.52 meters) on the transfer side, 4 feet (1.22 meters) on the non-transfer side, and 8 feet (2.44 meters) between beds.
- (3) In renovation of existing critical care units, every effort shall be made to meet the above minimum standards. If it is not possible to meet the above area standards, authorities having jurisdiction shall be permitted to grant approval for deviations from this requirement. In such cases, the following standards shall be met:

- (a) Separate rooms or cubicles for single patient use shall have a minimum clear floor area of 150 square feet (13.94 square meters).
- (b) Multiple-bed space shall have a minimum clear floor area of 150 square feet (13.94 square meters) per bed.

2.2-2.6.2.3 Windows

- (1) Each patient bed shall be provided with natural light by means of a window(s) in accordance with Section 2.1-7.2.2.5. See A2.2-2.2.2.3 for further information.
- (2) If a multiple-bed room with patient cubicles is provided, there shall be no more than one intervening patient cubicle between any patient bed and the window(s).
- (3) Windows in renovation projects
 - (a) Use of new clerestory windows equipped with glare and sun control shall be permitted. Operating mechanism controls for window coverings shall be located a maximum of 5 feet (1.52 m) above the floor.
 - (b) Distance from the patient bed to the window shall not exceed 50 feet (15.24 meters).
 - (c) Where partitioned cubicles are used, patients' view to windows shall be through no more than two separate clear vision panels.

2.2-2.6.2.4 Patient privacy

- (1) When private rooms or cubicles are provided, view panels to the corridor with a means to ensure visual privacy shall be required.
- (2) The space shall be sized to allow for a minimum of two seated visitors without interfering with providers' access to the patient and equipment.

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A2.2-2.6.1.3 Transportation of patients to and from the critical care unit should ideally be separated from public corridors and visitor waiting areas.

A2.2-2.6.2 Provision should be made for rapid and easily accessible information exchange and communication within the unit and the hospital.

A2.2-2.6.2.2 In critical care units, the size of the patient care space should be determined by the intended functional use. The patient space in critical care units, especially those caring for surgical patients following major trauma or cardiovascular, transplant, or orthopedic procedures and those caring for medical patients simultaneously requiring ventilation, dialysis, and/or treatment with other large equipment (e.g., intra-aortic balloon pump) may be overwhelmed if designed to the absolute minimum clear floor area.

- (3) Each patient bed area shall have provisions for visual privacy from casual observation by other patients and visitors.

2.2-2.6.2.5 Hand-washing stations. For design requirements, see 2.1-7.2.2.8 and 2.1-8.4.3.2.

- (1) Hand-washing stations shall be convenient to nurse stations and patient bed areas.
- (2) There shall be at least one hand-washing station for every three beds in open plan areas and one in each patient room.
- (3) The hand-washing station shall be located near the entrance to the patient cubicle or room, sized to minimize splashing water onto the floor, and equipped with hands-free operable controls.
- (4) Where towel dispensers are provided, they shall operate so that dispensing requires only the towel to be touched.

2.2-2.6.2.6 Toilet or soiled utility room

- (1) Each critical care patient room shall have direct access to an enclosed toilet room or soiled utility room for disposal of bodily waste. In pediatric units, provisions for disposal of bodily waste shall be provided as required by the functional program.
- (2) The toilet room or soiled utility room shall be equipped with a toilet with bedpan washer or a flushing clinical sink.

***2.2-2.6.2.7 Nurse call system.** A nurse call system shall be provided in accordance with Section 2.1-8.3.7 (Call Systems).

2.2-2.6.3 Reserved

2.2-2.6.4 Special Patient Care Areas

2.2-2.6.4.1 General

2.2-2.6.4.2 Airborne infection isolation (AII) room

- (1) At least one AII room shall be provided, unless provided in another critical care unit. The number of additional AII rooms shall be based on an ICRA.
- (2) Each room shall comply with the requirements of Section 2.1-2.4.2 except that the bathtub or shower is not required.
- (3) Special ventilation requirements for AII rooms are located in Part 6.

2.2-2.6.5 Support Areas for Patient Care—General

For requirements, see 2.1-2.5.

2.2-2.6.6 Support Areas for the Critical Care Unit

The following shall be provided for all types of critical care units unless otherwise noted.

***2.2-2.6.6.1 Administrative center or nurse station**

- (1) An administrative center or nurse station shall be provided in accordance with Section 2.1-2.6.1.
- (2) Visual observation. There shall be direct or remote visual observation between the administrative center, nurse station, or staffed charting stations and all patient beds in the critical care unit. Such observation shall provide a view of the patient while the patient is in bed.

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A2.2-2.6.2.7 A staff emergency assistance system should be provided on the most accessible side of the bed. The system should announce at the nurse station with backup from another staffed area from which assistance can be summoned.

A2.2-2.6.6.1 Patients should be visually observed at all times. This can be achieved in a variety of ways.

- a. If a central station is chosen, it should be located to allow for complete visual control of all patient beds in the critical care unit. It

should be designed to maximize efficiency in traffic patterns. Patients should be oriented so that they can see the nurse but cannot see the other patients. There should be an ability to communicate with the clerical staff without having to enter the central station.

- b. If a central station is not chosen, the unit should be designed to provide visual contact between patient beds so that there can be constant visual contact between the nurse and patient.

2.2 SPECIFIC REQUIREMENTS FOR GENERAL HOSPITALS

***2.2-2.6.6.2 Documentation and information review spaces.** Space shall be provided within the unit to accommodate the recording of patient information.

- (1) The documentation space shall be located within or adjacent to the patient bed space. It shall include countertop that will provide for a large flow sheet typical of critical care units and a computer monitor and keyboard. There shall be one documentation space with seating for each patient bed.
- (2) There shall be a specifically designated area within the unit for information review located to facilitate concentration.

***2.2-2.6.6.3 Nurse or supervisor office.** Adequate office space for critical care medical and nursing management/administrative personnel shall be available immediately adjacent to the critical care unit. The offices shall be linked with the unit by telephone or an intercommunications system.

2.2-2.6.6.4 Multipurpose room. Multipurpose room(s) shall be provided for staff, patients, and patients' families for patient conferences, reports, education, training sessions, and consultation. These rooms shall be accessible to each nursing unit.

2.2-2.6.6.5 Reserved

***2.2-2.6.6.6 Medication station.** Provision shall be made for 24-hour distribution of medications in accordance with Section 2.1-2.6.6.

2.2-2.6.6.7 Nourishment area. This area shall be provided in accordance with Section 2.1-2.6.7. More than one critical care unit shall be permitted to share this area provided direct access is available from each.

2.2-2.6.6.8 Ice making-equipment. Each unit shall have equipment to provide ice for treatment and nourishment. Ice-making equipment shall be provided in accordance with Section 2.1-2.6.8.

2.2-2.6.6.9 Clean workroom or clean supply room

- (1) A clean workroom or clean supply room shall be provided in accordance with Section 2.1-2.6.9.
- (2) The clean workroom or clean supply room shall be readily accessible within each critical care suite. The room shall be permitted to serve more than one critical care unit provided direct access is available from each unit.

2.2-2.6.6.10 Soiled workroom or soiled holding room.

- (1) A soiled workroom or soiled holding room shall be provided in accordance with Section 2.1-2.6.10.

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A2.2-2.6.6.2 The requirements for documenting patient information by providers have become substantial and continue to grow. A growing number of providers and others review patient records in critical care units. Confidentiality of patient information is important. Computers are increasingly used to meet these expectations.

- a. Separate areas need to be designed for the unit secretary and staff charting. Planning should consider the potential volume of staff (both medical and nursing) that could be present at any one time and translate that to adequate charting surfaces.
- b. The secretarial area should be accessible to all. However, the charting areas may be somewhat isolated to facilitate concentration.
- c. Storage for chart forms and supplies should be readily accessible.
- d. Space for computer terminals and printer and conduit for computer hookup should be provided when automated information systems are in use or planned for the future.
- e. Patient records should be readily accessible to clerical, nursing, and physician staff.

A2.2-2.6.6.2 (1) Documentation space. The countertop area should be a minimum of 8 square feet (0.74 square meter). If a documentation space is to serve two patient beds, it should be a minimum of 10 square feet (0.93 square meter).

A2.2-2.6.6.2 (2) Information review space. There should be a minimum of 8 square feet (0.74 square meter) of countertop and seating to accommodate two people for every five patient beds it serves.

A2.2-2.6.6.3 The offices should be large enough to permit consulting with members of the critical care team and visitors.

A2.2-2.6.6.6 To minimize distraction of those preparing medications, the area should be enclosed. A glass wall or walls may be advisable to permit observation of patients and unit activities. A self-contained medicine-dispensing unit may be located at the nurse station, in the clean workroom, in an alcove, or in another area directly under visual control of nursing or pharmacy staff.

- (2) The soiled workroom or soiled holding room shall be readily accessible within each critical care suite. The room shall be permitted to serve more than one critical care unit provided direct access is available from each unit.

2.2-2.6.6.11 Equipment and supply storage

- (1) Clean linen storage
- Clean linen storage shall be provided in accordance with Section 2.1-2.6.11.1.
 - Clean linen storage shall be readily accessible within each critical care suite. The clean linen storage area shall be permitted to serve more than one critical care unit provided direct access is available from each unit.
- *(2) Equipment storage room or alcove
- Appropriate equipment storage room(s) or alcove(s) shall be provided in accordance with Section 2.1-2.6.11.2.
 - Each critical care unit shall have not less than 20 square feet (1.86 square meters) per patient bed for equipment storage.
- (3) Wheelchair and stretcher storage. Space to store stretchers and wheelchairs shall be provided in accordance with Section 2.1-2.6.11.3.
- (4) Emergency equipment storage. Space shall be provided in accordance with Section 2.1-2.6.11.4.

2.2-2.6.6.12 Environmental services room. An environmental services room shall be provided within or immediately adjacent to the critical care unit.

- (1) The environmental services room shall not be shared with other nursing units or departments.

- (2) The environmental services room shall contain a service sink or floor receptor and provisions for storage of supplies and housekeeping equipment.

2.2-2.6.6.13 Reserved

***2.2-2.6.6.14 Special procedures room.** If required by the functional program, a special procedures room shall be provided in accordance with 2.1-3.2.1 (Examination/Treatment Room).

***2.2-2.6.6.15 Patient monitoring equipment.** Each unit shall contain equipment for continuous monitoring, with visual displays for each patient at the bedside and at the nurse station. Monitors shall be located to permit easy viewing and access but shall not interfere with access to the patient.

2.2-2.6.6.16 X-ray viewing facility. The unit shall have an x-ray viewing facility, which shall be permitted to serve more than one critical care unit provided direct access is available from each.

2.2-2.6.7 Support Areas for Staff

The following shall be provided for all types of critical care units.

2.2-2.6.7.1 Staff lounge facilities. Staff lounge facilities shall be provided in accordance with Section 2.1-2.7.1. One lounge shall be permitted to serve adjacent critical care units.

- The lounge shall be located so that staff may be recalled quickly to the patient area in emergencies.
- The lounge shall have telephone or intercom and emergency code alarm connections to the critical care unit it serves.

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A2.2-2.6.6.11 (2) Equipment storage room or alcove

- The location of the equipment storage room or alcove should not interfere with the flow of traffic.
- Work areas and storage of critical care supplies should be readily accessible to nursing and physician staff.
- Shelving, file cabinets, and drawers should be accessible to all requiring use.
- Electrical outlets should be provided in sufficient numbers to permit recharging stored battery-operated equipment.

- Alcoves should be provided for the storage and rapid retrieval of crash carts and portable monitor/defibrillator units.

A2.2-2.6.6.14 A special procedures room may be located outside the critical care unit if readily convenient.

A2.2-2.6.6.15 The unit should provide the ability to continuously monitor the physiological parameters appropriate for the types of patients the unit is expected to care for.

2.2 SPECIFIC REQUIREMENTS FOR GENERAL HOSPITALS

- (3) Furnishings, equipment, and space for seating and the preparation and consumption of snacks and beverages shall be provided.
- (4) The staff lounge shall not be the same space as the multipurpose room required by Section 2.2-2.6.6.4.

2.2-2.6.7.2 Staff toilet room(s). A staff toilet room(s) shall be provided in accordance with Section 2.1-2.7.2; it shall be readily accessible to the lounge.

2.2-2.6.7.3 Staff storage facilities. Facilities for personal use of staff shall be provided in accordance with Section 2.1-2.7.3.

2.2-2.6.7.4 Staff accommodations. Sleeping and personal care accommodations shall be provided for staff on 24-hour, on-call work schedules. Personal care accommodations shall include the following:

- (1) Space for a chair
- (2) Individually secured storage for personal items
- (3) A room with a toilet, a shower, and a hand-washing station. This room shall permit shared use by staff.

2.2-2.6.8 Support Areas for Families and Visitors

The following support area shall be provided. Location of this area outside the critical care unit shall be permitted if it is readily accessible to the unit.

2.2-2.6.8.1 Visitor waiting room

- (1) This room shall be designed to accommodate the long stays and stressful conditions common to such spaces, including provisions for privacy, means to facilitate communications, and toilets that are readily accessible.
- (2) The location and size of visitor waiting space outside the patient room shall be provided as required by the functional program and shall provide a seating capacity of not less than 1.5 persons per patient bed.

2.2-2.6.9 Special Design Elements

2.2-2.6.9.1 Architectural details

- (1) Door openings
 - (a) For a private patient room or a room with

multiple patient bed spaces, at least one door opening shall have a minimum clear width of at least 3 feet 8 inches (1.12 meters) and shall be arranged to minimize interference with movement of beds and large equipment.

- (b) Where sliding doors are used for access to a patient room within a suite, a 3-foot-wide (91.44 centimeters) swinging door shall also be permitted for personnel use.
- (c) Sliding doors shall not have floor tracks and shall have hardware or a breakaway feature that minimizes jamming possibilities.

2.2-2.7 Coronary Critical Care Unit

Coronary patients have special needs. They are often fully aware of their surroundings but still need immediate and critical emergency care.

2.2-2.7.1 General

The coronary critical care unit shall meet the general requirements for critical care units in 2.2-2.6.

2.2-2.7.2 Coronary Critical Care Patient Room

2.2-2.7.2.1 Capacity. Each coronary patient shall have a single-bed room for acoustical and visual privacy.

2.2-2.8 Combined Medical/Surgical Critical Care and Coronary Critical Care Unit

If medical/surgical and coronary critical care services are combined in one critical care unit, at least 50 percent of the beds shall be located in private rooms or cubicles.

2.2-2.9 Pediatric Critical Care Unit

Critically ill pediatric patients have unique physical and psychological needs.

2.2-2.9.1 General

2.2-2.9.1.1 If a facility has a specific pediatric critical care unit, the functional program shall include consideration for staffing, isolation, transportation, life support, and environmental systems.

2.2-2.9.1.2 The requirements set forth for a general critical care unit in Section 2.2-2.6 shall apply to a pediatric critical care unit. In addition, a pediatric unit shall meet the requirements in this section.

2.2-2.9.2 Pediatric Patient Rooms and Care Areas

2.2-2.9.2.1 General. For requirements, see 2.2-2.6.2 and the information in this section.

2.2-2.9.2.2 Additional space requirements

(1) Space shall be provided at each bedside for families and visitors in addition to the space provided for staff. The space provided for parental accommodations as defined by the functional program shall not limit or encroach upon the minimum clearance requirements for staff and medical equipment around the patient's bed station.

*(2) Sleeping space shall be provided for parents who may be required to spend long hours with the patient. If the sleeping area is separate from the patient area, it shall be in communication with the critical care unit.

2.2-2.9.3 Reserved**2.2-2.9.4 Special Patient Care Rooms**

For requirements, see 2.2-2.6.4.

2.2-2.9.5 Support Areas for Patient Care—General

2.2-2.9.5.1 For general requirements, see 2.1-2.5.

2.2-2.9.5.2 In addition to the requirements in 2.2-2.6.6, 2.2-2.6.7, and 2.2-2.6.8, the requirements in 2.2-2.9.6 shall apply to the pediatric critical care unit.

2.2-2.9.6 Support Areas for the Pediatric Critical Care Unit

2.2-2.9.6.1 Consultation/demonstration room. This room shall be provided within, or convenient to, the pediatric critical care unit for private discussions.

***2.2-2.9.6.2 Equipment and supply storage.** The following shall be provided in addition to the space for equipment storage in 2.2-2.6.6.11 (2):

- *(1) Provisions for formula storage
- (2) Separate storage cabinets or closets for toys and games

***2.2-2.9.6.3 Examination and treatment room(s).** Examination/treatment rooms shall be provided as required by the functional program.

2.2-2.10 Newborn Intensive Care Unit**2.2-2.10.1 General**

2.2-2.10.1.1 Application. In addition to the requirements in this section, the requirements in 2.2-2.6.1 (General) for critical care units shall apply to the newborn intensive care unit (NICU):

2.2-2.10.1.2 Location

- *(1) All entries to the NICU shall be controlled. The family entrance and reception area shall be clearly identified. The reception area shall permit visual observation and contact with all traffic entering the unit.
- (2) The NICU shall be designed as part of an overall safety program to protect the physical security of infants, parents, and staff and to minimize the risk of infant abduction.

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A2.2-2.9.2.2 (2) Parent sleeping accommodations should be provided at the patient's bedside.

A2.2-2.9.6.2 Space allowances for pediatric beds and cribs are greater than those for adult beds because of the variation in bed/crib sizes and the potential for change. The functional program may determine that general storage be provided in the pediatric critical care unit above the minimum required in 2.2-2.6.6.11 (2).

A2.2-2.9.6.2 (1) Formula storage may be outside the unit but

should be available for use at all times. The functional program should determine the location and size of formula storage.

A2.2-2.9.6.3 The number and location of examination/treatment rooms should be based on the functional program.

A2.2-2.10.1.2 (1) There should be efficient access to the unit from the labor and delivery area and emergency department or other referral entry points.

2.2-2.10.2 NICU Nursery Rooms and Areas

2.2-2.10.2.1 Reserved

2.2-2.10.2.2 Space requirements

(1) Area

- (a) Multiple-bed rooms, including ones with cubicles or fixed cubicle partitions, each patient care space shall contain a minimum clear floor area of 120 square feet (11.15 square meters) per infant care bed excluding sinks and aisles.
- (b) Rooms intended for the use of a single infant shall contain a minimum clear floor area of 150 square feet (13.94 square meters) excluding sinks and aisles.

(2) Aisles

- (a) In multiple-bed rooms, there shall be an aisle adjacent to each infant care space with a minimum width of 4 feet (1.22 meters).
- (b) When single-patient rooms or fixed cubicle partitions are used in the design, there shall be an adjacent aisle with a minimum clear width of 8 feet (2.44 meters) to permit the passage of equipment and personnel.

- (3) In multiple-bed rooms, there shall be a minimum clear dimension of 8 feet (2.44 meters) between infant care beds.

2.2-2.10.2.3 Window(s). At least one source of daylight shall be visible from infant care areas.

- (1) External windows in infant care rooms shall be glazed with insulating glass to minimize heat gain or loss.
- (2) External windows in infant care rooms shall be situated at least 2 feet (60.96 centimeters) away from any part of an infant's bed to minimize radiant heat loss from the infant.
- (3) All external windows shall be equipped with easily cleaned shading devices that are neutral color or opaque to minimize color distortion from transmitted light.

2.2-2.10.2.4 Patient privacy

- (1) When viewing windows are provided, provision shall be made to control casual viewing of infants.

- (2) Each patient care space shall be designed to allow privacy for the infant and family.
- (3) Each bed shall have provisions for visual privacy.

2.2-2.10.2.5 Hand-washing stations. For design requirements, see 2.1-7.2.2.8 and 2.1-8.4.3.2.

- (1) In a multiple-bed room, every bed position shall be within 20 feet (6.10 meters) of a hands-free hand-washing station.
- (2) Where an individual room concept is used, a hands-free hand-washing station shall be provided within each infant care room.

2.2-2.10.3 Reserved

2.2-2.10.4 Special Patient Care Rooms

2.2-2.10.4.1 Reserved

2.2-2.10.4.2 Airborne infection isolation (AII) room. An AII room shall be required.

- (1) The room shall be enclosed with provisions for observation of the infant from adjacent area(s) of the NICU.
- (2) All AII rooms in the NICU shall comply with the requirements of 2.1-2.4.2 except the requirements for separate toilet, bathtub, or shower.

2.2-2.10.5 Support Areas for Patient Care—General

For requirements, see 2.1-2.5.

2.2-2.10.6 Support Areas for the NICU

2.2-2.10.6.1 Administrative center or nurse station. A central area shall serve as a control station.

- (1) This area shall have space for counters and storage.
- (2) This area shall have convenient access to hand-washing stations.
- (3) It shall be permitted to be combined with or to include centers for reception and communication and patient monitoring.

2.2-2.10.6.2 Documentation area. Charting facilities shall have adequate linear surface space to ensure that staff and physicians may chart and have simultaneous access to information and communication systems.

2.2-2.10.6.3 Nurse/supervisor office or station. A nurse/supervisor office or station shall be provided. For requirements, see 2.1-2.6.3.

2.2-2.10.6.4 Multipurpose room(s) for staff, patients, and patients' families for patient conferences, reports, education, training sessions, and consultation.

- (1) Multipurpose rooms shall be accessible to each nursing unit. They shall be permitted to be on other floors if convenient for regular use.
- (2) One such multipurpose room shall be permitted to serve several nursing units and/or departments.

2.2-2.10.6.5 Reserved

2.2-2.10.6.6 Medication station. A medication station shall be provided in accordance with Section 2.1-2.6.6 (Medication Dispensing Location).

2.2-2.10.6.7 Reserved

2.2-2.10.6.8 Reserved

***2.2-2.10.6.9 Clean workroom or clean supply room.**

A clean workroom or clean supply room shall be provided in accordance with Section 2.1-2.6.9.

***2.2-2.10.6.10 Soiled workroom or soiled holding room.**

A soiled workroom or soiled holding room shall be provided in accordance with Section 2.1-2.6.10.

2.2-2.10.6.11 Emergency equipment storage. Space for storage of emergency equipment shall be provided in accordance with Section 2.1-2.6.11.4.

2.2-2.10.6.12 Environmental services room. An environmental services room shall be provided for the unit.

- (1) This room shall be directly accessible from the unit and dedicated for the exclusive use of the NICU.

- (2) This room shall contain a service sink or floor receptor and provisions for storage of supplies and housekeeping equipment.

2.2-2.10.6.13 Diagnostic, treatment, and service areas. Support space shall be accessible for the following when these activities are routinely performed on the unit:

- (1) Respiratory therapy
- (2) Blood gas lab
- (3) Developmental therapy
- (4) Social work
- (5) Laboratory services
- (6) Pharmacy services
- (7) Radiology services
- (8) Other ancillary services

2.2-2.10.6.14 Lactation support space. Space shall be provided for lactation support and consultation in or immediately adjacent to the NICU. Provision shall be made, either within the room or conveniently located nearby, for hand-washing station, counter, refrigeration and freezing, storage for pump and attachments, and educational materials.

2.2-2.10.6.15 Infant formula facilities

- (1) Location
 - (a) Where infant formula is prepared on site, direct access from the formula preparation room to any infant care room is prohibited.
 - (b) The formula preparation room shall be permitted to be located near the NICU or at other appropriate locations in the hospital.
- (2) The formula preparation room shall include the following:
 - (a) A separate cleanup area for washing and sanitizing. This area shall include a hand-washing

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A2.2-2.10.6.9 Whenever possible, supplies should flow through special supply entrances from external corridors so that penetration of the semi-sterile zone by non-nursery personnel is unnecessary.

A2.2-2.10.6.10 Soiled materials should be sealed and stored in a soiled holding area until removed. This holding area should be located where there will be no need to pass back through the semi-sterile zone to remove the soiled materials.

station, facilities for bottle washing, and a work counter.

- (b) A separate room for preparing infant formula. This room shall contain a refrigerator, work counter, formula sterilizer, storage facilities, and a hand-washing station.
- (3) Refrigerated storage and warming facilities for infant formula shall be accessible for use by NICU personnel at all times.
- (4) Where a commercial infant formula is used, omission of the separate cleanup and preparation rooms shall be permitted, and storage and handling in the NICU workroom or another appropriate room that is conveniently accessible at all hours shall be permitted. The preparation area shall have the following:
 - (a) A work counter
 - (b) A hand-washing station
 - (c) Storage facilities

2.2-2.10.7 Support Areas for Staff

2.2-2.10.7.1 Staff lounge, storage facilities, and toilet. A lounge, locker room, and staff toilet shall be provided within or adjacent to the unit for staff use.

2.2-2.10.7.2 Staff accommodations. Physician sleeping facilities with access to a toilet and shower shall be provided. If not contained within the unit itself, the area shall have a telephone or intercom connection to the NICU.

2.2-2.10.8 Support Areas for Families, Patients, and Visitors

2.2-2.10.8.1 Visitor waiting room. A visitor waiting room shall be provided in accordance with Section 2.2-2.6.8.1 and shall be located in or immediately adjacent to the NICU.

2.2-2.10.8.2 Parent/infant room(s). A room(s) shall be provided within the NICU that allow(s) parents and infants extended private time together.

- (1) The room(s) shall have direct, private access to sink and toilet facilities, communication linkage with the NICU staff, electrical and medical gas outlets as specified for other NICU beds, sleeping facilities for at least one parent, and sufficient space for the infant's bed and equipment.
- (2) Use of the room(s) for other purposes shall be permitted when it is not required for family use.

2.2-2.10.9 Special Design Elements

2.2-2.10.9.1 Architectural details

- (1) Door openings. Each patient room in the unit shall be provided with a door opening that has a minimum clear width of 3 feet 8 inches (1.12 meters) and minimum height of 7 feet (2.10 meters).

* (2) Ceilings

- (a) Ceilings shall be easily cleanable and nonfriable.

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A2.2-2.10.9.1 (2) Ceilings in NICUs

a. Since sound abatement is a high priority in the NICU, use of acoustical ceiling systems is desirable. Acoustical ceiling systems must be selected and designed carefully to meet this standard. In most NICUs, the ceiling offers the largest available area for sound absorption. The standard for ceiling finishes includes areas that communicate with infant rooms and adult sleep areas (e.g., hallways, corridors, storage, and staff work areas) when doors are opened in the course of daily activity.

Ceilings with high acoustical absorption (i.e., high NRC ratings) do not have a significant barrier effect (in other words, they do not offer protection from sounds transmitted between adjacent areas). A CAC-29 rating provides a moderate barrier effect and allows use of a broad range of ceiling products. Poor barrier effects can result

if room-dividing partitions are discontinued above the ceiling, allowing room-to-room cross talk, or if there are noise-producing elements in the ceiling plenum. If the ceiling plenum contains noise sources such as fan-powered boxes, in-line exhaust fans, variable air volume devices, etc., then a CAC rating higher than CAC-29 may be necessary.

- b. VOCs and PBTs such as cadmium are often found in paints and ceiling tiles and should be avoided. Specify low- or no-VOC paints and coatings.
- c. High-performance mineral fiber ceiling tiles achieving NRC 0.70 or greater have high sound absorption properties in speech frequencies (500 Hz to 1000 Hz). It is very difficult to achieve NRC 0.95 and CAC 29 in the same ceiling tile, and only a small number of foil-backed glass fiber tiles meet this requirement. The requirement of NRC 0.95 and

- (b) Ceiling construction shall limit passage of particles from above the ceiling plane into the clinical environment.
- (c) Ceilings shall have a noise reduction coefficient (NRC) of 0.95 for 80 percent of the entire surface area or an average NRC of 0.85 for the entire ceiling, including reflective and acoustically absorptive surfaces.
- (d) Ceilings in infant rooms and adult sleep areas shall have a ceiling attenuation class (CAC) of 29 or higher.

*⁽³⁾ Walls. For wall sound isolation requirements, see 1.2-6.1.5 (Design Criteria for Performance of interior Wall and Floor/Ceiling Constructions).

*⁽⁴⁾ Doors. For door sound isolation requirements, see 1.2-6.1.5 (Design Criteria for Performance of interior Wall and Floor/Ceiling Constructions).

2.2-2.10.9.2 Lighting

- (1) Provisions shall be made for indirect lighting and high-intensity lighting in the NICU.

- (2) Electric light sources shall have a color rendering index of no less than 80, a full-spectrum color index of no less than 55, and a gamut area of no less than 65 and no greater than 100.
- (3) Controls shall be provided to enable lighting to be adjusted over individual patient care spaces.
- (4) Darkening sufficient for transillumination shall be available when necessary.
- (5) No direct ambient lighting shall be permitted in the infant care space, and any direct ambient lighting used outside the infant care area shall be located or framed to avoid a direct line of sight from any infant to the fixture. This does not exclude the use of direct procedure lighting.
- (6) Lighting fixtures shall be easy to clean.

***2.2-2.10.9.3 Noise control.** Infant rooms (including airborne infection isolation rooms), staff work areas, family areas, and staff lounge and sleeping areas—and the spaces opening onto them—shall be

APPENDIX (continued)

CAC 29 can be achieved by composite panels that consist of glass fiber facing the occupied space with a mineral fiber backing, but these are not commodity tiles and are more expensive than regular tiles.

A2.2-2.10.9.1 (3) Acoustically absorptive surfaces reduce reverberation and thus reduce sound levels at a distance from the sound source. When possible, two perpendicular walls should be covered with sound absorptive surface materials with an NRC of at least 0.65. Where this is not possible, the upper portions of all four walls (above areas likely to be damaged by the movement of equipment) should be covered with such material. Glass should be limited to the area actually required for sight in order to leave wall surface available for absorptive surface treatment.

A2.2-2.10.9.1 (4) Although a variety of flooring materials can limit impact noise somewhat, specialized carpeting offers the most protection. Carpeting used in infant areas must have impermeable backing, be monolithic or have chemically or heat-welded seams, and be tolerant of heavy cleaning (including the use of bleach).

A2.2-2.10.9.3 Noise control in the NICU

- a. Fire alarms in the infant area should be restricted to flashing lights without an audible signal. The audible alarm level in other occupied areas must be adjustable.
- b. Telephones audible from the infant area should have adjustable announcing signals.
- c. Water supply and faucets selected for infant areas should be types

that minimize noise and provide instant warm water to minimize time “on.”

- d. Loudspeakers located in sensitive areas should be outfitted with adjustable volume controls.
- e. Noise-generating activities (linen and supply carts, conference areas, clerk’s areas, multiple-person work stations, and travel paths not essential to infant care), permanent equipment, and office equipment should be acoustically isolated from the infant area. Vibration isolation pads are recommended under leveling feet of permanent equipment and appliances in noise-sensitive areas and areas in open or frequent communication with them.
- f. With space at a premium, many incompatible adjacencies are possible in NICU designs (e.g., break area, meeting room, or mechanical room sharing a wall with an infant or adult sleep room). Specialized wall and floor/ceiling treatments will help to meet noise criteria in these non-optimal conditions.
- g. The criteria given in Table A2.1-a (Sound Transmission Loss or Attenuation Through Horizontal and Vertical Barriers in NICUs) are for sound transmission loss (TL) or attenuation through horizontal barriers (e.g., walls, doors, windows) and vertical barriers (e.g., between floors). The Sound Transmission Class (STC) rating spans speech frequencies and is relevant for separation of spaces with conversational and other occupant-generated noise. The recommended criteria for TL given here apply to barriers between adjacent spaces and infant areas or adult rest or sleep rooms.

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designed to produce minimal background noise and to contain and absorb much of the transient noise that arises within them. Also see Section 1.2-6.1 (Acoustic Design).

- * (1) The combination of continuous background sound and operational sound in infant bed rooms and adult sleep areas shall not exceed an hourly L_{eq} of 45 dBA and an hourly L_{10} of 50 dBA. The L_{max} (transient sounds) shall not exceed 65 dBA in these rooms/areas.

- (2) The combination of continuous background sound and operational sound in staff work areas, family areas, and staff lounge areas shall not exceed an hourly L_{eq} of 50 dBA and an hourly L_{10} of 55 dBA. Transient sounds as determined using the L_{max} shall not exceed 70 dBA in these areas.

2.2-2.11 Obstetrical Unit

*2.2-2.11.1 General

APPENDIX (continued)

h. Sound transmission from the exterior of the building should meet the NC criteria inside all spaces identified in the *Recommended Standards for Newborn ICU Design*.

i. To achieve the required noise levels in NICU areas, building mechanical systems and permanent equipment should conform to a maximum of NC-25 in infant and adult sleep areas and a maximum of NC-30 in staff work areas, family areas, and staff lounge areas.

Building mechanical systems include heating, ventilation, and air conditioning systems (HVAC) and other mechanical systems (e.g., plumbing, electrical, vacuum tube systems, and door mechanisms). Permanent equipment includes refrigerators, freezers, ice machines, storage/supply units, and other large non-medical equipment that is rarely replaced.

j. Acoustic seals should be provided for doors and exterior openings (e.g., windows, skylights) to meet STC criteria for demising assemblies separating infant rooms, on-call and sleep rooms, family transition rooms, and conference rooms or offices in which sensitive staff and patient-related information is discussed.

The acoustic environment is a function of both the physical environment (e.g., building mechanical systems and permanent equipment, the intrusion of exterior sounds, the sound containment afforded by doors and walls, and the sound absorption afforded by surface finishes) and operations (e.g., the activities of people and function of medical equipment and furnishings).

The acoustic conditions of the NICU should favor speech intelligibility; normal or relaxed vocal effort; speech privacy for staff and parents; and physiologic stability, uninterrupted sleep, and freedom from acoustic distraction for infants and adults. Such favorable conditions encompass more than the absence of noise and require specific planning to be achieved. Speech intelligibility ratings in infant areas, parent areas, and staff work areas should be “good” to “excellent” as defined by the International Organization for Standardization in ISO 9921: *Ergonomics—Assessment of speech communication*. Speech intelligibility for non-native but fluent speakers and listeners of a second language requires a 4 to 5 dBA improvement in signal-to-noise ratio for similar intelligibility with native speakers. The L_{eq} , L_{10} and L_{max} limits will safeguard this intelligibility and also protect infant sleep.

k. Sound level descriptors should be measured using slow sound level meter response.

l. It is advisable to enlist the services of an acoustical engineer from the onset of a project through post-construction validation. This specialty service, usually not covered by architectural fees, can assist in program and design development, design of mechanical systems, specification of equipment and building construction, and test and balance validation. Enlistment of acoustical services late in the design process often results in fewer and more costly options for meeting performance standards.

A2.2-2.10.9.3 (1) The permissible noise criteria of an hourly L_{eq} of 45 dBA in infant rooms and adult sleep areas is more likely to be met in a fully operational NICU if building mechanical systems and permanent equipment in those areas and areas in open communication with them are rated to conform to NC-25 or less (see *Recommended Standards for Newborn ICU Design*). NC-25 translates to approximately 35 dBA of facility noise. A realistic addition of 10 dBA of operational noise above this background will result in a L_{eq} of about 45 dBA. Limiting operational noise to only 10 dBA above the background will require conscientious human effort.

Post-construction validation of specifications for the building mechanical systems and permanent equipment should include noise and vibration measurement, reporting, and remediation. Measurement of NC levels should be made at the location of the infant or adult bed or at the anticipated level of the adult head in other areas. Each bed space must conform to the *Recommended Standard for Newborn ICU Design*.

A2.2-2.11.1 Obstetrical program models vary widely in their delivery methodologies. The models are essentially of three types. The following narrative describes the organizational framework of each model.

a. Traditional Model

Guidelines for new construction of traditional delivery rooms have been eliminated from this document. Traditional delivery rooms are not designed to meet cesarean delivery room standards and are not designed as LDRs or LDRPs. Under the traditional model, labor, delivery, recovery, and postpartum occur in separate areas. The birthing woman is treated as the moving part. She is moved through these functional areas depending on the status of the birth process. This model has become obsolete for new construction.

2.2-2.11.1.1 Location

- (1) The obstetrical unit shall be located and designed to prohibit nonrelated traffic through the unit.
- (2) LDR rooms may be located in a separate LDR suite, as part of the cesarean delivery suite, and in the postpartum unit.
- (3) When cesarean delivery rooms are located within the obstetrical suite, access and service arrangements shall be such that neither staff nor patients must travel through the cesarean delivery area to access other services.

2.2-2.11.1.2 Newborn Nursery

A newborn nursery shall be provided in the obstetrical unit. For requirements, see 2.2-2.12.3.1.

2.2-2.11.1.3 Renovation

Except as permitted otherwise herein, existing facilities being renovated shall, as far as practicable, provide all the required support services.

***2.1-2.11.2 Antepartum and Postpartum Unit**

2.2-2.11.2.1 Antepartum room. For requirements, see 2.2-2.2.2 (Patient Room).

2.2-2.11.2.2 Postpartum room. For requirements, see 2.2-2.2.2 with the exception of 2.2-2.2.2 (1) (Area, for a typical patient room).

- (1) Space requirements. In new construction, patient rooms in the postpartum unit shall be constructed to meet the needs of the functional program and shall have a minimum clear floor area of 150 square feet (13.94 square meters).

2.2-2.11.3 LDR and LDRP Rooms

When required by the functional program, delivery procedures in accordance with birthing concepts may be performed in the labor-delivery-recovery (LDR) or labor-delivery-recovery-postpartum (LDRP) rooms.

2.2-2.11.3.1 Capacity. Each LDR or LDRP room shall be for single occupancy.

2.2-2.11.3.2 Space requirements

- *(1) LDR and LDRP rooms shall have a minimum clear floor area of 340 square feet (31.57 square meters) with a minimum clear dimension of 13 feet (3.96 meters). This includes an infant stabilization and resuscitation space with a minimum clear floor area of at least 40 square feet (3.7 square meters).

- (a) The infant stabilization and resuscitation space shall be an area within the room that is distinct from the mother's area.
- (b) Where required by the functional program, there shall be enough space for a crib and reclining chair for a support person.

- (2) When renovation work is undertaken, every effort shall be made to meet the above minimum

APPENDIX (continued)**b. Labor-Delivery-Recovery Model**

All labor-delivery-recovery rooms (LDRs) are designed to accommodate the birthing process from labor through delivery and recovery of mother and baby. They are equipped to handle most complications, with the exception of cesarean sections.

The birthing woman moves only to a postpartum room or to a cesarean delivery room (surgical operative room) if delivery complications occur.

After the mother and baby are recovered in the LDR, they are transferred to a mother-baby care unit for postpartum stay.

c. Labor-Delivery-Recovery-Postpartum Model

Single-room maternity care in labor-delivery-recovery-postpartum rooms (LDRPs) adds a "P" to the LDR model. Room design and capability to handle most emergencies remain the same as the LDRs.

However, the LDRP model eliminates a move to postpartum after delivery. LDRP uses one private room for labor, delivery, recovery, and postpartum stay.

Equipment is moved into the room as needed, rather than moving the patient to the equipped room. Certain deliveries are handled in a cesarean delivery room (surgical operative room) should delivery complications occur.

A2.2-2.11.2 Separation of postpartum and antepartum beds is recommended; however, in some obstetrical services there is a need to use these beds flexibly and to combine them in one unit.

A2.2-2.11.3.2 (1) A minimum dimension of 15 feet (4.57 meters) is preferable to accommodate the equipment and staff needed for complex deliveries.

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standards. If it is not possible to meet the above square-footage standards, existing LDR or LDRP rooms shall be permitted to have a minimum clear floor area of 200 square feet (18.58 square meters).

2.2-2.11.3.3 Reserved

2.2-2.11.3.4 Patient privacy. Windows or doors within a normal sightline that would permit observation into the room shall be arranged or draped as necessary for patient privacy.

2.2-2.11.3.5 Reserved

2.2-2.11.3.6 Hand-washing station. Each room shall be equipped with hand-washing stations. (Hand-washing stations with hands-free operation are acceptable for scrubbing.)

2.2-2.11.3.7 Patient bathroom. Each LDR or LDRP room shall have direct access to a private toilet room with shower or tub.

2.2-2.11.3.8 Patient bathing facilities

- (1) Where bathing facilities are not provided in patient rooms, there shall be at least one shower and/or bathtub for each six beds or fewer and for each fraction thereof.
- (2) A toilet and hand-washing station shall be provided within or directly accessible to each bathing facility.

2.2-2.11.3.9 Special design elements

- (1) Finishes shall be selected to facilitate cleaning and to resist strong detergents.
- (2) Portable examination lights shall be permitted, but must be immediately accessible.
- (3) Medical gas and vacuum systems
 - (a) See Table 2.1-6 for station outlet requirements.
 - (b) These outlets shall be located in the room so they are accessible to the mother's delivery area and infant resuscitation area.

2.2-2.11.4 Special Patient Care Rooms

2.2-2.11.4.1 Reserved

2.2-2.11.4.2 Airborne infection isolation room. An airborne infection isolation room is not required for the obstetrical unit. Provisions for the care of the perinatal patient with an airborne infection shall be determined by an ICRA.

2.2-2.11.5 Support Areas for Patient Care— General

For requirements, see 2.1-2.5.

2.2-2.11.6 Support Areas for the Obstetrical Unit

The following support areas shall be provided for this unit.

2.2-2.11.6.1 Nurse station

2.2-2.11.6.2 Documentation area

2.2-2.11.6.3 Nurse office

2.2-2.11.6.4 Reserved

2.2-2.11.6.5 Reserved

2.2-2.11.6.6 Medication dispensing location

- (1) Provision shall be made for storage and distribution of drugs and routine medications. This may be done from a medicine preparation room or unit, from a self-contained medicine-dispensing unit, or by another system.
- (2) Medicine preparation room or unit
 - (a) If used, a medicine preparation room or unit shall be under visual control of nursing staff.
 - (b) This room or unit shall contain a work counter, sink, refrigerator, and double-locked storage for controlled substances.
 - (c) Convenient access to hand-washing stations shall be provided. (Standard cup-sinks provided in many self-contained units are not adequate for hand-washing.)

2.2-2.11.6.7 Nourishment area. A nourishment area shall be provided in accordance with Section 2.1-2.6.7.

2.2-2.11.6.8 Reserved

2.2-2.11.6.9 Clean workroom or clean supply room

- (1) A clean workroom or clean supply room shall be provided in accordance with Section 2.1-2.6.9.
- (2) A clean workroom is required if clean materials are assembled within the obstetrical suite prior to use.

2.2-2.11.6.10 Soiled workroom or soiled holding

room. A soiled workroom or soiled holding room shall be provided for the exclusive use of the obstetrical unit in accordance with Section 2.1-2.6.10.

2.2-2.11.6.11 Equipment and supply storage

- (1) Clean linen storage. This shall be provided in accordance with Section 2.1-2.6.11.1.
- (2) Equipment storage room. Each unit shall provide sufficient storage area(s) on the patient floor to keep its required corridor width free of equipment and supplies.
 - (a) This storage area shall be not less than 10 square feet (0.93 square meter) per postpartum room and 20 square feet (1.86 square meters) per each labor-delivery-recovery (LDR) or labor-delivery-recovery-postpartum (LDRP) room.
 - (b) This storage area shall be in addition to any storage in patient rooms.
- (3) Storage space for stretchers and wheelchairs. Storage space shall be provided in accordance with Section 2.1-2.6.11.3.
- (4) Emergency equipment storage. Storage shall be close to the nurse station.

2.2-2.11.6.12 Environmental services room. An environmental services room shall be provided for the exclusive use of the obstetrical suite in accordance with Section 2.1-2.6.12.

2.2-2.11.6.13 Examination/treatment room and/or multipurpose diagnostic testing room

- (1) Location. When this room is used for obstetric triage, it shall be accessible to or located within the units where births occur (LDR, LDRP, and cesarean delivery rooms) and not in the postpartum unit.

- (2) Space requirements

- (a) This room shall have a minimum clear floor area of 120 square feet (11.15 square meters).
- (b) When used only as a multi-patient diagnostic testing room, a minimum clear floor area of 80 square feet (7.43 square meters) per patient shall be provided.

- (3) An adjoining toilet room shall be provided for patient use.

2.2-2.11.7 Support Areas for Staff

The following support areas shall be provided for this unit.

2.2-2.11.7.1 Staff lounge

2.2-2.11.7.2 Staff storage facilities. Lockable closets or cabinets for personal articles of staff shall be provided.

2.2-2.11.7.3 Staff toilet room**2.2-2.11.8 Support Areas for Families, Patients, and Visitors**

2.2-2.11.8.1 Patient lounge. The patient lounge may be omitted if all rooms are single-bed rooms.

2.2-2.11.9 Cesarean Delivery Room(s)**2.2-2.11.9.1 General**

- (1) Number. A minimum of one cesarean delivery room shall be provided for every obstetrical unit unless direct access for cesarean delivery procedures is provided in surgical operating rooms as defined by the functional program for small facilities.
- (2) Infant resuscitation space shall be provided within the cesarean delivery room.

2.2-2.11.9.2 Space requirements

- (1) A cesarean delivery room shall have a minimum clear floor area of 440 square feet (40.85 square meters) with a minimum clear dimension of 16 feet (4.88 meters). This includes an infant resuscitation space with a minimum clear floor area of 80 square feet (7.4 square meters).

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- (*) (2) Infant resuscitation space provided in a separate but immediately accessible room shall have a minimum clear floor area of 150 square feet (13.94 square meters).

2.2-2.11.9.3 Receptacles. Six single or three duplex receptacles shall be provided for the infant in addition to the facilities required for the mother.

2.2-2.11.10 Support Areas for the Cesarean Delivery Suite

2.2-2.11.10.1 General. Individual rooms shall be provided as indicated in the following requirements; otherwise, alcoves or other open spaces that do not interfere with traffic may be used.

2.2-2.11.10.2 Support areas solely for the cesarean delivery suite. The following areas only serve cesarean delivery rooms and areas.

- (1) A control/nurse station. This shall be located to restrict unauthorized traffic into the suite.
- (2) Soiled workroom or soiled holding room. This room shall be provided in accordance with 2.1-2.6.10.
- (3) Fluid waste disposal

2.2-2.11.10.3 Support areas permitted to be shared.

The following support areas shall be permitted to be shared with the surgical facilities in accordance with the functional program. Where shared, areas shall be arranged to avoid direct traffic between the delivery and operating rooms.

- (1) A supervisor's office or station
- (2) Scrub facilities for cesarean delivery rooms
 - (a) Two scrub positions shall be provided adjacent to the entrance to each cesarean delivery room.
 - (b) Scrub facilities shall be arranged to minimize any splatter on nearby personnel or supply carts.

- (c) In new construction, view windows shall be provided at scrub stations to permit observation of room interiors.

(3) Medication station

- (a) A drug distribution station with hand-washing stations and provisions for controlled storage, preparation, and distribution of medication shall be provided.
- (b) A self-contained medication dispensing unit in accordance with Section 2.1-2.6.6.2 may be utilized instead.

(4) Clean workroom or clean supply room

- (a) Clean workroom
 - (i) A clean workroom shall be provided if clean materials are assembled within the obstetrical suite prior to use.
 - (ii) The clean workroom shall contain a work counter, hand-washing station, and space for storage of supplies.
- (b) Clean supply room. Provision of a clean supply room shall be permitted when the functional program defines a system for the storage and distribution of clean and sterile supplies. See (5)(a) just below for sterile storage.

(5) Equipment and supply storage. Storage room(s) shall be provided for equipment and supplies used in the obstetrical suite. Equipment and supply storage rooms shall include the following:

- (a) A clean sterile storage area readily available to the delivery room. The size shall be based on level of usage, functions provided, and supplies from the hospital central distribution area.
- (b) Medical gas storage facilities. For requirements, see 2.2-3.3.6.11 (3).
- (c) An area for storing stretchers out of the path of normal traffic

(6) Environmental services room. A room with a floor receptacle or service sink and storage space for housekeeping supplies and equipment shall be provided.

(7) Anesthesia workroom. An anesthesia workroom for cleaning, testing, and storing anesthesia equipment shall be provided. It shall contain the following:

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A2.2-2.11.9.2 (2) Infant resuscitation space in a separate room is not required; inclusion of such separate space should be as determined by the functional program.

- (a) Work counter
- (b) Sink
- (c) Provisions for separation of clean and soiled items

*** (8) Sterilization facilities**

- (a) Sterilization facilities with high-speed sterilizers shall be located convenient to all cesarean/delivery rooms.
- (b) Sterilization facilities shall be separate from the delivery area and adjacent to clean assembly.

2.2-2.11.11 Support Areas for Staff

The following support areas shall be permitted to be shared with the surgical facilities in accordance with the functional program. Where shared, areas shall be arranged to avoid direct traffic between the delivery and operating rooms.

2.2-2.11.11.1 Lounge and toilet facilities. Lounge and toilet facilities for obstetrical staff convenient to delivery, labor, and recovery areas. The toilet room shall contain hand-washing stations.

2.2-2.11.11.2 Staff change areas

- (1) The clothing change area(s) shall be laid out to encourage one-way traffic and eliminate cross-traffic between clean and contaminated personnel.
- (2) The area(s) shall contain lockers, showers, toilets, hand-washing stations, and space for donning and disposing scrub suits and booties.

2.2-2.11.11.3 Support person change areas. Change areas, designed as described above, shall be provided for male and female support persons.

2.2-2.11.11.4 Staff accommodations. An on-call room(s) shall be provided for physician and/or staff. It may be located elsewhere in the facility.

2.2-2.11.12 Support Areas for Families, Patients, and Visitors

The following support areas shall be permitted to be shared with the surgical facilities in accordance with the functional program.

2.2-2.11.12.1 Waiting room. A waiting room, with the following, shall be conveniently located.

- (1) Toilets. The toilet room shall contain hand-washing stations.
- (2) Telephones
- (3) Provisions for drinking water

2.2-2.11.13 Recovery Space

***2.2-2.11.13.1 Number.** A minimum of two recovery spaces shall be provided.

2.2-2.11.13.2 Area. A minimum clear floor area of 80 square feet (7.43 square meters) shall be provided for each bed, with space for additional equipment described in the functional program.

2.2-2.11.13.3 Where labor-delivery-recovery (LDR) or labor-delivery-recovery-postpartum (LDRP) rooms are located within or directly accessible to the cesarean delivery suite, they shall be permitted to serve as the required recovery spaces.

2.2-2.11.14 Support Areas for Recovery Rooms

2.2-2.11.14.1 Nurse station and documentation area. The recovery room shall have a nurse station with documentation area located to permit visual control of all beds.

2.2-2.11.14.2 Hand-washing station. Each room shall include a hand-washing station.

2.2-2.11.14.3 Medication dispensing facilities. Each room shall include facilities for dispensing medicine.

2.2-2.11.14.4 Equipment and supply storage. Storage for supplies and equipment shall be available.

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A2.2-2.11.10.3 (8) High-speed autoclaves should only be used in an emergency situation (e.g., a dropped instrument and no sterile replacement readily available).

A2.2-2.11.13.1 Recovery spaces may be open bays or private rooms.

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2.2-2.11.14.5 Clinical sink. A clinical sink with bedpan flushing device shall be available.

2.2-2.11.15 Support Areas for Families

When required by the functional program, there shall be enough space for baby and crib and a chair for the support person. There shall be the ability to maintain visual privacy for the new family.

2.2-2.12 Nursery Unit

2.2-2.12.1 General

Infants shall be housed in nurseries that comply with the standards in this section.

2.2-2.12.1.1 Location. All nurseries shall be convenient to the postpartum nursing unit and obstetrical facilities.

2.2-2.12.1.2 Layout

- (1) The nurseries shall be located and arranged to preclude the need for unrelated pedestrian traffic.
- (2) No nursery shall open directly onto another nursery.

2.2-2.12.1.3 Safety and security

- (1) All nurseries shall be designed to protect the physical security of infants, parents, and staff and to minimize the risk of infant abduction.
- (2) All entries to the nursery shall be controlled.

2.2-2.12.2 Requirements for All Nursery Types

2.2-2.12.2.1 General. The requirements in this section shall apply to all nurseries in 2.2-2.12.

2.2-2.12.2.2 Space requirements. Enough space shall be provided for parents to stay 24 hours.

2.2-2.12.2.3 Viewing windows. Glazed observation windows to permit the viewing of infants from public areas, workrooms, and adjacent nurseries shall be provided.

2.2-2.12.2.4 Hand-washing station(s). At least one hand-washing station equipped with hands-free

operable controls shall be provided for each eight or fewer infant stations.

2.2-2.12.2.5 Storage for infant supplies. Convenient, accessible storage for linens and infant supplies shall be provided at each nursery room.

2.2-2.12.3 Requirements for Specific Nursery Types

2.2-2.12.3.1 Newborn nursery

* (1) Capacity

- (a) Each newborn nursery room shall contain no more than 16 infant stations.
 - (b) When a rooming-in program is used, the total number of bassinets in these units shall be permitted to be reduced, but the newborn nursery shall not be omitted in its entirety from any facility that includes delivery services.
- (2) Area. The minimum clear floor area shall be 24 square feet (2.23 square meters) per bassinet, exclusive of auxiliary work areas.

2.2-2.12.3.2 Baby-holding nursery

(1) General

- (a) In postpartum and labor-delivery-recovery-postpartum (LDRP) units, a baby-holding nursery shall be permitted.
 - (b) These holding nurseries shall be located next to the nurse station on these units.
- (2) Capacity. The holding nursery shall be sized to accommodate the percentage of newborns that does not remain with their mothers during the postpartum stay.
 - (3) Area. The minimum clear floor area per bassinet shall be the same as that required for newborn nurseries in 2.2-2.12.3.1 (2).

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A2.2-2.12.3.1 (1) For facilities that use a rooming-in program in which all infants are returned to the nursery at night, a reduction in nursery size may not be practical.

- (4) The ventilation, electrical, and medical vacuum and gas requirements shall be the same as those for the newborn nursery in 2.2-2.12.3.1.

2.2-2.12.3.3 Continuing care nursery. Some hospitals provide continuing care for infants requiring close observation (e.g., low birth-weight babies who are not ill but require more hours of nursing than normal infants). There are multiple potential levels of step-down care, which are based on the availability of specialized equipment and staff.

(1) General

- (a) Levels of step-down care provided by the facility shall be identified in the functional program.
- (b) Location of continuing care infant stations in a defined area within the hospital's NICU shall be permitted.
- (c) Sharing of support spaces with adjacent nurseries shall be permitted.

(2) Space requirements

- (a) Where provided, a continuing care nursery shall have a minimum clear floor area of 120 square feet (11.2 square meters) per infant station.
- (b) A minimum clear dimension of 8 feet (2.4 meters) shall be provided between and at all sides of each bassinet.

2.2-2.12.4 Special Patient Care Rooms

2.2-2.12.4.1 Reserved

2.2-2.12.4.2 Airborne infection isolation room. An airborne infection isolation room shall be provided in or near at least one level of nursery care.

- (1) The room shall be enclosed and separated from the nursery unit with provisions for observation of the infant from adjacent nurseries or control area(s).

- (2) All airborne infection isolation rooms shall comply with the requirements of Section 2.1-2.4.2 except for the separate toilet, bathtub, or shower.

2.2-2.12.5 Support Areas for Patient Care— General

For requirements, see 2.1-2.5.

2.2-2.12.6 Support Areas for Nurseries

The following requirements shall apply to nurseries.

2.2-2.12.6.1 Documentation area. Charting facilities shall have linear surface space to ensure that staff and physicians may chart and have simultaneous access to information and communication systems.

***2.2-2.12.6.2 Workroom(s).** Each nursery room shall be served by a connecting workroom.

- (1) The workroom shall contain scrubbing and gowning facilities at the entrance for staff and environmental services personnel, work counter, refrigerator, storage for supplies, and a hands-free hand-washing station.
- (2) One workroom shall be permitted to serve more than one nursery room provided that required services are convenient to each.
- (3) Omission of the workroom serving the full-term and continuing care nurseries shall be permitted if equivalent work and storage areas and facilities, including those for scrubbing and gowning, are provided within that nursery. Space required for work areas located within the nursery is in addition to the area required for infant care.
- (4) Provision shall be made for storage of emergency cart(s) and equipment out of traffic.
- (5) Provision shall be made for the sanitary storage and disposal of soiled waste.
- (6) Visual control shall be provided via view panels between the staff work area and each nursery.

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A2.2-2.12.6.2 When the functional program includes a mother-baby couplet approach to nursing care, the workroom functions

described above may be incorporated into the nurse station that serves the postpartum patient rooms.

2.2 SPECIFIC REQUIREMENTS FOR GENERAL HOSPITALS

2.2-2.12.6.3 Lactation support room. A consultation/demonstration/breastfeeding or pump room shall be provided convenient to the nursery.

- (1) Provision shall be made, either within the room or conveniently located nearby, for hand-washing station, counter, refrigeration and freezing, storage for pump and attachments, and educational materials.
- (2) If conveniently located, this ancillary area shall be permitted to be shared for other purposes.

2.2-2.12.6.4 Soiled workroom or soiled holding room. A soiled workroom or soiled holding room shall be provided in accordance with Section 2.1-2.6.10.

2.2-2.12.6.5 Environmental services room

- (1) An environmental services room shall be provided for the exclusive use of the nursery unit. It shall be directly accessible from the unit.
- (2) This room shall contain a service sink or floor receptor and provide for storage of supplies and housekeeping equipment.

2.2-2.12.6.6 Infant examination and treatment areas. When an infant examination and treatment area is required by the functional program, it shall contain the following:

- (1) A work counter
- (2) Storage facilities
- (3) Hands-free hand-washing station

*2.2-2.13 Pediatric and Adolescent Unit

The unit shall meet the following standards:

2.2-2.13.1 Reserved

2.2-2.13.2 Patient Rooms

2.2-2.13.2.1 Capacity. Maximum room capacity shall be two patients.

2.2-2.13.2.2 Space requirements. The space requirements for pediatric patient beds shall be the same as for adult beds due to the size variation and the need to change from cribs to beds and vice-versa. For requirements, see 2.2-2.2.2.2.

2.2-2.13.2.3 Window. Each patient room shall have a window in accordance with Sections 2.2-2.2.2.3 and 2.1-7.2.2.5.

*2.2-2.13.3 Family Support Requirements

Additional provisions for hygiene, toilets, sleeping, and personal belongings shall be made where the program indicates that parents will be allowed to remain with young children. (See 2.2-2.9 for pediatric critical care units and 2.2-2.12 for newborn nurseries.)

2.2-2.13.4 Special Patient Care Rooms

2.2-2.13.4.1 Reserved

2.2-2.13.4.2 Airborne infection isolation room

- (1) At least one such room shall be provided in each pediatric unit. The total number of infection isolation rooms shall be determined by an ICRA.
- (2) Airborne infection isolation room(s) shall comply with the requirements of 2.1-2.4.2.

2.2-2.13.5 Support Areas for Patient Care—General

2.2-2.13.5.1 For general requirements, see 2.1-2.5.

2.2-2.13.5.2 Support areas shall conform to the requirements for medical/surgical nursing units in 2.2-2.2.6, 2.2-2.2.7, and 2.2-2.2.8.

2.2-2.13.6 Support Areas for Pediatric and Adolescent Units

2.2-2.13.6.1 Support areas in pediatric and adolescent nursing units shall conform to the requirements in 2.2-2.2.6 and shall also meet the following requirements:

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A2.2-2.13 In view of their unique physical and developmental needs, pediatric and adolescent patients, to the extent their condition permits, should be grouped together in distinct units or distinct areas of general units separate from adults.

A2.2-2.13.3 Family support spaces, including family sleep rooms, pantry, toilets, showers, washers and dryers, and access to computers, phones, and copy machines, should be provided.

2.2-2.13.6.2 Multipurpose or individual room

- (1) Multipurpose or individual room(s) shall be provided within or adjacent to areas serving pediatric and adolescent patients for dining, education, and developmentally appropriate play and recreation, with access and equipment for patients with physical restrictions.
- (2) If the functional program requires, an individual room shall be provided to allow for confidential parent/family comfort, consultation, and teaching.
- (3) Insulation, isolation, and structural provisions shall minimize the transmission of impact noise through the floor, walls, or ceiling of the multipurpose room(s).

2.2-2.13.6.3 Formula facilities. Space for preparation and storage of formula shall be provided within the unit or other convenient location. Provisions shall be made for continuation of special formula that may have been prescribed for the pediatric patient prior to admission or readmission.

2.2-2.13.6.4 Clean and soiled workrooms. Separate clean and soiled workrooms or holding rooms shall be provided as described in Sections 2.1-2.6.9 and 2.1-2.6.10.

2.2-2.13.6.5 Equipment and supply storage

- (1) Storage closets or cabinets shall be provided for toys, educational, and recreational equipment.
- (2) Storage space shall be provided to permit exchange of cribs and adult beds.
- (3) Provisions shall also be made for storage of equipment and supplies (including cots or recliners, extra linen, etc.) for parents who stay with the patient overnight.

2.2-2.13.6.6 Examination/treatment room(s). An examination/treatment room shall be provided for pediatric and adolescent patients in accordance with 2.1-3.2.1 (Single-Bed Examination/Treatment Room or Area).

2.2-2.13.7 Support Areas for Staff

Staff support areas in pediatric and adolescent nursing units shall conform to the requirements in 2.2-2.2.7.

2.2-2.13.8 Support Areas for Patients

2.2-2.13.8.1 Patient toilet room(s). In addition to toilet rooms serving bed areas, toilet room(s) with hand-washing station(s) in each room shall be convenient to multipurpose room(s) and to each central bathing facility.

2.2-2.14 Psychiatric Nursing Unit**2.2-2.14.1 General**

2.2-2.14.1.1 Functional program. Provisions shall be made in the design for adapting the area for various types of medical and psychiatric therapies as described in the functional program.

***2.2-2.14.1.2 Environment of care.** The facility shall provide a therapeutic environment appropriate for the planned treatment programs.

***2.2-2.14.1.3 Safety and security.** Safety and security appropriate for the planned treatment programs shall be provided.

2.2-2.14.1.4 Shared facilities. In no case shall adult and pediatric patients be mixed. This does not exclude sharing of nursing stations or support areas, as long as the separation and safety of the units can be maintained.

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A2.2-2.14.1.2 The facility should provide a therapeutic environment appropriate for the planned treatment programs. The environment should be characterized by a feeling of openness with emphasis on natural light. In every aspect of building design and maintenance it is essential to make determinations based on the potential risk to the specific patient population served.

A2.2-2.14.1.3 A safe environment is critical; however, no environment can be entirely safe and free of risk. Each organization will need to determine the appropriate environment for the treatment programs it provides and the patients it serves.

The majority of persons who attempt suicide suffer from a treatable mental disorder or a substance abuse disorder or both. Patients of

2.2-2.14.2 Patient Room

For requirements, see 2.5-2.2.2 (Psychiatric Patient Room).

2.2-2.14.3 Reserved

2.2-2.14.4 Special Patient Care Areas

2.2-2.14.4.1 Reserved

2.2-2.14.4.2 Seclusion treatment rooms. For requirements, see 2.1-2.4.3.

2.2-2.14.5 Support Areas for Patient Care—General

For requirements, see 2.5-2.2.5.

2.2-2.14.6 Support Areas for Psychiatric Nursing Unit Patients

For requirements, see 2.5-2.2.6.

2.2-2.14.7 Support Areas for Staff

For requirements, see 2.5-2.2.7.

2.2-2.14.8 Support Areas for Patients and Visitors

For requirements, see 2.5-2.2.8.

2.2-2.14.9 Special Design Elements

For requirements, see 2.5-7.2 (Architectural Details, Surfaces, and Furnishings) and 2.5-8 (Building Systems).

2.2-2.15 In-Hospital Skilled Nursing Unit

Many facilities have incorporated extended stay units for the medical/surgical department; these are often referred to as in-hospital skilled nursing units or facilities. These units should not be confused with long-term skilled nursing units found in Chapter 4.1 of these

Guidelines. These extended stay unit beds are licensed hospital beds for patients requiring skilled nursing care as part of their recovery process. Many of these facilities are intended for elderly patients undergoing various levels of rehabilitation and recuperating stroke victims or brain trauma victims requiring rehabilitation.

2.2-2.15.1 General

2.2-2.15.1.1 Location

- (1) The location of the unit shall provide convenient access to the Physical and Rehabilitation Medicine departments.
- (2) Wherever possible, the unit shall be located to provide access to outdoor spaces that can be utilized for therapeutic purposes.

2.2-2.15.1.2 Layout. The unit shall be located to exclude unrelated traffic going through the unit to access other areas of the hospital.

2.2-2.15.2 Patient Room

The basic requirements contained in 2.2-2.2.2 (Medical/Surgical Patient Room) shall apply.

2.2-2.15.3 Reserved

2.2-2.15.4 Reserved

2.2-2.15.5 Support Areas for Patient Care—General

For requirements, see 2.1-2.5.

2.2-2.15.6 Support Areas for In-Hospital Skilled Nursing Units

In addition to the support areas required under Sections 2.2-2.2.5 through 2.2-2.2.7, the following rooms and support elements shall be provided:

- a. Consideration should be given to visual control (including electronic surveillance) on nursing units of corridors, dining areas, and social areas such as dayrooms and activity areas. Hidden alcoves or blind corners or areas should be avoided.
- b. The openness of the nurse station will be determined by the planned treatment program. Consideration should be given to patient privacy and also to staff safety.

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inpatient psychiatric treatment facilities are considered at high risk for suicide; the environment should avoid physical hazards while maintaining a therapeutic environment. The built environment, no matter how well designed and constructed, cannot be relied upon as an absolute preventive measure. Staff awareness of their environment, latent risks of that environment, and the behavior risks and needs of the patients served in the environment are absolute necessities. Different organizations and different patient populations will require greater or lesser tolerance for risk.

2.2-2.15.6.1 Storage for patient transport devices and walking aids. Additional storage spaces in close proximity to the patient population shall be included in the design of the unit to accommodate walking aids, portable mechanical patient lifting devices, and other patient transport devices as required by the functional program and the patient handling and movement assessment (PHAMA); however, not less than 5 square feet (0.46 square meters) of storage per bed shall be provided.

2.2-2.15.6.2 Physical rehabilitation room. When required by the functional program, a physical rehabilitation room shall be provided for the use of the skilled nursing unit if the unit is not located conveniently to the facility's physical and rehabilitation therapy departments. The room size and the equipment provided shall be adequate to provide the therapeutic milieu required by the facility's functional program.

2.2-2.15.7 Reserved

2.2-2.15.8 Support Areas for Patients

2.2-2.15.8.1 Dining and recreation spaces

- (1) Factors for determining space requirements. The space needed for dining and recreation shall be determined by considering the following:
 - (a) The needs of patients who use adaptive equipment and mobility aids and receive assistance from support and service staff
 - (b) The extent to which support programs shall be centralized or decentralized
 - (c) The number of patients to be seated for dining at one time, as required by the functional program
- (2) Space requirements. Nothing in these Guidelines is intended to restrict a facility from providing additional square footage per resident beyond what is required herein for dining rooms, activity areas, and similar spaces.
 - (a) In new construction, the total area set aside for dining, patient lounges, and recreation shall be at least 25 square feet (2.32 square meters) per bed with a minimum total area of at least 225 square feet (20.90 square meters). At least 20 square feet (1.86 square meters) per bed shall

- be available for dining. Additional space may be required for outpatient day care programs.
- (b) For renovations, at least 14 square feet (1.30 square meters) per bed shall be available for dining. Additional space may be required for outpatient day care programs.

2.2-2.15.8.2 Private space. When required by the functional program, the unit shall contain private space for the use of individual patients, family, and caregivers to discuss the specific patient's needs or private family matters.

- (1) This space shall have a minimum clear floor area of 250 square feet (23.23 square meters).
- (2) This space is permitted to be considered part of the square footage per bed outlined in 2.2-2.15.8.1 (2) just above (Space requirements).

2.2-2.15.8.3 Patient grooming room. When required by the functional program, a room for patient grooming shall be provided.

- (1) The minimum area shall not be part of the aggregate area outlined in 2.2-2.15.8.1 (2) and shall be as determined by the functional program.
- (2) This room shall provide spaces for hair-washing station(s), hair clipping and hair styling, and other grooming needs.
- (3) A hand-washing station, mirror, work counter(s), storage shelving, and sitting area(s) for patients shall be provided as part of the room.

2.2-2.15.9 Special Design Elements

2.2-2.15.9.1 Architectural details

- (1) Handrails located in accordance with ADA and all local, state, and federal requirements shall be installed on both sides of the patient use corridor. Where corridors are defined by walls, handrails shall be provided on both sides of all corridors normally used by patients.
- (2) A minimum clearance of 1.5 inches (3.81 centimeters) shall be provided between the handrail and the wall.
- (3) Rail ends shall be returned to the wall or floor.

***2.2-2.16 Bariatric Care Unit**

The need for bariatric care units (and care for the extremely obese patient in general) is growing in the United States. Not only do these patients require facilities with more space and staff with greater strength to carry heavier loads, they also have a variety of special health care needs from climate control requirements to the need for specialty bathing fixtures.

2.2-2.16.1 General

Bariatric care units can be either units specifically designed to accommodate bariatric surgery patients or units designed to provide the full range of acute care services to an extremely obese patient population.

2.2-2.16.1.1 Application. These standards shall apply to all beds designated for bariatric care.

2.2-2.16.1.2 Location. In hospitals that provide bariatric care, rooms shall be designated for this purpose. These rooms shall be permitted to constitute a separate unit or to be provided as a designated part of another unit.

2.2-2.16.2 Patient Room

The following shall apply to all bariatric care units unless otherwise noted.

2.2-2.16.2.1 Capacity. All bariatric patient rooms shall be single-patient rooms.

2.2-2.16.2.2 Space requirements. Minor encroachments (including columns and hand-washing stations that do not interfere with functions) may be ignored when determining space requirements for patient rooms.

- (1) Area. In new construction, patient rooms shall be constructed to meet the needs of the functional program, with a minimum clear floor area of 200 square feet (18.58 square meters).
- (2) Clearances
 - (a) Room dimensions and arrangements shall provide a minimum clear dimension of 5 feet (1.52 meters) between the sides and the foot of the bed and any wall or other fixed obstructions.
 - (b) In multiple-bed rooms, a minimum clear dimension of 5 feet (1.52 meters) shall be available at the foot of each bed to permit the passage of equipment and beds.
- (3) Renovation. Where renovation work is undertaken, every effort shall be made to meet these standards. If it is not possible to meet these minimum standards, the authority having jurisdiction may grant approval to deviate from this requirement. In such cases, patient rooms shall have a minimum clear floor area of 150 square feet (13.94 square meters).

2.2-2.16.2.3 Windows. Each patient room shall have a window in accordance with Sections 2.2-2.2.2.3 and 2.1-7.2.2.5.

2.2-2.16.2.4 Reserved***2.2-2.16.2.5 Hand-washing stations**

- (1) These shall be provided to serve each patient room and shall comply with the requirements of 2.1-2.2.5.
- (2) Hand-washing stations in bariatric units/areas shall be mounted with sufficient strength/stability to withstand downward static force of 1,000 lbs.

APPENDIX**A2.2-2.16 Bariatric care units**

The following definitions for obesity and bariatric are excerpted from Kathryn M. Pelczarski and Linda Wallace, "Preparing for an Epidemic," *Extended Care Product News* 120:6 (July 2007), 18-23.

"Obesity is defined in terms of an individual's body mass index (BMI), which is calculated by dividing a person's weight by the square of his or her height. Internationally, BMI is expressed in metric form as kilograms/meter² or kg/m². An obese person has a BMI of 30–39.9 kg/m². An extremely obese person has a BMI greater than or equal to 40 kg/m².

m2. Given these definitions, an extremely obese resident can range in weight from 250 or 350 pounds to 1,000 pounds or more, depending on the individual's height.

"This article uses the standardized definitions for obesity and extreme obesity. The term 'bariatric residents' refers more generally to the obese or extremely obese resident."

A2.2-2.16.2.5 It is recommended that bariatric sinks be floor mounted (unless contraindicated by requirements for barrier-free design serving a wheelchair bariatric population).

(543.59 kilograms) at the edge of the sink without breaking any caulk seals or causing any physical damage.

2.2-2.16.2.6 Toilet rooms. Toilet rooms shall be provided in accordance with Section 2.1-2.2.6.

- (1) Toilets in bariatric units or areas for bariatric patients shall be designed to support 1,000 lbs. (543.59 kilograms) and shall be mounted a minimum of 24 inches (60.96 centimeters) from the finished wall to the centerline of the toilet.
- (2) There shall be 44 inches (111.76 centimeters) of clear space on the opposite side of the toilet for wheelchair access and to allow caregivers room to assist the patient.

2.2-2.16.2.7 Patient bathing facilities. Patients shall have access to bathing facilities.

- (1) Shower stalls designated for bariatric patients shall be a minimum of 4 feet by 6 feet (1.22 meters by 1.83 meters).
- (2) Showers shall be equipped with grab bars that are capable of supporting 1,000 lbs. (543.59 kilograms).
- (3) Showers shall be provided with handheld spray nozzles mounted on a side wall.
- (4) Each shower or bathtub in a central bathing facility shall be in an individual room or enclosure that provides privacy for bathing, drying, and dressing.
- (5) A water closet and hand-washing station in a separate enclosure shall be directly accessible to each central bathing facility.

2.2-2.16.2.8 Patient storage. Storage locations for patient use shall be provided in accordance with Section 2.2-2.2.2.8.

2.2-2.16.2.9 Patient lift system. At least one room in each bariatric unit shall be provided with a built-in mechanical lift system (e.g., a ceiling rail system) capable of transporting a 600-pound (272.16-kilogram) patient from the bed to the toilet room.

2.2-2.16.3 Reserved

2.2-2.16.4 Special Patient Care Rooms

2.2-2.16.4.1 Reserved

2.2-2.16.4.2 Airborne infection isolation (AII) room

- (1) At least one bariatric AII room shall be provided in the bariatric care unit unless provided elsewhere in the facility. The number of additional bariatric AII rooms shall be determined on the basis of an infection control risk assessment (ICRA).
- (2) Each bariatric AII room shall comply with the requirements previously set forth for a bariatric patient room as well as the AII room requirements set forth in 2.1-2.4.2.2 and 2.1-2.4.2.4.

2.2-2.16.5 Support Areas for Patient Care—General

2.2-2.16.5.1 For general requirements, see 2.1-2.5.

2.2-2.16.5.2 Application

- (1) The size and location of each staff support area shall depend on the numbers and types of beds served.
- (2) Services shared with adjacent units shall be permitted.

2.2-2.16.5.3 Location

- (1) Provision for the support areas listed in 2.16.6 shall be in or readily available to each bariatric care unit.
- (2) The location of each staff support area shall depend on the numbers and types of beds served.

2.2-2.16.6 Support Areas for Bariatric Care Units

2.2-2.16.6.1 Administrative center or nurse station.

An administrative center or nurse station shall be provided in accordance with Section 2.1-2.6.1.

2.2-2.16.6.2 Documentation area. A documentation area shall be provided in accordance with 2.1-2.6.2.

2.2-2.16.6.3 Nurse management space. A separate physical area devoted to nursing management of bariatric patient care shall be provided.

2.2-2.16.6.4 Reserved**2.2-2.16.6.5 Hand-washing stations**

- (1) In nursing locations, hand-washing stations shall be conveniently accessible to the nurse station, medication station, and nourishment area.
- (2) If it is convenient to each, one hand-washing station shall be permitted to serve several areas.

2.2-2.16.6.6 Medication station. Provision shall be made for 24-hour distribution of medications in accordance with 2.1-2.6.6.

2.2-2.16.6.7 Nourishment area. A nourishment area shall be provided in accordance with 2.1-2.6.7.

2.2-2.16.6.8 Ice machine. A self-dispensing ice machine shall be provided in accordance with Section 2.1-2.6.8.

2.2-2.16.6.9 Clean workroom or clean supply room. A clean workroom or clean supply room shall be provided in accordance with Section 2.1-2.6.9.

2.2-2.16.6.10 Soiled workroom or soiled holding room. A soiled workroom or soiled holding room shall be provided in accordance with Section 2.1-2.6.10.

2.2-2.16.6.11 Equipment and supply storage

- (1) Equipment storage room. An equipment storage room shall be provided for storage of equipment necessary for patient care.
 - (a) This room shall be permitted to serve more than one unit.
 - * (b) The size of the equipment storage room shall be as required by the functional program, but not less than 25 square feet (2.32 square meters) per patient bed shall be provided.
- (2) Emergency equipment storage. This shall be provided in accordance with Section 2.1-2.6.11.4.

2.2-2.16.6.12 Environmental services room. This room shall be provided in accordance with Section 2.1-2.6.12.

2.2-2.16.7 Support Areas for Staff

2.2-2.16.7.1 Staff lounge facilities. Staff lounge facilities shall be provided in accordance with Section 2.1-2.7.1.

- (1) The location of these facilities shall be convenient to the bariatric care unit.
- (2) These facilities may be shared with other nursing unit(s).

2.2-2.16.7.2 Staff toilet room. Staff toilet room(s) shall be provided in accordance with Section 2.1-2.7.2.

2.2-2.16.7.3 Staff storage facilities. Storage facilities for personal use of the staff shall be provided in accordance with Section 2.1-2.7.3.

2.2-2.16.8 Support Areas for Patients and Visitors

2.2-2.16.8.1 Visitor waiting areas. Visitor waiting areas shall be provided convenient to the bariatric unit. A minimum of 10 percent of the furniture in public areas of this unit shall be designed to accommodate the size and weight of a 600-pound (272.16-kilogram) person.

2.2-2.16.9 Special Design Elements**2.2-2.16.9.1 Door openings**

- (1) Door openings in the general path of travel for bariatric patients from public areas (including public dining areas within the facility) to the bariatric unit shall have a minimum clear width of 3 feet 8 inches (1.06 meters).
- (2) Door openings to bariatric patient rooms shall have a minimum clear width of 4 feet 9.5 inches (1.46 meters).

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A2.2-2.16.6.11 (1)(b) Lift slings and accessories for bariatric patients are considerably larger than standard and require greater unit and in-room storage space.

■ 2.2-3 Diagnostic and Treatment Locations

*2.2-3.1 Emergency Services

2.2-3.1.1 General

***2.2-3.1.1.1 Definition.** Emergency care ranges from initial emergency care to definitive emergency care. Initial and definitive emergency care areas must be able to provide services 24 hours a day, 7 days a week.

(1) Initial emergency care is provided to stabilize a patient's condition and to minimize potential for deterioration during transport to an appropriate facility. Patients may be brought to the "nearest hospital," which may or may not have a dedicated emergency department. In those cases, it is important that the hospital be able to assess and stabilize emergent illnesses and injuries and arrange for appropriate transfer.

(2) Definitive emergency care is care that takes place within a dedicated emergency department. This care may range from suturing lacerations to full-scale emergency medical procedures. Facilities that include personnel and equipment for definitive emergency care provide care leading to discharge to the patient's home or admission to the appropriate hospital.

2.2-3.1.1.2 Application. The extent and type of emergency service to be provided depends on community needs and the availability of other services in the area.

(1) Initial emergency services shall be available at every hospital.

(2) All services need adequate equipment and 24-hour staffing to ensure no delay in essential treatment.

(3) The functional program shall determine the additional type, size, and number of services needed.

APPENDIX

A2.2-3.1 Surge Capacity and NBC Hazards Control

When consistent with the functional program and disaster planning, acute care facilities with emergency services can serve as receiving, triage, and initial treatment centers in the event of infectious disease outbreaks; natural or man-made disasters; or nuclear, biological, or chemical (NBC) exposure. These facilities should have the capacity to handle a surge of patients above the current emergency department capacity and should designate specific area(s) for these functions.

- a. This preparation should include provision of adjacent space for triage and management of incoming patients. Utility upgrades for these areas (oxygen, water, electrical) should be considered.
- b. The area should provide for depressurization to help control aerosolized infectious particles with 100 percent exhaust capability. If 100 percent exhaust cannot be achieved, appropriate proven technology should be utilized to reduce airborne particles by > 95 percent. If patient care areas are to be utilized in the hospital to house these patients, the route to the patient care unit should minimize the potential for cross-contamination. Existing smoke control areas could be utilized to meet the ventilation requirements. Air-handling systems should be designed to provide required pressure differentials. Written protocols must be developed to ensure proper performance of the means to accomplish the intended goals. DHHS, the Office of Emergency Preparedness, will have more up-to-date information.
- c. Facilities may designate an outdoor parking lot adjacent to the emergency department to serve as a primary decontamination area for NBC hazards control, which should include appropriate plumbing fixtures (e.g., hot and cold water) and drainage.

—Use of screens and tents in these areas may be needed.

—Other contingencies may require airborne infection isolation, application and removal of therapeutic chemical substances, and temporary container storage of contaminated materials.

—Hand-washing and shower capabilities will usually be of paramount importance in biohazard control efforts.

A2.2-3.1.1.1 Classification of emergency departments/services/trauma centers. All hospitals, by regulation of the Centers for Medicare and Medicaid Services, are required to appraise medical emergencies and provide initial treatment and referral when appropriate, regardless of whether the hospital has an emergency department. A dedicated emergency department may be part of a trauma system with a Level I–IV designation. Trauma system level designations are awarded based on the services provided by the hospital. All emergency departments, regardless of trauma level designation, must be able to provide for the initial evaluation and stabilizing treatment of trauma patients.

The following American College of Surgeons reference provides detailed descriptions of Level I–Level IV trauma centers: "Trauma Center Descriptions and Their Roles in a Trauma System," chapter 2 in *Resources for Optimal Care of the Injured Patient* (ACS, 1999).

A2.2-3.1.1.1 (1) Examples of facilities that may provide initial emergency care include critical access hospitals, long-term acute care hospitals, and specialty hospitals.

A2.2-3.1.1.1 (2) Examples of facilities that provide definitive emergency care include academic medical centers and community hospitals.

2.2-3.1.2 Initial Emergency Management

2.2-3.1.2.1 General

- (1) At a minimum, each hospital shall have provisions for emergency treatment for staff, employees, and visitors as well as for persons who may be unaware of or unable to immediately reach services in other facilities. This is not only for patients with minor illnesses or injuries that may require minimal care but also for persons with severe illness and injuries who must receive immediate emergency care and stabilization prior to transport to other facilities.
- (2) Provisions for initial emergency management shall include the following:

2.2-3.1.2.2 Entrance

- (1) A well-marked, illuminated, and covered entrance shall be provided at grade level. The emergency vehicle entry cover shall provide shelter for both the patient and the emergency medical crew during transfer between an emergency vehicle and the building.
- (2) Emergency department ambulance entrances shall provide a minimum of 6 feet (1.83 meters) in clear width to accommodate bariatric stretchers, mobile patient lift devices, and accompanying attendants.
- (3) If required by the functional program, bariatric lifts shall be available in the covered ambulance bay and positioned to provide assistance with patient transfers.

2.2-3.1.2.3 Reception, triage, and control station.

This shall be located to permit staff observation and control of access to the treatment area, pedestrian and ambulance entrances, and public waiting area.

2.2-3.1.2.4 Public waiting area. Provisions shall be made for public waiting, including the following:

- (1) A public toilet with hand-washing station(s)
- (2) A telephone

2.2-3.1.2.5 Communication center. Communication connections to the regional emergency medical service (EMS) system shall be provided.

2.2-3.1.2.6 Treatment room. At least one treatment room shall be provided in accordance with Section 2.1-3.2 (Examination/Treatment Room or Area).

- (1) Multiple-bed treatment rooms shall have cubicle curtains for privacy.
- (2) Each treatment room shall contain the following in addition to the requirements of Section 2.1-3.2:
 - (a) A work counter
 - (b) Space for medical equipment as specified in the functional program
 - (c) Cabinets
 - (d) Medication storage
 - (e) Adequate electrical outlets above floor level

2.2-3.1.2.7 Patient toilet. A patient toilet room with hand-washing station(s) shall be provided convenient to the treatment room(s).

2.2-3.1.2.8 Equipment and supply storage. Storage shall be provided for general medical/surgical emergency supplies, medications, and equipment (e.g., a ventilator, defibrillator, splints, etc.). This storage shall be located out of traffic and under staff control.

2.2-3.1.3 Definitive Emergency Care

2.2-3.1.3.1 General. Where a health care organization provides definitive emergency care, facilities shall be provided to accommodate the type, size, and number of services as defined in the functional program. At minimum, the facilities outlined in this section shall be provided.

2.2-3.1.3.2 Entrance

- (1) A well-marked, illuminated, and covered entrance shall be provided at grade level.
- (2) This entrance shall provide direct access from public roads for ambulance and vehicle traffic.
- (3) Paved emergency access to permit discharge of patients from automobiles and ambulances and temporary parking convenient to the entrance shall be provided.

* (4) Entrance and driveway shall be clearly marked, and directional signage shall be visible from all public vehicle entrances.

(5) If a raised platform is used for ambulance discharge, a ramp shall be provided for pedestrian and wheelchair access.

(6) The emergency vehicle entry cover shall provide shelter for both the patient and the emergency medical crew during transfer between an emergency vehicle and the building.

(7) The emergency vehicle bays shall be sized so they are compatible with horizontal and vertical vehicle clearances of regional EMS providers.

2.2-3.1.3.3 Reception, triage, and control station.

The emergency department shall be designed to ensure that emergency medical staff and hospital security personnel maintain control of access at all times. In the event of a disaster, terrorist event, or infectious disease outbreak, the emergency department and its exterior perimeter must remain under the control of the hospital to ensure the continued availability of the emergency department as a resource.

(1) Reception, triage, and/or the control station(s) shall be located to permit staff observation and control of access to the main entrance to the department, pedestrian and ambulance entrances, the public waiting area, and the treatment area. (For station outlet requirements, see Table 2.1-6.)

(2) Public access points to the treatment area shall be under direct observation of the reception and control or security function.

* (3) The triage area requires special consideration.

(a) The area shall be visible from the reception, triage, or control station to permit observation of patients waiting for treatment.

(b) As the point of entry and assessment for patients with undiagnosed and untreated airborne infections, the triage area shall be designed and ventilated to reduce the expo-

sure of staff, patients, and families to airborne infectious diseases. For requirements, see Part 6 (ASHRAE 170).

2.2-3.1.3.4 Public waiting area

(1) A public waiting area with the following shall be provided:

- (a) Toilet facilities
- (b) Drinking fountains
- (c) Telephones

(2) If required by the hospital ICRA, special measures to reduce the risk of airborne infection transmission shall be provided in the emergency department waiting area. These measures may include enhanced general ventilation and air disinfection similar to inpatient requirements for airborne infection isolation rooms. See the CDC “Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health Care Facilities.”

2.2-3.1.3.5 Communications center

(1) The communications center shall be convenient to the nursing station

(2) The communications center shall have radio, telephone, and intercommunication systems. For requirements, see 2.1-7.1.3.2 (Emergency communication system).

(3) If the functional program requires a regional EMS base station, the communications center shall be designed to reduce noise, distractions, and interruptions during radio transmissions.

2.2-3.1.3.6 Examination/treatment room or area

(1) General

(a) For oxygen and vacuum requirements, see Table 2.1-6 (Station Outlets for Oxygen, Vacuum, and Medical Air Systems in Hospitals).

(b) Examination/treatment rooms used for pelvic exams shall allow for the foot of the examination table to face away from the door.

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A2.2-3.1.3.2 (4) Public vehicle access should be a sufficient distance from the entrance to provide for the safe movement of pedestrians and/or wheelchair traffic.

A2.2-3.1.3.3 (3) Consider providing a separate area for patients waiting for triage. This area should have appropriate ventilation and be clearly visible from the triage station.

2.2 SPECIFIC REQUIREMENTS FOR GENERAL HOSPITALS

(2) Single-bed treatment room(s). Single-bed treatment rooms shall be provided in accordance with Section 2.1-3.2.1, unless otherwise noted in this section.

(a) Space requirements. Where renovation work is undertaken, every effort shall be made to meet the minimum space requirements in 2.1-3.2.1.1. Where this is not possible, a minimum clear floor area of 100 square feet (9.29 square meters) shall be permitted.

(b) In addition to the requirements listed in Section 2.1-3.2.1.3, each treatment room shall contain the following:

- (i) A work counter(s)
- (ii) A cabinet(s)
- (iii) Space for medical equipment
- (iv) A vision panel designed for patient visual privacy adjacent to and/or in the door

(3) Multiple-bed treatment room(s). Space and provisions for several patients shall be permitted in compliance with Section 2.1-3.2.2, except as noted in this section.

- (a) Where treatment cubicles are in open multiple-bed areas, cubicles shall be separated from adjoining cubicles by curtains.
- (b) Combining cubicles to accommodate bariatric patients shall be permitted.
- (c) A hand-washing station shall be provided for each three or fewer treatment cubicles and for each major fraction thereof in multiple-bed areas.

* (4) Pediatric treatment rooms. Facilities for the treatment of pediatric cases in dedicated pediatric room(s) shall be provided as required by the functional program.

- (a) The quantity of dedicated rooms shall be based on the functional program.
- (b) Where there is a discrete pediatric emergency service, the following shall be provided:
 - (i) Space for triage, registration, and discharge. Separate triage, registration, and discharge

areas may be provided for pediatric patients as directed by the functional program.

- (ii) A waiting area and a playroom
- (iii) At least one isolation room
- (iv) At least one room for pelvic examinations if required by the functional program
- (v) A medical staff work area
- (vi) Storage for supplies and medication

(c) Location. Treatment rooms designated for pediatric patients shall be located adjacent to a family waiting area and toilet.

(d) Space requirements

- (i) Each treatment room shall have a minimum clear floor area of 120 square feet (11.15 square meters).
- (ii) A trauma room with a minimum clear floor area of 250 square feet (23.23 square meters) shall be provided.
- (iii) Where required by the functional program, rooms shall be sized with a minimum clear floor area of more than 120 square feet (11.15 square meters) to accommodate the additional equipment and escorts that accompany pediatric cases.

(e) Each treatment and trauma room shall have the following:

- (i) A hand-washing station
- (ii) Vacuum, oxygen, and air outlets
- (iii) Examination light(s)
- (iv) A wall-/column-mounted ophthalmoscope/otoscope
- (e) At least one X-ray illuminator and/or picture archiving and communications system (PACS) shall be provided in the pediatric treatment room(s) area.

(5) Treatment rooms for bariatric patients. All emergency centers shall provide accommodations for bariatric patients.

- (a) A treatment room for bariatric patients shall be provided with a minimum clear floor area of 200 square feet (18.58 square meters) and a minimum clear dimension of 12 feet (3.66 meters).
- (b) When not in use for a bariatric patient, a bariatric treatment room shall be permitted to be subdivided with cubicle curtains or movable

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A2.2-3.1.3.6 (4) Particular attention should be paid to the sound-proofing of pediatric treatment rooms.

- partitions to accommodate more than one non-bariatric patient if each resulting cubicle meets all electrical and medical gas requirements for emergency room treatment areas.
- (c) A minimum clear dimension of 5 feet (1.52 meters) shall be provided on both sides and at the foot of the treatment table or bed.
- (d) Accommodations for patient lift and transport shall be provided either by an overhead lifting system or by a portable lifting assist. These devices shall be designed to accommodate a weight of not less than 800 lbs. (362.87 kilograms).
- (e) All furniture, plumbing fixtures, and casework shall be floor-mounted and/or designed to accommodate 1,000 lbs. (543.59 kilograms) of weight.
- (f) Storage requirements for a bariatric treatment room. Where a portable lift is used, the minimum storage per bariatric patient treatment bed shall be 35 square feet (3.25 square meters). Where a ceiling lift system is used in the bariatric treatment room, a minimum of 25.2 square feet (2.34 square meters) of storage shall be provided.
- (g) All doorways, corridors, and vertical transportation (elevators) that are used and/or required to provide access from the building perimeter or lower floor(s) to the bariatric treatment room shall have an opening with a minimum clear width of 3 feet 8 inches (1.12 meters) to allow for movement of larger pieces of equipment.

* (6) A trauma/resuscitation room(s) for emergency procedures, including emergency surgery, shall be provided and shall meet the following requirements:

- (a) Space requirements
 - (i) Area. Each trauma/resuscitation room shall have a minimum clear floor area of 250 square feet (23.23 square meters).
 - (ii) Clearances. A minimum clear dimension of 5 feet (1.52 meters) to any permanently

- fixed object shall be provided around all sides of the stretcher.
- (iii) Additional space with cubicle curtains for privacy may be provided to accommodate more than one patient at a time in the trauma/resuscitation room; however, these cubicles shall meet the minimum clearances identified in paragraph 2.2-3.1.3.6 (6)(a)(ii) just above.

(b) Facility requirements. The room shall contain the following:

- (i) Cabinets
- (ii) Emergency supply shelves
- (iii) X-ray film illuminators and/or picture archiving and communications systems (PACS)
- (iv) Examination lights
- (v) Counter space for writing or electronic documentation

(c) Patient monitoring. Provisions shall be made for monitoring the patients.

(d) Supply storage. Storage shall be provided for immediate access to personal protective equipment.

(e) Door openings. Doorways leading from the ambulance entrance to the trauma/resuscitation room shall have a minimum clear dimension of 6 feet (1.83 meters) to simultaneously accommodate stretchers, equipment, and personnel. The size of gurneys and equipment used by regional EMS personnel shall be incorporated into the design.

(f) Renovation. In renovation projects, every effort shall be made to have existing trauma/resuscitation rooms meet the above minimum standards. If it is not possible to meet the above square-foot standards, the authorities having jurisdiction may grant approval to deviate from this requirement. In such cases, doorways leading from the ambulance entrance to the room shall be permitted to be 4 feet (1.22 meters) wide.

(7) Provisions for orthopedic and cast work. These may be in separate room(s) or in the trauma/resuscitation room.

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A2.2-3.1.3.6 (6) Access should be convenient to the ambulance entrance.

2.2 SPECIFIC REQUIREMENTS FOR GENERAL HOSPITALS

- (a) Space requirements. The minimum clear floor area shall depend on the functional program and the procedures and equipment to be accommodated in this room or area.
- (b) Plaster trap. If a sink is used for the disposal of plaster of paris, a plaster trap shall be provided.
- (c) Equipment and supply storage. They shall include storage for splints and other orthopedic supplies, traction hooks, x-ray film illuminators, and examination lights.

***(8) Diagnostic service areas.** Convenient access to radiology and laboratory services shall be provided.

***(9) Decontamination area**

- (a) Location. In new construction, a decontamination room shall be provided with an outside entry door located as far as practical, but no less than 10 feet (3.05 meters), from the closest other entrance. The internal door of this room shall open into a corridor of the emergency department, swing into the room, and be lockable against ingress from the corridor.
- (b) Space requirements. The room shall have a minimum clear floor area of 80 square feet (7.43 square meters).
- (c) Special architectural details
 - (i) The room shall have all smooth,

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A2.2-3.1.3.6 (8) When advanced imaging technologies such as CT are available, the emergency department should have convenient access.

A2.2-3.1.3.6 (9) Decontamination area on the exterior perimeter

- a. Ideally 150 feet (45.72 meters) from the ambulance entrance (if required by the constraints of the structures involved, this may be no less than 30 feet (9.14 meters) from the ambulance entrance).
- b. At a location where no windows or doors abut the defined area or where all doors are securable from the outside and all windows are capable of being shuttered.
- c. Boundaries shall be defined on the paved ground surface with a yellow paint line and the word "DECON" painted within these boundaries.
- d. At least two shower heads, temperature-controlled and separated by at least 6 feet (1.83 meters); a separate spigot for attachment of a hose.
- e. Semipermanent or portable/collapsible structures (curtains, tents, etc.) that will provide shelter from the environment, privacy, and some containment of the contaminant/infectious agent.
- f. Secured access to the hospital telephone system and a duplex electrical outlet for each two shower heads and no closer than 4 feet (1.22 meters) to any shower.
- g. Exterior lighting to maximize visibility; appropriate for wet/shower facilities.
- h. Water runoff shall be contained and disposed of safely to ensure that it does not enter community drainage systems. This shall be accomplished either by graded floor structures leading to a drain with a collection system separate from that of the hospital or by the use of plastic pools or specialized decontamination stretchers.

Decontamination room within the facility

- a. Separate, independent, secured external entrance adjacent to the ambulance entrance, but no less than 30 feet (9.14 meters) distant;

lighted and protected from the environment in the same way as the ambulance entrance; a yellow painted boundary line 3 feet (0.91 meter) from each side of the door and extending 6 feet (1.83 meters) from the hospital wall; the word "DECON" painted within these boundaries.

- b. Internal entrance to a corridor within the emergency area.
- c. It shall have spatial requirements and the medical support services of a standard emergency area airborne infection isolation room, with air externally exhausted separate from the hospital system. It shall contain a work counter, hand-washing station with hands-free controls, an area for personnel gowning, and a storage area for supplies, as well as equipment for the decontamination process.
- d. Ceiling, wall, and floor finishes shall be smooth, nonporous, scrubable, nonadsorptive, nonperforated, capable of withstanding cleaning with and exposure to harsh chemicals, nonslip, and without crevices or seams. Floors shall be self-coving to a height of 6 inches (15.24 centimeters). The surface of the floor shall be self-finished and require no protective coating for maintenance.
- e. Two hospital telephones; two duplex electrical outlets, secured appropriately for a wet environment.
- f. At least two hand-held shower heads, temperature-controlled; curtains or other devices to allow patient privacy, to the extent possible.
- g. Appropriately heated and air-cooled for a room with an external door and very high relative humidity.
- h. Water drainage must be contained and disposed of safely to ensure that it does not enter the hospital or community drainage systems. There should be a "saddle" at the floor of the door buck to prevent efflux.
- i. A certified physicist or other qualified expert representing the owner or the state agency shall specify the type, location, and amount of radiation protection to be installed in accordance with final approved department layout and the functional program. These specifications shall be incorporated into the plans.
- j. The decontamination area may function as an isolation room or a patient hygiene room under routine departmental function.

- nonporous, scrubbable, nonadsorptive, nonperforated surfaces.
 - (ii) The floor of the decontamination room shall be self-coving to a height of 6 inches (15.24 centimeters).
 - (d) Special plumbing system requirements
 - (i) The room shall be equipped with two hand-held shower heads with temperature controls and a floor drain. A dedicated holding tank shall be provided if required by the local authorities.
 - (ii) Fixtures shall be acid resistant.
 - (iii) Portable or hard-piped oxygen shall be provided. Portable suction shall also be available.
 - (e) This section does not preclude decontamination capability at other locations or entrances immediately adjacent to the emergency department.
- (10) Fast-track area. If the functional program includes a fast-track area, it shall meet the following requirements:
- (a) Space requirements
 - (i) Examination/treatment areas shall have a minimum clear floor area of 100 square feet (9.29 square meters).
 - (ii) A separate treatment/procedure room with a minimum clear floor area of 120 square feet (11.15 square meters) shall be provided.
 - (b) Examination/treatment areas shall include the following:
 - (i) Hand-washing stations
 - (ii) Vacuum, oxygen, and medical air outlets
 - (iii) Examination lights
 - (c) At least one examination/treatment room shall be designated for pelvic examinations.

- (d) A fast-track area shall include space for a physician/nurse work station.
- (e) Storage areas for supplies and medication shall be included.

2.2-3.1.3.7 Patient toilet room. A minimum of one patient toilet room per eight treatment rooms or fewer and for each fraction thereof shall be provided, with hand-washing station(s) in each toilet room.

2.2-3.1.4 Special Patient Care Areas

2.2-3.1.4.1 Reserved

2.2-3.1.4.2 Airborne infection isolation (AII) room

- (1) At least one AII room shall be included as part of each initial emergency care service and each definitive emergency care service as described in 2.1-2.4.2.1 (3) (Location), 2.1-2.4.2.4 (1) (Architectural details), 2.1-8.2.2.1 (HVAC requirements for AII rooms), and Part 6 (ASHRAE 170).
- (2) The need for additional AII rooms or for protective environment rooms as described in 2.2-2.2.4.4 shall be determined by an ICRA.

***2.2-3.1.4.3 Observation unit.** If required by the functional program, an observation unit for patients requiring observation up to 23 hours shall be provided in accordance with the following requirements:

- (1) The size of the unit shall depend on the patient acuity mix and projected use of the unit.
- (2) Space requirements
 - (a) A patient cubicle with a minimum clear floor area of 100 square feet (9.29 square meters) shall be provided.
 - (b) If a patient room is used, it shall have a minimum clear floor area of 120 square feet (11.15 square meters).

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A2.2-3.1.4.3 Chest pain center. Emergency care may include a chest pain center. Detailed criteria for chest pain center implementation and management, including functional facility design, are specified in the *Accreditation Manual* of the Society of Chest Pain Centers (www.sccp.org).

Where a chest pain observation unit is incorporated into an emer-

gency department, the facility requirements must include at least one dedicated observation space of at least 120 square feet (11.4 square meters). This space must accommodate family support and have toilet facilities within close proximity. Further attention must be focused on assurance of control over lighting and noise levels as well as rapid access to stress testing, MRI and CT services, nuclear medicine, and surgery.

2.2 SPECIFIC REQUIREMENTS FOR GENERAL HOSPITALS

- (c) Each patient bed area shall have space at bedside for visitors.
- (3) Patient privacy. Each patient bed area shall have provision for visual privacy from casual observation by other patients and visitors.
- (4) A centralized nurse station shall be provided.
- (5) Nurse call and monitoring capability shall be available as determined by the functional program.
- (6) Hand-washing station
 - (a) A hand-washing station shall be provided for each four or fewer observation cubicles and for each major fraction thereof.
 - (b) Hand-washing stations shall be convenient to nurse stations and patient bed areas.
- (7) Toilet room. One toilet room shall be provided for each eight observation cubicles or fewer and for each major fraction thereof.
- (8) Shower room. One shower room shall be provided for each sixteen treatment cubicles or major fraction thereof; the shower room and toilet room may be combined into the same room.
- (9) Nourishment area. A nourishment area that may be shared shall be provided in accordance with Section 2.1-2.6.7.
- (10) Storage space for medical supplies shall be provided under staff control.
- (11) X-ray illuminators and/or picture archiving and communications systems (PACS) shall be immediately accessible to the observation unit.

***2.2-3.1.4.4 Secure holding room.** When required by the functional program, a secure holding room that meets the following requirements shall be provided.

- (1) The location of the secure holding room(s) shall facilitate staff observation and monitoring of patients in these areas.
- (2) The secure holding room shall have a minimum clear floor area of 60 square feet (5.57 square

meters) with a minimum wall length of 7 feet (2.13 meters) and a maximum wall length of 11 feet (3.35 meters). The minimum ceiling height shall be 9 feet (2.74 meters).

- (3) This room shall be designed to prevent injury to patients:
 - (a) All finishes, light fixtures, vents and diffusers, and sprinklers shall be tamper resistant.
 - (b) There shall not be any electrical outlets, medical gas outlets, or similar devices.
 - (c) There shall be no sharp corners, edges, or protrusions, and the walls shall be free of objects or accessories of any kind.
 - (d) Patient room doors shall swing out and shall have hardware on the exterior side only. The minimum width of the door shall be 44 inches (1.12 meters).
 - (e) A small impact-resistant view panel or window shall be provided in the door for discreet staff observation of the patient.

2.2-3.1.5 Support Areas for Patient Care— General

For requirements, see 2.1-2.5.

2.2-3.1.6 Support Areas for Definitive Emergency Service Facilities

2.2-3.1.6.1 Administrative center or nurse station

- (1) An administrative center or nurse station for staff work and charting shall be provided in accordance with 2.1-2.6.1.
- (2) The administrative or nurse station shall include space for medication storage.
- (3) Nursing stations decentralized near clusters of treatment rooms shall be permitted.
- (4) Where feasible, visual observation of all traffic into the unit and of all patients shall be provided from the nursing station.

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A2.2-3.1.4.4 Secure holding room. Consideration should be given to the emergency department's procedures for providing care to patients with psychiatric conditions. Attention should be paid to the location

of secure holding rooms as well as to the methods used in monitoring patients in these areas (e.g. cameras, windows, etc.).

***2.2-3.1.6.2 Security station.** Where dictated by local needs, a security system shall be located near the emergency entrances and triage/reception area.

2.2-3.1.6.3 EMS communications center. If provided, the EMS communications center shall be permitted to be part of the staff work and charting area.

2.2-3.1.6.4 Reserved

2.2-3.1.6.5 Scrub stations. Scrub stations located in or adjacent and convenient to each trauma and/or orthopedic room.

2.2-3.1.6.6 Reserved

2.2-3.1.6.7 Reserved

2.2-3.1.6.8 Provisions for disposal of solid and liquid waste. This may be a clinical sink with bedpan flushing device within the soiled workroom.

2.2-3.1.6.9 Clean workroom or clean supply room. A clean workroom or clean supply room shall be provided in accordance with Section 2.1-2.6.9. If the area serves children, additional storage shall be provided to accommodate supplies and equipment in the range of sizes required for pediatrics.

***2.2-3.1.6.10 Soiled workroom or soiled holding room.** A soiled workroom or soiled holding room shall be provided in accordance with Section 2.1-2.6.10 for the exclusive use of the emergency service.

2.2-3.1.6.11 Equipment and supply storage

- (1) Wheelchair and stretcher storage. Storage for wheelchairs and stretchers for arriving patients shall be located out of traffic with convenient access from emergency entrances.
- (2) Emergency equipment storage. Sufficient space shall be provided for emergency equipment (e.g., a CPR cart, pumps, ventilators, patient monitoring equipment, and portable x-ray unit) in accordance with Section 2.1-2.6.11.4.

2.2-3.1.6.12 Environmental services room. An environmental services room shall be directly accessible from the unit and shall contain a service sink or floor receptor and provisions for storage of supplies and housekeeping equipment.

2.2-3.1.7 Support Areas for Staff in Definitive Emergency Care

2.2-3.1.7.1 Staff lounge. Convenient and private access to staff toilets, lounge, and lockers shall be provided.

2.2-3.1.7.2 Reserved

2.2-3.1.7.3 Staff storage facilities. Securable closets or cabinet compartments shall be provided for the personal effects of all on-duty staff. For requirements, see 2.1-2.7.3.

*2.2-3.1.8 Support Areas for Families, Patients, and Visitors in Definitive Emergency Care

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A2.2-3.1.6.2 A security station and/or system should be located to maximize visibility of the treatment areas, waiting areas, and key entrance sites.

- a. The system should include visual monitoring devices installed both internally in the emergency department as well as externally at entrance sites and parking lots.
- b. Special requirements for a security station should include accommodation for hospital security staff, local police officers, and monitoring equipment.
- c. Design consideration should include installation of silent alarms, panic buttons, and intercom systems, and physical barriers such as doors to patient entry areas.

d. The security monitoring system should be included on the hospital's emergency power backup system.

A2.2-3.1.6.10 Disposal space for regulated medical waste (e.g., gauzes/linens soaked with body fluids) should be separate from routine disposal space.

A2.2-3.1.8 Other space considerations. Provision of a patient hygiene room with shower and toilet facilities should be considered.

2.2-3.1.8.1 Bereavement room*2.2-3.2 Freestanding Emergency Care Facility****2.2-3.2.1 General****2.2-3.2.1.1 Definition**

- (1) “Freestanding emergency care facility” shall mean an extension of an existing hospital emergency department that is physically separate from (i.e., not located on the same campus as) the main hospital emergency department and that is intended to provide comprehensive emergency service.
- (2) A freestanding emergency care facility that does not provide 24-hour-a-day, seven-day-a-week operation or that is not capable of providing basic services as defined for hospital emergency departments shall not be classified as a freestanding emergency care facility and shall be described under other portions of this document.

2.2-3.2.1.2 Application. Except as noted in the following sections, the requirements for freestanding emergency service shall be the same as for hospital emergency service as described in Section 2.2-3.1 (Emergency Service).

2.2-3.2.2 Facility Requirements

2.2-3.2.2.1 General. For requirements, see 2.2-3.1.1.

2.2-3.2.2.2 Initial emergency management. For requirements, see 2.2-3.1.2.

2.2-3.2.2.3 Definitive emergency care. For requirements, see 2.2-3.1.3.

2.2-3.2.2.4 Support areas. For requirements, see 2.2-3.1.5 through 2.2-3.1.7.

2.2-3.2.3 Additional Facility Requirements

The freestanding emergency care facility shall have the following capabilities and/or functions within the facility:

2.2-3.2.3.1 Diagnostic and treatment areas

- (1) Observation beds. At least one of these shall have full cardiac monitoring.
- (2) Diagnostic imaging. This shall include radiography and fluoroscopy.

2.2-3.2.3.2 Patient support services

- (1) Laboratory. These facilities shall accommodate those functions described in 2.2-4.1 (Laboratory Services).
- (2) Pharmacy
- (3) Dietary facilities. Provision for serving patient and staff meals shall be provided. A kitchen or a satellite serving facility shall be permitted.

2.2-3.2.3.3 General support services and facilities.

Support services and functions shall include environmental services, laundry, general stores, maintenance and plant operations, and security.

***2.2-3.3 Surgical Services**

are appropriate for Class B and Class C facilities.

Class B: Provides for minor or major surgical procedures performed in conjunction with oral, parenteral, or intravenous sedation or under analgesic or dissociative drugs.

Class C: Provides for major surgical procedures that require general or regional block anesthesia and support of vital bodily functions.

- a. When invasive procedures are performed on patients known or suspected to have pulmonary tuberculosis, these procedures should not be performed in the operating suite. They should be performed in a room meeting airborne infection isolation room ventilation requirements or in a space using local exhaust ventilation. If the procedure must be performed in the operating suite, see the “CDC Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health Care Facilities.”

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A2.2-3.1.8.1 At least one bereavement room should be provided. This room should be accessible from both the emergency treatment corridor and the emergency waiting area. This room should be comfortable enough to provide respite to the bereaved family and should be equipped with a sound transmission coefficient equivalent to 65 for the walls and 45 for the floors and ceiling.

A2.2-3.3 Surgical Service

- a. The size and location of the surgical procedure rooms shall be determined by the level of care to be provided. The levels of care as defined by the American College of Surgeons are as follows:

Class A: Provides for minor surgical procedures performed under topical, local, or regional anesthesia without pre-operative sedation. Excluded are intravenous, spinal, and epidural routes; these methods

2.2-3.3.1 General

2.2-3.3.1.1 Application

- (1) Additions to, and adaptations of, the following elements shall be made for the special procedure operating rooms found in larger facilities.
- (2) The number of operating rooms and recovery beds and the sizes of the support areas shall be based on the expected surgical workload.

2.2-3.3.1.2 Location

- (1) The surgical suite shall be located and arranged to prevent nonrelated traffic through the suite.
- (2) The clinical practice setting shall be designed to facilitate movement of patients and personnel into, through, and out of defined areas within the surgical suite. Signs shall clearly indicate the surgical attire required.
- (3) An operating room suite design with a clean core shall provide for no cross-traffic of staff and supplies from the soiled/decontaminated areas to the sterile/clean areas. The use of facilities outside the operating room for soiled/decontaminated processing and clean assembly and sterile processing shall be designed to move the flow of goods and personnel from dirty to clean/sterile without compromising universal precautions or aseptic techniques in both departments.
- (4) The surgical suite shall be divided into three designated areas—unrestricted, semi-restricted, and restricted—defined by the physical activities performed in each area.

(a) Unrestricted area

- (i) The unrestricted area includes a central control point established to monitor the entrance of patients, personnel, and materials.
- (ii) Street clothes are permitted in this area and traffic is not limited.

(b) Semi-restricted area

- (i) The semi-restricted area includes the peripheral support areas of the surgical suite. It has storage areas for clean and

sterile supplies, work areas for storage and processing of instruments, scrub sink areas, and corridors leading to the restricted areas of the surgical suite.

- (ii) Traffic in this area is limited to authorized personnel and patients. Personnel are required to wear surgical attire and cover all head and facial hair.

(c) Restricted area

- (i) The restricted area includes operating and procedure rooms and the clean core.
- (ii) Surgical attire and hair coverings are required. Masks are required where open sterile supplies or scrubbed persons may be located.

2.2-3.3.1.3 Provisions for outpatient surgery.

In the functional program, the size, location, and configuration of the surgical suite and support areas shall reflect the projected volume of outpatients. This may be achieved by designing either an outpatient surgery facility or a combined inpatient/outpatient surgical suite.

- (1) Hospital surgical suite. Where outpatient surgery is provided in the surgical suite of the hospital facility, it shall comply with the requirements of 2.2-3.3 (Surgical Services) and the requirements for outpatient surgery in 2.2-3.3.3.4 (Phase II recovery) and 2.2-3.3.8.1 (Patient clothing change areas).
- (2) Separate hospital unit or outpatient surgical facility. Where outpatient surgery and post-anesthetic care is provided in a separate unit of the hospital facility or in a separate outpatient surgical facility, it shall comply with the requirements for outpatient surgery in Chapter 3.7.

2.2-3.3.2 Operating and Procedure Rooms

2.2-3.3.2.1 General operating room

(1) Space requirements

- (a) Each operating room shall have a minimum clear floor area of 400 square feet (37.16 square meters) with a minimum clear dimension of 20 feet (6.10 meters) between fixed cabinets and built-in shelves.

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- (b) Where a general operating room is also used for cesarean and other delivery procedures, space for infant resuscitation shall be provided as required in 2.2-2.11.9.2 (1).
 - *(c) Renovation. Where renovation work is undertaken, every effort shall be made to meet the above minimum standards. If it is not possible to meet the above square-footage standards, each room shall have a minimum clear floor area of 360 square feet (33.45 square meters) with a minimum clear dimension of 18 feet (5.49 meters) between fixed cabinets and built-in shelves.
- (2) Communication system. Each room shall have a system for emergency communication with the surgical suite control station.
 - (3) X-ray viewers. X-ray film viewers for handling at least four films simultaneously or digital image viewers shall be provided.
 - (4) Architectural details. Operating room perimeter walls, ceiling, and floors, including penetrations, shall be sealed. (See Glossary.)

2.2-3.3.2.2 Room for surgical procedures that require additional personnel and/or large equipment (e.g., some cardiovascular, orthopedic, and neurological procedures)

- (1) Space requirements
 - (a) When included, these room(s) shall have, in addition to the above requirements for general operating rooms, a minimum clear floor area of 600 square feet (55.74 square meters) with a minimum clear dimension of 20 feet (6.10 meters).
 - (b) Renovation. Where renovation work is undertaken, every effort shall be made to meet the above minimum standards. If it is not possible to meet the above square-footage standards, the following standards shall be met:
 - (i) Orthopedic surgical rooms shall have a

minimum clear floor area of 360 square feet (33.45 square meters) with a minimum clear dimension of 18 feet (5.49 meters).

- (ii) Rooms for cardiovascular, neurological, and other special procedures shall have a minimum clear floor area of 400 square feet (37.16 square meters).
- (2) Pump room. Where open-heart surgery is performed, an additional room in the restricted area of the surgical suite, preferably adjoining this operating room, shall be designated as a pump room where extra corporeal pump(s), supplies, and accessories are stored and serviced.
 - (3) Equipment storage rooms. Where complex orthopedic and neurosurgical surgery is performed, additional rooms shall be in the semi-restricted area of the surgical suite, preferably adjoining the specialty operating rooms, which shall be designated as equipment storage rooms for the large equipment used to support these procedures.
 - (4) Plumbing and electrical connections. Appropriate plumbing and electrical connections shall be provided in the cardiovascular, orthopedic, neurosurgical, pump, and storage rooms.

2.2-3.3.2.3 Additional requirements for orthopedic surgery

- (1) Equipment storage. Where included, this room shall, in addition to the above requirements, have enclosed storage space for splints and traction equipment. Storage may be outside the operating room but must be conveniently located.
- (2) Plaster trap. If a sink is used for the disposal of plaster of paris, a plaster trap shall be provided.

2.2-3.3.2.4 Room for surgical cystoscopic and other endourologic procedures

- (1) Space requirements
 - (a) This room shall have a minimum clear floor

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A2.2-3.3.2.1 (1)(c) The functional program may require additional clear space, plumbing, and mechanical facilities to accommodate special functions in one or more of these rooms. When existing functioning

operating rooms are modified, and it is impractical to increase the square footage because of walls or structural members, the operating room may continue in use when requested by the hospital.

area of 350 square feet (32.52 square meters) with a minimum clear dimension of 15 feet (4.57 meters) between fixed cabinets and built-in shelves.

- (b) In renovation projects, rooms for surgical cystoscopy shall be permitted to have a minimum clear floor area of 250 square feet (23.23 square meters).
- (2) X-ray viewing capability to accommodate at least four films simultaneously shall be provided.

2.2-3.3.2.5 Endoscopy suite. For requirements, see Chapter 3.9, Endoscopy Facilities.

2.2-3.3.2.6 Intraoperative MRI room. Intraoperative MRI rooms in the surgical suite shall meet the requirements for space, shielding, and protection from the magnetic field and for limited access that apply to MRI facilities in the radiology suite. For further requirements, see 2.2-3.4.4 (Magnetic Resonance Imaging).

2.2-3.3.3 Pre- and Postoperative Patient Care Areas

2.2-3.3.3.1 General

- (1) Bariatric accommodations
 - * (a) If required by the functional program, bariatric accommodations shall be provided in the surgical prep and recovery areas.
 - (b) All facilities that perform diagnostic testing and treatment for bariatric patients shall provide adequate accommodations for these patients.

2.2-3.3.3.2 Preoperative patient care area. In facilities with two or more operating rooms, area(s) shall be provided to accommodate stretcher patients as well as sitting space for ambulatory patients.

- (1) Location. This area shall be under the direct visual control of the nursing staff and may be part of the recovery suite to achieve maximum flexibility in managing surgical caseloads.
- (2) Space requirements. Where patient cubicles are used, the following space requirements shall be met:
 - (a) Area. Each patient cubicle shall have a minimum clear floor area of 80 square feet (7.43 square meters), with space for additional equipment described in the functional program.
 - (b) Clearances
 - (i) Each patient cubicle shall have a minimum clear dimension of 5 feet (1.52 meters) between the sides of patient beds and 4 feet (1.22 meters) between the sides of patient beds and adjacent walls or partitions.
 - (ii) Each cubicle shall have a minimum clear dimension of at least 3 feet (91.44 centimeters) between the foot of the bed and the cubicle curtain or wall.
- (3) Patient privacy. Provisions such as cubicle curtains shall be made for patient privacy.
- (4) Provisions shall be made for the isolation of infectious patients.
- (5) An airborne infection isolation room is not required in a preoperative holding area. Provisions

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A2.2-3.3.3.1 (1)(a) Bariatric accommodations in pre- and post-operative holding areas

- a. A preoperative/postoperative area to specifically accommodate bariatric patients should be provided.
 - (1) Number. The number of spaces provided should be as determined by the functional program.
 - (2) Clearances. A minimum clear dimension of 5 feet (1.52 meters) should be provided on three sides of the stretcher/bed.
- b. Patient lift equipment. Accommodations for patient lift and transport should be provided whether by an overhead lifting system or a portable lifting assist. These devices should be designed to accommodate a weight of not less than 800 pounds.
 - c. Specific storage requirements for a bariatric treatment room. To accommodate a bariatric patient, a portable lift (9.8 square feet or 0.91 square meter), a walker (3.88 square feet or 0.36 square meter), a wheelchair (11.3 square feet or 1.05 square meters), and a portable commode (5 square feet or 0.46 square meter) are needed. All of these should have bariatric capabilities.
 - (1) Where a portable lift is used, the minimum storage per bariatric patient treatment bed should be 35 square feet (3.25 square meters).
 - (2) Where rooms are provided with a ceiling lift system, the minimum storage required should be 25.2 square feet (2.34 square meters).

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for the recovery of a potentially infectious patient with an airborne infection shall be determined by an ICRA.

*2.2-3.3.3.3 Post-anesthetic care unit (PACU)

(1) Space requirements

- (a) Area. The design shall provide a minimum clear floor area of 80 square feet (7.43 square meters) for each patient bed with space for additional equipment described in the functional program.
 - (b) Clearances. A minimum clear dimension of 5 feet (1.52 meters) shall be provided between the sides of patient beds and 4 feet (1.22 meters) between the sides of patient beds and adjacent walls or partitions.
- (2) In new construction, at least one door to the recovery room shall provide access directly from the surgical suite without crossing public hospital corridors.
 - (3) Patient privacy. Provisions for patient privacy such as cubicle curtains shall be made.
 - (4) Each PACU shall contain the following:
 - (a) A medication station
 - (b) Hand-washing stations. At least one hand-washing station with hands-free or wrist-blade operable controls shall be available for every four beds, uniformly distributed to provide equal access from each bed.
 - (c) Nurse station with charting facilities
 - (d) Clinical sink
 - (e) Provisions for bedpan cleaning
 - (f) Storage space for stretchers, supplies, and equipment
 - (g) Staff toilet. A staff toilet shall be located within the working area to maintain staff availability to patients.
 - (5) Provisions shall be made for the isolation of infectious patients.
 - (6) An airborne infection isolation room (AIIR) is not required in a PACU. Provisions for the recovery

of a potentially infectious patient with an airborne infection shall be determined by an ICRA.

2.2-3.3.3.4 Phase II recovery

(1) General

- (a) Where outpatient surgeries are to be part of the surgical suite, and where outpatients receive sedation, a separate Phase II or step-down recovery room shall be provided.
- (b) In new construction, at least one door shall access the PACU without crossing unrestricted corridors of the hospital.

(2) Space requirements

(a) Area

- (i) Where patient cubicles are used, the design shall provide a minimum of 50 square feet (4.65 square meters) for each patient in a lounge chair or stretcher, with space for additional equipment described in the functional program.
- (ii) Where permanent partitions (full or partial height or width) are used to define the patient care station, each station shall have a minimum clear floor area of 80 square feet (7.43 square meters).
- (iii) In single-bed rooms, a minimum clear floor area of 100 square feet (9.29 square meters) shall be provided.

- (b) Clearances. A minimum clear dimension of 4 feet (1.22 meters) shall be provided between the sides of lounge chairs/stretchers and 3 feet (91.44 centimeters) between walls or partitions and the sides and/or foot of lounge chairs/stretchers.

- (3) Patient privacy. Provisions for patient privacy such as cubicle curtains shall be made.

- (4) The Phase II recovery room shall contain the following:

- (a) Hand-washing stations

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A2.2-3.3.3.3 Separate and additional recovery space may be necessary to accommodate patients. If children receive care, recovery space

should be provided for pediatric patients and the layout of the surgical suite should facilitate the presence of parents in the PACU.

- (i) A hand-washing station shall be provided in each room.
 - (ii) At least one hand-washing station with hands-free operable controls shall be provided for every four lounge chairs, uniformly distributed to provide equal access from each lounge chair.
- (b) Toilet rooms
- (i) Staff toilet. A staff toilet shall be provided with direct access to the working area to maintain staff availability to patients.
 - (ii) Patient toilet. A patient toilet shall be provided with direct access to the Phase II recovery unit for the exclusive use of patients. Additional toilets shall be provided at the ratio of one patient toilet for each eight lounge chairs or fewer and for each major fraction thereof.
- (c) A nurse station with charting facilities
 - (d) A clinical sink
 - (e) Provision for bedpan cleaning
 - (f) Storage space for supplies and equipment
- (5) Provisions shall be made for the isolation of infectious patients.
- (6) An airborne infection isolation room is not required in a Phase II recovery area. Provisions for the recovery of a potentially infectious patient with an airborne infection shall be determined by an ICRA.

2.2-3.3.4 Reserved

2.2-3.3.5 Support Areas for Patient Care—General

2.2-3.3.5.1 For general requirements, see 2.1-2.5.

2.2-3.3.5.2 Support areas, except for the enclosed soiled workroom mentioned in 2.2-3.3.6.9 and the environmental services room in 2.2-3.3.6.12, shall be permitted to be shared with the obstetrical facilities in accordance with the functional program.

2.2-3.3.5.3 Support areas, where shared with delivery rooms, shall be designed to avoid the passing of patients or staff between the operating room and the delivery room areas. The following support areas shall be provided:

2.2-3.3.6 Support Areas for the Surgical Suite

2.2-3.3.6.1 **A control station.** This shall be located to permit visual observation of all traffic into the suite.

2.2-3.3.6.2 **Documentation area.** The dictation and report preparation area may be accessible from the lounge area.

2.2-3.3.6.3 **A supervisor office or station.** The number of offices, stations, and teaching areas in the surgical suite shall depend upon the functional program.

2.2-3.3.6.4 Reserved

2.2-3.3.6.5 Scrub facilities

- (1) Two scrub positions shall be provided near the entrance to each operating room, located within the semi-restricted area of the surgical suite.
- (2) Two scrub positions may serve two operating rooms if both positions are adjacent to the entrance of each operating room.
- (3) Scrub facilities shall be arranged to minimize incidental splatter on nearby personnel, medical equipment, or supply carts.
- (4) The scrub sinks shall be recessed into an alcove out of main traffic areas.

2.2-3.3.6.6 **Medication station.** Provision shall be made for storage and distribution of drugs and routine medications in accordance with 2.1-2.6.6 (Medication Dispensing Location).

2.2-3.3.6.7 Reserved

2.2-3.3.6.8 **Ice-making equipment.** An ice machine shall be provided in accordance with 2.1-2.6.8.

2.2-3.3.6.9 **Clean workroom or clean supply room.** Soiled and clean workrooms or holding rooms shall be separated.

- (1) General
 - (a) Storage space for sterile and clean supplies shall be sized to meet the functional program.
 - (b) This storage space shall be moisture and temperature controlled and free from cross-traffic.

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- (c) The clean workroom or supply room shall not be used for food preparation.
- (2) Clean workroom. A clean workroom shall be provided when clean materials are assembled within the surgical suite prior to use or following the decontamination cycle.
 - (a) The clean workroom shall contain the following:
 - (i) A work counter
 - (ii) A hand-washing station
 - (iii) Storage facilities for clean supplies
 - (iv) A space to package reusable items
 - (b) The storage for sterile supplies shall be separated from this space.
- (3) Clean supply room. If the room is used only for storage and holding as part of a system for distribution of clean and sterile supply materials, omission of the work counter and hand-washing station shall be permitted.

2.2-3.3.6.10 Soiled workroom or holding room.

Soiled and clean workrooms or holding rooms shall be separated.

- (1) General
 - (a) An enclosed soiled workroom (or soiled holding room that is part of a system for the collection and disposal of soiled material) shall be provided for the exclusive use of the surgical suite.
 - (b) The room shall be located in the semi-restricted area.
 - (c) The room shall not have direct connection with operating rooms or other sterile activity rooms.
- (2) Soiled workroom. The soiled workroom shall contain the following:
 - (a) A flushing-rim clinical sink or equivalent flushing-rim fixture
 - (b) A hand-washing station

- (c) A work counter
- (d) Space for waste receptacles and soiled linen receptacles

- (3) Soiled holding room. Omission of the flushing-rim clinical sink and work counters shall be permitted in rooms used only for temporary holding of soiled material. However, if the flushing-rim clinical sink is omitted, other provisions for disposal of liquid waste shall be provided.

***2.2-3.3.6.11 Equipment and supply storage.** Storage room(s) shall be provided for equipment and supplies used in the surgical suite.

- (1) Each surgical suite shall provide sufficient storage area to keep its required corridor width free of equipment and supplies, but not less than 300 square feet (27.87 square meters) or 50 square feet (4.65 square meters) per operating room, whichever is greater.
- (2) Storage areas shall be provided for portable x-ray equipment, stretchers, fracture tables, warming devices, auxiliary lamps, etc. These areas shall be out of corridors and traffic.
- (3) Medical gas storage. Main storage of medical gases may be outside or inside the facility in accordance with NFPA 99. Provision shall be made for additional separate storage of reserve gas cylinders necessary to complete at least one day's procedures.

2.2-3.3.6.12 Environmental services facilities.

Environmental services facilities shall be provided for the exclusive use of the surgical suite. They shall be directly accessible from the suite and shall contain a service sink or floor receptor and provisions for storage of supplies and housekeeping equipment.

2.2-3.3.6.13 Examination and treatment area. Provisions shall be made for patient examination, interviews, preparation, testing, and obtaining vital signs of patients for outpatient surgery.

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A2.2-3.3.6.11 Equipment storage room(s) for equipment and supplies used in the surgical suite should be strategically located and sized

for convenient access and utilization. In larger surgical suites, storage spaces should be located for ready access to specialty rooms.

***2.2-3.3.6.14 A substerile room.** If the functional program requires emergent sterilization, a room(s) for this purpose shall be provided in the surgery suite. Facilities for processing and sterilizing reusable instruments, etc., are typically located in another hospital department, such as central services.

- (1) This substerile room shall be either accessible from the operating room(s) it serves or shall be located inside the clean core if the clean core is directly accessible from the operating room(s). This room shall be able to be accessed without traveling through any operating rooms.
- (2) This room shall be equipped with the following:
 - (a) A steam sterilizer as described in the functional program
 - (b) A countertop
 - (c) Built-in storage for supplies

2.2-3.3.6.15 Anesthesia workroom. An anesthesia workroom for cleaning, testing, and storing anesthesia equipment shall be provided.

- (1) This room shall contain work counter(s) and sink(s) and racks for cylinders.
- (2) Provisions shall be made for separate storage of clean and soiled items.
- (3) In new construction, depending on the functional and space programs, the anesthesia workroom shall provide space for anesthesia case carts and other anesthesia equipment.

2.2-3.3.6.16 Storage for blood, organs, and pathological specimens

- (1) Provisions for refrigerated blood bank storage that meets the standards of the American Blood Banking Association shall be provided.

- (2) Where applicable, refrigeration facilities for harvested organs shall be provided.
- (3) Provisions for storage of pathological specimens prior to transfer to pathology section shall be provided.

2.2-3.3.6.17 Area for preparation and examination of frozen sections. This area may be part of the general laboratory if immediate results are obtainable without unnecessary delay in the completion of surgery.

2.2-3.3.7 Support Areas for Staff

2.2-3.3.7.1 Staff lounge and toilet facilities

- (1) Separate or combined lounges shall be provided for male and female staff.
- (2) Lounge(s) shall be designed to minimize the need to leave the suite and to provide convenient access to the recovery room.

2.2-3.3.7.2 Staff clothing change areas. Appropriate areas shall be provided for male and female personnel (orderlies, technicians, nurses, and doctors) working within the surgical suite.

- (1) Staff clothing change areas shall contain the following:
 - (a) Lockers
 - (b) Showers
 - (c) Toilets
 - (d) Hand-washing stations
 - (e) Space for donning surgical attire
- (2) These areas shall be designed to provide a one-way traffic pattern so that personnel entering from outside the surgical suite can change and move directly into the surgical suite.

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A2.2-3.3.6.14 Substerile service room(s)

- a. These facilities may be located in central services if convenient.
- b. Additional space should be provided as the number of rooms served, amount and types of equipment, and/or the expected number of staff working in the room increases.
- c. Countertop and hand-washing requirements should address the need for various work functions to be performed in the room as described in the functional program.

- d. The requirement for a separate room can be waived if the required facilities are located near each other and adequate separation from other functions within the surgical suite is provided to avoid cross-contamination. Note that environmental contamination can result from airborne dust, droplet nuclei, and aerosols as well as physical contact. Therefore, provision of as much separation as possible between decontamination and inspection/assembly functions is recommended.

2.2-3.3.8 Support Areas for Outpatients

2.2-3.3.8.1 Patient clothing change areas. If the functional program defines outpatient surgery as part of the surgical suite, a separate area shall be provided where outpatients and same-day admission patients may change from street clothing into hospital gowns and be prepared for surgery.

- (1) A patient clothing change area shall include the following:
 - (a) A waiting room
 - (b) Locker(s)
 - (c) Toilet(s)
 - (d) Clothing change or gowning area
- (2) Where private holding room(s) or cubicle(s) are provided, a separate change area is not required.

2.2-3.4 Diagnostic Imaging Services

The diagnostic imaging department commonly provides procedures such as fluoroscopy, radiography, mammography, tomography, computerized tomography scanning, ultrasound, magnetic resonance, angiography, and similar techniques.

2.2-3.4.1 General

- *2.2-3.4.1.1 Application.** Equipment and space shall be as necessary to accommodate the functional program.
- *2.2-3.4.1.2 Location.** Beds and stretchers shall have ready access to and from other departments of the institution.

2.2-3.4.1.3 Radiation protection. Most imaging requires radiation protection. A certified physicist or other qualified expert representing the owner

or appropriate state agency shall specify the type, location, and amount of radiation protection to be installed in accordance with the final approved department layout and equipment selections.

- (1) Where protected alcoves with view windows are required, a minimum of 3 feet 6 inches (1.07 meters) shall be provided between the exposure control and the outside partition edge.
- (2) Radiation protection requirements shall be incorporated into the specifications and the building plans.

2.2-3.4.1.4 Special design elements

- (1) Floor. Floor shall be adequate to meet load requirements.
- (2) Ceiling. A lay-in type ceiling shall be permitted to be considered for ease of installation, service, and remodeling.

*2.2-3.4.2 Computerized Tomography (CT) Scanning

2.2-3.4.2.1 Space requirements. CT scan rooms shall be sized in compliance with manufacturers' recommendations for installation and maintenance.

- (1) The room shall be sized to allow a minimum clear dimension of 3 feet (91.44 centimeters) on three sides of the table for access to the patient and to facilitate transfer.
- (2) The door swing shall not encroach on the equipment, patient circulation, or transfer space.

2.2-3.4.2.2 Control room. A control room shall be provided that is designed to accommodate the computer and other controls for the equipment.

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A2.2-3.4.1.1 Space layouts should be developed in compliance with manufacturer's recommendations because area requirements may vary from machine to machine. Since technology changes frequently and from manufacturer to manufacturer, rooms can be sized larger to allow upgrading of equipment over time.

A2.2-3.4.1.2 Particular attention should be paid to the management of outpatients for preparation, holding, and observation. The emer-

gency, surgery, cystoscopy, and outpatient clinics should be accessible to the imaging suite. Imaging should be located on the ground floor, if practical, because of equipment ceiling height requirements, close proximity to electrical services, and expansion considerations.

A2.2-3.4.2 Based on the functional program, CT scan procedures that are interventional may be performed. In such cases, guidelines related to interventional imaging should apply if the intervention is performed in the CT scan room.

- (1) A view window shall be provided to permit full view of the patient.
- (2) The angle between the control and equipment centroid shall permit the control operator to see the patient's head.
- (3) The control room shall be located to allow convenient film processing.

2.2-3.4.2.3 Patient toilet. A patient toilet shall be provided. It shall be convenient to the procedure room and, if directly accessible to the scan room, arranged so a patient can leave the toilet without having to reenter the scan room.

2.2-3.4.3 Diagnostic X-Ray

***2.2-3.4.3.1 Space requirements.** Radiography rooms shall be of a size to accommodate the functional program.

***2.2-3.4.3.2 Tomography and radiography/fluoroscopic rooms.** Separate toilets with hand-washing stations shall be provided with direct access from each dedicated gastrointestinal fluoroscopic room and to an adjacent passage so that a patient can leave the toilet without having to reenter the fluoroscopic room.

*2.2-3.4.3.3 Mammography rooms

2.2-3.4.3.4 Shielded control alcove

- (1) Each x-ray room shall include a shielded control alcove. For mammography machines with built-in shielding for the operator, omission of the alcove

shall be permitted when approved by the certified physicist or state radiation protection agency.

- (2) This area shall be provided with a view window designed to provide full view of the examination table and the patient at all times, including full view of the patient when the table is in the tilt position or the chest x-ray is in use.

2.2-3.4.3.5 Hand-washing station. A hand-washing station shall be provided within the procedure room unless the room is used only for routine screening such as chest x-rays where the patient is not physically handled by the staff.

*2.2-3.4.4 Magnetic Resonance Imaging (MRI)

2.2-3.4.4.1 Space requirements

- (1) Space within the overall MRI suite shall be provided as necessary to accommodate the functional program and to meet the minimum technical siting requirements provided by the MRI equipment manufacturer.
- (2) MRI suites as well as spaces around, above, and below (as applicable) shall be designed and configured to facilitate adherence to U.S. Food and Drug Administration requirements established to prevent unscreened individuals from entering the 5-gauss (0.5 millitesla) volume around the MRI equipment.
- * (3) The MRI scanner room shall be large enough to accommodate equipment and to allow clearance in accordance with manufacturers' recommendations.

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A2.2-3.4.3.1 Radiography rooms should be a minimum of 180 square feet (16.72 square meters). (Dedicated chest x-ray may be smaller.)

A2.2-3.4.3.2 Tomography and radiography/fluoroscopy (R&F) rooms should be a minimum of 250 square feet (23.23 square meters).

A2.2-3.4.3.3 Mammography rooms should be a minimum of 100 square feet (9.29 square meters).

A2.2-3.4.4 Cryogen storage in the MRI suite. Cryogen storage may be required in areas where service to replenish supplies is not readily available.

- a. If provided, the space should be a minimum of 50 square feet (4.65 square meters) to accommodate two large dewars of cryogen.
- b. If provided, cryogen storage areas should be designed and constructed to protect occupants from pressure, thermal, and asphyxiation risks that arise from discharge of cryogenic gases.

A2.2-3.4.4.1 (3) If anesthesia support is anticipated, additional space, electrical outlets, and gas lines may be required.

2.2-3.4.4.2 Design configuration of the MRI suite

- (1) Suites for MRI equipment shall be planned to conform to the four-zone screening and access control protocols identified in the American College of Radiology's "Guidance Document for Safe MR Practices."
- (2) The layout shall include provisions for the following functions:
 - (a) Patient interviews and clinical screening
 - (b) Physical screening and changing areas (as indicated)
 - (c) Siting of ferromagnetic detection systems
 - (d) Access control
 - (e) Accommodation of site-specific clinical and operational requirements
- (3) An anteroom visible from the control room shall be located outside the MRI scanner room so that patients, health care personnel, and other employees must pass through it before entering the scanning area and control room. This room shall be outside the restricted areas of the MRI's magnetic field.
- * (4) Any area in which the magnetic field strength is equal to or greater than 5 gauss (0.5 millitesla) shall be physically restricted by the use of key locks or pass-key locking systems.

***2.2-3.4.4.3 Control room**

- (1) A control room shall be provided with a full view of the patient within the MRI scanner.
- (2) The control console shall be positioned so the operator has a full view of the approach and entrance to the MRI scanner room.

2.2-3.4.4.4 Hand-washing station. Hand-washing stations shall be provided convenient to the MRI scanner room, but need not be within the room.

***2.2-3.4.4.5 Patient preparation, holding, and recovery area or room.** This shall comply with Section 2.2-3.5.6.2, requirements for the same area or room under Section 2.2-3.5 (Interventional Imaging Services).

***2.2-3.4.4.6 Computer room.** A computer room shall be provided.

2.2-3.4.4.7 Equipment installation requirements

- * (1) Power conditioning shall be provided as indicated by the MRI manufacturer's power requirements and specific facility conditions.
- * (2) Magnetic shielding shall be provided at those sites where magnetic field hazards or interferences cannot be adequately controlled through facility planning.

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A2.2-3.4.4.2 (4) A risk of injury or death is posed by the penetration of areas in which the magnetic field strength is equal to or greater than 5 gauss by unscreened persons or ferromagnetic objects or equipment.

A2.2-3.4.4.3 Control rooms should be a minimum of 100 square feet (9.29 square meters), but may be larger depending on the vendor and magnet size.

A2.2-3.4.4.5 When patient holding areas are provided, they should be located near the MRI unit and should be large enough to accommodate stretcher(s). When anesthesia/sedation is provided, monitored induction/recovery areas with appropriate medical gas services should be provided (these areas may be incorporated with patient holding). All MRI providers should designate a code treatment area outside the MRI room.

A2.2-3.4.4.6 A computer room may range from 150 square feet (13.94 square meters) to 380 square feet (35.30 square meters) depending on the vendor and magnet strength. Self-contained air conditioning supplement is normally required.

A2.2-3.4.4.7 (1) Power conditioning and voltage regulation equipment as well as direct current (DC) may be required.

A2.2-3.4.4.7 (2) Magnetic shielding can often be avoided in new construction when suite design and planning are employed to mitigate magnetic field hazards. Magnetic shielding is not required for MRI equipment operation.

Magnetic shielding may be required to restrict the magnetic field plot. Radio frequency shielding may be required to attenuate stray radio frequencies. The area around, above and below the MRI suite shall be reviewed and evaluated for the following:

Possible occupancy by person(s) who could have pacemakers or other metal implants.

Equipment that can be disrupted by a magnetic field. Examples include but are not limited to personal computers, monitors, CT scanners, and nuclear cameras.

After reviewing and evaluating the surrounding space, appropriate magnetic shielding should be provided based upon the type of MRI scanner to be installed.

- (3) For super-conducting MRI equipment, cryogen venting, emergency exhaust, and passive pressure relief systems shall be provided in accordance with the original equipment manufacturer's specifications.

2.2-3.4.4.8 Special design elements for the MRI scanner room

- (1) General. Use of ferromagnetic materials that may interfere with the operation of the MRI scanner shall be avoided or minimized in MRI scanner rooms.
- (2) Architectural details
- The floor structure shall be designed to support the weight of MRI scanner equipment and to prevent disruptive environmental vibrations. Floor loading along the pathway required for equipment removal and replacement shall also be considered.
 - Wall, floor, and ceiling assemblies shall accommodate the installation of required radio frequency (RF)-shielded assemblies. All doors, windows, and penetrations into the RF-shielded enclosure shall be RF-shielded.
 - In addition to RF shielding, individual sites may also require magnetic shielding on some or all surfaces to contain portions of the magnetic field not contained by the RF shield.
 - A knock-out panel or roof hatch is recommended for delivery and removal of the MRI scanner.
 - MRI rooms shall be marked with a lighted sign with a red light to indicate when the magnet is on.
- (3) Surfaces, fixtures, and equipment
- Because of the dangers of magnetic fields, servicing finishes, fixtures, and equipment within the MRI scanner room is potentially hazardous. Finishes, fixtures, and equipment should be selected to minimize the need for maintenance and servicing.
 - Facilities may wish to use finishes or markings to identify the critical values of the magnetic field surrounding the MRI scanner, including the 5-gauss exclusion zone or other magnetic

field strength values that may impair the operation of equipment.

- (c) Because MRI scanners are increasingly being used as an interventional platform for image-guided biopsies and procedures, changes in infection control provisions, equipment, and finishes brought about by changes in clinical use shall be considered.

- (3) Ventilation requirements. An insulated cryogen quench exhaust pipe as well as room exhaust and pressure equalization shall be provided where superconducting MRI scanners are installed to protect occupants in the event of a cryogen breach.

2.2-3.4.5 Ultrasound

2.2-3.4.5.1 Space requirements. Space shall be provided as necessary to accommodate the functional program.

- Area. Rooms used for ultrasound examination/treatment shall have a minimum clear floor area of 120 square feet (11.15 square meters).
- Clearances. A minimum clear dimension of 3 feet (91.44 centimeters) shall be provided on three sides of the table/stretchers.

2.2-3.4.5.2 Hand-washing station. A hand-washing station shall be provided within the procedure room.

2.2-3.4.5.3 Patient toilet

- A patient toilet, directly accessible from the procedure room, shall be provided.
- The patient toilet shall be permitted to serve more than one procedure room.

2.2-3.4.6 Support Areas for Diagnostic Imaging Services

The spaces included in this section are common to the diagnostic imaging department and are minimum requirements unless stated otherwise.

2.2-3.4.6.1 Control desk and reception area

2.2-3.4.6.2 Offices for radiologist(s) and assistant(s). Offices shall include provisions for viewing, individual consultation, and charting of film.

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2.2-3.4.6.3 Consultation area. An appropriate area for individual consultation with referring clinicians shall be provided.

2.2-3.4.6.4 Patient holding area. A convenient holding area under staff control shall be provided to accommodate inpatients on stretchers or beds.

2.2-3.4.6.5 Hand-washing stations. For requirements, see sections on specific imaging services.

2.2-3.4.6.6 Clerical offices/spaces. Office space shall be provided as necessary for the functional program.

2.2-3.4.6.7 Medication storage. Provision shall be made for locked storage of medications and drugs.

2.2-3.4.6.8 Reserved

2.2-3.4.6.9 Clean storage. Provision shall be made for the storage of clean supplies and linens. If conveniently located, storage shall be permitted to be shared with another department.

2.2-3.4.6.10 Soiled holding. Provision shall be made for soiled holding. Separate provisions for contaminated handling and holding shall be made. Hand-washing stations shall be provided.

2.2-3.4.6.11 Cleanup facilities. Provisions for cleanup shall be located within the suite for convenient access and use.

- (1) The facilities shall include service sink or floor receptacle as well as storage space for equipment and supplies.
- (2) If automatic film processors are used, a receptacle of adequate size with hot and cold water for cleaning the processor racks shall be provided.

2.2-3.4.6.12 Film processing room

- (1) If film systems are used, a darkroom shall be provided for processing film unless the processing equipment normally used does not require a darkroom for loading and transfer. When daylight processing is used, the darkroom shall be permitted to be minimal for emergency and special uses.

- (2) Film processing shall be located convenient to the procedure rooms and to the quality control area.

2.2-3.4.6.13 Quality control area. An area or room shall be provided near the processor for viewing film immediately after it is processed. All view boxes shall be illuminated to provide light of the same color value and intensity for appropriate comparison of several adjacent films.

2.2-3.4.6.14 Contrast media preparation

- (1) If contrast media are used, this area shall include a sink, counter, and storage to allow for mixing of contrast media.
- (2) One preparation room, if conveniently located, shall be permitted to serve any number of rooms.
- (3) Where pre-prepared media are used, this area shall be permitted to be omitted, but storage shall be provided for the media.

2.2-3.4.6.15 Image storage

- (1) Image storage (active). Where digital systems are used, space shall be provided for image storage within the institution or off site. Where film is used, a room with cabinet or shelves for filing patient film for immediate retrieval shall be provided.
- (2) Image storage (inactive). A room or area for inactive image storage shall be provided. It shall be permitted to be outside the imaging suite, but must be under the administrative control of the imaging staff and properly secured to protect films against loss or damage.
- (3) Storage for unexposed film. If film systems are used, storage facilities for unexposed film shall include protection of film against exposure or damage and shall not be warmer than the air of adjacent occupied spaces.

2.2-3.4.7 Support Areas for Staff

The following spaces are common to the imaging department and are minimum requirements unless stated otherwise:

2.2-3.4.7.1 Staff lounge. Staff lounge with lockers shall be permitted to be outside the suite but shall be convenient for staff use.

2.2-3.4.7.2 Staff toilets. Toilets shall be permitted to be outside the suite but shall be convenient for staff use. In suites of three or more procedure rooms, toilets internal to the suite shall be provided.

2.2-3.4.8 Support Areas for Patients

The following spaces are common to the imaging department and are minimum requirements unless stated otherwise:

2.2-3.4.8.1 Patient waiting area

- (1) The area shall be out of traffic and under staff control.
- (2) The area shall have seating capacity in accordance with the functional program.
- (3) If the suite is routinely used for outpatients and inpatients at the same time, separate waiting areas shall be provided with screening for visual privacy between them.
- (4) If so determined by an ICRA, the diagnostic imaging waiting area shall require special measures to reduce the risk of airborne infection transmission. These measures shall include enhanced general ventilation and air disinfection techniques similar to inpatient requirements for airborne infection isolation rooms (see Part 6). See the “CDC Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health Care Facilities.”

2.2-3.4.8.2 Patient toilet rooms. Toilet rooms with hand-washing stations convenient to the waiting rooms shall be provided.

2.2-3.4.8.3 Patient dressing rooms. Dressing rooms shall be provided convenient to the waiting areas and x-ray rooms. Each room shall include a seat or bench, mirror, and provisions for hanging patients’ clothing and securing valuables.

2.2-3.5 Interventional Imaging Services

Interventional imaging provides diagnostic and therapeutic procedures such as cardiac catheterization, electrophysiology, interventional angiography, cardiac stenting, and implantation of devices.

2.2-3.5.1 General

2.2-3.5.1.1 Application. Equipment and space shall be provided for interventional imaging as necessary to accommodate the functional program.

2.2-3.5.1.2 Location. Required interventional imaging facilities shall be permitted to be in a freestanding unit, in the imaging suite, or in the interventional platform that includes the operating rooms.

2.2-3.5.2 Cardiac Catheterization Lab (Cardiology)

2.2-3.5.2.1 Location. The cardiac catheterization lab is normally a separate suite, but location in the imaging suite shall be permitted provided the appropriate sterile environment is provided. (See 2.2-3.3.1.2 [Location for surgical services] for guidance on the appropriate sterile environment.) Combination with angiography shall be permitted in low usage situations as identified by the functional program.

2.2-3.5.2.2 Space requirements

- (1) Procedure rooms
 - (a) The number of procedure rooms shall be based on expected utilization.
 - (b) The procedure room shall have a minimum clear floor area of 400 square feet (37.16 square meters).
- (2) Prep, holding, and recovery rooms. The size of the prep, holding, and recovery areas shall be based on expected utilization.

2.2-3.5.3 Electrophysiology Labs

2.2-3.5.3.1 If electrophysiology labs are also provided in accordance with the functional program, location of these labs shall be permitted within and integral to the catheterization suite or in a separate functional area proximate to the cardiac care unit.

2.2-3.5.3.2 These procedure rooms shall comply with all the requirements of 2.2-3.5.2 (Cardiac Catheterization Lab).

2.2-3.5.4 Reserved**2.2-3.5.5 Support Areas for Patient Care—General**

For requirements, see 2.1-2.5.

2.2-3.5.6 Support Areas for Interventional Imaging Services

2.2-3.5.6.1 Control room or area. A control room or area shall be provided.

- (1) The control room or area shall be large enough to contain and provide for the efficient functioning of the x-ray and image-recording equipment.
- (2) A view window permitting full view of the patient from the control console shall be provided.

2.2-3.5.6.2 Patient preparation, holding, and recovery area or room

- (1) A patient preparation, holding, and recovery area or room shall be provided and arranged to provide visual observation by staff before and after the procedure.
- (2) Area. Where patient cubicles are used in this area, each patient cubicle shall have a minimum clear floor area of 80 square feet (7.43 square meters).
- (3) Clearances. Each patient cubicle shall have a minimum clear dimension of 5 feet (1.52 meters) between patient beds and 4 feet (1.22 meters) between patient beds and adjacent walls.

2.2-3.5.6.3 Scrub facilities

- (1) Scrub facilities with hands-free operable controls shall be provided adjacent to and outside the entrance of procedure rooms.
- (2) Scrub facilities shall be arranged to minimize incidental splatter on nearby personnel, medical equipment, or supplies.

2.2-3.5.6.4 Viewing room. A viewing room shall be available for use by the interventional imaging suite.

2.2-3.5.6.5 Electrical equipment room. An equipment room or enclosure large enough to contain x-ray transformers, power modules, and associated electronics and electrical gear shall be provided.

2.2-3.5.6.6 Clean workroom or clean supply room.

A clean workroom or clean supply room shall be provided in accordance with Section 2.1-2.6.9.

2.2-3.5.6.7 Soiled workroom or soiled holding room. A soiled workroom shall be provided in accordance with Section 2.1-2.6.10.

2.2-3.5.6.8 Environmental services closet. An environmental services closet shall be provided in accordance with Section 2.1-2.6.12.

2.2-3.5.7 Support Areas for Staff

2.2-3.5.7.1 Staff clothing change area(s). Staff change area(s) shall be provided and arranged to ensure a traffic pattern so that personnel can enter from outside the suite, change their clothing, and move directly into the cardiac catheterization suite.

2.2-3.6 Nuclear Medicine Services**2.2-3.6.1 General**

2.2-3.6.1.1 Space shall be provided as necessary to accommodate the functional program.

2.2-3.6.1.2 Where the functional program calls for it, nuclear medicine procedure room(s) shall accommodate the equipment specified in the functional program as well as the following: stretcher, exercise equipment (treadmill and/or bicycle), and staff work space.

2.2-3.6.1.3 Space shall be adequate to permit entry of stretchers and beds and to accommodate imaging equipment, electronic consoles, and if present, computer terminals.

2.2-3.6.2 Radiopharmacy

If radiopharmaceutical preparation is performed on-site, an area adequate to house a radiopharmacy shall be provided with appropriate shielding.

2.2-3.6.2.1 Space requirements

- (1) This area shall include adequate space for storage of radionuclides, chemicals for preparation, dose calibrators, and record-keeping.

- (2) If pre-prepared materials are used, storage and calculation area may be considerably smaller than that for on-site preparation.
- (3) Space shall provide adequately for dose calibration, quality assurance, and record-keeping.

2.2-3.6.2.2 Radiation protection requirements. The area may still require shielding from other portions of the facilities.

2.2-3.6.2.3 Architectural details. Floors and walls shall be constructed of easily decontaminated materials.

2.2-3.6.2.4 HVAC system. Hoods for pharmaceutical preparation shall meet applicable standards.

2.2-3.6.3 Positron Emission Tomography (PET)

2.2-3.6.3.1 Space requirements. PET scanning is now widely used in a number of clinical settings and requires space for a scanner and a cyclotron when the service is provided. Space shall be provided as necessary to accommodate the functional program.

2.2-3.6.3.2 PET facilities

- (1) Scanner room
 - (a) The scanner room shall be of a size recommended by the scan vendor.
 - (b) A scanner room that accommodates both PET and CT scanning (PET-CT scanner room) shall be permitted. No additional space requirements are necessary when PET is combined with CT.
- (2) Cyclotron room. Where radiopharmaceuticals are prepared on site, a cyclotron shall be provided. A cyclotron is not needed when radiopharmaceuticals are provided by commercial sources.

- (a) If the PET cyclotron is self-shielded, a separate lead vault is not necessary. However, a self-shielded unit shall be sited away from patient waiting areas or other areas of high occupancy by personnel not working with the cyclotron.
- (b) An unshielded cyclotron requires a concrete vault that is 6 feet (1.83 meters) thick with an internal maze for reduction of neutron exposure. The cyclotron manufacturer shall be included in the team designing the vault.

2.2-3.6.3.3 Laboratory facilities

- (1) Hot lab
 - (a) The hot lab shall be shielded according to the manufacturer's specifications.
 - (b) A source storage area, a dose storage area, and a storage area for syringe shields shall be provided.

2.2-3.6.3.4 Patient holding and recovery area. A dedicated patient holding and recovery area shall be provided to accommodate at least two stretchers. This area shall comply with 2.2-3.5.6.2 (Patient preparation, holding, and recovery area or room).

2.2-3.6.3.5 Patient uptake room. A shielded room with a toilet to accommodate radioactive waste and a hand-washing station shall be provided.

2.2-3.6.4 Radiotherapy Suite

2.2-3.6.4.1 General. Rooms and spaces shall be provided as necessary to accommodate the functional program.

*2.2-3.6.4.2 Space requirements

- * (1) Simulator, accelerator, and cobalt rooms shall be sized to accommodate the equipment and patient

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A2.2-3.6.4.2 Equipment manufacturers' recommendations should be sought and followed, since space requirements may vary from one machine to another and one manufacturer to another.

- a. The radiotherapy suite may contain electron beam therapy or radiation therapy or both.
- b. Although not recommended, a simulation room may be omitted in

small linear accelerator facilities where other positioning geometry is provided.

A2.2-3.6.4.2 (1) Minimum size should be 260 square feet (24.15 square meters) for the simulator room; 680 square feet (63.17 square meters), including the maze, for accelerator rooms; and 450 square feet (41.81 square meters) for cobalt rooms.

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access on a stretcher, medical staff access to the equipment and patient, and service access.

- (2) Radiotherapy rooms shall be sized in compliance with the manufacturers' recommendations.
 - (a) Where a table is used, the room shall be sized to provide a minimum clear dimension of 4 feet (1.22 meters) to facilitate bed transfer and to provide access to the patient on three sides of the table.
 - (b) The door swing shall not encroach on the equipment or on patient circulation or transfer space.

2.2-3.6.4.3 Support areas for the radiotherapy suite. The following areas shall be provided. Sharing of these areas between the radiotherapy suite and other areas shall be permitted if required by the functional program:

- (1) Business office and/or reception/control area
- (2) Examination room for each radiotherapy treatment room. These shall be as specified by the functional program.
 - (a) Each exam room shall be a minimum of 100 square feet (9.29 square meters).
 - (b) Each exam room shall be equipped with a hand-washing station.
- (3) A stretcher hold area
 - (a) This shall be located adjacent to the treatment rooms, screened for privacy, and combined with a seating area for outpatients.
 - (b) The size of the area will be dependent on the program for outpatients and inpatients.
- (4) Patient gowning area
 - (a) Safe storage for valuables and clothing shall be provided.
 - (b) At least one space should be large enough for staff-assisted dressing.
- (5) Darkroom. This shall be convenient to the treatment room(s) and the quality control area.
 - (a) Where daylight processing is used, the darkroom may be minimal for emergency use.
 - (b) If automatic film processors are used, a receptacle of adequate size with hot and cold

water for cleaning the processor racks shall be provided either in the darkroom or nearby.

- (6) Film file area
- (7) Film storage area for unprocessed film
- (8) Environmental services room. This shall be equipped with service sink or floor receptor and large enough for equipment or supplies storage.

2.2-3.6.4.4 Optional support areas for the radiotherapy suite. The following areas may be required by the functional program:

- (1) Offices
 - (a) Oncologist's office (may be combined with consultation room)
 - (b) Physicist's office (may be combined with treatment planning)
- (2) Treatment planning and record room
- (3) Consultation room
- (4) Quality control area. This shall have view boxes illuminated to provide light of consistent color value and intensity.
- (5) Computer control area. This is normally located just outside the entry to the treatment room(s).
- (6) Dosimetry equipment area
- (7) Hypothermia room (may be combined with an exam room)
- (8) Workstation/nutrition station

2.2-3.6.4.5 Additional support areas for the linear accelerator

- (1) Mold room with exhaust hood and hand-washing station
- (2) Block room with storage. The block room may be combined with the mold room.

2.2-3.6.4.6 Additional support areas for the cobalt room

- (1) Hot lab

2.2-3.6.4.7 Special design elements for the radiotherapy suite

- (1) Architectural details
 - (a) Flooring shall be adequate to meet load requirements for equipment, patients, and personnel.
 - (b) Ceiling-mounted equipment shall have properly designed rigid support structures located above the finished ceiling.
 - * (c) When entry into the radiation vault is via direct-shielded door, both a motor-driven automatic opening system and an emergency manual opening system shall be provided.
 - (d) The height and width of doorways, elevators, and mazes shall be adequate to allow delivery of equipment and replacement sources into treatment rooms.
- (2) Building systems. Provision for wiring raceways, ducts, or conduit shall be made in floors and ceilings.

***2.2-3.6.4.8 Radiation protection requirements.**

Cobalt, linear accelerators, and simulation rooms require radiation protection. Both photons and neutrons shall be taken into account in the shielding for electron accelerators of higher energy.

- (1) Layouts shall be designed to prevent the escape of radioactive particles.
- * (2) Openings into the room, including doors, ductwork, vents, and electrical raceways and conduits, shall be baffled to prevent direct exposure to other areas of the facility.

- (3) A certified physicist representing the owner or appropriate state agency shall specify the type, location, and amount of protection to be installed in accordance with final approved department layout and equipment selection. The architect shall incorporate these specifications into the hospital building plans.

2.2-3.6.5 Support Areas for Patient Care—General

For requirements, see 2.1-2.5.

2.2-3.6.6 Support Areas for Nuclear Medicine Services

The nuclear medicine area, when operated separately from the imaging department, shall include the following:

2.2-3.6.6.1 Control desk and reception area**2.2-3.6.6.2 Reserved**

2.2-3.6.6.3 Medical staff offices. Offices for physicians and assistants shall be provided and equipped for individual consultation, viewing, and charting of film.

2.2-3.6.6.4 Consultation area. A consultation area with view boxes illuminated to provide light of the same color value and intensity for appropriate comparison of several adjacent films shall be provided. Space shall be provided for computer access and display terminals if such are included in the program.

2.2-3.6.6.5 Hand-washing stations. These shall be provided within each procedure room.

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A2.2-3.6.4.7 (1)(c) Use of a maze can greatly decrease the shielding requirement for the door. For higher energy rooms, an extra door constructed of thermal neutron absorbing material at the inside of the maze may reduce the required length for the maze or the shielding requirement for the outside door.

A2.2-3.6.4.8 Detailed discussion of shielding material options can be found in National Council on Radiation Protection & Measurements (NCRP) Report #151: *Structural Shielding Design and Evaluation for Megavoltage X and Gamma-Ray Radiotherapy Facilities* (2005).

A2.2-3.6.4.8 (2) Ducts should be oriented to minimize direct radiation passing through the aperture and to allow the least possible amount of concrete displacement in the direction of the radiation beam. For rooms that have mazes, the ideal location for duct penetrations is directly through the shielding above the door since that location has the lowest neutron and photon flux. For rooms without mazes, the walls parallel to the gantry (which have lower shielding requirements than those in the gantry rotation plane) should be used for duct penetrations. Detailed discussion of this topic can be found in NCRP Report #151, referenced in Section 1.1-5.5.2 and in A2.2-3.6.4.8.

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***2.2-3.6.6.6 Dose administration area.** A dose administration area as specified by the functional program shall be provided, located near the preparation area. Because as much as several hours may elapse before a dose takes effect, the area shall provide for visual privacy from other areas.

2.2-3.6.6.7 Patient holding area

- (1) A holding area for patients on stretchers or beds shall be provided out of traffic and under control of staff.
- (2) Combination of this area with the dose administration area shall be permitted provided there is visual privacy between the areas.

2.2-3.6.6.8 Clerical offices and spaces. These shall be provided as necessary for the program to function.

2.2-3.6.6.9 Reserved

2.2-3.6.6.10 A soiled workroom or holding room

- (1) Soiled workroom. It shall contain a hand-washing station and a clinical sink (or equivalent flushing-rim fixtures).
- (2) Soiled holding room. If the room is used for temporary holding of soiled materials, omission of the clinical sink shall be permitted.

2.2-3.6.6.11 Equipment and supply storage

- (1) Film storage. Inactive image storage under departmental administrative control and properly secured to protect images from loss or damage shall be provided and can be off site.
- (2) Clean linen storage. A storage area for clean linen with a hand-washing station.

2.2-3.6.6.12 Environmental services rooms. An environmental services room shall be provided within the suite in accordance with Section 2.1-2.6.12.

***2.2-3.6.6.13 Darkroom.** If film processing is used, an on-site darkroom shall be provided for film processing.

2.2-3.6.6.14 Computer room. When the functional program requires a centralized computer area, it shall be a separate room with access terminals available within the imaging rooms.

2.2-3.6.7 Support Areas for Staff

2.2-3.6.7.1 Staff toilet(s). These shall be provided convenient to the nuclear medicine laboratory.

2.2-3.6.8 Support Areas for Patients

2.2-3.6.8.1 Patient waiting areas. Waiting areas shall be provided out of traffic, under staff control, and with seating capacity in accordance with the functional program. If the department is routinely used for outpatients and inpatients at the same time, separate waiting areas shall be provided with screening or visual privacy between the waiting areas.

2.2-3.6.8.2 Patient dressing rooms

- (1) These shall be convenient to the waiting area and procedure rooms.
- (2) Each dressing room shall include a seat or bench, a mirror, and provisions for hanging patients' clothing and securing valuables.

2.2-3.6.8.3 Patient toilet rooms. Toilet rooms reserved for nuclear medicine patients shall be provided convenient to waiting and procedure rooms.

2.2-3.6.9 Special Design Elements for Nuclear Medicine Areas

2.2-3.6.9.1 Architectural details. Ceiling-mounted equipment shall have properly designed rigid support structures located above the finished ceiling.

2.2-3.6.9.2 Radiation protection requirements. A certified physicist or other qualified expert represent-

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A2.2-3.6.6.6 Because patients in this area may be held for long periods of time, the design of the area should incorporate such features as comfortable seating, varied lighting, an entertainment center, music headphones, and availability of reading materials.

A2.2-3.6.6.13 The darkroom should contain protective storage facilities for unexposed film that guard the film against exposure or damage.

ing the owner or state agency shall specify the type, location, and amount of radiation protection to be installed in accordance with final approved department layout and equipment selection. These specifications shall be incorporated into the plans.

2.2-3.6.9.3 Building systems. Provision for wiring raceways, ducts, or conduits shall be made in floors, walls, and ceilings.

2.2-3.7 Rehabilitation Therapy Service

Rehabilitation therapy is primarily for restoration of body functions and may contain one or several categories of services.

2.2-3.7.1 General

2.2-3.7.1.1 When a formal rehabilitation therapy service is included in a project, the facilities and equipment needed to accommodate the functional program shall be provided.

2.2-3.7.1.2 Where two or more rehabilitation services are included, facilities and equipment may be shared as appropriate.

2.2-3.7.2 Physical Therapy Areas

2.2-3.7.2.1 General. If physical therapy is part of the service, at least the following shall be provided:

2.2-3.7.2.2 Individual treatment areas

- (1) Space requirements. Each individual treatment space shall have a minimum clear floor area of 70 square feet (6.51 square meters).
- (2) Patient privacy. Each individual treatment space shall have privacy screens or curtains.
- (3) Hand-washing stations
 - (a) Hand-washing stations for staff shall be located either within or at each treatment space.
 - (b) Each treatment room shall have at least one hand-washing station.

2.2-3.7.2.3 Exercise area and facilities

2.2-3.7.2.4 Provisions for additional therapies.

If required by the functional program, provisions for thermotherapy, diathermy, ultrasonics, and hydrotherapy shall be made.

2.2-3.7.2.5 Reserved

2.2-3.7.2.6 Support areas for physical therapy

- (1) Soiled material storage. Separate storage for soiled linen, towels, and supplies shall be provided.
- (2) Equipment and supply storage
 - (a) Clean linen and towel storage
 - (b) Storage for equipment and supplies

2.2-3.7.2.7 Reserved

2.2-3.7.2.8 Support areas for patients

- (1) If required by the functional program, patient dressing areas, showers, and lockers shall be provided.
- (2) These support areas shall be accessible and usable by the disabled.

2.2-3.7.3 Occupational Therapy Areas

2.2-3.7.3.1 Application. If occupational therapy is part of the service, at least the following shall be provided:

2.2-3.7.3.2 Work areas and counters. These shall be suitable for wheelchair access.

***2.2-3.7.3.3 Teaching area.** An area for teaching daily living activities with the following shall be provided:

- (1) Area for a bed
- (2) Kitchen counter with appliances and sink
- (3) Bathroom
- (4) Table and chair

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A2.2-3.7.3.3 The facilities should be similar to a residential environment.

2.2 SPECIFIC REQUIREMENTS FOR GENERAL HOSPITALS

2.2-3.7.3.4 Hand-washing stations

2.2-3.7.3.5 Support areas for occupational therapy

- (1) Equipment and supply storage

2.2-3.7.4 Other Rehabilitation Therapy Services

2.2-3.7.4.1 Prosthetic and orthotic work areas. If prosthetics and orthotics are part of the service, at least the following shall be provided:

- (1) Workspace for technicians
- (2) Space for evaluation and fitting. This shall have provision for privacy.
- (3) Space for equipment, supplies, and storage

2.2-3.7.4.2 Speech and hearing services. If speech and hearing services are offered, at least the following shall be provided:

- (1) Space for evaluation and treatment
- (2) Space for equipment and storage

2.2-3.7.5 Reserved

2.2-3.7.6 Support Areas for the Rehabilitation Therapy Department

Each rehabilitation therapy department shall include the following, which may be shared or provided as separate units for each service:

2.2-3.7.6.1 Reception and control station(s). This shall permit visual control of waiting and activities areas and may be combined with office and clerical space.

2.2-3.7.6.2 Reserved

2.2-3.7.6.3 Office and clerical space. Provision shall be made for filing and retrieval of patient records.

2.2-3.7.6.4 Multipurpose room. Access to a demonstration/conference room shall be provided.

2.2-3.7.6.5 through 2.2-3.7.6.10 Reserved

2.2-3.7.6.11 Equipment and supply storage

- (1) Wheelchair and stretcher storage. Space(s) shall be provided for storing wheelchairs and stretchers out of traffic while patients are using the services. These spaces may be separate from the service area but must be conveniently located.

2.2-3.7.6.12 Environmental services room. A conveniently accessible environmental services room and service sink for environmental services use shall be provided.

2.2-3.7.7 Support Areas for Staff

Each rehabilitation therapy department shall include the following, which may be shared or provided as separate units for each service:

2.2-3.7.7.1 Reserved

2.2-3.7.7.2 Staff toilet. Convenient access to toilets shall be provided.

2.2-3.7.7.3 Staff storage. Locking closets or cabinets shall be provided within the vicinity of each work area for securing staff personal effects.

2.2-3.7.8 Support Areas for Patients

Each rehabilitation therapy department shall include the following, which may be shared or provided as separate units for each service:

2.2-3.7.8.1 Patient waiting area(s). These shall be located out of traffic with provision for wheelchairs.

2.2-3.7.8.2 Patient toilets with hand-washing stations accessible to wheelchair patients.

2.2-3.8 Respiratory Therapy Service

The type and extent of respiratory therapy service in different institutions vary greatly. In some, therapy is delivered in large sophisticated units, centralized in a specific area; in others, basic services are provided only at patients' bedsides.

2.2-3.8.1 General

If respiratory service is provided, the following elements shall be provided.

2.2-3.8.2 Locations for Cough-Inducing and Aerosol-Generating Procedures

2.2-3.8.2.1 All cough-inducing procedures performed on patients who may have infectious *Mycobacterium tuberculosis* shall be performed in rooms using local exhaust ventilation devices (e.g., booths or special enclosures that have discharge HEPA filters and exhaust directly to the outside).

2.2-3.8.2.2 If a ventilated booth is used, the air exchange rate within the booth shall be at least 12 air changes per hour, with a minimum exhaust flow rate of 50 cfm and differential pressure of 0.01" w.c. (2.5 Pa).

2.2-3.8.2.3 These procedures may also be performed in a room that meets the ventilation requirements for airborne infection control. See Part 6 for airborne infection isolation room ventilation requirements.

2.2-3.8.3 Outpatient Testing and Demonstration Services

If respiratory services such as testing and demonstration for outpatients are part of the program, additional facilities and equipment shall be provided as necessary for the appropriate function of the service, including but not limited to the following:

2.2-3.8.3.1 A reception and control station

2.2-3.8.3.2 Room(s) for patient education and demonstration

2.2-3.8.3.3 Patient waiting area with provision for wheelchairs

2.2-3.8.3.4 Patient toilets and hand-washing stations

2.2-3.8.4 through 2.2-3.8.5 Reserved

2.2-3.8.6 Support Areas for the Respiratory Therapy Service

2.2-3.8.6.1 Reception and control station. This shall permit visual control of waiting and activities areas and may be combined with office and clerical space.

2.2-3.8.6.2 Office and clerical space. Provision shall be made for filing and retrieval of patient records.

2.2-3.8.6.3 through 2.2-3.8.6.9 Reserved

2.2-3.8.6.10 Space and utilities for cleaning and disinfecting equipment

- (1) The space for receiving and cleaning soiled materials shall be physically separated from the space for storage of clean equipment and supplies.
- (2) Appropriate local exhaust ventilation shall be provided if glutaraldehyde or other noxious disinfectants are used in the cleaning process.

2.2-3.8.6.11 Equipment and supply storage

2.2-3.8.7 Support Areas for Staff

2.2-3.8.7.1 Reserved

2.2-3.8.7.2 Staff toilet. Convenient access to toilets shall be provided.

2.2-3.8.7.3 Staff storage. Locking closets or cabinets shall be provided within the vicinity of each work area for securing staff personal effects.

2.2-3.9 Renal Dialysis Services (Acute and Chronic)

2.2-3.9.1 General

2.2-3.9.1.1 Application. Equipment and space shall be provided as required by the functional program, which may include treatment for acute (inpatient) and chronic cases, home treatment, and kidney dialyzer reuse facilities.

2.2-3.9.1.2 Location

- (1) The location shall offer convenient access for outpatients. Accessibility to the unit from parking and public transportation shall be a consideration.
- (2) Provision of inpatient services in critical care units and designated areas in the hospital shall be permitted with appropriate utilities.
- (3) The treatment area shall be separate from administrative and waiting areas.

2.2 SPECIFIC REQUIREMENTS FOR GENERAL HOSPITALS

2.2-3.9.2 Treatment Area

2.2-3.9.2.1 General. The treatment area shall be permitted to be an open area.

2.2-3.9.2.2 Space requirements

- (1) Area. Individual patient treatment areas shall have a minimum clear floor area of 80 square feet (7.43 square meters).
- (2) Clearance. There shall be a minimum clear dimension of 4 feet (1.22 meters) between beds and/or lounge chairs.

2.2-3.9.2.3 Reserved

2.2-3.9.2.4 Patient privacy. The open unit shall be designed to provide privacy for each patient.

2.2-3.9.2.5 Hand-washing stations

- (1) Hand-washing stations shall be convenient to the nurse station and patient treatment areas.
- (2) There shall be at least one hand-washing station serving no more than four stations.
- (3) The hand-washing stations shall be uniformly distributed to provide equal access from each patient station.

2.2-3.9.2.6 Patient toilet room. A patient toilet with hand-washing stations shall be provided.

2.2-3.9.2.7 Reserved

2.2-3.9.2.8 Nurse station. A nurse station(s) shall be located within the dialysis treatment area and designed to provide visual observation of all patient stations.

2.2-3.9.3 Home Training Room

2.2-3.9.3.1 If home training is provided in the unit, a private treatment area of at least 120 square feet (11.15 square meters) shall be provided for patients who are being trained to use dialysis equipment at home.

2.2-3.9.3.2 This room shall contain a counter, hand-washing stations, and a separate drain for fluid disposal.

2.2-3.9.4 Special Patient Care Rooms

2.2-3.9.4.1 Reserved

2.2-3.9.4.2 Airborne infection isolation (AII) room.

The number of and need for required AII rooms shall be determined by an ICRA. When required, the AII room(s) shall comply with the requirements of 2.1-2.4.2.

2.2-3.9.5 Support Areas for Patient Care— General

For requirements, see 2.1-2.5.

2.2-3.9.6 Support Areas for the Renal Dialysis Unit

2.2-3.9.6.1 Administrative space. Office and clinical workspace shall be available for administrative services.

2.2-3.9.6.2 through 2.2-3.9.6.5 Reserved

2.2-3.9.6.6 Medication dispensing station. If required by the functional program, there shall be a medication dispensing station for the dialysis center.

- (1) A work counter and hand-washing stations shall be included in this area.
- (2) Provisions shall be made for the controlled storage, preparation, distribution, and refrigeration of medications.

2.2-3.9.6.7 Nourishment area

- (1) If a nourishment area for the dialysis service is provided, it shall contain the following:
 - (a) A hand-washing station
 - (b) A work counter
 - (c) A refrigerator
 - (d) Storage cabinets
 - (e) A drinking water-dispensing unit for patient use separate from the hand-washing station
 - (f) Equipment for serving nourishments as required
- (2) If provided, the nourishment area shall be located away from the treatment area to prevent the risk of cross-contamination.

2.2-3.9.6.8 Reserved

2.2-3.9.6.9 Clean workroom or supply room. A clean workroom shall be provided in accordance with 2.1-2.6.9 (Clean Workroom or Clean Supply Room).

2.2-3.9.6.10 Soiled workroom. A soiled workroom shall be provided in accordance with 2.1-2.6.10.1 (Soiled workroom).

2.2-3.9.6.11 Equipment and supply storage

- (1) Clean linen storage. A clean linen storage area shall be provided in accordance with 2.1-2.6.11.1.
- (2) Supply areas/carts. Supply areas or supply carts shall be provided.
- (3) Storage space for stretchers and wheelchairs. If stretchers are provided, storage space shall be provided in accordance with 2.1-2.6.11.3.

2.2-3.9.6.12 Environmental services room. An environmental services closet shall be provided in accordance with 2.1-2.6.12 and with the additional requirements included here:

- (1) The environmental services room shall be adjacent to and for the exclusive use of the dialysis unit.
- (2) Water supply and drain connection for testing machines shall be provided.

2.2-3.9.6.13 Dialyzer reprocessing room. If dialyzers are reused, a reprocessing room sized to perform the functions required shall be provided.

- (1) This room shall include a one-way flow of materials from soiled to clean.
- (2) This room shall include the following:
 - (a) Provisions for refrigeration for temporary storage of dialyzers
 - (b) Decontamination/cleaning areas
 - (c) Sinks
 - (d) Processors
 - (e) Computer processors and label printers
 - (f) A packaging area
 - (g) Dialyzer storage cabinets

2.2-3.9.6.14 Mixing room. The mixing room shall include a sink, storage space, and holding tanks.

2.2-3.9.6.15 Delivery system. Each facility using a central batch delivery system shall provide—either on the premises or through written arrangements—individual delivery systems for the treatment of any patient requiring special dialysis solutions.

2.2-3.9.6.16 Water treatment equipment room. The water treatment equipment shall be located in an enclosed room.

2.2-3.9.6.17 Equipment repair room. If required by the functional program, an equipment repair and breakdown room shall be equipped with the following:

- (1) Hand-washing station
- (2) Deep service sink
- (3) Work counter
- (4) Storage cabinet

2.2-3.9.6.18 Laboratory space

- (1) If required by the functional program to accommodate processing of blood draws and urine samples, a laboratory space shall be provided that includes the following:
 - (a) Counters
 - (b) Sinks
 - (c) Cabinets
 - (d) Label machines
 - (e) Computers
 - (f) Hand-washing stations
- (2) Stat laboratory
 - (a) If a stat laboratory for blood and urinalysis is provided, the stat laboratory shall contain the following:
 - (i) Hand-washing station
 - (ii) Work counters
 - (iii) Storage spaces
 - (iv) Undercounter refrigerator for specimens
 - (v) Cup sink
 - (b) An area for the phlebotomists' use shall be provided adjacent to the laboratory.
 - (c) A pass-through for specimens shall be provided between the patient toilet room and the laboratory.

2.2-3.9.7 Support Areas for Staff

2.2-3.9.7.1 Appropriate staff clothing change areas and lounge shall be available for male and female personnel. The areas shall contain:

- (1) Lockers
- (2) Shower
- (3) Toilet
- (4) Hand-washing stations

2.2-3.9.8 Support Areas for Patients

2.2-3.9.8.1 The following shall be available or accessible to the dialysis unit:

- (1) Waiting room
- (2) Toilet room with hand-washing stations
- (3) Source of drinking water
- (4) Public telephone
- (5) Seating accommodations for waiting periods

2.2-3.9.8.2 Storage for patients' belongings shall be provided.

2.2-3.10 Cancer Treatment/Infusion Therapy Service

2.2-3.10.1 General

2.2-3.10.1.1 Application. Equipment and space shall be provided as necessary to meet the functional program.

2.2-3.10.1.2 Location

- (1) The cancer treatment/infusion therapy unit shall be located to offer convenient access for outpatients.
- (2) Provision of inpatient services in critical care units or other designated areas in the hospital shall be permitted if those areas meet the requirements of this section.
- (3) The treatment area shall be separate from administrative and waiting areas.

2.2-3.10.2 Treatment Area

2.2-3.10.2.1 General. The treatment area shall be permitted to be an open area.

2.2-3.10.2.2 Space requirements

- (1) Area. Individual patient treatment stations shall have a minimum clear floor area of 80 square feet (7.43 square meters).
- (2) Clearances. There shall be a minimum clear dimension of 5 feet (1.52 meters) between beds and/or lounge chairs used for chemotherapy treatment/infusion.

2.2-3.10.2.3 Reserved

2.2-3.10.2.4 Patient privacy. The open unit shall be designed to provide visual privacy for each patient.

2.2-3.10.2.5 Hand-washing station. One hand-washing station shall be provided for every four or fewer patient treatment stations.

- (1) Hand-washing stations shall be convenient to the nurse station and patient treatment stations.
- (2) Hand-washing stations shall be uniformly distributed to provide equal access from each patient treatment station.

2.2-3.10.2.6 Patient toilet. At least one patient toilet with hand-washing station shall be provided in the treatment area. The need for additional patient toilets shall be determined by the functional program.

2.2-3.10.2.7 Reserved

2.2-3.10.2.8 Nurse station. A nurse station(s) shall be located within the treatment area.

- (1) Nurse station(s) shall be designed to provide visual observation of all patient treatment stations.
- (2) Nurse station(s) shall be positioned to provide visual control of the unit but out of the direct line of traffic.

2.2-3.10.4 Special Patient Care Area**2.2-3.10.4.1 Reserved****2.2-3.10.4.2 Airborne infection isolation (AII) room**

- (1) The need for and number of required AII rooms shall be determined by an ICRA.
- (2) When required, AII room(s) shall comply with the requirements of 2.1-2.4.2.

2.2-3.10.5 Support Areas for Patient Care—General

For general requirements, see 2.1-2.5.

2.2-3.10.6 Support Areas for Cancer Treatment/Infusion Therapy Facilities**2.2-3.10.6.1 through 2.2-3.10.6.5 Reserved**

2.2-3.10.6.6 Medication preparation room. A medication preparation room shall be provided. For requirements, see 2.1-2.6.6.1.

2.2-3.10.6.7 Nourishment area or room

- (1) A nourishment area or room shall be provided. For requirements, see 2.1-2.6.7.
- (2) In addition, a drinking water-dispensing unit for patient use separate from the hand-washing station shall be provided.

2.2-3.10.6.8 Reserved

2.2-3.10.6.9 Clean workroom or clean supply room. A clean workroom or supply room shall be provided. For requirements, see 2.1-2.6.9.

2.2-3.10.6.10 Soiled workroom or soiled holding room. A soiled workroom or holding room shall be provided. For requirements, see 2.1-2.6.10.

2.2-3.10.6.11 Equipment and supply storage. Stretcher/wheelchair storage space shall be provided. For requirements, see 2.1-2.6.11.3.

2.2-3.10.6.12 Environmental services room. An environmental services room shall be provided within the unit. For requirements, see 2.1-2.6.12.

2.2-3.10.7 Support Areas for Staff

2.2-3.10.7.1 Lounge facilities. Staff lounge facilities shall be provided. For requirements, see 2.1-2.7.1.

- (1) These facilities shall be located on the same floor as the cancer treatment/infusion therapy unit and shall be convenient to the unit.
- (2) These facilities shall be permitted to serve more than one service area.

2.2-3.10.7.2 Staff toilet. A staff toilet shall be provided in accordance with 2.1-2.7.2.

2.2-3.10.8 Support Areas for Patients

2.2-3.10.8.1 Waiting room. A waiting room with the following shall be available to the treatment unit:

- (1) A toilet room with hand-washing station
- (2) Drinking fountain
- (3) Public telephone
- (4) Seating accommodations for waiting periods

2.2-3.10.8.2 Patient storage. Storage for patient belongings shall be provided.

2.2-3.10.9 Special Design Elements

- (1) Decorative water features shall not be placed inside cancer treatment/infusion therapy facilities.
- (2) Fish tanks shall not be installed in cancer treatment/infusion therapy facilities.

2.2-3.11 Endoscopy Service

When endoscopy service is provided in the hospital and is not part of surgical services, it shall meet the requirements of Chapter 3.9, Specific Requirements for Endoscopy Facilities.

***2.2-3.12 Hyperbaric Suite**

APPENDIX

A2.2-3.12 Hyperbaric Suite**Applicability**

These guidelines should apply to hyperbaric facilities designated for clinical hyperbaric oxygen therapy, including hospital-affiliated and freestanding facilities.

General Facility Requirements

Hyperbaric chambers should be constructed in conformance with applicable construction codes (ASME PVHO-1, *Safety Standard for Pressure Vessels for Human Occupancy*) and carry a “U” stamp.

The facility should be constructed to comply with applicable local, state, and national construction codes governing the type of occupancy (health care, commercial, other) housing the hyperbaric chamber(s).

When a hyperbaric suite/clinic is provided, it should meet the requirements of the NFPA 99 “Hyperbaric Facilities” chapter and NFPA 101.

Multiplace (Class A Chamber) Facilities*Emergency exit requirements*

- a. The facility housing a Class A chamber should be designed to allow rapid or emergency removal of patients and staff.
- b. In the case of multiple Class A chambers installed in a single setting or a Class A chamber that contains multiple compartments, the rapid or emergency removal of a patient or personnel from one chamber/compartment should not restrict in any way the rapid and simultaneous removal of patients or personnel from all other chambers or compartments.
- c. A minimum of two exits should be provided for the chamber room unless a single exit opens directly to a primary evacuation hallway.

Space requirements

The space required to house Class A chambers and supporting equipment should be defined by the NFPA 99 “Hyperbaric Facilities” chapter and the equipment manufacturer, but in any case should not be less than the space required to meet the following:

- a. Chamber entry should be designed for gurney/stretchers access: 8 feet 6 inches (2.59 meters).
- b. Entries designed for wheeled gurneys should be provided with access ramps that are flush with the chamber entry doorway.
- c. Chambers that utilize fixed internal stretcher frames and transfer gurneys should be designed to allow immediate removal of the patient upon chamber depressurization.
- d. Chambers with entry locks or compartments utilizing circular entry hatchways: 3 feet (91.44 centimeters).
- e. There should be a minimum clear dimension of 3 feet (91.44 centimeters) all the way around the chamber, except as specified with regard to entry areas.

- f. If the chamber control console is immediately adjacent to the chamber, a minimum passageway of 3 feet (91.44 centimeters) should be provided between the control console and any obstruction.

Monoplace (Class B Chamber) Facilities*Emergency exit requirements*

- a. In the case of multiple Class B chambers installed in a single setting, the rapid or emergency removal of a patient from one chamber should not restrict in any way the rapid and simultaneous removal of patients from all other chambers.
- b. A minimum of two exits should be provided for the chamber room unless a single exit opens directly to a primary evacuation hallway.
- c. Exit door openings should have a minimum clear width of 3 feet 10 inches (1.17 meters).

Space requirements

The space required to house Class B chambers and supporting equipment should be defined by the equipment manufacturer and conform to the NFPA 99 “Hyperbaric Facilities” chapter requirements, but in any case should not be less than the space required to meet the following:

- a. Minimum clear dimensions between individual (Class B) hyperbaric chambers should be as follows:
 - Chamber and side wall, 18 inches (45.72 centimeters). **Exception:** If any chamber controls, ventilation valves, or other operator-adjustable devices are located on or under the chamber adjacent to the side wall, the minimum clear dimension should be 3 feet (91.44 centimeters).
 - Between control side of two chambers, 3 feet (91.44 centimeters)
 - Between back side of two chambers, 18 inches (45.72 centimeters)
- b. A minimum passage of 18 inches (45.72 centimeters) should be provided at the foot end of each chamber.
- c. A minimum clear dimension of 8 feet 6 inches (2.59 meters) should be available at the head end of the chamber to allow for the safe insertion and removal of the patient from the chamber.
- d. Any electrical service outlets located within 10 feet (3.05 meters) of the Class B chamber entrance should be sited no less than 3 feet (0.91 meter) above floor level.
- e. An oxygen shut-off valve should be provided for each chamber and should be unobstructed by the chamber and located as to be immediately accessible to the chamber operator.

Support Areas

The following support areas should be provided for the hyperbaric facility. If the hyperbaric facility is included as an integral portion of another service such as a wound care department, support areas may be shared:

Support areas for the hyperbaric suite

- a. Reception/control desk

■ 2.2-4 Patient Support Services

2.2-4.1 Laboratory Services

*2.2-4.1.1 General

2.2-4.1.1.1 Application. Laboratory facilities shall be provided for the performance of tests in hematology, clinical chemistry, urinalysis, microbiology, anatomic pathology, cytology, and blood banking to meet the workload described in the functional program.

2.2-4.1.1.2 Location. Certain procedures may be performed on-site or provided through a contractual

arrangement with a laboratory service acceptable to the authority having local jurisdiction.

(1) Provisions shall be made to perform testing on site that supports acute care of patients as specified in the functional program. Determination of specific testing to be done on site with point-of-care and other laboratory instrumentation shall be reviewed with the medical staff of the hospital.

(2) Provisions shall be included for specimen collection and processing.

2.2-4.1.1.3 Equipment requirements. The functional program shall describe the type and location of all

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- b. Patient waiting area. The waiting area should be large enough to accommodate the clinical program and chamber mix if also used as a holding area. The area should be out of traffic, under staff control, and should have seating capacity in accordance with the functional program. When the hyperbaric suite is routinely used for outpatients and inpatients at the same time, separate waiting areas should be provided with screening for visual privacy between the waiting areas. Patient waiting areas may be omitted for facilities housing two or fewer Class B hyperbaric chambers.
- c. Holding area. The area should be out of traffic flow from the chamber and should not obstruct access to the exits. A holding area under staff control should accommodate inpatients on stretchers or beds. Stretcher patients should be out of the direct line of normal traffic. The patient holding area may be omitted for facilities housing two or fewer Class B hyperbaric chambers.
- d. Consultation/treatment rooms. Appropriate room for individual consultation and treatment with referring clinicians should be provided.
- e. Patient record storage area. An area should be provided that is out of traffic flow and under staff control. This can be in the clinical area or located at the reception/control desk.
- f. Hand-washing stations. A lavatory equipped for hand-washing with hands-free operable controls should be located in the room where the hyperbaric chambers are located.
- g. Compressor room. This area should be large enough to house the chamber compressors, accumulator tanks, fire suppression system and their ability to meet the requirements of the NFPA 99 "Hyperbaric Facilities" chapter. The reserve breathing gases may also be housed here if it is in close proximity to the chamber room.
- h. Soiled holding area. A soiled holding room should be provided with waste receptacles and soiled linen receptacles.
- i. Equipment and supply storage
 - Clean supply and linen storage. A clean storage space should be provided for clean supplies and linens. Hand-washing fixtures should

be provided with hands-free operable controls. When a separate storage room is provided, it may be shared with another department.

Gas cylinder room. This room should be large enough to accommodate the storage of enough (H) cylinders and manifolds for the reserve breathing gases required for chamber operations. The minimum room size should be able to house eight (H) cylinders and two gas manifolds, consisting of at least two (H) cylinders on each manifold.

- j. Environmental services room. The environmental services room should contain a floor receptor or service sink and storage space for housekeeping supplies and equipment. The room should be located near the hyperbaric suite (wound care department). When a separate storage rooms is provided, it may be shared with another department.

Support areas for staff

Toilets with hand-washing fixtures with hands-free operable controls may be outside the suite but should be convenient for staff use.

Support areas for patients

- a. Patient dressing rooms. Dressing rooms for outpatients should be provided and should include a seat or bench, mirror, and provisions for hanging patients' clothing and for securing valuables. At least one dressing room should be provided to accommodate wheelchair patients.
- b. Patient toilet rooms. Toilet rooms should be provided with hand-washing fixtures with hands-free operable controls with direct access from the hyperbaric suite.

A2.2-4.1.1 Refer to NFPA code requirements applicable to hospital laboratories, including standards clarifying that hospital units do not necessarily have the same fire safety requirements as commercial chemical laboratories.

2.2 SPECIFIC REQUIREMENTS FOR GENERAL HOSPITALS

special equipment that is to be wired, plumbed, or plugged in, and the utilities required to operate each.

2.2-4.1.2 Laboratory Work Areas

The following physical facilities shall be provided within the hospital:

2.2-4.1.2.1 Work areas shall include sinks with water and access to vacuum, gases, tele/data service, and electrical service as needed.

2.2-4.1.2.2 Laboratory work counter(s) with space for equipment, specimen preparation, and computer/paperwork shall be provided.

2.2-4.1.2.3 Hand-washing stations. These shall be located within 25 feet (7.62 meters) of each workstation and within each room with a workstation.

2.2-4.1.2.4 Design considerations

- (1) Chemical safety provisions. These shall include emergency shower, eye-flushing devices, and appropriate storage for flammable liquids, etc.
- (2) Terminal sterilization provisions. Facilities and equipment shall be provided for terminal sterilization of contaminated specimens before transport (autoclave or electric oven). (Terminal sterilization is not required for specimens that are incinerated on-site.)
- (3) Radioactive material-handling provisions. If radioactive materials are employed, facilities for long-term storage and disposal of these materials shall be provided. No special provisions shall normally be required for body waste products from most patients receiving low-level isotope diagnostic material. Requirements of authorities having jurisdiction shall be verified.

2.2-4.1.3 through 2.2-4.1.5 Reserved

2.2-4.1.6 Support Areas for the Laboratory

2.2-4.1.6.1 Administrative areas. These shall include offices as well as space for clerical work, filing, and record maintenance.

2.2-4.1.6.2 Refrigerated blood storage facilities.

A refrigerator to store blood for transfusions shall be

equipped with temperature-monitoring and alarm signals.

***2.2-4.1.6.3 Storage facilities for reagents, standards, supplies, and stained specimen microscope slides, etc.** These shall include refrigeration. Such facilities shall conform to applicable NFPA standards.

2.2-4.1.6.4 A specimen collection facility. This facility may be located outside the laboratory suite.

- (1) The blood collection area shall have a work counter, space for patient seating, and hand-washing stations.
- (2) The urine and feces collection facility shall be equipped with a water closet and hand-washing station.

2.2-4.1.7 Support Areas for Staff

2.2-4.1.7.1 Lounge, locker, and toilet facilities shall be conveniently located for male and female laboratory staff.

2.2-4.1.7.2 Location of these areas outside the laboratory area and sharing of these areas with other departments shall be permitted.

2.2-4.2 Pharmacy Service

2.2-4.2.1 General

2.2-4.2.1.1 Application. The size and type of services to be provided in the pharmacy will depend upon the type of drug distribution system used, number of patients to be served, and extent of shared or purchased services. These factors shall be described in the functional program.

2.2-4.2.1.2 Location. The pharmacy room or suite shall be located for convenient access, staff control, and security.

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A2.2-4.1.6.3 For example, separate facilities should be provided for such incompatible materials as acids and bases, and vented storage should be provided for volatile solvents.

2.2-4.2.2 Pharmacy Areas

Facilities and equipment shall be as necessary to accommodate the functional program. (Satellite facilities, if provided, shall include those items required by the program.)

2.2-4.2.2.1 Dispensing facilities

- (1) A room or area for receiving, breakout, and inventory control of materials used in the pharmacy
- (2) Work counters and space for automated and manual dispensing activities
- *(3) An extemporaneous compounding area. This shall include a sink and sufficient counter space for drug preparation.
- (4) An area for reviewing and recording
- (5) An area for temporary storage, exchange, and restocking of carts
- (6) Security provisions for drugs and personnel in the dispensing counter area, if one is provided

2.2-4.2.2.2 Manufacturing facilities

- (1) A bulk compounding area
- (2) Provisions for packaging and labeling
- (3) A quality control area

2.2-4.2.2.3 Storage. Cabinets, shelves, and/or separate rooms or closets shall be provided.

- (1) Bulk storage
- (2) Active storage
- (3) Refrigerated storage
- (4) Storage for volatile fluids and alcohol. This shall be constructed according to applicable fire safety codes for the substances involved.
- (5) Storage for narcotics and controlled drugs. Secure storage shall be provided for narcotics and controlled drugs.

- (6) Equipment and supply storage. Storage shall be provided for general supplies and equipment not in use.

2.2-4.2.3 through 2.2-4.2.5 Reserved**2.2-4.2.6 Support Areas for the Pharmacy**

2.2-4.2.6.1 Patient information. Provision shall be made for cross-checking medication and drug profiles of individual patients.

2.2-4.2.6.2 Pharmacological information. Poison control, reaction data, and drug information centers

2.2-4.2.6.3 Office. A separate room or area shall be provided for office functions. This room shall include space to accommodate a desk, filing capabilities, communication equipment, and reference materials.

2.2-4.2.6.4 Provisions for patient counseling and instruction. A room separate from the pharmacy shall be permitted to meet this requirement.

2.2-4.2.6.5 A room for education and training. A multipurpose room shared with other departments shall be permitted to serve this purpose.

2.2-4.2.6.6 Outpatient consultation/education area. If the functional program requires dispensing of medication to outpatients, an area for consultation and patient education shall be provided.

2.2-4.2.6.7 Hand-washing stations. A hand-washing station shall be provided either in an ante-room or immediately outside the room where open medication(s) are prepared.

2.2-4.2.6.8 Sterile work areas

- (1) If intravenous (IV) solutions are prepared in the pharmacy, a sterile work area with a laminar-flow workstation designed for product protection shall be provided.
 - (a) The laminar-flow workstation shall include a nonhydroscopic filter rated at 99.97 percent (HEPA), as tested by dioctyl-phtalate (DOP) tests.

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A2.2-4.2.2.1 (3) Floor drainage may also be required, depending on the extent of compounding conducted.

2.2 SPECIFIC REQUIREMENTS FOR GENERAL HOSPITALS

- (b) The laminar-flow workstation shall have a visible pressure gauge for detection of filter leaks or defects.
- (2) A separate room shall be provided for preparation of Cytotoxic IV admixtures under a Class II: Type B1, B2, B3 or Class III biological safety cabinet.
- (3) Layout of the pharmacy shall preclude unrelated traffic through the IV or cytotoxic preparation rooms.

2.2-4.2.6.9 Additional equipment and supply storage. If unit dose procedure is used, additional space and equipment for supplies, packaging, labeling, and storage, as well as for the carts.

2.2-4.2.7 Support Areas for Staff

2.2-4.2.7.1 Staff toilet. Convenient access to toilet shall be provided.

2.2-4.2.7.2 Staff storage. Convenient access to locker shall be provided.

2.2-4.3 Dietary Services

2.2-4.3.1 General

***2.2-4.3.1.1 Application.** Food service facilities shall provide food service for staff, visitors, inpatients, and outpatients in accordance with the functional program.

2.2-4.3.1.2 Location. Patient food preparation areas shall be located adjacent to delivery, interior transportation, and storage facilities.

2.2-4.3.1.3 Standards. Food service facilities and equipment shall conform to these requirements and to the standards of the National Sanitation Foundation, the FDA model food code, and other applicable codes.

2.2-4.3.1.4 Construction requirements. Finishes in the dietary facility shall be selected to ensure cleanability and the maintenance of sanitary conditions.

2.2-4.3.2 Dietary Areas

If on-site conventional food service preparation is used, the following shall be provided, in size and number appropriate for the functional program:

2.2-4.3.2.1 Receiving/control stations. An area for receiving and control of incoming dietary supplies shall be provided.

(1) This area shall be separated from the general receiving area.

(2) It shall contain a control station and a breakout area for loading, uncrating, and weighing supplies.

2.2-4.3.2.2 Hand-washing stations. Hands-free operable hand-washing stations shall be conveniently accessible at locations throughout the unit.

2.2-4.3.2.3 Food preparation work spaces

(1) Work spaces shall be provided for food preparation, cooking, and baking. These areas shall be as close as possible to the user (i.e., tray assembly and dining).

(2) Additional spaces shall be provided for thawing and portioning.

2.2-4.3.2.4 Assembly and distribution. A patient tray assembly area shall be close to the food preparation and distribution areas.

2.2-4.3.2.5 Food service carts

(1) A cart distribution system shall be provided, with spaces for storage, loading, distribution, receiving, and sanitizing of the food service carts.

(2) The cart traffic shall be designed to eliminate any danger of cross-circulation between outgoing food carts and incoming, soiled carts, and the cleaning and sanitizing process. Cart circulation shall not be through food processing areas.

2.2-4.3.2.6 Area for receiving, scraping, and sorting soiled tableware. This shall be adjacent to ware-washing and separate from food preparation areas.

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A2.2-4.3.1.1 Consideration may also be required for meals to VIP suites and for cafeterias for staff, ambulatory patients, and visitors, as well as providing for nourishments and snacks between scheduled meal service.

2.2-4.3.2.7 Ware-washing facilities

- (1) Ware-washing facilities shall be designed to prevent contamination of clean wares with soiled wares through cross-traffic.
- (2) Ware-washing facilities shall be designed to permit the transfer of clean wares for storage or use in the dining area without passing through food preparation areas.

2.2-4.3.2.8 Pot-washing facilities

- (1) Pot-washing facilities shall include multi-compartmented sinks of adequate size for the intended use, convenient to the using service.
- (2) Mobile carts or other provisions shall be made for drying and storing pots and pans.

2.2-4.3.3 Dining Area

Dining space(s) shall be provided for ambulatory patients, staff, and visitors. These spaces shall be separate from the food preparation and distribution areas.

2.2-4.3.4 Other Dietary Facilities**2.2-4.3.4.1 Facilities for commissary or contract services from other areas**

- (1) Provision shall be made to protect food delivered to ensure freshness, retain hot and cold temperatures, and avoid contamination. If delivery is from outside sources, protection against weather shall be provided.
- (2) Provision shall be made for thorough cleaning and sanitizing of equipment to avoid mixing soiled and clean equipment.

2.2-4.3.4.2 Vending services. If vending devices are used for unscheduled meals, a separate room shall be provided that can be accessed without having to enter the main dining area.

- (1) The vending room shall contain coin-operated machines, bill changers, a hand-washing station, and a sitting area.
- (2) Facilities for servicing and sanitizing the machines shall be provided as part of the facility's food service program.

2.2-4.3.5 Reserved**2.2-4.3.6 Support Areas for Dietary Facilities**

2.2-4.3.6.1 Office spaces. Offices for the use of the food service manager shall be provided. In smaller facilities, location of this space in an area that is part of the food preparation area shall be permitted.

2.2-4.3.6.2 Equipment

- (1) Mechanical devices shall be heavy-duty, suitable for use intended, and easily cleaned.
- (2) Where equipment is movable, heavy-duty locking casters shall be provided. If equipment is to have fixed utility connections, the equipment shall not be equipped with casters.
- (3) Walk-in coolers, refrigerators, and freezers shall be insulated at floor as well as at walls and top.
- (4) Coolers, refrigerators, and freezers shall be thermostatically controlled to maintain desired temperature settings in increments of 2 degrees or less.
 - (a) Coolers and refrigerators shall be capable of maintaining a temperature down to freezing.
 - (b) Freezers shall be capable of maintaining a temperature of 20 degrees below 0° F (−2° C).
 - (c) Interior temperatures shall be indicated digitally so as to be visible from the exterior. Controls shall include audible and visible high and low temperature alarm. Time of alarm shall be automatically recorded.
- (5) Walk-in units
 - (a) These may be lockable from outside but must have release mechanism for exit from inside at all times.
 - (b) Interior shall be lighted.
 - (c) All shelving shall be corrosion resistant, easily cleaned, and constructed and anchored to support a loading of at least 100 lbs. per linear foot (148.80 kg/linear meter).
- (6) Cooking equipment. All cooking equipment shall be equipped with automatic shutoff devices to prevent excessive heat buildup.
- (7) Ice-making equipment. Ice-making equipment shall be provided for use with both drinks and food products.

2.2 SPECIFIC REQUIREMENTS FOR GENERAL HOSPITALS

- (a) Ice-making equipment shall be convenient for service and easily cleaned.
 - (b) Self-dispensing ice-making equipment shall be used in public areas.
 - (c) Use of storage-bin type ice-making equipment shall be permitted in areas restricted to staff use only.
- (8) Construction requirements. Under-counter conduits, piping, and drains shall be arranged to not interfere with cleaning of the equipment or of the floor below.

2.2-4.3.6.3 Equipment and supply storage

- (1) General. Storage spaces shall be convenient to the receiving area and accessible without traveling through the food preparation area.
- (2) Food storage
 - (a) Storage spaces for bulk, refrigerated, and frozen foods shall be provided. Provision shall be made for storage of a minimum of four days' supplies.
 - (b) Food storage components shall be grouped for convenient access to the receiving and food preparation areas.
 - (c) All food shall be stored clear of the floor. Lowest shelf shall be not less than 12 inches (30.48 centimeters) above the floor or shall be closed in and sealed tight for ease of cleaning.
- (3) Additional storage rooms. These shall be provided as necessary for the storage of cooking wares, extra trays, flatware, plastic and paper products, and portable equipment.
- (4) Cleaning supplies storage. A separate storage room shall be provided for the storage of nonfood items such as cleaning supplies that might contaminate edibles.

2.2-4.3.6.4 Environmental services rooms

- (1) These shall be provided for the exclusive use of the dietary department and shall contain a floor sink and space for mops, pails, and supplies.
- (2) Where hot water or steam is used for general cleaning, additional space within the room shall be provided for the storage of hoses and nozzles.

- (3) Environmental services rooms shall not be combined with locations for trash storage.

2.2-4.3.7 Support Areas for Staff

2.2-4.3.7.1 Toilets, lockers, and lounges. Toilets, lockers and lounge facilities shall be convenient to the dietary department. These facilities shall be permitted to be shared with adjacent services provided they are adequately sized.

2.2-5 General Support Services and Facilities

2.2-5.1 Central Services

The following shall be provided:

2.2-5.1.1 Reserved

2.2-5.1.2 Soiled and Clean Work Areas

The soiled and clean work areas shall be physically separated.

2.2-5.1.2.1 Soiled workroom

- (1) This room shall be physically separated from all other areas of the department.
- (2) Work space shall be provided to handle the cleaning and initial sterilization/disinfection of all medical/surgical instruments and equipment. Work tables, sinks, flush-type devices, and washer/sterilizer decontaminators shall be provided.
- (3) Pass-through doors and washer/sterilizer decontaminators shall deliver into clean processing area/workrooms.

***2.2-5.1.2.2 Clean assembly/workroom.** This workroom shall contain hand-washing stations, work space,

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A2.2-5.1.2.2 Sterilization room. This room is used exclusively for the inspection, assembly, and packaging of medical/surgical supplies and equipment for sterilization.

- a. Access to the sterilization room should be restricted.
- b. This room should contain Hi-Vacuum or gravity steam sterilizers and sterilization equipment to accommodate heat-sensitive equipment (ETO sterilizer) and ETO aerators.

and equipment for terminal sterilizing of medical and surgical equipment and supplies.

2.2-5.1.3.1 Clean/sterile medical/surgical supplies

- (1) A room for breakdown shall be provided for manufacturers' clean/sterile supplies. The clean processing area shall not be in this area but in an adjacent space.
- (2) Storage for packs, etc., shall include provisions for ventilation, humidity, and temperature control.

2.2-5.1.3.2 Storage room for patient care and distribution carts. This area shall be adjacent and easily available to clean and sterile storage and close to the main distribution point to keep traffic to a minimum and ease work flow.

2.2-5.1.4 Support Areas for Staff

2.2-5.1.4.1 Administrative/changing room. If required by the functional program, this room shall be separate from all other areas and provide for staff to change from street clothes into work attire.

2.2-5.1.4.2 Staff accommodations. Lockers, hand-washing station, and showers shall be made available within the immediate vicinity of the department.

2.2-5.2 Linen Services

2.2-5.2.1 General

2.2-5.2.1.1 Each facility shall have provisions for storing and processing of clean and soiled linen for appropriate patient care.

2.2-5.2.1.2 Processing may be done within the facility, in a separate building on- or off-site, or in a commercial or shared laundry.

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- c. It should contain worktables, counters, a hand-washing station, ultrasonic storage facilities for backup supplies and instrumentation, and a drying cabinet or equipment.
- d. The area should be spacious enough to hold sterilizer carts for loading of prepared supplies for sterilization.

2.2-5.2.2 Internal Linen Processing Areas

Facilities and equipment shall be as required for cost-effective operation as described in the functional program. At a minimum, the following elements shall be provided:

2.2-5.2.2.1 Soiled linen holding room. A separate room shall be provided for receiving and holding soiled linen until ready for pickup or processing.

2.2-5.2.2.2 Clean linen storage. A central clean linen storage and issuing room(s) shall be provided in addition to the linen storage required at individual patient units.

2.2-5.2.2.3 Cart storage area(s). These shall be provided for separate parking of clean- and soiled-linen carts out of traffic.

2.2-5.2.2.4 Clean linen inspection and mending room or area. If not provided elsewhere, a clean linen inspection, delinting, folding, assembly, and packaging area shall be provided as part of the linen services.

- (1) Mending shall be provided for in the linen services department.
- (2) A space for tables, shelving, and storage shall be provided.

2.2-5.2.2.5 Hand-washing stations. These shall be provided in each area where unbagged, soiled linen is handled.

2.2-5.2.3 On-Site Laundry Facility

If linen is processed in a laundry facility that is part of the project (within or as a separate building), the following shall be provided in addition to the requirements for internal processing facilities in Section 2.2-5.2.2.

2.2-5.2.3.1 Layout. Equipment shall be arranged to permit an orderly work flow and minimize cross-traffic that might mix clean and soiled operations.

2.2-5.2.3.2 Control and distribution room. A receiving, holding, and sorting room shall be provided for control and distribution of soiled linen. Discharge from soiled linen chutes shall be received in a separate room adjacent to it.

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***2.2-5.2.3.3 Laundry processing room.** This shall have commercial or industrial-type equipment that can process at least a seven-day supply within the regular scheduled work week.

2.2-5.2.3.4 Hand-washing stations. Employee hand-washing stations shall be provided in each room where clean or soiled linen is processed and handled.

2.2-5.2.3.5 Storage for laundry supplies

2.2-5.2.4 Additional Areas for Outside Laundry Services

If linen is processed outside the building, provisions shall also be made for:

2.2-5.2.4.1 Service entrance. A service entrance, protected from inclement weather, shall be provided for loading and unloading of linen.

2.2-5.2.4.2 Control station. A control station shall be provided for pickup and receiving.

2.2-5.2.5 Support Areas for Staff

Conveniently accessible staff lockers, showers, and lounge shall be provided.

2.2-5.2.6 Linen Chutes

If provided, these shall meet or exceed the following standards:

2.2-5.2.6.1 Standards

- (1) Service openings to chutes shall comply with NFPA 101.
- (2) Chutes shall meet the provisions described in NFPA 82.

- (3) Chute discharge into collection rooms shall comply with NFPA 101.

2.2-5.2.6.2 Dimensions. The minimum cross-sectional dimension of gravity chutes shall be 2 feet (60.96 centimeters).

*2.2-5.3 Materials Management Facilities

2.2-5.3.1 Reserved

2.2-5.3.2 Receiving Facilities

The following shall be provided:

2.2-5.3.2.1 Off-street unloading facilities

2.2-5.3.2.2 Receiving area. Adequate receiving areas shall be provided to accommodate delivery trucks and other vehicles.

* (1) Location

- (a) Dock areas shall be segregated from other occupied building areas and located so that noise and odors from operation will not adversely affect building occupants.
- (b) The receiving area shall be convenient to service elevators and other internal corridor systems.
- (c) Receiving areas shall be segregated from waste staging and other outgoing materials-handling functions.

(2) Space requirements

- (a) Adequate space shall be provided to enable breakdown, sorting, and staging of incoming materials and supplies.
- (b) Balers and other devices shall be located to capture packaging for recycling or return to manufacturer or deliverer.
- (c) In facilities with centralized warehousing, adequate space shall be provided at receiving

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A2.2-5.2.3.3 This may require a capacity for processing a seven-day supply in a 40-hour week.

A2.2-5.3 Acoustic considerations for building services. Building services include trash compacting and removal, truck unloading, refrigeration trucks, and ambulance arrival. These all include potentially noisy diesel vehicles entering into, under, or immediately adjacent to the building. Hours of operation are usually unlimited.

Patient or other sensitive rooms often overlook these areas. The transmission of sound from these vehicles and associated activities into the building should be considered.

A2.2-5.3.2.2 (1) The receiving area should be located to promote the safe, secure, and efficient movement of arriving materials without compromising patient areas.

points to permit the staging of reusable transport containers for supplies moving from central warehouses to individual receiving sites.

2.2-5.3.3 General Stores

2.2-5.3.3.1 General

- (1) In addition to supply facilities in individual departments, a central storage area with the following storage rooms and areas shall be provided.
- (2) General stores may be located in a separate building on site with provisions for protection against inclement weather during transfer of supplies.

2.2-5.3.3.2 General storage room(s)

- (1) Location of storage in separate, concentrated areas within the institution or in one or more individual buildings on site shall be permitted. Off-site location for a portion of this storage shall be permitted.
- (2) Space requirements. General storage room(s) with a total area of not less than 20 square feet (1.86 square meters) per inpatient bed shall be provided.

2.2-5.3.3.3 Additional storage areas for outpatient facilities

- (1) Location of additional storage areas in combination with and in addition to the general stores, or in a central area within the outpatient department, shall be permitted. Off-site location for a portion of this storage shall also be permitted.
- (2) Space requirements. Additional storage areas for outpatient facilities shall be provided in an amount not less than 5 percent of the total area of those facilities.

2.2-5.4 Waste Management Facilities

2.2-5.4.1 Waste Collection and Storage

For requirements, see 2.1-5.4.1.

2.2-5.4.2 Waste Treatment and Disposal

For requirements, see 2.1-5.4.2.

2.2-5.4.3 Nuclear Waste Disposal

See *Code of Federal Regulations*, Title X, parts 20 and

35, concerning the handling and disposal of nuclear materials in health care facilities.

2.2-5.5 Environmental Services

2.2-5.5.1 Environmental Services Rooms

2.2-5.5.1.1 Number

- (1) In addition to the environmental services rooms required in certain departments, a sufficient number of environmental services rooms shall be provided throughout the facility to maintain a clean and sanitary environment.
- (2) A minimum of one environmental services room per floor shall be provided.

2.2-5.5.1.2 Facility requirements. Each environmental services room shall contain the following:

- (1) A floor receptor or service sink
- (2) Storage space for housekeeping equipment and supplies
- (3) A hand-sanitation station

2.2-5.5.2 Facilities for Cleaning and Sanitizing Carts

Facilities shall be provided to clean and sanitize carts serving the central service department, dietary facilities, and linen services. These facilities shall be permitted to be centralized or departmentalized.

2.2-5.6 Engineering and Maintenance Services

2.2-5.6.1 General

Sufficient space shall be included in all mechanical and electrical equipment rooms for proper maintenance of equipment. Provisions shall also be made for removal and replacement of equipment.

2.2-5.6.2 Equipment Locations

Room(s) or separate building(s) shall be provided for boilers, mechanical, and electrical equipment, *except*:

2.2-5.6.2.1 Rooftop air conditioning and ventilation equipment installed in weatherproof housings

2.2 SPECIFIC REQUIREMENTS FOR GENERAL HOSPITALS

2.2-5.6.2.2 Emergency generators where the engine and appropriate accessories (i.e., batteries) are properly heated and enclosed in a weatherproof housing

2.2-5.6.2.3 Cooling towers and heat rejection equipment

2.2-5.6.2.4 Electrical transformers and switchgear where required to serve the facility and where installed in a weatherproof housing

2.2-5.6.2.5 Medical gas parks and equipment

2.2-5.6.2.6 Air-cooled chillers where installed in a weatherproof housing

2.2-5.6.2.7 Trash compactors and incinerators

2.2-5.6.2.8 Site lighting, post indicator valves, and other equipment normally installed on the exterior of the building

2.2-5.6.3 Equipment and Supply Storage

2.2-5.6.3.1 Storage for building maintenance supplies

- (1) A storage room shall be provided for building maintenance supplies.
- (2) Storage for solvents and flammable liquids shall comply with applicable NFPA codes.

2.2-5.6.3.2 Outdoor equipment storage. Yard equipment and supply storage areas shall be provided. These shall be located so that equipment may be moved directly to the exterior without interference with other work.

2.2-5.6.4 General Maintenance Shop(s)

These shall be provided to accommodate repair and maintenance requirements.

2.2-5.6.5 Medical Equipment Shop

A separate area or room shall be provided specifically for storage, repair, and testing of electronic and other medical equipment. The amount of space and type of utilities will vary with the type of equipment involved and types of outside contracts used, as specified in the functional program.

2.2-5.6.6 Engineer's Office

An engineer's office shall be provided. This shall have file space and provisions for protected storage of facility drawings, records, manuals, etc.

2.2-5.7 Morgue Facilities

2.2-5.7.1 Location

These facilities shall be accessible through an exterior entrance and shall be located to avoid the need for transporting bodies through public areas.

*2.2-5.7.2 Autopsy Facilities

If autopsies are performed in the hospital, the following elements shall be provided:

2.2-5.7.2.1 Refrigerated facilities for body holding. Body-holding refrigerators shall be equipped with temperature-monitoring and alarm signals that annunciate at a 24-hour staffed location.

2.2-5.7.2.2 An autopsy room. This shall contain the following:

- (1) A work counter with a hand-washing station
- (2) A storage space for supplies, equipment, and specimens
- (3) An autopsy table
- (4) A deep sink for washing specimens

2.2-5.7.2.3 Environmental services facilities. A housekeeping service sink or receptor shall be provided for cleanup and housekeeping.

2.2-5.7.3 Body-Holding Room

If autopsies are performed outside the facility, a well-ventilated, temperature-controlled body-holding room shall be provided.

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A2.2-5.7.2 Autopsy rooms should be equipped with downdraft local exhaust ventilation.

■ 2.2-6 Public and Administrative Areas

2.2-6.1 Public Areas

The following shall be provided:

2.2-6.1.1 Vehicular Drop-Off and Pedestrian Entrance

For requirements, see 2.1-6.1.1.

2.2-6.1.2 Lobby

For requirements, see 2.1-6.1.2.

2.2-6.1.3 Reserved

2.2-6.1.4 Public Toilet Rooms

2.2-6.1.4.1 All public waiting areas serving more than fifteen people shall include toilet room(s) equipped with hand-washing stations.

2.2-6.1.4.2 These toilet rooms shall be located near the waiting areas and may serve more than one such area.

2.2-6.2 Administrative Areas

The following shall be provided:

2.2-6.2.1 Admissions Area

If required by the functional program for initial admission of inpatients, the area shall include:

2.2-6.2.1.1 A separate waiting area for patients and accompanying persons

2.2-6.2.1.2 A work counter or desk for staff

2.2-6.2.1.3 Wheelchair storage. A storage area for wheelchairs shall be provided out of the path of normal traffic.

2.2-6.2.2 Interview Space

For requirements, see 2.1-6.2.2.

2.2-6.2.3 General or Individual Office

For requirements, see 2.1-6.2.3.

2.2-6.2.4 Multipurpose Room

2.2-6.2.4.1 Multipurpose room(s) that include provisions for the use of visual aids shall be provided for conferences, meetings, and health education purposes.

2.2-6.2.4.2 Several services shall be permitted to share one multipurpose room.

2.2-6.2.5 Medical Records

Rooms, areas, or offices for the following personnel and/or functions shall be provided:

2.2-6.2.5.1 Medical records administrator/technician

2.2-6.2.5.2 Review and dictation

2.2-6.2.5.3 Sorting, recording, or microfilming records

2.2-6.2.5.4 Record storage

2.2-6.2.6 Equipment and Supply Storage

Storage shall be provided for office equipment and supplies.

2.2-6.3 Support Areas for Staff and Volunteers

Lockers, lounges, toilets, etc. shall be provided for employees and volunteers. These shall be in addition to, and separate from, those required for medical staff and the public.

■ 2.2-7 Design and Construction Requirements

For requirements, see 2.1-7.

■ 2.2-8 Building Systems

2.2-8.1 Reserved

2.2-8.2 Heating, Ventilation, and Air-Conditioning (HVAC) Systems

For HVAC system requirements, see 2.1-8.2 and additional requirements in this section.

2.2-8.2.1 Reserved**2.2-8.2.2 HVAC Requirements for Specific Locations****2.2-8.2.2.1 Reserved**

2.2-8.2.2.2 Protective environment (PE) rooms. The PE room is used to protect the profoundly immunosuppressed patient with prolonged neutropenia (i.e., a patient undergoing an allogeneic or autologous bone marrow/stem cell transplant) from common environmental airborne infectious microbes (e.g., *Aspergillus* spores).

(1) These special ventilation areas shall be designed to provide directed airflow from the cleanest patient care area to less clean areas.

* (2) Supply air to PE rooms, and to anterooms if provided, shall pass through HEPA filters just before entering the room. For a suite of rooms, installation of the HEPA filters upstream of the suite shall be permitted.

(3) Each PE room shall have a permanently installed visual mechanism to constantly monitor the pressure status of the room when occupied by a patient requiring a protective environment. The mechanism shall monitor the pressure differential between the PE room and the corridor or common space, whether or not there is an anteroom between the corridor or common space and the PE room.

(4) When an anteroom is provided, airflow shall be from the patient room into the anteroom and from the anteroom into the corridor.

(5) See Part 6 for additional ventilation requirements.

2.2-8.2.2.3 Combination airborne infection isolation/protective environment (AII/PE) room

(1) Supply air shall comply with the requirements of 2.2-8.2.2.2 (2) for PE rooms.

(2) Exhaust air from the combination AII/PE room and anteroom shall comply with the requirements of AII rooms.

(3) The airflow pattern for the anteroom shall be one of the following:

(a) Airflow from the anteroom to both the patient room and the corridor, or

(b) Airflow from both the patient room and the corridor into the anteroom.

(4) Rooms with reversible airflow provisions for the purpose of switching between protective environment and airborne infection isolation functions shall not be permitted.

(5) Each combination AII/PE room shall have two permanently installed visual mechanisms to constantly monitor the pressure status of the room when occupied by patients with an airborne infectious disease and/or requiring a protective environment. One mechanism shall monitor the pressure differential between the patient room and the anteroom. The second mechanism shall monitor the pressure differential between the anteroom and the corridor.

2.2-8.3 Electrical Systems

For electrical system requirements, see 2.1-8.3 and additional requirements in this section.

2.2-8.3.1 General

See 2.1-8.3 for common requirements that apply to general hospitals. The specific requirements included in this section shall also apply to general hospitals.

2.2-8.3.1.1 Applicable standards. Field labeling of equipment and materials shall be permitted only when provided by a nationally recognized testing laboratory that has been certified by the Occupational Safety and Health Administration (OSHA) for that referenced standard.

2.2-8.3.2 through 2.2-8.3.4 Reserved**2.2-8.3.5 Electrical Equipment**

***2.2-8.3.5.1 Special electrical equipment.** Special equipment is identified in the sections on critical care

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A2.2-8.2.2.2 (2) These interrupting filters protect patient rooms from maintenance-derived release of environmental microbes from the ventilation system components. Recirculation HEPA filters can be used to increase the equivalent room air exchanges.

units, newborn nurseries, pediatric and adolescent unit, psychiatric nursing unit, obstetrical suite, surgical suites, emergency service, imaging suite, nuclear medicine, laboratory suite, rehabilitation therapy department, renal dialysis unit, respiratory therapy service, morgue, pharmacy, dietary facilities, public and administrative areas, medical records, central services, general stores, and linen services. These sections shall be consulted to ensure compatibility between programmatically defined equipment needs and appropriate power and other electrical connection needs.

2.2-8.3.6 Receptacles

2.2-8.3.6.1 Receptacles in corridors. Special receptacles marked for x-ray use shall be installed in corridors of patient areas so that mobile equipment may be used anywhere within a patient room using a cord length of 50 feet (15.24 meters) or less. If the same mobile

x-ray unit is used in operating rooms and in nursing areas, receptacles for x-ray use shall permit the use of one plug in all locations. Where capacitive discharge or battery-powered x-ray units are used, special x-ray receptacles are not required.

2.2-8.4 Plumbing Systems

For requirements, see 2.1-8.4.

2.2-8.5 Communications Systems

For requirements, see 2.1-8.5.

2.2-8.6 Electronic Safety and Security Systems

For requirements, see 2.1-8.6.

2.2-8.7 Special Systems

For requirements, see 2.1-8.7.

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A2.2-8.3.5.1 Special attention should be paid to safety hazards associated with equipment cabling. Every attempt should be made to minimize these hazards, where practical.

2.3 Specific Requirements for Small Primary Care Hospitals

Appendix material, shown in shaded boxes at the bottom of the page, is advisory only.

■ *2.3-1 General

2.3-1.1 Application

The small primary care hospital shall meet the specific requirements described herein and the general requirements referenced in Chapter 2.1. Such facilities shall also meet the requirements outlined in the referenced ambulatory care facilities chapters in Part 3.

2.3-1.2 Functional Program

For requirements, see 1.2-2 and 2.1-1.2.

2.3-1.2.1 Swing Beds

When the concept of swing beds is part of the functional program, care shall be taken to include requirements for all intended categories.

2.3-1.3 Site

2.3-1.3.1 Reserved

2.3-1.3.2 Parking

2.3-1.3.2.1 Comply with the general requirements of Section 1.3-3.3, Parking, and the following specific requirements:

*2.3-1.3.2.2 In the absence of local codes governing parking space requirements, one space shall be provided for each bed plus one space for each employee normally present on any single weekday shift.

2.3-1.3.2.3 Separate and additional space shall be

provided for service delivery vehicles, vehicles used for emergency services, and mobile transportable units.

2.3-1.3.3 Transfer Support Features

2.3-1.3.3.1 Part of the facility's transfer agreements with higher care hospital providers shall include use of helicopter and/or ambulance services to ensure timely transfer to a tertiary care hospital of patients presenting to the emergency room of the small primary care hospital.

*2.3-1.3.3.2 Helicopter facilities

- (1) Helicopter pad and ambulance ports shall be located close to the emergency suite and to the designated patient rooms where patients are held who have been stabilized but require transfer to a tertiary care hospital for treatment.
- (2) Helicopter pads shall be located with clear approach and departure paths.
- (3) Helicopter pads shall be sized to provide adequate clear ground maneuvering clearance.
- (4) Helipads shall be paved and marked and include an illuminated windsock.

2.3-1.3.3.3 Where appropriate, features such as garages, landing pads, approaches, lighting, and fencing required to meet state and local regulations that govern the placement, safety features, and elements required to accommodate helicopter and ambulance services shall be provided.

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*A2.3-1 Since the early 1990s, the health care community has been looking at traditional hospital models (and nursing homes built under the Hill-Burton hospital model) and their delivery of care roles as established in the 1947 Hill-Burton Act. The Kellogg Foundation Report titled "Hospital Community Benefits Standards," published in the early 1990s, stated that to eliminate identified health disparities, all primary care providers should become more community responsive in their orienta-

tion and develop coalitions with local health departments, community health centers, and the communities they serve.

A2.3-1.3.2.2 Additional parking may be required to accommodate other services.

A2.3-1.3.3.2 Refer to FAA Advisory Circular 150/5390-2B, *Helicopter Design*, for more information.

2.3-1.4 Transfer and Service Agreements

All necessary transfer and service agreements with secondary or tertiary care hospitals shall be included in the functional program.

2.3-2 Nursing Unit**2.3-2.1 General**

2.3-2.1.1 A single nursing unit shall be provided for the small primary care hospital. The number of patient rooms contained in the unit shall be as determined by the functional program but shall not exceed 25 beds per unit.

2.3-2.1.2 Incorporation of an additional unit into the design of the facility shall be permitted based on a demographic analysis and the facility's demonstrated ability to provide adequate support services for the additional beds.

2.3-2.2 Small Hospital Nursing Unit**2.3-2.2.1 General**

The unit shall be designed to accommodate multiple patient modalities, with adequate support areas to accomplish the modalities referenced in the functional program.

2.3-2.2.2 Patient Room**2.3-2.2.2.1 Capacity**

- (1) The maximum number of beds per room shall be one unless the functional program demonstrates the necessity of a two-bed arrangement. Approval of a two-bed arrangement shall be obtained from the licensing authority.
- (2) Where renovation work is undertaken and the present capacity is more than one patient, maximum room capacity shall be no more than the present capacity, with a maximum of four patients.

2.3-2.2.2.2 Space requirements***(1) Area**

- (a) Patient rooms shall be constructed to meet the needs of the functional program.
- (b) Patient rooms shall have a minimum clear floor area of 120 square feet (11.15 square meters) in a single-bed room and 100 square feet (9.29 square meters) per bed in a multiple-bed room.

(2) Clearances

- (a) The dimensions and arrangement of rooms shall be such that there is a minimum clear dimension of 3 feet (91.44 centimeters) between the sides and foot of the bed and any wall or any other fixed obstruction.
- (b) In multiple-bed rooms, a minimum clear dimension of 4 feet (1.22 meters) shall be available at the foot of each bed to permit the passage of equipment and beds.

- (3) Where renovation work is undertaken, every effort shall be made to meet the above minimum standards. If it is not possible to meet the above minimum standards, authorities having jurisdiction may grant approval to deviate from this requirement. In such cases, patient rooms shall have a minimum clear floor area of 100 square feet (9.29 square meters) in a single-bed room and 80 square feet (7.43 square meters) per bed in a multiple-bed room.

2.3-2.2.2.3 Window. Each patient room shall have a window in accordance with Section 2.1-7.2.2.5.

2.3-2.2.2.4 Patient privacy. For requirements, see 2.1-2.2.4.

2.3-2.2.2.5 Hand-washing stations

- (1) A hand-washing station for the exclusive use of the staff shall be provided to serve each patient room;

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A2.3-2.2.2.2 (1) In new construction, single-patient rooms should be at least 12 feet (3.65 meters) wide by 13 feet (3.96 meters) deep (approximately 160 square feet or 14.86 square meters) exclusive of toilet rooms, closets, lockers, wardrobes, alcoves, or vestibules. These

spaces should accommodate comfortable furniture for one or two family members without blocking staff member access to patients. Efforts should be made to provide the patient with some control of the room environment.

this hand-washing station shall be placed outside the patient toilet room.

(2) Design requirements

- (a) For hand-washing station design details, see 2.1-7.2.2.8.
- (b) For sinks, see 2.1-8.4.3.2 (Hand-washing stations).

2.3-2.2.2.6 Patient toilet room

- (1) A patient toilet room shall be provided.
- (2) The patient toilet room shall contain a toilet, a hand-washing station, and a shower.
- (3) The door to the patient toilet room shall swing outward or be double-acting.

2.3-2.2.2.7 Patient bathing facilities. For requirement, see 2.3-2.2.2.6 (2).

2.2.-2.2.2.8 Patient storage. Each patient shall have within his or her room a separate wardrobe, locker, or closet suitable for hanging full-length garments and for storing personal effects.

2.3-2.2.3 Family/Caregiver Accommodations

2.3-2.2.3.1 Areas for overnight stay for patient's significant other or for the patient's selected family caregiver shall be provided.

2.3-2.2.3.2 Adequate spaces for sitting, lounging, and visiting shall be provided to meet the needs outlined in the functional program.

2.3-2.2.4 Special Patient Care Areas

2.3-2.2.4.1 Reserved

2.3-2.2.4.2 Airborne infection isolation (AII) room. If the functional program requires a dedicated AII room, it shall meet the criteria established in 2.1-2.4.2.

2.3-2.2.4.3 Protective environment (PE) room. If the functional program requires a PE room, it shall meet the criteria established in 2.2-2.2.4.3.

2.3-2.2.4.4 Seclusion room. If the functional pro-

gram requires a seclusion room, it shall meet the criteria established in 2.1-2.4.3.

2.3-2.2.4.5 Critical care room. These rooms are intended for temporary care of patients needing transportation to an intensive care setting in a higher level facility, not for active critical care treatment.

- (1) The patient rooms described in this section shall have the capability of serving as temporary critical care patient rooms in the event a patient arrives at the facility in need of stabilization and monitoring prior to transfer to a tertiary care facility.
- (2) These rooms shall also be capable of serving the needs of patients requiring hospice and ventilator care.

2.3-2.2.4.6 LDR/LDRP room. When an obstetrical patient presents herself to the small primary care hospital, arrangements for transfer of the patient to a tertiary care hospital with maternity programs shall be made. However, in the event the transfer cannot be accomplished in a timely manner, the small primary care hospital shall include the following:

- (1) Patient rooms with the capability of serving as labor/delivery/recovery or labor/delivery/recovery/postpartum (LDR/LDRP) rooms in the event an obstetrical patient arrives at the facility in need of such services. These rooms shall have a second patient station with electrical, medical gas, and vacuum services to accommodate infant resuscitation needs.
- (2) If the functional program requires a small primary care hospital to include LDR/LDRP functions, a storage area with a minimum of 100 square feet (9.29 square meters) per LDR bed for the storage of case carts, delivery equipment, and bassinets

2.3-2.2.4.7 Cesarean delivery room. A minimum of one cesarean delivery room shall be provided unless direct access for cesarean delivery procedures is provided in surgical operating rooms as defined by the functional program.

2.3-2.2.5 Support Areas for Patient Care—General

2.3-2.2.5.1 General. For requirements, see 2.1-2.5.

2.3 SPECIFIC REQUIREMENTS FOR SMALL PRIMARY CARE HOSPITALS

2.3-2.2.5.2 Application. The size of each support area shall depend on the numbers and types of modalities served.

2.3-2.2.5.3 Location

- (1) Provision for the support areas listed shall be readily available in each nursing unit.
- (2) The location of each support area shall depend on the numbers and types of modalities served.

2.3-2.2.6 Support Areas for the Small Hospital Nursing Unit

2.3-2.2.6.1 Administrative center or nurse station

- (1) Location. This area shall be located to control access to the nursing unit and serve as a security checkpoint for visitors and vendors entering the nursing unit. It shall have direct visual access to the entrance to the unit.
- (2) For requirements, see 2.1-2.6.1.

2.3-2.2.6.2 Documentation area. For requirements, see 2.1-2.6.2.

2.3-2.2.6.3 Nurse or supervisor office

2.3-2.2.6.4 Reserved

2.3-2.2.6.5 Hand-washing stations

- (1) Hand-washing stations shall be conveniently accessible to the nurse station, medication station, and nourishment area.
- (2) If it is convenient to each, one hand-washing station shall be permitted to serve several areas.

2.3-2.2.6.6 Medication dispensing location. Provisions shall be made for distribution of medications. For requirements, see 2.1-2.6.6.

2.3-2.2.6.7 Nourishment area. For requirements, see 2.1-2.6.7.

2.3-2.2.6.8 Ice-making equipment. Each nursing unit shall have equipment to provide ice for treatments and nourishment. For requirements, see 2.1-2.6.8.

2.3-2.2.6.9 Clean workroom or clean supply room.

For requirements, see 2.1-2.6.9.

2.3-2.2.6.10 Soiled workroom or soiled holding room.

For requirements, see 2.1-2.6.10.

2.3-2.2.6.11 Equipment and supply storage

- (1) Clean linen storage
 - (a) Each nursing unit shall contain a designated area for clean linen storage. For requirements, see 2.1-2.6.11.1.
 - (b) If a covered cart distribution system is used, storage shall be under staff control and protected from contamination.
- (2) Equipment storage room or alcove. A room or alcove shall be provided in each nursing unit appropriate for the storage of equipment necessary for patient care and as required by the functional program. For requirements, see 2.1-2.6.11.2.
- (3) Emergency equipment storage. For requirements, see 2.1-2.6.11.4.

2.3-2.2.6.12 Environmental services room. An environmental services room shall be provided for each nursing unit. For requirements, see 2.1-2.6.12.

2.3-2.2.7 Support Areas for Staff

2.3-2.2.7.1 Staff lounge. These facilities shall be located as close as possible to the centralized nurse station or, if the nurse station is decentralized, in close proximity to the work core of the nursing unit. For further requirements, see 2.1-2.7.1.

2.3-2.2.7.2 Staff toilet room. For requirements, see 2.1-2.7.2.

2.3-2.2.7.3 Staff storage locations. For requirements, see 2.1-2.7.3.

2.3-2.2.8 Support Areas for Families, Patients, and Visitors

2.3-2.2.8.1 Patient toilet rooms. In addition to those serving bed areas, patient toilet rooms shall be conveniently located to multipurpose rooms. Patient toilet

rooms located within the multipurpose rooms may also be designated for public use.

■ 2.3-3 Diagnostic and Treatment Services

2.3-3.1 General

As dictated by the functional program and community needs (and agreements with tertiary care hospitals), the following elements shall be provided for clinical services:

2.3-3.2 Examination/Treatment Room or Area

An examination/treatment room or area may be required in many locations in a health care facility. When this room or area is required by the functional program, it shall meet the following requirements:

2.3-3.2.1 Single-Bed Examination/Treatment Room or Area

2.3-3.2.1.1 Each single-patient examination/treatment room shall have a minimum clear floor area of 120 square feet (11.15 square meters).

2.3-3.2.1.2 Provision shall be made to preserve patient privacy from observation from outside the examination/treatment room through an open door.

2.3-3.2.1.3 The examination/treatment room shall contain the following:

- (1) An examination light
- (2) A hand-washing station
- (3) Storage facilities for supplies
- (4) A desk, counter, or shelf space for writing or electronic documentation

2.3-3.2.2 Multiple-Bed Examination/Treatment Room or Area

2.3-3.2.2.1 Multiple-bed examination/treatment rooms shall have separate patient cubicles with a minimum clear floor area of 80 square feet (7.43 square meters) per cubicle.

2.3-3.2.2.2 The cubicle shall contain the following:

- (1) An examination light
- (2) Storage facilities for supplies
- (3) A desk, counter, or shelf space for writing or electronic documentation

2.3-3.2.2.3 In a multiple-bed examination/treatment room, a hand-washing station shall be provided in the room for each three or fewer patient cubicles.

2.3-3.2.3 Observation Room

2.3-3.2.3.1 Location

- (1) Rooms for the isolation of suspect or disturbed patients shall be convenient to a nurse or control station. This is to permit close observation of patients and to minimize the possibility that patients can hide, escape, injure themselves, or commit suicide.
- (2) Modification of an examination room to accommodate this function shall be permitted.

2.3-3.2.3.2 Space requirements. These rooms shall have a minimum clear floor area of 80 square feet (7.43 square meters).

2.3-3.2.3.3 Toilet room. A toilet room with hand-washing station shall be immediately accessible.

2.3-3.2.4 Reserved

2.3-3.2.5 Support Areas for Patient Care—General

For requirements, see 2.1-2.5.

2.3-3.2.6 Support Areas for Examination and Treatment Rooms

2.3-3.2.6.1 Work station. A work station shall be provided.

- (1) The work station shall have a counter, communication system, space for supplies, and provisions for charting.
- (2) If a fully integrated electronic information management system is planned, the following shall be provided:

2.3 SPECIFIC REQUIREMENTS FOR SMALL PRIMARY CARE HOSPITALS

- (a) A centralized work station controlling all ingress and egress to the unit
- (b) Additional alcoves or spaces within individual rooms to accommodate the information technology equipment needed to accomplish the integration

2.3-3.2.6.2 through 2.3-3.2.6.5 Reserved

2.3-3.2.6.6 Medication station. This may be part of the work station.

- (1) This shall include a work counter, hand-washing station, lockable refrigerator, and locked storage for controlled drugs. (Standard cup sinks in many self-contained units are not adequate for hand-washing.)
- (2) If a self-contained medicine dispensing unit is provided, it may be located at the work station, in the clean workroom, or in an alcove, provided the unit has adequate security for controlled drugs and adequate lighting to easily identify drugs.

2.3-3.2.6.7 Reserved

2.3-3.2.6.8 Reserved

2.3-3.2.6.9 Clean storage. A separate room or closet for storing clean and sterile supplies shall be provided. This storage shall be in addition to that provided by cabinets and shelves.

2.3-3.2.6.10 Soiled workroom or soiled holding room. For requirements, see 2.1-2.6.10.

2.3-3.2.6.11 Equipment and supply storage. Wheelchair storage spaces shall be provided out of corridors.

2.3-3.2.6.12 Reserved

2.3-3.2.6.13 Reserved

2.3-3.2.6.14 Sterilization facilities. A system for sterilizing equipment and supplies shall be provided. Sterilizing procedures may be done on or off site as long as the off-site location is monitored by the facility regularly and meets the facility's infection control criteria for sterilizing locations and transportation and

handling methods for sterilized supplies. Disposable supplies may be used to satisfy the facility's needs.

2.3-3.3 Emergency Services

Emergency facilities for the small primary care hospital shall meet the criteria established for Section 2.2-3.2 (Freestanding Emergency Care Facility).

2.3-3.4 Surgical Services

2.3-3.4.1 Surgical procedures that occur in these facilities shall be limited to types that can be performed and supported in an ambulatory surgical setting.

2.3-3.4.2 Surgical facilities for the small primary care hospital shall meet the criteria established for 3.7-3, 3.7-5, 3.7-7, and 3.7-8 in Part 3.

2.3-3.5 Imaging Services

2.3-3.5.1 General

Facilities for basic diagnostic procedures shall be provided, including the following:

*2.3-3.5.2 Radiography Rooms

Radiography rooms shall be of a size to accommodate the functional program.

2.3-3.5.3 through 2.3-3.5.5 Reserved

2.3-3.5.6 Support Areas for Imaging Services

2.3-3.5.6.1 Viewing and administrative areas shall be provided.

2.3-3.5.6.2 Toilet rooms with hand-washing stations shall be provided accessible to fluoroscopy rooms.

2.3-3.5.6.3 Film processing facilities shall be provided. (If part of a picture archiving and communication system [PACS], film processing may be retained for emergency use and film development for special cases.)

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A2.3-3.5.1 Radiography rooms should have a minimum clear floor area of 180 square feet (7.43 square meters). (Dedicated chest x-ray rooms may be smaller.)

2.3-3.5.6.4 Storage facilities shall be provided for film and equipment.

2.3-3.5.7 Support Areas for Staff

Toilet rooms with hand-washing stations shall be provided accessible to work stations.

2.3-3.5.8 Support Areas for Patients

2.3-3.5.8.1 Dressing rooms or booths shall be as required for services provided.

2.3-3.5.8.2 Toilet rooms with hand-washing stations shall be provided accessible to dressing rooms or booths.

2.3-3.6 Telemedicine Service

2.3-3.6.1 General

If the facility has telemedicine agreements with tertiary care hospitals, the following support areas for the mobile transportable units, staff, and patients shall be provided:

2.3-3.6.2 Telemedicine Areas

2.3-3.6.2.1 Reception and waiting

- (1) Size. A reception and waiting area for patients and visitors shall be sized according to program needs.
- (2) Toilets. The area shall be equipped with public and staff toilets.

2.3-3.6.2.2 Staging area. A staging area for privacy isolation of inpatients awaiting diagnostic treatment shall be provided.

- (1) The staging area shall be located in a triage area near the patient corridor but separate from the corridor to ensure proper isolation and privacy.
- (2) The staging area shall contain hand-washing stations equipped with hands-free operable controls.
- (3) Ventilation in the staging area shall provide negative air pressure to the surrounding areas.

2.3-3.6.2.3 Consultation room. Rooms shall be provided for staff viewing and consultation with the tertiary care specialist.

- (1) Privacy and confidentiality of patients records and

discussions shall be considered when designing these rooms.

- (2) Consultation rooms shall be provided at a ratio of one room per mobile transportable unit access port.

2.3-3.6.3 through 2.3-3.6.5 Reserved

2.3-3.6.6 Support Areas for Telemedicine Service

In facilities where telemedicine is contemplated, adequate spaces to support the telemedicine functions shall be planned in conjunction with information technology spaces. Satellite linkages, communication and viewing rooms and consoles, consultation spaces, electronic interview rooms, and satellite hookups shall be considered when planning the spaces.

2.3-3.6.7 Reserved

2.3-3.6.8 Support Areas for Patients

Outpatient clothing change and waiting areas shall be provided. Separate areas shall be provided for male and female patients to change from street clothing into hospital gowns and to wait for procedures.

2.3-3.6.8.1 These areas shall include lockers and clothing change or gowning area(s). Provisions for visual and sound privacy shall be made in these spaces.

2.3-3.6.8.2 A toilet for patient use shall be provided.

2.3-3.6.9 Mobile Transportable Unit Connection Requirements

2.3-3.6.9.1 Access ports

- (1) A weather enclosure to protect the transportable unit and patient from the elements shall be a main consideration when considering placement and enclosure of these spaces.
- (2) One or more ports shall be provided for use by the facility and the tertiary care hospital, as required by the functional program and identified community needs.

2.3-3.6.9.2 Connection to special life safety needs.

The mobile transportable unit shall be integrated with all of the facility's life safety systems, including connection to the facility's fire alarm, sprinkler, security, and exiting systems.

2.3-3.7 Additional Diagnostic and Treatment Services

2.3-3.7.1 References

Additional diagnostic and treatment services for the small primary care hospital shall meet the criteria established in the following sections of these Guidelines:

2.3-3.7.1.1 If a booth is used for cough-inducing and aerosol-generating procedures, see 2.2-3.8.2 for requirements. If an airborne infection isolation room is used for this purpose, see Part 6 for ventilation requirements.

2.3-3.7.1.2 Chapter 3.4, Freestanding Outpatient Diagnostic and Treatment Facilities

2.3-3.7.1.3 Chapter 3.9, Endoscopy Facilities

2.3-3.7.2 Mobile Units

If mobile units are used to provide additional diagnostic and treatment services, refer to Chapter 5.1, Mobile, Transportable, and Relocatable Units.

■ 2.3-4 Patient Support Services

2.3-4.1 Laboratory Services

2.3-4.1.1 General

2.3-4.1.1.1 Facilities shall be provided within the outpatient department or through an effective contract arrangement with a tertiary care hospital, for hematology, clinical chemistry, urinalysis, cytology, pathology, and bacteriology.

2.3-4.1.1.2 If these services are provided on contract, the support spaces described herein shall be provided in the facility.

2.3-4.1.2 Stat Laboratory

2.3-4.1.2.1 A laboratory room with work counters, sinks, hand-washing station, emergency equipment (e.g., flood shower and eyewash station), and tele/data and electrical services shall be provided.

2.3-4.1.2.2 Blood storage facilities meeting the Clinical Laboratory Improvement Act standards for blood banks shall be provided.

2.3-4.1.2.3 Proper storage for reagents, specimens, flammable materials, acids, bases, and other supplies shall be provided as necessary.

2.3-4.1.3 Specimen Collection

Specimen collection facilities with toilet for collection of urine and solid samples, blood-drawing cubicles, adequate seating spaces, storage spaces for specimen collection supplies, and work counters for labeling and storage of specimens awaiting pick-up shall be provided.

■ 2.3-5 General Support Services and Facilities

2.3-5.1 through 2.3-5.3 Reserved

2.3-5.4 Waste Management Facilities

For requirements, see 2.1-5.4.

2.3-5.5 Environmental Services

2.3-5.5.1 Reserved

2.3-5.5.2 Environmental Services Room

2.3-5.5.2.1 At a minimum, one environmental services room per support unit or suite shall be provided.

2.3-5.5.2.2 These rooms shall contain a sink and storage spaces for clean supplies and cleaning equipment.

2.3-5.6 Engineering and Maintenance Services

The following shall be provided:

2.3-5.6.1 Equipment Room

Rooms for boilers, mechanical equipment, and electrical equipment shall have a minimum clearance around the equipment of 2 feet 6 inches (76.20 centimeters) for ease of maintenance.

2.3-5.6.2 Storage Room

Storage rooms shall be provided for supplies and equipment.

■ 2.3-6 Public and Administrative Areas

2.3-6.1 Public Areas

These shall be conveniently accessible to persons with disabilities and include the following:

2.3-6.1.1 Entrance

For requirements, see 2.1-6.1.1.

2.3-6.1.2 Lobby

2.3-6.1.2.1 The reception and information counter or desk shall be located to control the entrance to the facility and to monitor visitors and arriving patients.

2.3-6.1.2.2 For other requirements, see 2.1-6.1.2.

2.3-6.1.3 Enclosed Vending Area

2.3-6.1.4 Wheelchair Storage Areas

These shall be provided out of the path of traffic.

2.3-6.2 Administrative Areas

2.3-6.2.1 Reserved

2.3-6.2.2 Interview Space

For requirements, see 2.1-6.2.2. These spaces shall be designed for confidentiality and privacy.

2.3-6.2.3 General and Individual Offices

2.3-6.1.3.1 For requirements, see 2.1-6.2.3.

2.3-6.2.3.2 General clerical spaces or rooms for typing, photocopying, filing, and other clerical work shall be separated from public areas for confidentiality.

2.3-6.2.4 Multipurpose Rooms

Multipurpose rooms that include provisions for the use of visual aids shall be provided for conferences, training, meetings, health education programs, and community outreach activities.

2.3-6.2.5 Reserved

2.3-6.2.6 Equipment and Supply Storage

Facilities shall be provided for storage of general supplies and equipment needed for continuing operation.

2.3-6.3 Support Areas for Employees and Volunteers

2.3-6.3.1 Employee Storage Locations

Storage spaces with locking drawers or cabinets shall be provided for the personal effects of the staff. Such storage shall be near individual work stations and under staff control.

■ 2.3-7 Design and Construction Requirements

2.3-7.1 Building Codes and Standards

The diagnostic and treatment locations, service areas, and public and administrative areas in this chapter shall be permitted to fall under the business occupancy provisions of the applicable life safety and building codes if they are separated from the inpatient portion of the facility by two-hour construction.

2.3-7.2 Architectural Details

The required minimum corridor width for inpatient facilities (8 feet or 2.44 meters) shall apply to all areas where patients are housed and receive treatment.

■ 2.3-8 Building Systems

2.3-8.1 Reserved

2.3-8.2 Heating, Ventilation, and Air-Conditioning (HVAC) Systems

For requirements, see 2.1-8.2.

2.3-8.3 Electrical Systems

For requirements, see 2.1-8.3.

2.3-8.4 Plumbing Systems

For requirements, see 2.1-8.4.

2.3-8.5 Reserved

2.3-8.6 Electronic Safety and Security Systems

Consideration shall be given in the design of these facilities to active and passive security systems. Locking arrangements, security alarms, and monitoring devices shall be placed carefully and shall not interfere with the life safety features necessary to operate

and maintain a healthy and functional environment.

2.3-8.7 Special Systems

2.3-8.7.1 General

For requirements, see 2.1-8.7.1.

2.4 Specific Requirements for Critical Access Hospitals

Guidelines for critical access hospitals were drafted too late in the 2010 Guidelines revision cycle to be included in this edition. To review the draft guidelines, visit the Facility Guidelines Institute Web site at www.fgiguideines.org and click on the link “White Papers and Draft Guidelines.” At the first all-hands meeting of the 2014 Guidelines revision cycle, the

Health Guidelines Revision Committee will consider whether to accept this draft for consideration along with the 2010 edition during the public proposal period. In that case, the public will be invited to make proposals to accept, modify, or reject these draft guidelines. More information about the Guidelines revision process is available on the FGI Web site and in the preface of this book.

2.5 Specific Requirements for Psychiatric Hospitals

Appendix material, shown in shaded boxes at the bottom of the page, is advisory only.

■ 2.5-1 General

*2.5-1.1 Application

This section covers a psychiatric hospital intended for the care and treatment of inpatients who do not require acute medical services. See Section 2.2-2.14 (Psychiatric Nursing Unit) for psychiatric units within general hospitals. See Chapter 3.11, Psychiatric Outpatient Centers, for community outpatient psychiatric services. See the appendix item to this section for information on residential psychiatric treatment centers.

2.5-1.2 Functional Program

For requirements, see 1.2-2 and 2.1-1.2.

2.5-1.2.1 Swing Beds

Change to the occupancy of a group of rooms within the facility shall be permitted to accommodate different patient groups based on age, sex, security level, or treatment programs.

2.5-1.3 Site

2.5-1.3.1 Parking

2.5-1.3.1.1 Parking for psychiatric hospitals shall comply with the general requirements in 1.3-3.3 and the following specific requirements:

2.5-1.3.1.2 In the absence of local requirements governing parking, the following shall be provided:

- (1) At least one space for each employee normally present during one weekday shift plus one space for every five beds, or a total of 1.5 spaces per patient. Reduction of this ratio shall be permitted in compliance with Section 1.3-3.3.3
- (2) Additional parking to accommodate outpatient or other services provided on site

2.5-1.4 Shared Services

Where the psychiatric facility is part of another facility, or where different psychiatric patient populations

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A2.5-1.1 Residential Psychiatric Treatment Centers

Not covered by this chapter are residential psychiatric treatment centers. Some generalized information for this type of facility is given here; however, state or local licensing authorities should be contacted for more specific requirements.

Residential psychiatric treatment centers, with their various manifestations and names, offer care to residents who do not require the level of care of a psychiatric hospital. Generally, these facilities are more residential in character and have programs for a specified period of time and diagnosis, such as for alcohol and drug abuse treatment. Residents can enter such a facility either voluntarily and involuntarily. Accreditation programs include the Joint Commission and the Commission on Accreditation of Rehabilitation Facilities.

The levels of care, depending on program requirements, can include (1) intake, (2) inpatient acute, (3) short stay/outpatient, and (4) mentally retarded/developmentally disabled.

State licensing and code authorities having jurisdiction (AHJ) over these facilities can range from a department of health to departments such as social services and welfare. The occupancy of these buildings can be classified as institutional/health care or as a less restrictive residential

type occupancy. Each state may have its own written operational and physical plant requirements, which should be consulted.

a. A residential treatment center requires, as defined in its functional program, the site, nursing, diagnostic and treatment, support, and public and administrative services that are standard for psychiatric hospitals.

As is the case for psychiatric hospitals, in some cases these services may be shared or provided by contract, depending on the program requirements.

- b. Residents can be pediatric or adult. When a facility serves both populations, there should be a separation between them.
- c. At level 4 care, up to four bedrooms might be provided, depending on the age of the residents and the functional program.
- d. Outdoor activity areas are important.
- e. Spaces to accommodate educational therapy/services should be provided in centers with residents of school age.
- f. In general, special systems and building systems should meet the requirements for such systems in psychiatric hospitals unless they must meet specific state requirements.

share the same facility, shared ancillary and clinical services shall be permitted when these shared services are located and configured to accommodate programmatic requirements for safety, security, and other clinical considerations.

***2.5-1.5 Environment of Care**

***2.5-1.5.1 Therapeutic Environment**

2.5-1.5.1.1 Hidden alcoves or blind corners or areas shall be avoided.

2.5-1.5.2 Security

2.5-1.5.2.1 The design shall provide the level of security appropriate for the specific type of service or program provided as well as the age level, acuity, and risk of the patients served (e.g., geriatric, acute psychiatric, or forensic for adult, child, and adolescent care).

***2.5-1.5.2.2 Perimeter security.** Perimeter security addresses elopement prevention, prevention of contraband smuggling, visitor access control, and exit process and procedures.

(1) A perimeter security system shall be provided that will contain patients within the nursing unit until clinical staff and/or hospital security can escort them to an adjacent compartment or an exit stair.

(2) The perimeter security system shall be designed to prevent contraband smuggling and shall include provisions for monitoring and controlling visitor access and egress.

***3** Openings in the perimeter security system (e.g., windows, doors, and gates) shall be controlled by locks (manual, electric, or magnetic) when required by the functional program.

(4) Use of security cameras or alternate security measures consistent with the functional program requirements shall be permitted in addition to the security perimeter requirements listed above.

***2.5-1.5.2.3 Patient safety and suicide prevention.** Special design considerations for injury and suicide prevention shall be given to details, finishes, and equipment as specified in 2.5-7.2 and 2.5-8.

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A2.5-1.5 Environment of Care

A safe environment is critical; however, no environment can be entirely safe and free of risk. The majority of persons who attempt suicide suffer from a treatable mental disorder or a substance abuse disorder or both. Patients of inpatient psychiatric treatment facilities are considered at high risk for suicide; the environment should avoid physical hazards while maintaining a therapeutic environment. The built environment, no matter how well it is designed and constructed, cannot be relied upon as an absolute preventive measure. Staff awareness of their environment, the latent risks of that environment, and the behavior risks and needs of the patients served in the environment are absolute necessities. Different organizations and different patient populations will require greater or lesser tolerance for risk.

A2.5-1.5.1 Therapeutic Environment

The facility should provide a therapeutic environment appropriate for the planned treatment programs.

- a. The environment of a psychiatric hospital should be characterized by a feeling of openness with emphasis on natural light. In every aspect of building design and maintenance, it is essential to base determinations on the potential risk to the specific patient population served.
- b. There should be visual control (e.g., electronic surveillance) of nursing unit corridors, dining areas, and social areas such as dayrooms and activity areas.

c. The openness of the nurse station will depend on the planned treatment program. Consideration should be given to patient privacy and also to staff safety.

A2.5-1.5.2.2 The owner or designer should consult with the authorities having jurisdiction regarding the acceptability of the perimeter security system.

A2.5-1.5.2.2 (3) Perimeter locks

- a. Manual locks. Manual locks should have a normal lock function on the inpatient unit side.
- b. Electric locks. Electric locks should have a fail secure function with a key override on emergency power with battery backup to prevent loss of security during power failure. These locks may also be equipped with card or proximity readers to ease staff access.
- c. Magnetic locks. Use of magnetic locks on double egress doors and other doors is permitted. Magnetic locks should be on emergency power with battery backup and must have a key override to ensure security during power failure. These locks may also be equipped with card or proximity readers to ease staff access.

A2.5-1.5.2.3 Patient safety risk assessment. The facility's clinical and administrative staff, with the participation of the architect, should develop a detailed assessment of the level of patient safety risk

■ 2.5-2 Nursing Units

2.5-2.1 General

2.5-2.1.1 New Construction

Nursing units in psychiatric hospitals shall meet the minimum design requirements described herein and those in Chapter 2.1, Common Elements for Hospitals, that are referenced in this chapter.

2.5-2.1.2 Renovation

For renovation of nursing units in existing facilities, see 1.1-1.3.5 (Deviations from the Guidelines) and 1.1-3 (Renovation) for further guidance when compliance with these Guidelines is impractical.

2.5-2.2 General Psychiatric Nursing Unit

2.5-2.2.1 Reserved

2.5-2.2.2 Patient Room

Each patient room shall meet the following standards:

2.5-2.2.2.1 Capacity. Maximum room capacity shall be two patients.

2.5-2.2.2.2 Space requirements

- (1) Patient rooms shall have a minimum clear floor area of 100 square feet (9.29 square meters) for single-bed rooms and 80 square feet (7.43 square meters) per bed for multiple-bed rooms.
- (2) The areas noted herein are intended as minimums

and do not prohibit use of larger rooms where required by the functional program.

2.5-2.2.2.3 Windows. Each patient room shall have a window(s) in accordance with Sections 2.1-7.2.2.5 and 2.5-7.2.2.3.

2.5-2.2.2.4 Patient privacy. For requirements, see 2.1-2.2.4.

2.5-2.2.2.5 Reserved

2.5-2.2.2.6 Patient toilet room

- (1) Each patient shall have access to a toilet room without having to enter a corridor. Omission of this direct access requirement shall be permitted at child or adolescent patient rooms or in specific patient rooms where the use of corridor access is part of the hospital's written clinical risk assessment and management program.
- (2) One toilet room shall serve no more than two patient rooms and no more than four beds.
- (3) The toilet room shall contain a toilet and a hand-washing station.
- (4) Toilet room doors
 - (a) Where indicated by the patient safety risk assessment, toilet room doors shall be equipped with keyed locks that allow staff to control access to the toilet room.
 - (b) The door to the toilet room shall swing outward or be double-acting.

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for each program area. Each area should be evaluated to identify the details, surfaces, and furnishings and exposed mechanical and electrical devices and components that should be addressed in the patient safety risk assessment.

The patient safety risk assessment should include a determination of the anticipated level of suicide risk and the anticipated level of staff supervision for each area.

The assessment should establish at least three levels of concern:

- a. Highest level
 - Patient bedrooms and bathrooms (areas where patients spend long periods of time out of direct supervision of the staff)
 - Psychiatric emergency department (Comprehensive Psychiatric Emergency Program, or CPEP—an area under good supervision

but dealing with unpredictable patients under initial evaluation and often under heavy medication)

- b. Moderate level
 - Activity spaces group rooms, and treatment spaces (supervised with good visibility)
 - Dining rooms and recreation spaces, both indoor and outdoor
 - Corridors (always visible)
- c. Lower level
 - Exam rooms, private offices, and conciliation rooms (always supervised)
 - Staff and support areas (not accessible by patients)

2.5 SPECIFIC REQUIREMENTS FOR PSYCHIATRIC HOSPITALS

- (c) Each entry door into a patient toilet room required to be ADA- or ANSI-compliant shall provide space for health care providers to transfer patients to the toilet using portable mechanical lifting equipment.
- (5) Where a toilet room is required to be ADA- or ANSI-compliant, thresholds shall be designed to facilitate use and to prevent tipping of wheelchairs and other portable wheeled equipment by patients and staff.

2.5-2.2.2.7 Patient bathing facilities

- (1) A bathtub or shower shall be provided for each six beds not otherwise served by bathing facilities within the patient rooms.
- (2) Bathing facilities shall be designed and located for patient convenience and privacy.

2.5-2.2.2.8 Patient storage

- (1) Each patient shall have within his or her room a separate wardrobe, locker, or closet for storing personal effects.
- (2) Shelves for folded garments shall be used instead of arrangements for hanging garments.
- (3) Adequate storage shall be available for a daily change of clothes for seven days.

*2.5-2.2.3 Outdoor Areas

2.5-2.2.4 Special Patient Care Rooms

2.5-2.2.4.1 Reserved

2.5-2.2.4.2 Airborne infection isolation (AII) room(s)

- (1) The need for and number of required AII rooms in the psychiatric hospital shall be determined by an ICRA.

- (2) Where required, the airborne infection isolation room(s) shall comply with the general requirements of 2.1-2.4.2.

2.5-2.2.4.3 Seclusion treatment room. For requirements, see 2.1-2.4.3.

2.5-2.2.4.4 Quiet room. A quiet room shall be provided for a patient who needs to be alone for a short period of time but does not require a seclusion room.

- (1) A minimum of 80 square feet (7.43 square meters) shall be provided.

- (2) Use of the visitor room for this purpose shall be permitted unless it is already being used as a consultation room under the exception in 2.5-2.2.6.13 (3).

2.5-2.2.5 Support Areas for Patient Care—General

2.5-2.2.5.1 General. For general requirements, see 2.1-2.5.

2.5-2.2.5.2 Location

- (1) Provision for the support areas listed shall be located in or readily available to each nursing unit unless otherwise noted.
- (2) Each support area may be arranged and located to serve more than one nursing unit; however, unless otherwise noted, at least one such support area shall be provided on each nursing floor.

2.5-2.2.6 Support Areas for the Psychiatric Nursing Unit

2.5-2.2.6.1 Administrative center or nurse station

2.5-2.2.6.2 Documentation area. A separate charting area with provisions for acoustical and patient file privacy shall be provided.

2.5-2.2.6.3 Office(s) for staff

2.5-2.2.6.4 Multipurpose room. Location of these space(s) either within the psychiatric unit or immediately accessible to it shall be permitted unless otherwise dictated by the functional program.

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A2.5-2.2.3 Outdoor areas are not required; however, if patient care programs require them to be provided, they should be arranged to prevent confused residents from wandering outside of designated resident areas.

2.5-2.2.6.5 Hand-washing station. For requirements, see 2.1-2.6.5.

2.5-2.2.6.6 Medication station. For requirements, see 2.1-2.6.6 (Medication Dispensing Location).

2.5-2.2.6.7 Nourishment area. Food service within the unit may be one or a combination of the following:

- (1) A nourishment station
- (2) A kitchenette designed for patient use with staff control of heating and cooking devices
- (3) A kitchen service within the unit that includes a hand-washing station, storage space, refrigerator, and facilities for meal preparation

2.5-2.2.6.8 Ice-making equipment. For requirements, see 2.1-2.6.8.

2.5-2.2.6.9 Clean workroom or clean supply room. For requirements, see 2.1-2.6.9.

2.5-2.2.6.10 Soiled workroom. For requirements, see 2.1-2.6.10.

2.5-2.2.6.11 Equipment and supply storage. Location of these areas either within the psychiatric units or immediately accessible to them shall be permitted unless otherwise dictated by the functional program.

- (1) Clean linen storage. For requirements, see 2.1-2.6.11.1.
- (2) Wheelchair storage space. Storage space for wheelchairs may be outside the psychiatric unit, provided that provisions are made for convenient access as needed for disabled patients.
- (3) Emergency equipment storage. Space shall be provided for emergency equipment that is under direct control of the nursing staff, such as a CPR cart.
 - (a) This space shall be in close proximity to a nurse station.
 - (b) The space may serve more than one unit.
- (4) Administrative supplies storage

2.5-2.2.6.12 Environmental services room. Location of this room either in or immediately accessible to the

nursing unit shall be permitted unless otherwise dictated by the functional program. For requirements, see 2.1-2.6.12.

2.5-2.2.6.13 Consultation room(s)

- (1) Separate consultation room(s), with a minimum floor area of 100 square feet (9.29 square meters) each, shall be provided at a room-to-bed ratio of one consultation room for each 12 psychiatric beds or fewer.
- (2) The room(s) shall be designed for acoustical and visual privacy and constructed to achieve a level of voice privacy of 50 STC (which in terms of vocal privacy means some loud or raised speech is heard only by straining, but is not intelligible).
- (3) The visitor room may serve as a consultation room.

2.5-2.2.6.14 Conference room. A conference and treatment planning room shall be provided for use by the psychiatric unit. This room may be combined with the charting room.

2.5-2.2.6.15 Space for group therapy. This may be combined with the quiet space noted in 2.5-2.2.8.2 (Social spaces) when the unit accommodates no more than 12 patients and when at least 225 square feet (20.90 square meters) of enclosed private space is available for group therapy activities.

2.5-2.2.7 Support Areas for Staff

2.5-2.2.7.1 Staff lounge facilities

2.5-2.2.7.2 Staff toilet room(s)

2.5-2.2.7.3 Staff storage locations. Securable closets or cabinet compartments for the personal effects of nursing personnel shall be conveniently located to the administrative center or nurse station. At a minimum, these shall be large enough for purses and billfolds.

2.5-2.2.8 Support Areas for Patients

2.5-2.2.8.1 Visitor room. A visitor room with a minimum floor area of 100 square feet (9.29 square meters) shall be provided for patients to meet with friends or family.

2.5-2.2.8.2 Social spaces

- (1) At least two separate social spaces, one appropriate for noisy activities and one for quiet activities, shall be provided.
- (2) Space requirements
 - (a) The combined area shall have a minimum of 25 square feet (2.32 square meters) per patient with at least 120 square feet (11.15 square meters) for each of the two spaces.
 - (b) Use of this space for dining activities shall be permitted if an additional 15 square feet (1.39 square meters) per patient is added; otherwise, 20 square feet (1.86 square meters) per patient shall be provided for dining.
- (3) Dining facilities may be located off the nursing unit in a central area.

2.5-2.2.8.3 Patient laundry facilities. Patient laundry facilities with an automatic washer and dryer shall be provided.

2.5-2.2.8.4 Patient storage facilities. A staff-controlled, secured storage area shall be provided for patients' effects determined potentially harmful (e.g., razors, nail files, cigarette lighters, etc.).

2.5-2.3 Child Psychiatric Unit

2.5-2.3.1 General

Child psychiatric unit patient areas shall be separate and distinct from any adult psychiatric unit patient areas. The requirements of 2.5-2.2 (General Psychiatric Nursing Unit) shall apply to child units with the following exceptions:

2.5-2.3.2 Patient Room

2.5-2.3.2.1 Capacity. Maximum room capacity shall be four children.

2.5-2.3.2.2 Space requirements. Patient room areas (with beds or cribs) shall meet the following space requirements:

- (1) For single-bed rooms, a minimum of 100 square feet (9.29 square meters)

- (2) For multiple-bed rooms, a minimum of 80 square feet (7.43 square meters) per bed and 60 square feet (5.57 square meters) per crib

2.5-2.3.3 Activity Areas

2.5-2.3.3.1 Space requirements

- (1) The combined area for social activities shall have 35 square feet (3.25 square meters) per patient.
- (2) The total area for social activities and dining space shall have a minimum of 50 square feet (4.65 square meters) per patient.
- (3) If a separate dining space is provided, it shall have a minimum of 15 square feet (1.39 square meters) per patient.

*2.5-2.3.4 Outdoor Areas

2.5-2.3.5 Reserved

2.5-2.3.6 Support Areas for the Child Psychiatric Unit

2.5-2.3.6.1 Storage. Storage space shall be provided for toys, equipment, extra cribs and beds, and cots or recliners for parents who may stay overnight.

2.5-2.4 Geriatric, Alzheimer's, and Other Dementia Unit

2.5-2.4.1 Application

The requirements of 2.5-2.2 (General Psychiatric Nursing Unit) shall apply to geriatric units with the following exceptions:

2.5-2.4.2 Patient Room

2.5-2.4.2.1 Space requirements. Patient room areas shall be at least 120 square feet (11.15 square meters) in single-bed rooms and 200 square feet (18.58 square meters) in multiple-bed rooms.

2.5-2.4.2.2 Bathing facilities. Patients shall have access to at least one bathtub in each nursing unit.

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A2.5-2.3.4 Outdoor areas should be protected to allow children to have easy access to secure outdoor areas for play and therapy in facilities where length of stay is two weeks or greater.

2.5-2.4.2.3 Linen storage. Each patient bedroom shall have storage for extra blankets, pillows, and linen.

2.5-2.4.3 through 2.5-2.4.5 Reserved

2.5-2.4.6 Support Areas for Geriatric, Alzheimer's, and Other Dementia Units

2.5-2.4.6.1 Wheelchair storage. Storage space for wheelchairs shall be provided in the nursing unit.

2.5-2.4.7 Reserved

2.5-2.4.8 Support Areas for Patients

2.5-2.4.8.1 Social spaces. The requirements of 2.5-2.2.8.2 (social spaces for the general psychiatric nursing unit) shall apply, except that the combined area for social activities shall have a minimum of 30 square feet (2.79 square meters) per patient.

2.5-2.4.9 Special Design Elements

2.5-2.4.9.1 Door openings. Door openings to patient rooms shall have a minimum clear width of 3 feet 8 inches (1.12 meters).

2.5-2.4.9.2 Nurse call system

- (1) A nurse call system shall be provided in accordance with the standards in Section 2.1-8.3.7 (Call Systems).
- (2) Provisions shall be made for easy removal of or for covering call button outlets.
- (3) Call cords or strings in excess of 6 inches (15.24 centimeters) shall not be permitted.

2.5-2.5 Forensic Psychiatric Unit

2.5-2.5.1 General

2.5-2.5.1.1 The requirements of 2.5-2.2 (General Psychiatric Nursing Unit) shall apply to forensic units.

2.5-2.5.1.2 Forensic units shall have security vestibules or sally ports at the unit entrance.

2.5-2.5.1.3 Areas for children, juveniles, and adolescents shall be separated from adult areas.

2.5-2.5.2 Space Requirements

Specialized program requirements may indicate the need for additional treatment areas, police and courtroom space, and security considerations.

■ 2.5-3 Diagnostic and Treatment Locations

2.5-3.1 Examination/Treatment Room

2.5-3.1.1 Location

Examination/treatment rooms shall be permitted to serve several nursing units and may be on a different floor if conveniently located for routine use.

2.5-3.1.2 Space Requirements

Examination/treatment rooms shall have a minimum clear floor area of 120 square feet (11.15 square meters).

2.5-3.1.3 Facility Requirements

The room shall contain the following:

- (1) A hand-washing station
- (2) Storage facilities
- (3) A desk, counter, or shelf space for writing or electronic documentation.

2.5-3.2 Imaging Suite

Provision of radiology services is not required within a psychiatric hospital. However, if radiology services are provided, the radiology suite shall comply with the requirements in 2.2-3.4 (Diagnostic Imaging Services).

2.5-3.3 Nuclear Medicine

Nuclear medicine services are not required to be provided within a psychiatric hospital. If they are provided, the nuclear medicine area shall comply with the requirements in 2.2-3.6.

2.5-3.4 Rehabilitation Therapy Service

Rehabilitation therapy in a psychiatric hospital is primarily for the diagnosis and treatment of mental functions but may also seek to address physical functions in varying degrees. It may contain one or several categories of services.

2.5-3.4.1 General

2.5-3.4.1.1 When a formal rehabilitative therapy service is included in a project, the facilities and equipment needed to accommodate the functional program shall be provided.

2.5-3.4.1.2 Where two or more rehabilitative services are included, facilities and equipment may be shared as appropriate.

2.5-3.4.2 Physical Therapy Areas

An individual's physical health can have a direct effect on his or her mental health. Therefore, physical therapy may be desirable in a psychiatric hospital, especially for long-term care patients and elderly patients.

2.5-3.4.2.1 General. If physical therapy is included in the functional program, the following shall be provided.

2.5-3.4.2.2 Individual treatment areas

- (1) Each individual treatment space shall have a minimum clear floor area of 60 square feet (5.57 square meters).
- (2) Each area shall have privacy screens or curtains.

2.5-3.4.2.3 Hand-washing stations

- (1) Hand-washing stations for staff shall be available either within or at each treatment space.
- (2) One hand-washing station shall be permitted to serve several treatment stations.

2.5-3.4.2.4 Exercise area and facilities

2.5-3.4.2.5 Provision for additional therapies. If required by the functional program, provisions for thermotherapy, diathermy, ultrasonics, and hydrotherapy shall be made.

2.5-3.4.2.6 Support areas for physical therapy

- (1) Soiled material storage. Separate storage for soiled linen, towels, and supplies shall be provided.
- (2) Equipment and supply storage
 - (a) Clean linen and towel storage
 - (b) Storage for equipment and supplies

2.5-3.4.2.7 Support areas for patients. Dressing areas, showers, and lockers for outpatients shall be provided.

2.5-3.4.3 Occupational Therapy Areas

Occupational therapy may include such activities as woodworking, leather tooling, art, needlework, painting, sewing, metalwork, and ceramics.

2.5-3.4.3.1 General. If occupational therapy is included in the functional program, the following shall be provided:

2.5-3.4.3.2 Work areas and counters

- (1) These shall be suitable for wheelchair access.
- (2) Work areas shall be sized for one therapy group at a time.

2.5-3.4.3.3 Other facilities

- * (1) A separate room or alcove shall be provided for a kiln.
- * (2) Display areas shall be provided.

2.5-3.4.3.4 Hand-washing stations shall be provided.

2.5-3.4.3.5 Support areas for occupational therapy

- (1) Equipment and supply storage
 - (a) Storage shall be provided for supplies and equipment.
 - (b) Secured storage shall be provided for potentially harmful supplies and equipment.

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A2.5-3.4.3.3 (1) Exposure to some art materials, such as solvents and ceramic glazes, is associated with adverse health effects. Such risks should be controlled by adopting methods recommended in appropriate instructional manuals.

A2.5-3.4.3.3 (2) Display areas for patients' work, such as shelves or wall surfaces, should be provided.

2.5-3.4.3.6 Special design elements

- (1) Electrical switching. Remote electrical switching shall be provided for potentially harmful equipment.

2.5-3.4.4 Vocational Therapy

Vocational therapy assists patients in the development and maintenance of productive work and interaction skills through the use of work tasks. These activities may occur in an industrial therapy workshop in another department or outdoors.

2.5-3.4.4.1 General. If vocational therapy is included in the functional program, the following shall be provided:

2.5-3.4.4.2 Work areas

- (1) These shall be suitable for wheelchair access.
- (2) Group work areas shall be sized for one therapy group at a time.

2.5-3.4.4.3 Hand-washing stations. These shall be provided if required by the functional program.

2.5-3.4.4.4 Support areas for vocational therapy

- (1) Equipment and supply storage
 - (a) Storage for supplies and equipment shall be provided.
 - (b) Secured storage for potentially harmful supplies and equipment shall be provided.

2.5-3.4.4.5 Special design elements

- (1) Electrical switching. Remote electrical switching shall be provided for potentially harmful equipment.

2.5-3.4.5 Recreation Therapy Areas

Recreation therapy assists patients in the development and maintenance of community living skills through the use of leisure-time activity tasks. These activities may occur in a recreation therapy department, in specialized facilities (e.g., gymnasium), multipurpose space in other areas (e.g., the nursing unit), or outdoors.

2.5-3.4.5.1 General. If recreation therapy is included in the functional program, the following shall be provided:

2.5-3.4.5.2 Activity areas. Activity areas shall be suitable for wheelchair access.

2.5-3.4.5.3 Hand-washing stations. These shall be provided if required by the functional program.

2.5-3.4.5.4 Support areas for recreation therapy

- (1) Equipment and supply storage
 - (a) Storage for supplies and equipment shall be provided.
 - (b) Secured storage for potentially harmful supplies and equipment shall be provided.

2.5-3.4.5.5 Special design elements

- (1) Electrical switching. Remote electrical switching shall be provided for potentially harmful equipment.

2.5-3.4.6 Education Therapy Areas

Education therapy may be a program requirement, especially for children and adolescents.

2.5-3.4.6.1 General. If education therapy is part of the functional program, the following shall be provided.

2.5-3.4.6.2 Classroom

- (1) At least one classroom with desks shall be provided.
- (2) Space requirements
 - (a) Each classroom shall have 30 square feet (2.79 square meters) per desk.
 - (b) Each classroom shall have a minimum of 150 square feet (13.94 square meters).
- (3) A desk and lockable storage shall be provided for the teacher.
- (4) Storage for supplies, equipment, and books shall be provided.

2.5-3.4.7 Support Areas—General

Each rehabilitative therapy department shall include the following, which may be shared or provided as separate areas for each service.

2.5-3.4.8 Support Areas for Rehabilitation Therapy

2.5-3.4.8.1 Reception and control station(s)

- (1) If reception and control station(s) are required by the functional program, provision shall be made for visual control of waiting and activity areas.
- (2) Reception and control stations may be combined with office and clerical space.

2.5-3.4.8.2 Patient waiting area(s)

- (1) Location. Patient waiting area(s) shall be located out of traffic, with provision for wheelchairs.
- (2) Omission of the waiting area shall be permitted if it is not required by the functional program. (Patient waiting time for rehabilitation therapy should be minimized in a psychiatric hospital.)

2.5-3.4.8.3 Office and clerical space. Provision shall be made for filing and retrieval of patient records.

2.5-3.4.8.4 Multipurpose room. Access to a demonstration/conference room shall be provided.

2.5-3.4.8.5 Environmental services room. A conveniently accessible environmental services room and service sink for housekeeping use shall be provided.

2.5-3.4.9 Support Areas for Staff

2.5-3.4.9.1 Convenient access to toilets and lockers shall be provided.

2.5-3.4.9.2 A secured area or cabinet shall be provided within the vicinity of each work area for securing staff personal effects.

2.5-3.4.10 Support Areas for Patients

Patient toilets with hand-washing stations that are accessible to wheelchair patients shall be provided.

■ 2.5-4 Patient Support Services

2.5-4.1 Laboratory Services

Required laboratory tests may be performed on-site or provided through a contractual arrangement with a laboratory service.

2.5-4.1.1 General

2.5-4.1.1.1 Application

- (1) Where required by the functional program, provisions shall be made for the following procedures to be performed on-site: urinalysis, blood glucose, and electrolytes.
- (2) Provisions shall also be made for specimen collection and processing.

2.5-4.1.2 Laboratory

Minimum facilities provided on-site shall include a defined area with the following:

2.5-4.1.2.1 Laboratory lab counter

2.5-4.1.2.2 Sink

2.5-4.1.2.3 Refrigerated storage

2.5-4.1.2.4 Storage for equipment and supplies

2.5-4.1.2.5 Clerical area

2.5-4.1.2.6 Record storage

2.5-4.2 Pharmacy Services

2.5-4.2.1 General

As described in the functional program, the size and type of facilities and equipment to be provided in the pharmacy shall depend on the type of patients and illnesses treated, type of drug distribution system used, number of patients to be served, and extent of shared or purchased services.

2.5-4.2.2 Pharmacy Room or Suite

2.5-4.2.2.1 Location. The pharmacy room or suite shall be located for convenient access, staff control, and security.

2.5-4.2.2.2 Facility requirements. It shall include provisions for procurement, storage, distribution, and recording of drugs and other pharmacy products.

2.5-4.2.3 Satellite Facilities

Satellite facilities, if provided, shall include those items required by the functional program.

2.5-4.3 Dietary Services

For requirements, see 2.2-4.3.

■ 2.5-5 General Support Services and Facilities

2.5-5.1 Central Services

2.5-5.1.1 If only primary medical care is provided, central services may not be required or may be provided by countertop sterilizing/cleaning equipment.

2.5-5.1.2 If decontamination and sterilization are required on-site, a full central services area shall be provided (for requirements, see 2.2-5.1).

2.5-5.2 Linen Services

For requirements, see 2.2-5.2.

2.5-5.3 Materials Management Facilities**2.5-5.3.1 General Stores**

2.5-5.3.1.1 Location. Location of storage in separate, concentrated areas within the institution or in one or more individual buildings on-site shall be permitted. A portion of this storage may be provided off-site.

2.5-5.3.1.2 Space requirements. General storage room(s) with a total area of not less than 4 square feet (0.37 square meter) per inpatient bed shall be provided.

2.5-5.4 Waste Management Facilities

For requirements, see 2.2-5.4.

2.5-5.5 Environmental Services**2.5-5.5.1 Environmental Services Room**

For requirements, see 2.2-5.5.1.

2.5-5.5.2 Facilities for Cleaning and Sanitizing Carts

For requirements, see 2.2-5.5.2.

2.5-5.6 Engineering and Maintenance Services

For requirements, see 2.2-5.6.

■ 2.5-6 Public and Administrative Areas

2.5-6.1 Public Areas

For requirements, see 2.1-6.1 and additional requirements in 2.2-6.1.

2.5-6.2 Administrative Areas

For requirements, see 2.1-6.2 and additional requirements in 2.2-6.2.

2.5-6.3 Support Areas for Staff and Volunteers

Lockers, lounges, toilets, etc. shall be provided for employees and volunteers. These shall be in addition to, and separate from, those required for medical staff and the public.

■ 2.5-7 Design and Construction Requirements

2.5-7.1 Building Codes and Standards

For requirements, see 2.1-7.1.

2.5-7.2 Architectural Details, Surfaces, and Furnishings**2.5-7.2.1 General**

Details, surfaces, and furnishings shall comply with Section 2.1-7.2 except as amended in this section. Special design consideration shall be given to injury and suicide prevention as discussed here.

2.5-7.2.2 Architectural Details**2.5-7.2.2.1 Ceilings**

- (1) In patient bathrooms, the ceiling shall be secured from access or 9 feet (2.74 meters) in height to prevent patient access. Ceiling systems of a non-secured (non-clipped down) lay-in ceiling tile design are not permitted.
- (2) In patient bedrooms where acoustical ceilings are permitted by the functional program, the ceiling shall be secured from access or 9 feet (2.74 meters) in height to prevent patient access.
- (3) In patient bathrooms, any plumbing, piping, ductwork, or other potentially hazardous elements shall be concealed above a ceiling.
- (4) In patient bedrooms and bathrooms, ceiling access panels shall be secured or the ceiling shall be 9 feet (2.74 meters) in height to prevent patient access.
- (5) In patient bedrooms and bathrooms, ventilation grilles shall be secured and have small perforations to eliminate their use as a tie-off point or shall be of sufficient height to prevent patient access.
- (6) In seclusion rooms, the ceilings shall be monolithic.

2.5-7.2.2.2 Doors and door hardware

- (1) Door openings. Door openings for patient use in new construction shall have a minimum clear width of 2 feet 10 inches (86.36 centimeters).
- (2) Door swings. Door swings for private patient bathrooms or shower areas shall swing out to allow for staff emergency access.
- (3) Door closers
 - (a) Door closers are to be avoided unless required.

- (b) Door closer devices, if required on the patient room door, shall be mounted on the public side of the door rather than the private patient side of the door.

- (c) Ideally, the door closer (if required) should be within view of a nurse or staff workstation.

(4) Door hinges

- (a) Door hinges shall be designed to minimize points for hanging (i.e., cut hinge type).
- (b) Door hinges used shall be consistent with the level of care for the patient.

(5) Door lever handles. Except for specifically designed anti-ligature hardware, these shall point downward when in the latched or unlatched position.**(6) Fasteners.** All hardware shall have tamper-resistant fasteners.***2.5-7.2.2.3 Windows****(1) Windows located in patient care areas or areas used by patients shall be designed to limit the opportunities for patients to seriously harm themselves as a result of breaking the windows and using pieces of the broken glazing material to inflict harm to themselves or others.**

- (a) All glazing (both interior and exterior), borrowed lights, and glass mirrors shall be fabricated with laminated safety glass or protected by polycarbonate, laminate, or safety screens.
- (b) Use of tempered glass for borrowed lights shall be permitted.

(2) To prevent opportunities for suicide, the anchorage of windows and window assemblies, including frames, shall be designed to resist impact loads applied from the inside and shall be tested in accordance with ANSI Z97.1. When operable windows**APPENDIX****A2.5-7.2.2.3 Windows**

- a. The use of drapery is discouraged.
- b. The use of integral blinds within the window assembly is highly desirable to provide privacy and sun control without suicide risk.
- c. Use of operable windows with security locks is recommended to allow for fumigation of the room should extensive cleaning be required.

- d. Tempered glass is often preferred for borrowed lights since it has substantial impact resistance, does not scratch or discolor, and—when broken—shatters into round pellets rather than the jagged shards of laminated glass.
- e. The Dade County hurricane test, ASTM E1886, and ASTM E1996 are recommended as alternate impact tests. This test may simulate a 250-pound patient throwing a piece of furniture at the window, but may be excessive.

are used, the hinges and locking devices shall also be tested.

2.5-7.2.2.4 Bathroom hardware and accessories.

Special design considerations for injury and suicide prevention shall be given to shower, bath, toilet, and sink hardware and accessories, including grab bars and toilet paper holders.

(1) Grab bars

- (a) ADA- or ANSI-compliant grab bars are required in 10 percent of the private/semi-private patient toilet rooms. The remaining rooms are not required to have grab bars.
- (b) Grab bars in patient toilet rooms for fully ambulatory patients shall be removable.
- (c) Where grab bars are provided, the space between the bar and the wall shall be filled to prevent a cord being tied around it for hanging.
- (d) Bars, including those that are part of such fixtures as soap dishes, shall be sufficiently anchored to sustain a concentrated load of 250 pounds (113.4 kilograms).

(2) The following are not permitted:

- (a) Towel bars
- (b) Shower curtain rods
- (c) Lever handles, except where a specifically designed anti-ligature lever handle is used

2.5-7.2.2.5 Sprinkler heads and other protrusions

- (1) In unsupervised patient areas, sprinkler heads shall be recessed or of a design to minimize patient access.
- (2) In patient bathrooms, lighting fixtures, sprinkler heads, electrical outlets, and other appurtenances shall be of the tamper-resistant type.

2.5-7.2.3 Reserved

2.5-7.2.4 Furnishings

2.5-7.2.4.1 Furniture

- (1) Clothing rods or hooks, if present, shall be designed to minimize the opportunity for residents to cause injury.

- (2) Furniture shall be constructed to withstand physical abuse.
- (3) Drawer pulls shall be of the recessed type to eliminate the possibility of use as a tie-off point.

■ 2.5-8 Building Systems

2.5-8.1 Application

The common requirements for building systems in 2.1-8 shall apply to psychiatric hospitals as amended in this chapter. Spaces included in Section 2.1-8 that are not required by the functional program of the psychiatric hospital are not required by this reference.

2.5-8.2 Heating, Ventilation, and Air-Conditioning (HVAC) Systems

2.5-8.2.1 HVAC Filters

2.5-8.2.1.1 Filter efficiencies. All central ventilation or air-conditioning systems shall be equipped with filters with efficiencies equal to or greater than those specified in Table 6-1 of Part 6 (ASHRAE 170), except filter bank number 2 shall not be required.

2.5-8.3 Electrical Systems

2.5-8.3.1 Reserved

2.5-8.3.2 Reserved

2.5-8.3.3 Power-Generating and -Storing Equipment

2.5-8.3.3.1 Emergency electrical service

- (1) As a minimum, psychiatric hospitals or sections thereof shall have emergency electrical systems as required in NFPA 99, NFPA 101, and NFPA 110.
- (2) Where the psychiatric facility is a distinct part of an acute care hospital, it may use the emergency generator system for required emergency lighting and power if such sharing does not reduce hospital services. Life support systems and their respective areas shall be subject to applicable standards of 2.1-8.3.

2.5 SPECIFIC REQUIREMENTS FOR PSYCHIATRIC HOSPITALS

- (3) An emergency electrical source shall provide lighting and/or power during an interruption of the normal electrical supply.

2.5-8.3.4 Lighting

2.5-8.3.4.1 General

- (1) Lighting shall be engineered to the specific application.
- (2) As required by the functional program, special needs of the elderly shall be incorporated into the lighting design.

2.5-8.3.4.2 Light fixtures. Light fixtures shall be secured or of sufficient height to prevent patient access.

2.5-8.3.4.3 Lighting for specific locations in the psychiatric hospital

- (1) Patient rooms. Patient rooms shall have general lighting and night lighting. At least one nightlight fixture in each patient room shall be controlled at the room entrance.
- (2) Nursing unit corridors. Corridors in nursing units shall have general illumination with provisions for reducing light levels at night.
- (3) Exterior lighting. Approaches to buildings and parking lots and all occupied spaces shall have lighting fixtures that can be illuminated as necessary.

2.5-8.3.5 Electrical Equipment

2.5-8.3.5.1 General electrical equipment. Special design considerations for injury and suicide prevention shall be given to the electrical equipment in the psychiatric hospital, including light fixtures, electrical outlets, electrical appliances, nurse call systems and staff emergency assistance systems.

2.5-8.3.5.2 Special electrical equipment. Special equipment is identified in the sections on nursing units, support areas, rehabilitation therapy, laboratory, pharmacy, and imaging, if applicable. These sections shall be consulted to ensure compatibility between programmatically defined equipment needs and appropriate power and other electrical connection needs.

2.5-8.3.6 Receptacles

2.5-8.3.6.1 Receptacles in patient rooms. Electrical receptacles in patient rooms shall be tamper-resistant or equipped with ground-fault circuit interrupters.

2.5-8.3.7 Call Systems

*2.5-8.3.7.1 General

- (1) For general requirements, see 2.1-8.3.7. The specific requirements in 2.5-8.3.7 shall apply to the psychiatric hospital.
- (2) Staff response call systems shall be low voltage, current limited.
- (3) Control to limit unauthorized use shall be permitted.

2.5-8.3.7.2 Nursing unit. A nurse call system is not required in psychiatric nursing units, but if it is included the following shall apply:

- (1) Provisions shall be made for easy removal or covering of call buttons.
- (2) All hardware shall have tamper-resistant fasteners.
- (3) Signal location
 - (a) Calls shall activate a visible signal in the corridor at the patient's door and at an annunciator panel at the nurse station or other appropriate location.
 - (b) In multi-corridor nursing units, additional visible signals shall be installed at corridor intersections.

2.5-8.3.7.3 Emergency call system

- (1) If provided, the staff emergency call shall be designed so that a signal activated by staff at a patient's calling station will initiate a visible and audible signal distinct from the regular nurse call system.
- (2) The signal shall activate an annunciator panel at the nurse station or other appropriate location, a

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A2.5-8.3.7.1 If radio frequency systems are used, consideration should be given to electromagnetic compatibility between internal and external sources.

distinct visible signal in the corridor at the door to the room from which the signal was initiated, and at other areas defined by the functional program.

2.5-8.4 Plumbing Systems

2.5-8.4.1 General

In the absence of local and state plumbing codes, all plumbing systems shall be designed and installed in accordance with the chapters in the *International Plumbing Code* that are applicable for this occupancy.

2.5-8.4.2 Plumbing Fixtures

Special design considerations for injury and suicide prevention shall be given to shower, bath, toilet, and sink plumbing fixtures. Shower heads shall be of flush-mounted design to minimize hanging appendages.

2.5-8.5 Communications Systems

2.5-8.5.1 Locations for terminating telecommunications and information system devices shall be provided.

2.5-8.5.2 An area shall be provided for central equipment locations. Special air conditioning and voltage regulation shall be provided when recommended by the manufacturer.

2.5-8.5.3 Data processing and/or automated laboratory or diagnostic equipment, if provided, may require safeguards from power line disturbances.

2.5-8.6 Electronic Safety and Security Systems

2.5-8.6.1 Fire Alarm System

Fire extinguisher cabinets and fire alarm pull stations shall be located in staff areas or otherwise secured in patient-accessible locations.

2.5-8.7 Special Systems

2.5-8.7.1 Reserved

2.5-8.7.2 Elevators

2.5-8.7.2.1 General. All buildings with patient facilities (such as bedrooms, dining rooms, or recreation areas) or services (such as diagnostic or therapeutic areas) located on other than the main entrance floor shall have electric or hydraulic elevators.

2.5-8.7.2.2 Reserved

2.5-8.7.2.3 Reserved

2.5-8.7.2.4 Leveling device. For requirements, see 2.1-8.7.2.4.

2.5-8.7.2.5 Elevator controls

- (1) Each elevator, except those for material handling, shall be equipped with an independent keyed switch for staff use for bypassing all landing button calls and responding to car button calls only.
- * (2) Elevator call buttons shall be key controlled if required by the functional program, and controls shall not be activated by heat or smoke. Light beams, if used for operating door reopening devices without touch, shall be used in combination with door-edge safety devices and shall be interconnected with a system of smoke detectors.

2.5-8.7.2.6 Installation and testing. For requirements, see 2.1-8.7.2.6.

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A2.5-8.7.2.5 (2) This is so the light control feature will be overridden or disengaged should it encounter smoke at any landing.

2.6 Specific Requirements for Rehabilitation Hospitals and Other Facilities

Appendix material, shown in shaded boxes at the bottom of the page, is advisory only.

■ 2.6-1 General

In general, rehabilitation hospitals have larger space requirements, longer lengths of stay, and environments that are less institutional and more residential than general hospitals.

2.6-1.1 Application

This chapter covers rehabilitation facilities organized under hospitals (organized departments of rehabilitation), outpatient clinics, rehabilitation centers, and other facilities designed to serve either single- or multiple-disability categories, including but not limited to cerebrovascular, head trauma, spinal cord injury, amputees, complicated fractures, arthritis, neurological degeneration, genetic, and cardiac.

2.6-1.2 Functional Program

For requirements, see 1.2-2 and 2.1-1.2.

2.6-1.3 Site

2.6-1.3.1 Parking Capacity

2.6-1.3.1.1 Parking for rehabilitation facilities shall comply with the general requirements in 1.3-3.3 (Parking) and the specific requirements in this section.

2.6-1.3.1.2 In the absence of a formal parking study or local requirements governing parking, the following minimum parking requirements shall be met:

- (1) One space per four patient beds plus one space for each employee normally present on any single weekday shift
- (2) Separate and additional space for service delivery vehicles and vehicles used for patient transfer
- (3) Additional parking to accommodate outpatient and other service volumes on site

■ 2.6-2 Nursing Unit and Living Areas

2.6-2.1 General

Where inpatients are a part of the facility, each nursing unit shall provide the spaces and facilities described in this section.

2.6-2.2 Rehabilitation Nursing Unit

2.6-2.2.1 Application

Each patient room shall meet the following standards:

2.6-2.2.2 Patient Room

2.6-2.2.2.1 Capacity

- (1) The maximum number of beds per room shall be one unless the approved functional program demonstrates the necessity of a multi-bed arrangement. Approval of a multi-bed arrangement shall be obtained from the authority having jurisdiction.
- (2) Larger units shall be permitted if justified by the functional program.
- (3) At least two single-bed rooms with private toilet rooms shall be provided for each nursing unit.

2.6-2.2.2.2 Space requirements

- (1) Area. Patient rooms shall have a minimum clear floor area of 140 square feet (13.01 square meters) in single-bed rooms and 125 square feet (11.61 square meters) per bed in multiple-bed rooms.
- (2) Clearances. In multiple-bed rooms, a minimum clear dimension of 3 feet 8 inches (1.12 meters) shall be maintained at the foot of each bed to permit the passage of equipment and beds.

2.6-2.2.2.3 Window. Each patient room shall have a window(s) in accordance with Section 2.1-7.2.2.5.

2.6-2.2.2.4 Patient privacy. For requirements, see 2.1-2.2.4.

2.6-2.2.2.5 Hand-washing station

- (1) Hand-washing station(s) shall be provided in each patient room.
- (2) Design requirements
 - (a) For hand-washing station design details, see 2.1-7.2.2.8.
 - (b) For sinks, see 2.1-8.4.3.2 (Hand-washing stations).

2.6-2.2.2.6 Patient toilet room

- (1) Each patient shall have access to a toilet room without having to enter a corridor.
- (2) One toilet room shall serve no more than two patient rooms and no more than four beds.
- (3) The toilet room shall contain a toilet and a hand-washing station. Omission of the hand-washing station shall be permitted where the toilet room serves single-bed and two-bed rooms if each such patient room contains a hand-washing station.
- (4) Each toilet room shall be of sufficient size to ensure that wheelchair users will have access.
- (5) If required by the functional program, each entry door into the patient toilet room shall provide sufficient space for health care providers to transfer patients to the toilet using portable mechanical lifting equipment.
- (6) If required by the functional program, thresholds shall be designed to facilitate use and to prevent tipping of wheelchairs and other portable wheeled equipment by patients and staff.

2.6-2.2.2.7 Patient bathing facilities

- (1) Bathtubs or showers shall be provided at a ratio of one bathing facility for each eight beds not otherwise served by bathing facilities within patient rooms.
- (2) Each tub or shower shall be in an individual room or privacy enclosure that provides space for the private use of bathing fixtures, for drying and dressing, and for a wheelchair and an assistant.

- (3) Showers in central bathing facilities shall be at least 4 feet (1.22 meters) square, curb-free, and designed for use by wheelchair patients.
- (4) If required by the functional program, doorways shall be designed in a manner to allow entry of portable/mobile mechanical lifts and shower gurney devices.
- (5) If required by the functional program, thresholds shall be designed to facilitate use and to prevent tipping of wheelchairs and other portable wheeled equipment by patients and staff.
- (6) If required by the functional program, adult patient shower rooms shall be designed in a manner to allow entry of portable/mobile mechanical lifts and shower gurney devices.
- (7) Toilet facilities. A toilet room that does not require travel through the general corridor shall be accessible to each central bathing area.
 - (a) Door openings to toilet rooms shall have a minimum clear width of 2 feet 10 inches (86.36 centimeters) to admit a wheelchair.
 - (b) Doors to toilet rooms shall permit access from the outside in case of an emergency.
 - (c) A hand-washing station shall be provided for each toilet in each multi-fixture toilet room.

2.6-2.2.2.8 Patient storage. Rehab patients' length of stay is longer than that of typical acute care patients.

- (1) Space for storage of patients' personal effects shall meet the needs of the functional program.
- (2) Each patient shall have a wardrobe, closet, or locker with minimum clear dimensions of 1 foot 10 inches (55.88 centimeters) by 1 foot 8 inches (50.80 centimeters).
- (3) An adjustable clothes rod and adjustable shelf shall be provided.

2.6-2.2.3 Reserved

2.6-2.2.4 Special Patient Care Rooms

2.6-2.2.4.1 Reserved

2.6-2.2.4.2 Airborne infection isolation (AII) room

- (1) The need for and number of required airborne

infection isolation rooms in the rehabilitation facility shall be determined by an infection control risk assessment.

- (2) When provided, All rooms shall follow the general requirements in 2.1-2.4.2.

2.6-2.2.5 Support Areas for Patient Care— General

2.6-2.2.5.1 General. For requirements, see 2.1-2.5.

2.6-2.2.5.2 Application. The size and disposition of each support area shall meet the needs of the functional program.

2.6-2.2.5.3 Location

- (1) Although identifiable spaces are required for each indicated function, consideration shall be given to alternative designs that accommodate some functions without designating specific areas or rooms.
- (2) Each support area may be arranged and located to serve more than one nursing unit, but at least one such support area shall be provided on each nursing floor.

2.6-2.2.6 Support Areas for the Rehabilitation Nursing Unit

The support areas noted shall be provided in or readily available to each nursing unit.

2.6-2.2.6.1 Administrative center or nurse station

2.6-2.2.6.2 Documentation area

2.6-2.2.6.3 Nurse office

2.6-2.2.6.4 Reserved

2.6-2.2.6.5 Hand-washing stations

- (1) Hand-washing stations shall be located near the nurse station and the drug distribution station.
- (2) One hand-washing station shall be permitted to serve both areas.

2.6-2.2.6.6 Medication station. Provisions shall be made for convenient and prompt 24-hour distribution of medicine to patients. Distribution may be from a

medicine preparation room, self-contained medicine dispensing unit, or by another approved system.

- (1) A medicine preparation room
 - (a) If used, this room shall be under the visual control of the nursing staff.
 - (b) If used, this room shall contain a work counter, refrigerator, and locked storage for biologicals and drugs.

- (2) A self-contained medicine dispensing unit. Location of such a unit shall be permitted at a nurse station, in the clean workroom, or in an alcove or other space under direct control of nursing or pharmacy staff.

2.6-2.2.6.7 Nourishment area. The nourishment station shall be accessible to patients and shall contain the following:

- (1) Equipment for serving nourishment between scheduled meals
- (2) Refrigerator
- (3) Storage cabinets
- (4) A hand-washing station

2.6-2.2.6.8 Ice machine. Ice maker-dispenser units shall be provided for patient service and treatment.

2.6-2.2.6.9 Clean workroom or clean holding room

2.6-2.2.6.10 Soiled workroom or soiled holding room

2.6-2.2.6.11 Equipment and supply storage

- (1) Clean linen storage
 - (a) A separate closet or an area within the clean workroom shall be provided for this purpose.
 - (b) If a closed-cart system is used, storage in an alcove shall be permitted.
- (2) Equipment storage room. A storage room shall be provided for equipment such as IV stands, inhalators, air mattresses, and walkers.
- (3) Storage space for stretchers and wheelchairs. Parking for stretchers and wheelchairs shall be located out of the path of normal traffic.

- (4) Storage for administrative supplies

2.6-2.2.6.12 Examination/treatment room

- (1) General

- (a) Omission of this room shall be permitted if all patient rooms are single-bed rooms.
- (b) The examination room in the evaluation unit shall be permitted to serve this purpose if it is conveniently located.

- (2) Space requirements

- (a) This room shall have a minimum clear floor area of 120 square feet (11.15 square meters).
- (b) The minimum room dimension shall be 10 feet (3.05 meters).

- (3) Facility requirements. The room shall contain the following:

- (a) Work counter
- (b) Hand-washing station
- (c) Storage facilities
- (d) Desk, counter, or shelf space for writing or electronic documentation

2.6-2.2.7 Support Areas for Staff

2.6-2.2.7.1 Lounge and toilet room(s)

2.6-2.2.7.2 Staff storage facilities. Individual closets or compartments for safekeeping of the personal effects of nursing personnel shall be located convenient to the duty station or in a central location.

2.6-2.3 Patient Living Areas

2.6-2.3.1 Dining, Recreation, and Day Spaces

The following standards shall be met for patient dining, recreation, and day spaces (areas may be in separate or adjoining spaces):

2.6-2.3.1.1 Space requirements

- (1) Inpatient spaces. A minimum of 55 square feet (5.11 square meters) per bed shall be provided.
- (2) Outpatient services
 - (a) If dining is part of the day care program, a minimum of 55 square feet (5.11 square meters) per person shall be provided.

- (b) If dining is not part of the program, a minimum of 35 square feet (3.25 square meters) per person shall be provided for recreation and day spaces.

2.6-2.3.1.2 Hand-washing station. A hand-washing station shall be provided in each dining room.

2.6-2.3.1.3 Equipment and supply storage. Storage spaces shall be provided for recreational equipment and supplies.

2.6-2.3.2 Activity Areas

2.6-2.3.2.1 Activities for daily living unit. A unit shall be provided for teaching daily living activities.

- (1) Facility requirements. The unit shall include the following:

- (a) A bedroom
- (b) A bath. The bathroom shall be in addition to other toilet and bathing requirements.
- (c) A kitchen
- (d) Space for training stairs

- (2) Equipment. Equipment shall be functional. The facilities shall be similar to those in a residential environment so patients can learn to use those at home.

2.6-2.3.3 Personal Services (Barber/Beauty) Areas

A separate room with appropriate fixtures and utilities shall be provided for patient grooming. The activities for daily living unit may serve this purpose.

■ 2.6-3 Diagnostic and Treatment Locations

Functional units and support areas shall include the following:

2.6-3.1 Medical Evaluation Unit

Each rehabilitation facility shall contain a medical evaluation unit.

2.6-3.1.1 Examination Room(s)

2.6-3.1.1.1 Space requirements. Examination rooms shall have a minimum clear floor area of 140 square

feet (13.01 square meters). The minimum room dimension shall be 10 feet (3.05 meters).

2.6-3.1.1.2 Facility requirements. The room shall contain the following:

- (1) Hand-washing station
- (2) Work counter
- (3) Storage facilities
- (4) Desk, counter, or shelf space for writing or electronic documentation

2.6-3.1.2 Evaluation Room(s)

Where the facility is small and workload light, evaluation shall be permitted in examination room(s).

2.6-3.1.2.1 Layout. Evaluation rooms shall be arranged to permit appropriate evaluation of patient needs and progress and to determine specific programs of rehabilitation.

2.6-3.1.2.2 Facility requirements. Rooms shall include a desk and work area for the evaluators; writing and work space for patients; and storage for supplies.

2.6-3.1.3 Reserved

2.6-3.1.4 Reserved

2.6-3.1.5 Support Areas for Patient Care—General

For requirements, see 2.1-2.5.

2.6-3.1.6 Support Areas for the Medical Evaluation Unit

2.6-3.1.6.1 Office(s). These shall be provided for personnel.

2.6-3.2 Other Required Units

In addition to the medical evaluation unit, each rehabilitation facility shall contain one or more of the following units:

2.6-3.2.1 Psychological Services Unit

Office(s) and work space shall be provided for testing, evaluation, and counseling.

2.6-3.2.2 Social Services Unit

Office space(s) shall be provided for private interviewing and counseling.

2.6-3.2.3 Vocational Services Unit

Office(s) and work space shall be provided for vocational training, counseling, and placement.

2.6-3.3 Optional Units

The following units, if required by the functional program, shall be provided as outlined in these sections. The sizes of the various units shall depend upon the requirements of the functional program.

2.6-3.3.1 Physical Therapy Unit

2.6-3.3.1.1 General

- (1) The size of the unit shall depend upon the requirements of the functional program.
- (2) The elements listed in this section (2.6-3.3.1) shall be provided. Facilities in 2.6-3.3.1.6 (Support areas for the occupational therapy unit) and 2.6-3.3.1.8 (Support areas for patients) may be planned and arranged for shared use by occupational therapy patients and staff if the functional program reflects this sharing concept.

2.6-3.3.1.2 Treatment area(s)

- (1) Space requirements
 - (a) As a minimum, one individual treatment area shall be enclosed within walls, have a door for access, and have a minimum clear floor area of 80 square feet (7.43 square meters).
 - (b) Curtained treatment areas shall have a minimum clear floor area of 70 square feet (6.51 square meters).
- (2) Privacy. For thermotherapy, diathermy, ultrasonics, hydrotherapy, etc., cubicle curtains shall be provided around each individual treatment area.
- (3) Hand-washing station(s) shall also be provided. One hand-washing station may serve more than one cubicle.
- (4) Facilities for collection of wet and soiled linen and other material shall be provided.

2.6-3.3.1.3 Exercise area. Space requirements shall be designed to permit access to all equipment and be sized to accommodate equipment for physical therapy.

2.6-3.3.1.4 Therapeutic pool. A therapeutic pool shall be provided if required by the functional program. The size of the pool shall depend upon the requirements of the functional program.

2.6-3.3.1.5 Reserved

2.6-3.3.1.6 Support areas for the physical therapy unit

- (1) Waiting space
- (2) Office space
- (3) Equipment and supply storage
 - (a) Storage for clean linen, supplies, and equipment shall be provided.
 - (b) Wheelchair and stretcher storage shall be provided.

2.6-3.3.1.7 Reserved

2.6-3.3.1.8 Support areas for patients. Patients' dressing areas, showers, lockers, and toilet rooms shall be provided as required by the functional program.

2.6-3.3.2 Occupational Therapy Unit

2.6-3.3.2.1 General

- (1) The size of the unit shall depend upon the requirements of the functional program.
- (2) The elements listed in this section (2.6-3.3.2) shall be provided. Facilities in 2.6-3.3.2.6 (Support areas for the occupational therapy unit) and 2.6-3.3.2.8 (Support areas for patients) may be planned and arranged for shared use by physical therapy patients and staff if the functional program reflects this sharing concept.

2.6-3.3.2.2 Activity areas

2.6-3.3.2.3 through 2.6-3.3.2.5 Reserved

2.6-3.3.2.6 Support areas for the occupational therapy unit

- (1) Waiting space
- (2) Office space
- (3) Equipment and supply storage

2.6-3.3.2.7 Reserved

2.6-3.3.2.8 Support areas for patients. Patients' dressing areas, showers, lockers, and toilet rooms shall be provided as required by the functional program.

2.6-3.3.3 Prosthetics and Orthotics Unit

2.6-3.3.3.1 General

- (1) The size of the unit shall depend upon the requirements of the functional program.
- (2) The following elements shall be provided:

2.6-3.3.3.2 Work space for technician(s)

2.6-3.3.3.3 Space for evaluation and fitting. This shall include provision for privacy.

2.6-3.3.3.4 through 2.6-3.3.3.5 Reserved

2.6-3.3.3.6 Support areas for the prosthetics and orthotics unit. Space for equipment, supplies, and storage shall be provided.

2.6-3.3.4 Speech and Hearing Unit

2.6-3.3.4.1 General

- (1) The size of the unit shall depend upon the requirements of the functional program.
- (2) The unit shall include the following:

2.6-3.3.4.2 Space for evaluation and treatment

2.6-3.3.4.3 through 2.6-3.3.4.5 Reserved

2.6-3.3.4.6 Support areas for the speech and hearing unit

- (1) Office(s) for therapists
- (2) Equipment and supply storage

2.6-3.3.5 Dental Unit

2.6-3.3.5.1 Operatory. This shall contain a hand-washing station.

2.6-3.3.5.2 Laboratory and film processing facilities**2.6-3.3.6 Imaging Suite**

2.6-3.3.6.1 Size. The size of the unit shall depend upon the requirements of the functional program. The sizes of the various areas shall depend on the requirements of the service to be provided.

2.6-3.3.6.2 Facility requirements. This unit shall contain imaging room(s) as required by the functional program. Areas for the following services, if required, shall be provided as outlined in 2.2-3.4 (Diagnostic Imaging Facilities).

- (1) Electromyography
- (2) CAT scan
- (3) MRI
- (4) Nuclear medicine
- (5) Diagnostic x-ray

■ 2.6-4 Patient Support Services

The following services, if required by the functional program, shall be provided as outlined in these sections.

2.6-4.1 Laboratory Services**2.6-4.1.1 General**

2.6-4.1.1.1 Facilities shall be provided within the rehabilitation department or through contract arrangement with a nearby hospital or laboratory service for hematology, clinical chemistry, urinalysis, cytology, pathology, and bacteriology.

2.6-4.1.1.2 Size. The size of the unit shall depend upon the requirements of the functional program.

2.6-4.1.2 Minimum Services

If laboratory facilities are provided through contract,

the following minimum laboratory services shall be provided in the rehabilitation facility:

2.6-4.1.2.1 Laboratory work counter(s). A sink and gas, data/tele, and electric services shall be provided as required by the functional program.

2.6-4.1.2.2 Hand-washing stations**2.6-4.1.2.3 Specimen collection facilities**

- (1) Urine collection rooms shall be equipped with a water closet and hand-washing station.
- (2) Blood collection facilities shall have space for a chair and work counter.

2.6-4.1.2.4 Storage cabinet(s) or closet(s)**2.6-4.2 Pharmacy Services****2.6-4.2.1 General**

The size and type of services to be provided in the pharmacy will depend on the drug distribution system chosen and whether the facility proposes to provide, purchase, or share pharmacy services.

2.6-4.2.2 Pharmacy Areas

If a pharmacy is required by the functional program, provisions shall be made for the following functional areas:

2.6-4.2.2.1 Dispensing facilities

- (1) A compounding area
- (2) A dispensing area with a hand-washing station
- (3) An editing or order review area
- (4) A drug information area

2.6-4.2.2.2 Manufacturing facilities

- (1) A packaging area
- (2) A quality control area

2.6-4.2.3 through 2.6-4.2.5 Reserved**2.6-4.2.6 Support Areas for the Pharmacy****2.6-4.2.6.1 Administrative areas**

2.6-4.2.6.2 Storage areas

2.6-4.3 Dietary Services

***2.6-4.3.1 General**

Construction, equipment, and installation of food service facilities shall meet the requirements of the functional program.

2.6-4.3.2 Dietary Areas

The following facilities shall be provided as required to implement the food service selected:

2.6-4.3.2.1 Receiving/control station. A control station for receiving food supplies shall be provided.

2.6-4.3.2.2 Hand-washing station. Hand-washing station(s) shall be located in the food preparation area.

2.6-4.3.2.3 Food preparation work spaces

- (1) Conventional food preparation systems require space and equipment for preparing, cooking, and baking.
- (2) Convenience food service systems such as frozen prepared meals, bulk packaged entrees, individually packaged portions, and contractual commissary services require space and equipment for thawing, portioning, cooking, and/or baking.

2.6-4.3.2.4 Assembly and distribution. Facilities shall be provided for tray assembly and distribution.

2.6-4.3.2.5 Reserved

2.6-4.3.2.6 Reserved

2.6-4.3.2.7 Ware-washing space

- (1) This shall be located in a room or alcove separate from the food preparation and serving area.
- (2) Commercial dish-washing equipment shall be provided.

(3) A hand-washing station shall be conveniently available.

(4) Space shall also be provided for receiving, scraping, sorting, and stacking soiled tableware and for transferring clean tableware to the using areas.

2.6-4.3.2.8 Pot-washing facilities

2.6-4.3.3 through 2.6-4.3.5 Reserved

2.6-4.3.6 Support Areas for the Dietary Unit

2.6-4.3.6.1 Office(s). Office(s) or desk spaces shall be provided for the dietitian(s) or the dietary service manager.

2.6-4.3.6.2 Self-dispensing ice-making facilities.

These may be in an area or room separate from the food preparation area but shall be easily cleanable and convenient to dietary facilities.

2.6-4.3.6.3 Equipment storage. Storage areas shall be provided for cans, carts, and mobile tray conveyors.

2.6-4.3.6.4 Environmental services room

- (1) This shall be located within the dietary department.
- (2) This shall contain a floor receptor or service sink and storage space for housekeeping equipment and supplies.

2.6-4.3.6.5 Waste storage facilities. These shall be located in a separate room easily accessible to the outside for direct waste pickup or disposal.

2.6-4.3.7 Support Areas for Staff

2.6-4.3.7.1 Separate dining space for staff

2.6-4.3.7.2 Toilets. Toilets shall be provided for dietary staff. Hand-washing stations shall be immediately available.

2.6-4.4 Home Health Service

APPENDIX

A2.6-4.3.1 Services may consist of an on-site conventional food preparation system, a convenience food service system, or an appropriate

combination thereof. On-site facilities should be provided for emergency food preparation and refrigeration.

■ 2.6-5 General Support Services and Facilities

2.6-5.1 Reserved

2.6-5.2 Linen Services

2.6-5.2.1 On-Site Processing

If linen is to be processed on site, the following shall be provided:

2.6-5.2.1.1 Soiled linen holding room. A room shall be provided for soiled linen receiving, holding, and sorting. This shall have a hand-washing station and cart-washing facilities.

2.6-5.2.1.2 Clean linen storage. A clean linen storage, issuing, and holding room or area shall be provided.

2.6-5.2.1.3 Laundry processing room. This shall be provided with commercial equipment that can process seven days' laundry within a regularly scheduled work week.

2.6-5.2.1.4 Hand-washing station. A hand-washing station shall be provided.

2.6-5.2.1.5 Supply storage. Storage shall be provided for laundry supplies.

2.6-5.2.1.6 Environmental services room. This shall contain a floor receptor or service sink and shall provide storage space for housekeeping equipment and supplies.

2.6-5.2.2 Off-Site Processing

If linen is processed off the rehabilitation facility site, the following shall be provided:

2.6-5.2.2.1 Soiled linen holding room

2.6-5.2.2.2 Clean linen storage. Clean linen receiving, holding, inspection, and storage room(s) shall be provided.

2.6-5.3 Reserved

2.6-5.4 Waste Management Facilities

For requirements, see 2.1-5.4.

2.6-5.5 Environmental Services

2.6-5.5.1 Reserved

2.6-5.5.2 Environmental Services Room

2.6-5.5.2.1 In addition to the environmental services rooms called for in certain departments, environmental services rooms shall be provided throughout the facility as required to maintain a clean and sanitary environment.

2.6-5.5.2.2 Each environmental services room shall contain the following:

- (1) A floor receptor or service sink
- (2) Storage space for housekeeping supplies and equipment

2.6-5.6 Engineering and Maintenance Services

2.6-5.6.1 Equipment Rooms

Rooms for boilers, mechanical equipment, and electrical equipment shall be provided.

2.6-5.6.2 Storage Room

Storage room(s) for building maintenance supplies and yard equipment shall be provided.

2.6-5.7 Sterilization Facilities

Where required by the functional program, a system for sterilizing equipment and supplies shall be provided. Its size shall depend upon the requirements of the functional program.

■ 2.6-6 Public and Administrative Areas

2.6-6.1 Public Areas

2.6-6.1.1 Entrance

For requirements, see 2.1-6.1.1.

2.6-6.1.2 Lobby

For requirements, see 2.1-6.1.2.

2.6-6.1.2.1 Wheelchair storage space(s) shall be provided.

2.6-6.1.3 Convenience Store

An expanded gift shop with toiletries and other items available to patients during extended stays shall be provided according to the requirements of the functional program.

2.6-6.2 Administrative Areas

2.6-6.2.1 Reserved

2.6-6.2.2 Interview Space

For requirements, see 2.1-6.2.2.

2.6-6.2.3 General or Individual Office(s)

For requirements, see 2.1-6.2.3.

2.6-6.2.4 Multipurpose Room

Multipurpose room(s) for conferences, meetings, health education, and library services shall be provided.

2.6-6.2.5 Reserved

2.6-6.2.6 Equipment and Supply Storage

Separate space shall be provided for office supplies, sterile supplies, pharmaceutical supplies, splints and other orthopedic supplies, and housekeeping supplies and equipment.

2.6-6.3 Support Areas for Staff and Volunteers

In addition to the employee facilities such as locker rooms, lounges, toilets, or showers called for in certain departments, a sufficient number of such facilities to accommodate the needs of all personnel and volunteers shall be provided.

■ 2.6-7 Design and Construction Requirements

2.6-7.1 Building Codes and Standards

2.6-7.1.1 Building Codes

For requirements, see 2.1-7.1.1.

2.6-7.1.2 Construction Requirements

For further requirements, see 2.1-7.1.2.

2.6-7.1.2.1 General

- (1) Rehabilitation facilities that accommodate inpatients shall comply with the requirements in 2.1-7.1.2.
- (2) Except as noted below, construction of freestanding outpatient rehabilitation facilities shall comply with the applicable requirements of NFPA 101, requirements contained herein, and requirements of authorities of having jurisdiction.

2.6-7.1.2.2 Fire prevention/protection measures

- (1) Compartmentation, exits, automatic extinguishing systems, and other details relating to fire prevention and fire protection in inpatient rehabilitation facilities shall comply with requirements listed in NFPA 101.
- (2) In freestanding outpatient rehabilitation facilities, details relating to exits and fire safety shall comply with the appropriate occupancy chapter of NFPA 101 and the requirements outlined herein.

2.6-7.1.3 Provisions for Disasters

For requirements, see 2.1-7.1.3.

2.6-7.2 Architectural Details, Surfaces, and Furnishings

2.6-7.2.1 General

Patients in a rehabilitation facility will be disabled to differing degrees. Therefore, high standards of safety for the occupants shall be provided to minimize accidents. All details and finishes for renovation projects as well as for new construction shall comply with the following requirements insofar as they affect patient services.

2.6-7.2.2 Architectural Details

2.6-7.2.2.1 Corridor width. Items such as provisions for drinking water, telephone booths, vending

machines, and portable equipment shall not restrict corridor traffic or reduce the corridor width below the required minimum.

2.6-7.2.2.2 Ceiling height. For requirements, see 2.1-7.2.2.2.

2.6-7.2.2.3 Doors and door hardware

- (1) For requirements, see 2.1-7.2.2.3, as amended in this section.
- (2) Door openings. Where the functional program states that the sleeping facility will be for residential use (and therefore not subject to in-bed patient transport), door openings to patient rooms shall be permitted to have a minimum clear width of 3 feet (91.44 centimeters) if approved by the local authority having jurisdiction.

2.6-7.2.2.4 Thresholds and expansion joint covers. For requirements, see 2.1-7.2.2.4.

2.6-7.2.2.5 Windows. For requirements, see 2.1-7.2.2.5.

2.6-7.2.2.6 Insect screens. For requirements, see 2.1-7.2.2.6.

2.6-7.2.2.7 Glazing materials. For requirements, see 2.1-7.2.2.7.

2.6-7.2.2.8 Hand-washing stations. For requirements, see 2.1-7.2.2.8.

- (1) Lavatories intended for use by disabled patients shall be installed in accordance with the standards referenced in 1.1-4.1 (Design Standards for the Disabled).

2.6-7.2.2.9 Grab bars. For requirements, see 2.1-7.2.2.9 and additional requirements in this section.

- (1) Ends of grab bars shall be constructed to prevent snagging the clothes of patients.
- (2) Special consideration shall be given to shower curtain rods that may be momentarily used for support. Recessed soap dishes shall be provided in showers and bathrooms.

2.6-7.2.2.10 Handrails

- (1) Handrails shall be provided on both sides of corridors used by patients.
- (2) A clear distance of 1-1/2 inches (3.81 centimeters) shall be provided between the handrail and the wall, and the top of the rail shall be about 2 feet 8 inches (81.28 centimeters) above the floor, except for special care areas such as those serving children.
- (3) Ends of handrails shall be constructed to prevent snagging the clothes of patients.

2.6-7.2.2.11 Radiation protection. For requirements, see 2.1-7.2.2.11.

2.6-7.2.2.12 Noise control. For requirements, see 2.1-7.2.2.12.

2.6-7.2.2.13 Temperature control. For requirements, see 2.1-7.2.2.13.

2.6-7.2.3 Surfaces

2.6-7.2.3.1 Selection characteristics and criteria. For requirements, see 2.1-7.2.3.1.

2.6-7.2.3.2 Flooring. For requirements, see 2.1-7.2.3.2.

2.6-7.2.3.3 Walls. For requirements, see 2.1-7.2.3.3.

2.6-7.2.3.4 Ceilings

- (1) Ceilings throughout shall be readily cleanable.
- (2) All overhead piping and ductwork in the dietary and food preparation area shall be concealed behind a finished ceiling.
- (3) Finished ceilings may be omitted in mechanical and equipment spaces, shops, general storage areas, and similar spaces, unless required for fire-resistive purposes.
- (4) Acoustical ceilings shall be provided for corridors in patient areas, nurse stations, day rooms, recreational rooms, dining areas, and waiting areas.

2.6-7.2.3.5 Penetrations. Floors and wall areas penetrated by pipes, ducts, and conduits shall be tightly

sealed to minimize entry of pests. Joints of structural elements shall be similarly sealed.

2.6-7.2.4 Furnishings

2.6-7.2.4.1 Noncombustible or flame-retardant materials. Cubicle curtains and draperies shall be non-combustible or rendered flame retardant and shall pass both the large- and small-scale tests in NFPA 701.

■ 2.6-8 Building Systems

2.6-8.1 Reserved

2.6-8.2 Heating, Ventilation, and Air-Conditioning (HVAC) Systems

For requirements, see 2.1-8.2.

2.6-8.3 Electrical Systems

For electrical system requirements, see 2.1-8.3 and additional requirements in this section.

2.6-8.3.1 Electrical Equipment

2.6-8.3.1.3 Special electrical equipment. Special equipment is identified in the sections in this chapter on nursing units, support areas, physical therapy, occupational therapy, and imaging, if applicable. These sections shall be consulted to ensure compatibility between programmatically defined equipment needs and appropriate power and other electrical connection needs.

2.6-8.4 Plumbing

For plumbing system requirements, see 2.1-8.4 and additional requirements in this section.

2.6-8.4.1 General

In the absence of local and state plumbing codes, all plumbing systems shall be designed and installed in accordance with the *International Plumbing Code*.

2.6-8.4.2 Plumbing and Other Piping Systems

2.6-8.4.2.1 Drainage systems. The following standards shall apply to drainage systems:

(1) Piping

- (a) Drain lines from sinks used for acid waste disposal shall be made of acid-resistant material.
- (b) Drain lines serving some types of automatic blood-cell counters shall be of carefully selected material that will eliminate potential for undesirable chemical reactions (and/or explosions) between sodium azide wastes and copper, lead, brass, solder, etc.
- (c) Insofar as possible, drainage piping shall not be installed within the ceiling or exposed in operating rooms, food preparation centers, food serving facilities, food storage areas, central services, electronic data processing areas, electric closets, and other sensitive areas. Where exposed overhead drain piping in these areas is unavoidable, special provisions shall be made to protect the space below from leakage, condensation, or dust particles.

2.6-8.5 Communications Systems

2.6-8.5.1 Locations for terminating telecommunications and information system devices shall be provided.

2.6-8.5.2 An area shall be provided for central equipment locations. Special air conditioning and voltage regulation shall be provided when recommended by the manufacturer.

2.6-8.6 Electronic Safety and Security Systems

Fire alarm and detection systems shall be provided in compliance with NFPA 72 and NFPA 101.

2.6-8.7 Special Systems

2.6-8.7.1 General

For requirements, see 2.1-8.7.1.

2.6-8.7.2 Elevators

For elevator requirements, see 2.1-8.7.2 and additional requirements in this section.

2.6-8.7.2.1 Number

The number of elevators required shall be determined from a study of the facility plan and of the estimated vertical transportation requirements.

Ambulatory Care Facilities

3

3.1 Common Elements for Outpatient Facilities

Appendix material, shown in shaded boxes at the bottom of the page, is advisory only.

■ 3.1-1 General

The outpatient facilities described in Part 3 of the Guidelines are used primarily by patients who are able to travel or be transported to the facility for treatment, including those confined to wheelchairs. These facilities may be an outpatient unit in a hospital, a freestanding facility, or an outpatient facility in a multiple-use building containing an ambulatory health care facility as defined in the NFPA 101: *Life Safety Code*[®] occupancy chapters.

3.1-1.1 Application

3.1-1.1.1 This chapter contains elements that are common to most types of outpatient facilities. The elements are required only when referenced in a specific outpatient facility chapter. Consideration shall be given to the special needs of anticipated patient groups/ demographics as determined by the functional program.

3.1-1.1.2 Additional specific requirements are located in the facility chapters of Part 3 (facility chapters are listed below). Consult the facility chapters to determine if elements in this chapter are required.

- Primary care outpatient facilities (Chapter 3.2)
- Small primary care (neighborhood) outpatient facilities (Chapter 3.3)
- Freestanding outpatient diagnostic and treatment facilities (Chapter 3.4)
- Freestanding urgent care facilities (Chapter 3.5)
- Cancer treatment facilities (Chapter 3.6)
- Outpatient surgical facilities (Chapter 3.7)
- Office surgical facilities (Chapter 3.8)
- Endoscopy facilities (Chapter 3.9)

- Renal dialysis centers (Chapter 3.10)
- Psychiatric outpatient facilities (Chapter 3.11)
- Outpatient rehabilitation facilities (Chapter 3.12)

3.1-1.1.3 Language from other chapters in these Guidelines is included in the criteria given in this Part when reference is made to a specific section. Such references include the section as identified by number and heading and all its subsections, unless otherwise noted.

3.1-1.2 Functional Program

3.1-1.2.1 General

3.1-1.2.1.1 Each project sponsor shall provide a functional program for the facility. For requirements, see 1.2-2.

3.1-1.2.1.2 Specialty outpatient facilities not included in Part 3 may have needs that are not addressed in this chapter. Development of such specialty facilities shall rely on a detailed and specific functional program to establish physical environment requirements beyond the general requirements identified in this chapter.

3.1-1.2.2 Patient Privacy

Each facility design shall ensure appropriate levels of patient acoustical and visual privacy and dignity throughout the care process, consistent with needs established in the functional program. (For more information, see 1.1-4.4, National Standards for the Protection of Patient Health Information.)

3.1-1.2.3 Shared/Purchased Services

***3.1-1.2.3.1 Shared services.** If space and/or services are to be shared, details of such shared space and/

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A3.1-1.2.3.1 Shared space and/or services may include, but are not limited to, space and/or services for storage, laundry, public areas, housekeeping facilities, and waste management.

When space and/or services are shared, ancillary service agreements/ contracts are encouraged.

or services shall be incorporated into the functional program to ensure design considerations are addressed.

***3.1-1.2.3.2 Purchased services**

- (1) Use of purchased space and/or services shall be permitted only when practical.
- (2) Purchase of services other than accommodations for storage, laundry, public areas, housekeeping facilities, and waste management shall be cleared with the authority having jurisdiction.
- (3) Details of these services shall be incorporated into the functional program to ensure design considerations are addressed.

3.1-1.3 Site

***3.1-1.3.1 Location**

Refer to Chapter 1.3, Site, for general requirements.

3.1-1.3.2 Parking

3.1-1.3.2.1 Parking provided shall comply with the general requirements in 1.3-3.3 and the specific requirements in each facility chapter in Part 3.

3.1-1.3.2.2 Separate and additional space shall be provided for service delivery vehicles and vehicles used for patient transfer.

3.1-1.3.3 Facility Access

3.1-1.3.3.1 Building entrances used to reach outpatient services shall be at grade level, clearly marked, and located so patients need not go through other activity areas. (Shared lobbies shall be permitted in multi-occupancy buildings.)

3.1-1.3.3.2 Design shall preclude unrelated traffic within the unit.

■ **3.1-2 Reserved**

■ **3.1-3 Diagnostic and Treatment Locations**

3.1-3.1 General

When required by the functional program, the following clinical and support areas shall be provided.

***3.1-3.2 Examination and Treatment Rooms**

3.1-3.2.1 General

3.1-3.2.1.1 Provision shall be made to preserve patient privacy from observation from outside an examination/treatment room through an open door.

3.1-3.2.1.2 If an examination or a treatment room is used as an observation room, it shall be located convenient to the nurse or control station and a toilet room shall be immediately accessible.

***3.1-3.2.2 General Purpose Examination/Observation Room**

3.1-3.2.2.1 Reserved

3.1-3.2.2.2 Space requirements

- (1) Area. Each examination/observation room shall have a minimum clear floor area of 80 square feet (7.43 square meters).
- (2) Clearances. Room arrangement shall permit a minimum clear dimension of 2 feet 8 inches (81.28 centimeters) at each side and at the foot of the examination table, recliner, or chair.

3.1-3.2.2.3 Hand-washing station. A hand-washing station shall be provided.

3.1-3.2.2.4 Documentation space. A counter or shelf

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A3.1-1.2.3.2 Service agreements/contracts should be required for purchased services.

A3.1-1.3.1 Community outpatient units should ideally be conveniently accessible to patients via available public transportation.

A3.1-3.2 Door swings should be oriented to provide patient privacy.

A3.1-3.2.2 There is no distinction in size or standards for different types of general purpose examination/observation rooms.

space for writing or electronic documentation shall be provided.

*3.1-3.2.3 Special Purpose Examination Room

3.1-3.2.3.1 Reserved

3.1-3.2.3.2 Space requirements

- (1) Area. Rooms for special clinics—including but not limited to eye, ear, nose, and throat examinations—shall have a minimum clear floor area of 100 net square feet (9.29 square meters).
- (2) Clearances. Room arrangement shall permit a minimum clear dimension of 2 feet 8 inches (81.28 centimeters) on both sides and at one end of the examination table, bed, or chair.

3.1-3.2.3.3 Hand-washing station. A hand-washing station shall be provided.

3.1-3.2.3.4 Documentation space. A counter or shelf space for writing shall be provided.

*3.1-3.2.4 Treatment Room

3.1-3.2.4.1 Reserved

3.1-3.2.4.2 Space requirements

- (1) Area. Each treatment room shall have a minimum clear floor area of 120 square feet (11.15 square meters). The minimum room dimension shall be 10 feet (3.05 meters).
- (2) Clearance. Room arrangement shall permit a minimum clear dimension of 3 feet (91.44 centimeters) at each side and at the foot of the bed.

3.1-3.2.4.3 Hand-washing station. A hand-washing station shall be provided.

3.1-3.2.4.4 Documentation space. A counter or shelf for writing or electronic documentation shall be provided.

3.1-3.3 Reserved

3.1-3.4 Special Patient Care Rooms

3.1-3.4.1 General

In facilities with a functional program that includes treatment of patients with known infectious disease and/or populations with known compromised or suppressed immune systems, the need for and number of airborne infection isolation rooms and protective environment rooms shall be determined by an infection control risk assessment (ICRA).

*3.1-3.4.2 Airborne Infection Isolation (All) Room

3.1-3.4.2.1 General

- (1) The AII room requirements contained in these Guidelines for particular areas throughout a facility shall be:
 - (a) Predicated on an ICRA and designated by the functional program.
 - (b) Based on the needs of specific community and patient populations served by an individual health care organization (see Glossary and 1.2–3.4 [Infection Control Risk Mitigation]).
 - (c) Applied to patients who require an AII room but do not need a protective environment (PE) room.
- (2) Number. For specific requirements, see facility chapters.

3.1-3.4.2.2 AII room requirements

- (1) Capacity. Each patient room shall contain only one bed.

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A3.1-3.2.3 There is no distinction in size or standards for different types of special purpose examination rooms.

A3.1-3.2.4 There is no distinction in size or standards for different types of treatment rooms.

A3.1-3.4.2 For additional information, refer to the Centers for Disease Control and Prevention (CDC) “Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-Care Settings,” December 2005, and “Guidelines for Environmental Infection Control in Health-Care Facilities,” December 2003, both published in *MMWR* and available on the CDC Web site.

3.1 COMMON ELEMENTS FOR OUTPATIENT FACILITIES

- (2) A hand-washing station shall be located in each patient room. Placement of an additional hand-washing station outside the room entrance shall be permitted.
- (3) An area for gowning and storage of clean and soiled materials shall be located either directly outside or inside the entry door to the patient room.
- (4) A separate room with a toilet and hand-washing station shall be provided for each airborne infection isolation room.

3.1-3.4.2.3 Anteroom. An anteroom is not required; however, if an anteroom is part of the design concept, it shall meet the following requirements:

- * (1) The anteroom shall provide space for persons to don personal protective equipment before entering the patient room.
- (2) All doors to the anteroom shall have self-closing devices.

3.1-3.4.2.4 Special design elements

- (1) Architectural details
 - (a) All room perimeter walls, ceiling, and floor, including penetrations, shall be sealed tightly so that air does not infiltrate the environment from the outside or from other spaces.
 - (b) Airborne infection isolation room(s) shall have self-closing devices on all room exit doors.
 - (c) Doors shall have edge seals.
- * (2) Window treatments and privacy curtains. In addition to the requirements below, see requirements in 3.1-7.2.4.3.
 - (a) Window treatments shall be selected for ease of cleaning. Smooth-surfaced, easy-to-clean,

wipeable, nonpleated window treatments shall be used.

- (b) Fabric drapes and curtains shall not be used for window treatments.
- (c) Use of fabric privacy curtains shall be permitted if they are washable. A wipeable fabric with a smooth surface is preferable.

(3) For HVAC requirements, see 3.1-8.2.2.1.

3.1-3.4.3 Protective Environment (PE) Room

The protective environment room is used to protect the profoundly immunosuppressed patient with prolonged neutropenia (i.e., a patient undergoing an allogeneic or autologous bone marrow/stem cell transplant) from common environmental airborne infectious microbes (e.g., *Aspergillus* spores). The differentiating factors between protective environment rooms and other patient rooms are the requirements for filtration and positive air pressure relative to adjoining spaces.

* **3.1-3.4.3.1 General.** When determined by an ICRA or the functional program, special design considerations and ventilation to ensure the protection of patients who are highly susceptible to infection shall be required.

3.1-3.4.3.2 Number. The number of PE rooms shall be as required by the ICRA.

3.1-3.4.3.3 Location. The appropriate location of PE rooms shall be as required by the ICRA.

3.1-3.4.3.4 In addition to the requirements in this section (3.1-3.4.3), each PE room shall comply with the requirements of 3.1-3.4.2 (Airborne Infection Isolation Room) except that a toilet shall not be required.

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A3.1-3.4.2.3 (1) The anteroom may be used for hand hygiene and for storage of personal protective equipment (PPE) (e.g., respirators, gowns, gloves) and clean equipment.

A3.1-3.4.2.4 (2) Window shades should be a neutral color to maintain true coloration of patient skin.

A3.1-3.4.3.1 Many facilities care for patients with an extreme susceptibility to infection (immunosuppressed patients with prolonged

granulocytopenia, most notably bone marrow recipients and patients with hematological malignancies who are receiving chemotherapy and are severely granulocytopenic). These rooms are not intended for use with patients diagnosed with HIV infection or AIDS unless they are also severely granulocytopenic. Generally, protective environments are not needed in community hospitals unless these facilities take care of these types of patients.

3.1-3.4.3.5 Special design elements

- (1) Architectural details
 - (a) The ceiling shall be monolithic.
 - (b) The floor shall be smooth, with sealed seams.
- (2) Surfaces and furnishings. All surfaces (e.g., floors, walls, ceilings, doors, and windows) shall be cleanable.
- (3) Building systems
 - (a) HVAC systems. See 3.1-8.2.2.2 for HVAC requirements for PE rooms.
 - (b) Electrical systems. Lighting fixtures shall have lenses and shall be sealed.

3.1-3.5 Support Areas for Patient Care—General

Identifiable spaces shall be provided for each function indicated in all sections with requirements for support areas. Where the word “room” or “office” is used, a separate, enclosed space for the one named function is intended. Otherwise, the described area shall be permitted to be a specific space in another room or common area.

3.1-3.6 Support Areas for Examination and Treatment Rooms**3.1-3.6.1 Nurse Station(s)**

The nurse station shall include the following:

3.1-3.6.1.1 Work counter**3.1-3.6.1.2 Communication system****3.1-3.6.1.3 Space for supplies****3.1-3.6.1.4 Provisions for charting****3.1-3.6.2 Documentation Area**

A counter, area for a desk, or storage for a movable table shall be provided as designated documentation space.

3.1-3.6.3 Reserved**3.1-3.6.4 Reserved****3.1-3.6.5 Hand-Washing Stations**

3.1-3.6.5.1 Location. Hand-washing stations shall be provided in each room where hands-on patient care is provided. For further requirements, see facility chapters.

3.1-3.6.5.2 Design requirements

- (1) For hand-washing station design details, see 3.1-7.2.2.8 (Hand-washing stations).
- (2) For sinks, see 3.1-8.4.3.2 (Hand-washing stations).

3.1-3.6.6 Medication Distribution Station

This may be a part of the nurse station and shall include the following:

3.1-3.6.6.1 Work counter**3.1-3.6.6.2 Sink****3.1-3.6.6.3 Refrigerator****3.1-3.6.6.4 Locked storage for biologicals and drugs****3.1-3.6.7 Nourishment Area or Room**

3.1-3.6.7.1 The nourishment area or room shall have the following:

- (1) Sink
- (2) Work counter
- (3) Refrigerator
- (4) Storage cabinets
- (5) Equipment for serving nourishment as required by the functional program

3.1-3.6.7.2 A hand-washing station shall be located in the nourishment room or adjacent to the nourishment area.

3.1-3.6.8 Reserved**3.1-3.6.9 Clean Storage**

A separate room or closet for storing clean and sterile supplies shall be provided. This storage shall be in addition to that of cabinets and shelves.

3.1 COMMON ELEMENTS FOR OUTPATIENT FACILITIES

3.1-3.6.10 Soiled Holding

Provisions shall be made for separate collection, storage, and disposal of soiled materials.

3.1-3.6.11 Equipment and Supply Storage

3.1-3.6.11.1 through 3.1-3.6.11.4 Reserved

3.1-3.6.11.5 Wheelchair storage space

(1) Storage. If required by the functional program, a designated area located out of the required access width shall be provided for at least one facility-owned wheelchair.

* (2) Parking. If the facility provides services that require patients to transfer to a facility chair, wheelchair, recliner, examination table, or stretcher, provision for the secure handling of patient wheelchairs shall be required. A designated area shall be provided for parking at least one patient wheelchair in a non-public area located out of the required access width.

3.1-3.6.12 Reserved

3.1-3.6.13 Reserved

3.1-3.6.14 Sterilization Facilities

If required by the functional program, sterilizing facilities shall be provided. For requirements, see 3.7-3.6.14 in the chapter on outpatient surgical facilities.

3.1-3.7 Reserved

3.1-3.8 Support Areas for Patients

3.1-3.8.1 Toilet(s) for patient use. These shall be provided separate from public use toilet(s) and located to

permit access from patient care areas without passing through publicly accessible areas.

3.1-3.9 Diagnostic Imaging Services

*3.1-3.9.1 General

Basic diagnostic procedures (these may be part of the outpatient service, off-site, shared, by contract, or by referral) shall be provided as determined by the functional program.

3.1-3.9.2 Diagnostic Imaging Facilities

See 2.2-3.4 for requirements for diagnostic imaging services required by the functional program.

3.1-3.9.3 Support Areas for Diagnostic Imaging Facilities

3.1-3.9.3.1 Viewing and administrative areas(s)

3.1-3.9.3.2 Film and media processing facilities.

These shall be provided as indicated in the functional program and as technology requires.

3.1-3.9.3.3 Storage facilities for exposed film.

These shall be provided as indicated in the functional program and as technology requires.

3.1-3.9.4 Support Areas for Patients

3.1-3.9.4.1 Dressing rooms or booths. These shall be provided as required by the functional program, with convenient toilet access.

3.1-3.9.4.2 Toilet rooms. Toilet rooms with hand-washing stations shall be provided adjacent to procedure room(s) if procedures provided require patient toilet facilities.

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A3.1-3.6.11.5 (2) Wheelchair parking. Facilities that provide a significant quantity of services to aging and disabled populations that use wheelchairs (e.g., dialysis patients) should provide more than one wheelchair parking space.

Other facilities may be able to address the issue with scheduling and transportation procedures. Check with the authority having jurisdiction to determine if this is an acceptable alternative.

A3.1-3.9.1 Diagnostic Imaging Services

- Access. Stretchers should have ready access to and from other areas of the facility. The emergency, surgery, cystoscopy, and outpatient clinics should be accessible to the imaging suite.
- Layout. Particular attention should be paid to the management of outpatients for preparation, holding, and observation.
- Location. Imaging should be located with consideration of ceiling height requirements, proximity to electrical services, and future expansion considerations.

■ 3.1-4 Patient Support Services

3.1-4.1 Laboratory Services

3.1-4.1.1 General

Facilities for laboratory services identified by the functional program shall be provided within the outpatient department or through an effective contract arrangement with a nearby hospital or laboratory service. The following laboratory facilities shall be provided in (or be immediately accessible to) the outpatient facility:

3.1-4.1.2 Laboratory Testing/Work Area

3.1-4.1.2.1 When lab tests are performed on site, a separate, dedicated room shall be provided.

3.1-4.1.2.2 Work counters

- (1) Work counters and equipment space shall be provided to accommodate all on-site tests identified in the functional program.
- (2) Work counters shall be sufficient to meet equipment specifications and lab technician needs and have the following:

- (a) Sinks
- (b) Access to vacuum
- (c) Communications service
- (d) Electrical service

3.1-4.1.2.3 Hand-washing station(s). Hand-washing stations or counter sink(s) equipped for hand washing shall be provided.

3.1-4.1.3 Support Areas for the Laboratory

3.1-4.1.3.1 Storage cabinet(s) or closet(s)

3.1-4.1.3.2 Specimen collection facilities

- (1) These shall have a water closet and lavatory.
- (2) Blood collection facilities shall have seating space, a work counter, a hand-washing station, and a reclining chair or gurney for patients who become unsteady.

■ 3.1-5 General Support Services and Facilities

3.1-5.1 Reserved

3.1-5.2 Linen Services

3.1-5.2.1 Reserved

3.1-5.2.2 On-Site Processing Area

If the functional program requires linen to be processed on site, the following shall be provided:

3.1-5.2.2.1 A separate distinct and dedicated linen processing area

- (1) The area shall be large enough to accommodate a washer, a dryer, and any plumbing equipment needed to meet the temperature requirements of Table 2.1-5 (Hot Water Use—General Hospital).
- (2) The area shall be divided into distinct soiled (sort and washer) and clean (drying and folding) areas.

3.1-5.2.2.2 Storage for laundry supplies

3.1-5.2.2.3 Clean linen storage

3.1-5.2.2.4 Hand-washing station

3.1-5.2.3 Reserved

3.1-5.2.4 Areas for Off-Site Laundry Services

If the functional program requires linen to be processed off site, the following shall be provided:

3.1-5.2.4.1 Soiled linen holding area or designated and dedicated area for soiled laundry cart

3.1-5.2.4.2 Clean linen storage area that protects linen from soil or damage

3.1-5.3 Materials Management Facilities

3.1-5.3.1 Shared/Purchased Services

Use of shared or purchased materials management services shall be permitted as long as on-site handling and storage areas commensurate with the facility's needs are provided as defined by the functional program.

3.1-5.3.2 Receiving Facilities

The route for supply delivery shall be identified and an unpacking or box breakdown area shall be provided if required by the functional program. This area shall be accessible from the designated delivery door. Movement of supplies from this area to storage shall be direct, with minimal impact on clinical and public areas.

3.1-5.3.3 Clean Clinical Storage

3.1-5.3.3.1 This storage area shall not include space for storage of office supplies or environmental paper products.

3.1-5.3.3.2 Sterile items that are stored in manufacturers' packaging that is safe for handling shall be considered "clean" and appropriately stored with clean supplies.

3.1-5.3.3.3 Items that are sterile shall be stored as established by criteria in 3.7-5.1.2.3 (Storage for sterile supplies).

3.1-5.4 Waste Management Facilities

3.1-5.4.1 Waste Collection and Storage

3.1-5.4.1.1 General. These facilities shall use techniques acceptable to the appropriate health and environmental authorities.

(1) Location

- (a) Necessary waste collection and storage locations shall be determined by the facility as a component of the functional program.
- (b) The location of compactors, balers, sharps containers, and recycling container staging at docks or other waste removal areas shall be stipulated by the functional program.

*(c) Red bag waste shall be staged in enclosed and secured areas. Biohazardous and environmen-

tally hazardous materials, including mercury, nuclear reagent waste, and other regulated waste types, shall be segregated and secured.

3.1-5.4.1.2 Space requirements

- (1) The functional program shall stipulate the categories and volumes of waste for disposal and the methods of handling and disposing of waste.
- (2) The functional program shall outline the space requirements, including centralized waste collection and storage spaces. The size of spaces shall be based upon the volume of projected waste and length of anticipated storage.

3.1-5.4.1.3 Regulated waste storage spaces

- (1) If provided, regulated medical waste or infectious waste storage spaces shall have a floor drain, cleanable floor and wall surfaces, lighting, and exhaust ventilation.
- (2) Such spaces shall be safe from weather, animals, and unauthorized entry.
- (3) Refrigeration requirements for such storage facilities shall comply with state and/or local regulations.

3.1-5.4.1.4 Refuse chutes. The design and construction of trash chutes, if provided, shall comply with NFPA 82.

3.1-5.4.2 Waste Treatment and Disposal

***3.1-5.4.2.1 Incineration.** On-site hospital incinerators shall comply with federal, state, and local regulatory and environmental requirements. The design and construction of incinerators shall comply with NFPA 82: *Standard on Incinerators and Waste and Linen Handling Systems and Equipment.*

3.1-5.4.2.2 Other waste treatment technologies.

Types of non-incineration technology used by the facility shall be determined by facility management in

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A3.1-5.4.1.1 (1)(c) An analysis should be made of the anticipated volume of biohazardous waste. The types of procedures to be conducted by the facility, the anticipated volume of patients, the extent of the biohazardous waste produced, and the frequency of biohazardous waste pickup or incineration should be considered.

A3.1-5.4.2.1 When incinerators are used, consideration should be given to the recovery of waste heat from on-site incinerators used to dispose of large amounts of waste materials.

conjunction with environmental, economic, and regulatory considerations. The functional program shall describe waste treatment technology components.

(1) Location

- (a) Safe transfer routes, distances from waste sources, temporary storage requirements, and space requirements for treatment equipment shall be considered in determining where to locate a non-incineration technology.
- (b) The location of the technology shall not cause traffic problems as waste is brought in and out.
- (c) Odor, noise, and the visual impact of medical waste operations on patients, visitors, public access, and security shall be considered.

(2) Space requirements shall be determined by equipment requirements, including associated area(s) needed for opening waste entry doors; access to control panels; and space for hydraulic lifts, conveyors, and operational clearances.

(3) Areas for holding waste to be disposed of or treated off site shall be sized according to the anticipated volume of materials and frequency of removal. Holding areas shall be secured from public access.

(4) Use of mobile or portable units, trailer-mounted units, underground installations, or all-weather enclosed shelters at an outdoor site shall be permitted, subject to local regulatory approvals.

(5) Ventilation

- (a) Exhaust vents from the treatment technology, if any, shall be located a minimum of 25 feet (7.62 meters) from inlets to HVAC systems.
- (b) If the technology involves heat dissipation, cooling and ventilation sufficient to prevent overheating of the space and equipment therein shall be provided.

3.1-5.4.3 Nuclear Waste Disposal

For information about handling and disposal of nuclear materials in health care facilities, see *Code of Federal Regulations*, Title X, Parts 20 and 35.

3.1-5.5 Environmental Services

3.1-5.5.1 Environmental Services Room(s)

*3.1-5.5.1.1 Number

- (1) The number of environmental services rooms provided shall be as required by the functional program.
- (2) A minimum of one environmental services room per floor shall be provided.
- (3) Sanitation needs may be met using separate environmental services rooms or room(s) large enough to hold multiple housekeeping carts.

*3.1-5.5.1.2 Facility requirements

- (1) Facility-based services
 - (a) At least one environmental services room shall be provided to maintain a clean and therapeutic environment.
 - (b) Each environmental services room shall contain the following:
 - (i) A service sink or floor basin
 - (ii) Storage for housekeeping supplies and equipment
- (2) Non-facility based services. Area requirements shall be based on the service agreement and outlined in the functional program.

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A3.1-5.5.1.1 When determining the number of environmental services areas needed for outpatient settings, areas should be grouped by similar sanitation needs. Following are a few examples:

- a. Sterile areas: Operating rooms, substerile corridors, sterile labs, and sterile storage
- b. Clinical areas: Pre-procedure areas, examination rooms, blood draw areas, PACUs, dialysis treatment areas, infusion areas, or other areas likely to come into contact with blood or body fluids

- c. Processing rooms: Endoscopy room, uroscopy room, and instrument processing room (If these areas are within a sterile area, the sanitation needs of these areas can be addressed procedurally, for example, by cleaning them last.)
- d. Public and administrative areas: Waiting areas, offices, and hallways

A3.1-5.5.1.2 Storage areas for housekeeping supplies should be identified.

3.1-5.6 Engineering and Maintenance Services

3.1-5.6.1 General

Shared engineering services and maintenance facilities shall be permitted provided capacity is appropriate for use:

3.1-5.6.2 Equipment Locations

Equipment room(s) for boilers, mechanical equipment, telecommunications equipment, and electrical equipment shall be provided.

3.1-5.6.3 Equipment and Supply Storage

Storage room(s) for building maintenance supplies and equipment shall be provided.

3.1-6 Public and Administrative Areas

3.1-6.1 Public Areas

The following shall be provided:

3.1-6.1.1 Vehicular Drop-Off and Pedestrian Entrance

This shall be at grade level, sheltered from inclement weather, and accessible to the disabled.

3.1-6.1.2 Reception

A reception and information counter or desk shall be provided.

***3.1-6.1.3 Waiting Space(s)**

3.1-6.1.4 Public Toilets

Toilet(s) for public use shall be conveniently accessible from the waiting area without passing through patient care or staff work areas or suites.

3.1-6.1.5 Local Telephone Access

Access to make local phone calls shall be provided.

3.1-6.1.6 Provisions for Drinking Water

Conveniently accessible provisions for drinking water shall be provided.

3.1-6.1.7 Wheelchair Storage

Conveniently accessible wheelchair storage shall be provided.

***3.1-6.2 Administrative Areas**

3.1-6.2.1 Reserved

3.1-6.2.2 Interview Space

Space(s) shall be provided for private interviews related to social services, credit, etc.

***3.1-6.2.3 General or Individual Offices**

Space providing adequate work area for business transactions, records storage, and administrative and professional staffs shall be provided. This shall include space designated for computers, printers, fax machines, and copiers if required by the functional program.

3.1-6.2.4 Reserved

3.1-6.2.5 Medical Records

Provisions shall be made for securing medical records of all media types.

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A3.1-6.1.3 Consideration should be given to special needs of specific patient groups in a shared/general waiting area, such as separation of adolescent and geriatric patients.

A3.1-6.2 Multipurpose room(s) should be provided for private interviews, conferences, meetings, and health education purposes. Where health education is accommodated, the room(s) should be equipped for audiovisual aids.

A3.1-6.2.3 The following types of employees/services are among those to be considered when determining the amount of office space

required by the functional program:

- a. Owner/director
- b. Other levels of supervisors
- c. Business office personnel
- d. Each type of health care professional employed by the facility
- e. Physicians (unique confidentiality duties may make private office space critical)
- f. Social work
- g. Maintenance
- h. Dietary

3.1-6.2.5.1 Space required shall be defined by the functional program.

3.1-6.2.5.2 The identified area shall be located to maintain confidentiality of records and shall be either restricted to staff movement or remote from treatment and public areas.

3.1-6.2.5.3 Records shall be protected from loss or damage.

3.1-6.2.5.4 Storage area(s) shall be provided for forms or documents used to create medical records.

*3.1-6.2.6 Equipment and Supply Storage

General storage facilities for supplies and equipment shall be provided as identified in the functional program.

3.1-6.3 Support Areas for Staff

3.1-6.3.1 Storage for Employees

3.1-6.3.1.1 Special storage for staff personal effects with locking drawers or cabinets (may be individual desks or cabinets) shall be provided.

3.1-6.3.1.2 Such storage shall be convenient to individual workstations and shall be staff controlled.

■ 3.1-7 Design and Construction Requirements

3.1-7.1 Building Codes and Standards

3.1-7.1.1 Building Codes

3.1-7.1.1.1 NFPA 101

(1) The outpatient facilities described in Part 3 of the Guidelines may be an outpatient unit in a

hospital, a freestanding facility, or an outpatient facility in a multiple-use building containing an ambulatory health care facility as defined in the NFPA 101 occupancy chapters. Occasional facility use by patients on stretchers shall not be used as a basis for more restrictive institutional occupancy classifications.

(2) Exits. Details relating to exits and fire safety shall comply with NFPA 101 or equivalent building, fire, and safety codes where adopted and enforced by the authority having jurisdiction, and the standards outlined herein.

3.1-7.1.1.2 Construction and structural elements of freestanding outpatient facilities shall comply with recognized building code requirements for offices (business occupancies) and the standards contained herein.

3.1-7.1.1.3 Outpatient facilities that are an integral part of a hospital or that share common areas and functions with a hospital shall comply with the construction standards for general hospitals. For requirements, see applicable sections of Chapters 2.1 and 2.2 in Part 2 of these Guidelines.

3.1-7.1.2 Reserved

3.1-7.1.3 Provision for Disasters

For further requirements, see 1.2-6.5.

3.1-7.1.3.1 Earthquakes. Seismic force resistance of new construction for outpatient facilities shall comply with Section 1.2-6.5 (Provisions for Disasters) and shall be given an importance factor of one. Where the outpatient facility is part of an existing building, that facility shall comply with applicable local codes.

*3.1-7.1.3.2 Other natural disasters

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A3.1-6.2.6 Storage areas for the following should be identified:

- a. Non-clinical records, documents, and reports
- b. Office supplies
- c. Decorations and furnishings

A3.1-7.1.3.2 Special design provisions should be made for buildings in regions that have sustained loss of life or damage to buildings from hurricanes, tornadoes, floods, or other natural disasters.

3.1-7.2 Architectural Details, Surfaces, and Furnishings

3.1-7.2.1 General

Details, surfaces, and furnishings shall comply with the requirements in 3.1-7.2.2, 3.1-7.2.3, and 3.1-7.2.4.

3.1-7.2.2 Architectural Details

3.1-7.2.2.1 Corridor width

- (1) Public corridors shall have a minimum width of 5 feet (1.52 meters). Staff-only corridors shall be permitted to be 3 feet 8 inches (1.12 meters) wide unless greater width is required by NFPA 101 (occupant load calculations).
- (2) Items such as provisions for drinking water, telephone booths, vending machines, etc., shall not restrict corridor traffic or reduce the corridor width below the required minimum.
- (3) In-corridor storage or parking space for portable equipment shall not overlap required corridor widths.

3.1-7.2.2.2 Ceiling height. The minimum ceiling height shall be 7 feet 10 inches (2.39 meters), with the following exceptions:

- (1) Corridors, storage rooms, toilet rooms, etc. Ceiling height in corridors, storage rooms, toilet rooms, and other minor rooms shall not be less than 7 feet 8 inches (2.34 meters).
- (2) Rooms with ceiling-mounted equipment/light fixtures. Radiographic and other rooms containing ceiling-mounted equipment shall have ceilings of sufficient height to accommodate the equipment and/or fixtures.
- (3) Boiler rooms. Boiler rooms shall have ceiling clearances not less than 2 feet 6 inches (76.20 centimeters) above the main boiler header and connecting piping.

- (4) Clearances. Tracks, rails, and pipes suspended along the path of normal traffic shall be not less than 6 feet 8 inches (2.03 meters) above the floor.

3.1-7.2.2.3 Doors and door hardware

- (1) Door openings
 - (a) The minimum door opening width for patient use shall be 2 feet 10 inches (86.36 centimeters).
 - (b) If the outpatient facility serves patients confined to stretchers or wheelchairs, the minimum width of door openings to rooms shall be 3 feet 8 inches (1.12 meters).

3.1-7.2.2.4 through 3.1-7.2.2.6 Reserved

3.1-7.2.2.7 Glazing materials

- (1) Doors, sidelights, borrowed lights, and windows glazed to within 18 inches (45.72 centimeters) of the floor shall be constructed of safety glass, wired glass, or plastic glazing material that resists breakage and creates no dangerous cutting edges when broken.
- (2) Similar materials shall be used in wall openings of playrooms and exercise rooms unless otherwise required for fire safety.
- (3) Glazing materials used for shower doors and bath enclosures shall be safety glass or plastic.

*3.1-7.2.2.8 Hand-washing stations

- (1) General
 - (a) Hand sanitation dispensers shall be provided in addition to hand-washing stations.
 - (b) The number and location of both hand-washing stations and hand sanitation dispensers shall be determined by the ICRA. For more information about the number and placement of hand-washing stations and hand sanitation dispensers, see 1.2-3.2.1.2 (ICRA Considerations—Design elements).
- (2) Sinks. For these requirements, see 3.1-8.4.3.2 (Hand-washing stations).
- (3) Reserved

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A3.1-7.2.2.8 Consideration should be given to electrical devices (space needed for work flow and placement away from the sink).

(4) Fittings

- (a) General hand-washing stations used by medical and nursing staff, patients, and food handlers shall be trimmed with valves that can be operated without hands.
 - (i) Single-lever or wrist blade devices shall be permitted.
 - (ii) Blade handles used for this purpose shall be at least 4 inches (10.2 centimeters) in length.
 - (iii) Care shall be taken to provide the required clearance for operation of blade-type handles.
- (b) Sensor-regulated water fixtures shall meet user need for temperature and length of time the water flows. Electronic faucets shall be capable of functioning during loss of normal power.
- (c) Sensor-regulated faucets with manual temperature control shall be permitted.

(5) Provisions for drying hands. Provisions for hand drying shall be required at all hand-washing stations except scrub sinks.

- (a) Hand-washing stations shall include a hand-drying device that does not require hands to contact the dispenser.
- (b) If provided, hand towels shall be directly accessible to sinks.

(6) Cleansing agents. Hand-washing stations shall include liquid or foam soap dispensers.

3.1-7.2.2.9 Grab bars**3.1-7.2.2.10 Handrails**

3.1-7.2.2.11 Radiation protection. Radiation protection for x-ray and gamma ray installations shall comply with requirements in 2.1-7.2.2.11.

3.1-7.2.2.12 Reserved

3.1-7.2.2.13 Protection from heat-producing equipment. Rooms containing heat-producing equipment (such as boiler or heater rooms) shall be insulated and ventilated to prevent occupied adjacent floor or wall surfaces from exceeding a temperature 10°F above the ambient room temperature.

3.1-7.2.2.14 Decorative water features. Decorative water features installed in outpatient spaces shall be designed for easy maintenance and capped or covered.

3.1-7.2.3 Surfaces

3.1-7.2.3.1 Surface selection characteristics and criteria. See A1.2-3.2.1.5 for information on recommendations and code requirements for surface selection.

3.1-7.2.3.2 Flooring

- * (1) Selected flooring surfaces shall be easy to maintain, readily cleanable, and appropriately wear-resistant for the location.
- * (2) Flooring surfaces shall allow for ease of ambulation and self-propulsion.
- * (3) Flooring surfaces shall provide smooth transitions between different flooring materials.
- * (4) Flooring surfaces, including those on stairways, shall have slip-resistant surfaces according to ASTM C1028, Standard Test Method for Determining the Static Coefficient of Friction

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A3.1-7.2.3.2 (1) Portable lifting equipment without powered wheels may require more exertion by staff than ceiling-mounted equipment to move an elevated resident around and through a space. The exertion required by staff may increase with the use of carpet; however, different types and brands of carpet may have significantly different levels of resistance to wheeled devices. Installation of a mock-up to test flooring materials in relationship to wheeled equipment and devices used in a facility is recommended. Carpet should not be automatically discounted as inappropriate due to this challenge as it has major advan-

tages over hard-surface flooring in terms of noise reduction, acoustics, and residential appearance, all of which are important in creating a comfortable, attractive living environment for patients.

A3.1-7.2.3.2 (2) Color contrast between walls and floors and minimized transitions to different types of flooring may reduce falling risk.

A3.1-7.2.3.2 (3) Flush thresholds should be used to reduce tripping.

A3.1-7.2.3.2 (4) Soft flooring (carpet, cushioned flooring, etc.) can be used to reduce the risk of falls and the impact of associated injuries.

of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method.

- (5) Slip-resistant flooring products shall be considered for flooring surfaces in wet areas (e.g., kitchens, shower and bath areas), ramps, entries from exterior to interior space, and areas that include water for patient services.
- (6) All floor surfaces shall allow easy movement of all wheeled equipment required by the functional program.
- (7) In all areas subject to frequent wet cleaning methods, flooring materials shall not be physically affected by germicidal or other types of cleaning solutions.
- * (8) Highly polished flooring or flooring finishes that create glare shall be avoided.
- (9) Carpet and carpet with padding in patient areas shall be glued down or stretched taut and free of loose edges or wrinkles that might create hazards or interfere with the operation of lifts, wheelchairs, walkers, wheeled carts, or residents utilizing orthotic devices.
- (10) Joints for floor openings for pipes, ducts, and conduits shall be tightly sealed to minimize entry of pests. Joints of structural elements shall be similarly sealed.

3.1-7.2.3.3 Walls, wall bases, and wall protection

- (1) Wall finishes
 - (a) Wall finishes shall be washable. In the vicinity of plumbing fixtures, wall finishes shall be smooth, scrubbable, and moisture-resistant.
 - (b) Wall finish treatments shall not create ledges or crevices that can harbor dust and dirt.
- (2) Wall surfaces in wet areas (e.g., kitchens, environmental services rooms) shall be monolithic and all seams shall be covered and/or sealed.

- (3) Wall bases in areas routinely subjected to wet cleaning shall be monolithic and covered with the floor, tightly sealed to the wall, and constructed without voids.
- (4) Wall areas penetrated by pipes, ducts, and conduits shall be tightly sealed to minimize entry of rodents and insects. Joints of structural elements shall be similarly sealed.
- (5) Highly polished walls or wall finishes that create glare shall be avoided.
- (6) Sharp, protruding corners shall be avoided.
- (7) Wall protection devices and corner guards shall be durable and scrubbable.

3.1-7.2.3.4 Ceilings

3.1-7.2.4 Furnishings

3.1-7.2.4.1 Casework, millwork, and built-ins

3.1-7.2.4.2 Furniture

3.1-7.2.4.3 Window treatments

3.1-7.2.4.4 Signage and wayfinding

■ 3.1-8 Building Systems

3.1-8.1 Reserved

3.1-8.2 Heating, Ventilation, and Air-Conditioning (HVAC) Systems

*3.1-8.2.1 General

Basic HVAC system requirements are defined in Part 6, ANSI/ASHRAE/ASHE Standard 170-2008: *Ventilation of Health Care Facilities*. This section of the Guidelines includes additional requirements.

weather stripping, etc., should be brought up to standard for maximum economy and efficiency. Consideration should be given to additional work that may be needed to achieve this.

A3.1-8.2.1.1 (1) Insofar as practical, the facility should include provisions for recovery of waste cooling and heating energy.

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A3.1-7.2.3.2 (8) The selection of non-wax flooring eliminates finish glare. Where a finish coat is required, smooth flooring surfaces should be sealed with a matte finish to reduce surface glare.

A3.1-8.2.1 Remodeling and work in existing facilities may present special problems. As practicality and funding permit, existing insulation,

3.1-8.2.1.1 Mechanical system design

(1) Efficiency. The mechanical system shall be designed for overall efficiency and appropriate life-cycle cost. Details for cost-effective implementation of design features are interrelated and too numerous (as well as too basic) to list individually.

(a) Recognized engineering procedures shall be followed for the most economical and effective results. A well-designed system can generally achieve energy efficiency at minimal additional cost and simultaneously provide improved patient comfort. Different geographic areas may have climatic and use conditions that favor one system over another in terms of overall cost and efficiency.

(b) In no case shall patient care or safety be sacrificed for energy conservation.

(c) Use of recognized energy-saving mechanisms such as variable-air-volume (VAV) systems, load shedding, programmed controls for unoccupied periods (nights and weekends, etc.), and use of natural ventilation shall be considered, site and climatic conditions permitting.

(d) Facility design considerations shall include site, building mass, orientation, configuration, fenestration, and other features relative to passive and active energy systems.

(e) Air-handling systems shall be designed with an economizer cycle where appropriate to use outside air. (Use of mechanically circulated outside air does not reduce the need for filtration.)

(f) VAV systems. The energy-saving potential of VAV systems is recognized, and the standards herein are intended to maximize appropriate use of such systems. Any system used for occupied areas shall include provisions to avoid air stagnation in interior spaces where thermostat demands are met by temperatures of surrounding areas.

(2) Air-handling systems with unitary equipment that serves only one room. These units shall be permitted for use as recirculating units only. All outdoor air shall be provided by a separate central air-handling system with proper filtration, as noted in 3.1-8.2.5.1 (filter efficiencies).

(3) Vibration isolators. Mechanical equipment, ductwork, and piping shall be mounted on vibration isolators as required to prevent unacceptable structure-borne vibration.

(4) System valves. Supply and return mains and risers for cooling, heating, and steam systems shall be equipped with valves to isolate the various sections of each system. Each piece of equipment shall have valves at the supply and return ends.

(5) Renovation. If system modifications affect greater than 10 percent of the system capacity, designers shall utilize pre-renovation water/air flow rate measurements to verify that sufficient capacity is available and that renovations have not adversely affected flow rates in non-renovated areas.

(6) Acoustic considerations

(a) Outdoor mechanical equipment shall not produce sound that exceeds 65 dBA at the hospital façade, unless special consideration is given to façade sound isolation design in impinged areas.

(b) Outdoor mechanical equipment shall not produce sound that exceeds daytime and nighttime noise limits at neighboring properties as required by local ordinance.

3.1-8.2.1.2 Ventilation and space-conditioning

requirements. All rooms and areas used for patient care shall have provisions for ventilation. See Part 6 for further requirements.

(1) Although natural ventilation for nonsensitive and patient areas (via operable windows) shall be

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A3.1-8.2.1.1 (1)(e) It may be practical in many areas to reduce or shut down mechanical ventilation during appropriate climatic and patient care conditions and to use open windows for ventilation.

A3.1-8.2.1.1 (6)(a) and (b) Outdoor mechanical equipment includes cooling towers, rooftop air handlers, exhaust fans, and fans located inside buildings with openings on the outside of the building.

Noise that these and other outdoor equipment produce may impinge on hospital buildings and may require special consideration of the hospital building shell in these areas, or may impinge on adjacent properties where jurisdictional noise limits and/or owner land uses must be considered.

permitted, mechanical ventilation shall be provided for all rooms and areas in the facility in accordance with Table 7-1 in Part 6 (ASHRAE 170).

3.1-8.2.2 HVAC Requirements for Specific Locations

3.1-8.2.2.1 Airborne infection isolation (AII)

rooms. The AII room is used for isolating the airborne spread of infectious diseases (e.g., measles, varicella, tuberculosis).

- (1) Use of AII rooms for routine patient care during periods not requiring isolation precautions shall be permitted. Differential pressure requirements shall remain unchanged when the AII room is used for routine patient care.
- (2) Each AII room shall have a permanently installed visual mechanism to constantly monitor the pressure status of the room when occupied by patients with an airborne infectious disease. The mechanism shall monitor the pressure differential between the AII room and the corridor, whether or not there is an anteroom between the corridor and the AII room.
- (3) When an anteroom is provided, airflow shall be from the corridor into the anteroom and from the anteroom into the patient room.
- (4) See Part 6 for additional ventilation requirements.

3.1-8.2.2.2 Protective environment (PE) rooms.

The PE room is used to protect the profoundly immunosuppressed patient with prolonged neutropenia (i.e., a patient undergoing an allogeneic or autologous bone marrow/stem cell transplant) from common environmental airborne infectious microbes (e.g., *Aspergillus* spores).

- (1) These special ventilation areas shall be designed to provide directed airflow from the cleanest patient care area to less clean areas.

- * (2) Supply air to PE rooms, and to anterooms if provided, shall pass through HEPA filters just before entering the room. For a suite of rooms, installation of the HEPA filters upstream of the suite shall be permitted.
- (3) Each PE room shall have a permanently installed visual mechanism to constantly monitor the pressure status of the room when occupied by a patient requiring a protective environment. The mechanism shall monitor the pressure differential between the PE room and the corridor or common space, whether or not there is an anteroom between the corridor or common space and the PE room.
- (4) When an anteroom is provided, airflow shall be from the patient room into the anteroom and from the anteroom into the corridor.
- (5) See Part 6 for additional ventilation requirements.

3.1-8.2.2.3 Reserved

3.1-8.2.2.4 Reserved

3.1-8.2.2.5 Operating rooms

- (1) Air supply. In addition to the required low return (or exhaust) grilles, such grilles placed high on the walls shall be permitted.
- (2) Ventilation rates
 - * (a) Operating room ventilation systems shall operate at all times, except during maintenance and conditions requiring shutdown by the building's fire alarm system.
 - (b) During unoccupied hours, operating room air change rates may be reduced, provided that

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A3.1-8.2.2.2 (2) These interrupting filters protect patient rooms from maintenance-derived release of environmental microbes from the ventilation system components. Recirculation HEPA filters can be used to increase the equivalent room air exchanges.

A3.1-8.2.2.5 (2)(a) Ventilation rates for operating rooms. The operating and delivery room ventilation systems should

operate at all times to maintain the air movement relationship to adjacent areas. The cleanliness of the spaces is compromised when the ventilation system is shut down. For example, airflow from a less clean space such as the corridor can occur, and standing water can accumulate in the ventilation system (near humidifiers or cooling coils).

the positive room pressure is maintained as required in Part 6 (ASHRAE 170).

3.1-8.2.2.6 Bronchoscopy rooms

- (1) Differential pressure shall be a minimum of 0.01" water gauge (2.5 Pa).
- (2) Local exhaust shall be provided.

3.1-8.2.2.7 Emergency and radiology waiting areas.

When these areas are not enclosed, the exhaust air change rate shall be based on the general volume of the space.

3.1-8.2.2.8 Anesthesia storage rooms. The ventilation systems for inhalation anesthesia storage rooms shall conform to the requirements for medical gas storage or transfilling as described in NFPA 99.

3.1-8.2.2.9 ETO sterilizer space. The ventilation system for the space that houses ethylene oxide (ETO) sterilizers shall be designed as follows:

- (1) A dedicated (not connected to a return air or other exhaust system) exhaust system shall be provided. Refer to 29 CFR Part 1910.1047.
- (2) All source areas shall be exhausted, including the sterilizer equipment room, service/aeration areas, and the space above the sterilizer door, as well as the aerator.
 - (a) If the ETO cylinders are not located in a well-ventilated, unoccupied equipment space, an exhaust hood shall be provided over the cylinders.
 - (b) The relief valve shall be terminated in a well-ventilated, unoccupied equipment space or outside the building.
 - (c) If the floor drain to which the sterilizer(s) discharges is not located in a well-ventilated, unoccupied equipment space, an exhaust drain cap shall be provided (coordinate with local codes).
- (3) General airflow shall be away from the sterilizer operator(s).
- (4) The exhaust outlet to the outside shall be at least 25 feet (7.62 meters) away from any air intake.
- (5) An audible and visual alarm shall activate in the

sterilizer work area, and in a 24-hour staffed location, upon loss of airflow in the exhaust system.

3.1-8.2.2.10 Food preparation centers

- (1) Exhaust hoods handling grease-laden vapors in food preparation centers shall comply with NFPA 96.
- (2) All hoods over cooking ranges shall be equipped with grease filters, fire extinguishing systems, and heat-actuated fan controls.
- (3) Cleanout openings shall be provided every 20 feet (6.10 meters) and at changes in direction in the horizontal exhaust duct systems serving these hoods. Each horizontal duct run shall have at least one cleanout opening. Horizontal runs of ducts serving range hoods shall be kept to a minimum.

3.1-8.2.2.11 Fuel-fired equipment rooms. Rooms with fuel-fired equipment shall be provided with sufficient outdoor air to maintain equipment combustion rates and to limit workstation temperatures.

3.1-8.2.3 Thermal Insulation and Acoustical Provisions

3.1-8.2.3.1 General. Insulation shall be provided within the building to conserve energy, protect personnel, prevent vapor condensation, and reduce noise.

- (1) Vapor barrier. Insulation on cold surfaces shall include an exterior vapor barrier. (Material that will not absorb or transmit moisture will not require a separate vapor barrier.)
- (2) Flame-spread rating. Insulation, including finishes and adhesives on the exterior surfaces of ducts, piping, and equipment, shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less as determined by an independent testing laboratory in accordance with NFPA 255.
- (3) Renovation. Existing accessible insulation within areas of facilities to be modernized shall be inspected, repaired, and/or replaced, as appropriate.

3.1-8.2.3.2 Duct linings

3.1 COMMON ELEMENTS FOR OUTPATIENT FACILITIES

- (1) Duct linings exposed to air movement shall not be used in ducts serving operating rooms, delivery rooms, LDR rooms, nurseries, protective environment rooms, and critical care units. This requirement shall not apply to mixing boxes and sound attenuators that have special coverings over such lining.
- (2) Duct lining shall not be installed within 15 feet (4.57 meters) downstream of humidifiers.
- (3) Renovation. If existing lined ductwork is reworked in a renovation project, the liner seams and punctures shall be resealed.

3.1-8.2.4 HVAC Air Distribution

3.1-8.2.4.1 Return air systems. For patient care areas, return air shall be via ducted systems.

3.1-8.2.4.2 HVAC ductwork

- (1) General. When smoke partitions are required, heating, ventilating, and air conditioning zones shall be coordinated with compartmentation insofar as practical to minimize the need to penetrate fire and smoke partitions.
- * (2) Duct humidifiers
 - (a) If duct humidifiers are located upstream of the final filters, they shall be at least twice the rated distance for full moisture absorption upstream of the final filters.
 - (b) Ductwork with duct-mounted humidifiers shall have a means of water removal.
 - (c) Humidifiers shall be connected to airflow proving switches that prevent humidification unless the required volume of airflow is present or high-limit humidistats are provided.
 - (d) All duct takeoffs shall be sufficiently downstream of the humidifier to ensure complete moisture absorption.

- (e) Steam humidifiers shall be used. Reservoir-type water spray or evaporative pan humidifiers shall not be used.
- (3) Fire and smoke dampers
 - (a) Fire and smoke dampers shall be constructed, located, and installed in accordance with the requirements of NFPA 101, 90A, and the specific damper's listing requirements.
 - (b) Fans, dampers, and detectors shall be interconnected so that damper activation will not damage ducts.
 - (c) Maintenance access shall be provided at all dampers.
 - (d) All damper locations shall be shown on design drawings.
 - (e) Dampers shall be activated in accordance with NFPA 90A. Installation of switching systems for restarting fans shall be permitted for fire department use in venting smoke after a fire has been controlled. Provisions to avoid possible damage to the system due to closed dampers shall be permitted.
 - (4) Construction requirements. Ducts that penetrate construction intended to protect against x-ray, magnetic, RFI, or other radiation shall not impair the effectiveness of the protection.

3.1-8.2.4.3 Exhaust systems

- (1) General
 - (a) To enhance the efficiency of recovery devices required for energy conservation, combined exhaust systems shall be permitted.
 - (b) Local exhaust systems shall be used whenever possible in place of dilution ventilation to reduce exposure to hazardous gases, vapors, fumes, or mists.
 - (c) Fans serving exhaust systems shall be located at the discharge end and shall be readily serviceable.

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3.1-8.2.4.2 (2) One way to achieve basic humidification may be by a steam-jacketed manifold-type humidifier with a condensate separator that delivers high-quality steam. Additional booster humidification (if required) should be provided by steam-jacketed humidifiers for each individually controlled area. Steam to be used for humidification may be generated in a separate steam generator. The steam generator feedwa-

ter may be supplied either from soft or reverse osmosis water. Provisions should be made for periodic cleaning.

3.1-8.2.4.3 (2) See *Industrial Ventilation: A Manual of Recommended Practice*, published by the American Conference of Governmental Industrial Hygienists (www.acgih.org), for additional information.

- (d) Airborne infection isolation rooms shall not be served by exhaust systems incorporating a heat wheel.
- * (2) Anesthesia scavenging system. Each space routinely used for administering inhalation anesthesia and inhalation analgesia shall be served by a scavenging system to vent waste gases.
 - (a) If a vacuum system is used, the gas-collecting system shall be arranged so that it does not disturb patients' respiratory systems.
 - (b) Gases from the scavenging system shall be exhausted directly to the outside. The anesthesia evacuation system may be combined with the room exhaust system, provided that the part used for anesthesia gas scavenging exhausts directly to the outside and is not part of the recirculation system.
 - (c) Where anesthesia scavenging systems are required, air supply shall be at or near the ceiling. Return or exhaust air inlets shall be near the floor level.
 - (d) Scavenging systems are not required for areas where gases are used only occasionally, such as the emergency department, offices for routine dental work, etc.

3.1-8.2.4.4 Ventilation hoods

- (1) Exhaust hoods and safety cabinets
 - (a) Hoods and safety cabinets are permitted to be used for normal exhaust of a space provided minimum air change rates are maintained.
 - (b) If air change standards in Part 6 (ASHRAE 170) do not provide sufficient air for proper operation of exhaust hoods and safety cabinets (when in use), makeup air (filtered and pre-heated) shall be provided around these units to maintain the required airflow direction and exhaust velocity. Use of makeup air will avoid dependence upon infiltration from outdoor and/or from contaminated areas.
 - (c) Makeup systems for hoods shall be arranged to minimize "short circuiting" of air and to avoid reduction in air velocity at the point of contaminant capture.
- (2) Laboratory fume hoods. Laboratory fume hoods shall meet the following general standards:
 - (a) General standards
 - (i) Average face velocity of 75 feet per minute (0.45 to 0.56 meters per second)
 - (ii) Connection to an exhaust system to the outside that is separate from the building exhaust system
 - (iii) Location of an exhaust fan at the discharge end of the system
 - (iv) Inclusion of an exhaust duct system of noncombustible corrosion-resistant material as needed to meet the planned usage of the hood
 - (b) Special standards for use with strong oxidants
 - (i) Fume hoods, and their associated equipment in the air stream intended for use with perchloric acid and other strong oxidants, shall be constructed of stainless steel or other material consistent with special exposures.
 - (ii) These hoods and equipment shall be provided with a water wash and drain system to permit periodic flushing of duct and hood.
 - (iii) Electrical equipment intended for installation within such ducts shall be designed and constructed to resist penetration by water. Lubricants and seals shall not contain organic materials.
 - (iv) When perchloric acid or other strong oxidants are only transferred from one container to another, standard laboratory fume hoods and the associated equipment may be used in lieu of stainless steel construction.
 - (c) Special standards for use with infectious or radioactive materials. In new construction and major renovation work, each hood used to process infectious or radioactive materials shall meet the following requirements:
 - (i) Each hood shall have a minimum face velocity of 90 to 110 feet per minute (0.45 to 0.56 meters per second) with suitable pressure-independent air-modulating devices and alarms to alert staff of fan shutdown or loss of airflow.
 - (ii) Each hood shall have filters with a 99.97

percent efficiency (based on the DOP test method) in the exhaust stream, and be designed and equipped to permit the safe removal, disposal, and replacement of contaminated filters. Filters shall be located within 10 feet (3.05 meters) of the hood to minimize duct contamination.

- (iii) Fume hoods intended for use with radioactive isotopes shall be constructed of stainless steel or other material suitable for the particular exposure and shall comply with NFPA 801: *Facilities for Handling Radioactive Materials*. **Note:** Radioactive isotopes used for injections, etc., without probability of airborne particulates or gases may be processed in a clean-workbench-type hood where acceptable to the Nuclear Regulatory Commission.

3.1-8.2.5 HVAC Filters

See Part 6 (ASHRAE 170) for further filter requirements.

3.1-8.2.5.1 Filter efficiencies. Noncentral air-handling systems shall be equipped with permanent (cleanable) or replaceable filters with a minimum efficiency of MERV 6.

3.1-8.2.5.2 Filter frames. Filter frames shall be durable and proportioned to provide an airtight fit with the enclosing ductwork. All joints between filter segments and enclosing ductwork shall have gaskets or seals to provide a positive seal against air leakage.

3.1-8.2.6 Heating Systems and Equipment

3.1-8.2.6.1 Boilers

- (1) Capacity. For requirements, see Section 6.1.2.1 of Part 6 (ASHRAE 170). In addition, domestic hot water for clinical, dietary, and patient/resident use shall be included in the reserve capacity to be served by the remaining sources.
- (2) Fuel sufficient to meet demand loads for the same length of time required for emergency generators shall be provided on site.

3.1-8.2.6.2 Boiler plant accessories. Major sup-

porting components of the heating plant, including feedwater pumps, fuel pumps, and condensate transfer pumps, shall be provided with redundancy that makes it possible to meet the heating capacity of the plant required by Section 3.1-8.2.6.1 (Boilers—Capacity) when any one of these components is out of service due to failure or routine maintenance.

3.1-8.2.6.3 Temperature control

- (1) Rooms containing heat-producing equipment, such as boiler or heater rooms or laundries, shall be ventilated to prevent the floor surface above and/or the adjacent walls of occupied areas from exceeding a temperature of 10°F (6°C) above ambient room temperature.
- (2) Heating units shall have a maximum surface temperature of 125°F (51.67°C) or shall be protected from occupant contact.

3.1-8.3 Electrical Systems

3.1-8.3.1 General

3.1-8.3.1.1 Applicable standards

- (1) All electrical material and equipment, including conductors, controls, and signaling devices, shall be installed in compliance with applicable sections of NFPA 70 and NFPA 99.
- (2) All electrical material and equipment shall be listed as complying with available standards of listing agencies or other similar established standards where such standards are required.

3.1-8.3.1.2 Testing and documentation. Electrical installations, including alarm and communication systems, shall be tested to demonstrate that equipment installation and operation is appropriate and functional. A written record of performance tests on special electrical systems and equipment shall show compliance with applicable codes and standards.

3.1-8.3.1.3 Power disturbance safeguards. Data processing and/or automated laboratory or diagnostic equipment, if provided, may require safeguards from power line disturbances.

3.1-8.3.2 Electrical Distribution and Transmission**3.1-8.3.2.1 Switchboards**

- (1) Location
 - (a) Main switchboards shall be located in an area separate from plumbing and mechanical equipment and shall be accessible to authorized persons only.
 - (b) Switchboards shall be convenient for use and readily accessible for maintenance but away from traffic lanes.
 - (c) Switchboards shall be located in dry, ventilated spaces free of corrosive or explosive fumes or gases or any flammable material.
- (2) Overload protective devices. These shall operate properly in ambient room temperatures.

3.1-8.3.2.2 Panelboards

- (1) Panelboards serving normal lighting and appliance circuits shall be located on the same floor as the circuits they serve.
- (2) Panelboards serving critical branch emergency circuits shall be located on each floor that has major users.
- (3) Panelboards serving life safety emergency circuits may also serve floors above and/or below.

3.1-8.3.2.3 Ground-fault circuit interrupters

- (1) Ground-fault circuit interrupters (GFCIs) shall comply with NFPA 70: National Electrical Code.
- (2) When GFCIs are used in critical care areas, provisions shall be made to ensure that other essential equipment is not affected by activation of one interrupter.

3.1-8.3.3 Power Generating and Storing Equipment

3.1-8.3.3.1 Emergency electrical service. Emergency lighting and power shall be provided for in accordance with NFPA 99, NFPA 101, and NFPA 110.

***3.1-8.3.4 Lighting**

***3.1-8.3.4.1** As required by the functional program, special needs of the elderly shall be incorporated into the lighting design.

3.1-8.3.4.2 Reserved**3.1-8.3.4.3 Lighting for specific locations in the outpatient facility**

- (1) Examination/treatment/trauma rooms. A portable or fixed examination light shall be provided for examination, treatment, and trauma rooms.
- (2) Operating and delivery rooms. Operating and delivery rooms shall have general lighting in addition to special lighting units provided at surgical and obstetrical tables. General lighting and special lighting shall be on separate circuits.

3.1-8.3.5 Electrical Equipment

3.1-8.3.5.1 Special electrical equipment. Special equipment is identified in the subsections of 3.1-3, Diagnostic and Treatment Locations, of this chapter. These sections shall be consulted to ensure compatibility between programmatically defined equipment needs and appropriate power and other electrical connection needs.

3.1-8.3.5.2 Reserved**APPENDIX**

A3.1-8.3.4 Required levels for artificial illumination in health care facilities should comply with Illuminating Engineering Society of North America (IES) publication RP-29: *Recommended Practices for Lighting for Hospitals and Health Care Facilities*. Light intensity for staff and patient needs should generally comply with these IES guidelines. Consideration should be given to controlling intensity and/or wavelength to prevent harm to the patient's eyes (i.e., retina damage to premature infants and cataracts due to ultraviolet light).

Many procedures are available to satisfy lighting requirements, but the design should consider light quality as well as quantity for effectiveness and efficiency. While light levels in the IES publications are referenced herein, those publications include other useful guidance and recommendations which the designer is encouraged to follow.

A3.1-8.3.4.1 Refer to IES publication ANSI/IESNA RP-28: *Recommended Practices for Lighting and the Visual Environment for Senior Living*.

3.1 COMMON ELEMENTS FOR OUTPATIENT FACILITIES

3.1-8.3.5.3 X-ray equipment. Fixed and mobile x-ray equipment installations shall conform to articles 517 and 660 of NFPA 70.

3.1-8.3.5.4 Inhalation anesthetizing locations. At inhalation anesthetizing locations, all electrical equipment and devices, receptacles, and wiring shall comply with applicable sections of NFPA 99 and NFPA 70.

3.1-8.3.6 Receptacles (Convenience Outlets)

3.1-8.3.6.1 Duplex grounded-type receptacles (convenience outlets) shall be installed in all areas in sufficient quantities for tasks to be performed as needed.

3.1-8.3.6.2 Each examination and worktable shall have access to a minimum of two duplex receptacles.

3.1-8.4 Plumbing Systems

3.1-8.4.1 General

3.1-8.4.1.1 Application. These requirements do not apply to outpatient facilities that do not perform invasive applications or procedures.

3.1-8.4.1.2 Standards. Unless otherwise specified herein, all plumbing systems shall be designed and installed in accordance with the *International Plumbing Code*.

3.1-8.4.2 Plumbing and Other Piping Systems

3.1-8.4.2.1 General piping and valves

- (1) All piping, except control-line tubing, shall be identified.
- (2) All valves shall be tagged, and a valve schedule shall be provided to the facility owner for permanent record and reference.
- (3) In food preparation and service areas, no plumbing piping shall be exposed overhead or exposed on walls where possible accumulation of dust or soil may create a cleaning problem or where leaks would create a potential for food contamination.

3.1-8.4.2.2 Hemodialysis piping

- (1) Where the functional program includes hemodialysis, continuously circulated filtered cold water shall be provided. Piping shall be in accordance with AAMI RD62.
- (2) In new construction and renovation where hemodialysis or hemoperfusion are routinely performed, a separate water supply and drainage facility that does not interfere with hand-washing shall be provided.

3.1-8.4.2.3 Potable water supply systems. The following standards shall apply to potable water supply systems:

- (1) Capacity. Systems shall be designed to supply water at sufficient pressure to operate all fixtures and equipment during maximum demand. Supply capacity for hot- and cold-water piping shall be determined on the basis of fixture units, using recognized engineering standards. Where the ratio of plumbing fixtures to occupants is proportionally more than required by the building occupancy and is in excess of 1,000 plumbing fixture units, a diversity factor is permitted.
- (2) Valves. Each water service main, branch main, riser, and branch to a group of fixtures shall have valves.
 - (a) Stop valves shall be provided for each fixture.
 - (b) Appropriate panels for access shall be provided at all valves where required.
- (3) Backflow prevention
 - (a) Systems shall be protected against cross-connection in accordance with American Water Works Association (AWWA) Recommended Practice for Backflow Prevention and Cross-connection Control.
 - (b) Vacuum breakers or backflow prevention devices shall be installed on hose bibs and supply nozzles used for connection of hoses or tubing in laboratories, housekeeping sinks, etc.
- (4) Potable water storage vessels (hot and cold) not intended for constant use shall not be installed.
- (5) Emergency eyewash and showers shall comply with ANSI Z358.1.

3.1-8.4.2.4 Reserved

3.1-8.4.2.5 Hot water systems. The following standards shall apply to hot water systems:

- * (1) The water-heating system shall have sufficient supply capacity at the temperatures and amounts indicated in the applicable table. Storage of water at higher temperatures shall be permitted.
- (2) Hot water distribution systems serving patient/resident care areas shall be under constant recirculation to provide continuous hot water at each hot water outlet. Non-recirculated fixture branch piping shall not exceed 25 feet (7.62 meters) in length.
- (3) Dead-end piping (risers with no flow, branches with no fixture) shall not be installed. In renovation projects, dead-end piping shall be removed. Empty risers, mains, and branches installed for future use shall be permitted.
- * (4) Provisions shall be included in the domestic hot water system to limit the amount of *Legionella* bacteria and opportunistic waterborne pathogens.

3.1-8.4.2.6 Drainage systems

- (1) Piping
 - (a) Drain lines from sinks used for acid waste disposal shall be made of acid-resistant material.
 - (b) Drain lines serving some types of automatic blood-cell counters shall be of carefully

selected material that will eliminate the potential for undesirable chemical reactions (and/or explosions) between sodium azide wastes and copper, lead, brass, solder, etc.

- (c) Insofar as possible, drainage piping shall not be installed within the ceiling or exposed in operating and delivery rooms, nurseries, food preparation centers, food-serving facilities, food storage areas, central services, electronic data processing areas, electric closets, and other sensitive areas. Where exposed overhead drain piping in these areas is unavoidable, special provisions shall be made to protect the space below from leakage, condensation, or dust particles.
- (2) Floor drains
 - (a) Floor drains shall not be installed in operating and delivery rooms, except as permitted in dedicated cystoscopy rooms.
 - * (b) If a floor drain is installed in a dedicated cystoscopy room, it shall contain a nonsplash, horizontal-flow flushing bowl beneath the drain plate.
 - (c) Dietary area floor drains and/or floor sinks
 - (i) Type. These shall be of a type that can be easily cleaned by removing the cover. Removable stainless steel mesh shall be provided in addition to grilled drain covers to prevent entry of large particles of waste that might cause stoppages.

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A3.1-8.4.2.5 (1) Water temperature is measured at the point of use or inlet to the equipment.

A3.1-8.4.2.5 (4) There are several ways to treat domestic water systems to kill *Legionella* and opportunistic waterborne pathogens. Complete removal of these organisms is not feasible, but methods to reduce the amount include hyperchlorination (free chlorine, chlorine dioxide, monochloramine), elevated hot water temperature, ozone injection, silver/copper ions, and ultraviolet light. Each of these options has advantages and disadvantages. While increasing the hot water supply temperature to 140°F (60°C) is typically considered the easiest option, the risk of scalding, especially to youth and the elderly, is significant. Additional consideration should be given to domestic water used in bone marrow transplant units. See CDC and ASHRAE Guideline 12, "Minimizing the Risk of Legionellosis Associated with Building Water Systems," for additional information. Another reference on this topic is

"*Legionella* Control in Health Care Facilities," available from the American Society of Plumbing Engineers.

A3.1-8.4.2.6 (2)(b) Floor drains in cystoscopy operating rooms have been shown to disseminate a heavily contaminated spray during flushing. Unless flushed regularly with large amounts of fluid, the trap tends to dry out and permit passage of gases, vapors, odors, insects, and vermin directly into the operating room. For new construction, if the users insist on a floor drain, the drain plate should be located away from the operative site and should be over a frequently flushed nonsplash, horizontal-flow type of bowl, preferably with a closed system of drainage. Alternative methods include (1) an aspirator/trap installed in a wall connected to the collecting trough of the operating table by a closed, disposable tube system or (2) a closed system using portable collecting vessels. (See NFPA 99.)

- (ii) Location. Floor drains or floor sinks shall be provided at all “wet” equipment (as ice machines) and as required for wet cleaning of floors. Location of floor drains and floor sinks shall be coordinated to avoid conditions where locations of equipment make removal of covers for cleaning difficult.
- (3) Sewers. Building sewers shall discharge into community sewerage. Where such a system is not available, the facility shall treat its sewage in accordance with local and state regulations.
- (4) Kitchen grease traps
 - (a) Grease traps shall be of capacity required.
 - (b) These shall be located and arranged to permit easy access without the need to enter food preparation or storage areas.
 - (c) These shall be accessible from outside the building without need to interrupt any services.
- (5) Plaster traps. Where plaster traps are used, provisions shall be made for appropriate access and cleaning.

3.1-8.4.2.7 Condensate drains

- (1) Condensate drains for cooling coils shall be a type that may be cleaned as needed without disassembly.
- (2) An air gap shall be provided where condensate drains empty into building drains.
- (3) Heater elements shall be provided for condensate lines in freezers or other areas where freezing may be a problem.

3.1-8.4.3 Plumbing Fixtures

The following standards shall apply to plumbing fixtures:

3.1-8.4.3.1 General

- (1) Materials. The material used for plumbing fixtures shall be non-absorptive and acid-resistant.
- (2) Clearances. Water spouts used in lavatories and sinks shall have clearances adequate to avoid contaminating utensils and the contents of carafes, etc.

***3.1-8.4.3.2 Hand-washing stations**

- (1) General. For further requirements regarding hand-washing stations, see 1.2-3.2.1.2 (ICRA considerations—Design elements), 3.1-7.2.2.8, and the facility chapters in Part 3.
- (2) Sinks
 - * (a) Sinks in hand-washing stations shall be designed with deep basins to prevent splashing to areas where direct patient care is provided, particularly those surfaces where sterile procedures are performed and medications are prepared.
 - (b) The area of the basin shall not be less than 144 square inches (929.03 square centimeters), with a minimum 9-inch (22.86-centimeter) width or length.
 - (c) Hand-washing basins/countertops shall be made of porcelain, stainless steel, or solid surface materials. Basins shall be permitted to be set into plastic laminate countertops if, at a minimum, the substrate is marine-grade plywood (or equivalent) with an impervious seal.
 - (d) Sinks shall have well-fitted and sealed basins to prevent water leaks onto or into cabinetry and wall spaces.
 - (e) The discharge point of hand-washing sinks shall be at least 10 inches (25.4 centimeters) above the bottom of the basin.
 - (f) The water pressure at the fixture shall be regulated.

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A3.1-8.4.3.2 Hand-washing stations. Plumbing lines under hand-washing stations should be protected for use by residents using wheelchairs.

A3.1-8.4.3.2 (2)(a) Recommendations for minimizing splashing through hand-washing station design and sink style

- a. Faucets should not discharge directly above the drain as this causes

- splashing (i.e., water should be angled away from the drain).
- b. Sink size and depth should follow ANSI standards for sink design.
- c. Water pressure should be adjusted to reduce forceful discharge into the sink at maximum flow.
- d. Design of sinks should accommodate ADA requirements for clearance under the sink basin.

- (g) Design of sinks shall not permit storage beneath the sink basin.

3.1-8.4.3.3 Showers and tubs

- (1) Showers and tubs shall have nonslip walking surfaces.
- (2) If provided, soap dishes shall be recessed.

3.1-8.4.3.4 Ice machines. Copper tubing shall be provided for supply connections to ice machines.

3.1-8.4.3.5 Clinical sinks

- (1) Handles on clinical sinks shall be at least 6 inches (15.24 centimeters) long.
- (2) Clinical sinks shall have an integral trap wherein the upper portion of the water trap provides a visible seal.

3.1-8.4.3.6 Scrub sinks. Freestanding scrub sinks and lavatories used for scrubbing in procedure rooms shall be trimmed with foot, knee, or ultrasonic controls; single-lever wrist blades shall not be permitted.

3.1-8.4.3.7 Eyewash devices. Eyewash devices shall be provided per OSHA 29 CFR 1910.151 and ANSI Z358.1: *Emergency Eyewash and Shower Equipment*.

3.1-8.4.4 Medical Gas and Vacuum Systems

Station outlets shall be provided consistent with need established by the functional program. (See Table 3.1-1 for station outlet requirements.)

3.1-8.4.4.1 Medical gas systems. If piped medical gas is used, the installation, testing, and certification of nonflammable medical gas and air systems shall comply with the requirements of NFPA 99, *Standard for Health Care Facilities*.

3.1-8.4.4.2 Vacuum systems. Where the functional program requires a central clinical vacuum system, design and installation shall be in accordance with NFPA 99.

3.1-8.5 Communications Systems

3.1-8.5.1 Locations for terminating telecommunications and information system devices shall be provided.

3.1-8.5.2 A space shall be provided for central equipment locations. Special air conditioning and voltage regulation shall be provided when recommended by the manufacturer.

3.1-8.6 Electronic Safety and Security Systems

3.1-8.6.1 Fire Alarm System

Any fire alarm system shall be as required by NFPA 101 and installed per NFPA 72.

3.1-8.7 Special Systems

3.1-8.7.1 General

As required by the functional program, special systems shall be installed in accordance with the following standards:

3.1-8.7.1.1 Testing

- (1) Prior to acceptance of the facility, all special systems shall be tested and operated to demonstrate to the owner or its designated representative that the installation and performance of these systems conform to design intent.
- (2) Test results shall be documented for maintenance files.

3.1-8.7.1.2 Documentation

- (1) Upon completion of the special systems equipment installation contract, the owner shall be furnished with a complete set of manufacturers' operating, maintenance, and preventive maintenance instructions; a parts list; and complete procurement information, including equipment numbers and descriptions.
- (2) Operating staff persons shall also be provided with instructions for proper operation of systems and equipment. Required information shall include all safety or code ratings as needed.

3.1 COMMON ELEMENTS FOR OUTPATIENT FACILITIES

3.1-8.7.1.3 Insulation. Insulation shall be provided surrounding special system equipment to conserve energy, protect personnel, and reduce noise.

3.1-8.7.2 Elevators

3.1-8.7.2.1 Reserved

3.1-8.7.2.2 Reserved

3.1-8.7.2.3 Dimensions. Cars shall have a minimum inside floor dimension of not less than 5 feet (1.52 meters).

3.1-8.7.2.4 Leveling device. Elevators shall be equipped with a two-way automatic level-maintaining device with an accuracy of $\pm 1/2$ inch (± 12.7 millimeters).

3.1-8.7.2.5 Elevator controls

(1) Elevator call buttons and controls shall not be activated by heat or smoke. Light beams, if used for operating door reopening devices without touch,

shall be used in combination with door-edge safety devices and shall be interconnected with a system of smoke detectors. This is so the light control feature will be overridden or disengaged should it encounter smoke at any landing.

(2) Elevator controls, alarm buttons, and telephones shall be accessible to wheelchair occupants and usable by the blind.

3.1-8.7.2.6 Installation and testing

(1) Standards. Installation and testing of elevators shall comply with ANSI/ASME A17.1 for new construction and ANSI/ASME A17.3 for existing facilities. (See ASCE/SEI 7 for seismic design and control system requirements for elevators.)

(2) Documentation. Field inspections and tests shall be made and the owner shall be furnished with written certification stating that the installation meets the requirements set forth in this section as well as all applicable safety regulations and codes.

Table 3.1-1

Station Outlets for Oxygen, Vacuum, and Medical Air in Outpatient Facilities

Section	Location	Oxygen	Vacuum	Medical Air
3.1-3.2.2/3.2.3	General/special purpose examination	0	0	--
3.1-3.2.4	Treatment	0	0	--
3.1-3.4.2	Isolation	0 ¹	0 ¹	--
	Urgent Care			
3.5-3.3	Procedure room	1	1	1
--	Cast room	0 ¹	0 ¹	--
--	Catheterization room	1	2	2
3.7-3.2	Examination in outpatient surgical facility	0 ¹	0 ¹	--
	Ambulatory operating rooms			
3.7-3.3.2	Class A—surgical procedures with minimal sedation	1	1	--
3.7-3.3.3	Class B—surgical procedure with moderate sedation	2	2	--
3.7-3.3.4	Class C—surgical procedure with deep sedation	2	3	--
3.7-3.4.2.2	Post-anesthesia recovery	1	1	--
3.7-3.4.2.3	Phase II recovery	0 ¹	0 ¹	--
--	Cysto procedure	1	3	--
	Endoscopy			
3.9-3.2.2	Procedure room	1	3	--
3.9-3.3	Holding/prep/recovery area	0 ¹	0 ¹	--
3.9-5.1.1.2	Decontamination area	--	--	--
5.2-2.2	Birthing room	1 ²	1 ²	--

¹ Portable source shall be available for the space.

² Use of portable equipment shall be permitted.

3.2 Specific Requirements for Primary Care Outpatient Centers

Appendix material, shown in shaded boxes at the bottom of the page, is advisory only.

■ 3.2-1 General

The primary care outpatient center provides comprehensive community outpatient medical services.

3.2-1.1 Application

All requirements in 3.1-1 (General), 3.1-3 (Diagnostic and Treatment Locations), 3.1-4 (Patient Support Services), 3.1-5 (General Support Services), 3.1-6 (Administrative and Public Areas), and 3.1-7 (Design and Construction Requirements) shall apply to primary care outpatient centers, with additions and modifications described in this chapter. [See Chapter 3.3 for small primary care (neighborhood) outpatient facilities.]

3.2-1.2 Functional Program

The functional program shall specify the number and type of diagnostic, treatment, and administrative areas needed to support the services and estimated patient load of the facility.

3.2-1.3 Site

3.2-1.3.1 Parking

Comply with parking requirements outlined in Chapter 1.3, Site.

■ 3.2-2 Reserved

■ 3.2-3 Diagnostic and Treatment Locations

3.2-3.1 Reserved

*3.2-3.2 Examination and Treatment Rooms

3.2-3.3 Imaging Facilities

Provisions shall be made for x-ray procedures as described in 3.1-3.9.2 (Diagnostic Imaging Facilities). Services may be shared or provided by contract off-site.

■ 3.2-4 Patient Support Services

3.2-4.1 Laboratory Services

3.2-4.1.1 General

Provisions shall be made for laboratory procedures as described in 3.1-4.1 (Laboratory Services). Services may be shared or provided by contract off-site.

3.2-4.1.2 Specimen Storage

Each outpatient unit shall have appropriate facilities for storage and refrigeration of blood, urine, and other specimens.

■ 3.2-5 Reserved

■ 3.2-6 Public and Administrative Areas

3.2-6.1 Public Areas

Public areas shall be situated for convenient access and designed to promote prompt accommodation of patient needs, with consideration for personal dignity.

3.2-6.1.1 Entrances

3.2-6.1.1.1 Entrances shall be well marked and at grade level.

3.2-6.1.1.2 Where entrance lobby and/or elevators are shared with other tenants, travel to the outpatient unit shall be direct and accessible to the disabled. Except for passage through common doors, lobbies, or elevator

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A3.2-3.2 Examination rooms and services as described in 3.1-3.2 (Examination and Treatment Rooms) may be provided. In addition, offices and/or practitioner consultation rooms may be combined with examination rooms.

3.2 SPECIFIC REQUIREMENTS FOR PRIMARY CARE OUTPATIENT CENTERS

stations, patients shall not be required to go through other occupied areas or outpatient service areas.

3.2-6.1.1.3 Entrances shall be convenient to parking and accessible via public transportation.

3.2-6.1.2 Reception

3.2-6.1.2.1 Reception/information counter. A reception and information counter or desk shall be located to provide visual control of the entrance to the outpatient unit and shall be immediately apparent from that entrance.

3.2-6.1.2.2 Control counter. A control counter shall be provided with access to patient files and records for scheduling of services. This shall be permitted to be part of the reception, information, and waiting room control.

3.2-6.1.3 Waiting Area

3.2-6.1.3.1 The waiting area for patients and escorts shall be under staff control.

3.2-6.1.3.2 The seating area shall contain not fewer than two spaces for each examination and/or treatment room.

3.2-6.1.3.3 Where the outpatient unit has a formal pediatrics service, a separate, controlled area for pediatric patients shall be provided.

3.2-6.1.3.4 Wheelchairs shall be accommodated within the waiting area.

3.2-6.2 Administrative Areas

3.2-6.2.1 General

Each primary care outpatient facility shall make provisions to support administrative activities, filing, and clerical work as appropriate. (See also 3.1-6.2 [Administrative Areas].) Administrative areas provided shall include the following:

3.2-6.2.2 Reserved

3.2-6.2.3 Office(s)

3.2-6.2.3.1 Office(s), separate and enclosed, with provisions for privacy shall be provided.

3.2-6.2.3.2 Clerical space or rooms for typing and clerical work shall be provided separate from public areas to ensure confidentiality.

3.2-6.2.4 Multipurpose Rooms

Multiuse rooms for conferences, meetings, and health education shall be provided. One room may be primarily for staff use but also available for public access as needed. In smaller facilities, the room may also serve for consultation and other purposes.

3.2-6.2.5 Medical Records

Filing cabinets and storage shall be provided for the safe and secure storage of patient records with provisions for ready retrieval.

3.2-6.2.6 Equipment and Supply Storage

For requirements, see 3.1-6.2.6.

3.2-6.3 Support Areas for Staff

A staff toilet and lounge in addition to and separate from public and patient facilities.

■ 3.2-7 Reserved

■ 3.2-8 Building Systems

3.2-8.1 Reserved

3.2-8.2 Heating, Ventilation, and Air-Conditioning (HVAC) Systems

All standards set forth in 3.1-8.2 shall be met.

3.2-8.3 Reserved

3.2-8.4 Plumbing

All standards set forth in 3.1-8.4 shall be met.

3.3 Specific Requirements for Small Primary Care (Neighborhood) Outpatient Facilities

■ 3.3-1 General

This chapter contains specific requirements for small outpatient facilities where primary care is provided. Such facilities are often contained within existing commercial or residential buildings as “storefront” units, but they may also be freestanding new or converted small structures. The size of the units limits occupancy, thereby minimizing hazards and allowing for less stringent standards. As a result, needed community services can be provided at an affordable cost.

3.3-1.1.1 For the purposes of this chapter, the term “small structure” shall be defined as space and equipment to serve three or fewer examination rooms at any one time.

3.3-1.1.2 Meeting all provisions of 3.1-3 (Diagnostic and Treatment Locations), 3.1-4 (Patient Support Services), 3.1-5 (General Support Services), 3.1-6 (Public and Administrative Areas), and 3.1-7 (Design and Construction Requirements) is desirable, but limited size and resources may preclude satisfying any but the basic minimums described. This section does not apply to outpatient facilities located within a hospital, nor is it intended for larger, more sophisticated units.

3.3-1.2 Reserved

3.3-1.3 Site

3.3-1.3.1 Location

The small primary care neighborhood center is expected to be especially responsive to communities with limited income. In densely populated areas, many patients might walk to services.

3.3-1.3.1.1 The neighborhood center shall be located for maximum accessibility and convenience.

3.3-1.3.1.2 Where a substantial number of patients rely on public transportation, the location of the neighborhood center shall permit convenient access requiring a minimum of transfers.

3.3-1.3.2 Parking

3.3-1.3.2.1 Not less than one convenient parking space shall be provided for each staff member on duty at any one time, and no fewer than four spaces shall be provided for patients.

3.3-1.3.2.2 Parking requirements may be satisfied by street parking or by a nearby public parking lot or garage.

3.3-1.3.2.3 Where the facility is within a shopping center or similar area, customer spaces shall be permitted to meet parking needs.

■ 3.3-2 Reserved

■ 3.3-3 Diagnostic and Treatment Locations

3.3-3.1 Reserved

3.3-3.2 Examination and Treatment Rooms

3.3-3.2.1 Number

At least one examination room shall be available for each provider who may be on duty at any one time.

3.3-3.2.2 Function

Rooms shall be permitted to serve as both examination and treatment spaces; see 3.1-3.2.2 (General Purpose Examination/Observation Room).

3.3-3.2.3 Reserved

3.3-3.2.4 Reserved

3.3-3.2.5 Support Areas for Patient Care— General

For requirements, see 3.1-3.5.

3.3-3.2.6 Support Areas for Examination and Treatment Rooms

3.3-3.2.6.1 through 3.3-3.2.6.5 Reserved

3.3-3.2.6.6 Biological and drug storage. Locked storage for biologicals and drugs shall be provided.

3.3-3.2.6.7 Toilet rooms

- (1) A toilet room containing a hand-washing station shall be accessible from all examination and treatment rooms.
- (2) Where a facility contains no more than three examination and/or treatment rooms, the patient toilet shall be permitted to serve waiting areas.

3.3-3.2.6.8 Reserved

3.3-3.2.6.9 Clean work area. A clean work area shall be provided in a separate room or in an isolated area and shall contain the following:

- (1) Counter
- (2) Hand-washing station
- (3) Storage for clean supplies

3.3-3.2.6.10 Soiled holding room. A soiled holding room shall be provided. For requirements, see 3.1-3.6.10.

3.3-3.2.6.11 Equipment and supply storage. Storage for sterile equipment and supplies shall be provided to meet functional requirements. (Sterile supplies may be prepackaged disposables or processed off-site.)

3.3-3.3 Diagnostic Services

3.3-3.3.1 General

3.3-3.3.1.1 The functional program shall identify diagnostic services to be provided within the facility and those to be provided off-site.

3.3-3.3.1.2 Spaces to accommodate services provided within the facility shall meet the requirements of 3.1-3, as applicable.

■ 3.3-4 Patient Support Services

3.3-4.1 Laboratory Services

Laboratory services and/or facilities shall meet the requirements in this section.

3.3-4.1.1 Laboratory Testing/Work Areas

3.3-4.1.1.1 Specimen collection

- (1) Urine collection rooms shall be equipped with a water closet and hand-washing station.
- (2) Use of the toilet room provided within the examination and treatment room shall be permitted for specimen collection.

3.3-4.1.1.2 Blood collection

- (1) Blood collection facilities shall have space for a chair and work counter.
- (2) A hand-washing station shall be provided.

3.3-4.1.2 Other Laboratory Services

Services shall be available within the facility or through a formal agreement or contract with a hospital or other laboratory for hematology, clinical chemistry, urinalysis, cytology, pathology, and bacteriology.

■ 3.3-5 Reserved

■ 3.3-6 Administrative and Public Areas

3.3-6.1 Public Areas

Public areas shall include the following:

3.3-6.1.1 Reception

A reception and information center or desk shall be provided.

3.3-6.1.2 Waiting Area

This space shall include provisions for wheelchairs.

3.3-6.2 Administrative Areas**3.3-6.2.1 Office**

An office area for business transactions, records, and other administrative functions, separate from public and patient areas, shall be provided.

3.3-6.2.2 Equipment and Supply Storage

General storage facilities for office supplies, equipment, sterile supplies, and pharmaceutical supplies shall be provided.

3.3-6.3 Support Areas for Staff**3.3-6.3.1 Staff Storage**

Locked storage (cabinets or secure drawers) convenient to workstations shall be provided for staff valuables.

■ 3.3-7 Design and Construction Requirements

3.3-7.1 Building Codes and Standards

3.3-7.1.1 Every building and every portion thereof shall be designed and constructed to sustain all dead and live loads in accordance with accepted engineering practices and standards.

3.3-7.1.2 If existing buildings are converted for use, consideration shall be given to the structural requirements for concentrated floor loadings, including x-ray equipment, storage files, and similar heavy equipment that may be added.

■ 3.3-8 Building Systems

3.3-8.1 General

The requirements in this section shall apply for the small outpatient facility in lieu of the requirements in 3.1-8.

3.3-8.2 Heating, Ventilation, and Air-Conditioning (HVAC) Systems

HVAC systems shall meet the following standards:

3.3-8.2.1 Mechanical System Design

A minimum indoor winter-design-capacity temperature of 75°F (24°C) shall be set for all patient areas. Controls shall be provided for adjusting temperature as appropriate for patient activities and comfort.

3.3-8.2.2 Ventilation and Space-Conditioning Requirements

All occupied areas shall be ventilated by natural or mechanical means.

3.3-8.2.3 HVAC Ductwork

Air-handling duct systems shall meet the requirements of NFPA 90A.

3.3-8.3 Electrical Systems**3.3-8.3.1 Testing**

Prior to completion and acceptance of the facility, all electrical systems shall be tested and operated to demonstrate that installation and performance conform to applicable codes and functional needs.

3.3-8.3.2 Lighting

3.3-8.3.2.1 General. Lighting shall be provided in all facility spaces occupied by people, machinery, and/or equipment, and in outside entryways.

3.3-8.3.2.2 Lighting for specific locations in the small outpatient facility

(1) Examination/treatment rooms. An examination light shall be provided for each examination and treatment room.

3.3-8.3.2.3 Emergency lighting. Automatic emergency lighting shall be provided in every facility that has a total floor area of more than 1,000 square feet (92.9 square meters) and in every facility requiring stairway exit.

3.3-8.3.3 Electrical Equipment

3.3-8.3.3.1 X-ray equipment. X-ray equipment installations, when provided, shall conform to NFPA 70.

3.3-8.3.4 Receptacles

3.3-8.3.4.1 Sufficient duplex grounded-type receptacles shall be available for necessary task performance.

3.3-8.3.4.2 Each examination and work table area shall be served by at least one duplex receptacle.

3.3-8.4 Plumbing Systems

3.3-8.4.1 General

Plumbing and other piping systems shall meet the requirements in this section.

3.3-8.4.1.1 Systems shall comply with applicable codes, be free of leaks, and be designed to supply water at sufficient pressure to operate all fixtures and equipment during maximum demand.

3.3-8.4.1.2 Backflow preventers (vacuum breakers) shall be installed on all water supply outlets to which hoses or tubing can be attached.

3.3-8.4.1.3 Water temperature at lavatories shall not exceed 110°F (43°C).

3.3-8.4.1.4 All piping registering temperatures above 110°F (43°C) shall be covered with thermal insulation.

3.4 Specific Requirements for Freestanding Outpatient Diagnostic and Treatment Facilities

■ 3.4-1 General

This section applies to the outpatient diagnostic and treatment facility that is separate from the acute care hospital. This facility is a form of outpatient center that is capable of accommodating a wide array of outpatient diagnostic services and minimally invasive procedures. The range of services provided in these facilities is dynamic and growing, including diagnostic cardiac catheterization, general radiography, fluoroscopy, mammography, CT scanning, magnetic resonance imaging (MRI), ultrasound, radiation therapy, and IV therapies. Facilities may specialize in only one of these areas or may provide a mix of services.

3.4-1.1 Application

The general requirements for outpatient facilities set forth in 3.1-1 (General), 3.1-3 (Diagnostic and Treatment Locations), 3.1-4 Patient Support Services), 3.1-5 (General Support Services and Areas), 3.1-6

(Public and Administrative Areas), and 3.1-7 (Design and Construction Requirements) shall apply to the freestanding outpatient diagnostic and treatment facility, with two modifications:

3.4-1.1.1 For those facilities performing diagnostic imaging and minimally invasive interventional procedures, all provisions of 2.2-3.4 (Diagnostic Imaging Services) and 2.2-3.5 (Interventional Imaging Services) shall also apply, except that adjacencies to emergency, surgery, cystoscopy, and outpatient clinics shall not be required.

3.4-1.1.2 For those facilities performing nuclear medicine procedures, all requirements in 2.2-3.6 (Nuclear Medicine Services) shall also apply, except that support services such as radiology, pathology, emergency department, and outpatient clinics shall not be required.

3.5 Specific Requirements for Freestanding Urgent Care Facilities

Appendix material, which appears in shaded boxes at the bottom of the page, is advisory only.

■ 3.5-1 General

3.5-1.1 Application

This chapter applies to facilities that provide urgent care to the public but are not part of licensed hospitals, are not freestanding emergency departments, or do not provide care on a 24-hour-per-day, seven-day-per-week basis.

3.5-1.2 Reserved

3.5-1.3 Site

3.5-1.3.1 Reserved

3.5-1.3.2 Parking

Comply with the general requirements of 1.3-3.3 and the following specific requirements:

3.5-1.3.2.1 Additional spaces shall be provided for emergency vehicles.

3.5-1.3.2.2 Street, public, and shared lot spaces, if included as part of this standard, shall be exclusively for the use of the urgent care facility.

3.5-1.3.2.3 All required parking spaces shall be convenient to the urgent care entrance.

3.5-1.3.3 Signage

3.5-1.3.3.1 The facility shall post interior or exterior signs that clearly indicate the type and level of care offered and the hours of operation (if not 24 hours per day, seven days per week).

3.5-1.3.3.2 The facility shall post the address of the nearest 24-hour emergency facility.

■ 3.5-2 Reserved

■ 3.5-3 Diagnostic and Treatment Locations

3.5-3.1 Reserved

3.5-3.2 Examination and Treatment Rooms

In addition to the requirements in 3.1-3.2, the following requirements shall be met:

3.5-3.2.1 Examination/Treatment Room

3.5-3.2.1.1 Number. At least two examination rooms shall be provided.

3.5-3.2.1.2 Space requirements

- (1) Area. Each examination room shall have a minimum clear floor area of 80 square feet (7.43 square meters). (Use of treatment rooms for examinations shall be permitted.)
- (2) Clearances. If used as a treatment room, room arrangement shall permit a minimum clear dimension of 3 feet 6 inches (1.07 meters) at each side, head, and foot of the bed.

3.5-3.2.2 Observation Facilities

3.5-3.2.2.1 General. Facilities shall be provided for holding urgent care patients until they can be discharged or transferred to an appropriate hospital.

3.5-3.2.2.2 Number. Use of one or more examination/treatment rooms for this purpose shall be permitted.

3.5-3.2.2.3 Facility requirements. Size, type, and equipment shall be as required for anticipated patient load and lengths of stay.

3.5-3.2.2.4 Functional requirements. Each observation bed shall permit the following:

- (1) Direct visual observation of each patient from the nurse station, except where examination/treatment

3.5 SPECIAL REQUIREMENTS FOR FREESTANDING URGENT CARE FACILITIES

rooms are used for patient holding. View from the duty station may be limited to the door.

- (2) Patient privacy
- (3) Access to patient toilets
- (4) Secure storage of patients' valuables and clothing
- (5) Dispensing of medication
- (6) Bedpan storage and cleaning
- (7) Nourishment area
 - (a) For requirements, see 3.1-3.6.7.
 - (b) Meal provisions shall be made for patients held for more than four hours.

3.5-3.3 Procedure Room

3.5-3.3.1 General

3.5-3.3.1.1 Number. At least one procedure room with the following characteristics shall be provided.

3.5-3.3.1.2 Capacity. The maximum number of patients to be accommodated at any time shall be one.

3.5-3.3.2 Space Requirements

- (1) Area. Each patient area shall have a minimum clear floor area of 80 square feet (7.43 square meters).
- (2) Clearances. Room arrangement shall permit a minimum clear dimension of 3 feet 6 inches (1.07 meters) at each side, head, and foot of the bed.

3.5-3.3.3 Scrub Stations

Hands-free scrub stations or a hand-washing station shall be located at each procedure room.

3.5-3.4 Reserved

3.5-3.5 Support Areas for Patient Care—General

For requirements, see 3.1-3.5.

3.5-3.6 Support Areas for Diagnostic and Treatment Locations

3.5-3.6.1 Nurse Control and Workstation

3.5-3.6.1.1 A nurse control and workstation shall accommodate charting, files, and staff consultation activities.

3.5-3.6.1.2 It shall be located to permit visual control of clinical area and its access.

3.5-3.6.1.3 Communication links with the examination/treatment area, procedure room, reception control, laboratory, radiology, and on-call staff shall be provided.

3.5-3.6.2 Poison Control Center

A poison control center with immediately accessible antidotes and a file of common poisons shall be provided.

3.5-3.6.2.1 Communication links with regional and/or national poison centers and regional EMS centers shall be provided.

3.5-3.6.2.2 This service may be part of the nurse control and workstation.

3.5-3.6.3 Equipment Storage

3.5-3.6.3.1 Location for CPR emergency cart.

A CPR emergency cart shall be provided. It shall be located away from public circulation areas but immediately accessible to all areas, including entrance and receiving areas.

3.5-3.6.3.2 Wheelchair and stretcher storage. In addition to wheelchair storage, a holding area shall be provided for stretchers within the clinical area, away from traffic and under staff control.

3.5-3.7 Support Areas for Staff

If required by the functional program, facilities for on-call medical staff shall be provided.

3.5-3.8 Reserved

3.5-3.9 Imaging Services

3.5-3.9.1 General

Requirements stipulated in 3.1-3.9 (Diagnostic Imaging Services) shall be met during all hours of operation.

3.5-3.9.2 Facility Requirements

Radiographic equipment shall be adequate for any part of the body including, but not limited to, fractures.

3.5-3.9.3 Support Areas for Patients

Separate dressing rooms are not required for unit(s) used only for emergency procedures.

■ 3.5-4 Patient Support Services**3.5-4.1 Laboratory Services****3.5-4.1.1 General**

For requirements, see 3.1-4.1 (Laboratory Services).

3.5-4.1.2 Facility Requirements

In addition, immediate access to blood for transfusions and provisions for cross-match capabilities shall be provided.

■ 3.5-5 Reserved**■ 3.5-6 Public and Administrative Areas**

Public and administrative areas shall conform to the requirements in 3.1-6 with the additions in this section.

3.5-6.1 Public Areas**3.5-6.1.1 Entrances**

3.5-6.1.1.1 Entrances shall be well marked, illuminated, and covered to permit protected transfer of patients from ambulance and/or automobile.

3.5-6.1.1.2 The urgent care entrance shall have vision panels to minimize conflict between incoming and outgoing traffic and to allow for observation of the unloading area from the control station.

3.5-6.1.1.3 Accessibility

(1) Convenient access to wheelchairs and stretchers shall be provided at the urgent care entrance.

(2) If a platform is provided for ambulance use, a ramp for wheelchairs and stretchers shall be provided in addition to steps.

3.5-6.1.2 Lobby and Reception

3.5-6.1.2.1 General. Reception and information functions may be combined or separate.

3.5-6.1.2.2 Facility requirements. These areas shall meet the following requirements:

- (1) Reception and information areas shall provide direct visual control of the urgent care entrance and access to the treatment area and the lobby. Urgent care entrance control functions shall include observation of arriving vehicles.
- (2) Control stations normally include a triage function and shall be in direct communication with medical staff.
- (3) A public toilet with hand-washing stations shall be provided.
- (4) A convenient telephone shall be provided.

3.5-6.1.3 Waiting Area**3.5-6.1.3.1 Urgent care waiting area(s)**

- (1) This shall include provisions for wheelchairs.
- (2) This shall be separate from the area provided for scheduled outpatient services.

3.5-6.1.3.2 Diagnostic imaging waiting area. If the urgent care facility ICRA determines that the diagnostic imaging waiting area requires special consideration to reduce the risk of airborne infection transmission, public waiting areas shall be designed, ventilated, and maintained with available technologies such as enhanced general ventilation and air disinfection techniques similar to inpatient requirements for airborne infection isolation (AII) rooms. See the CDC “Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health Care Settings.”

3.5-6.2 Administrative Areas**3.5-6.2.1 Reserved**

3.5-6.2.2 Interview Space

Initial interviews may be conducted at the triage reception/control area.

3.5-6.2.2.1 Facilities for conducting interviews on means of reimbursement, social services, and personal data shall include provision for acoustical privacy.

3.5-6.2.2.2 These facilities may be separate from the reception area, but they must be convenient to the urgent care service waiting area.

3.5-6.2.3 Office

For requirements, see 3.1-6.2.3 (General or Individual Offices).

3.5-6.2.4 Multipurpose Room

Multipurpose room(s) shall be provided for staff conferences. This room may also serve for consultation.

3.5-6.2.5 Reserved

3.5-6.2.6 Storage

For requirements concerning general storage, see 3.1-6.2.6 (Equipment and Supply Storage).

3.5-6.3 Support Areas for Staff

For requirements concerning special storage for staff, see 3.1-6.3.1 (Storage for Employees).

■ 3.5-7 Design and Construction Requirements

3.5-7.1 Reserved

3.5-7.2 Architectural Details

3.5-7.2.1 Corridor Width

The minimum corridor width shall be 3 feet 8 inches (1.12 meters) except where patients are transported on stretchers or beds, where the corridors shall be 6 feet (1.83 meters) wide.

3.5-7.2.2 Doors to Patient Care Rooms

3.5-7.2.2.1 Door openings to patient care rooms serving stretcher-borne patients shall have a minimum clear width of 3 feet 8 inches (1.12 meters).

3.5-7.2.2.2 All other door openings to patient service areas shall have a minimum clear width of 2 feet 10 inches (86.36 centimeters).

■ 3.5-8 Building Systems

3.5-8.1 Reserved

3.5-8.2 Heating, Ventilation, and Air-Conditioning (HVAC) Systems

For requirements, see 3.1-8.2.

3.5-8.3 Electrical Systems

For requirements, see 3.1-8.3.

3.5-8.4 Plumbing Systems

For requirements, see 3.1-8.4.

3.6 Specific Requirements for Freestanding Cancer Treatment Facilities

Appendix material, shown in shaded boxes at the bottom of the page, is advisory only.

■ 3.6-1 General

3.6-1.1 Reserved

3.6-1.2 Functional Program

Equipment and space shall be provided as necessary to meet the functional program.

3.6-1.3 Site

3.6-1.3.1 Location

The location of a cancer treatment facility shall offer convenient access for outpatients. Accessibility from parking and public transportation shall be a consideration.

3.6-1.3.2 Parking

For requirements, see 3.1-1.3.2.

■ 3.6-2 Reserved

■ 3.6-3 Diagnostic and Treatment Locations

3.6-3.1 Reserved

3.6-3.2 Cancer Treatment Area

3.6-3.2.1 General

3.6-3.2.1.1 The treatment area shall be permitted to be an open area.

3.6-3.2.1.2 The treatment area shall be separate from administrative and waiting areas.

3.6-3.2.2 Space Requirements

3.6-3.2.2.1 **Area.** Individual patient treatment areas shall have a minimum clear floor area of 80 square feet (7.43 square meters) per patient cubicle.

3.6-3.2.2.2 **Clearances.** There shall be a minimum clear dimension of at least 5 feet (1.52 meters) between beds and/or lounge chairs.

3.6-3.2.3 Privacy

The open treatment area shall be designed to provide privacy for each patient.

3.6-3.2.4 Nurse Station(s)

Nurse station(s) shall be located within the treatment area and designed to provide visual observation of all patient stations. Nurse station(s) shall be located out of the direct line of traffic.

3.6-3.2.5 Hand-Washing Stations

3.6-3.2.5.1 Hand-washing stations shall be located so they are convenient to nurse stations and patient treatment areas.

3.6-3.2.5.2 At least one hand-washing station shall be provided for every four patient stations.

3.6-3.2.5.3 The hand-washing stations shall be uniformly distributed to provide equal access from each patient station.

3.6-3.2.6 Patient Toilet

At least one patient toilet with hand-washing station shall be provided in the treatment area. The need for additional patient toilets shall be determined by the functional program.

3.6-3.3 Reserved

3.6-3.4 Special Patient Treatment Rooms

3.6-3.4.1 Airborne Infection Isolation (All) Room

3.6-3.4.1.1 The need for and number of required AII rooms shall be determined by an infection control risk assessment (ICRA).

3.6-3.4.1.2 When required, All room(s) shall comply with the requirements of 3.1-3.4.2.

3.6-3.5 Reserved

3.6-3.6 Support Areas for the Cancer Treatment Facility

3.6-3.6.1 through 3.6-3.6.5 Reserved

3.6-3.6.6 Medicine Room

A medicine room with the following shall be provided:

3.6-3.6.6.1 Work counter

3.6-3.6.6.2 Hand-washing station

3.6-3.6.6.3 Provisions for controlled storage, preparation, distribution, and refrigeration of medications

3.6-3.6.7 Nourishment Station

3.6-3.6.7.1 For general requirements, see 3.1-3.6.7 (Nourishment Area or Room).

3.6-3.6.7.2 A drinking water-dispensing unit for patient use shall be provided separate from the hand-washing station.

3.6-3.6.7.3 A sink is not required in addition to the hand-washing station.

3.6-3.6.8 Reserved

3.6-3.6.9 Clean Workroom or Clean Supply Room

A clean workroom or clean supply room shall be provided. Soiled and clean workrooms or holding rooms shall be separated and have no direct connection.

3.6-3.6.9.1 Clean workroom. A clean workroom shall contain the following:

- (1) Work counter
- (2) Hand-washing station
- (3) Storage facilities for clean and sterile supplies

3.6-3.6.9.2 Clean supply room. If the room is used only for storage and holding as part of a system for distribution of clean and sterile materials, omission of the work counter and hand-washing station shall be permitted.

3.6-3.6.10 Soiled Workroom

A soiled workroom shall be provided and shall include the following:

3.6-3.6.10.1 A flushing-rim clinical sink with a bed-pan-rinsing device and a hot-and-cold mixing faucet

3.6-3.6.10.2 Hand-washing station

3.6-3.6.10.3 Work counter

3.6-3.6.10.4 Storage cabinets

3.6-3.6.10.5 Waste receptacles

3.6-3.6.11 Equipment Storage

3.6-3.6.11.1 Stretcher/wheelchair storage. Space for storage of stretchers and wheelchairs shall be provided out of the direct line of traffic.

3.6-3.6.12 Environmental Services Room

An environmental services room shall be provided and shall contain a service sink or floor basin and storage for housekeeping supplies and equipment

3.6-3.7 Support Areas for Staff

3.6-3.7.1 Staff Lounge

A staff lounge shall be available and shall contain lockers, toilet, and hand-washing stations.

3.6-3.7.2 Staff Toilet

A staff toilet with hand-washing station shall be provided convenient to the nurse station.

3.6-3.8 Support Areas for Patients

3.6-3.8.1 Waiting Room

A waiting room shall be available to the treatment area and shall include the following: seating accommodations for waiting periods, a toilet room with hand-

washing station, local telephone access, and drinking fountain.

3.6-3.8.2 Patient Storage

Storage for patient belongings shall be provided.

3.7 Specific Requirements for Outpatient Surgical Facilities

Appendix material, which appears in shaded boxes at the bottom of the page, is advisory only.

■ 3.7-1 General

3.7-1.1 Application

3.7-1.1.1 This chapter of the Guidelines applies to outpatient facilities (see 3.1-1.1) where surgery is performed.

3.7-1.1.2 The general requirements set forth in Chapter 3.1, Common Elements for Outpatient Facilities, shall apply to outpatient surgical facilities with the modifications set forth in this chapter.

*3.7-1.2 Functional Program

*3.7-1.2.1 Facility Requirements

The extent (number and type) of the diagnostic, clinical, and administrative facilities to be provided will be determined by the services contemplated and the estimated patient load as described in the functional program. Provisions shall be made for medical and nursing assessment, nursing care, preoperative testing, and physical examination for outpatient surgeries.

3.7-1.2.2 Patient Privacy

Visual and acoustical privacy shall be provided by design and include the registration, preparation, examination, treatment, and recovery areas.

3.7-1.2.3 Shared Services

3.7-1.2.3.1 If the outpatient surgical facility is part of an acute care hospital or other medical facility, services may be shared to minimize duplication as appropriate and acceptable to authorities having jurisdiction.

3.7-1.2.3.2 Where outpatient surgical services are provided within the same area or suite as inpatient surgery, additional space shall be provided as needed.

3.7-1.2.3.3 If inpatient and outpatient procedures are performed in the same room(s), the functional program shall describe in detail scheduling and techniques used to separate inpatients from outpatients.

3.7-1.3 Site

3.7-1.3.1 Reserved

3.7-1.3.2 Parking

Comply with the general requirements of Section 1.3-3.3 and the following specific requirements:

3.7-1.3.2.1 Four spaces shall be provided for each room routinely used for surgical procedures plus one space for each staff member.

3.7-1.3.2.2 Additional parking spaces convenient to the entrance for pickup of patients after recovery shall be provided.

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A3.7-1.2 The functional program describes in detail staffing, patient types, hours of operation, function and space relationships, transfer provisions, and availability of off-site services.

A3.7-1.2.1 Outpatient surgery is performed without anticipation of overnight patient care, and most outpatient procedures do not require an overnight stay. However, some require extended patient observation for up to “23 hours and 59 minutes” of care.

a. This extended care possibility should be addressed in a recovery care center that provides facilities for adequate sleeping, bathroom, and

nutrition services for the patient.

b. Recovery care centers should have adequate waiting areas for family, including children and adolescents, and privacy (noise barriers and sight barriers) for meetings between physicians and other professionals with family. The areas should be large enough for translators or have available translation equipment.

c. A key element to housing patients is the communication system and the ability to obtain additional assistance as necessary.

3.7-1.3.3 Facility Access

The outpatient surgical facility shall be designed to facilitate movement of patients and personnel into, through, and out of defined areas within the surgical suite. Signs shall be provided at all entrances to restricted areas and shall clearly indicate the surgical attire required.

3.7-1.3.4 Layout

3.7-1.3.4.1 General. The outpatient surgical facility shall be divided into three designated areas—unrestricted, semi-restricted, and restricted—that are defined by the physical activities performed in each area.

- (1) Unrestricted area. The unrestricted area shall include a central control point established to monitor the entrance of patients, personnel, and materials into the restricted areas. (Street clothes are permitted in this area, and traffic is not limited.)
- (2) Semi-restricted area. The semi-restricted area shall include the peripheral support areas of the surgical suite, including those listed here. (Personnel in the semi-restricted area are required to wear surgical attire and cover head and facial hair. Traffic in this area is limited to authorized personnel and patients.)
 - (a) Storage areas for clean and sterile supplies
 - (b) Work areas for storage and processing of instruments
 - (c) Corridors leading to the restricted areas of the surgical suite
 - (d) Scrub sink areas
- (3) Restricted area. The restricted area shall include those listed here. (Surgical attire and hair coverings

are required. Masks are required where open sterile supplies or scrubbed persons may be located.)

- (a) Operating and other procedure rooms
- (b) The clean core (if required by the functional program)

■ **3.7-2 Reserved**

■ ***3.7-3 Diagnostic and Treatment Locations**

3.7-3.1 General

Facilities for diagnostic services shall be provided on or off site for pre-admission tests as required by the functional program.

***3.7-3.2 Examination Room**

At least one room, ensuring both visual and acoustical privacy, shall be provided for examination of patients, private medical consultations, and confidential communication with patients and their families/legal guardians.

3.7-3.2.1 This room(s) may be an examination room or a treatment room as described in 3.1-3.2.2 (General Purpose Examination/Observation Room) or 3.1-3.2.4 (Treatment Room).

3.7-3.2.2 Use of a multifunctional room for examinations shall be permitted if additional uses do not eliminate the ability of the room to support an examination of the patient.

***3.7-3.3 Ambulatory Operating Rooms**

ment, access from both clinical and public areas as well as the ability to restrict/lock doors.

A3.7-3.3 When invasive procedures need to be performed on persons who are known or suspected of having airborne infectious disease, these procedures are ideally performed in a room meeting airborne infection isolation (AII) ventilation requirements or in a space using local exhaust ventilation. If the procedure must be performed in the operating suite, follow recommendations outlined in the CDC “Guidelines for Environmental Infection Control in Health-Care Facilities” or the CDC “Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health-Care Facilities.”

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A3.7-3 Provisions should be made to separate pediatric from adult patients. Separate areas should include pre- and postoperative care areas and should allow for parental presence.

A3.7-3.2 An examination room used as a multifunctional space can accommodate both clinical and administrative functions. For example, if the area is used as a changing area, it must provide enough room for the exam table/recliner/stretchers and the ability to secure medical supplies. Another example would be using the room as a private interview space for the business area (to discuss insurance and billing). For this use, the space would require a way to secure supplies and equip-

3.7-3.3.1 General

3.7-3.3.1.1 The size and location of the operating rooms shall depend on the level of care and equipment specified in the functional program.

***3.7-3.3.1.2** Operating rooms shall be as defined by the American College of Surgeons and designed in accordance with the levels of sedation/analgesia defined by the American Society of Anesthesiologists Continuum of Depth of Sedation.

3.7-3.3.1.3 Facilities that meet the guidelines for a particular category of procedure (Class A, B, and C) automatically qualify for procedures in all less restrictive categories. For example, facilities that meet the guidelines for Class C procedures automatically qualify for Class A and Class B procedures.

3.7-3.3.2 Class A Operating Room

These operating rooms are for surgery and other procedures that require “minimal” sedation.

3.7-3.3.2.1 Space requirements. Class A operating rooms shall have a minimum clear floor area of 150 square feet (45.72 square meters) with a minimum clear dimension of 12 feet (3.65 meters).

3.7-3.3.2.2 Clearances. There shall be a minimum clear distance of 3 feet 6 inches (1.07 meters) at each side, the head, and the foot of the operating table.

3.7-3.3.2.3 Location. Class A operating rooms may be accessed from the semi-restricted corridors of the surgical suite or from an unrestricted corridor adjacent to the surgical suite.

3.7-3.3.3 Class B Operating Room

These operating rooms are for surgery and other procedures that require “moderate” sedation.

APPENDIX**A3.7-3.3.1.2 Operating room definitions****a. American College of Surgeons Surgical Facility Classes**

The following definitions are adapted from the American College of Surgeons publication 04GR-0001: *Guidelines for Optimal Ambulatory Surgical Care and Office-Based Surgery*, which was developed by the Board of Governors Committee on Ambulatory Surgical Care and published in May 2000.

Class A: Provides for minor surgical procedures performed under topical and local infiltration blocks with or without oral or intramuscular preoperative sedation. (Excluded are procedures that make use of spinal, epidural axillary, and stellate ganglion blocks; regional blocks (e.g., interscalene) and supraclavicular, infraclavicular, and intravenous regional anesthesia.) These procedures are also appropriately performed in Class B and C facilities.

Class B: Provides for minor or major surgical procedures performed in conjunction with oral, parenteral, or intravenous sedation or under analgesic or dissociative drugs. These procedures are also appropriately performed in Class C facilities.

Class C: Provides for major surgical procedures that require general or regional block anesthesia and support of vital bodily functions.

b. American Society of Anesthesiologists Continuum of Depth of Sedation

The level of sedation/analgesia is defined by the American Society of Anesthesiologists in “Continuum of Depth of Sedation, Definition of General Anesthesia and Levels of Sedation/Analgesia,” which was approved by the ASA House of Delegates on October 13, 1999, and amended on October 17, 2004.

General anesthesia is a drug-induced loss of consciousness during which patients are not arousable, even by painful stimulation. The ability to independently maintain ventilatory function is often impaired. Patients often require assistance in maintaining a patent airway, and positive pressure ventilation may be required because of depressed spontaneous ventilation or drug-induced depression of neuromuscular function. Cardiovascular function may be impaired.

Deep sedation/analgesia is a drug-induced depression of consciousness during which patients cannot be easily aroused but respond purposefully following repeated or painful stimulation. (Reflex withdrawal from a painful stimulus is *not* considered a purposeful response.) The ability to independently maintain ventilatory function may be impaired. Patients may require assistance in maintaining a patent airway, and spontaneous ventilation may be inadequate. Cardiovascular function is usually maintained.

Moderate sedation/analgesia (“conscious sedation”) is a drug-induced depression of consciousness during which patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation. No interventions are required to maintain a patent airway, and spontaneous ventilation is adequate. Cardiovascular function is usually maintained.

Minimal sedation (anxiolysis) is a drug-induced state during which patients respond normally to verbal commands. Although cognitive function and coordination may be impaired, ventilatory and cardiovascular functions are unaffected.

3.7 SPECIFIC REQUIREMENTS FOR OUTPATIENT SURGICAL FACILITIES

3.7-3.3.3.1 Space requirements. Class B operating rooms shall have a minimum clear floor area of 250 square feet (23.23 square meters) with a minimum clear dimension of 15 feet (4.57 meters).

3.7-3.3.3.2 Clearances. Room arrangement shall permit a minimum clear dimension of 3 feet 6 inches (1.07 meters) at each side, the head, and the foot of the operating table.

3.7-3.3.3.3 Location. Class B operating rooms shall be accessed from the semi-restricted corridors of the surgical suite.

3.7-3.3.4 Class C Operating Room

These operating rooms are for surgery and procedures that require general anesthesia or “deep” sedation.

3.7-3.3.4.1 Space requirements. These operating rooms shall have a minimum clear floor area of 400 square feet (37.16 square meters) and a minimum clear dimension of 18 feet (5.49 meters).

3.7-3.3.4.2 Clearances. Room arrangement shall permit a minimum clear dimension of 4 feet (1.22 meters) at each side, the head, and the foot of the operating table.

3.7-3.3.4.3 Location. Class C operating rooms shall be accessed from the semi-restricted corridors of the surgical suite.

3.7-3.3.5 Emergency Communication System

All operating rooms shall be equipped with an emergency communication system designed and installed to effectively summon additional qualified staff support with no more than push activation of an emergency call switch.

*3.7-3.3.6 Image Viewer

Each operating room shall have access to at least one medical image viewer located as required by the functional program.

A3.7-3.3.5 For surgeries dependent upon medical imaging, such as many orthopedic procedures, medical image viewers should be provided in each operating room.

3.7-3.3.7 Special Design Elements

3.7-3.3.7.1 For mechanical system requirements, see 3.1-8.2 (HVAC Systems) and Part 6 (ASHRAE 170).

3.7-3.3.7.2 For medical gas requirements, see Table 3.1-1 (Station Outlets for Oxygen, Vacuum, and Medical Air in Outpatient Facilities).

3.7-3.4 Pre- and Post-operative Holding Areas

3.7-3.4.1 Preoperative Patient Holding Areas

3.7-3.4.1.1 General

- (1) Location. Preoperative holding areas shall be under direct visual control of the nursing staff.
- (2) Number. The minimum number of patient stations within the preoperative holding areas shall be as follows:
 - (a) Class A operating room
 - (i) At least one patient station per Class A operating room shall be required if the operating room is accessed from the semi-restricted area.
 - (ii) If the operating room is accessed from an unrestricted area and the functional program allows for preoperative care to be carried out within the operating room, no patient station shall be required for the Class A operating room.
 - (b) At least one patient station per Class B operating room shall be provided.
 - (c) At least one patient station per Class C operating room shall be provided.
- (3) In facilities with Class B and C operating rooms, area shall be provided to accommodate stretcher patients and/or seating space.

3.7-3.4.1.2 Space requirements

- (1) Area. Each preoperative holding area shall provide a minimum clear floor area of 80 square feet (7.43 square meters) for each patient station.

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* (2) Clearances. Each preoperative holding area shall have a minimum clear dimension of 5 feet (1.52 meters) between patient stretchers and 4 feet (1.22 meters) between patient stretchers and adjacent walls (at the stretcher's sides and foot).

(3) If the functional program requires other uses for the preoperative holding area, such as an overflow post-anesthesia recovery area or a holding area at the end of the day, see Section 3.7-3.4.2.2 (2), Space Requirements for Post-Anesthesia Recovery Positions, for area and clearance requirements.

3.7-3.4.1.3 Reserved

3.7-3.4.1.4 Patient privacy. Provisions such as cubicle curtains shall be made for patient privacy.

3.7-3.4.1.5 Hand-washing station

(1) Hand-washing stations with hands-free or wrist blade-operable controls shall be available, with at least one station for every four positions or fewer and for each major fraction thereof.

(2) Hand-washing stations shall be uniformly distributed to provide convenient access from each patient position.

3.7-3.4.1.6 Reserved

3.7-3.4.1.7 Documentation space. A counter, table, area for a desk, or storage for a movable table shall be provided.

3.7-3.4.2 Recovery Areas

3.7-3.4.2.1 General

(1) When determining the number of recovery positions required, recovery area design shall, at minimum, take into consideration the types of surgery and procedures performed in the facility, the types of anesthesia used, average recovery periods, and anticipated staffing levels.

(2) Recovery areas shall be accessible directly from the

semi-restricted area. If both are required by the functional program, preoperative holding areas and recovery areas shall be permitted to share the same space if all patient positions meet the most restrictive requirements of both areas.

* (3) Clearances noted around gurneys are between the normal use position of the gurney and any adjacent fixed surface or between adjacent gurneys.

(4) Staff shall have direct sightlines to patients in acute recovery stations.

(5) If pediatric surgery is part of the program, the following requirements shall be met:

- (a) Pediatric recovery stations shall be separate from adult stations.
- (b) Pediatric stations shall provide space for parents.
- (c) Sound attenuation shall be required.
- (d) The ability to view the patient from the nursing station shall be required.

3.7-3.4.2.2 Post-anesthesia recovery positions.

Room(s) for post-anesthesia recovery in outpatient surgical facilities shall be provided in accordance with the functional program.

(1) Number

- (a) A minimum of one recovery station per operating room shall be provided. A recovery area analysis shall determine the need for additional recovery stations.
- (b) In the absence of a recovery area analysis approved by the authority having jurisdiction, the minimum number of post-anesthesia recovery positions shall be as follows:
 - (i) Three recovery positions for each Class C operating room
 - (ii) Two recovery positions for each Class B operating room
 - (iii) One recovery position for each Class A operating room

(2) Space requirements

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A3.7-3.4.1.2 (2) Clearances do not include any area that would have to be shared to meet the standard.

A3.7-3.4.2.1 (3) Clearances do not include any area that would have to be shared to meet the standard.

3.7 SPECIFIC REQUIREMENTS FOR OUTPATIENT SURGICAL FACILITIES

(a) Area

- (i) When a patient cubicle is used for each patient care station, a minimum clear floor area of 80 square feet (7.43 square meters) shall be provided.
- (ii) Space shall also be provided for additional equipment described in the functional program.

(b) Clearances. Each post-anesthesia recovery area shall provide a minimum clear dimension of 5 feet (1.52 meters) between patient stretchers or beds, 4 feet (1.22 meters) between patient stretchers or beds and adjacent walls (at the stretcher's sides and foot), and at least 3 feet (91.44 centimeters) from the foot of the stretcher or bed to the closed cubicle curtain.

(3) Reserved

(4) Patient privacy. Provisions for patient privacy such as cubicle curtains shall be made.

(5) Hand-washing stations. For requirements, see 3.7-3.4.1.5.

(6) Support areas for post-anesthesia recovery rooms. Support areas listed below shall be provided in accordance with the requirements for such areas in 3.7-3.6 (Support Areas for Surgical Service Areas). If the post-anesthesia recovery room(s) is located immediately adjacent to the surgical suite, sharing of these support areas shall be permitted.

- (a) Supply storage
- (b) Provisions for soiled linen and waste holding
- (c) Documentation space
- (d) Drug distribution station
- (e) Equipment storage

3.7-3.4.2.3 Phase II recovery

(1) General

- (a) A Phase II recovery area shall be provided if required by the functional program.
- (b) Location of the Phase II recovery area within the post-anesthesia recovery area shall be permitted, but the Phase II area shall be an identifiably separate and distinct part of the post-anesthesia recovery area.

(2) Space requirements

(a) Area. When a patient cubicle is used for each patient care station, the design shall provide a minimum of 50 square feet (4.65 square meters) for each patient in a lounge chair with space for additional equipment described in the functional program.

(b) Clearances

- (i) The design shall provide a minimum clear dimension of 4 feet (1.22 meters) between the sides of adjacent lounge chairs and between the foot of the lounge chairs and the nearest obstruction.
- (ii) When permanent partitions (full or partial height or width) are used to partially define the patient care station (rather than cubicle curtains), a minimum clear dimension of 3 feet (91.44 centimeters) shall be provided on the sides of the lounge chair.

(3) Reserved

(4) Patient privacy. Provisions for patient privacy such as cubicle curtains shall be made.

(5) Hand-washing station. If a Phase II recovery area is provided, see 3.7-3.4.1.5 for hand-washing station requirements.

(6) Patient toilet room(s)

- (a) In facilities with three or more operating rooms, a dedicated patient toilet room shall be provided in the Phase II recovery area.
- (b) In facilities with two or fewer operating rooms, a patient toilet room shall be provided in or adjacent to the Phase II recovery area.

(7) Support areas for Phase II recovery areas. If a Phase II recovery area is provided, it shall contain the following with exceptions as described:

- (a) Nurse control. In Phase II recovery areas, a dedicated nurse utility/control station with a view of patients is not required. If the Phase II recovery area is designed as a separate unit, sightlines and easy access from the post-anesthesia recovery area nurse control station shall be provided.
- (b) Storage space for supplies and equipment
- (c) Documentation space. A counter, table, area for a desk, or storage for a movable table shall be provided.

- (d) Space for family members
- (e) Nourishment facilities

3.7-3.5 Support Areas for Patient Care— General

For requirements, see 3.1-3.5.

3.7-3.6 Support Areas for Surgical Service Areas

The following shall be provided in surgical service areas:

3.7-3.6.1 Nurse or Control Station

A nurse or control station(s) shall be located to permit visual surveillance of patients in post-anesthesia recovery positions and all traffic entering the semi-restricted corridor (the passage used to access operating rooms and ancillary semi-restricted areas).

3.7-3.6.2 Documentation Area

A counter, table, area for a desk, or storage for a movable table shall be provided.

3.7-3.6.3 Reserved

3.7-3.6.4 Reserved

3.7-3.6.5 Scrub Facilities

3.7-3.6.5.1 Scrub station(s) shall be provided directly adjacent to the entrance to each operating room.

3.7-3.6.5.2 A scrub station may serve two operating rooms if it is located directly adjacent to the entrances to both.

3.7-3.6.5.3 Scrub stations shall be arranged to minimize splatter on nearby personnel or supply carts.

3.7-3.6.6 Medication Distribution Station

A medication distribution station shall be provided.

3.7-3.6.6.1 Provisions shall be made for storage and preparation of medications administered to patients.

3.7-3.6.6.2 A refrigerator for pharmaceuticals and double-locked storage for controlled substances shall be provided if required by the functional program.

3.7-3.6.6.3 Convenient access to hand-washing stations shall be provided.

3.7-3.6.7 through 3.7-3.6.9 Reserved

3.7-3.6.10 Soiled Workroom

- (1) A soiled workroom shall be provided. This may be the same workroom as that described in 3.7-5.1.2.1 (Soiled workroom).
- (2) The soiled workroom shall contain a clinical sink or equivalent flushing-type fixture, a work counter, a hand-washing station, and waste receptacle(s).
- (3) The soiled workroom shall be located within the semi-restricted area.

3.7-3.6.11 Equipment and Supply Storage

3.7-3.6.11.1 **General equipment and supply storage.** Equipment storage room(s) shall be provided for equipment and supplies used in the surgical suite.

- (1) Area. The combined area of equipment and clean clinical supply storage room(s) shall have a minimum floor area of 50 square feet (15.24 square meters) for each operating room(s) up to two and an additional 25 square feet (7.62 square meters) per additional operating room.
- (2) Location. Equipment storage room(s) shall be located within the semi-restricted area.

3.7-3.6.11.2 **Anesthesia equipment and supply storage.** Provisions shall be provided for cleaning, testing, and storing anesthesia equipment and supplies, as defined by the functional program. This space shall be located within the semi-restricted area.

3.7-3.6.11.3 **Medical gas storage.** Provisions shall be made for the medical gas(es) used in the facility. Adequate space for supply and storage, including space for reserve cylinders, shall be provided and protected per NFPA 99 standards.

3.7-3.6.11.4 **Stretcher storage area.** In facilities that provide Class B and C operating rooms, a stretcher storage area for at least one stretcher shall be provided. This storage area shall be convenient for use and located outside the required width of the exit access corridor.

3.7-3.6.11.5 **Wheelchair storage space.** Wheelchair storage space shall be provided. See Section 3.1-3.6.11.5 for requirements.

3.7 SPECIFIC REQUIREMENTS FOR OUTPATIENT SURGICAL FACILITIES

3.7-3.6.11.6 Emergency equipment/supply storage.

Provisions shall be made for convenient access to and use of emergency resuscitation equipment and supplies (crash cart(s) and/or anesthesia carts) at both the surgical and recovery areas.

3.7-3.6.12 Environmental Services Room

An environmental services room shall be provided exclusively for the surgical suite. This room shall contain a floor receptor or service sink and storage space for housekeeping supplies and equipment.

3.7-3.6.13 Reserved

3.7-3.6.14 Sterilization Facilities

Space shall be provided for a high-speed sterilizer or other sterilizing equipment for immediate or emergency use, as required by the functional program.

- (1) This space shall be located in the semi-restricted area.
- (2) The space shall include a separate area for cleaning and decontamination of instruments prior to sterilization.

3.7-3.6.15 Fluid Waste Disposal Facilities

3.7-3.6.15.1 Fluid waste disposal facilities shall be convenient to the general operating rooms and post-anesthesia recovery positions.

3.7-3.6.15.2 A clinical sink or equivalent equipment in a soiled workroom shall meet this requirement in the operating room area, and a toilet equipped with a bedpan-cleaning device or a separate clinical sink shall meet the requirement in the recovery area.

3.7-3.7 Support Areas for Staff

3.7-3.7.1 Staff Lounge and Toilet Facilities

Staff lounge and toilet facilities shall be provided in facilities with three or more operating rooms. The toilet room shall be near the recovery area.

3.7-3.7.2 Staff Clothing Change Area

Appropriate change area(s) shall be provided for male and female staff working within the surgical suite (a

unisex locker area with one or more private changing rooms shall be permitted).

3.7-3.7.2.1 The area(s) shall contain lockers, toilet(s), hand-washing station(s), and space for donning scrub attire.

3.7-3.7.2.2 For facilities that provide Class B and C surgical services, this area(s) shall be designed to effect a one-way traffic pattern so that personnel entering from outside the surgical suite can change and move directly into the suite's semi-restricted corridor.

3.7-3.7.3 Staff Shower

At least one staff shower shall be provided that is conveniently accessible to the surgical suite and recovery areas.

3.7-3.8 Support Areas for Patients

3.7-3.8.1 Outpatient Surgery Change Area

3.7-3.8.1.1 A separate area(s) shall be provided for outpatients to change from street clothing into hospital gowns and to prepare for surgery. This area shall include the following:

- (1) Lockers
- (2) Toilet(s)
- (3) Clothing change or gowning area(s)
- (4) Space for administering medications

3.7-3.8.1.2 Provisions shall be made for securing patients' personal effects.

3.7-3.8.2 Toilet Room

3.7-3.8.2.1 A toilet room(s) shall be provided for patient use.

3.7-3.8.2.2 The patient toilet room(s) shall be separate from public use toilet(s) and located to permit access from pre- and postoperative holding areas. For specific requirements for the patient toilet room in Phase II recovery areas, see 3.7-3.4.2.3 (6).

■ 3.7-4 Reserved

■ 3.7-5 General Support Services and Facilities

3.7-5.1 Sterilization Facilities

A system for sterilizing equipment and supplies shall be provided.

3.7-5.1.1 General

3.7-5.1.1.1 When sterilization is provided off site, a room for the adequate handling (receiving and distribution) and on-site storage of sterile supplies that meets the requirements of 3.7-5.1.2.3 shall be provided.

3.7-5.1.1.2 Provisions shall be made for sanitizing clean and soiled carts and/or vehicles consistent with the needs of the particular transportation system.

3.7-5.1.2 On-Site Facilities

If on-site processing facilities are provided, they shall include the following:

3.7-5.1.2.1 Soiled workroom. Soiled and clean workrooms or holding rooms shall be separated. A self closing door or pass-through opening for decontaminated instruments is permitted between soiled and clean workrooms.

- (1) The soiled workroom (or a soiled holding room that is part of a system for the collection and disposal of soiled material) is for the exclusive use of the surgical suite.
- (2) The soiled workroom shall be located in the semi-restricted area and shall not have direct connection with operating rooms.
- (3) The soiled workroom shall contain the following:
 - (a) Flushing-rim clinical sink or equivalent flushing-rim fixture
 - (b) Hand-washing station

- (c) Work counter
- (d) Space for waste receptacles and soiled linen receptacles

- (4) Omission of the flushing-rim clinical sink and work counters shall be permitted in rooms used only for temporary holding of soiled material. However, if the flushing-rim clinical sink is omitted, other provisions for disposal of liquid waste shall be provided.

***3.7-5.1.2.2 Clean assembly/workroom.** Clean and soiled work areas shall be physically separated.

- (1) The clean assembly room shall have adequate space for the designated number of work areas as defined in the functional program as well as space for storage of clean supplies, sterilizer carriages (if used), and instrumentation.
- (2) Access to this room shall be restricted.
- (3) This room shall contain the following:
 - (a) Hand-washing station
 - (b) Workspace
 - (c) Equipment for terminal sterilizing of medical and surgical equipment and supplies

3.7-5.1.2.3 Storage for sterile supplies

- (1) Storage for packs, etc., shall include provisions for ventilation, humidity, and temperature control.
- (2) The sterile supply room shall have a minimum floor area of 70 square feet (21.3 square meters) or 50 square feet (15.24 square meters) per operating room, whichever is greater.
- (3) Location of this clean and sterile supply storage in an area within the clean assembly/workroom described in 3.7-5.1.2.2 shall be permitted if it is a permanently designated area and meets the space requirements in 3.7-5.1.2.3 (2).

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A3.7-5.1.2.2 This room is exclusively for the inspection, assembly, and packaging of medical/surgical supplies and equipment for sterilization. The area should contain worktables or counters and storage facilities for backup supplies and instrumentation. An area for a drying

cabinet or equipment may be required. The area should be spacious enough to hold sterilizer carts, if used, for loading or prepared supplies for sterilization.

3.7 SPECIFIC REQUIREMENTS FOR OUTPATIENT SURGICAL FACILITIES

3.7-5.2 Linen Services

Designated space in the post-anesthesia recovery area(s) shall be provided for clean and soiled linen.

3.7-5.3 Reserved

3.7-5.4 Reserved

3.7-5.5 Environmental Services

3.7-5.5.1 Environmental Services Rooms

See 3.1-5.5.1.1 (Number), including the corresponding appendix, to determine the number of housekeeping carts/environmental services rooms required.

■ 3.7-6 Public and Administrative Areas

The following shall be provided:

3.7-6.1 Public Areas

*3.7-6.1.1 Entrance

A covered entrance shall be provided for pickup of patients after surgery. The entrance covering shall not be required to cover the driveway or street areas but only the patient entrance of the building.

3.7-6.2 Administrative Areas

3.7-6.2.1 Reserved

3.7-6.2.2 Interview Space

Space(s) for private interviews relating to admission shall be provided separate from public and patient areas. Use of a multipurpose or consultation room for this purpose shall be permitted.

3.7-6.2.3 Office Space

At a minimum, designated office space shall be pro-

vided for general and individual office(s) for business transactions.

3.7-6.2.4 Multipurpose or Consultation Room(s)

At least one private multipurpose or consultation room shall be provided as part of the unrestricted area.

3.7-6.2.5 Medical Records

For requirements regarding paper or electronic medical records, see Section 3.1-6.2.5.

3.7-6.2.6 General Storage

General administrative storage facilities shall be provided.

3.7-6.3 Support Areas for Staff

Special storage, including locking drawers and/or cabinets, for the personal effects of administrative staff, shall be provided.

■ 3.7-7 Design and Construction Requirements

3.7-7.1 Building Codes and Standards

3.7-7.1.1 The outpatient surgical facility, whether freestanding or adjacent to a separate occupancy, shall comply with the New Ambulatory Health Care Occupancies section of NFPA 101 and with the requirements herein.

3.7-7.1.2 Separation for hazardous areas and smoke separation shall conform to NFPA 101.

3.7-7.1.3 Flammable anesthetics shall not be used in outpatient surgical facilities.

3.7-7.1.4 Outpatient surgical facility exits shall conform to NFPA 101 or equivalent building, fire, and safety codes where adopted and enforced by the authority having jurisdiction.

3.7-7.2 Architectural Details, Surfaces, and Furnishings

In addition to the requirements in 3.1-7.2, the requirements in this section shall be met.

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A3.7-6.1.1 Such roof overhang or canopy should extend as far as practicable to the face of the driveway or curb of the passenger access door of the transport vehicle. Vehicles in the loading area should not block or restrict movement of other vehicles in the drive or parking areas immediately adjacent to the facility.

3.7-7.2.1 Reserved**3.7-7.2.2 Architectural Details****3.7-7.2.2.1 Corridor width**

- (1) Public corridors shall have a minimum width of 5 feet (1.52 meters), except that corridors connecting the operating room section and the PACU and at least one (ambulance transfer) exit, where patients are transported on stretchers or beds, shall have a minimum width of 6 feet (1.83 meters).
- (2) The semi-restricted corridor shall have a minimum width of 8 feet (2.44 meters) in areas used to transport patients on gurneys between preoperative, procedure, and post-anesthesia recovery areas.
- (3) Passages and corridors used exclusively for staff access shall be a minimum of 3 feet 8 inches (1.12 meters) in clear width.

3.7-7.2.2.2 Reserved**3.7-7.2.2.3 Doors and door hardware**

- (1) Door openings
 - (a) Door openings serving occupiable spaces shall have a minimum clear width of 2 feet 10 inches (86.36 centimeters).
 - (b) Door openings requiring gurney/stretchers access shall have a minimum clear width of 3 feet 8 inches (1.12 meters).
- (2) Toilet rooms. Toilet rooms for patient use in surgery and recovery areas shall comply with the following:
 - (a) These toilet rooms shall be equipped with doors and hardware that permit access from the outside in emergencies.
 - (b) When such rooms have only one opening or are small, the doors shall open outward or be otherwise designed to open without pressing against a patient who may have collapsed within the room.

3.7-7.2.3 Surfaces

3.7-7.2.3.1 General. Surfaces shall comply with NFPA 101.

3.7-7.2.3.2 Flooring. Floor finishes shall be appropriate for the areas in which they are located and shall be as follows:

- (1) Floor finishes shall be cleanable.
- (2) Floor finishes in areas such as clean corridors, central sterile supply spaces, specialized radiographic rooms, and Class A operating rooms shall be washable, smooth, and able to withstand chemical cleaning.
- (3) Floor finishes in areas such as operating rooms, delivery rooms, and trauma rooms shall be scrubable, able to withstand chemical cleaning, and monolithic, with an integral base.
- (4) All floor surfaces in clinical areas shall be constructed of materials that allow the easy movement of all required wheeled equipment.

3.7-7.2.3.3 Walls. Wall finishes shall be appropriate for the areas in which they are located and shall be as follows:

- (1) Wall finishes shall be cleanable.
- (2) Wall finishes in areas such as clean corridors, central sterile supply spaces, specialized radiographic rooms, and minor surgical procedure rooms shall be washable, smooth, and able to withstand chemical cleaning.
- (3) Wall finishes in areas such as operating rooms, delivery rooms, and trauma rooms shall be scrubable, able to withstand chemical cleaning, and monolithic.

3.7-7.2.3.4 Ceilings. Ceiling finishes shall be appropriate for the areas in which they are located and shall be as follows:

- * (1) Semi-restricted areas

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A3.7-7.2.3.4 (1) Ceilings in semi-restricted areas. If a lay-in ceiling is provided, it should be gasketed or each ceiling tile should weigh 1 pound per square foot to prevent the passage of particles from the cavity above the ceiling plane into the semi-restricted environment.

3.7 SPECIFIC REQUIREMENTS FOR OUTPATIENT SURGICAL FACILITIES

- (a) Ceiling finishes in semi-restricted areas such as clean corridors, central sterile supply spaces, specialized radiographic rooms, and Class A operating rooms shall be smooth, scrubbable, nonabsorptive, nonperforated, capable of withstanding cleaning with chemicals, and without crevices that can harbor mold and bacteria growth.
 - (b) Perforated, tegular, serrated, or highly textured tiles shall not be used.
- (2) Restricted areas
- (a) Ceilings in restricted areas such as operating rooms shall be monolithic, scrubbable, and capable of withstanding chemicals. Cracks or perforations in these ceilings are not allowed.
 - (b) All access openings in ceilings in restricted areas shall be gasketed.
- (3) Mechanical and electrical rooms. Suspended ceilings may be omitted in mechanical and electrical rooms/spaces unless required for fire safety purposes.

■ 3.7-8 Building Systems

3.7-8.1 Reserved

3.7-8.2 Heating, Ventilation, and Air-Conditioning (HVAC) Systems

HVAC systems shall be as described for similar areas in 3.1-8.2 and in Part 6.

3.7-8.3 Electrical Systems

For requirements, see 3.1-8.3.

3.7-8.4 Plumbing Systems

For requirements, see 3.1-8.4.

3.7-8.4.1 Medical Gas Systems

Flammable anesthetics shall not be used in outpatient surgical facilities.

3.7-8.5 Communications Systems

See Section 3.1-8.5.

3.7-8.6 Electronic Safety and Security Systems

3.7-8.6.1 Fire Alarm System

A manually operated, electrically supervised fire alarm system shall be installed in each facility as described in NFPA 101.

3.8 Specific Requirements for Office Surgical Facilities

■ 3.8-1 General

An office surgical facility is an outpatient facility that has within it physician office(s) and space(s) for the performance of invasive procedures.

3.8-1.1 Application

Facilities that may have more than three patients rendered incapable of self-preservation without assistance from others shall meet requirements of Chapter 3.7, Specific Requirements for Outpatient Surgical Facilities.

3.8-1.2 Size

The number and type of diagnostic, clinical, and administrative facilities to be provided shall be determined by the services contemplated and the estimated patient load as described in the functional program.

■ 3.8-2 Reserved

■ 3.8-3 Diagnostic and Treatment Locations

3.8-3.1 Reserved

3.8-3.2 Reserved

3.8-3.3 Operating Rooms

Operating rooms shall meet requirements as described in Section 3.7-3.3 (Ambulatory Operating Rooms).

3.8-3.4 Recovery Areas

3.8-3.4.1 Location

Post-operative recovery shall be conducted in the operating room or in a specifically designated space. An operating room shall be used by no more than one post-operative patient at a time.

3.8-3.4.2 Facility Requirements

If the recovery area is located in a specifically designated space, the following requirements shall be met:

3.8-3.4.2.1 The recovery station shall be located in direct view of a nurse station.

3.8-3.4.2.2 Cubicle curtains or other provisions for privacy during post-operative care shall be provided.

3.8-3.5 Support Areas for Patient Care—General

For requirements, see 3.1-3.5.

3.8-3.6 Support Areas for Operating Rooms

The following shall be immediately accessible to the operating room(s):

3.8-3.6.1 through 3.8-3.6.4 Reserved

3.8-3.6.5 Scrub Facilities

3.8-3.6.5.1 Hands-free scrub station(s) shall be provided outside of but near the entrance to each operating room.

3.8-3.6.5.2 One scrub station shall be permitted to service two operating rooms if needed.

3.8-3.6.5.3 Scrub station(s) shall be arranged to minimize incidental splatter on nearby personnel or supply carts.

3.8-3.6.5.4 The scrub station shall be permitted to meet the hand-washing station requirements of immediately adjacent area(s).

3.8-3.6.6 Drug Distribution Station

Provisions shall be made for storage and preparation of medications administered to patients.

3.8 SPECIFIC REQUIREMENTS FOR OFFICE SURGICAL FACILITIES

3.8-3.6.6.1 A refrigerator for pharmaceuticals and double-locked storage for controlled substances shall be provided.

3.8-3.6.6.2 Convenient access to hand-washing stations shall be provided.

3.8-3.6.7 through 3.8-3.6.8 Reserved

3.8-3.6.9 Clean Storage

A clean storage area, including space for preparing instruments and supplies for surgery, shall be provided.

3.8-3.6.10 Soiled Storage/Workroom

A soiled handling/storage area, including provision for disposal of fluid waste, shall be provided.

3.8-3.6.11 Equipment and Supply Storage

3.8-3.6.11.1 Medical gas supply

3.8-3.6.11.2 Crash cart. Space for crash cart, including outlets for battery charging, shall be provided.

3.8-3.7 Support Areas for Staff

A staff clothing change area shall be provided.

■ **3.8-4 Reserved**

■ **3.8-5 General Support Areas and Facilities**

3.8-5.1 Sterilization Facilities

A system for sterilizing equipment and supplies shall be provided.

3.8-5.1.1 General

3.8-5.1.1.1 When sterilization is provided off site, space for the adequate handling (receiving and distribution) and on-site storage of sterile supplies that meets the minimum requirements for on-site facilities in 3.8-5.1.2.3 (Storage for clean/sterile supplies) shall be provided.

3.8-5.1.1.2 Provisions shall be made for cleaning and sanitizing carts and vehicles used for transporting supplies.

3.8-5.1.2 On-Site Facilities

If on-site processing facilities are provided, they shall include the following:

3.8-5.1.2.1 Soiled workroom. This room shall be physically separated from all other areas of the facility.

- (1) Workspace shall be provided to handle the cleaning and the gross cleaning, debridement, and disinfection of all medical/surgical instruments and equipment.
- (2) The soiled workroom shall contain the following:
 - (a) Work surface(s)
 - (b) Sink(s)
 - (c) Washer/sterilizer decontaminators, flush-type devices(s), or other decontamination equipment as appropriate to the functional program

3.8-5.1.2.2 Clean/assembly workroom. Clean and soiled work areas shall be physically separated.

- (1) The clean assembly room shall have adequate space for the designated number of work areas as defined in the functional program.
- (2) This workroom shall have a hand-washing station.
- (3) This room shall contain appropriate and sufficient workspace and equipment for terminal sterilizing of medical and surgical equipment and supplies.

3.8-5.1.2.3 Storage for clean/sterile supplies

- (1) Storage for packs, etc., shall include provisions for ventilation, humidity, and temperature control.
- (2) A system for sterilizing equipment and supplies shall be provided. When sterilization is provided off site, adequate handling and on-site storage of sterile supplies shall be provided.

3.8-5.1.2.4 Soiled holding area

- (1) Space shall be provided for handling and storage of soiled materials and equipment separate from areas designated for storage of clean and sterile materials and equipment.

- (2) Appropriate receptacles for biohazardous waste shall be provided, and these shall be placed in the designated soiled holding area.

■ 3.8-6 Reserved

■ 3.8-7 Design and Construction Requirements

3.8-7.1 Reserved

3.8-7.2 Architectural Details, Surfaces, and Furnishings

3.8-7.2.1 Reserved

3.8-7.2.2 Architectural Details

3.8-7.2.2.1 Corridor width

- (1) Items such as provisions for drinking water, telephone booths, vending machines, etc., shall not restrict corridor traffic or reduce the corridor width below the required minimum.
- (2) Out-of-traffic storage space for portable equipment shall be provided to maintain required egress and/or functional corridor width.

3.8-7.2.2.2 Door openings

- (1) The minimum clear width of door openings for patient use shall be 2 feet 10 inches (86.36 centimeters) except that door openings requiring gurney/stretchers access (as defined by the functional program) shall have a nominal width of 3 feet 8 inches (1.11 meters).

- (2) Toilet room doors for patient use shall open outward or be equipped with hardware that permits access from the outside in emergencies.

3.8-7.2.3 Surfaces

3.8-7.2.3.1 Reserved

3.8-7.2.3.2 Flooring

- (1) Seam welds in sheet flooring shall utilize manufacturer's weld product recommendations.
- (2) Vinyl composition tile (VCT) or similar products shall not be permitted in these areas.

3.8-7.2.3.3 Walls, wall bases, and wall protection

- (1) Wall finishes in operating room(s) shall be scrubable, able to withstand harsh chemical cleaning, and monolithic.
- (2) Wall bases in operating rooms and areas frequently subjected to wet cleaning shall be monolithic and coved directly up from the floor, tightly sealed to the wall, and constructed without voids.

3.8-7.2.3.4 Ceilings

- (1) Ceiling finishes in general areas are optional and may be omitted in mechanical and electrical rooms/spaces unless required for fire-resistive purposes.
- (2) Ceiling finishes in operating rooms shall conform with the requirements in 3.7-7.2.3.4.

3.8-7.2.3.5 Penetrations. Floor and wall areas penetrated by pipes, ducts, and conduits shall be tightly sealed to minimize entry of rodents and insects.

3.9 Specific Requirements for Endoscopy Facilities

Appendix material, which appears in shaded boxes at the bottom of the page, is advisory only.

■ 3.9-1 General

3.9-1.1 Application

3.9-1.1.1 This part of the Guidelines applies to outpatient facilities (see 3.1-1.1) or portions thereof where endoscopy procedures are performed.

3.9-1.1.2 The general requirements in Chapter 3.1, Common Elements for Outpatient Facilities, shall apply to endoscopy facilities with the modifications set forth in this chapter.

3.9-1.2 Functional Program

3.9-1.2.1 Facility Requirements

Endoscopy is performed without anticipation of overnight patient care.

3.9-1.2.1.1 The extent (number and type) of the diagnostic, clinical, and administrative facilities to be provided shall be determined by the services contemplated and the estimated patient load as described in the functional program. Provisions shall be made for patient examination, interview, preparation, and testing and for obtaining vital signs of patients for endoscopic procedures.

3.9-1.2.1.2 The functional program shall describe in detail staffing, patient types, hours of operation, function and space relationships, transfer provisions, and availability of off-site services.

3.9-1.2.2 Patient Privacy

Patient privacy shall be provided by design, as appropriate for the registration, preparation, examination, procedure, and recovery areas.

3.9-1.2.3 Shared Services

3.9-1.2.3.1 Where endoscopy services are provided within the same area or suite as surgical services,

additional space shall be provided as needed.

3.9-1.2.3.2 If inpatient and outpatient procedures are performed in the same room(s), the functional program shall describe in detail scheduling and techniques used to separate inpatients and outpatients.

3.9-1.3 Site

3.9-1.3.1 through 3.9-1.3.3

3.9-1.3.4 Facility Layout and Circulation

3.9-1.3.4.1 Layout

The endoscopy suite shall be divided into a minimum of three major functional areas: the procedure room(s), instrument processing room(s), and patient holding/preparation and recovery room or area.

3.9-1.3.4.2 Circulation and Restricted Access

The endoscopy suite shall be designed to facilitate movement of patients and personnel into, through, and out of defined areas within the procedure suite. Signs shall be provided at all entrances to restricted areas and shall clearly indicate the proper attire required.

■ 3.9-2 Reserved

■ 3.9-3 Diagnostic and Treatment Locations

*3.9-3.1 Examination Room

APPENDIX

A3.9-3.1 An examination room used as a multifunctional space can accommodate both clinical and administrative functions. For example, if the room is used as a changing area, there must be enough space for the exam table/recliner/stretchers and the ability to secure medical supplies.

3.9 SPECIFIC REQUIREMENTS FOR ENDOSCOPY FACILITIES

3.9-3.1.1 At least one room that ensures both visual and acoustical privacy shall be provided for examination of patients, private medical consultation, and confidential communication with patients and their families/legal guardians.

3.9-3.1.2 This may be an examination room or treatment room as described in 3.1-3.2.2 (General Purpose Examination/Observation Room) and 3.1-3.2.4 (Treatment Room).

3.9-3.1.3 This room shall be permitted to serve multiple functions. However, any additional uses that make the room inappropriate for the examination of patients shall not be permitted (see 3.9-3.1.1 just above).

***3.9-3.2 Endoscopy Procedure Suite**

3.9-3.2.1 Reserved

3.9-3.2.2 Procedure Room

3.9-3.2.2.1 Reserved

3.9-3.2.2.2 Space requirements

- (1) Area. Each procedure room shall have a minimum clear floor area of 200 square feet (15 square meters).
- (2) Clearances. Room arrangement shall permit a minimum clear dimension of 3 feet 6 inches (1.07 meters) at each side, head, and foot of the stretcher/table.

3.9-3.2.2.3 Reserved

3.9-3.2.2.4 Reserved

3.9-3.2.2.5 Hand-washing station. A dedicated

hand-washing station with hands-free controls shall be available to each procedure room.

3.9-3.2.2.6 Patient toilet room. Patient toilet rooms shall be provided separate from public use toilet(s) and located to permit access directly from procedure room(s) and/or from patient holding areas. (Also see 3.9-3.3.1.1 (4).)

3.9-3.2.2.7 Reserved

3.9-3.2.2.8 Emergency communication system. All procedure rooms shall be equipped with an emergency communication system designed and installed to effectively summon additional qualified staff support with no more than push activation of an emergency call switch.

3.9-3.3 Pre- and Post-Operative Holding Areas

3.9-3.3.1 Pre-Procedure Patient Holding Area

3.9-3.3.1.1 General

- (1) Application. In facilities with two or more procedure rooms, pre-procedure holding area(s) shall be provided to accommodate stretcher patients and/or sitting space.
- (2) Location. These holding areas shall be under the direct visual control of the nursing staff.
- (3) Number. There shall be at least one pre-procedure holding area per procedure room.
- (4) Patient toilet rooms shall be provided separate from public use toilet(s) and located to permit access from patient holding areas and/or directly from procedure room(s). (Also see 3.9-3.2.2.6.)

APPENDIX (continued)

Another example would be using the room as private interview space for the business area (to discuss insurance and billing); this would require the space to accommodate security for supplies and equipment, access from both clinical and public areas, and restricted access to or locking of doors.

A3.9-3.2 Procedure suite. When procedures are to be per-

formed on persons known to have or suspected of having airborne infectious diseases, these procedures should be performed only in a room meeting airborne infection isolation (AII) ventilation requirements or in a space using local exhaust ventilation. See the CDC "Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-Care Facilities."

3.9-3.3.1.2 Space requirements

- (1) Area. Each holding area shall provide a minimum clear floor area of 80 square feet (7.43 square meters) for each patient station.
- (2) Clearances. Each holding area shall provide a minimum clear dimension of 5 feet (1.52 meters) between patient stretchers and 4 feet (1.22 meters) between patient stretchers and adjacent walls (at the stretcher's sides and foot).
- (3) If the functional program requires use of the pre-procedure holding area as a post-procedure area for overflow or at the end of the day, see 3.9-3.3.2 (Recovery Areas) for area and clearance criteria.

3.9-3.3.1.3 Reserved

3.9-3.3.1.4 Patient privacy. Provisions such as cubicle curtains shall be made for patient privacy.

3.9-3.3.1.5 Hand-washing stations

- (1) Hand-washing stations with hands-free or wrist blade-operable controls shall be available, with at least one station for every four positions or portion thereof.
- (2) The hand-washing stations shall be uniformly distributed to facilitate access from each patient position.

3.9-3.3.1.6 Reserved

3.9-3.3.1.7 Documentation area. A counter, table, area for a desk, or storage for a movable table shall be provided as designated documentation space.

3.9-3.3.2 Recovery Areas

When determining the number of recovery positions required, design of the recovery area shall, at a minimum, take into consideration the procedures performed, the types of anesthesia used, average recovery periods, and anticipated staffing levels as identified in a recovery area analysis.

3.9-3.3.2.1 Post-procedure recovery positions

- (1) Number

- (a) A recovery area analysis shall not result in fewer than one recovery position per procedure room.
- (b) In the absence of a recovery area analysis approved by the AHJ, the minimum number of post-procedure recovery positions shall be two per procedure room.
- (c) When the minimum number of recovery positions required is six or more, location of up to half the total recovery positions in a step-down recovery area shall be permitted.

(2) Space requirements

- (a) Area. A minimum clear floor area of 80 square feet (7.43 square meters) shall be provided for each patient station with sufficient space for additional equipment described in the functional program.
- (b) Clearances. A minimum clear dimension of 5 feet (1.52 meters) between patient stretchers and 4 feet (1.22 meters) between patient stretchers and adjacent walls (at the stretcher's sides and foot) shall be provided.

(3) Reserved

(4) Patient privacy. Provisions for patient privacy such as cubicle curtains shall be provided.

(5) Hand-washing stations. For requirements, see 3.9-3.3.1.5.

(6) Reserved

(7) Documentation area. A counter, table, area for a desk, or storage for a movable table shall be provided as designated documentation space.

3.9-3.3.2.2 Phase II recovery

(1) Application. A Phase II or step-down recovery area shall be provided if required by the functional program.

(2) Space requirements

- (a) Area. The design shall provide a minimum of 50 square feet (4.65 square meters) for each patient in a lounge chair with space for additional equipment described in the functional program.

(b) Clearances

- (i) The design shall provide a minimum clear dimension of 4 feet (1.22 meters) between the sides of adjacent lounge chairs and between the foot of the lounge chairs and the nearest obstruction.
- (ii) When permanent partitions (full or partial-height or -width) are used to partially define the patient care station (rather than cubicle curtains), a minimum clear dimension of 3 feet (91.44 centimeters) shall be provided on the sides of the lounge chair.

(3) Reserved

(4) Patient privacy. Provisions for patient privacy such as cubicle curtains shall be made.

(5) Hand-washing station. The step-down recovery area shall contain at least one hand-washing station. See 3.9-3.3.1.5 to determine if additional hand-washing stations are required.

(6) Reserved

(7) Documentation area. A counter, table, area for a desk, or storage for a movable table shall be provided as designated documentation space.

(8) In step-down recovery areas, a nurse utility/control station with a view of patients is not required.

3.9-3.4 Reserved

3.9-3.5 Support Areas for Patient Care—General

For requirements, see 3.1-3.5.

3.9-3.6 Support Areas for the Procedure Suite

3.9-3.6.1 Nurse or Control Station

A nurse or control station shall be provided.

- (1) Location. The nurse station shall be located to permit visual observation of all traffic entering the diagnostic and treatment areas.
- (2) Documentation area. A counter, table, area for a desk, or storage for a movable table shall be provided as designated documentation space.

3.9-3.6.2 through 3.9-3.6.5 Reserved

3.9-3.6.6 Medication Distribution Station

- (1) At least one drug distribution station shall be provided in the post-procedure recovery area.
- (2) Provisions shall be made for storage and preparation of medications administered to patients.
- (3) A refrigerator for pharmaceuticals and double-locked storage for controlled substances shall be provided if required by the functional program.

3.9-3.6.7 through 3.9-3.6.9 Reserved

3.9-3.6.10 Soiled Workroom

A soiled workroom shall be provided if required by the functional program.

3.9-3.6.10.1 The soiled workroom shall be physically separated from all other areas of the department.

3.9-3.6.10.2 The soiled workroom shall contain the following:

- (1) Sink(s) and flush-type device(s)
- (2) Work surface(s)
- (3) Holding areas for trash, linen, and other contaminated waste

3.9-3.6.11 Equipment and Supply Storage

3.9-3.6.11.1 General equipment and supply storage. Storage room(s) shall be provided for storage of equipment and clean clinical supplies used in the procedure suite.

- (1) Area. At a minimum, storage room(s) for equipment and clean clinical supplies shall have a combined floor area of 25 square feet (7.62 square meters) per procedure room.

3.9-3.6.11.2 Anesthesia equipment and supply storage. Provisions shall be made for cleaning, testing, and storing anesthesia equipment and supplies as defined by the functional program.

3.9-3.6.11.3 Medical gas storage. Provisions shall be made for the medical gas(es) used in the facility.

- (1) Adequate space for supply and storage, including space for reserve cylinders, shall be provided.
- (2) The medical gas storage location shall be protected as required by NFPA 99.

3.9-3.6.11.4 Stretcher storage area(s). If stretcher storage is required by the functional program, an area shall be provided that is convenient for use and out of the direct line of traffic.

3.9-3.6.11.5 Wheelchair storage. Space for wheelchair storage shall be provided according to Section 3.1-3.6.11.5 (Wheelchair storage space).

3.9-3.6.11.6 Resuscitation equipment and supply storage. Provisions for convenient access to and use of emergency resuscitation equipment and supplies (crash cart(s) and/or anesthesia carts) shall be provided at both procedure and recovery areas.

3.9-3.6.12 Environmental Services Room

An environmental services room containing a floor receptor or service sink and storage space for house-keeping supplies and equipment shall be provided exclusively for the procedure suite.

3.9-3.6.13 Fluid Waste Disposal Facilities

Fluid waste disposal facilities shall be provided.

3.9-3.6.13.1 Location. These shall be convenient to the procedure rooms and recovery positions.

- (1) In the procedure area, a clinical sink or equivalent equipment shall meet this requirement.
- (2) In the recovery area, a toilet equipped with bed-pan-cleaning device or a separate clinical sink shall meet this requirement.

3.9-3.7 Support Areas for Staff

3.7.1 Staff Clothing Change Areas

Appropriate change areas shall be provided for male and female staff working within the procedure suite. (A unisex changing room shall be permitted.) These shall include the following:

3.9-3.7.1.1 Hand-washing stations

3.9-3.7.1.2 Toilets

3.9-3.7.1.3 Lockers and space for changing clothes

3.9-3.7.1.4 Staff shower. At least one shower shall be conveniently accessible to the procedure suite and patient holding/prep/recovery areas.

3.9-3.7.2 Lounge and Toilet Facilities

Lounge and toilet facilities shall be provided in facilities having three or more procedure rooms.

3.9-3.8 Support Areas for Patients

3.9-3.8.1 Patient Change Areas

A separate area shall be provided for patients to change from street clothing into hospital gowns and to prepare for procedures.

3.9-3.8.1.1 This area shall include lockers, toilet(s), clothing change or gowning area(s), and space for administering medications.

3.9-3.8.1.2 Provisions shall be made for securing patients' personal effects.

3.9-4 Patient Support Services

3.9-4.1 Laboratory Services

Facilities for diagnostic services shall be provided on or off site for pre-admission tests as required by the functional program. For requirements, see relevant portions of 3.1-3.9 (Diagnostic Imaging Services) and 3.1-4.1 (Laboratory Services).

3.9-5 General Support Services and Facilities

3.9-5.1 Instrument Processing and Decontamination Facilities

3.9-5.1.1 Instrument Processing Room

3.9-5.1.1.1 Processing room. Dedicated processing room(s) for cleaning and decontaminating instruments shall be provided.

3.9 SPECIFIC REQUIREMENTS FOR ENDOSCOPY FACILITIES

- (1) Number. Processing room(s) shall be permitted to serve multiple procedure rooms.
- (2) Size. The size of the processing room(s) shall be dictated by the amount of equipment to be processed.
- (3) Layout. The cleaning area shall allow for flow of instruments from the contaminated area to the clean assembly area and then to storage. Clean equipment rooms, including storage, should protect the clean equipment from contamination.

3.9-5.1.1.2 Decontamination area. The decontamination area shall be equipped with the following:

- * (1) Utility sink(s). Sink(s) shall be provided as appropriate to the method of decontamination used.
- (2) Hand-washing station. One freestanding hand-washing station shall be provided.
- (3) Work counter space(s)
- (4) Equipment accommodations. Space and utility connections for automatic endoscope reprocessor, sonic cleaner, and sterilizers (where required by the functional program).

3.9-5.2 through 3.9-5.4 Reserved

3.9-5.5 Environmental Services

3.9-5.5.1 Environmental Services Room

See 3.1-5.5.1.1 (Number), including the corresponding appendix, for information about determining the number of environmental services carts/rooms required by the functional program.

■ 3.9-6 Public and Administrative Areas

3.9-6.1 Public Areas

3.9-6.1.1 Entrance

A covered entrance for pickup of patients after procedure shall be provided.

3.9-6.1.1.1 A roof overhang or canopy shall extend, at a minimum, to the face of the driveway or curb of the passenger access door of the transport vehicle.

3.9-6.1.1.2 Vehicles in the loading area shall not block or restrict movement of other vehicles in the drive or parking areas immediately adjacent to the facility.

3.9-6.1.2 Other Public Areas

The following public areas shall be provided according to the requirements in 3.1-6.1 (Public Areas):

3.9-6.1.2.1 Reception

3.9-6.1.2.2 Waiting space(s)

3.9-6.1.2.3 Public toilets

3.9-6.1.2.4 Public telephones

3.9-6.1.2.5 Provisions for drinking water

3.9-6.2 Administrative Areas

3.9-6.2.1 Reserved

3.9-6.2.2 Interview Space

Interview space(s) for private interviews relating to admission shall be provided.

3.9-6.2.2.1 Use of the room required under Section 3.9-6.2.4 (Multipurpose Room) as interview space shall be permitted.

3.9-6.2.2.2 Interview space shall be separate from public and patient areas.

3.9-6.2.3 Offices

At a minimum, designated office space for general and individual office(s) for business transactions shall be provided.

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A3.9-5.1.1.2 (1) This may require soaking sink(s), rinse sink(s), automated cleaning device(s), or a combination.

3.9-6.2.4 Multipurpose Room

At least one private multipurpose or consultation room(s) shall be provided.

3.9-6.2.5 Medical Records Storage

See Section 3.1-6.2.5 for medical records (paper or electronic) storage requirements.

3.9-6.3 Support Areas for Staff**3.9-6.3.1 Staff Storage Facilities**

Special storage, including locking drawers and/or cabinets, for the personal effects of administrative staff shall be provided.

■ 3.9-7 Design and Construction Requirements

3.9-7.1 Building Codes and Standards

3.9-7.1.1 The separate endoscopy facility or section shall comply with the “New Ambulatory Health Care Occupancies” section of NFPA 101 and requirements described herein.

3.9-7.1.2 Flammable anesthetics shall not be used in outpatient endoscopy facilities.

3.9-7.2 Architectural Details, Surfaces, and Furnishings**3.9-7.2.1 Reserved****3.9-7.2.2 Architectural Details****3.9-7.2.2.1 Corridor width**

- (1) Minimum public corridor width shall be 5 feet (1.52 meters), except that corridors where patients are transported on stretchers or beds shall be 8 feet (2.44 meters) wide.
- (2) Passages and corridors used exclusively for staff access may be 3 feet 8 inches (1.12 meters) in clear width.

3.9-7.2.2.2 Reserved**3.9-7.2.2.3 Door openings**

- (1) Door opening width
 - (a) Door openings serving occupiable spaces shall have a minimum clear width of 2 feet 10 inches (86.36 centimeters).
 - (b) Door openings requiring gurney/stretchers access shall have a minimum clear width of 3 feet 8 inches (1.12 meters).
- (2) Toilet room doors
 - (a) Toilet rooms in procedure and recovery areas for patient use shall be equipped with doors and hardware that permit access from the outside in emergencies.
 - (b) When such rooms have only one opening or are small, the doors shall open outward or be otherwise designed to open without pressing against a patient who may have collapsed within the room.

3.9-7.2.3 Surfaces**3.9-7.2.3.1 Reserved****3.9-7.2.3.2 Flooring**

- (1) Floor finishes. Floor finishes in the endoscopy facility shall be appropriate for the areas in which they are located and shall be as follows:
 - (a) Floor finishes shall be cleanable.
 - (b) Floor finishes in areas such as clean corridors and patient care areas shall be washable, smooth, and capable of withstanding chemical cleaning.
 - (c) Floor finishes in areas such as procedure rooms and the decontamination room shall be scrubbable, capable of withstanding chemical cleaning, and monolithic with an integral base.
- (2) Procedure room floor. Floor covering in the procedure suite shall be monolithic and joint free.
- (3) Instrument processing room floor. Floor covering in the instrument processing room shall be monolithic and joint free with 6-inch (15.24-centimeter) integral cove base.

3.9-7.2.3.3 Walls. Wall finishes shall be appropriate for the areas in which they are located and shall be as follows:

- (1) Wall finishes shall be cleanable.
- (2) Wall finishes in areas such as clean corridors, central sterile supply spaces, specialized radiographic rooms, and endoscopic procedure rooms shall be washable, smooth, and capable of withstanding chemical cleaning.
- (3) Wall finishes in areas such as procedure rooms shall be scrubbable, capable of withstanding chemical cleaning, and monolithic.

3.9-7.2.3.4 Ceilings. Ceiling finishes shall be appropriate for the areas in which they are located and shall be as follows:

- (1) Ceiling finishes in general areas are optional and may be omitted in mechanical and electrical rooms/spaces unless required for fire-resistive purposes.
- (2) Ceiling finishes in procedure rooms, the decontamination room, and other semirestricted areas shall be capable of withstanding cleaning with chemicals and without crevices that can harbor mold and bacteria growth. If a lay-in ceiling is provided, it shall be gasketed or clipped down to prevent the passage of particles from the cavity above the ceiling plane into the semirestricted environment. Perforated, tegular, serrated, cut, or highly textured tiles shall not be used.

■ 3.9-8 Building Systems

3.9-8.1 Reserved

3.9-8.2 Heating, Ventilation, and Air-Conditioning (HVAC) Systems

3.9-8.2.1 General

Heating, ventilation, and air conditioning shall be as described for similar areas in 3.1-8.2.

*3.9-8.2.2 Instrument Processing Room and Decontamination Facilities

See Table 3.1-1 (Stations Outlets for Oxygen, Vacuum [Suction], and Medical Air Systems in Hospitals) for ventilation requirements for this area.

3.9-8.3 Reserved

3.9-8.4 Plumbing Systems

3.9-8.4.1 Medical Gas and Vacuum Requirements

3.9-8.4.1.1 Medical gas requirements. Provisions shall be made for the medical gases used in the facility. See Part 6 (ASHRAE 170) for mechanical system requirements and Table 3.1-1 (Station Outlets for Oxygen, Vacuum, and Medical Air in Outpatient Facilities) for medical gas requirements.

3.9-8.4.1.2 Requirements for specific locations

- (1) Post-procedure recovery positions. Oxygen and suction per Table 3.1-1 shall be provided for each patient cubicle.
- (2) Procedure room. Station outlets for oxygen and vacuum (suction) shall be available in the procedure room.
- (3) Instrument processing room and decontamination area. Provision for vacuum and/or non-medical compressed air shall be provided as appropriate to cleaning methods used.

3.9-8.5 Electronic Safety and Security Systems

3.9-8.5.1 Fire Alarm System

A manually operated, electrically supervised fire alarm system shall be installed in each facility as described in NFPA 101.

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A3.9-8.2.2 Instrument processing room and decontamination facilities. Additional local exhaust ventilation systems may be provided to control disinfectant or detergent vapors at their source.

3.10 Specific Requirements for Renal Dialysis Centers

Appendix material, shown in shaded boxes at the bottom of the page, is advisory only.

■ 3.10-1 General

3.10-1.1 Application

This chapter applies to renal dialysis centers that treat patients for both acute and chronic conditions.

3.10-1.2 Functional Program

3.10-1.2.1 Size

3.10-1.2.1.1 The number of dialysis stations shall be based upon the functional program and may include several work shifts per day.

3.10-1.2.1.2 Space and equipment shall be provided as necessary to accommodate the functional program, which may include outpatient dialysis, home treatment support, and dialyzer reuse services.

3.10-1.3 Site

The location shall offer convenient access for outpatients. Accessibility to the renal dialysis center from parking and public transportation shall be a consideration.

■ 3.10-2 Reserved

■ 3.10-3 Diagnostic and Treatment Locations

3.10-3.1 Examination Room

At least one examination room shall be provided.

3.10-3.1.1 The examination room shall have a minimum clear floor area of 100 square feet (9.29 square meters).

3.10-3.1.2 The examination room shall have the following:

3.10-3.1.2.1 Hand-washing station

3.10-3.1.2.2 A counter or shelf space for writing or electronic documentation

3.10-3.2 Dialysis Treatment Area

3.10-3.2.1 General

3.10-3.2.1.1 Layout

- (1) The treatment area shall be separate from administrative and waiting areas.
- (2) The treatment area shall be permitted to be an open area.
- (3) Open treatment areas shall be designed to provide privacy for each patient.

3.10-3.2.2 Space Requirements

3.10-3.2.2.1 Individual patient treatment areas shall contain at least 80 square feet (7.44 square meters).

3.10-3.2.2.2 There shall be a clear dimension of at least 4 feet (1.22 meters) between beds and/or lounge chairs.

3.10-3.2.3 Reserved

3.10-3.2.4 Reserved

3.10-3.2.5 Hand-Washing Station

Hand-washing stations shall be provided following the requirements of 3.1-3.6.5.

3.10-3.2.6 Reserved

3.10-3.2.7 Reserved

3.10-3.2.8 Nurse Station

Nurse station(s) shall be located within the dialysis treatment area and designed to provide visual observation of all patient stations.

3.10-3.3 Home Training Room

If home training is provided at the center, the following requirements shall be met:

3.10-3.3.1 A private treatment area of at least 120 square feet (11.15 square meters) shall be provided for patients who are being trained to use dialysis equipment at home.

3.10-3.3.2 This room shall contain a counter, hand-washing stations, and a separate drain for fluid disposal.

3.10-3.4 Special Patient Care Rooms

3.10-3.4.1 Airborne Infection Isolation (All) Room

3.10-3.4.1.1 The number of and need for required AII rooms shall be determined by an ICRA.

3.10-3.4.1.2 Where required, the AII room shall comply with the requirements of 3.1-3.4.2 (AII Room).

3.10-3.4.2 Bloodborne Infection Isolation Room

Facilities that dialyze patients with known blood-borne pathogens shall have at least one separate room to use for those patients.

3.10-3.5 Support Areas for Patient Care— General

For requirements, see 3.1-3.5.

3.10-3.6 Support Areas for the Renal Dialysis Treatment Center

3.10-3.6.1 through 3.10-3.6.5 Reserved

3.10-3.6.6 Medication Station

If required by the functional program, there shall be a medication dispensing station for the dialysis center.

3.10-3.6.6.1 A work counter and hand-washing stations shall be included in this area.

3.10-3.6.6.2 Provisions shall be made for the controlled storage, preparation, distribution, and refrigeration of medications.

3.10-3.6.7 Nourishment Area

If a nourishment station for the dialysis service is provided, it shall meet the requirements of 3.1-3.6.7.

3.10-3.6.8 Reserved

3.10-3.6.9 Clean Workroom or Clean Supply Room

A clean workroom and/or clean supply room shall be provided. Such rooms shall be separated from the soiled workroom and have no direct connection to it.

3.10-3.6.9.1 Clean workroom. If the room is used for preparing patient care items, it shall contain the following:

- (1) Work counter
- (2) Hand-washing station
- (3) Storage facilities for clean and sterile supplies

3.10-3.6.9.2 Clean supply room. If the room is used only for storage and holding as part of a system for distribution of clean and sterile materials, omission of the work counter and hand-washing station shall be permitted.

3.10-3.6.10 Soiled Workroom

A soiled workroom shall be provided and shall contain the following:

3.10-3.6.10.1 A flushing-rim sink

3.10-3.6.10.2 A hand-washing station

3.10-3.6.10.3 A work counter

3.10-3.6.10.4 Storage cabinets

3.10-3.6.10.5 Waste receptacles

3.10-3.6.10.6 A soiled linen receptacle

3.10-3.6.11 Equipment and Supply Storage

Supply areas or supply carts shall be provided.

3.10-3.6.11.1 Clean linen storage. If blankets or other linens are used, a clean linen storage area shall be provided.

- (1) Location of the clean linen storage area within the clean workroom, a separate closet, or an approved distribution system shall be permitted.
- (2) If a closed cart system is used, storage in an alcove shall be permitted. It must be out of the path of normal traffic and under staff control.

3.10-3.6.11.2 Wheelchair storage space. If the facility provides services that require patients to transfer to a facility chair, wheelchair, recliner, examination table, or stretcher, accommodations for the secure handling of patient wheelchairs shall be provided.

- (1) If required by the functional program, a designated area shall be provided out of the direct line of traffic for at least one facility-owned wheelchair.
- * (2) A designated area shall be provided for parking at least one patient wheelchair in a non-public area out of the direct line of traffic without interfering with egress paths.

3.10-3.6.12 Environmental Services Room

***3.10-3.6.12.1 Number.** The functional program shall determine the number of environmental services rooms required. Sanitation needs may be met using separate environmental services rooms or rooms large enough to hold multiple carts.

3.10-3.6.12.2 Facility requirements

- (1) Facility-based services
 - (a) At least one environmental services room shall be provided to support maintenance of a clean and therapeutic environment.

- (b) Each environmental services room shall contain a service sink and storage for housekeeping supplies and equipment.

- (2) Non-facility-based services. Area requirements shall be based upon the service agreement and outlined in the functional program.

3.10-3.7 Support Areas for Staff

3.10-3.7.1 Appropriate area(s) shall be available for staff clothing change and lounge functions.

3.10-3.7.2 Clothing change area(s) shall contain the following:

3.10-3.7.2.1 Lockers

3.10-3.7.2.2 Shower

3.10-3.7.2.3 Toilet

3.10-3.7.2.4 Hand-washing stations

3.10-3.8 Support Areas for Patients

3.10-3.8.1 Patient Toilet

A patient toilet with hand-washing station shall be provided. It shall be equipped with an emergency call station.

3.10-3.8.2 Patient Storage Space

Storage for patients' belongings shall be provided.

■ 3.10-4 Reserved

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A3.10-3.6.11.2 (2) Wheelchair parking. Facilities that provide a significant number of services to aging and disabled populations who utilize wheelchairs (e.g., dialysis) should provide more than one space to park wheelchairs. Other facilities may be able to address the issue using scheduling and transportation procedures. Check with the authority having jurisdiction to determine if this is an acceptable alternative.

A3.10-3.6.12.1 When determining the number of environmental services rooms needed for outpatient settings, areas should be grouped by similar sanitation needs. Following are several examples:

- a. Sterile areas: Operating rooms, substerile corridors, sterile labs, and sterile storage
- b. Clinical areas: Pre-procedure areas, examination rooms, blood draw areas, PACUs, dialysis treatment areas, infusion areas, or other areas likely to come into contact with blood or body fluids
- c. Processing areas: Endoscopy room, uroscopy room, and instrument processing room. (If these areas are within a sterile area, the sanitation needs of these areas can be addressed procedurally, such as cleaning them last.)
- d. Administration and public areas: Waiting areas, offices, and hallways

■ 3.10-5 General Support Services and Facilities

3.10-5.1 Dialysis Support Facilities

3.10-5.1.1 Dialyzer Reprocessing Room

If dialyzers are reused, a reprocessing room shall be provided and sized to perform the functions required.

3.10-5.1.1.1 Layout. The dialyzer reprocessing room shall include one-way flow of materials from soiled to clean.

3.10-5.1.1.2 Facility requirements. The dialyzer reprocessing room shall have the following:

- (1) Provisions for refrigeration for temporary storage of dialyzers
- (2) Decontamination/cleaning areas
- (3) Sinks
- (4) Processors
- (5) Computer processors and label printers
- (6) A packaging area
- (7) Dialyzer storage cabinets

3.10-5.1.2 Dialysis Solutions Preparation Room

3.10-5.1.2.1 Each facility using a central batch delivery system shall provide, either on the premises or through written arrangements, individual delivery systems for the treatment of any patient requiring special dialysis solutions.

3.10-5.1.2.2 The mixing area shall include a sink, storage space, and holding tanks.

*3.10-5.1.3 Equipment Repair Room

An equipment repair and breakdown room equipped with the following shall be provided.

A3.10-5.1.3 If a renal dialysis facility is located within a hospital on a patient floor and equipment maintenance and repair are purchased or shared, the components of the equipment repair room preparation area should be dictated by the functional program.

3.10-5.1.3.1 A hand-washing station

3.10-5.1.3.2 Deep service sink or water supply and drain

3.10-5.1.3.3 A counter, table, or area for a desk to serve as designated documentation space

3.10-5.1.3.4 Storage for supplies, tools, parts, and records

■ 3.10-6 Public and Administrative Areas

3.10-6.1 Public Areas

The following public areas shall be available or accessible to the dialysis center:

3.10-6.1.1 A waiting room

3.10-6.1.2 Toilet room with hand-washing stations

3.10-6.1.3 Provisions for drinking water

3.10-6.1.4 Access to make local phone calls

3.10-6.1.5 Seating accommodations for waiting periods

3.10-6.2 Administrative Areas

3.10-6.2.1 Administrative Services

Office and clinical work space shall be available for administrative services.

3.10-6.2.2 Medical Records Storage

An identified area for storage of medical records (paper or electronic) that maintains their confidentiality shall be provided as defined by the functional program.

3.10-6.2.2.1 The medical records storage area shall either be restricted to staff movement or remote from therapy and public areas.

3.10-6.2.2.2 The medical records storage area shall be securable and shielded from water or fire damage to protect the records from loss or damage.

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3.10-6.2.2.3 A designated storage area shall be provided for forms or documents used to create medical records.

■ 3.10-7 Reserved

■ 3.10-8 Building Systems

3.10-8.1 Reserved

3.10-8.2 Heating, Ventilating, and Air-Conditioning (HVAC) Systems

*3.10-8.2.1 Dialyzer Reprocessing Room Ventilation Requirements

Ventilation for this room shall comply with the requirements in Table 2.1-2 (Ventilation Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities) for endoscopic instrument processing rooms.

3.10-8.3 Reserved

3.10-8.4 Plumbing Systems

*3.10-8.4.1 Plumbing and Other Piping Systems

3.10-8.4.1.1 Design consideration shall be given to the disposal of liquid waste from the dialyzing process to prevent odor and backflow.

3.10-8.4.1.2 Hemodialysis piping

- (1) In new construction and renovation, a separate water supply and a drainage facility that does not interfere with hand-washing shall be provided.
- (2) Continuously circulated filtered cold water shall be provided.
 - (a) Piping shall be in accordance with AAMI RD62.
 - (b) If the dialysis equipment includes sufficient water treatment provisions, use of domestic cold water without special piping requirements shall be permitted.
- (3) All dialysis system piping shall be readily accessible for inspection and maintenance.

3.10-8.4.2 Water Treatment Equipment Room

Water treatment equipment shall be located in an enclosed room.

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A3.10-8.2.1 In the dialyzer reprocessing room, additional local exhaust ventilation systems may be necessary to control disinfectant or detergent vapors at their source.

A3.10-8.4.1 All installed reverse osmosis water and dialysis solution piping should be accessible.

3.11 Specific Requirements for Psychiatric Outpatient Centers

Appendix material, shown in shaded boxes at the bottom of the page, is advisory only.

■ 3.11-1 General

The psychiatric outpatient center provides community outpatient psychiatric services.

3.11-1.1 Application

All standards set forth in Sections 3.1-1 (General), 3.1-3 (Diagnostic and Treatment Locations), 3.1-4 (Patient Support Services), 3.1-5 (General Support Services and Areas), 3.1-6 (Public and Administrative Areas), and 3.1-7 (Design and Construction Requirements) shall be met for psychiatric outpatient centers with the additions and modifications described herein. In no way are these requirements to be interpreted to inhibit placement of small neighborhood psychiatric outpatient centers (i.e., units with four or fewer employees) into existing commercial and residential facilities.

3.11-1.2 Functional Program

The number and type of diagnostic, clinical, and administrative areas shall be sufficient to support the services and estimated patient load described in the functional program.

3.11-1.3 Site

3.11-1.3.1 Parking

Parking spaces for patients and family shall be provided to meet the functional program.

■ 3.11-2 Reserved

■ 3.11-3 Diagnostic and Treatment Areas

3.11-3.1 General

Facilities shall be provided only for those services specified in the functional program. The areas included

in 3.11-3.2.2 (Group Rooms) shall be strongly considered for inclusion in any psychiatric outpatient center.

3.11-3.2 Areas for Patient Services

3.11-3.2.1 Consultation Room(s)

3.11-3.2.2 Group Rooms

3.11-3.2.3 Small Group Room(s)

3.11-3.2.4 Large Group Room(s)

These may also be used for activities.

3.11-3.2.5 Observation Room(s)

For requirements, see 3.1-3.2.1.2.

3.11-3.3 Reserved

3.11-3.4 Reserved

3.11-3.5 Reserved

3.11-3.6 Support Areas for the Psychiatric Outpatient Center

3.11-3.6.1 Nurse Station(s)

For requirements, see Section 3.1-3.6.1.

3.11-3.6.2 Reserved

3.11-3.6.3 Reserved

3.11-3.6.4 Multipurpose Rooms

Multiuse room(s) shall be provided for conferences, meetings, and health education.

3.11-3.6.4.1 One room may be primarily for staff use but also available for public access as needed.

3.11-3.6.4.2 If the program so indicates, these functions may take place in group room(s).

3.11-3.6.5 Reserved

3.11-3.6.6 Medication Distribution Station

For requirements, see Section 3.1-3.6.6.

3.11-3.6.7 Nourishment Area(s)

Location of kitchenette(s) by the large group room(s) shall be permitted.

3.11-3.6.8 Reserved

3.11-3.6.9 Clean Storage

For requirements, see 3.1-3.6.9.

3.11-3.6.10 Soiled Holding

For requirements, see 3.1-3.6.10.

3.11-3.6.11 Equipment and Supply Storage

Wheelchair storage space shall be provided. For requirements, see 3.1-3.6.11.5.

3.11-3.7 Support Areas for Staff

3.11-3.7.1 Staff Toilet and Lounge

3.11-3.7.1.1 Staff toilet and lounge shall be provided in addition to and separate from public and patient facilities.

***3.11-3.7.1.2** Centralized staff facilities are not required in small centers.

■ 3.11-4 Reserved

■ 3.11-5 Reserved

■ 3.11-6 Public and Administrative Areas

3.11-6.1 Public Areas

3.11-6.1.1 Entrances

3.11-6.1.1.1 Entrances shall be well marked, at grade level, and secured at least at the psychiatric outpatient unit.

3.11-6.1.1.2 Where entrance lobby and/or elevators are shared with other tenants, travel to the psychiatric outpatient unit shall be direct and accessible to the disabled. Except for passage through common doors, lobbies, or elevator stations, patients shall not be required to go through other occupied areas or outpatient service areas.

3.11-6.1.1.3 Entrance shall be convenient to parking and available via public transportation.

3.11-6.1.2 Reception

3.11-6.1.2.1 A reception and information counter or desk shall be located to provide visual control of the entrance to the psychiatric outpatient unit and shall be immediately apparent from that entrance.

3.11-6.1.2.2 A control counter shall have access to patient files and records for scheduling of services; this shall be permitted to be part of the reception, information, and waiting room control.

3.11-6.1.3 Waiting Area

3.11-6.1.3.1 The waiting area for patients and escorts shall be under staff control.

3.11-6.1.3.2 The seating shall contain no fewer than two spaces for each consultation room and no fewer than 1.5 spaces for the combined projected capacity at one time of the group rooms.

3.11-6.1.3.3 Where the psychiatric outpatient unit has a formal pediatrics service, a separate, controlled area for pediatric patients shall be provided.

3.11-6.1.3.4 The waiting area shall accommodate wheelchairs.

3.11-6.1.3.5 Provisions for drinking water shall be available for waiting patients. In shared facilities, provisions for drinking water may be outside the outpatient area if convenient for use.

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A3.11-3.7.1.2 In small centers, staff may utilize shared toilet facilities.

3.11-6.1.4 Public Toilet

Toilet(s) for public use shall be immediately accessible to the waiting area. In smaller units, the toilet may be unisex.

3.11-6.2 Administrative Areas

Each psychiatric outpatient center shall make provisions to support administrative activities, filing, and clerical work as appropriate. (See also Section 3.1-6.2.) Administrative areas shall include the following:

3.11-6.2.1 Reserved**3.11-6.2.2 Interview Spaces**

Space(s) for private interviews related to social service, credit, and so on shall be provided. Interviews may take place in an office or consultation room if the program so indicates.

3.11-6.2.3 Office Space

3.11-6.2.3.1 Office(s), separate and enclosed, with provisions for privacy, shall be provided.

3.11-6.2.3.2 Clerical space or rooms for typing and clerical work shall be separated from public areas to ensure confidentiality.

3.11-6.2.4 Reserved**3.11-6.2.5 Patient Records**

Records room(s) shall be provided with filing and storage for the safe and secure storage of patient records with provisions for ready retrieval.

3.11-6.2.6 Office Supply Storage

Office supply storage (closets or cabinets) shall be provided within or convenient to administrative services.

■ 3.11-7 Design and Construction Requirements**3.11-7.1 Security**

3.11-7.1.1 The level of patient safety and security shall be set by the owner in the functional program.

3.11-7.1.2 Observation of all public areas, including corridors, shall be possible.

3.11-7.1.2.1 This can be accomplished by electronic surveillance if it is not obtrusive.

3.11-7.1.2.2 Niches and hidden areas in corridors shall be prohibited.

3.11-7.2 Architectural Details**3.11-7.2.1 General**

The standards set forth in Section 3.1-7.2 (Architectural Details, Surfaces, and Furnishings) shall be met with the additions and modifications described herein:

3.11-7.2.2 Tamper Resistance and Suicide Prevention

3.11-7.2.2.1 If the functional program determines suicide or staff safety risks are present, ceilings, walls, floors, windows, etc., shall be tamper-resistant in patient treatment areas. In addition, any rods, doors, grab bars, handrails, etc., shall be constructed so they do not allow attempts at suicide and cannot be used as weapons.

3.11-7.2.2.2 Cubicle curtains and draperies shall not be used where a risk assessment in the functional program clearly identifies them as a potential risk.

3.12 Specific Requirements for Outpatient Rehabilitation Facilities

Appendix material, shown in shaded boxes at the bottom of the page, is advisory only.

■ 3.12-1 General

Rehabilitation therapy is the provision of services to help patients develop, maintain, and restore maximum movement and functional ability throughout their lives. These services include physical, occupational, and speech therapies. Outpatient rehabilitation therapy facilities provide these services to patients who are able to travel or be transported to and from the treatment area. These facilities may be freestanding, housed within commercial or business complexes, or found in hospitals, nursing facilities, or rehabilitation facilities.

3.12-1.1 Application

3.12-1.1.1 This part of the Guidelines applies to outpatient facilities or portions thereof where rehabilitation services are offered.

3.12-1.1.2 See Chapter 3.1, Common Elements for Outpatient Facilities, for details. The requirements of Chapter 3.1 shall be incorporated by reference with the modifications set forth in this chapter.

3.12-1.2 Functional Program

For requirements, see 3.1-1.2.

3.12-1.3 Site

For requirements, see 3.1-1.3, Site.

■ 3.12-2 Reserved

■ 3.12-3 Diagnostic and Treatment Locations

3.12-3.1 Reserved

3.12-3.2 Physical/Occupational Therapy Treatment Space

3.12-3.2.1 General

Where physical and/or occupational therapy services are offered, the requirements in this section (3.12-3.2) shall be met.

3.12-3.2.2 Treatment Areas

3.12-3.2.2.1 Therapy room

- (1) At a minimum, one therapy room shall be provided within the treatment space. Use of this room for evaluations and private communication with patient and/or family as well as therapy requiring privacy or seclusion shall be permitted.
- (2) Space requirements
 - (a) Area. A therapy room shall have a minimum clear floor area of 80 square feet (7.43 square meters).
 - (b) Clearances. Room arrangement shall permit a minimum clear dimension of 2 feet 8 inches (81.28 centimeters) on at least three sides of the treatment furniture (e.g., chairs, recliners, tables, beds, or mats).
- (3) Reserved
- (4) Each therapy room shall be enclosed within walls and have a door for access.
- (5) Hand-washing stations or hand sanitation dispensers. Individual therapy area(s) shall have access to either a hand-washing station or a hand sanitation dispenser.
 - (a) See 3.1-3.6.5 (Hand-washing stations) to determine if a hand-washing station is required within the therapy room.
 - (b) Any therapy room that does not require a hand-washing station shall have a dedicated hand sanitation dispenser.
- (6) Reserved
- (7) Documentation area. Counter, table, and area for a desk or storage for a movable table shall be provided as designated documentation space.

3.12-3.2.2.2 Individual therapy area

- (1) Individual therapy area(s) shall be provided if required by the functional program.
- (2) Space requirements. Individual therapy areas shall have a minimum clear floor area of 70 square feet (6.51 square meters).
- (3) Reserved
- (4) Privacy. Cubicle curtains or walls shall be provided around each individual therapy area.
- (5) Reserved
- (6) Reserved
- (7) Documentation area. Counter, table, and area for a desk or storage for a movable table shall be provided as designated documentation space.

3.12-3.2.3 Exercise Area

3.12-3.2.3.1 Layout. Clear paths for egress shall be maintained.

3.12-3.2.3.2 Space requirements. Size requirements shall be based upon the equipment used for therapeutic treatment. Sufficient space shall be provided to allow access to the equipment by the patient and the therapist when in use.

3.12-3.2.3.3 Reserved**3.12-3.2.3.4 Reserved**

3.12-3.2.3.5 Hand-washing station. At least one hand-washing station shall be provided within the exercise area.

3.12-3.2.3.6 Reserved

3.12-3.2.3.7 Documentation area. Counter, table, or area for a desk or storage for a movable table shall be provided as designated documentation space.

3.12-3.2.4 Therapeutic Pool

Therapeutic pool(s) shall be provided if required by the functional program.

3.12-3.3 Other Patient Care Areas**3.12-3.3.1 Prosthetics and Orthotics Area**

3.12-3.3.1.1 If required by the functional program, an area shall be provided for prosthetics and orthotics.

3.12-3.3.1.2 The size of the area shall depend on the requirements of the functional program.

3.12-3.3.1.3 Reserved

3.12-3.3.1.4 Designated work space shall be provided for therapist and/or technician(s) for patient evaluation and fitting of prosthetics and orthotics.

3.12-3.3.1.5 Hand-washing station. The prosthetics and orthotics area shall have a hand-washing station. For requirements, see 3.1-7.2.2.8.

- (1) If staff is required to work with or mix wet material, or handle material or chemicals that are caustic to the skin, a hand-washing station shall be provided.
- (2) If staff is not required to work with or mix wet material or handle material or chemicals that are caustic to the skin, provision of a hand sanitation dispenser or a hand-washing station shall be permitted.

3.12-3.3.1.6 Clinical sink. If the functional program requires prosthetic and orthotic areas that need running water for materials preparation, a clinical sink(s) shall be provided.

3.12-3.3.1.7 Documentation area. Counter, table, and area for a desk or storage for a movable table shall be provided as designated documentation space.

3.12-3.3.1.8 Eyewash station**3.12-3.3.2 Speech and Hearing Area**

3.12-3.3.2.1 Application. If required by the functional program, a speech and hearing area shall be provided and follow the requirements in this section.

3.12-3.3.2.2 Space requirements. The size of the area shall depend upon the requirements of the functional program.

3.12-3.3.2.3 Work space. Designated work space for therapist(s) shall be provided.

- (1) This shall include at least one room for evaluation and treatment.
- (2) The room shall be remote from high traffic and public areas to minimize external sound-producing elements.

3.12-3.3.2.4 Hand-washing station/hand sanitation dispenser

- (1) See 3.1-3.6.5 to determine if a hand-washing station(s) must be provided within the speech and hearing area.
- (2) A speech or hearing area that does not require a hand-washing station shall have a dedicated hand sanitation dispenser.

3.12-3.3.2.5 Reserved

3.12-3.3.2.6 Documentation area. Counter, table, and area for a desk or storage for a movable table shall be provided as designated documentation space.

3.12-3.4 Facilities for Other Services

These services include—but are not limited to—social services, psychological services, and vocational services.

3.12-3.4.1 Diagnostic and Treatment Area

When provision of other services is required by the functional program, dedicated diagnostic and treatment area(s) to accommodate those services shall be provided.

3.12-3.4.2 Hand-Washing Station

To determine if a hand-washing station is required for other services, see 3.1-3.6.5.

3.12-3.4.3 Documentation Area

Counter, table, or area for a desk or storage for a movable table shall be provided as designated documentation space in all clinical services required by the functional program.

3.12-3.5 Support Areas for Patient Care—General

For requirements, see 3.1-3.5.

3.12-3.6 Support Areas for Treatment and Other Patient Care Areas

3.12-3.6.1 through 3.12-3.6.10 Reserved

3.12-3.6.11 Equipment and Supply Storage

3.12-3.6.11.1 Storage for therapeutic equipment and safety devices. Designated storage for therapeutic equipment and safety devices shall be provided for the following areas when they are part of the clinical services offered by the facility:

- (1) Exercise area(s)
- (2) Therapy room(s) and therapy area(s)
- (3) Pool area(s)
- (4) Prosthetic, orthotic, speech, hearing, or other clinical services

3.12-3.6.11.2 Storage for other clinical supplies.

Storage shall be provided for materials used by prosthetic, orthotic, speech, hearing, or other clinical services.

3.12-3.6.11.3 Wheelchair storage space. When therapy services are offered for the back and/or lower extremities, a designated area for parking at least one patient wheelchair shall be provided in a non-public area.

3.12-3.7 Reserved

3.12-3.8 Support Areas for Patients

3.12-3.8.1 Provisions for Drinking Water

3.12-3.8.2 Patient Dressing Area

Patient dressing areas shall be provided if required by the functional program.

3.12-3.8.3 Showers

Showers shall be provided if required by the functional program.

3.12-3.8.4 Patient storage

3.12-3.8.4.1 Lockers shall be provided if required by the functional program.

3.12-3.8.4.2 An area to secure personal belongings and hang outerwear shall be provided.

3.12-3.8.5 Toilet Room

Toilet room(s) shall be provided for patient use. These shall be provided separate from public use toilet(s) and located to permit access from therapy and treatment area without passing through public areas.

3.12-3.8.6 Pool Support Areas

3.12-3.8.6.1 Patient dressing area. A patient dressing area shall be provided when therapy services include use of a pool.

- (1) The patient dressing area shall consist of single unisex rooms or a locker room to service multiple people of the same sex.
- (2) The patient dressing area shall be directly accessible to the pool without entering public or exercise areas.
- (3) Patient toilet room. A toilet room that is accessible without entering public or exercise areas shall be provided.
- (4) Bathing facilities. A shower shall be provided.

■ **3.12-4 Reserved**

■ **3.12-5 General Support Services and Facilities**

3.12-5.1 through 3.12-5.4 Reserved

3.12-5.5 Environmental Services

Storage for pool chemicals and testing equipment shall be provided.

■ **3.12-6 Public and Administrative Areas**

3.12-6.1 Public Areas

3.12-6.1.1 Reserved

3.12-6.1.2 Waiting space shall be provided.

3.12-6.2 Administrative Areas

Space shall be available and designated for computers, printers, fax machines, and copiers if required by the functional program.

■ **3.12-7 Design and Construction Requirements**

3.12-7.1 Reserved

3.12-7.2 Architectural Details, Surfaces, and Furnishings

3.12-7.2.1 Window Treatments

Window(s) in therapy areas shall have features, curtains, or shades to provide patient privacy.

■ **3.12-8 Building Systems**

3.12-8.1 Reserved

3.12-8.2 Heating, Ventilation, and Air-Conditioning Systems

***3.12-8.2.1 Ventilation Requirements for Specific Locations in Outpatient Rehabilitation Facilities**

3.12-8.3 Reserved

3.12-8.4 Plumbing Systems

3.12-8.4.1 Drainage Systems

Portable hydrotherapy whirlpools shall not be drained into hand-washing stations or environmental services sinks. A dedicated sink or drain shall be provided.

APPENDIX

A3.12-8.2.1 Prosthetics and orthotics areas. Drying glue vapors and flying debris from shaping prosthetics and orthotics should be controlled by appropriately designed local exhaust equipment. See ACGIH® *Industrial Ventilation: A Manual of Recommended Practice*.

Residential Health Care Facilities

4

4.1 Common Elements for Residential Health Care Facilities

Appendix material, which appears in shaded boxes at the bottom of the page, is advisory only.

■ 4.1-1 General

The types of residential health care facilities described in Part 4 of the Guidelines may be freestanding facilities or distinct parts of a general hospital or other health care facility. For information on residential psychiatric treatment centers, see A2.5-1.1 in Part 2.

*4.1-1.1 Application

4.1-1.1.1 This chapter contains elements that are common to most types of residential health care facilities. The elements are required only when referenced in a specific residential facility chapter.

4.1-1.1.2 Additional specific requirements are located in the facility chapters of Part 4 (facility chapters are listed below). Consult the facility chapters to determine if elements in this chapter are required.

- Nursing facilities (Chapter 4.2)
- Hospice facilities (Chapter 4.3)
- Assisted living facilities (Chapter 4.4)

4.1-1.1.3 Language from other chapters in these Guidelines is included in the criteria given in this Part when reference is made to a specific section. Such references include the section as identified by number and heading and all its subsections, unless otherwise noted.

4.1-1.2 Functional Program

4.1-1.2.1 General

4.1-1.2.1.1 Each project sponsor shall provide a functional program for the facility. For requirements, see 1.2-2 (Functional Program).

4.1-1.2.1.2 Environment of care. See facility chapters for requirements.

4.1-1.2.2 Reserved

4.1-1.2.3 Shared Services

4.1-1.2.3.1 Each residential facility shall, as a minimum, contain the elements described within the applicable paragraphs of this chapter. However, when a project calls for sharing or purchasing services, appropriate modifications or deletions in space and parking requirements shall be permitted.

4.1-1.2.3.2 When the residential facility is part of, or contractually linked with, another facility, services such as dietary, storage, pharmacy, linen, and laundry may be shared insofar as practical. In some cases, all ancillary service requirements will be met by the principal facility and the only modifications necessary will be within the residential facility. In other cases, programmatic concerns and requirements may dictate separate service areas.

4.1-1.3 Site

4.1-1.3.1 Location

For requirements regarding location and environmental pollution control, see 1.3-2 (Location) and 1.3-4 (Environmental Pollution Control).

4.1-1.3.2 Parking

4.1-1.3.2.1 In the absence of local requirements, each residential facility shall have parking space to satisfy the needs of residents, employees, staff, and visitors.

4.1-1.3.2.2 The facility shall provide a minimum of one space for every four beds.

APPENDIX

A4.1-1.1 For basic requirements, see Part 1.

4.1-1.3.3 Facility Access

4.1-1.3.3.1 Roads shall be provided within the property for access to the main entrance and service areas.

4.1-1.3.3.2 Fire department access shall be provided in accordance with local requirements.

4.1-1.3.3.3 The property or campus shall be marked to identify emergency services or departments.

4.1-1.4 Renovation

For requirements, see facility chapters.

4.1-1.5 Planning, Design, Construction, and Commissioning

For requirements, see facility chapters.

4.1-1.6 Equipment

For requirements, see facility chapters.

■ **4.1-2 Resident Areas**

4.1-2.1 General

The resident unit and living area requirements included in this section are common to most residential health care facilities. For requirements specific to a facility type, see the facility chapter in Part 4.

4.1-2.2 Resident Unit

4.1-2.2.1 Reserved

4.1-2.2.2 Resident Room

4.1-2.2.2.1 Capacity. For requirements, see facility chapters.

4.1-2.2.2.2 Space requirements. For requirements, see facility chapters.

4.1-2.2.2.3 Window

(1) Each room shall have a window(s) that meets the requirements of Section 4.1-7.2.2.5.

(2) For specific requirements, see facility chapters.

4.1-2.2.2.4 Resident privacy. Visual privacy shall be provided for each resident in multiple-bed rooms. Design for privacy shall not restrict resident access to the toilet, room entrance, window, or other shared common areas in the resident room.

4.1-2.2.2.5 Hand-washing station

(1) A hand-washing station shall be provided in each resident room. Omission of this station shall be permitted in a single-bed or two-bed room when a hand-washing station is located in an adjoining toilet room that serves that room only.

(2) Design requirements

(a) For hand-washing station design details, see 4.1-7.2.2.8.

(b) For sink design, see 4.1-8.4.3.2 (Hand-washing stations).

4.1-2.2.2.6 Toilet room. Each resident shall have access to a toilet room without the need to enter the corridor area.

(1) One toilet room shall serve no more than two residents in new construction and no more than two resident rooms or four beds in renovation projects.

(2) The toilet room shall contain the following:

(a) Toilet

(b) Hand-washing station

(c) Mirror. For requirements, see 4.1-7.2.2.8 (7).

(d) Private individual storage for the personal effects of each resident

(3) Use of hinged, sliding, or folding doors to toilet rooms shall be permitted, provided adequate provisions are made for acoustic privacy and resident safety.

(a) Each entry door into the resident toilet room shall provide space for health care providers to transfer residents to the toilet using a ceiling lift or portable mechanical lifting equipment.

(b) Thresholds shall be designed to facilitate use, and prevent tipping, of wheelchairs and other portable wheeled equipment used by residents and staff.

(c) In shared rooms, privacy locks shall be permitted with appropriate provisions for emergency access.

- * (4) Toilets used by residents shall be provided sufficient clearance on both sides of the toilet to enable physical access and maneuvering by staff members, who may have to assist the resident in wheelchair-to-toilet transfers and returns. Where independent transfers are feasible, alternative grab bar configurations shall be permitted.

4.1-2.2.2.7 Resident storage locations. Each resident shall be provided an individual wardrobe or closet.

- (1) This storage shall have minimum clear dimensions of 1 foot 10 inches (55.88 centimeters) in depth by 2 feet 6 inches (76.20 centimeters) in width.
- (2) A clothes rod and shelf shall be provided that is either adjustable or installed at heights accessible to the resident. Accommodations shall be made for storage of full-length garments. The shelf may be omitted if the unit provides at least two drawers.

***4.1-2.2.2.8 Resident bathing facilities**

- (1) A minimum of one bathtub or shower shall be provided for every 20 residents (or major fraction thereof) not otherwise served by bathing facilities in resident rooms. Sufficient bathtubs and showers shall be provided to permit each resident to be bathed according to the functional program.
- (2) Residents shall have access to at least one bathing unit (room) per floor or unit, sized to permit assisted bathing in a tub or shower.
 - (a) The bathtub in this room shall be accessible to residents in wheelchairs.
 - (b) The shower shall accommodate a shower gurney with fittings for a resident in a recumbent position.
 - (c) Doorways shall be designed to allow entry of portable/mobile mechanical lifts and shower gurney devices.

- (d) Thresholds shall be designed to facilitate use, prevent tripping, and prevent tipping of wheelchairs and other portable wheeled equipment.
- (e) Adult resident shower rooms shall be designed to allow entry of portable/mobile mechanical lifts and shower gurney devices.

(3) Other showers or tubs shall be in an individual room(s) or enclosure(s) with space for private use of the bathing fixture and drying and dressing as well as access to a grooming location.

- (a) Access to the grooming location shall not require reentry to the general corridor.
- (b) The grooming location shall contain a hand-washing station, mirror, and counter or shelf.

* (4) A separate toilet and hand-washing station shall be provided within or directly accessible to each resident's bathing facility without requiring entry into the general corridor.

***4.1-2.2.2.9 Medical gases.** Resident rooms designated for ventilator dependency shall have provisions for the administration of oxygen and suction.

4.1-2.2.3 Reserved

4.1-2.2.4 Reserved

4.1-2.2.5 Support Areas for Patient Care—General

4.1-2.2.5.1 Size and features. The size and features of each staff support area shall depend upon the number and types of residents served.

4.1-2.2.5.2 Space requirements. Identifiable spaces are required for each indicated function, but consideration shall be given to multiple-use design solutions that provide equivalent, though unspecified,

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A4.1-2.2.2.6 (4) For information about alternative grab bar configurations, see A4.1-7.2.2.9 (4).

A4.1-2.2.2.8 Consideration should be given to privacy when locating entrances to bathing rooms.

A4.1-2.2.2.8 (4) This toilet may also serve as the toilet-training facility.

A4.1-2.2.2.9 When a dedicated unit is provided for ventilator-dependent residents, piped oxygen and vacuum should be provided. Refer to NFPA 99 for emergency power requirements and medical gas installation information.

areas. Except where the word “room” or “office” is used, support functions may be accommodated in a multipurpose area.

4.1-2.2.5.3 Location. Staff support areas may be arranged and located to serve more than one resident unit, but at least one such support area shall be located on each resident floor unless noted otherwise. The support areas for patient care in 4.1-2.2.6 (Support Areas for Resident Units and Diagnostic and Treatment Locations) shall be located in or readily accessible to each resident unit.

4.1-2.2.6 Support Areas for Resident Units and Diagnostic and Treatment Locations

***4.1-2.2.6.1 Staff work area(s).** Resident units shall have staff work areas in central or decentralized direct care locations.

(1) Central staffing (nurse station). Where caregiving is organized on a central staffing model, such work areas shall provide for charting or transmitting charted data and any storage for administrative activities.

*** (2) Decentralized staffing (nurse station).** Where caregiving is decentralized, supervisory work areas need not accommodate charting activities nor have direct visualization of resident rooms. Rather, such functions shall be accomplished at decentralized direct care staff work areas, which shall provide for charting or transmitting charted data and any storage for administrative activities required by the functional program.

4.1-2.2.6.2 through 4.1-2.2.6.5 Reserved

4.1-2.2.6.6 Medication distribution locations (centralized and decentralized). Provision shall be made for 24-hour distribution of medications. A medication room, a self-contained medication distribution unit, medication storage in resident rooms, or other approach acceptable to the licensing authority shall be used for this purpose.

(1) Medication room

- (a) A medication room, if used, shall be provided on each resident unit. This room shall be for storage of emergency and contingency medications and supplies or part of a medication distribution system. The medication room shall include task lighting.
- (b) It shall contain a work counter, sink, refrigerator, and locked storage for controlled drugs.
- (c) It shall have a minimum area of 50 square feet (4.65 square meters).

(2) Self-contained medication distribution unit

- (a) Location of a self-contained medication distribution unit, if used, shall be permitted at the staff work area, in the clean workroom, in an alcove, or in other space convenient for staff.
- (b) Convenient access to hand-washing stations shall be provided.

4.1-2.2.6.7 Resident food area. Examples of the food areas intended here include a “country kitchen,” a “great room,” or other activity room that supports continued resident involvement with activities of daily living.

(1) Use of the food area for the following functions shall be permitted:

- (a) Serving nourishment between meals
- (b) Food distribution from central kitchen

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A4.1-2.2.6.1 Whether centralized or decentralized, staff work areas should be designed to minimize the institutional character, command-station appearance, and noise associated with traditional medical nursing stations, and should foster close, open relationships between residents and staff. Confidentiality or noisy staff conversations should be accommodated in an enclosed staff lounge and/or conference area. At least part of each staff work area should be low enough and open enough to permit easy conversations between staff and residents seated in wheelchairs.

A4.1-2.2.6.1 (2) Depending upon the type of service and care plan to be provided, direct care staff work areas need not be encumbered with all of the provisions for a supervisory administrative staff work area. In some decentralized arrangements, caregiving functions may be accommodated at a piece of residential furniture (such as a table or a desk) or at a work counter recessed into an alcove off a corridor or activity space, with or without computer and communications equipment, storage facilities, etc.

- (c) Cooking activities for residents
- (2) The food area shall contain the following:
 - (a) Work counter
 - (b) Refrigerator
 - (c) Storage cabinets
 - (d) Sink
 - (e) Range, cooktop, and/or oven with emergency shutoffs shall be permitted when required by the functional program.
 - (f) Food-warming and dishwashing equipment shall be permitted.
- (3) Hand-washing stations shall be in or immediately accessible from the food area.

4.1-2.2.6.8 Ice-making equipment. Ice for residents' consumption shall be provided by ice-making equipment.

- (1) Where accessible to residents and the public, ice-making equipment shall be self-dispensing.
- (2) Ice-making equipment shall be located, designed, and installed to minimize noise.
- (3) Ice-making equipment shall be permitted to serve more than one food area.

***4.1-2.2.6.9 Clean workroom or clean supply room**

- (1) Clean workroom. If the room is used for preparing resident care items, it shall contain a work counter, a hand-washing station, and storage facilities for clean and sterile supplies.
- (2) Clean supply room. If the room is used only for storage and holding as part of a system for distribution of clean and sterile materials, the work counter and hand-washing station may be omitted.

***4.1-2.2.6.10 Soiled utility or soiled holding room.**

This room shall contain the following:

- (1) Clinical sink or equivalent flushing-rim fixture with a rinsing hose or a bedpan sanitizer

- (2) Hand-washing station
- (3) Soiled linen receptacles
- (4) Waste receptacles in number and type as required by the functional program

4.1-2.2.6.11 Equipment and supply storage

- (1) Clean linen storage. A separate closet or designated area shall be provided. If a closed-cart system is used, storage may be in an alcove where staff control can be exercised.
- (2) Supply storage. Storage space(s) for supplies and recreation shall be provided near their points of use, as required by the functional program.
- (3) Wheelchair and other equipment storage. Space for wheelchairs and other equipment shall be provided away from normal traffic.

4.1-2.2.6.12 Reserved

4.1-2.2.6.13 Reserved

4.1-2.2.6.14 Personal laundry

- (1) Decentralized facilities for washing and drying personal laundry shall be permitted when called for by the functional program and where separate facilities are provided for small groups of residents.
- (2) When decentralized facilities are provided, combining personal laundry facilities with soiled utility and soiled laundry holding facilities shall be permitted when the airflow is from the washing/drying area to the soiled utility/holding area.

4.1-2.2.7 Support Areas for Staff

4.1-2.2.7.1 Staff lounge area. These area(s) may be shared by more than one resident unit or service.

4.1-2.2.7.2 Staff storage. Lockable storage shall be provided for safekeeping of staff members' personal items.

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A4.1-2.2.6.9 Combining the clean workroom/clean supply room with the medication room may be permitted if the functional program allows.

A4.1-2.2.6.10 Combining the soiled utility or soiled holding room with the environmental services room, for small groups of residents, may be permitted if the functional program allows.

4.1-2.2.7.3 Toilet room. Toilet room(s) shall contain toilets with hand-washing stations for staff and may be unisex.

4.1-2.2.8 Support Areas for Residents

4.1-2.2.8.1 Storage for resident needs. Storage space(s) for resident needs shall be provided near their points of use, as required by the functional program.

- *(1) Storage space(s) for resident equipment and supplies shall be provided near points of use, as required by the functional program.
- *(2) Appropriate room(s) shall be provided for storage of equipment necessary for resident care and as required by the functional program.
 - (a) Each unit shall provide sufficient storage area(s) located on the resident floor to keep its required corridor width free of all equipment and supplies.
 - (b) Storage areas shall be provided in close proximity to point of use.

***4.1-2.2.8.2 Resident telephone.** Provisions shall be made convenient to each resident unit to allow residents to make and receive telephone calls in private, unless otherwise indicated by the functional program.

4.1-2.3 Resident Living Areas

4.1-2.3.1 General

For new construction and renovation, resident com-

munal areas shall be designed and furnished to encourage resident use. **Note:** Nothing in these Guidelines is intended to restrict a facility from providing additional square footage per resident beyond what is required herein for dining rooms, activity areas, and similar spaces.

***4.1-2.3.2 Resident Dining and Recreation Areas**

4.1-2.3.2.1 General. The space needed for dining and recreation shall be determined in light of the following considerations.

- (1) The needs of residents to use adaptive equipment and mobility aids and receive assistance from support and service staff
- (2) The extent to which support programs shall be centralized or decentralized
- (3) The number of residents to be seated for dining at one time, as required by the functional program

4.1-2.3.2.2 Dining areas

- *(1) Space requirements. Dining areas shall provide space to accommodate the following:
 - (a) Adequate space for resident dining in accordance with the functional program, including residents in wheelchairs or residents who use other mobility devices when applicable
 - (b) Adequate space for residents to access and leave their tables without disturbing other residents

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A4.1-2.2.8.1 (1) Storage spaces, which may include cabinets, closets, rooms or alcoves, should have sufficient capacity to keep required corridor widths free of all equipment and supplies. Equipment may include but need not be limited to wheelchairs, motorized scooters, walkers, lifts, and carts. The storage requirement should accommodate portable mechanical lifting devices such as assist lifts and floor-based sling lifts. Supplies may include but need not be limited to linens, disposable products, slings, and accessories for lifts.

A4.1-2.2.8.1 (2) The storage requirement should accommodate portable mechanical lifting devices such as assist lifts and floor-based sling lifts.

A4.1-2.2.8.2 Use of technology is becoming increasingly prevalent in residential health care facilities. Cable television, high-speed Internet, and ready access to bedside telephones are just a few examples of the

expected norm in resident rooms. In-house closed-circuit television provides an opportunity for the resident to feel a part of the action. Many future residents will expect access to the Internet to communicate with family and friends or to surf the Internet. Phone jacks for each bed will become the norm in the future.

A4.1-2.3.2 It is important to provide outdoor views from dining, recreation, and living spaces. It is recommended that dining rooms have an outside wall with windows.

A4.1-2.3.2.2 (1) It is likely that facilities will be required to serve meals to the resident population in more than one shift. In practice, the dining room should be sized at a minimum of 28 net square feet (2.60 square meters) per resident seated at one time. Additional space may be required for outpatient day care programs.

- (c) Clear and unobstructed lanes for servers and food carts
- (d) Space for caregivers to assist residents who cannot feed themselves

(2) Location

- (a) Provision of separate satellite dining areas within or adjacent to resident units shall be permitted to accommodate less densely populated groupings and to be easily accessible to residents.
- (b) Hand-washing stations convenient to dining rooms shall be provided.
- (c) Toilet facilities that accommodate wheelchair residents shall be readily accessible to all dining areas.
- (d) Use of dining areas for other activities shall be permitted in accordance with the functional program.

4.1-2.3.2.3 Recreation and lounge areas

- (1) Space requirements. Recreation and lounge areas shall provide space to accommodate the following:
- (a) Space adequate for resident activities in accordance with the functional program
 - (b) Areas sufficient in number and configuration for the following purposes:
 - (i) To allow resident groups of various sizes to gather
 - (ii) To accommodate separate and distinct activities

4.1-2.3.3 Reserved

***4.1-2.3.4 Personal Services (Barber/Beauty) Areas**

Facilities and equipment for resident hair care and grooming shall be provided separate from the resident rooms.

4.1-2.3.4.1 These shall be permitted to be unisex and located adjacent to central resident activity areas, provided that location and scheduling preserve patient dignity.

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A4.1-2.3.4 Consideration should be given to the special ventilation and exhaust requirements of these personal services areas.

4.1-2.3.4.2 Resident toilets shall be located convenient to the hair and grooming area(s).

4.1-3 Diagnostic and Treatment Locations

4.1-3.1 Physical/Occupational Rehabilitation Therapy Provisions

4.1-3.1.1 General

4.1-3.1.1.1 Each residential health care facility that provides physical and/or occupational therapy services for rehabilitating long-term care residents shall have areas and equipment that conform to program intent. Where the residential health care facility is part of a general hospital or other facility, services may be shared as appropriate.

4.1-3.1.1.2 As a minimum, the facilities included in 4.1-3.1 shall be provided on-site, convenient for use.

4.1-3.1.2 Therapy Area

4.1-3.1.2.1 Reserved

4.1-3.1.2.2 Space requirements. Space and equipment shall be provided for carrying out each type of therapy that may be prescribed.

4.1-3.1.2.3 Reserved

4.1-3.1.2.4 Resident privacy. Provisions shall be made for resident privacy.

4.1-3.1.2.5 Hand-washing stations. These shall be within the therapy unit.

4.1-3.1.2.6 Reserved

4.1-3.1.2.7 Reserved

4.1-3.1.2.8 Provisions shall be made to accommodate wheelchair residents.

4.1-3.1.3 Physical and Occupational Therapy Provisions for Outpatients

4.1-3.1.3.1 If the functional program includes outpatient treatment, the additional requirements in 4.1-3.1.2 shall be met.

4.1-3.1.3.2 Convenient, accessible facility entry shall be provided in compliance with 4.2-2.2.1.3 (1) (Layout). This requirement shall apply to new construction and renovation projects.

4.1-3.1.4 Reserved

4.1-3.1.5 Support Areas for Patient Care—General

Identifiable spaces shall be provided for each function indicated in all sections with requirements for support areas. Where the word “room” or “office” is used, a separate, enclosed space for the one named function is intended. Otherwise, the described area shall be permitted to be a specific space in another room or common area.

4.1-3.1.6 Support Areas for Rehabilitation Therapy

4.1-3.1.6.1 Space for files, records, and administrative activities

4.1-3.1.6.2 Equipment and supply storage

4.1-3.1.6.3 Environmental services rooms, in or near the unit

4.1-3.1.7 Reserved

4.1-3.1.8 Support Areas for Residents

4.1-3.1.8.1 Resident toilet room(s). These shall be usable by wheelchair occupants.

4.1-3.1.9 Support Areas for Outpatients

4.1-3.1.9.1 Waiting area for outpatients and the public shall be provided in addition to and separate from required resident support and activity areas. Public toilets shall be provided convenient to these waiting areas.

4.1-3.1.9.2 Facilities shall be provided for dressing and lockers for storing patients’ clothing and personal effects.

4.1-3.1.9.3 Toilet facilities dedicated for outpatient use shall be provided.

4.1-3.1.9.4 Showers shall be provided, if required by the functional program.

■ 4.1-4 Patient Support Services

4.1-4.1 Reserved

4.1-4.2 Reserved

4.1-4.3 Dietary Facilities

For requirements, see facility chapters.

■ 4.1-5 General Support Services and Facilities

4.1-5.1 Reserved

4.1-5.2 Linen Services

For requirements, see facility chapters.

4.1-5.3 Materials Management Facilities

4.1-5.3.1 Reserved

4.1-5.3.2 Receiving Areas

If required by the functional program, a loading dock and receiving and breakout area(s) shall be provided. These may be shared with other services.

4.1-5.4 Waste Management Facilities

4.1-5.4.1 Waste Storage and Collection

Facilities shall be provided for sanitary storage of waste and recyclables using techniques and capacities acceptable to the appropriate health and environmental authorities.

4.1-5.4.2 Waste Treatment and Disposal

Facilities shall be provided for treatment or disposal of waste and recyclables using techniques and

capacities acceptable to the appropriate health and environmental authorities.

4.1-5.5 Environmental Services

For requirements, see facility chapters.

4.1-5.6 Engineering and Maintenance Services

4.1-5.6.1 General

The facilities included in 4.1-5.6 shall be provided as necessary for effective service and maintenance functions:

4.1-5.6.2 Equipment Locations

Room(s) or separate building(s) shall be provided for boilers, mechanical equipment, and electrical equipment.

4.1-5.6.3 Equipment, Supply, and Facility Records Storage

4.1-5.6.3.1 Provisions shall be made for protected storage of facility drawings, records, manuals, etc.

4.1-5.6.3.2 Storage room for building maintenance supplies. **Note:** Storage for solvents and flammable liquids shall comply with applicable NFPA codes.

4.1-5.6.3.3 General storage space(s) for furniture and equipment such as intravenous stands, inhalators, air mattresses, walkers, medical supplies, and housekeeping supplies and equipment.

4.1-5.6.3.4 Yard equipment and supply storage areas, located so that equipment may be moved directly to the exterior.

4.1-5.6.4 General Maintenance Area

A general maintenance area shall be provided for repair and maintenance.

■ 4.1-6 Public and Administrative Areas

For requirements, see facility chapters.

■ 4.1-7 Design and Construction Requirements

4.1-7.1 Building Codes and Standards

All parts of the residential health care facility shall be designed and constructed to sustain dead and live loads in accordance with applicable building codes and accepted engineering practices and standards, including requirements for seismic forces and applicable sections of NFPA 101.

*4.1-7.2 Architectural Details, Surfaces, and Furnishings

4.1-7.2.1 General

***4.1-7.2.1.1** Resident facilities require features that encourage ambulation of both long-term residents and short-term rehabilitation residents.

4.1-7.2.1.2 Low-emitting materials shall be used for finishes, surfaces, substrates, furnishings, and signage.

***4.1-7.2.1.3** Potential hazards to residents from hot surfaces shall be avoided.

4.1-7.2.2 Architectural Details

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A4.1-7.2 Residential health care facilities should incorporate architectural details, surfaces, and furnishings that

- (1) Optimize sensory function in accordance with the vision and lighting guidelines established by ANSI/IESNA RP-28: *Recommended Practice for Lighting and the Visual Environment for Senior Living* and provide optimum light levels and glare-free finishes for the safety and vision comfort of residents and staff.
- (2) Provide acoustical solutions to address hearing loss, the use of hearing aids by residents, and noise sources.

A4.1-7.2.1.1 Clear signage, non-disorienting finishes, furnishings, and other wayfinding features should be provided to facilitate independent wayfinding by residents and visitors.

A4.1-7.2.1.3 Hot surfaces are intended to include those surfaces to which residents have normal access that exceed 110°F (43°C). This requirement does not extend to medical or therapeutic equipment.

4.1-7.2.2.1 Corridors

- (1) Width. The placement of drinking fountains, public telephones, vending machines, and wall-mounted items such as organizers, retractable computer workstations, etc., shall not restrict corridor traffic or reduce the corridor width below the minimum stipulated in NFPA 101.
- (2) Height of drinking fountains, public telephones, handrails, lean rails, and wall-mounted lighting fixtures shall comply with applicable accessibility standards referenced in 1.1-4.1 (Design Standards for the Disabled).

***4.1-7.2.2.2 Ceiling height.** The minimum ceiling height shall be 8 feet 0 inches (2.44 meters), with the following exceptions:

- (1) Storage rooms. Ceilings in storage rooms shall be at least 7 feet 8 inches (2.34 meters).
- (2) Ceilings in normally unoccupied spaces may be reduced to 7 feet (2.13 meters).
- (3) Rooms containing ceiling-mounted equipment. These shall have the ceiling height required to ensure proper functioning of the ceiling-mounted equipment.
- (4) Boiler rooms. Boiler rooms shall have minimum ceiling clearances of 2 feet 6 inches (76.2 centimeters) above the main boiler header and connecting pipe.
- (5) Clearances. Building components and suspended tracks, rails, and pipes located along the path of normal traffic shall be not less than 7 feet (2.13 meters) above the floor.
- (6) Renovation. In renovation projects, all new work shall comply, insofar as practical, with subparagraphs 4.1-8.2.2.2 (1) through (5) above. Where existing conditions make compliance impossible, exceptions may be considered (see Section 1.1-1.3.5 for deviations from the requirements herein). However, in no case shall ceiling heights

be reduced more than 4 inches (2.54 centimeters) below the minimum requirement for new construction.

- (7) Doorways and other openings. Architecturally framed and trimmed openings in corridors and rooms shall be permitted, provided a minimum height of 7 feet (2.13 meters) is maintained.

4.1-7.2.2.3 Doors and door hardware

- * (1) Door type. Doors to all rooms containing bathtubs, sitz baths, showers, and toilets for resident use shall be hinged, sliding, or folding.
- (2) Door openings. Door openings shall be determined based on the functional program to allow proper clearance for lifts, equipment, beds, ambulation of residents, wheelchairs, and carts.
- (3) Door hardware. Lever hardware shall be selected for ease of use by residents with mobility limitations.
- (4) Door protection devices shall be used as outlined in the functional program.
- (5) Exterior doors that may be left open shall have insect screens.
- (6) All interior and exterior doors used by residents shall open with ease and little resistance.

4.1-7.2.2.4 Reserved

4.1-7.2.2.5 Windows. Resident rooms or suites in new construction shall have window(s).

- (1) Operable windows or vents that open from the inside shall be restricted to inhibit possible resident escape or suicide.
- (2) Windows shall have sills located no higher than 32 inches (81.28 centimeters) above the finished floor.
- (3) Operable windows that may be left open shall have insect screens.

4.1-7.2.2.6 Reserved

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A4.1-7.2.2.2 Ceiling heights should allow for indirect lighting options in public spaces, resident use areas, and corridors.

A4.1-7.2.2.3 (1) Sliding doors that are surface-mounted work well for resident unit bathrooms.

***4.1-7.2.2.7 Glazing materials.** Glazing materials shall be easily accessed for cleaning and maintenance.

***4.1-7.2.2.8 Hand-washing stations**

(1) General

- (a) Hand sanitation dispensers shall be provided in addition to hand-washing stations.
- (b) The number and placement of both hand-washing stations and hand sanitation dispensers shall be determined by the ICRA. More information about the number and placement of hand-washing stations and hand sanitation dispensers can be found in Section 1.2-3.2.1.2 (ICRA Considerations—Design elements); in the common requirements chapters in Parts 2, 3, and 4 of these Guidelines; and in facility type chapters in Part 5.

(2) Sinks. For these requirements, see 4.1-8.4.3.2 (Hand-washing stations).

(3) Anchoring. Lavatories and hand-washing stations shall be securely anchored to withstand an applied vertical load of not less than 250 pounds (113.4 kilograms) on the fixture front.

(4) Fittings

- (a) General hand-washing stations used by medical and nursing staff, patients, and food handlers shall be trimmed with valves that can be operated without hands.
 - (i) Single-lever or wrist blade devices shall be permitted.
 - (ii) Blade handles used for this purpose shall be at least 4 inches (10.2 centimeters) in length.
 - (iii) Care shall be taken in location and arrangement of fittings to provide the clearance required for operation of blade-type handles.

(b) Sensor-regulated water fixtures shall meet user need for temperature and length of time the water flows. Electronic faucets shall be capable of functioning during loss of normal power.

(c) Sensor-regulated faucets with manual temperature control shall be permitted.

(5) Provisions for drying hands. Provisions for hand drying shall be required at all hand-washing stations except scrub sinks.

(a) Hand-washing stations shall include a hand-drying device that does not require hands to contact the dispenser.

(b) These provisions shall be paper or cloth units enclosed to protect against dust or soil and to ensure single-unit dispensing. Hot air dryers shall be permitted provided that installation precludes possible contamination by recirculation of air.

(c) If provided, hand towels shall be directly accessible to sinks.

(6) Cleansing agent. Hand-washing stations shall include liquid or foam soap dispensers.

(7) Mirror. Each resident hand-washing station shall have a mirror. Mirror placement shall allow for convenient use by both wheelchair occupants and ambulatory persons. Top and bottom edges of mirrors shall be at levels usable by individuals either sitting or standing, or additional mirrors shall be provided for wheelchair occupants. One separate full-length mirror shall be permitted to serve for wheelchair occupants.

4.1-7.2.2.9 Grab bars

(1) Grab bars shall be installed in all resident toilets, showers, tubs, and sitz baths.

*** (2)** For wall-mounted grab bars, a minimum clearance of 1½ inches (3.81 centimeters) from walls shall be provided.

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A4.1-7.2.2.7 Where local requirements permit, wire-free, fire-rated safety glazing should be used to enhance the home-like residential appearance preferred by residents and visitors.

A4.1-7.2.2.8 Consideration should be given to electrical devices (space needed for work flow and placement away from the sink).

A4.1-7.2.2.9 (2) Consideration should be given to increasing clearances for arthritic residents.

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(3) Grab bars, including those which are part of fixtures such as soap dishes and toilet paper holders, shall have the strength to sustain a concentrated load of 250 pounds (113.4 kilograms).

* (4) Toilets used by residents shall be provided sufficient clearance on both sides of the toilet to enable physical access and maneuvering by staff, who may have to assist the resident in wheelchair-to-water-closet transfers and return. When independent transfers are feasible, alternative grab bar configurations shall be permitted.

(5) Grab bars shall have a finish color that has a value that contrasts with the adjacent wall surface.

(6) Grab bars shall be returned to the wall or floor with eased corners if a mitered corner condition exists.

4.1-7.2.2.10 Handrails

* (1) Handrails shall comply with the Americans with Disabilities Act (ADA) Guidelines. Alternative cross sections and configurations that support senior mobility shall be permitted.

(2) All stairways and ramps shall have handrails.

(3) Where corridors are defined by walls, handrails or lean rails shall be provided on both sides of all corridors normally used by residents.

(4) A handrail shall be provided for each corridor wall length exceeding 12 inches (30.48 centimeters).

(5) A minimum clearance of 1½ inches (3.81 centimeters) shall be provided between the handrail and the wall.

(6) Handrails, lean rails, and fasteners shall be completely smooth and free of rough edges.

(7) Handrails or lean rails shall be returned to the wall with eased corners if a mitered corner condition exists.

4.1-7.2.2.11 Reserved

4.1-7.2.2.12 Reserved

4.1-7.2.2.13 Protection from heat-producing equipment and heated surfaces

(1) Rooms containing heat-producing equipment (e.g., boiler rooms, HVAC rooms, computer rooms, and laundries) shall be insulated and ventilated to prevent the floors of occupied areas overhead and the adjacent walls from exceeding a temperature of 10°F (6°C) above the ambient room temperature of such occupied areas.

* (2) Heated surfaces. Wherever heated surfaces are

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A4.1-7.2.2.9 (4) ADAAG, UFAS, and ANSI accessibility standards were all developed with the intention of providing greater access for individuals with disabilities. However, their standards are based on assumed stature and strength, and thus their dimensional and grab bar requirements are intended to facilitate wheelchair-to-toilet transfers by individuals with sufficient upper body strength and mobility to effect such a transfer. The typical residential health care facility resident is unlikely to have such capabilities and thus will require the assistance of one or more staff members. Insufficient clearance at the side of the toilet can restrict staff mobility and access and result in injury. There are ongoing efforts aimed at educating regulators and advisory panels to the difficulties caused by requiring compliance with inappropriate standards in environments serving frail and geriatric populations.

Alternative grab bar configurations should address the following scenarios:

a. When a resident is capable of independent transfer facilitated by the grab bar and side-wall location required by accessibility standards, a removable/temporary wall structure and grab bar can be installed alongside the toilet.

b. When a resident requires partial assistance in transfer, provision of fold-down grab bars on one or both sides of the toilet would facilitate such transfers. Installation of fold-down grab bars requires evaluation of the toilet in relation to the wall and the grab bars provided. Clearance is needed on both sides of the toilet for an assisted transfer involving two or more staff members. The location of the toilet should be reviewed with regulators.

A4.1-7.2.2.10 (1) Consideration should be given to increasing clearances and mounting handrails lower than required by ADA to enable frail residents to lean on the handrails for support when ambulating.

A4.1-7.2.2.13 (2) Heated surfaces

a. In most household care models, stoves or other cooking elements are often used as part of the “home-style” country kitchen and/or activity areas.

b. Heated surfaces referenced in this section are intended to include those surfaces to which residents have normal access that exceed 110°F (43°C). This requirement does not extend to medical or therapeutic equipment.

used in resident areas, emergency shutoffs shall be provided per the functional program.

4.1-7.2.2.14 Anchorage. Lavatories, hand-washing stations, and handrails that a resident could use for support shall be securely anchored.

4.1-7.2.2.15 Signage and wayfinding. Strategically placed interior and exterior signage and visual environmental and surface-applied cues shall be provided for patient/resident and visitor orientation.

4.1-7.2.3 Surfaces

4.1-7.2.3.1 Surface selection characteristics and criteria

- (1) See A1.2-3.2.1.5 for information on recommendations and code requirements for surface selection.
- (2) Materials provided for finishes shall comply with NFPA 101.

4.1-7.2.3.2 Flooring

- * (1) Flooring surfaces shall be easily maintainable, readily cleanable, and appropriate for the location.
- (2) Flooring surfaces shall allow for ease of ambulation and self-propulsion.
- (3) Flooring surfaces shall provide smooth transitions between differing flooring materials.
- (4) Flooring surfaces, including stairways, shall have slip-resistant surfaces according to ASTM C1028.
- (5) Thresholds and expansion joint covers shall be designed to accommodate rolling traffic and prevent tripping.
- (6) Slip-resistant flooring products shall be used for flooring surfaces in wet areas (e.g., kitchens, shower

and bath areas), ramps, and entries from exterior to interior space.

- (7) All floor surfaces shall allow easy movement of all wheeled equipment required by the functional program.
- (8) Food preparation areas
 - (a) Floors in areas used for food preparation and assembly shall be water-resistant.
 - (b) Floor surfaces, including tile joints, shall be resistant to food acids.
 - (c) Floor construction in dietary and food preparation areas shall be free of spaces that can harbor pests.
- (9) In all areas subject to frequent wet-cleaning methods, flooring materials shall not be physically affected by germicidal or other types of cleaning solutions.
- (10) Highly polished flooring or flooring finishes that create glare shall be avoided.
- (11) Carpet and carpet with padding in resident areas shall be glued down or stretched taut and free of loose edges or wrinkles that might create hazards or interfere with the operation of lifts, wheelchairs, walkers, wheeled carts, or residents utilizing orthotic devices.
- (12) Joints for floor openings for pipes, ducts, and conduits shall be tightly sealed to minimize entry of pests. Joints of structural elements shall be similarly sealed.

*4.1-7.2.3.3 Walls, wall bases, and wall protection

- (1) Wall finishes
 - (a) Wall finishes shall be washable. If near plumbing fixtures, wall finishes shall be smooth and moisture-resistant.

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A4.1-7.2.3.2 (1) Using portable lifting equipment without powered wheels to move an elevated resident around and through a space may require more exertion by staff than using ceiling-mounted equipment. The exertion required may increase with the use of carpet; however, different types and brands of carpet may present significantly different levels of resistance to wheeled devices. Installation of a mock-up to test flooring materials in relationship to wheeled equipment and devices

used in a facility is recommended. Carpet should not be automatically discounted as inappropriate due to this challenge as it has major advantages over hard-surface flooring in terms of noise reduction, acoustics, and residential appearance, all of which are important in creating a comfortable, attractive living environment for residents.

A4.1-7.2.3.3 Sharp, protruding corners should be avoided.

- (b) Wall surfaces in wet areas (e.g., kitchens, housekeeping closets) shall be water-resistant and provide a nonslip surface.
- (2) Wall bases in areas that require frequent wet cleaning (e.g., kitchens, soiled and clean utility rooms, environmental services rooms with mop sinks, public bathrooms) shall be continuous and coved with the floor, tightly sealed to the wall, and constructed without voids that can harbor insects or moisture.
- (3) Wall construction, finish, and trim in dietary and food storage areas shall be free from rodent- and insect-harboring spaces.
- (4) Wall openings for pipes, ducts, and conduits shall be tightly sealed to minimize entry of pests. Joints of structural elements shall be similarly sealed.
- (5) Highly polished walls or wall finishes that create glare shall be avoided.
- (6) Wall protection and corner guards shall be durable and scrubbable.

4.1-7.2.3.4 Ceilings

- (1) The finishes of all exposed ceilings in resident areas and staff work areas shall be cleanable.
- (2) Ceiling surfaces in dietary and laundry areas, bathrooms, and bathing rooms shall be moisture resistant.
- (3) Non-pervious ceiling finishes that are washable or easily cleaned shall be provided in dietary, soiled utility, housekeeping, and bath/shower rooms.

4.1-7.2.3.5 Doors and door hardware. Door and hardware finishes shall be selected to withstand cleaning and impact damage.

4.1-7.2.4 Furnishings

Materials provided for furnishings, including mat-

tresses and upholstery, shall comply with NFPA 101.

4.1-7.2.4.1 Casework, millwork, and built-ins

- (1) In resident use areas, corners shall be rounded or eased.
- * (2) If hand-washing basins are set into plastic laminate countertops, at a minimum the substrate shall include an impervious seal.

4.1-7.2.4.2 Furniture

- (1) Furniture selected shall comply with NFPA 101.
- (2) Furniture shall be upholstered with impervious materials in locations where infection control is a concern.
- * (3) Furniture used in patient/resident areas shall be sturdy and stable to safely support patient/resident transfer and weight-bearing requirements.
- (4) Furniture selected shall have round and eased edges.
- (5) Furniture shall be selected to permit as much resident independence as possible.

4.1-7.2.4.3 Window treatments and cubicle curtains

- (1) Cubicle curtains and window treatments shall comply with NFPA 101.
- (2) Blinds, sheers, or other resident-controlled window treatment shall be provided within resident units to control light levels and glare.
- (3) Window treatments shall be easy for residents to operate safely.

■ 4.1-8 Building Systems

4.1-8.1 General

See facility chapters for specific requirements.

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A4.1-7.2.4.1 (2) The presence of water around hand-washing sinks has consistently proven to encourage the growth of opportunistic fungi and molds in the substrate materials if the countertops are not properly sealed and maintained. Integral backsplashes eliminate intersections that need to be caulked.

A4.1-7.2.4.2 (3) Furniture guidelines for seating include 18–19 in. (0.46–0.48 meter) seat height, 24–26 in. (0.61–0.66 meter) arm height, a firm seat, and seat depth and configuration that will allow residents to exit seating comfortably and safely without assistance. Final furniture selection should be completed per the functional program.

4.1-8.2 Heating, Ventilation, and Air-Conditioning (HVAC) Systems

4.1-8.2.1 General

Basic HVAC system requirements are defined in Part 6, ANSI/ASHRAE/ASHE Standard 170-2008: *Ventilation of Health Care Facilities*. This section of the Guidelines includes additional requirements.

4.1-8.2.1.1 Mechanical system design

- (1) Efficiency. The mechanical system shall be subject to general review for operational efficiency and appropriate life-cycle cost. Details for cost-effective implementation of design features are interrelated and too numerous (as well as too basic) to list individually.
 - (a) Recognized engineering procedures shall be followed for the most economical and effective results. A well-designed system can generally achieve energy efficiency with minimal additional cost and simultaneously provide improved resident comfort.
 - (b) In no case shall resident care or safety be sacrificed for energy conservation.
 - (c) Facility design consideration shall include site, building mass, orientation, configuration, fenestration, and other features relative to passive and active energy systems.
 - (d) Air-handling systems shall be designed with an economizer cycle where appropriate to use outside air. (Use of mechanically circulated outside air does not reduce the need for filtration.)
- (2) Air-handling systems with unitary equipment that serves only one room. These units shall be

permitted for use as recirculating units only. All outdoor air requirements shall be provided by a separate central air-handling system with the proper filtration, as noted in 4.1-8.2.5.1.

- (3) System valves. Supply and return mains and risers for cooling, heating, and steam systems shall be equipped with valves to isolate the various sections of each system. Each piece of equipment shall have valves at the supply and return ends.
- (4) Renovation. If system modifications affect greater than 10 percent of the system capacity, designers shall utilize pre-renovation water/air flow rate measurements to verify that sufficient capacity is available and that renovations have not adversely affected flow rates in non-renovation areas.
- (6) Acoustic considerations
 - * (a) Outdoor mechanical equipment shall not produce sound that exceeds 65 dBA at the hospital façade, unless special consideration is given to façade sound isolation design in impinged areas.
 - * (b) Outdoor mechanical equipment shall not produce sound that exceeds daytime and nighttime noise limits at neighboring properties as required by local ordinance.

***4.1-8.2.1.2 Ventilation and space conditioning requirements.** All rooms and areas in the facility shall have provision for positive ventilation.

- (1) Although natural ventilation (via operable windows) shall be permitted when weather and outside air quality permit, mechanical ventilation shall be provided for all rooms and areas in the facility.

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A4.1-8.2.1.1 (6)(a) and (b) Outdoor mechanical equipment includes cooling towers, rooftop air handlers, exhaust fans, and fans located inside buildings with openings on the outside of the building. Noise that these and other outdoor equipment produce may impinge on hospital buildings and may require special consideration of the hospital building shell in these areas, or may impinge on adjacent properties where jurisdictional noise limits and/or owner land uses must be considered.

A4.1-8.2.1.2 Humidity control

a. ASHRAE Standard 55 recommends 30 to 60 percent relative humidity

for comfort. In cold or arid climates, achieving relative humidities as high as 30 percent may not be practical. Where central ventilation systems are not utilized, these humidity requirements may not be achievable. Additional data are needed to establish a consensus on the cost/benefit of maintaining humidity within the recommended range.

- b. For more information about humidity control, see Chapter 25, "Eldercare Buildings," in Lew Harriman, Geoff Brundrett, and Reinhold Kittler, *Humidity Control Design Guide for Commercial and Institutional Buildings* (ASHRAE, 2001).

4.1-8.2.2 Requirements for Specific Locations**4.1-8.2.2.1 through 4.1-8.2.2.9 Reserved****4.1-8.2.2.10 Food preparation centers**

- (1) Exhaust hoods handling grease-laden vapors in food preparation centers shall comply with NFPA 96.
- (2) All hoods over cooking ranges shall be equipped with grease filters, fire-extinguishing systems, and heat-actuated fan controls.
- (3) Cleanout openings shall be provided every 20 feet (6.10 meters) and at changes in direction in the horizontal exhaust duct systems serving these hoods. Horizontal runs of ducts serving range hoods shall be kept to a minimum.
- (4) Food preparation facilities shall have ventilation systems whose air supply mechanisms are interfaced appropriately with exhaust hood controls or relief vents so that exfiltration or infiltration to or from exit corridors does not compromise the exit corridor restrictions of NFPA 90A, the pressure requirements of NFPA 96, or the maximum defined in Part 6.

4.1-8.2.2.11 Fuel-fired equipment rooms. Rooms with fuel-fired equipment shall be provided with sufficient outdoor air to maintain equipment combustion rates and to limit workstation temperatures.

4.1-8.2.3 Thermal and Acoustical Insulation

4.1-8.2.3.1 General. Insulation shall be provided within the building to conserve energy, protect personnel, prevent vapor condensation, and reduce noise.

- (1) Vapor barrier. Insulation on cold surfaces shall include an exterior vapor barrier. (Material that will not absorb or transmit moisture will not require a separate vapor barrier.)

- (2) Flame-spread rating. Insulation, including finishes and adhesives on the exterior surfaces of ducts, piping, and equipment, shall have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less as determined by an independent testing laboratory in accordance with NFPA 255.
- (3) Renovation. Existing accessible insulation within areas of facilities to be modernized shall be inspected, repaired, and/or replaced, as appropriate.

4.1-8.2.4 HVAC Air Distribution**4.1-8.2.4.1 Reserved****4.1-8.2.4.2 HVAC ductwork**

- (1) General. When smoke partitions are required, heating, ventilating, and air conditioning zones shall be coordinated with compartmentation insofar as practical to minimize the need to penetrate fire and smoke partitions.

*** (2) Duct humidifiers**

- (a) If duct humidifiers are located upstream of the final filters, they shall be at least twice the rated distance for full moisture absorption upstream of the final filters.
 - (b) Ductwork with duct-mounted humidifiers shall have a means of water removal.
 - (c) Humidifiers shall be connected to airflow proving switches that prevent humidification unless the required volume of airflow is present or high-limit humidistats are provided.
 - (d) All duct takeoffs shall be sufficiently downstream of the humidifier to ensure complete moisture absorption.
 - (e) Steam humidifiers shall be used. Reservoir-type water spray or evaporative pan humidifiers shall not be used.
- (3) Fire and smoke dampers
 - (a) Fire and smoke dampers shall be constructed, located, and installed in accordance with the

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A4.1-8.2.4.2 (2) One way to achieve basic humidification may be by a steam-jacketed manifold-type humidifier with a condensate separator that delivers high-quality steam. Additional booster humidification (if required) should be provided by steam-jacketed humidifiers for each

individually controlled area. Steam to be used for humidification may be generated in a separate steam generator. The steam generator feedwater may be supplied either from soft or reverse osmosis water. Provisions should be made for periodic cleaning.

- requirements of NFPA 101, 90A, and the specific damper's listing requirements.
- (b) Fans, dampers, and detectors shall be interconnected so that damper activation will not damage ducts.
 - (c) Maintenance access shall be provided at all dampers.
 - (d) All damper locations shall be shown on design drawings.
 - (e) Dampers shall be activated in accordance with NFPA 90A. Installation of switching systems for restarting fans shall be permitted for fire department use in venting smoke after a fire has been controlled. Provisions to avoid possible damage to the system due to closed dampers shall be permitted.
- (4) Construction requirements. Ducts that penetrate construction intended to protect against x-ray, magnetic, RFI, or other radiation shall not impair the effectiveness of the protection.

4.1-8.2.4.3 Exhaust systems

- (1) General
 - (a) To enhance the efficiency of recovery devices required for energy conservation, combined exhaust systems shall be permitted.
 - (b) Fans serving exhaust systems shall be located at the discharge end and shall be readily serviceable.

4.1-8.2.5 HVAC Filters

See Part 6 (ASHRAE 170) for further filter requirements.

4.1-8.2.5.1 Filter efficiencies. Noncentral air-handling systems shall be equipped with permanent (cleanable) or replaceable filters with a minimum efficiency of MERV 6.

4.1-8.2.5.2 Filter frames. Filter frames shall be durable and proportioned to provide an airtight fit with the enclosing ductwork. All joints between filter segments and the enclosing ductwork shall have gaskets or seals to provide a positive seal against air leakage.

4.1-8.2.6 Heating Systems and Equipment

4.1-8.2.6.1 Boilers

- (1) Capacity. For requirements, see Part 6, Section 6.1.2.1. In addition, domestic hot water for clinical, dietary, and patient/resident use shall be included in the reserve capacity to be served by the remaining sources.
- (2) Fuel sufficient to meet demand loads for the same length of time required for emergency generators shall be provided on site.

4.1-8.2.6.2 Boiler plant accessories. Major supporting components of the heating plant, including feedwater pumps, fuel pumps, and condensate transfer pumps, shall be provided with redundancy that makes it possible to meet the heating capacity of the plant required by Section 4.1-8.2.6.1 (Boilers—Capacity) when any one of these components is out of service due to failure or routine maintenance.

4.1-8.2.6.3 Temperature control

- (1) Rooms containing heat-producing equipment, such as boiler or heater rooms or laundries, shall be ventilated to prevent the floor surface above and/or the adjacent walls of occupied areas from exceeding a temperature of 10°F (6°C) above ambient room temperature.
- (2) Surface temperatures. Heating units shall have a maximum surface temperature of 125°F (52°C) or shall be protected from occupant contact.

4.1-8.3 Electrical Systems

4.1-8.3.1 General

4.1-8.3.1.1 Applicable standards

- (1) All material and equipment, including conductors, controls, and signaling devices, shall be installed to provide a complete electrical system in accordance with NFPA 70 and NFPA 99.
- (2) Electrical systems for residential health care facilities shall comply with applicable sections of NFPA 70.

4.1-8.3.1.2 Testing and documentation. All electrical installations and systems shall be tested to verify that the equipment has been installed and that it operates as designed.

4.1-8.3.2 Reserved**4.1-8.3.3 Power-Generating and Storing Equipment****4.1-8.3.3.1 Emergency electrical service**

- (1) Applicable standards. At a minimum, residential health care facilities or sections thereof shall have emergency electrical systems as required in NFPA 101 and in the requirements of NFPA 99 that address residential health care facilities.
- (2) Shared service. When the residential health care facility is a distinct part of an acute care hospital, it may use the emergency generator system for required emergency lighting and power if such sharing does not reduce hospital services. Life support systems and their respective areas shall be subject to applicable standards in 2.1-8.3 (Electrical Systems).
- (3) Lighting. An emergency electrical source shall provide lighting and/or power during an interruption of the normal electrical supply.
- (4) Stored fuel
 - (a) Where stored fuel is required, storage capacity shall permit continuous operation for at least 24 hours.
 - (b) Fuel storage for electricity generation shall be separate from heating fuels.
 - (c) If the use of heating fuel for diesel engines is considered after the required 24-hour supply has been exhausted, positive valving and

filtration shall be provided to avoid entry of water and/or contaminants.

4.1-8.3.3.2 Generators. Exhaust systems (including locations, mufflers, and vibration isolators) for internal combustion engines shall be designed and installed to minimize objectionable noise. Where a generator is routinely used to reduce peak loads, protection of patient areas from excessive noise may become a critical issue.

4.1-8.3.4 Lighting**4.1-8.3.4.1 General**

- (1) Lighting shall be engineered to the specific application. Unless alternative lighting levels are justified by the functional program, Table 4.1-3 (Minimum Maintained Average Illumination) shall be used as a guide to minimum required ambient and task lighting levels in all rooms, spaces, and exterior walkways.
- (2) As required by the functional program, recommended lighting design practices (including minimum lighting levels for nursing facilities and other senior living environments) developed by the Illuminating Engineering Society of North America (IESNA) shall be incorporated into the lighting design. Refer to ANSI/IESNA RP-28: Recommended Practices for Lighting and the Visual Environment for Senior Living.
- * (3) Approaches to buildings and parking lots, and all occupied spaces within buildings, shall be illuminated. Consideration shall be given to both

APPENDIX**A4.1-8.3.4.1 (3) Lighting in transition spaces**

- a. Excessive differences in lighting levels should be avoided in transition areas between parking lots, building entrances and lobbies or corridors, in transition zones between driveways and parking garages, etc. As the eye ages, pupils become smaller and less elastic, making visual adaptation to dark spaces slower. Upon entering a space with a considerably lower lighting level, elderly residents may need to stop or move to one side until their eyes adapt to excessive lighting changes. Elderly pedestrians may need several minutes to adjust to significant changes in brightness when entering a building from a sunlit walkway or terrace.
- b. Consideration should be given to increasing both indoor and outdoor illumination levels in such transition spaces to avoid excessive differ-

ences between electric lighting levels and natural daytime and nighttime illumination levels. In addition, it is very helpful for pedestrians to have conveniently located places to wait, giving them time to adjust their eyes to different lighting environments. Seating areas off busy lobbies or corridors can minimize the potential for accidents by giving them the time they need.

- c. Care should be taken to minimize extremes of brightness within spaces and in transitions between spaces. Excessive brightness contrast from windows or lighting systems can disorient residents.
- d. Research has established that older adults sleep best in total darkness. Therefore, to minimize resident sleep disruption, night lights should (1) provide very low levels of illumination; (2) be located so as to minimize light scatter and reflections on room surfaces; and (3) be

the quantity and quality of lighting, including the following:

- (a) Ability to control light levels
- (b) Glare control
- (c) Special lighting needs of residents
- (d) Area-specific lighting solutions
- (e) Use of glare-free daylighting in all resident rooms and resident use areas
- (f) Life-cycle costs of lighting
- (g) Other lighting design practices as defined and described in ANSI/IESNA RP-28

4.1-8.3.4.2 Light fixtures

- (1) Light fixtures in wet areas (e.g., kitchens, showers) shall be vapor resistant and have cleanable, shatter-resistant lenses and no exposed lamps.
- (2) Lighting shall be designed to reduce glare (see IESNA RP 28).

4.1-8.3.4.3 Lighting requirements for specific locations in residential health care facilities

- * (1) Resident rooms. Resident rooms and toilet rooms shall have general lighting, task lighting, and night lighting.

- (a) At least one task light shall be provided for each resident.
- (b) Task light controls shall be readily accessible to residents.
- * (c) At least one low-level night light fixture in each resident room or toilet room shall be provided. When the functional program stipulates staff shall use portable light sources, omission of night lights in resident rooms shall be permitted.
- (d) All light controls in resident areas shall be quiet-operating.

(2) Resident unit corridors

- * (a) Resident unit corridors shall have general illumination with provisions for reducing light levels at night. Corridors and common areas used by residents shall have even light distribution to avoid glare, shadows, and scalloped lighting effects.
- (b) Highly polished flooring or floors with glossy sheen shall not be used.

4.1-8.3.5 Reserved

4.1-8.3.6 Receptacles

Receptacles (convenience outlets) shall be provided as follows:

APPENDIX (continued)

switched off when not needed. However, even when properly specified, located, and operated, night lights often disturb resident sleep. Therefore, many providers prefer to have staff wear portable light sources instead of using night lights that were installed primarily to satisfy a code requirement.

- e. Lighting that creates glare and colors that do not differentiate between horizontal and vertical planes, or between objects and their backgrounds (such as handrails or light switches from walls, hardware from doors, faucets from sinks, or control knobs from appliances) should be avoided, unless therapeutic benefits can be demonstrated. (For example, it has been demonstrated that deliberately camouflaged door hardware may help control wandering and elopements by some cognitively impaired residents in Alzheimer's care facilities.)

A4.1-8.3.4.3 (1) Lighting in resident rooms

- a. Care should be taken to avoid injury from lighting fixtures. Light sources that may burn residents or ignite bed linen by direct contact should be covered or protected.
- b. Ambient light levels are determined on a horizontal plane above the

floor. The use of this method in the types of areas described should result in values of average illuminance within 10 percent of the values that would be obtained by dividing the area into 2-foot (0.6-meter) squares, taking a reading in each square, and averaging.

- c. The measuring instrument should be positioned so that when readings are taken, the surface of the light-sensitive cell is in a horizontal plane and 30 inches (760 millimeters) above the floor. This can be facilitated by means of a small portable stand of wood or other material that will support the cell at the correct height and in the proper plane. Daylight may be excluded during illuminance measurements. Readings can be taken at night or with shades, blinds, or other opaque covering on the fenestration.

A4.1-8.3.4.3 (1)(c) Research suggests that red or amber night lights are less disruptive to sleep.

A4.1-8.3.4.3 (2)(a) Where practical, windows and skylights should be utilized to minimize the need for artificial light and to allow residents to experience the natural daylight cycle. Residents benefit from higher light levels and daylight. Glare from windows and skylights should be avoided.

4.1-8.3.6.1 Receptacles in corridors. Duplex-grounded receptacles for general use shall be installed approximately 50 feet (15.24 meters) apart in all corridors and within 25 feet (7.62 meters) of corridor ends.

4.1-8.3.6.2 Receptacles in resident rooms. Each resident room shall have duplex-grounded receptacles, including at least one on each wall. There shall be at least two duplex outlets on the head wall(s) based on at least one bed location, with one at each side of the head of each bed. Omission of receptacles from exterior walls where construction makes installation impractical shall be permitted.

4.1-8.3.6.3 Emergency system receptacles. Electrical receptacle coverplates or electrical receptacles supplied from the emergency system shall be distinctively colored or marked for identification. If color is used for identification purposes, the same color shall be used throughout the facility.

4.1-8.3.6.4 Ground fault interrupters. Ground fault interrupters shall comply with NFPA 70.

4.1-8.3.7 Call System

A nurse/staff call system shall be provided.

***4.1-8.3.7.1 General.** Alternate technologies may be considered for emergency or nurse call systems. If radio frequency systems are used, consideration shall be given to electromagnetic compatibility between internal and external sources.

4.1-8.3.7.2 Patient room call station

- (1) Each bed location and/or resident shall be provided with a call device. Two call devices serving adjacent beds or residents may be served by one calling station.
- (2) Calls shall be initiated by a resident activating either a call device attached to a resident's call station or a portable device that sends a call signal to the call station and shall either:

- (a) Activate a visual signal in the corridor at the resident's door or other appropriate location. In multi-corridor or cluster resident units, additional visual signals shall be installed at corridor intersections; or
- (b) Activate a pager worn by a staff member, identifying the specific resident and/or room from which the call has been placed.

4.1-8.3.7.3 Reserved

4.1-8.3.7.4 Emergency call system. An emergency call device shall be provided at each resident toilet, bath, shower room, beauty parlor, resident lounge, and all common resident areas.

- (1) This device shall be accessible to a resident lying on the floor. Inclusion of a pull cord or portable wireless device will satisfy this requirement.
- (2) The emergency call system shall be designed so that a call activated by a resident will initiate a signal distinct from the resident room call device and that can be turned off only at the resident's location.
- (3) The signal shall activate an annunciator panel or screen at the staff work area or other appropriate location and at other areas defined by the functional program. In addition, the signal shall activate either a visual signal in the corridor at the resident's door or other appropriate location or a staff pager indicating the calling resident's name and/or room location.

4.1-8.3.8 Electrical Requirements for Specific Residential Health Care Facility Locations

4.1-8.3.8.1 Ventilator-dependent resident bedrooms

- (1) Dedicated circuit(s). This paragraph shall apply to both new and existing facilities serving ventilator-dependent patients.
 - (a) A minimum of one dedicated essential system circuit per bed for ventilator-dependent patients shall be provided in addition to the normal system receptacle at each bed location required by NFPA 70. This circuit shall be provided with a minimum of two duplex receptacles identified for emergency use.

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A4.1-8.3.7.1 Nurse and emergency call systems should be tested and listed by a nationally recognized testing laboratory (NRTL). The listing should be a standard applicable to health care environments.

- (b) Additional essential system circuits/receptacles shall be provided where the electrical life support needs of the patient exceed the minimum requirements stated in this paragraph.
- (2) Essential electrical system connections
 - (a) Heating equipment provided for ventilator-dependent patient bedrooms shall be connected to the essential electrical system. This paragraph shall apply to both new and existing facilities.
 - (b) Task lighting connected to the essential electrical system shall be provided for each ventilator-dependent patient bedroom. This paragraph shall apply to both new and existing facilities.

4.1-8.4 Plumbing Systems

4.1-8.4.1 General

In the absence of local and state plumbing codes, all plumbing systems shall be designed and installed in accordance with the International Plumbing Code.

4.1-8.4.2 Plumbing and Other Piping Systems

4.1-8.4.2.1 General piping and valves

- (1) All piping, except control-line tubing, shall be identified.
- (2) All valves shall be tagged, and a valve schedule shall be provided to the facility owner for permanent record and reference.

4.1-8.4.2.2 Reserved

4.1-8.4.2.3 Potable water supply systems

- (1) Capacity. Systems shall be designed to supply water at sufficient pressure to operate all fixtures and equipment during maximum demand. Supply capacity for hot- and cold-water piping shall be determined on the basis of fixture units, using recognized engineering standards. When the ratio of plumbing fixtures to occupants is proportionally more than required by the building occupancy and is in excess of 1,000 plumbing fixture units, a diversity factor shall be permitted.

- (2) Valves. Each water service main, branch main, riser, and branch to a group of fixtures shall have valves.
 - (a) Stop valves shall be provided for each fixture.
 - (b) Appropriate panels for access shall be provided at all valves where required.
- (3) Backflow prevention
 - (a) Systems shall be protected against cross-connection in accordance with American Water Works Association (AWWA) Recommended Practice for Backflow Prevention and Cross-connection Control.
 - (b) Vacuum breakers or backflow prevention devices shall be installed on hose bibs and supply nozzles used for connection of hoses or tubing in housekeeping sinks, bedpan-flushing attachments, etc.
- (4) Potable water storage. Potable water storage vessels (hot and cold) not intended for constant use shall not be installed.

4.1-8.4.2.4 Reserved

4.1-8.4.2.5 Hot water systems. The following standards shall apply to hot water systems:

- * (1) The water-heating system shall have sufficient supply capacity at the temperatures and amounts indicated in the applicable table. Storage of water at higher temperatures shall be permitted.
- (2) Hot water distribution systems serving patient/resident care areas shall be under constant recirculation to provide continuous hot water at each hot water outlet. Non-recirculated fixture branch piping shall not exceed 25 feet (7.62 meters) in length.
- (3) Dead-end piping (risers with no flow, branches with no fixture) shall not be installed. In renovation projects, dead-end piping shall be removed. Empty risers, mains, and branches installed for future use shall be permitted.

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A4.1-8.4.2.5 (1) Water temperature is measured at the point of use or inlet to the equipment.

- * (4) Provisions shall be included in the domestic hot water system to limit the amount of *Legionella* bacteria and opportunistic waterborne pathogens.

4.1-8.4.2.6 Drainage systems

- (1) Piping. Insofar as possible, drainage piping shall not be installed within the ceiling or exposed in food preparation centers, food serving facilities, food storage areas, central services, electronic data processing areas, electric closets, and other sensitive areas. Where exposed overhead drain piping in these areas is unavoidable, special provisions shall be made to protect the space below from leakage, condensation, or dust particles.
- (2) Reserved
- (3) Sewers. Building sewers shall discharge into community sewerage. Where such a system is not available, the facility shall treat its sewage in accordance with local and state regulations.
- (4) Kitchen grease traps. Grease traps shall be located and arranged to permit easy access.

4.1-8.4.3 Plumbing Fixtures

4.1-8.4.3.1 Clinical sinks. Clinical sinks shall have an integral trap wherein the upper portion of the water trap provides a visible seal.

***4.1-8.4.3.2 Hand-washing stations**

- (1) General. For further requirements regarding hand-washing stations, see 1.2-3.2.1.2 (ICRA

considerations—Design elements), 4.1-7.2.2.8, and 4.1-7.2.4.1.

(2) Sinks

- * (a) Sinks in hand-washing stations shall be designed with deep basins to prevent splashing to areas where direct patient care is provided, particularly those surfaces where sterile procedures are performed and medications are prepared.
- (b) The area of the basin shall not be less than 144 square inches (929.03 square centimeters), with a minimum width or length of 9 inches (58.06 centimeters).
- (c) Hand-washing basins/countertops shall be made of porcelain, stainless steel, or solid surface materials. Basins shall be permitted to be set into plastic laminate countertops if, at a minimum, the substrate is marine-grade plywood (or equivalent) with an impervious seal.
- (d) Sinks shall have well-fitted and sealed basins to prevent water leaks onto or into cabinetry and wall spaces.
- (e) The discharge point of hand-washing sinks shall be at least 10 inches above the bottom of the basin.
- (f) The water pressure at the fixture shall be regulated.
- (g) Design of sinks shall not permit storage beneath the sink basin.

4.1-8.4.4 Medical Gas and Vacuum Systems

Any installation of nonflammable medical gas, air, or clinical vacuum systems shall comply with the require-

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A4.1-8.4.2.5 (4) There are several ways to treat domestic water systems to kill *Legionella* and opportunistic waterborne pathogens. Complete removal of these organisms is not feasible, but methods to reduce the amount include hyperchlorination (free chlorine, chlorine dioxide, monochloramine), elevated hot water temperature, ozone injection, silver/copper ions, and ultraviolet light. Each of these options has advantages and disadvantages. While increasing the hot water supply temperature to 140°F (60°C) is typically considered the easiest option, the risk of scalding, especially to youth and the elderly, is significant. See CDC and ASHRAE Guideline 12, “Minimizing the Risk of Legionellosis Associated with Building Water Systems,” for additional information. Another reference on this topic is “*Legionella* Control in Health Care Facilities,” available from the American Society of Plumbing Engineers.

A4.1-8.4.3.2 Hand-washing stations. Plumbing lines under hand-washing stations should be protected for use by residents using wheelchairs.

A4.1-8.4.3.2 (2)(a) Recommendations for minimizing splashing through hand-washing station design and sink style:

- a. Faucets should not discharge directly above the drain as this causes splashing (i.e., water should be angled away from the drain).
- b. Sink size and depth should follow ANSI standards for sink design.
- c. Water pressure should be adjusted to reduce forceful discharge into the sink at maximum flow.
- d. Design of sinks should accommodate ADA requirements for clearance under the sink basin.

ments of NFPA 99. When any piping or supply of medical gases is installed, altered, or augmented, the altered zone shall be tested and certified as required by NFPA 99.

4.1-8.5 Communications Systems

4.1-8.5.1 Locations for terminating telecommunications and information system devices shall be provided.

4.1-8.5.2 A space shall be provided for central equipment locations. Special air conditioning and voltage regulation shall be provided when recommended by the manufacturer.

4.1-8.6 Electronic Safety and Security Systems

4.1-8.6.1 Fire Alarm System

Fire alarm and detection systems shall be provided in compliance with NFPA 101 and NFPA 72.

4.1-8.7 Special Systems

4.1-8.7.1 General

4.1-8.7.1.1 Testing

- (1) Prior to acceptance of the facility, all special systems shall be tested and operated to demonstrate to the owner or designated representative that the installation and performance of these systems conform to design intent.
- (2) Test results shall be documented for maintenance files.

4.1-8.7.1.2 Documentation

- (1) Upon completion of the special systems equipment installation contract, the owner shall be furnished with a complete set of manufacturers' operating, maintenance, and preventive maintenance instruc-

tions, a parts list, and complete procurement information, including equipment numbers and descriptions.

- (2) Operating staff shall also be provided with instructions for proper operation of systems and equipment. Required information shall include all safety or code ratings as needed.

4.1-8.7.1.3 Insulation

Insulation shall be provided surrounding special system equipment to conserve energy, protect personnel, and reduce noise.

4.1-8.7.2 Elevators

4.1-8.7.2.1 General

All buildings having resident use areas on more than one floor shall have electric or hydraulic elevator(s).

***4.1-8.7.2.2 Number.** Engineered traffic studies are recommended, but in their absence the following guidelines for minimum number of elevators shall apply:

- (1) At least one elevator sized to accommodate a bed, gurney, and/or medical carts and wheelchair users shall be installed where residents are housed on any floor other than the main entrance floor.
- (2) At least two elevators, one of which shall be of the hospital type, shall be installed where 60 to 200 residents are housed on floors other than the main entrance floor.
- (3) At least three elevators, one of which shall be of the hospital type, shall be installed where 201 to 350 residents are housed on floors other than main entrance floor.
- (4) For facilities with more than 350 residents housed above the main entrance floor, the number of elevators shall be determined from a study of the facility plan and from the estimated vertical transportation requirements.
- (5) When the residential health care facility is part of a general hospital, elevators may be shared and the standards of Section 2.1-8.7.2 shall apply.

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A4.1-8.7.2.2 These standards may be inadequate for moving large numbers of people in a short time; adjustments should be made as appropriate.

4.1 COMMON ELEMENTS FOR RESIDENTIAL HEALTH CARE FACILITIES

4.1-8.7.2.3 Dimensions and clearances

- *(1) Hospital-type elevator cars shall have inside dimensions that accommodate a resident bed with attendants. The minimum clear dimensions for the inside of such cars shall be 5 feet 4 inches (1.62 meters) wide by 8 feet 5 inches (2.43 meters) deep.
- (2) Car doors shall have a clear opening of not less than 3 feet 8 inches (1.12 meters).
- (3) Other elevators required for passenger service shall be constructed to accommodate wheelchairs.

4.1-8.7.2.4 Leveling device. Elevators shall be

equipped with an automatic two-way leveling device with an accuracy of $\pm\frac{1}{4}$ inch (7 millimeters).

4.1-8.7.2.5 Reserved

4.1-8.7.2.6 Installation and testing. Installation and testing of elevators shall comply with ANSI/ASME A17.1 (for new construction) or ANSI/ASME 17.3 (for existing buildings). (See ASCE/SEI 7 for seismic design and control system requirements for elevators.)

4.1-8.7.2.7 Handrails. Elevators shall have handrails on all sides without entrance door(s).

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A4.1-8.7.2.3 (1) Handrail projections of up to 3.5 inches (8.89 centimeters) should not be construed as diminishing the clear inside dimensions. If indicated by the functional program and the PHAMA, at

least one facility elevator should accommodate attending staff and a motorized resident bed 7 feet 6 inches (2.29 meters) in length and/or an expanded capacity width of 4 feet (1.22 meters) for bariatric residents.

Table 4.1-1**Ventilation Requirements for Areas Affecting Resident Care in Nursing Facilities¹**

Area designation	Air movement relationship to adjacent area	Minimum air changes of outdoor air per hour	Minimum total air changes per hour	All air exhausted directly to outdoors ^j	Recirculated by means of room units ^a	Relative humidity ^k (%)	Design temperature ^l (degrees F/C)
KEY: NR—no requirement, N—negative, P—positive							
RESIDENT UNITS							
Resident unit corridor	—	—	4	—	—	—	—
RESIDENT LIVING AREAS							
Personal services (barber/beauty)	N	2	20	Yes	No	—	—
SUPPORT AREAS							
Bathing rooms	N	—	10	Yes	No	—	75 (24)

Note: Lettered footnotes refer to footnotes in Part 6, Table 7-1.

¹ Additional ventilation requirements can be found in Table 7-1 of Part 6 (ANSI/ASHRAE/ASHE 170: *Ventilation of Health Care Facilities*).

Table 4.1-2**Hot Water Use—Nursing Facilities**

	Resident care areas	Dietary	Laundry
Liters per hour per bed ¹	11.9	7.2	7.6
Gallons per hour per bed ¹	3	2	2
Temperature (°Centigrade)	35-43 ²	60 ³	60 ⁴
Temperature (°Fahrenheit)	95-110 ²	140 (min.) ³	140 (min.) ⁴

¹ Quantities indicated for design demand of hot water are for general reference minimums and shall not substitute for accepted engineering design procedures using actual number and types of fixtures to be installed. Design will also be affected by temperatures of cold water used for mixing, length of run and insulation relative to heat loss, etc. As an example, total quantity of hot water needed will be less when temperature available at the outlet is very nearly that of the source tank and the cold water used for tempering is relatively warm.

² The range represents the maximum and minimum allowable temperatures.

³ Provisions shall be made to provide 180°F (82°C) rinse water at warewasher (may be by separate booster) unless a chemical rinse is provided.

⁴ Provisions shall be made to provide 160°F (71°C) hot water at the laundry equipment when needed. (This may be by steam jet or separate booster heater.) However, it is emphasized that this does not imply that all water used would be at this temperature. Water temperatures required for acceptable laundry results will vary according to type of cycle, time of operation, and formula of soap and bleach as well as type and degree of soil. Lower temperatures may be adequate for most procedures in many facilities but higher temperatures should be available when needed for special conditions. Minimum laundry temperatures are for central laundries only.

Table 4.1-3**Minimum Maintained Average Illuminance**

	AMBIENT LIGHT IN		TASK LIGHT IN	
	Lux	Footcandles	Lux	Footcandles
Exterior entrance (night)	100	10		
Interior entry (day)	1000	100		
Interior entry (night)	100	10		
Exit stairways and landings	300	30		
Elevator interiors	300	30		
Exterior walkways	50	5		
Administration (active hours)	300	30	500	50
Active areas (day only)	300	30	500	50
Visitor waiting (day)	300	30		
Visitor waiting (night)	100	10		
Resident room				
Entrance	300	30		
Living room	300	30	750	75
Bedroom	300	30	750	75
Wardrobe/closet	300	30		
Bathroom	300	30		
Makeup/shaving area	300	30	600	60
Shower/bathing rooms	300	30		
Kitchen area	300	30	500	50
Barber/beautician (day)	500	50		
Chapel or quiet area (active hours)	300	30		
Hallways (active hours)	300	30		
Hallways (sleeping hours)	100	10		
Dining (active hours)	500	50		
Medicine preparation	300	30	1000	100
Nurse station (day)	300	30	500	50
Nurse station (night)	100	10	500	50
Physical therapy area (active hours)	300	30	500	50
Occupational therapy (active hours)	300	30	500	50
Examination room (dedicated)	300	30	1000	100
Janitor's closet	300	30		
Laundry (active hours)	300	30	500	50
Clean/soiled utility	300	30		
Commercial kitchen	500	50	1000	100
Food storage (nonrefrigerated)	300	30		
Staff toilet area	200	20	600	60

Notes

1. "Older adults" include persons age 60 years and older and people of all ages with some form of visual impairment.
2. Ambient light levels are minimum averages measured at 30 inches (76 cm) above the floor in a horizontal plane. Task light levels are minimums taken on the visual task. For makeup/shaving, the measurement is to be taken on the face in a vertical position.
3. It should be understood that the values shown are minimums. The optimum solution for task lighting is to give users control over the intensity and positioning of the light source to meet their individual needs.
4. Use of daylight is encouraged in entryways to provide a transition between outside and inside illumination levels.

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4.2 Specific Requirements for Nursing Facilities

Appendix material, which appears in shaded boxes at the bottom of the page, is advisory only.

■ 4.2-1 General

4.2-1.1 Application

4.2-1.1.1 This chapter contains specific requirements for nursing facilities. The requirements described in Chapter 4.1, Common Elements for Residential Health Care Facilities, shall also apply to nursing facilities as referenced in this chapter.

4.2-1.1.2 This chapter covers the continuum of nursing services listed in this section. These services may be provided within freestanding facilities or as distinct parts of a general hospital or other health care facility. The continuum of nursing service and facilities may be distinguished by the levels of care, staff support areas, and service areas provided.

4.2-1.1.2.1 Nursing and skilled nursing facilities

4.2-1.1.2.2 Special care facilities. These include the following:

- (1) Subacute care facilities (Section 4.2-2.2.3.1)
- (2) Alzheimer's and other dementia units (Section 4.2-2.2.3.2)

4.2-1.1.3 Minimum Standards for New Facilities

The text of this chapter represents minimum requirements for new construction and shall not be applied to existing facilities unless major construction renovations (see 1.1-3) are undertaken.

*4.2-1.2 Functional Program

4.2-1.2.1 General

For requirements, see 4.1-1.2 (Functional Program).

4.2-1.2.2 Environment of Care

4.2-1.2.2.1 Flexibility. Nursing facilities shall be designed to provide flexibility in order to meet the changing physical, medical, and psychological needs of their residents.

***4.2-1.2.2.2 Supportive environment.** The facility design shall produce a supportive environment to enhance and extend quality of life for residents and facilitate wayfinding while promoting privacy, dignity, and self-determination.

- (1) The architectural design—through the organization of functional space, the specification of ergonomically appropriate and arranged furniture and equipment, and the selection of details and finishes—shall eliminate as many barriers as possible to effective access and use by residents of all space, services, equipment, and utilities appropriate for daily living.
- (2) Design shall maximize opportunities for ambulation and self-care, socialization, and independence and minimize the negative aspects of an institutional environment.

*4.2-1.2.3 Long-Term Care Space Needs

Although there are similarities in the spatial arrangement of hospitals and nursing facilities, the service requirements of long-term care residents require additional special design considerations.

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A4.2-1.2 The functional program should specify staff distances, staff station locations, and decentralized vs. centralized functions that will directly affect the facility design. Different care models should be evaluated to provide a resident-centered solution; see A4.2-2.2.1.3 (2)(a) and (2)(b).

A4.2-1.2.2.2 Culture change in long-term care should address move-

ment away from an institutional model toward one that is residential in scale, has homelike amenities, facilitates wayfinding, and allows residents and direct care workers to express choice in meaningful ways.

A4.2-1.2.3 When a section of an acute care facility is converted for use as a nursing facility, it may be necessary to reduce the number of beds to provide space for long-term care services.

4.2-1.3 Site

For requirements, see 4.1-1.3.

4.2-1.4 Renovation

For requirements, see 1.1-3.

4.2-1.5 Planning, Design, Construction, and Commissioning

For requirements, see Chapter 1.2.

4.2-1.6 Equipment

For requirements, see Chapter 1.4.

■ 4.2-2 Resident Areas**4.2-2.1 Reserved****4.2-2.2 Resident Unit**

Resident units are groups of resident rooms and support areas whose size and configuration are based on organizational patterns of staffing, functional operations, and communications as provided in the functional program for the facility.

4.2-2.2.1 General**4.2-2.2.1.1 Application**

Each resident unit in a nursing or skilled nursing facility shall comply with the following.

4.2-2.2.1.2 Resident Unit Size

In the absence of local requirements, consideration shall be given to restricting the size of the resident unit to 60 beds or a maximum travel distance from the staff station to a resident room door of 150 feet (45.72 meters).

4.2-2.2.1.3 Layout

- (1) In new construction, resident units shall be arranged to avoid unrelated travel through resident units.
- *(2) Facility layout shall reflect the care model and related staffing described in the functional program.
 - *(a) Clusters. Arranging groups of resident rooms adjacent to decentralized service areas, optional satellite staff work areas, and optional

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A4.2-2.2.1.3 (2) The most effective design is determined when the care model is defined during the functional programming process.

A4.2-2.2.1.3 (2)(a) Clusters and staffing considerations

- a. Clustering refers to several concepts wherein the design of traditional nursing home floor plans (straight halls, double- or single-loaded corridors) is reorganized to provide benefits to both residents and to the effectiveness with which people care for them. Clustering is done to achieve better image, faster service, shorter walking/wheeling distances, and more subtle handling of linen. It can also afford more localized social areas and optional decentralized staff work areas.
- b. A functioning cluster as described here is more than an architectural form where rooms are grouped around social areas without reference to caregiving. In a functioning cluster, the following will be accomplished:
 - Utility placement is better distributed for morning care: Clean and soiled linen rooms are located closer to the resident rooms, minimizing staff steps and maximizing the appearance of corridors (carts are not scattered through halls).
 - Unit scale and appearance reinforces smaller groups of rooms seen as being grouped or related: Clusters should offer identifiable social groups for both staff and older people, thereby reducing the sense of largeness often associated with centralized facilities.

- Geographically effective staffing: The staffing pattern and design reinforce each other so that nursing assistants can offer primary nursing care and relate to a given set of rooms. Their room assignments are grouped together and generally do not require unequal travel distances to basic utilities. Staff “buddying” is possible. Buddying involves sharing responsibilities such as lifting a non-weight-bearing person or covering for someone while the buddy provides off-unit transport or is on a break.
- Staffing that works as well at night as during the day: An effective cluster design incorporates multiple staffing ratios. A unit might have 42 beds, but with clustering, could staff effectively in various ratios of licensed nurses to nurses assistants: 1:7 days (six clusters); 1:14 or 1:21 nights (three or two neighborhoods).
- c. Clustering can also have some other benefits:
 - Cluster design can provide more efficient “gross/net area” when a variety of single and/or double rooms are “nested.”
 - Cluster design can be useful when a project is to have a high proportion of private occupancy rooms, because it reduces distances to staff work areas or nursing stations.
 - Clusters provide a method of distributing nursing staff through a building, nearer to bedrooms at night, so they can be responsive to vocal calls for assistance and toileting. (Central placement of staff requires greater skill in using traditional call systems than many residents possess.)

decentralized resident support areas shall be permitted.

- *(b) Household models. Arranging resident rooms within a residentially scaled “home” or “household” that is located within a larger facility or is freestanding—including a residentially scaled kitchen and living room in conjunction with a reorganization of staff to provide resident-centered care—shall be permitted.

4.2-2.2.2 Resident Room

Each resident room shall meet the following requirements:

APPENDIX (continued)

- Cluster units of a given size may “stack” or be placed over each other, but might have different staffing for varying care levels.
- If digital call systems are used (such as those allowing reprogramming of what room reports to which zone or nursing assistant’s work area), then one unit might easily be changed over time, such as when client needs justify higher ratios of nursing assistants to older people. For example, a 48-bed unit might start at 1:8 staffing but also respond to 1:6 staffing needs. In some units, staffing might also be slightly uneven, such as where 60-bed units are comprised of clusters of 1:7 and 1:8 during days.

d. Architectural form and clustering: Clusters involve architectural form and may have an impact on overall building shape.

- The longer length of stay of nursing home residents compared with hospital clients is one factor that makes clustering rooms in more residential groups particularly appropriate. However, the visual advantages of units without long corridors has also attracted hospital planners. In both facility types, architectural clustering may help both staff and residents socially identify a space or sub-unit within a larger unit.
- Though architectural clustering may involve grouping rooms, this should not result in windowless social areas, or the incorporation of all social options in a windowless social area directly outside of the bedroom doorways.

A4.2-2.2.1.3 (2)(b) Nursing household models and staffing considerations. Nursing households use resident-centered care models that achieve deinstitutionalization by changing the philosophy of care, creating a household-scale environment, and adopting a resident-centered organizational structure through use of team-based management and changes in staff roles and responsibilities. The goal is to create a small community of residents who consider the nursing household their home and are supported by staff members specially trained in this philosophy of care.

Nursing households are one approach to accomplishing clustering as described in A4.2-2.2.1.3 (2)(a). The purpose behind the nursing

*4.2-2.2.2.1 Capacity

In new construction and renovations, maximum room occupancy shall be two residents.

Where renovation work is undertaken and the present capacity is more than two residents, maximum room capacity shall be no more than the present capacity with a maximum of four residents.

*4.2-2.2.2.2 Space requirements

- (1) Area and dimensions. The area and dimensions of each resident space shall be based on provision of the following:

households (whether stand-alone or connected) is to provide residentially scaled spaces with familiar, homelike environments (e.g., a kitchen, dining room, and living room).

Nursing households are created to allow residents freedom of movement by providing safe spaces in all areas of the house or household. They are designed to support and maximize function and habilitation by incorporating short walking distances.

Nursing households are self-contained and functionally independent, with all activities of daily living provided in each household. Support services may be provided within the household or in a larger organizational structure.

The design of nursing households varies. Such a facility can be single-story or multistoried, stand-alone or linked with other households. It can be an add-on or replacement to an existing nursing home or part of the campus of a continuing care retirement community (CCRC). Clusters of houses can also be embedded in residential neighborhoods in the community. Residents are provided a great degree of privacy and control of their environment, which may include private rooms and baths. Optimally, access to safe outdoor space is provided.

Additional information is available from the National Alliance of Small Houses: www.smallhousealliance.org.

A4.2-2.2.2.1 Changes to the maximum number of residents per room may be made upon a determination by the authority having jurisdiction that such an alternate room configuration provides a preferable environment for residents with unusual care requirements. Single resident rooms with an individual toilet room are encouraged. In two-bed rooms, consideration should be given to creating room configurations that maximize individual resident privacy, access to windows, room controls, and equivalent space.

A4.2-2.2.2.2 To facilitate planning for minimum clearances around beds, bed type and size should be established as part of the functional program. As acceptable to authorities having jurisdiction, bed placement should be chosen to satisfy the needs and desires of individual residents.

4.2 SPECIFIC REQUIREMENTS FOR NURSING FACILITIES

- (a) The ability to accommodate bed locations, including one where staff members have access to the bed on three sides
 - (b) A window accessible from a wheelchair
 - (c) A wardrobe or a closet accessible from a wheelchair
 - (d) A bed, lounge chair, dresser, nightstand, and side chair, all accessible from a wheelchair
 - (e) Direct access from the room entry to the toilet room, closet or wardrobe, and window, without going through the living space of another resident
 - *(f) Clearance for staff members to use lifting equipment to access the bed, chairs, and toilet
- (2) Every bed location shall have sufficient space to permit placement of a stretcher along one side for lateral transfer of the resident from the bed to the stretcher by at least two staff members without substantial rearrangement of furniture.
- (3) Clearances
- (a) In multiple-bed rooms, clearance shall allow for the movement of beds and equipment without disturbing residents.
 - (b) Clear access to one side of the bed shall be provided along 75 percent of its length.
 - (c) Mechanical and fixed equipment shall not obstruct access to any required element.

- (d) These guidelines shall allow arrangement of furniture that may reduce these access provisions, without impairing access provisions for other occupants.

4.2-2.2.2.3 Window

- (1) For common requirements, see 4.1-2.2.2.3.
- (2) In renovated construction, beds shall be no more than two deep from windows.

4.2-2.2.2.4 Resident privacy

- (1) For common requirements, see 4.1-2.2.2.4.
- (2) In multi-bed rooms, each resident shall be provided the opportunity for visual privacy from the other resident.

4.2-2.2.2.5 Hand-washing station. For requirements, see 4.1-2.2.2.5.

4.2-2.2.2.6 Toilet room. For requirements, see 4.1-2.2.2.6.

4.2-2.2.2.7 Resident storage. For requirements, see 4.1-2.2.2.7.

4.2-2.2.2.8 Resident bathing facilities. For requirements, see 4.1-2.2.2.8.

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A4.2-2.2.2.2 (1)(f) Although the use of portable lifting equipment requires more clearance for maneuvering than fixed lifting equipment, using fixed equipment does not eliminate the need for portable equipment. Portable equipment will be required if a resident falls out of range of a fixed lift or requires a sit-to-stand lift.

Using portable lifting equipment without powered wheels to move a resident laterally requires more exertion by staff than using fixed equipment; in addition, the exertion required increases with carpet. However, various types of carpet construction and materials differ in their resistance to wheeled devices, and carpet has significant advantages over hard-surface flooring in noise reduction and residential appearance, both of which are important in creating a comfortable, attractive living environment. See Section 4.1-7.2 (Architectural Details, Surfaces, and Furnishings).

Resident rooms and associated toilets may be equipped with ceiling-mounted track to accommodate ceiling-mounted mobility and lifting devices. The track layout should be designed to aid in maintaining or improving resident mobility and ambulation, independent function, and strength as well as to help staff members transfer residents to or

from bed/chair/toilet/bathing facilities/stretcher, etc., or reposition them in bed or a chair.

The design of ceiling track, lifting devices, and support vests and slings is evolving as use of this technology increases in nursing facilities. One objective in using ceiling systems should be to assist residents who do not have good balance or are unable to bear all of their weight to stand and ambulate throughout the room. A second objective should be to maximize resident choice and control of bed location and room arrangement, key factors in creating "home" for the resident.

A way to meet these objectives is to install permanent tracks the full length of two sides of the room with a perpendicular spur that extends into the toilet room over the toilet and into a shower, if provided. With this basic layout, when residents requiring mobility or transfer assistance move to a room, a cross track and lift device can be installed for the duration of their stay. This approach would make all areas of the room accessible to the lifting device, thereby offering the resident a variety of room arrangements and substantially reducing the need for a portable lift.

4.2-2.2.2.9 Medical gases. For requirements, see 4.1-2.2.2.9.

4.2-2.2.3 Special Care Facilities

*4.2-2.2.3.1 Subacute care facilities

4.2-2.2.3.2 Alzheimer's and other dementia units

- * (1) Safety. Safety concerns must be emphasized because of poor judgment inherent in those with dementia:
 - (a) Hazard avoidance. Areas or pieces of furniture that could be hazardous to these residents shall be eliminated or designed to minimize possible accidents.
 - (b) Doors. Resident security shall be addressed through systems that secure the unit and comply with life safety codes. Should the functional program (see 1.2-2) justify limiting the

movements of any resident(s) for their safety, any door locking arrangements shall be in full compliance with applicable requirements of NFPA 101. A secure unit shall contain appropriate activity area(s), dining, bathing, soiled linen/utility, and staff work area.

- * (2) Outdoor space. Secure outdoor gardens and lounge areas shall be available for residents of the Alzheimer's/dementia resident unit.
- * (3) Activity space. Activity spaces shall be provided for resident use in dementia programs.
- (4) Window. Operable windows shall be permitted and shall comply with Section 4.1-7.2.2.5.

*4.2-2.2.3.3 Pediatric facilities

- * (1) Functional program

APPENDIX

A4.2-2.2.3.1 Subacute care facilities. Since subacute care comprises programs in various settings, the design of such units/facilities should focus on two major components:

- a. The unit/facility should comply with all applicable nursing home requirements contained in this chapter to the extent these do not conflict with the clinical program.
- b. The facility/unit should comply with the requirements dictated by the functional program.

A4.2-2.2.3.2 (1) The latest edition of the *Life Safety Code* recognizes the need to lock doors in Alzheimer's units. Consideration should be given to making locks on wardrobes, closets, or cupboards inconspicuous.

A4.2-2.2.3.2 (2) Outdoor spaces may include gardens on grade or on roof decks, or solaria, porches, balconies, etc. Lounge space may be a winterized sun room, a designated lounge space separate from the dining room, or a day room, where other residents may be sitting. Secure, accessible outdoor space can provide a calming change in environment and also a convenient place for agitated residents to walk.

A4.2-2.2.3.2 (3) Major characteristics of persons with Alzheimer's and other dementias are lack of attention span and an inability to orient themselves within space. The environment should provide attention-grabbing landmarks and wayfinding cues and information to aid in navigation from point to point. Sensory cuing used in other long-term care resident areas should also be incorporated for persons with dementia. Dementia program activities may include memory stimulation, music therapy, art therapy, horticultural therapy, etc. Dining and activity space in dedicated dementia units may be provided within the unit or in a location directly accessible to the residents of the unit per the minimum

standards described elsewhere in Chapters 4.1 and 4.2. Consideration should be given to:

- a. Landmarks. Design elements can provide clear reference points in the environment (e.g., a room, a large three-dimensional object, large picture, or other wall-mounted artifact).
- b. Signs. When appropriate, large characters and redundant word/picture combinations should be used on signs.
- c. Environmental design challenge. Residents with mental impairment often find it difficult to sit for long periods or to sit at all without becoming restless. Although it is not a universal trait, it is so common and requires so much staff time that environmental solutions should be explored in all areas to give cognitively impaired people interesting places and things on which to focus their attention.

A4.2-2.2.3.3 The unique characteristics of long-term pediatric nursing care can have a significant impact on facility planning and design. The potential age range of pediatric residents creates different needs than those of adult residents. Daily care activities are likely to be more intense, while continuing social development and maturity present different privacy considerations than those in a geriatric setting. The number of children in a room is related less to an individual resident's privacy needs and more to efficient and appropriate staff access and monitoring.

A4.2-2.2.3.3 (1) Pediatric long-term care stakeholders include the children, the families, and the staff. Residences (long-term care) that group children by age cohort and create an environment of care that focuses on the specific needs of children of those ages enhance the children's functionality. While there is a disease state for the child (either progressive or static), the development of the child continues. Family-centered care models and other forms of culture change are often implemented in pediatric long-term care facilities.

4.2 SPECIFIC REQUIREMENTS FOR NURSING FACILITIES

*(2) Space requirements

- (a) Resident rooms shall provide spatial considerations for overnight accommodations for family.
- (b) Adequate space shall be provided for enhanced staffing, close observation, and equipment as identified by the functional program.
- (c) Indoor and outdoor activity space shall be designed with consideration of resident and family culture, age cohorts, and age-appropriate activities and needs.

(3) Privacy. Privacy shall be provided for family members and child.

4.2-2.2.3.4 Bariatric facilities. As required by the functional program, the facility shall provide bariatric resident rooms.

4.2-2.2.4 Special Resident Rooms

*4.2-2.2.4.1 Isolation room

4.2-2.2.5 Support Areas for Patient Care— General

For requirements, see 4.1-2.2.5.

4.2-2.2.6 Support Areas for the Resident Unit

For requirements, see 4.1-2.2.6.

4.2-2.2.7 Support Areas for Staff

4.2-2.2.7.1 Staff lounge area. For requirements, see 4.1-2.2.7.1.

***4.2-2.2.7.2 Staff storage.** For requirements, see 4.1-2.2.7.2.

4.2-2.2.7.3 Toilet room. For requirements, see 4.1-2.2.7.3.

4.2-2.2.8 Support Areas for Residents

For requirements, see 4.1-2.2.8.

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A4.2-2.2.3.3 (2) In comparison to what is required by the typical geriatric facility, pediatric long-term care facilities often require additional equipment and more intensive staffing and observation. As well, parent/family involvement tends to be more frequent in pediatric facilities, requiring rooms designed to accommodate family participation in direct care in addition to privacy in visiting.

Due to the potential age range and length of stay of pediatric residents, functional and space needs vary significantly from those of adult residents, also affecting space needs for these facilities. Daily care activities are likely to be more involved from a functional perspective, while continuing social development and physical/mental maturity require a physical plant that is flexible to accommodate the pediatric resident's evolving needs. The number of children in a room is related to the individual resident's need for privacy as well as efficient and appropriate staff access, monitoring, and care.

Because of the varying age and degree of socialization of pediatric patients, room capacities range from four infants/toddlers requiring heavy nursing care in a single room to more private accommodations for adolescents. All resident rooms must accommodate the direct care activities of enhanced staffing as well as the likelihood of an increased family presence.

The various functional and physical abilities of this diverse population must be taken into account when designing facilities for toileting and bathing.

A4.2-2.2.4.1 Isolation room. Isolation rooms are not addressed in the main text of 4.2-2.2 (Resident Unit), although they receive considerable attention in some state regulations. Sample regulatory text includes the following:

- a. Isolation rooms shall be provided at the rate of not less than one private bedroom per 50 beds or major fraction thereof for the isolation of residents suffering from infectious diseases as defined by the Centers for Disease Control and Prevention (CDC). The bedroom shall meet all of the requirements for bedrooms as previously stated in these regulations. Isolation bedrooms may be used to provide for the special care of residents who develop acute illnesses, residents who have personality problems, or residents in terminal phases of illness. If central heating/cooling is provided, the air from the room shall be exhausted directly to the outside.
- b. Isolation rooms in nursing facilities shall have a lavatory within the room or within a private toilet.

A4.2-2.2.7.2 In cluster design, locating the locked storage close to the work area increases its accessibility to staff and reduces the need for clothing lockers.

4.2-2.3 Resident Living Areas

4.2-2.3.1 General

For new construction and renovation, resident communal areas shall be designed and furnished to encourage resident use. **Note:** Nothing in these Guidelines is intended to restrict a facility from providing additional square footage per resident beyond what is required herein for dining rooms, activity areas, and similar spaces.

4.2-2.3.2 Resident Dining and Recreation Areas

For requirements, see 4.1-2.3.2.

*4.2-2.3.3 Activity Areas

4.2-2.3.3.1 Space requirements. If required by the functional program, the minimum requirements for new construction shall include the following.

4.2-2.3.3.2 Activity spaces. Space and equipment shall be provided for carrying out each of the activities defined in the functional program.

4.2-2.3.3.3 Small group activity space. A space for small group and “one-on-one” activities shall be readily accessible to the residents.

***4.2-2.3.3.4 Activity storage.** Storage for large items used for large group activities (e.g., recreation materials and exercise equipment; supplies for religious services) shall be placed near the location of the planned activity and at the point of first use.

4.2-2.3.3.5 Resident toilet room. Toilet room(s) that are convenient to activity spaces shall be provided for residents.

4.2-2.3.4 Personal Services (Barber/Beauty) Areas

For requirements, see 4.1-2.3.4.

*4.2-2.3.5 Resident Outdoor Area

Access to outdoor areas shall be provided in accordance with the functional program.

■ 4.2-3 Diagnostic and Treatment Locations

*4.2-3.1 Rehabilitation Therapy

For requirements, see 4.1-3.1 (Physical/Occupational Therapy Provisions).

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A4.2-2.3.3 Activity programs focus on the social, spiritual, and creative needs of residents and clients and provide quality, meaningful experiences for them. These programs may be facility-wide or for smaller groups.

If included in the functional program, the activity department is generally responsible for coordination of activities for large groups as well as small groups and personalized individual programs involving one resident and one therapist. These activities may be conducted in other portions of the building (e.g., dining rooms, recreation spaces, lounges, etc.), but dedicated spaces are preferred for efficient operation of quality programs. Large space requirements (e.g., libraries, chapels, auditoriums, and conference, classroom, and/or training spaces) depend upon the programming decisions of the sponsors as reflected in the functional program for the facility.

A4.2-2.3.3.4 If required by the functional program, include space for files, records, computers, and administrative activities; a storage space for supplies and equipment; and a quiet space for residents to maximize conversations. This quiet space may be incorporated within space for

administrative activities. **Note:** Hearing loss in the elderly is well documented. Quiet space is very important to enable conversation.

A4.2-2.3.5 Outdoor areas should be within reasonable proximity to the building; allow for direct staff observation; include seating, nonglare surfaces, and shade; and be appropriate for the resident type being served per the functional program and regional location. Outdoor areas should have the following:

- a. Shaded and sheltered areas
- b. Accessible walking surfaces that are firm and stable
- c. Space and outdoor furniture with flexibility in arrangement to accommodate residents who use wheelchairs and mobility aids
- d. Shrubs, natural foliage, and trees

A4.2-3.1 Rehabilitation Therapy

For many nursing homes, the Medicare-funded short-stay rehabilitation program is a sufficiently large income source that a separate section of the facility is renovated to be strictly dedicated to short-term rehab residents. These successful programs separate short-stay residents from the general nursing home population, often with a separate entrance.

■ 4.2-4 Patient Support Services

4.2-4.1 Reserved

4.2-4.2 Reserved

4.2-4.3 Dietary Facilities

4.2-4.3.1 General

4.2-4.3.1.1 Food service facilities and equipment shall conform to these standards and other applicable food and sanitation codes and standards.

4.2-4.3.1.2 Facilities and equipment for provision of food service shall be provided.

4.2-4.3.1.3 Food receiving, storage, and preparation areas shall facilitate quality control.

4.2-4.3.1.4 Provision shall be made for transport of hot and cold foods as required by the functional program.

4.2-4.3.1.5 Separate dining areas shall be provided for staff and for residents.

4.2-4.3.1.6 The design and location of dining facilities shall encourage resident use.

4.2-4.3.1.7 Facilities shall be furnished to provide nourishment and snacks between scheduled meal service.

4.2-4.3.1.8 The dietary facility shall be easy to clean and maintain in a sanitary condition.

4.2-4.3.2 Functional Elements

If the dietary department is on-site, the following facil-

ities, in the size and number appropriate for the type of food service selected, shall be provided:

4.2-4.3.2.1 Control station. A control station shall be provided for receiving and controlling food supplies.

4.2-4.3.2.2 Hand-washing station(s). Hand-washing station(s) shall be located in the food preparation area.

4.2-4.3.2.3 Food preparation facilities. These facilities shall be provided to accommodate the method of food preparation specified in the functional program.

- (1) Conventional food preparation systems require space and equipment for preparing, cooking, and baking.
- (2) Convenience food service systems using frozen prepared meals, bulk packaged entrees, individual packaged portions, or those using contractual commissary services require space and equipment for thawing, portioning, cooking, and baking.

4.2-4.3.2.4 Ice-making facilities. These may be located in the food preparation area or in a separate room. They shall be easily cleanable and convenient to the dietary function.

4.2-4.3.2.5 Assembly and distribution. Facilities for assembly and distribution of resident meals shall be provided.

4.2-4.3.2.6 Ware-washing space. Ware-washing space shall be provided in a room or an alcove separate from the food preparation and serving area.

- (1) Commercial-type ware-washing equipment shall be provided.
- (2) Space shall be provided for receiving, scraping, sorting, and stacking soiled tableware and for transferring clean tableware to the using areas.

APPENDIX (continued)

Resident rooms in this area should be designed for privacy and provide amenities similar to a motel room. Many successful facilities are providing separate counter space in the bedroom complete with sink, refrigerator, and microwave.

If a microwave and refrigerator are not provided in the individual resident room, it is important to follow the guidelines for providing a nourishment station located within the rehab space.

Dining space for short-stay residents should be segregated from the main nursing home dining room, and consideration should be given to providing space for in-room dining.

The typical short-stay resident does not want the stigma of being part of the nursing home population, so every attempt should be made to create a convenient space where rehabilitation therapy can take place close to the resident sleeping rooms.

- (3) Convenient hand-washing stations shall be provided.

4.2-4.3.2.7 Pot-washing facilities

4.2-4.3.3 Support Areas for Dietary Facilities

4.2-4.3.3.1 Offices(s). Office(s) or desk spaces for dietitian(s) and/or a dietary service manager

4.2-4.3.3.2 Storage. The following shall be provided:

- (1) Food storage space, including cold storage
- (2) Storage areas and sanitizing facilities for cans, carts, and mobile-tray conveyors
- (3) Waste, storage, and recycling facilities (per local requirements) located accessible to the outside for direct pickup or disposal

4.2-4.3.3.3 Environmental services room. An environmental services room shall be located within the dietary department. It shall include a floor receptor or service sink and storage space for housekeeping equipment and supplies.

4.2-4.3.4 Support Areas for Staff

4.2-4.3.4.1 Staff toilet. Toilet for dietary staff shall be provided convenient to the kitchen area.

■ 4.2-5 General Support Services and Facilities

4.2-5.1 Reserved

4.2-5.2 Linen Services

4.2-5.2.1 General

Each facility shall have provisions for storing and processing clean and soiled/contaminated linen for resident care. Processing may be done within the facility, in a separate building on- or off-site, or in a commer-

cial or shared laundry. At a minimum, the following elements shall be included:

4.2-5.2.2 Laundry Facility

4.2-5.2.2.1 General

- (1) Layout. Equipment shall be arranged to permit an orderly work flow and minimize cross-traffic that might mix clean and soiled operations.
- (2) If linen is processed in a laundry facility within the facility, the following shall be provided:

4.2-5.2.2.2 Receiving, holding, and sorting room. A receiving, holding, and sorting room shall be provided for control and distribution of soiled linen. Discharge from soiled linen chutes may be received within this room or in a separate room adjacent to it.

4.2-5.2.2.3 Washers/extractors. Washers/extractors shall be located between the soiled linen receiving and clean processing areas.

4.2-5.2.2.4 Supply storage. Storage shall be provided for laundry supplies.

4.2-5.2.2.5 Inspection and mending area. An area shall be provided for linen inspection and mending.

4.2-5.2.3 Support Areas for Internal Processing

4.2-5.2.3.1 Soiled holding room(s). Separate central or decentralized room(s) shall be provided for receiving and holding soiled linen for pickup or processing.

- (1) Such room(s) shall have proper ventilation and exhaust.
- (2) Discharge from soiled linen chutes shall be received in this room or in a separate room, as required by the local authority having jurisdiction.
- (3) Such room(s) used for processing shall be provided with a deep sink for soaking and/or a flushing-rim sink as required by the functional program.

4.2-5.2.3.2 Central clean linen storage. A central clean linen storage and issuing room(s) shall be provided in addition to the linen storage required at individual resident units.

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A4.2-4.3.3.2 (1) Facilities in remote areas may require proportionally more food storage facilities.

4.2 SPECIFIC REQUIREMENTS FOR NURSING FACILITIES

4.2-5.2.3.3 Linen carts

- (1) Storage. Provisions shall be made for parking of clean and soiled linen carts separately and out of traffic.
- (2) Cleaning. Provisions shall be made for cleaning of linen carts on premises (or exchange of carts off premises).

4.2-5.2.3.4 Hand-washing stations. Hand-washing stations shall be provided in each area where unbagged, soiled linen is handled.

4.2-5.2.4 Support Areas for Off-Site Processing

If linen is processed off-site or in a separate building on-site, the following shall be provided:

4.2-5.2.4.1 Service entrance. A service entrance, protected from inclement weather, for loading and unloading of linen. This can be shared with other services and serve as the loading dock for the facility.

4.2-5.2.4.2 Control station. A control station for pickup and receiving shall be provided. This can be shared with other services and serve as the receiving and pickup point for the facility.

4.2-5.3 Reserved

4.2-5.4 Waste Management Facilities

For requirements, see 4.1-5.4.

4.2-5.5 Environmental Services

4.2-5.5.1 Environmental Services Rooms

4.2-5.5.1.1 Location. Environmental services rooms shall be provided throughout the facility as required to maintain a clean and sanitary environment.

4.2-5.5.1.2 Number. At least one environmental services room shall be provided for each floor.

4.2-5.5.1.3 Facility requirements. Each environmental services room shall contain a floor receptor or service sink and storage space for housekeeping equipment and supplies.

4.2-5.6 Engineering and Maintenance Services

For requirements, see 4.1-5.6.

■ 4.2-6 Public and Administrative Areas

The following shall be provided:

4.2-6.1 Public Areas

4.2-6.1.1 Vehicular Drop-Off and Pedestrian Entrance

This shall be at grade level, sheltered from inclement weather, and accessible to the disabled.

4.2-6.1.2 Administrative/Public Lobby Area

This shall include the following:

4.2-6.1.2.1 A counter or desk for reception and information

4.2-6.1.2.2 Public waiting area(s)

4.2-6.1.2.3 Public toilet facilities

4.2-6.1.2.4 Public telephone(s)

4.2-6.1.2.5 Provisions for drinking water

4.2-6.2 Administrative Areas

4.2-6.2.1 General or Individual Office

4.2-6.2.1.1 Office(s) shall be provided for business transactions, admissions, social services, medical and financial records, and administrative and professional staff. Provisions for private interviews shall be included.

4.2-6.2.1.2 Space for clerical files and staff office space shall be provided as required by the functional program.

4.2-6.2.2 Multipurpose Room(s)

A multipurpose room for conferences, meetings, and health education purposes shall be provided as

required by the functional program; it shall include provisions for the use of visual aids. One multipurpose room may be shared by several services.

4.2-6.2.3 Supply Room

Space for storage of office equipment and supplies shall be provided as required by the functional program.

■ **4.2-7 Design and Construction Requirements**

For requirements, see 4.1-7.

■ **4.2-8 Building Systems**

For building system, requirements, see 4.1-8.

4.3 Specific Requirements for Hospice Facilities

Appendix material, which appears in shaded boxes at the bottom of the page, is advisory only.

■ 4.3-1 General

Hospice care is a medically directed, interdisciplinary program of palliative care and services for terminally ill individuals and their family members or significant others. Hospice care supports terminally ill persons through the dying process with a focus on maintaining dignity and quality of life while providing palliation or controlling unpleasant symptoms to the extent possible. Hospice care is provided by a team of professionals that may include nurses, social workers, certified nursing assistants, dietitians, therapists, volunteers, and clergy as well as physicians who may visit on a scheduled basis or in response to a crisis. No curative interventions are used. Inpatient hospices are part of a continuum of palliative care. They have been developed as new facilities and through renovation.

4.3-1.1 Application

This chapter shall apply to inpatient freestanding hospice facilities. At the discretion of the authority having jurisdiction, the design concepts presented herein may be applied to a hospice located in other health care facilities.

4.3-1.2 Functional Program

For requirements, see 4.1-1.2.

4.3-1.3 Site

For requirements, see 4.1-1.3.

4.3-1.4 Renovation

For requirements, see 1.1-3.

4.3-1.5 Planning, Design, Construction, and Commissioning

For requirements, see Chapter 1.2.

4.3-1.6 Equipment

For requirements, see Chapter 1.4.

■ 4.3-2 Hospice Areas

4.3-2.1 General

Each hospice facility shall comply with the requirements in 4.3-2.

4.3-2.2 Hospice Unit

*4.3-2.2.1 General

In the absence of local requirements, consideration shall be given to restricting the size of the care unit to 25 beds.

4.3-2.2.2 Resident Room

Each resident room shall meet the following requirements:

4.3-2.2.2.1 Capacity. Maximum room occupancy shall be one resident unless justified by the functional program and approved by the licensing authority. In no case shall bedrooms exceed two resident beds. For requirements, see 4.1-2.2.

4.3-2.2.2.2 Space requirements. Room size shall be based on the program of care, distinctive in-room furniture, and clothing storage requirements.

- (1) If consistent with the functional program, accommodation for dining shall be provided in the resident room.
- (2) Seating for visitors, with provision for at least one sleeping accommodation in resident rooms, shall be provided.

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A4.3-2.2.1 Overwhelming fatigue is the most predominant complaint of hospice residents. Use of assistive devices is often humiliating for residents. Arranging groups of resident rooms adjacent to decentralized service areas, optional satellite staff work areas, and optional decentralized resident support areas is desirable.

4.3 SPECIFIC REQUIREMENTS FOR HOSPICE FACILITIES

(3) Access shall be provided to both sides of the resident bed.

***4.3-2.2.2.3 Windows.** For requirements, see 4.1-2.2.2.3 and 4.1-7.2.2.5.

4.3-2.2.2.4 Resident privacy. For requirements, see 4.1-2.2.2.4.

4.3-2.2.2.5 Hand-washing station. For requirements, see 4.1-2.2.2.5.

4.3-2.2.2.6 Toilet room. For requirements, see 4.1-2.2.2.6.

4.3-2.2.2.7 Resident storage. For requirements, see 4.1-2.2.2.7.

4.3-2.2.2.8 Resident bathing facilities. When the functional program calls for resident bathing facilities, see 4.1-2.2.2.8 for requirements.

4.3-2.2.2.9 Safety. For requirements, see 4.2-2.2.3.2 (1) (Alzheimer's and other dementia units—Safety).

4.3-2.2.3 Reserved

4.3-2.2.4 Special Patient Care Areas

4.3-2.2.4.1 Airborne infection isolation room. The need for and number of required airborne infection isolation room(s) shall be determined by an infection control risk assessment. Where required, the airborne infection isolation room(s) shall comply with the general requirements of Section 2.1-2.4.2.

4.3-2.2.5 Support Areas for Resident Care—General

Support areas shall be provided according to 4.1-2.2.5 when required by the functional program.

4.3-2.2.6 Support Areas for Hospice Units

Support areas shall be provided according to 4.1-2.2.6 when required by the functional program.

4.3-2.2.7 Support Areas for Staff

Support areas shall be provided according to 4.1-2.2.7 when required by the functional program.

4.3-2.2.8 Support Areas for Residents

Support areas shall be provided according to 4.1-2.2.8 when required by the functional program.

4.3-2.3 Resident Living Areas

4.3-2.3.1 Reserved

4.3-2.3.2 Resident Dining and Kitchen Areas

4.3-2.3.2.1 For dining area requirements, see 4.1-2.3.2.1 (General) and 4.1-2.3.2.2 (Dining areas).

4.3-2.3.2.2 Where locally allowed, residential “home-like” kitchen and dining facilities shall be permitted to accommodate residents and their visitors.

4.3-2.3.3 Reserved

4.3-2.3.4 Personal Services (Barber/Beauty) Areas

If these services are required by the functional program, see 4.1-2.3.4 for requirements.

*4.3-2.3.5 Resident Outdoor Spaces

Outdoor areas shall be available for residents.

■ 4.3-3 Diagnostic and Treatment Locations

4.3-3.1 Rehabilitation Therapy

If these services are required by the functional program

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A4.3-2.2.2.3 Exterior windows should provide views to the natural environment and light when possible. Residents who are confined to their beds need a venue for visual stimulation. Plantings and other attempts to provide objects of visual interest should be made when exterior views of the natural environment are not possible due to existing building adjacencies.

A4.3-2.3.5 Due to the significant benefits of the natural environment, consideration should be given to providing access to the outdoors. Accessible outdoor space can provide a calming change in environment and also a convenient place for agitated or anxious patients to walk. Furthermore, gardens symbolize the full cycle of life and death and can be a source of serenity and spiritual calm.

to maximize current levels of resident function, see 4.1-3.1.

■ 4.3-4 Patient Support Services

4.3-4.1 Reserved

4.3-4.2 Reserved

4.3-4.3 Dietary Facilities

The following facilities shall be provided:

4.3-4.3.1 Food Preparation Facilities

4.3-4.3.1.1 If food preparation is provided on site, the facility shall dedicate space and equipment for the preparation of meals.

4.3-4.3.1.2 The physical environment for food service and food service equipment shall comply with locally adopted food and sanitary regulations.

4.3-4.3.2 Ice-Making Facilities

These may be located in the food preparation area or in a separate room and shall be easily cleanable and convenient to the dietary function.

4.3-4.3.2.1 Ice-making facilities shall be self-dispensing if available for use by residents and/or visitors.

4.3-4.3.2.2 Ice-making facilities under the control of the dietary staff and not available for use by residents and/or visitors may be bin type or self-dispensing.

4.3-4.3.3 Distribution

Provision shall be made for transport of hot and cold foods, as required by the functional program.

4.3-4.3.4 Dining Areas

4.3-4.3.4.1 The design and location of dining facilities shall encourage resident use.

4.3-4.3.4.2 Separate dining areas shall be provided for staff and residents.

■ 4.3-5 Reserved

■ 4.3-6 Reserved

■ 4.3-7 Design and Construction Requirements

4.3-7.1 Building Codes and Standards

See 1.1-7.

4.3-7.2 Architectural Details, Surfaces, and Furnishings

For requirements, see 4.1-7.2.

■ 4.3-8 Building Systems

4.3-8.1 Reserved

4.3-8.2 Heating, Ventilation, and Air-Conditioning (HVAC) Systems

For requirements, see 4.1-8.2.

4.3-8.3 Electrical Systems

For requirements, see 4.1-8.3.

4.3-8.4 Plumbing Systems

For requirements, see 4.1-8.4.

4.3-8.5 Communications Systems

For requirements, see 4.1-8.5.

4.3-8.6 Electronic Safety and Security Systems

4.3-8.6.1 Fire Alarm System

For requirements, see 4.1-8.6.

4.4 Specific Requirement for Assisted Living Facilities

Appendix material, which appears in shaded boxes at the bottom of the page, is advisory only.

■ *4.4-1 General

4.4-1.1 Application

4.4-1.1.1 This chapter contains specific requirements for assisted living facilities. The requirements described in Chapter 4.1, Common Elements for Residential Health Care Facilities, shall also apply to assisted living facilities as referenced in this chapter.

4.4-1.1.2 For the purposes of this chapter, assisted living facilities are a vital and growing component of the continuum of care, providing a supportive residential environment for consumer-directed services.

4.4-1.1.3 Minimum Standards for New Facilities

4.4-1.1.3.1 This chapter acknowledges that the many resident-driven variations of assisted living facilities that can be found represent the programmatic needs and preferences of the individuals who choose to live in them. Therefore, the requirements and recommendations contained herein are intended to represent base-level standards that will ensure the safety, accessibility, and residential aspects of all assisted living facilities.

4.4-1.1.3.2 This chapter identifies the minimum requirements for assisted living facilities and recognizes various configurations of assisted living facilities, which must comply with applicable state and local requirements. Acknowledging that occupancy and building construction requirements vary among jurisdictions, it

is the intent of this chapter to establish minimal standards for safety and accessibility for a residential care environment, regardless of facility scope and scale. The common goal of this chapter and individual local and state requirements is to facilitate accountability as well as protection of the consumer.

4.4-1.2 Functional Program

4.4-1.2.1 General

The sponsor of each project shall provide a functional program that defines the scope and scale of the facility, facilitates the application of licensure and occupancy approvals by authorities having jurisdiction, and addresses applicable provisions of this chapter. See Section 1.2-2 for additional information about the functional program.

4.4-1.2.2 Environment of Care

For general requirements, see Chapter 1.2.

4.4-1.2.2.1 Supportive environment

- (1) Assisted living facilities are unique in that services provided are in large part driven by the service needs and lifestyle preferences of the residents being served. The architectural environment shall support these services and levels of care provided within the facility.
- (2) Assisted living facilities shall be designed and constructed to provide a supportive residential environment that is conducive to day-to-day activities consistent with the cultural, emotional,

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A4.4-1 Assisted living facilities can be very different from one state to another and within each state. In some states, the building itself is not licensed; rather, the entity that provides services is licensed. In addition, the design of assisted living facilities varies, taking into consideration cultural, geographic, socioeconomic, and ethnic differences.

Assisted living facilities provide care for individuals who may need or desire assistance with medications and activities of daily living (e.g.,

eating, bathing, dressing, toileting, and ambulating). Some facilities care only for people requiring minimal assistance, while others may offer more intensive services, including dementia-specific care. The design and construction of assisted living facilities, as much as possible, should reflect the needs and preferences of the individuals who reside in the facility.

4.4 SPECIFIC REQUIREMENT FOR ASSISTED LIVING FACILITIES

and spiritual needs of the individuals who need assistance. This supportive environment shall promote independence, privacy, and dignity; balance autonomy with safety; and provide choice for all residents in a manner that encourages family and community involvement.

***4.4-1.2.2.2 Barrier free environment.** The architectural environment shall eliminate as many barriers as possible to effective access and use of the space, services, equipment, and utilities appropriate for daily living.

4.4-1.2.3 Reserved

4.4-1.2.4 Shared Services

4.4-1.2.4.1 When a facility shares or purchases services, appropriate modification or deletion of space and parking requirements shall be permitted.

***4.4-1.2.4.2 Auxiliary services**

4.4-1.3 Site

4.4-1.3.1 Location

Assisted living facilities shall obtain applicable land use approval from the relevant jurisdiction. See Chapter 1.3 for other general requirements.

4.4-1.3.2 Parking

Each assisted living facility shall have parking space to satisfy the needs of residents, families, staff, and

visitors. The number of parking spaces shall be based on local requirements, a formal parking study, or informed judgment about the parking needs of staff, families, and residents, taking into account the size and type of the population to be served. See Chapter 1.3 for other general requirements.

4.4-1.3.3 Facility Access

Roads shall be provided within the property for access to the main entrance and service areas. Fire department and emergency vehicle access shall be provided in accordance with local requirements. See Chapter 1.3 for other general requirements.

4.4-1.4 Renovation

For requirements, see 1.1-3.

4.4-1.5 Planning, Design, Construction, and Commissioning

For requirements, see Chapter 1.2.

4.4-1.6 Equipment

Assisted living facilities shall be equipped and furnished with facility and occupant items in accordance with the functional program. See Chapter 1.4 for other issues to consider.

■ 4.4-2 Resident Living Environment

*4.4-2.1 General

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A4.4-1.2.2.2 “Universal design” practices (e.g., installing kitchen appliances in common areas that can be used by people with various disabilities) that promote barrier-free environments should be encouraged.

A4.4-1.2.4.2 Auxiliary services. In accordance with the functional program and insofar as practical, services such as home health, hospice, dietary, storage, pharmacy, linen, and laundry may be contractually provided or shared with other licensed or unlicensed entities.

A4.4-2.1 Assisted living has developed into a variety of models that are designed to meet differing social, economic, and therapeutic considerations. The many varieties of assisted living may generally be categorized into the following two types, although some facilities may combine elements from these approaches.

Apartment model. Apartment model facilities provide private resident units ranging in size from efficiency to two- or three-bedroom apartments. These apartments typically have cooking facilities (sometimes limited to a microwave) and are often indistinguishable from apartment units available to the general population. Common group activity areas that residents may utilize in addition to their private apartments are provided to promote the social and programmatic aspects of the facility.

Group living model. Group living model facilities provide smaller private spaces that are sometimes limited to a private or shared resident bedroom area. The focus of daily life is provided within shared activity spaces that are residential-scaled and organized similar to a typical house. These smaller-scale “homes” may be freestanding or grouped together in attached or detached configurations. At times, commons

4.4-2.1.1 Space Requirements

Facility spatial requirements shall be determined by the functional program.

4.4-2.1.2 Layout

Areas for the care and treatment of users not residing in the facility shall not interfere with or infringe upon the space of residents living in the facility.

4.4-2.2 Resident Unit or Private Living Area**4.4-2.2.1 General**

The facility shall provide adequately sized bedrooms or apartments (dwelling units) that allow for sleeping, afford privacy, provide access to furniture and belongings, and accommodate the care and treatment provided to the resident.

4.4-2.2.2 Resident Room or Apartment**4.4-2.2.2.1 Capacity**

Bedrooms shall be limited to single or double occupancy.

***4.4-2.2.2.2 Space requirements**

- (1) Resident room size (area and dimensions) shall permit resident(s) to move about the room with the assistance of a walker or wheelchair, allowing access to at least one side of a bed, window, closet or wardrobe, chair, dresser, and nightstand.

- (2) Room size and configuration shall permit resident(s) options for bed location(s) and shall comply with spatial requirements of the authority having jurisdiction.

- (3) Bedrooms shall not be used as passageways, corridors, or access to other bedrooms.

- * (4) Where cooking is permitted in resident rooms (apartments), additional floor area shall be provided for cooking and dining. The cooking area shall be equipped with a dedicated sink and cooking and refrigeration appliances.

4.4-2.2.2.3 Window

Resident bedrooms shall have a window(s) that provides natural light with a maximum sill height of 3 feet (91.44 centimeters) above the finished floor.

4.4-2.2.2.4 Reserved**4.4-2.2.2.5 Reserved*****4.4-2.2.2.6 Toilet room**

Each resident shall have access to a toilet room.

- (1) A minimum of one toilet room shall be provided for every four residents not otherwise served by toilet rooms adjoining resident rooms.
- (2) The toilet room shall contain a water closet, lavatory, and a horizontal surface for the personal effects of each resident.

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or community facilities are provided to allow residents to participate in activities outside of their "home."

Alternative models. Many alternative facility configurations have been created that incorporate aspects from each of these approaches. These guidelines are intended to allow and encourage the continued evolution of this facility type without locking into a particular program or model.

A4.4-2.2.2.2 In cases where double-occupancy resident rooms are provided, configurations should be utilized that provide individual privacy and control of the environment. The design should not restrict access to shared, common elements within the room.

A4.4-2.2.2.2 (4) Cooking equipment in resident rooms should be installed in a manner that allows it to be disabled by facility management as deemed necessary or appropriate.

A4.4-2.2.2.6 Toilet room

- a. Doors. Doors to toilet rooms may be hinged or, where local requirements permit, sliding, pocket, or folding doors may be used for toilet rooms in resident rooms, provided adequate provisions are made for acoustic and visual privacy and resident safety and usability.
- b. Clearances. Toilets used by residents should have sufficient clearance on both sides of the water closet to enable physical access and maneuvering by staff, who may need to assist the resident in wheelchair-to-water closet transfers and returns.
- c. Grab bars. Where independent transfers are feasible, alternative grab bar configurations should be permitted.

4.4 SPECIFIC REQUIREMENT FOR ASSISTED LIVING FACILITIES

4.4-2.2.2.7 Bathing facilities

- (1) Location. Bathing facilities shall be provided on each floor where resident sleeping areas are located.
- (2) Number
 - (a) One bathtub or shower shall be provided for each eight residents or fewer (and for each fraction thereof) not otherwise served by bathing facilities in resident rooms.
 - (b) A bathtub shall be provided for resident use when required by the functional program.
- (3) Space requirements. Bathing fixtures shall be located in individual rooms or enclosures that provide the following:
 - (a) Space for private use of the bathing fixture
 - (b) Space for drying and dressing
 - (c) Convenient access to a grooming location with a lavatory, mirror, and counter or shelf
- (4) Toilet. A toilet shall be provided within or directly accessible to each resident bathing facility without requiring entry into the general corridor.

4.4-2.2.2.8 Resident Storage

Separate and adequate enclosed storage volume within the resident room shall be provided for each resident.

4.4-2.2.3 Special Care Facilities

4.4-2.2.3.1 Reserved

*4.4-2.2.3.2 Alzheimer's and other dementia units.

A secure unit is a distinct living environment designed for the particular needs and behaviors of residents with dementia. Dementia units within assisted living facilities shall, in addition to the assisted living requirements, comply with the following:

- (1) Controlled egress. Dementia units shall provide an appropriate controlled-egress system on all required exit doors and doors leading to other areas

of the facility unless prior approval of an alternative method for prevention of resident elopement from the unit has been obtained from the authority having jurisdiction.

- (2) Windows. All operable windows shall be equipped with mechanisms to limit exterior window openings, to prevent elopement and accidental falls.
- (3) Leisure and dining space. A dementia unit operated as a portion of an assisted living facility must provide self-contained leisure and dining room space unless it can be demonstrated to the satisfaction of the authority having jurisdiction that use of shared common areas is appropriate to the needs of all residents.
- (4) Support services and areas. For operational efficiency, location of support services and areas within adjacent program areas shall be permitted.
- (5) Toilet and bathing fixtures. Alternative toilet and bathing fixture ratios (residents per fixture) shall be allowed in accordance with the functional program.

4.4-2.2.4 Reserved

4.4-2.2.5 Support Areas for Resident Care—General

For requirements, see 4.1-2.2.5.

4.4-2.2.6 Support Areas for Resident Rooms/Apartments

4.4-2.2.6.1 Staff work areas. These area(s) shall be provided in accordance with the functional program.

- (1) Lockable storage shall be provided for resident records.
- (2) Direct visualization of resident rooms or corridors from staff work areas is not required.

4.4-2.2.6.2 through 4.4-2.2.6.5 Reserved

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A4.4-2.2.3.2 Dementia units. These are secure units specifically designed for individuals with dementia. However, in some assisted living facilities, a significant percentage of individuals with some level of dementia may not reside in a dementia unit. Thus, the entire assisted living facility should be designed to facilitate the highest level of func-

tioning for all residents. The living environment should be equipped with special features such as personalized resident bedrooms, features that support resident orientation to their surroundings, secured storage, safe outside areas, and security considerations to support individuals with varying levels of cognitive impairment.

4.4-2.2.6.6 Medication preparation. When required by the functional program, provision shall be made for 24-hour distribution of medications. A medicine preparation room, a self-contained medicine dispensing unit, or other system may be used for this purpose.

(1) Medicine preparation room

- (a) The medicine preparation room, if used, shall provide for security.
- (b) It shall contain a work counter, sink, refrigerator, and locked storage for controlled drugs.

(2) Medicine dispensing unit. A self-contained medicine dispensing unit, if used, may be located at the staff work area, in the clean workroom, in an alcove, or in other space convenient for staff control. (Standard “cup” sinks provided in many self-contained units are not adequate for hand-washing.)

4.4-2.2.7 Support Areas for Staff

4.4-2.2.7.1 Staff lounge area. When required by the functional program, a staff lounge area shall be provided.

4.4-2.2.7.2 Toilet room. Toilet room(s) for staff and public use shall be provided.

- (1) These shall contain water closets with a hand-washing station.
- (2) Toilet rooms may be unisex and shared by public and residents.

4.4-2.2.7.3 Staff storage. Lockable closets, drawers, or compartments shall be provided for safekeeping of staff personal effects such as handbags.

4.4-2.3 Resident Living Areas

4.4-2.3.1 General

For new construction and renovation, resident communal areas shall be designed and furnished to encourage resident use.

4.4-2.3.2 Dining Areas

4.4-2.3.2.1 General

- (1) Space for dining, separate from social areas, shall be provided.
- (2) Natural light shall be provided in resident dining areas.

4.4-2.3.2.2 Space requirements

- (1) Adequate space shall be provided for resident dining, including for residents in wheelchairs when applicable, in accordance with the functional program.
- (2) Adequate space shall be provided for residents to access and leave their tables without disturbing other residents.
- (3) Adequate clearances shall be provided for residents in wheelchairs and/or residents who use other mobility devices.
- (4) Clear and unobstructed lanes for servers and food carts shall be provided.
- (5) Space shall be provided for attendants to assist residents who cannot feed themselves.

4.4-2.3.2.3 Location. Location of dining areas in separate satellite dining areas within or adjacent to living areas shall be permitted to accommodate less densely populated groupings and to make dining areas easily accessible to residents.

4.4-2.3.3 Recreation and Lounge Areas

4.4-2.3.3.1 Space requirements

- (1) Activity areas shall accommodate both group and individual activities.
- (2) Recreation and lounge areas shall provide the following space:
 - (a) Space adequate for resident activities in accordance with the functional program
 - (b) Areas sufficient in number and configuration to accommodate the following:
 - (i) Gatherings of resident groups of various sizes
 - (ii) Occurrence of separate and distinct activities
 - (iii) Simultaneous dining and lounge/recreational activities

4.4 SPECIFIC REQUIREMENT FOR ASSISTED LIVING FACILITIES

4.4-2.3.3.2 Outdoor area. Outdoor areas shall be provided for residents, visitors, and staff. Outdoor spaces may include solaria, porches, and balconies or gardens on grade or on roof decks.

4.4-2.3.3.3 Toilet room. Toilet room(s) shall be provided convenient to activity areas.

4.4-2.3.4 Reserved

4.4-2.3.5 Reserved

4.4-2.3.6 Support Areas for Resident Living Areas

4.4-2.3.6.1 Toilet rooms. Toilet facilities that accommodate wheelchair residents shall be readily accessible to all dining and social areas.

4.4-2.3.6.2 Storage. The facility shall provide storage space for equipment and supplies required for the care of residents as required by the functional program.

■ 4.4-3 Reserved

■ 4.4-4 Patient Support Services

4.4-4.1 Reserved

4.4-4.2 Reserved

4.4-4.3 Dietary Services

The food preparation and service area shall be provided with sufficient and suitable space and equipment to maintain efficient and sanitary operation of all required functions, in compliance with the applicable state and local sanitary codes.

■ 4.4-5 General Support Services and Facilities

4.4-5.1 Reserved

4.4-5.2 Linen Services

Space shall be provided for laundry services, as defined by the functional program.

4.4-5.2.1 Contractual Linen Services

If contractual services are used, the facility shall provide the following:

4.4-5.2.1.1 An area for soiled linen awaiting pickup

4.4-5.2.1.2 A separate area for storage and distribution of clean linen

4.4-5.2.2 On-Site Linen Services

If on-site services are provided, the facility shall provide the following:

4.4-5.2.2.1 Areas dedicated to laundry that are separate from food preparation areas

4.4-5.2.2.2 A laundry area for facility-processed bulk laundry. This shall be divided into separate soiled (sort and washer area) and clean (drying, folding, and mending area) rooms.

4.4-5.2.2.3 Separate soaking and hand-washing sinks and housekeeping room located convenient to laundry areas

4.4-5.2.3 Personal Laundry Areas

If shared personal laundry areas are provided, these areas shall be equipped with a washer and dryer for use by residents and a conveniently located hand-washing station.

4.4-5.3 Reserved

4.4-5.4 Waste Management Facilities

4.4-5.4.1 Waste Collection and Storage

Accommodations shall be made for the collection and storage of waste produced within the facility. Space shall be provided for enclosed waste storage that is separate from food preparation, personal hygiene, and other clean functions.

4.4-5.4.2 Waste Disposal

Accommodations shall be made for the disposal of waste produced within the facility. For requirements, see 4.1-5.4.2.

4.4-5.5 Environmental Services

4.4-5.5.1 Environmental Services Rooms

4.4-5.5.1.1 Space shall be provided for storage of housekeeping supplies and equipment.

4.4-5.5.1.2 A designated service sink shall be provided.

4.4-5.6 Engineering and Maintenance Services

Assisted living facilities shall provide the area necessary to effectively house building systems and maintenance functions in accordance with the functional program. For further requirements, see 4.1-5.6.

■ 4.4-6 Public and Administrative Areas

4.4-6.1 Public Notice Area

Areas shall be provided that are suitable for posting required notices, documents, and other written materi-

als in public locations visible to and accessible to residents, staff, and visitors.

4.4-6.2 Private Meeting Space

Private space(s) shall be provided for residents to meet with others.

■ 4.4-7 Design and Construction Requirements

*4.4-7.1 Building Codes and Standards

4.4-7.1.1 General

A code-compliant, safe, and accessible environment shall be provided. For requirements, see 4.1-7.1 (Building Codes and Standards).

4.4-7.1.1.1 A facility that seeks accreditation, certification, licensure, or other credentials shall comply with applicable design and construction standards.

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A4.4-7.1 Building Codes and Standards

a. Appropriate code. There has been a great deal of discussion about which building code or life safety code is appropriate for the design and construction of assisted living facilities. Facilities serving similar resident groups and providing similar services are considered residential occupancies in some jurisdictions and institutional occupancies in others.

The model codes do not adequately recognize the unique nature of assisted living as a distinct occupancy classification. Institutional codes place overly restrictive and costly requirements on facility construction. Residential codes, however, may not require adequate protection.

b. Residential construction type. To provide the flexibility needed to serve residents whose physical and mental capabilities may change over time, to eliminate the requirement for authorities having jurisdiction to continually monitor the evacuation capabilities of residents within assisted living facilities, and to provide additional protection for facilities occupied by physically and mentally frail occupants who may require physical assistance from others, use of a "Residential Plus" construction type is recommended for assisted living facilities with 24-hour staff. A "Residential Plus" occupancy allows use of residential construction, with the addition of several technological and institutional requirements. These additional requirements provide for prompt detection, notification, and suppression of fire within a facil-

ity and allow use of a "defend-in-place" approach that minimizes the need for evacuation of occupants.

c. Safety features. Assisted living facilities utilizing residential occupancy and construction types should be permitted with the addition of the following safety features:

Protection of the facilities throughout with a supervised automatic fire suppression system with quick-response sprinklers in smoke compartments containing sleeping rooms. Automatic fire suppression systems in facilities with more than 16 occupants should be installed in accordance with NFPA 13.

Smoke barriers subdividing every story into at least two smoke compartments. Such smoke compartments should be not more than 22,500 square feet (6,858 square meters), and the travel distance from any point in each smoke compartment to a smoke barrier door should not exceed 200 feet (61 meters).

d. Resident waiting areas. The therapeutic and programmatic benefits of providing waiting areas and similar spaces open to the corridor have long been recognized within long-term care facilities. Spaces open to the corridor significantly enhance resident mobility and accessibility to programs, encouraging resident participation.

Spaces open to corridors should be allowed within assisted living facilities utilizing residential occupancy and construction types where the following criteria are met:

4.4 SPECIFIC REQUIREMENT FOR ASSISTED LIVING FACILITIES

4.4-7.1.1.2 When institutional codes are required, the facility shall maintain the residential environment desired by residents.

4.4-7.1.2 Accessibility Codes

The facility shall comply with applicable federal, state, and local requirements; see 1.1-4.1 (Design Standards for the Disabled).

4.4-7.2 Architectural Details, Surfaces, and Furnishings

For requirements, see 4.1-7.2.

■ 4.4-8 Building Systems

4.4-8.1 General

Assisted living facilities shall have building systems that are designed and installed in a manner that provides for the safety, comfort, and well-being of the residents. For further requirements, see 4.1-8.

*4.4-8.2 Heating, Ventilation, and Air-Conditioning (HVAC) Systems

4.4-8.2.1 General

Assisted living facilities shall have an HVAC system(s) to prevent concentrations of contaminants and tem-

peratures that impair health or cause discomfort to residents and employees. Airflow shall move generally from clean to soiled locations. For further HVAC system requirements, see 4.1-8.2 and Part 6 (ASHRAE 170).

4.4-8.2.2 Heating System

The facility shall have a permanently installed heating system capable of maintaining an interior temperature of 72° Fahrenheit (22° Celsius) under heating design temperatures.

4.4-8.2.3 Cooling System

The facility shall be configured and equipped with a cooling system capable of maintaining an interior temperature of 75° F (24° C) under cooling design temperatures.

4.4-8.3 Electrical Systems

4.4-8.3.1 Power-Generating Equipment

4.4-8.3.1.1 Emergency electrical service. If life support equipment is permitted by the functional program, emergency power shall be provided.

*4.4-8.3.2 Lighting

4.4-8.3.2.1 General

potential for aging in place, particular attention should be paid to overall accessibility. Locations where individuals may not require physical assistance from others in emergency situations typically require compliance with standards for multifamily housing (a specific subset is now used as “safe harbor” for Fair Housing architectural requirements). In addition, the Uniform Federal Accessibility Guidelines shall apply for structures built with federal assistance. Locations where individuals require physical assistance from others in emergency situations may require compliance with the Americans with Disabilities Act Accessibility Guidelines (ADAAG).

A4.4-8.2 Individual temperature control should be provided for resident sleeping rooms.

A4.4-8.3.2 Lighting

a. Excessive differences in lighting levels should be avoided in transition areas between parking lots, building entrances and lobbies, or corridors; in transition zones between driveways and parking garages, etc. As the eye ages, pupils become smaller and less elastic, making visual adaptation to dark spaces slower. Upon entering a space with

APPENDIX (continued)

The spaces are not used as sleeping rooms or hazardous or incidental use areas, and the space is arranged so access to required exits is not obstructed.

The corridors and areas open to corridors are equipped with quick response sprinklers and an automatic smoke detection system, which automatically notifies emergency forces.

e. Programmatic considerations may call for the control of egress from some facilities or portions of facilities. Where such egress control is desired, the following should be followed:

The means of egress should not be locked except when clinical reasons are well documented and when such egress control is not a substitute for appropriate staffing.

When the means of egress is locked, a keyed or electronically released locking device must automatically open upon activation of the fire alarm system or loss of power.

No device operation sign should be posted when 24-hour awake and trained staff supervises the locking device.

f. Accessibility. Assisted living facilities should consider residents with varying and possibly increasing levels of acuity. To maximize the

- * (1) Lighting shall be engineered to the specific application. Unless alternative lighting levels are justified by the functional program, Table 4.1-3 (Minimum Maintained Average Illuminance) shall be used as a guide to minimum required ambient and task lighting levels in all rooms, spaces, and exterior walkways.
- (2) Approaches to buildings and parking lots and all occupied spaces within buildings shall be illuminated. Consideration shall be given to both the quantity and quality of lighting, including the following:
- (a) Ability to control light levels
 - (b) Glare control
 - (c) Special lighting needs of the elderly
 - (d) Area-specific lighting solutions
 - (e) Use of glare-free daylighting in all resident rooms and resident use areas
 - (f) Life-cycle costs of lighting
 - (g) Other lighting design practices as defined and described in ANSI/IESNA RP-28: *Recommended Practices for Lighting and the Visual Environment for Senior Living*

4.4-8.3.2.2 Lighting requirements for specific locations

- * (1) Resident rooms and toilet rooms
- * (a) Resident rooms and toilet rooms shall have provisions for general lighting and task lighting.

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- a considerably lower lighting level, elderly residents may need to stop or move to one side until their eyes adapt to excessive lighting changes. Elderly pedestrians may need several minutes to adjust to significant changes in brightness when entering a building from a sunlit walkway or terrace.
- b. Consideration should be given to increasing both indoor and outdoor illumination levels in such transition spaces to avoid excessive differences between electric lighting levels and natural daytime and nighttime illumination levels. In addition, it is very helpful for pedestrians to have conveniently located places to wait, giving them time to adjust their eyes to different lighting environments.
 - c. Care should be taken to minimize extremes of brightness within spaces and in transitions between spaces. Excessive brightness contrast from windows or lighting systems can disorient residents.
 - d. Lighting that creates glare and colors that do not differentiate between horizontal and vertical planes, or between objects and their backgrounds (such as handrails or light switches from walls, hardware from doors, faucets from sinks, bathroom fixtures from wall colors, or control knobs from appliances) should be avoided, unless therapeutic benefits can be demonstrated. (For example, it has been demonstrated that deliberately camouflaged door hardware may help control wandering and elopements by some cognitively impaired residents in Alzheimer's care facilities.)
 - e. Care should be taken to avoid injury from lighting fixtures. Light sources that may burn residents or ignite bed linen by direct contact should be covered or protected.
 - f. Ambient light levels are determined on a horizontal plane above the floor. The use of this method in areas such as those listed in Table 4.1-4 should result in values of average illuminance within 10 percent

of the values that would be obtained by dividing the area into 2-foot (0.6-meter) squares, taking a reading in each square, and averaging.

The measuring instrument should be positioned so that when readings are taken, the surface of the light-sensitive cell is in a horizontal plane and 30 inches (760 millimeters) above the floor. This can be facilitated by means of a small portable stand of wood or other material that will support the cell at the correct height and in the proper plane. Daylight may be excluded during illuminance measurements. Readings can be taken at night or with shades, blinds, or other opaque covering on the fenestration.

A4.4-8.3.2.1 (1) The Illuminating Engineering Society of North America (IESNA) has developed recommended lighting design practices, including minimum lighting levels for senior living environments. Refer to ANSI/IESNA RP-28: *Recommended Practices for Lighting and the Visual Environment for Senior Living*, for additional information.

A4.4-8.3.2.2 (1) Residents should be empowered as much as possible to control artificial and natural lighting in their rooms.

A4.4-8.3.2.2 (1)(a) Consider separate low-level night lights or general lighting that can be dimmed for resident toilet rooms. Experiencing bright light during the day and darkness at night is important to maintain circadian rhythm. Exposure to a bright light at night will disrupt an individual's circadian rhythm by shutting down the flow of melatonin. Also, when residents get up in the night to use the bathroom, exposure of their dark-adapted eyes to a bright light in the bathroom will compromise their night vision. It has been reported that more falls occur on the way back from the bathroom than on the way to the bathroom.

4.4 SPECIFIC REQUIREMENT FOR ASSISTED LIVING FACILITIES

- (b) All light controls in resident areas shall be quiet-operating.
- (2) Resident unit corridors
 - (a) Resident unit corridors shall have general illumination with provisions for reducing light levels at night.
 - (b) Corridors and common areas used by residents shall have even light distribution to avoid glare, shadows, and scalloped lighting effects.
 - (c) Highly polished flooring or floors with glossy sheen shall not be used.

*4.4-8.3.3 Call System

4.4-8.4 Plumbing Systems

Plumbing and other piping systems shall comply with applicable codes and regulations. For further requirements, see 4.1-8.4.

4.4-8.5 Communications Systems

Telecommunication and information systems shall be provided in accordance with the functional program. For further requirements, see 4.1-8.5.

4.4-8.6 Fire Alarm and Detection Systems

Fire alarm and detection systems shall be provided in accordance with applicable codes and regulations. For further requirements, see 4.1-8.6.

4.4-8.7 Special Systems

4.4-8.7.1 Elevators

Multistory assisted living facilities shall be provided with independent access to all resident use floors.

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A4.4-8.3.3 Assisted living facilities with more than 16 residents or facilities where residents may not be heard effectively by staff members should have an emergency communication or call system. Such a system

should be capable of activation/operation from resident toilets, bedrooms, and bathing areas. The signal should be transmitted to on-duty staff (through fixed locations or wearable devices).

Other Health Care Facilities

5

5.1 Mobile, Transportable, and Relocatable Units

Appendix material, which appears in shaded boxes at the bottom of the page, is advisory only.

■ 5.1-1 General

5.1-1.1 Application

5.1-1.1.1 Unit Types

This section applies to mobile, transportable, and modular structures as defined below. These units can increase public access to needed services.

5.1-1.1.1.1 Mobile unit. A mobile unit is any trailer or self-propelled unit equipped with a chassis on wheels and intended to provide medical services on a temporary basis. These units shall be maintained and equipped to be moved.

5.1-1.1.1.2 Transportable unit. A transportable unit is any pre-manufactured structure or trailer equipped with a chassis on wheels that is intended to provide medical services on an extended temporary basis.

5.1-1.1.1.3 Relocatable unit. A relocatable unit is any structure not on a chassis or wheels that is built to be relocated at any time and to provide medical services.

*5.1-1.1.2 Requirements

5.1-1.1.2.1 All work shall comply with Guidelines sections 3.1-3 (Diagnostic and Treatment Locations), 3.1-5 (General Support Areas and Facilities), 3.1-6 (Public and Administrative Areas), and 3.1-7 (Design and Construction Requirements) as amended by the requirements in this chapter. (For further information, see 5.1-7.1 (Building Codes and Standards).)

5.1-1.1.2.2 In the absence of local and/or state AHJ classification, classification of modular facilities shall

be as listed in the building codes and in NFPA 101: *Life Safety Code*.

5.1-1.1.3 Maximum Size

These facilities shall be limited in size and scope to accommodate four or fewer workers at any one time.

5.1-1.1.4 Mobile Unit Certification and Placarding

5.1-1.1.4.1 The mobile unit shall be certified by the unit manufacturer as meeting the criteria listed in this chapter.

5.1-1.1.4.2 The mobile unit shall have affixed to the carriage a placard identifying the unit manufacturer's certification and testing information.

5.1-1.1.4.3 The host facility and the mobile unit shall have records on the premises available for review that include the fire ratings of all structural materials and finishes and all testing and calibration records, including those for air balancing, air filtration, sprinkler, bio-medical equipment, and electrical testing.

5.1-1.2 Reserved

5.1-1.3 Site

5.1-1.3.1 Location

5.1-1.3.1.1 Factors to accommodate delivery of unit. Access for the unit to arrive shall be provided. Site access shall address the following:

- (1) Turning radius of the vehicles (appropriate for the size and type of unit)
- (2) Approach slopes of 6 percent maximum

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A5.1-1.1.2 When invasive procedures are performed in mobile, relocatable, or transportable units, the standard of care and the environ-

ment of care should be at least as safe as a hospital or outpatient facility in which similar procedures are performed.

- (3) Ease of maneuverability when being transported by a carrier

5.1-1.3.1.2 Factors that affect the location of the unit

- (1) The mobile unit shall be parked on a solid, level surface, and safeguards shall be in place adequate to prevent movement of the unit while in use.
- (2) A separation of 30 feet (9.14 meters) shall be provided between any building outside air intake and any HVAC or generator exhaust from the unit.
- (3) A separation of at least 20 feet (6.10 meters) shall be provided between a mobile unit and any unsprinklered building.
- (4) The location of the unit and routing of utilities shall avoid interference with appropriate access to and exiting from all occupied areas, including exterior means of egress to a public way.
- (5) Use of an exit from the building as an access point to the mobile unit shall not be permitted unless the exit is specifically designed to serve both functions.
- (6) The unit shall be located to avoid interference with fire lanes and direct access to the facility by emergency personnel and vehicles during an emergency.
- (7) The unit shall be sited to accommodate delivery services being provided to the facility.

5.1-1.3.2 Parking and Drop-off Zones

5.1-1.3.2.1 Sites shall provide hazard-free drop-off zones and adequate parking for patients. See also 5.1-6.1.1 (Entrance).

5.1-1.3.2.2 A parking area shall be provided for the transporting carrier during the unit’s stay at a facility. This parking area shall be located to provide easy access from building services to the mobile unit’s support connectors without constituting a tripping hazard for patients and staff.

5.1-1.3.3 Facility Access

5.1-1.3.3.1 Access to the unit shall be provided for wheelchair/stretchers patients.

5.1-1.3.3.2 Protection from the elements during transport of patients from the host facility to the mobile unit shall be provided.

5.1-1.3.3.3 Access to the mobile unit from the facility shall be clearly marked and well lit so as not to pose a hazard to patients and staff.

5.1-1.3.4 Environmental Standards

All mobile, transportable, and relocatable units shall be sited in full compliance with such federal, state, and local environmental laws and regulations as may apply; for example, those listed in Section 1.3-4.

***5.1-1.3.5 Utility Requirements**

5.1-1.3.5.1 Sites shall be provided with properly sized power, including emergency power, water, waste, telephone, and fire alarm connections, as required by local and state building codes.

5.1-1.3.5.2 Adequate protection shall be provided for utility hook-ups, cables, and wires by concealing them in conduits, burying them underground, or installing them overhead.

5.1-1.3.6 Foundation

***5.1-1.3.6.1** Sites shall have level concrete pads or piers and be designed for the structural loads of the unit. Construction of pads shall meet local, state, and seismic codes and shall conform to the manufacturer’s requirements.

5.1-1.3.6.2 Each facility shall provide a means of preventing unit movement, either by blocking the wheels or by providing pad anchors.

5.1-1.3.7 MRI Unit Site Considerations

A5.1-1.3.6.1 Concrete-filled steel pipe bollards are recommended for protection of the facility and the unit.

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A5.1-1.3.5 It is recommended that each site requiring water and waste services to the unit provide a means of freeze protection in geographic areas where freezing temperatures occur.

5.1-1.3.7.1 Gauss fields and radio frequency interference generated by magnetic resonance imaging (MRI) units shall be studied, both for environmental effects on (interference with) the integrity of the scan and for potentially adverse effects on adjacent devices, materials, and/or persons. The site design shall address any concerns raised by these studies.

5.1-1.3.7.2 Sites where MRI systems are used shall provide adequate access for cryogen-servicing of the magnet per the manufacturer's recommendations.

■ 5.1-2 Reserved

■ 5.1-3 Diagnostic and Treatment Locations

5.1-3.1 Mobile Units

5.1-3.1.1 through 5.1-3.1.4 Reserved

5.1-3.1.5 Hand-Washing Stations

5.1-3.1.5.1 Noninvasive procedure locations.

Mobile units where noninvasive procedures are performed shall be provided with hand-washing stations unless each site can provide hand-washing stations within 25 feet (7.47 meters) of the unit.

5.1-3.1.5.2 Invasive procedure locations. When invasive procedures are performed in a mobile unit, all units shall be provided with hand-washing stations.

5.1-3.2 Transportable Units

Transportable units shall be provided with hand-washing stations.

5.1-3.3 Relocatable Units

5.1-3.3.1 Seismic and Structural Requirements

5.1-3.3.1.1 Seismic force resistance for relocatable units shall comply with Section 1.2-6.5 (Provisions for Disasters) and shall be given an importance factor of one when applied to the seismic design formulas.

5.1-3.3.1.2 These units shall meet the structural requirements of local and state building codes.

5.1-3.3.2 through 5.1-3.3.4 Reserved

5.1-3.3.5 Hand-Washing Stations

Relocatable units shall be provided with hand-washing stations.

5.1-3.4 Reserved

5.1-3.5 Support Areas for Patient Care—General

5.1-3.5.1 Application

5.1-3.5.1.1 Areas required to support the mobile unit while it is stationed at a facility shall be provided as specified in the functional program and according to the requirements in 5.1-3.6 (Support Areas for Mobile, Transportable, and Relocatable Units).

5.1-3.5.1.2 Additional support spaces as dictated by the functional program shall be provided by the facility that is supporting the mobile services.

5.1-3.5.2 Location

Location of required support areas shall be permitted inside the licensed building or in the mobile unit.

5.1-3.6 Support Areas for Mobile, Transportable, and Relocatable Units

5.1-3.6.1 Recovery Areas

5.1-3.6.1.1 Recovery areas shall be designed according to the services provided by the mobile unit and the requirements of the functional program.

5.1-3.6.1.2 Omission of recovery areas shall be permitted based on the types of services provided and the requirements of the functional program.

5.1-3.6.2 Clean and Soiled Utility Rooms

5.1-3.6.2.1 A clean utility room shall be provided to support the mobile unit. This room shall be permitted to serve both the mobile unit and an adjacent unit in the facility.

5.1-3.6.2.2 A soiled utility room shall be provided to support the mobile unit. This room shall be permitted

to serve both the mobile unit and an adjacent unit in the facility. The soiled utility room shall include the following:

- (1) Supply storage
- (2) Work counter
- (3) Hand-washing station
- (4) A clinical service sink for disposal of solid and liquid waste

5.1-3.6.3 Equipment and Supply Storage

5.1-3.6.3.1 Storage areas for clean gowns and supplies shall be provided adjacent to the gowning areas and the access point to the mobile unit.

5.1-3.6.3.2 Cryogenic equipment and supply storage. Storage for dewars, which are of substantial weight and size, shall be included in space planning.

5.1-3.6.4 Environmental Services Closet

5.1-3.7 Support Areas for Patients

Patient gowning areas designed for privacy of patients shall be provided.

■ 5.1-4 Reserved

■ 5.1-5 Reserved

■ 5.1-6 Public and Administrative Areas

For general requirements, see 3.1-6.

5.1-6.1 Public Areas

*5.1-6.1.1 Entrance

Patient protection from the elements during transport to and from the mobile unit shall be provided.

5.1-6.1.1.1 Use of means other than covered walkways shall be permitted to protect patients from the elements.

5.1-6.1.1.2 Snow shall be kept clear of pathways to and from the mobile unit. Effective means of abating ice shall be used when conditions exist.

5.1-6.1.2 Reception Area

5.1-6.1.3 Public Waiting Space(s)

Waiting space(s) with drinking fountains, public telephone, and toilets shall be provided. These areas may be shared with other departments and/or be part of waiting areas in the host facility.

5.1-6.1.4 Toilets

The facility shall provide patient/staff toilets as close to the unit docking area as possible.

5.1-6.1.5 Hand-Washing Stations

5.1-6.1.5.1 A hand-washing station shall be located convenient to the unit.

5.1-6.1.5.2 If a hand-washing station is not provided in the unit, sanitizing gels shall be provided.

■ 5.1-7 Design and Construction Requirements

5.1-7.1 Building Codes and Standards

5.1-7.1.1 Applicable Codes

5.1-7.1.1.1 In the absence of local or state AHJ classification, the applicable requirements of NFPA 101: *Life Safety Code* shall apply.

5.1-7.1.1.2 Tractors and/or cabs that have fuel tanks with a capacity of less than or equal to 100 gallons and that do not support the mobile unit while it is in use shall be detached and located more than 10 feet from the hospital. Tractors and/or cabs with fuel capacities greater than 100 gallons shall meet the requirements of NFPA 30, Flammable and Combustible Liquids Code.

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A5.1-6.1.1 It is recommended that each site provide a covered walkway or enclosure to ensure patient safety from the outside elements. Protecting the patient from dust and wind also needs to be considered.

5.1-7.1.1.3 Exits from the mobile unit must meet the requirements of Chapter 7, Means of Egress, in NFPA 101.

- (1) Use of a hoist or lift as the sole means of egress to grade from the mobile unit shall not be permitted.
- (2) Use of a coil-up door as the sole means of egress shall not be permitted.

5.1-7.1.2 Radiation Protection

Radiation protection for x-ray and gamma ray installations shall be in accordance with National Council on Radiation Protection & Measurements (NCRP) reports 147 and 116, in addition to all applicable local and state requirements.

5.1-7.2 Architectural Details and Surfaces for Unit Construction

5.1-7.2.1 Architectural Details

5.1-7.2.1.1 Doors

- (1) Horizontal sliding doors and power-operated doors shall comply with NFPA 101.
- (2) Units shall be permitted a single means of egress as permitted by NFPA 101.
- (3) All glazing in doors shall be safety or wire glass.

5.1-7.2.1.2 Stairs

- (1) Stairs for mobile and transportable units shall be in accordance with Table 5.1-1 (Stair Requirements for Mobile and Transportable Units).
- (2) Dimensions
 - (a) The tolerance between the largest and smallest tread shall not exceed 3/8 inch (9.52 millimeters) in any flight.
 - (b) There shall be no variation exceeding 3/16 inch (4.76 millimeters) in depth of adjacent treads or in the height of adjacent risers. Exception: Where the bottom riser adjoins a public way, walk, or driveway having an established grade and serving as a landing, the landing cross-slope shall not exceed 1 in 12.
 - (c) Adjustable legs at the bottom of the stair assembly shall be permitted to allow for grade differences.

- (3) Stairs and landings for relocatable units shall comply with NFPA 101.
- (4) Handrails shall be provided on at least one side.
- (5) Handrails shall be installed and constructed in accordance with NFPA 101, with the following exception: Provided the distance from grade to unit floor height is not greater than 4 feet 5 inches (1.35 meters), one intermediate handrail with a clear distance between rails of 19 inches (48.26 centimeters) maximum shall be permitted. (This exception is not applicable to existing units having a floor height of 5 feet 3 inches, or 1.60 meters, maximum.)

5.1-7.2.2 Surfaces

If the mobile unit is permanently installed, finishes shall comply with the requirements in this section.

5.1-7.2.2.1 Interior finish materials

- (1) Interior finish materials shall be class A as defined in NFPA 101.
- (2) Textile materials having a napped, tufted, looped, woven, nonwoven, or similar surface shall be permitted on walls and ceilings provided such materials have a class A rating and rooms or areas are protected by automatic extinguishment or sprinkler system.
- (3) Fire-retardant coatings shall be permitted in accordance with NFPA 101.
- (4) Curtains and draperies shall be noncombustible or flame retardant and shall pass both the large- and small-scale tests required by NFPA 101.

5.1-7.2.2.2 Exterior finish materials

- (1) If the connecting link to the host facility is a fabric-type canopy, the material shall be treated with fire retardant and documentation of such shall be available for inspection at all times.
- (2) Fabric (membrane) structures and supporting elements shall be designed in accordance with the building code of record.
 - (a) Permanent membrane structures shall also comply with applicable sections of NFPA 101.
 - (b) Temporary membrane structures (limited to 45 days) shall comply with NFPA 101.

- (3) Construction of permanent passageways shall be consistent with the construction type of the connected building or separated per NFPA 101.

■ 5.1-8 Building Systems

5.1-8.1 Reserved

5.1-8.2 Heating, Ventilation, and Air-Conditioning (HVAC) Systems

5.1-8.2.1 General

5.1-8.2.1.1 HVAC equipment, ductwork, and related equipment shall be installed in accordance with NFPA 90B: *Standard for the Installation of Warm Air Heating and Air Conditioning Systems*.

5.1-8.2.1.2 Requirements for HVAC systems not mentioned in 5.1-8.2 shall comply with the requirements of 3.1-8.2.

5.1-8.2.1.3 Mobile units shall be consistent with the mechanical requirements for small primary care (neighborhood) outpatient facilities in 3.3-8.2 (HVAC Systems).

5.1-8.2.2 Air-Handling Units

Air-handling units shall have a minimum of two filter banks.

5.1-8.2.2.1 Pre-filters shall be located upstream of the air-conditioning equipment, and final filters shall be located downstream of any fan or blowers.

5.1-8.2.2.2 Pre-filters shall have a minimum filter efficiency of 30 percent, and final filters shall have a minimum efficiency of 90 percent.

5.1-8.2.2.3 Filter efficiencies shall be permitted to exceed the efficiencies noted, based on the complexity

and sensitivity of the procedures performed in the mobile unit.

5.1-8.2.3 Air Intake

Air intake for the mobile unit, if provided, shall be located a minimum of 25 feet (7.62 meters) from all plumbing vents, exhaust fans, sources of combustion, idling vehicles, and any other sources of noxious fumes or odors. This distance shall be increased if prevailing wind patterns dictate this is appropriate.

5.1-8.3 Electrical Systems

5.1-8.3.1 General

5.1-8.3.1.1 Applicable standards

- (1) All electrical material and equipment, including conductors, controls, and signaling devices, shall be installed in compliance with applicable sections of NFPA 70 and NFPA 99.
- (2) All electrical material and equipment shall be listed as complying with available standards of listing agencies or other similar established standards where such standards are required.

5.1-8.3.1.2 Testing and documentation. The electrical installations, including alarm, nurse call, and communication systems, shall be tested to demonstrate that equipment installation and operation is appropriate and functional. A written record of performance tests on special electrical systems and equipment shall show compliance with applicable codes and standards.

*5.1-8.3.1.3 Power disturbance safeguards

5.1-8.3.2 Electrical Distribution and Transmission

5.1-8.3.2.1 Switchboards

- (1) Location
 - (a) Main switchboards shall be located in an area separate from plumbing and mechanical equipment and shall be accessible to authorized persons only.
 - (b) Switchboards shall be convenient for use and readily accessible for maintenance but away from traffic lanes.

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A5.1-8.3.1.3 Data processing and/or automated laboratory or diagnostic equipment, if provided, may require safeguards from power line disturbances.

- (c) Switchboards shall be located in dry, ventilated spaces free of corrosive or explosive fumes, gases, or any flammable material.
- (2) Overload protective devices. These shall operate properly in ambient room temperatures.

5.1-8.3.2.2 Panelboards

Panelboards serving normal lighting and appliance circuits shall be located on the same level as the circuits they serve.

5.1-8.3.3 Power Generating and Storing Equipment

5.1-8.3.3.1 Emergency electrical service. Emergency electrical services shall be provided for mobile units if required by the functional program and/or the services provided. Emergency lighting and power shall be provided in accordance with NFPA 99, NFPA 101, and NFPA 110.

- (1) The shared service provider shall provide documentation showing that emergency generators that are an integral part of the mobile unit have been tested and inspected as required by NFPA 110. Documentation of such testing shall be maintained with the mobile unit at all times and shall be made available for review to the authority having jurisdiction.
- (2) Fuel capacity for use by on-board emergency generators shall not be greater than required to run the generator for the minimum period required by NFPA for the life support equipment used in the mobile unit.
- (3) Emergency generators serving life support and equipment shall have an automatic start sequence and conform to NFPA 70.
- (4) Emergency exit lighting shall be provided by either battery backup or lighting fixtures served by the emergency generator.

- (5) Mobile units that provide critical care services as defined by the hospital shall provide battery backup light fixtures to ensure the areas where the service is provided will not be in total darkness between the period of normal power loss and emergency power service.

5.1-8.3.4 Lighting

*5.1-8.3.4.1 General

- (1) Lighting shall be engineered to the specific application.
- (2) Approaches to buildings and parking lots and all occupied spaces shall have lighting fixtures that can be illuminated as necessary.

5.1-8.3.4.2 Lighting for examination, treatment and trauma rooms. A portable or fixed examination light shall be provided for examination, treatment, and trauma rooms.

5.1-8.3.5 Receptacles

5.1-8.3.5.1 Duplex grounded-type receptacles (convenience outlets) shall be installed in all areas in sufficient quantities for tasks to be performed as needed.

5.1-8.3.5.2 Each examination and work table shall have access to a minimum of two duplex receptacles.

5.1-8.3.6 Equipment

5.1-8.3.6.1 X-ray equipment. Fixed and mobile x-ray equipment installations shall conform to articles 517 and 660 of NFPA 70.

5.1-8.3.6.2 Inhalation anesthetizing locations. At inhalation anesthetizing locations, all electrical equipment and devices, receptacles, and wiring shall comply with applicable sections of NFPA 99 and NFPA 70.

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A5.1-8.3.4.1 Lighting

a. Recommended lighting levels for health care facilities developed by the Illuminating Engineering Society of North America (IES) should be considered. Refer to ANSI/IESNA RP-29: *Recommended Practices for Lighting for Hospitals and Health Care Facilities*.

b. Consideration should be given to the special needs of the elderly. Excessive contrast in lighting levels that makes effective sight adaptation difficult should be minimized. Refer to ANSI/IESNA RP-28: *Recommended Practices for Lighting and the Visual Environment for Senior Living*.

5.1-8.4 Plumbing Systems

5.1-8.4.1 General

5.1-8.4.1.1 If provided, water and sanitary lines to and from the unit shall have a means of freeze protection.

5.1-8.4.1.2 If provided, backflow prevention shall be installed at the point of water connection to the mobile unit.

5.1-8.4.2 Plumbing and Other Piping Systems

Plumbing and other piping systems shall be installed in accordance with applicable model plumbing codes, unless specified herein.

5.1-8.4.2.1 Plumbing vents

- (1) Mobile units. Venting through the roof shall not be required for mobile units requiring sinks. Waste lines shall be permitted to be vented through the sidewalls or other acceptable locations.
- (2) Transportable and relocatable units. These shall be vented through the roof per model plumbing codes.

5.1-8.4.2.2 Water supply connection. Backflow prevention shall be installed at the point of water connection on the unit.

5.1-8.4.2.3 Waste connection. All waste lines shall be designed and constructed to discharge into the facility sanitary sewage system.

5.1-8.4.3 Reserved

5.1-8.4.4 Medical Gas and Vacuum Systems

Medical gases and suction systems, if installed, shall be in accordance with NFPA 99.

5.1-8.5 Communications Systems

5.1-8.5.1 A means for connecting the unit to the hospital emergency communication system shall be provided.

5.1-8.5.2 Air conditioning and voltage regulation shall be provided per the manufacturer's recommendations.

5.1-8.6 Safety and Security Systems

5.1-8.6.1 Fire Alarm System

Fire alarm notification shall be provided to the facility while the unit is on site.

5.1-8.6.1.1 Each mobile, connecting link and/or passageway shall be equipped with fire alarm systems and with smoke detection as required per NFPA 101.

- (1) The fire alarm system shall comply with minimum requirements for fire alarm systems appropriate to the occupancy of the building served by the unit per NFPA 101.
- (2) Where a fire alarm system is provided, at least one manual pull station shall be provided in accordance with NFPA 72.

5.1-8.6.1.2 Fire alarm notification shall be provided by one of the following methods:

- (1) Via an auto-dialer connected to the unit's smoke detectors
- (2) An audible device located on the outside of the unit
- (3) Connection to the building fire alarm system

5.1-8.6.1.3 Fire protection equipment. Manual fire extinguishers shall be provided in accordance with NFPA 101.

Table 5.1-1**Stair Requirements for Mobile and Transportable Units**

	New Units	Existing Units
Minimum width clear of all obstructions, except projections not exceeding 3½ inches (8.89 centimeters) at or below handrail height on each side	2 feet 10 inches (86.36 centimeters)	2 feet 3 inches (68.58 centimeters)
Minimum headroom	6 feet 8 inches (2.03 meters)	6 feet 8 inches (2.03 meters)
Maximum height of risers	9 inches (22.86 centimeters)	9 inches (22.86 centimeters)
Minimum height of risers	4 inches (10.16 centimeters)	4 inches (10.16 centimeters)
Minimum tread depth	9 inches (22.86 centimeters)	7 inches (17.78 centimeters)
Doors opening immediately onto stairs without a landing	No	Yes

5.2 Freestanding Birth Centers

Appendix material, which appears in shaded boxes at the bottom of the page, is advisory only.

■ 5.2-1 General

A freestanding birth center is exclusively dedicated to serving the childbirth-related needs of women and their newborns. A birth center is any health facility, place, or institution that is not a hospital or in a hospital where birth is planned to occur away from the mother's residence following a normal, uncomplicated pregnancy.

5.2-1.1 Application

The freestanding birth center shall meet the standards described herein and the standards referenced in Part 1 of these Guidelines as applicable to all health care facilities.

*5.2-1.2 Functional Program

The functional program shall describe the various components planned for the facility and how they will interface with each other.

5.2-1.2.1 Size and Layout

Department sizes and clear floor areas depend on program requirements and organization of services within the facility. As required by community needs, combination or sharing of some functions shall be permitted, provided the layout does not compromise safety standards and medical nursing practices.

5.2-1.2.2 Transfer and Service Affiliations

Transfer and service affiliations with hospitals with obstetrical services shall be part of planning for a freestanding birth center.

5.2-1.3 Site

5.2-1.3.1 Location

5.2-1.3.1.1 Mode of transport and travel times to affiliated hospitals shall be considered in facility location and design. Timeliness of maternal-fetal transport for commencement of cesarean delivery shall be the prime consideration. Other considerations shall include neonatal and maternal transport to surgical or specialty care.

5.2-1.3.1.2 The facility shall not be located on a site in a floodplain, on a seismic fault line, or with other natural impediment to maintaining a stable operational environment.

5.2-1.3.2 Parking

5.2-1.3.2.1 In the absence of a formal parking study, provide one space for each birthing room plus one space for each employee normally present on any single weekday shift.

5.2-1.3.2.2 Additional parking may be required to accommodate other services.

5.2-1.3.2.3. Separate and additional space shall be provided for emergency transfer vehicles.

5.2-1.3.3 Accessibility to Public Transportation

Where public transportation is available, the facility shall be sited to provide easy and convenient access to public transportation.

APPENDIX

A5.2-1.2 Functional Program

For additional information on generally accepted guidelines and standards, refer to the following two publications and contact the primary accrediting entity, the Commission for the Accreditation of Birth Centers (www.birthcenters.org).

American Association of Birth Centers, *Standards for Birth Centers* (Perkiomenville, Pa.: AABC; 2007).

American Academy of Pediatrics and American College of Obstetricians and Gynecologists. *Guidelines for Perinatal Care*, 6th ed. (Washington, DC: ACOG, 2007.)

■ 5.2-2 Birth Center Facilities

5.2-2.1 General

5.2-2.1.1 Size

The number of birthing rooms shall be determined by the functional program.

5.2-2.1.2 Location

5.2-2.1.2.1 Birthing rooms shall be located to ensure privacy during occupancy for labor, birth, and postpartum care until discharge from the center.

5.2-2.1.2.2 Birthing rooms shall be located out of the path of unrelated traffic and under direct supervision of the facility staff.

5.2-2.2 Birthing Room

5.2-2.2.1 Capacity

The maximum number of beds per room shall be one.

5.2-2.2.2 Space Requirements

5.2-2.2.2.1 A birthing room shall have a minimum clear floor area of 200 square feet (18.58 square meters), including the newborn care area.

5.2-2.2.2.2 A birthing room shall have a minimum clear dimension of 12 feet (3.66 meters).

5.2-2.2.3 Windows

Each birthing room shall have an outside window.

5.2-2.2.4 Privacy

Windows or doors within a normal sightline that would permit observation into the room shall be arranged or draped as necessary for mother and newborn privacy.

5.2-2.2.5 Hand-Washing Stations

Each birthing room shall be equipped with a hand-washing station with hands-free operation.

5.2-2.2.6 Bathrooms

Each birthing room shall have direct access to a private bathroom with the following:

5.2-2.2.6.1 Hand-washing station

5.2-2.2.6.2 Toilet

5.2-2.2.6.3 Shower or tub

5.2-2.3 Newborn Care Area

If required by the functional program, a separate newborn care area shall be provided in addition to the birthing room.

5.2-2.4 Reserved

5.2-2.5 Support Areas for Mother and Newborn Care—General

5.2-2.5.1 The size and location of each support area shall depend on the numbers and types of modalities served.

5.2-2.5.2 The support areas listed shall be readily available when required by the functional program.

5.2-2.5.3 Identifiable spaces shall be provided for each of the indicated functions.

5.2-2.6 Support Areas for Staff, Mothers, and Newborns

5.2-2.6.1 Reception and Administration

This area shall be located to control and monitor access to the birth center.

5.2-2.6.2 Staff Work Area

Work area(s) for staff shall be provided.

5.2-2.6.2.1 This area shall have space for counters and storage.

5.2-2.6.2.2 This area shall have convenient access to hand-washing facilities.

5.2-2.6.3 Office

Office space shall be located in the birth center unless the provider's professional office is attached to the birth center.

5.2-2.6.4 Reserved

5.2-2.6.5 Hand-Washing Stations

Hand-washing stations shall be readily accessible to child-bearing families and staff.

5.2-2.6.6 Medication Preparation Location

Provisions shall be made for the distribution of medications from a medicine preparation room or area, from a self contained-medicine dispensing unit or by another approved system.

5.2-2.6.6.1 Medicine Preparation room or area

- (1) The medicine preparation room or area shall be under the visual control of the staff.
- (2) The room shall contain the following:
 - (a) Work counter
 - (b) Hand-washing station
 - (c) Lockable refrigerator
 - (d) Locked storage for controlled drugs
- (3) When a medicine preparation room or area is to be used to store self-contained medicine dispensing units, the room shall be designed with adequate space to prepare medicines with the self-contained medicine-dispensing units present.

5.2-2.6.6.2 Self-contained medicine-dispensing unit

- (1) Location of a self-contained medicine-dispensing unit shall be permitted in the clean workroom or in an alcove, provided the center has adequate security for medications and adequate lighting to easily identify drugs.
- (2) Convenient access to hand-washing stations shall be provided.

5.2-2.6.7 Nourishment Area

5.2-2.6.7.1 A nourishment area, if required by the functional program, shall have the following:

- (1) Sink
- (2) Work counter
- (3) Refrigerator
- (4) Storage cabinets
- (5) Equipment for hot and cold nourishment

5.2-2.6.7.2 This area shall include space for trays and dishes used for nonscheduled meal service.

5.2-2.6.7.3 Provisions and space shall be included for separate temporary storage of unused and soiled dietary trays not picked up during meal time.

5.2-2.6.7.4 Hand-washing stations shall be in or immediately accessible from the nourishment area.

5.2-2.6.8 Ice-Making Equipment

Each center shall have equipment to provide ice for treatments and nourishment.

5.2-2.6.8.1 Ice-making equipment shall be permitted in the clean workroom or the nourishment room.

5.2-2.6.8.2 Ice intended for human consumption shall be provided in the nourishment station and shall be served from self dispensing ice-makers.

5.2-2.6.9 Clean Workroom

5.2-2.6.9.1 Such rooms shall be separate from and have no direct connection with soiled workrooms or soiled holding rooms.

5.2-2.6.9.2 If the room is used for preparing care items for mothers and newborns, it shall contain the following:

- (1) Work counter
- (2) Hand-washing station
- (3) Storage facilities for clean and sterile supplies and equipment

5.2-2.6.10 Soiled Workroom or Soiled Holding Room

Such rooms shall be separate from and have no direct connection with clean work rooms or clean supply rooms.

5.2-2.6.10.1 Soiled workroom. A soiled workroom shall contain the following:

- (1) A clinical sink (or equivalent flushing rim fixture) and a hand-washing station

- (2) A work counter and space for separate covered containers for soiled linen and a variety of waste types

5.2-2.6.10.2 Soiled holding room. Omission of the clinical sink and work counter shall be permitted in rooms used only for temporary holding of soiled material. If the flushing-rim clinical sink is not provided, facilities for cleaning bedpans shall be provided in the mothers' toilet rooms.

5.2-2.6.11 Clean Linen Storage Area

5.2-2.6.12 Environmental Services Room

5.2-2.6.12.1 An environmental services room shall be provided for the exclusive use of the birth center.

5.2-2.6.12.2 The environmental services room shall include the following:

- (1) Service sink or floor receptor
- (2) Space for storage of supplies, housekeeping equipment, and housekeeping carts

5.2-2.6.13 Examination Room

If required by the functional program, the examination room shall meet the requirements of 3.1-3.2.2 (General Purpose Examination Room).

5.2-2.7 Support Areas for Staff

5.2-2.7.1 Staff Changing Room

If required by the functional program, a changing room with shower shall be provided for staff to change into work attire.

5.2-2.7.2 Staff Lounge

A lounge for staff shall be provided.

5.2-2.7.3 Staff Toilet Room

A toilet room for the use of staff shall be provided.

5.2-2.7.4 Staff Storage Locations

Securable lockers, closets, and cabinet compartments for the personal articles of staff shall be provided near the staff work areas.

■ 5.2-3 Reserved

■ 5.2-4 Patient Support Services

5.2-4.1 Reserved

5.2-4.2 Reserved

5.2-4.3 Dietary Services

5.2-4.3.1 Facilities shall be provided for the provision of food service in accordance with the functional program.

5.2-4.3.2 Food service facilities and equipment shall conform to the requirements of these Guidelines and to the standards of the National Sanitation Foundation and other applicable codes.

5.2-4.3.3 For on-site conventional food service, follow the requirements of Section 2.2-4.3.2 (Dietary Areas) and 2.2-4.3.4 (Other Dietary Facilities).

■ 5.2-5 General Support Areas and Facilities

5.2-5.1 Reserved

5.2-5.2 Reserved

5.2-5.3 Materials Management Facilities

5.2-5.3.1 Receiving Area

Adequate receiving areas shall be provided as defined by the functional program.

5.2-5.3.2 General Stores

General storage shall be provided on site.

5.2-5.3.3 Service Entrance

When required by the functional program, a service entrance, protected from inclement weather, shall be provided for loading and unloading of supplies.

5.2-5.4 Waste Management Facilities

5.2-5.4.1 Waste Collection and Storage

Space and facilities shall be provided for the sanitary

storage and collection of waste, including biohazardous waste.

5.2-5.4.2 Waste Treatment and Disposal

For requirements, see Section 2.2-5.4.2.

5.2-5.5 Reserved

5.2-5.6 Engineering and Maintenance Services

Sufficient space for mechanical and electrical equipment and for proper maintenance of equipment shall be provided.

■ 5.2-6 Reserved

■ 5.2-7 Design and Construction Requirements

5.2-7.1 Building Codes

The birth center shall be permitted to fall under the business occupancy provisions of applicable life safety and building codes.

5.2-7.2 Architectural Details and Surfaces

The required details and surfaces shall be as outlined in 2.1-7.2.1 and 2.1-7.2.2.

5.2-7.2.1 Architectural Details

5.2-7.2.1.1 Corridors. The required minimum corridor width shall be 5 feet (1.52 meters).

5.2-7.2.2 Surfaces

5.2-7.2.2.1 Birthing rooms. Finishes shall be selected to facilitate cleaning and to resist strong detergents.

5.2-7.2.2.2 Dietary facilities. Finishes in the dietary facility shall be selected to ensure cleanability and the maintenance of sanitary conditions.

■ 5.2-8 Building Systems

Building systems for HVAC, electrical, plumbing, and related systems shall meet state and local building codes.

5.2-8.1 Reserved

5.2-8.2 Heating, Ventilation, and Air-Conditioning (HVAC) Systems

5.2-8.2.1 Ventilation in the Environmental Services Room

The environmental services (housekeeping) room shall be exhausted at a rate of no fewer than 10 air changes per hour.

5.2-8.3 Electrical Systems

5.2-8.3.1 Lighting

The birthing room shall provide both subdued indirect lighting and special lighting capable of providing at least 70 foot-candles in the delivery and newborn care area(s).

5.2-8.4 Plumbing Systems

5.2-8.4.1 Medical Gas Outlets

5.2-8.4.1.1 Birthing rooms shall have available oxygen and vacuum per the requirements of Table 3.1-1 (Station Outlets for Oxygen, Vacuum, and Medical Air in Outpatient Facilities). Use of portable equipment shall be permitted.

5.2-8.4.1.2 Medical gas storage shall be provided in accordance with NFPA 99 and NFPA-referenced standards.

5.2-8.5 Reserved

5.2-8.6 Security Systems

Consideration shall be given in the design of free-standing birth centers for active and passive security systems. Locking arrangements, security alarms, and monitoring devices shall be placed carefully and shall not interfere with the life safety features necessary to operate and maintain a healthy and functional environment.

5.2-8.7 Special Systems

5.2-8.7.1 Elevators

Where elevators are provided, they shall be equipped with a cab with minimum dimensions of 5 feet 8 inches wide by 7 feet 6 inches deep (1.73 meters wide by 2.29 meters deep).

5.3 Adult Day Health Care Facilities

Appendix material, which appears in shaded boxes at the bottom of the page, is advisory only.

■ 5.3-1 General

Adult day health care (ADHC) services are group programs designed to meet the needs of functionally and/or cognitively impaired adults. Adult day health care facilities provide a caring, non-institutional setting for individuals who, for their own safety and well-being, can no longer be left at home alone. Adult day health care facilities offer protected settings and include a mixture of health and support services. Many offer specialized services such as programs for individuals with Alzheimer's disease, developmental disabilities, traumatic brain injury, mental illness, HIV/AIDS, and vision and hearing impairments. Adult day health care facilities are an integral component of the continuum of care for the elderly and disabled.

5.3-1.1 Application

5.3-1.1.1 Multifunctional Facilities

A structured comprehensive, nonresidential program that provides for a variety of health, social, and support services in a protective setting. This type of facility is large enough to accommodate changing service needs.

5.3-1.1.2 Specialty Facilities

Structured comprehensive, nonresidential program that provides for a variety of health, social, and support services, as well as specialty services for a target population. These types of facilities have unique needs that affect usable activity space requirements.

5.3-1.2 Functional Program

5.3-1.2.1 Each adult day health care center, when it is located in a facility housing other services, shall have its own identifiable space. When permitted by the functional program, support spaces shall be permitted to be shared.

***5.3-1.2.2** The facility shall have sufficient space, furnishings, and equipment to accommodate the range of program activities and services for the number of participants as required by the functional program. This space shall include designated area(s) to be utilized when the privacy of the participants requires it.

5.3-1.2.3 Participants are defined as the number of people exclusive of staff occupying the space at the same time.

5.3-1.3 Site

*5.3-1.3.1 Facility Access

When possible, the ADHC facility shall be located on the street level or shall be equipped with ramps or elevators to allow easy access for persons with disabilities.

■ 5.3-2 Participant Care Locations

5.3-2.1 Participant Activity Space

5.3-2.1.1 Reserved

5.3-2.1.2 Space Requirements

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A5.3-1.2.2 Furniture should be sturdy and secure so that it cannot easily tip when used for support by participants while walking or sitting. Furniture should be scaled so it is easily used by persons with limited agility and should permit feet to rest on the floor.

A5.3-1.3.1 A covered entrance should be provided to protect partici-

pants from inclement weather. A space (zone of transition) should be created as a spatial "buffer" between entry spaces and program spaces as well as an experiential "buffer" that signals transition from home to day care program. The entry and reception area should be separate from the primary program space and not visually accessible from it.

5.3 ADULT DAY HEALTH CARE FACILITIES

5.3-2.1.2.1 Net usable space. Only spaces commonly used by participants are to be included as net usable activity space. Reception areas, storage areas, offices, restrooms, corridors, and service areas shall not be included. When a kitchen is used for activities other than meals, 50 percent of the floor area shall be counted as activity space.

5.3-2.1.2.2 Area. Minimum square footage requirements shall be based on the services offered by the adult day health care facility.

- (1) Multifunctional ADHC facilities. A minimum of 100 square feet (30.48 square meters) shall be provided for each of the first five participants and 60 square feet (18.28 square meters) of net usable program activity space for each participant thereafter.
- (2) Specialty ADHC facilities. A minimum of 30 square feet (9.14 square meters) shall be provided for each participant, but no facility shall have less than 300 square feet (91.44 square meters) of net usable activity space.
- (3) Net usable area for additional functions
 - (a) For social/recreational areas in an ADHC, an additional 20 square feet (6.09 square meters) shall be provided per participant to accommodate the programmed activities.
 - (b) For mental health/Alzheimer's ADHCs, an additional 40 square feet (12.19 square meters) of space shall be provided per participant.
 - (c) For physical rehabilitation therapy ADHCs, an additional 50 square feet (15.24 square meters) of space per participant shall be provided for activity space needed for equipment and treatment.
 - (d) For developmental disability ADHCs, an additional 70 square feet (21.33 square meters) of space shall be provided per participant to ensure the therapeutic milieu is maintained.

5.3-2.1.3 Hand-Washing Station(s)

All communal activity areas shall have convenient access to a hand-washing station.

5.3-2.2 Rest or Private Area

There shall be a rest area and/or a designated area to permit privacy and to isolate participants who become ill or disruptive or who require rest.

5.3-2.2.1 Application

This area shall be considered part of the usable activity space.

5.3-2.2.2 Location

5.3-2.2.2.1 This area shall be permitted to be part of the medical/health treatment room or nurse station.

5.3-2.2.2.2 This area shall be located in a place that can be clearly monitored and that is near a toilet room.

*5.3-2.3 Dining Area

5.3-2.4 Outdoor Area

5.3-2.4.1 If provided, outdoor recreation and/or relaxation area for participants shall be accessible to indoor areas.

5.3-2.4.2 Outdoor areas shall have a fence or landscaping to create a boundary that prevents participant elopement.

5.3-2.5 Reserved

5.3-2.6 Support Areas for Participant Care Locations

5.3-2.6.1 through 5.3-2.6.3 Reserved

5.3-2.6.4 Meeting Room

A space shall be available for participants and family/caregivers to have private meetings with staff.

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A5.3-2.3 Dining should occur in a space that is visually and spatially distinct from the activity areas. No single dining setting should serve more than 16 participants to decrease the potential for unpredictable social and sensory stimulation. Dining tables should be reserved for

meals and snacks and rarely, if ever, used for programmed activities. Refer to K. Diaz Moore, "Design Guidelines for Adult Day Services" in *AIA 005: Report on University Research* for additional information and further detail on toilets, dining, and the zone of transition.

5.3-2.6.5 through 5.3-2.6.10 Reserved**5.3-2.6.11 Equipment and Supply Storage**

Storage space shall be available for program and operating supplies.

5.3-2.7 Support Areas for Staff***5.3-2.7.1 Staff Lounge****5.3-2.7.2 Staff Toilet**

At least one dedicated staff toilet shall be provided.

5.3-2.8 Support Areas for Participants**5.3-2.8.1 Participant Toilet Rooms**

5.3-2.8.1.1 Number. The facility shall have at least one toilet and one lavatory for every ten participants.

5.3-2.8.1.2 Type. The facility shall provide a variety of toilet room types (e.g., independent, fully accessible, one-person assist, or two-person assist) as required by the functional program. All facilities shall include at least one toilet room that can accommodate a two-person assisted transfer between wheelchair and toilet.

5.3-2.8.1.3 Location. Participant toilet rooms shall be located no more than 40 feet (12.19 meters) away from the activity area.

5.3-2.8.1.4 Call system. Emergency call stations shall be provided in any toilet rooms used by participants.

***5.3-2.8.2 Bathing Facilities**

5.3-2.8.2.1 A shower or bathtub area shall be provided in all adult day health care facilities.

5.3-2.8.2.2 If the functional program indicates the need for bathing services, an assisted bathing facility shall be provided.

5.3-2.8.2.3 Emergency call stations shall be provided in bathing facilities used by participants.

■ 5.3-3 Diagnostic and Treatment Locations**5.3-3.1 Treatment Room or Nurse Station**

The ADHC shall have a medical/health treatment room or nurse station.

5.3-3.2 Support Areas for the Treatment Location**5.3-3.2.1 Medication and Equipment Storage**

5.3-3.2.1.1 This area shall be provided to contain first-aid materials and medical supplies and equipment.

5.3-3.2.1.2 This area shall provide for secure medication storage in a room, locked cabinetry, or a locked medication cart that includes the following:

- (1) Space that separates oral medications from topical agents
- (2) Refrigerator for medication storage
- (3) Double-locking storage for narcotics
- (4) Adequate space to store medications brought in by participants
- (5) Hand-washing station

■ 5.3-4 Reserved**■ 5.3-5 General Support Services and Facilities****5.3-5.1 through 5.3-5.4 Reserved****5.3-5.5 Environmental Services****APPENDIX**

A5.3-2.7.1 If the facility capacity is 40 participants or greater, a separate staff lounge should be provided.

A5.3-2.8.2 Access to a washer and dryer is preferable when the participants have incontinence or physical limitations that predispose

them to soiling with blood, body fluids, or food spills (e.g., swallowing or chewing problems, shakes or tremors).

5.3-5.5.1 Environmental Services Room

A housekeeping closet shall be provided that will contain a service sink and provide for the locked safe storage of housekeeping items.

■ 5.3-6 Public and Administrative Areas

5.3-6.1 Public Areas

5.3-6.1.1 Telephone

A telephone(s) shall be available for participant(s) in an area that affords privacy during use.

5.3-6.1.2 Provisions for Drinking Water

Drinking water shall be easily accessible to the participants.

■ 5.3-7 Design and Construction Requirements

For requirements, see 4.1-7.2.

■ 5.3-8 Building Systems

5.3-8.1 General

5.3-8.2 Heating, Ventilation, and Air-Conditioning (HVAC) Systems

5.3-8.2.1 Ventilation

Ventilation by mechanical means shall be provided. Air conditioning and heating equipment shall be adequate and capable of maintaining the temperature in each room used by participants between 72° F (22° C) and 78° F (26° C).

5.3-8.3 Electrical Systems

*5.3-8.3.1 Lighting

Lighting shall be engineered to the specific application. Table 4.1-3 (Minimum Maintained Average Illuminance) shall be used as a guide to minimum required ambient and task lighting levels in all rooms, spaces, and exterior walkways.

5.3-8.4 Plumbing Systems

5.3-8.4.1 Hot Water

Hot water at shower, bathing, and hand-washing facilities shall not exceed 110° F (43° C).

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A5.3-8.3.1 Refer to ANSI/IESNA RP-28: *Recommended Practices for Lighting and the Visual Environment for Senior Living* for additional information.

Ventilation of Health Care Facilities

6

Ventilation of Health Care Facilities

Incorporation of ASHRAE Standard 170 into the Guidelines

The 2008 edition of ANSI/ASHRAE/ASHE Standard 170: *Ventilation of Health Care Facilities*—including all issued addenda—is incorporated into the 2010 edition of the *Guidelines for Design and Construction of Health Care Facilities* with the exception of Section 4.1 (Compliance Requirements) and Section 4.2 (Administrative Requirements). For requirements on these subjects, see Chapter 1.1 in the Guidelines.

In the case of a conflict between the language in Standard 170-2008 and the text of the Guidelines, the Guidelines language shall have priority. In the case of a conflict between an addendum to Standard 170 and the text of the Guidelines, the addendum language shall have priority.

The definitions in Section 3 of Standard 170 apply only to Part 6 of the Guidelines. For definitions that apply to Parts 1 through 5 of the document, see the Guidelines glossary at the front of the book.

All references in Part 6 to the 2006 edition of the *Guidelines for Design and Construction of Health Care Facilities* shall be deemed as references to the 2010 edition.

Chris P. Rousseau, PE
Chair
2010 HGRC Focus Group on Engineering

Continuous Maintenance of Standard 170

ASHRAE has placed Standard 170: *Ventilation of Health Care Facilities* under continuous maintenance, which means the document will be updated regularly by a standing committee. The members of the 170 maintenance committee at the time of the publication of the 2010 Guidelines are listed here.

ASHRAE Standing Standard Project Committee 170

Cognizant Technical Committee: TC 9.6, Healthcare Facilities

Staff Liaison: William F. Walter
Paul T. Ninomura, *Chair**
Michael Patrick Sheerin, *Vice-Chair**
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Anand K. Seth*
Rajendra Kumar Shah
Andrew J. Streifel*
Michael E. Woolsey*

*Denotes members of voting status when Standard 170 was approved for publication

Addenda to ANSI/ASHRAE/ASHE Standard 170

Addenda to Standard 170 will be issued periodically. When this occurs, announcements will be made on the Web sites of the Facility Guidelines Institute (www.fgiguideines.org), ASHRAE (www.ashrae.org), and the American Society for Healthcare Engineering (www.ashe.org). Addenda are provided as PDF files and are available for download.

At the time the 2010 Guidelines went to press, one addendum had already been issued, making changes to the NICU and patient corridor entries in Table 7-1 (Design Parameters) as well as to two footnotes.



ASHRAE/ASHE STANDARD

Ventilation of Health Care Facilities

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NOTE

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FOREWORD

ANSI/ASHRAE/ASHE Standard 170, Ventilation of Health Care Facilities, is one of a family of documents that offers guidance, regulation, and mandates to designers of health care facilities. It is first and foremost a mandatory minimum requirement and, as such, may not offer the state-of-the-art best practice of health care ventilation design. Other publications, such as the ASHRAE HVAC Design Manual for Hospitals and Clinics, may provide more depth and detail for the designer. In addition, the health care designer must refer to any design requirements from the appropriate jurisdiction that has authority. Many jurisdictions use or refer to Guidelines for Design and Construction of Hospitals and Health Care Facilities, published by the American Institute of Architects (AIA). Where practical, the committee was cognizant of these other documents in the development of this standard.

Ventilation design for health care spaces is a combination of tasks that leads to a set of documents used in construction. One such task requires medical planners to develop departmental programs of spaces. These programs include space names that suggest the use for which the space is intended, and health care ventilation designers depend upon these names to determine the ventilation parameters for their designs. This standard provides these ventilation parameters.

Without high-quality ventilation in health care facilities, patients, health care workers, and visitors can become infected through normal respiration of particles in the air. Poorly ventilated health care facilities are places where the likelihood of pathogenic particles occurring in the air is quite high. These air-transmitted pathogens can be found everywhere in poorly ventilated health care facilities, and although most individuals can cope using their healthy immune systems, some patients are susceptible to these pathogens or even to normal environmental air-borne organisms such as fungal spores. Because these organisms are found in higher concentrations in hospitals, additional care must be taken in design of the ventilation systems.

1. PURPOSE

The purpose of this standard is to define ventilation system design requirements that provide environmental control for comfort, asepsis, and odor in health care facilities.

2. SCOPE

2.1 The requirements in this standard apply to patient care areas and related support areas within health care facilities, including hospitals, nursing facilities, and outpatient facilities.

2.2 This standard applies to new buildings, additions to existing buildings, and those alterations to existing buildings that are identified within this standard.

2.3 This standard considers chemical, physical, and biological contaminants that can affect the delivery of medical care to patients; the convalescence of patients; and the safety of patients, health care workers, and visitors.

3. DEFINITIONS

addition: an extension or increase in floor area or height of a building, building system, or equipment.

airborne infection isolation (AII): the isolation of patients infected with organisms spread by airborne droplet nuclei less than 5 µm in diameter (see CDC [2003] in Informative Annex B: Bibliography). For the purposes of this standard, the abbreviation “AII” refers to the room that provides isolation.

airborne infection isolation room: a room that is designed according to the requirements of this standard and that is intended to provide *airborne infection isolation*.

alteration: a significant change in the function or size of a space, in the use of its systems, or in the use of its equipment, either through rearrangement, replacement, or addition. Routine maintenance and service shall not constitute an alteration.

authority having jurisdiction: the agent or agency responsible for enforcing this standard.

average velocity: the volumetric flow rate obtained by dividing the air quantity issuing from an air distribution device by the nominal face area of the device.

building: a structure that is wholly or partially enclosed within exterior walls and a roof, or within exterior and party walls and a roof, and that affords shelter to persons, animals, or property. In this standard, a building is a structure intended for use as a hospital or health care facility.

classification of surgeries:

Class A surgery: provides minor surgical procedures performed under topical, local, or regional anesthesia without preoperative sedation. Excluded are intravenous, spinal, and epidural procedures, which are Class B or C surgeries.

Class B surgery: provides minor or major surgical procedures performed in conjunction with oral, parenteral, or intravenous sedation or performed with the patient under analgesic or dissociative drugs.

Class C surgery: provides major surgical procedures that require general or regional block anesthesia and/or support of vital bodily functions.

For more information on this method of classifying surgeries, see ACS (2000) in Informative Annex B: Bibliography.

equipment: devices for heating, ventilating, and/or air conditioning, including but not limited to furnaces, boilers, air conditioners, heat pumps, chillers, and heat exchangers.

high risk immunocompromised patients: patients who have the greatest risk of infection caused by airborne or waterborne microorganisms. These patients include but are not limited to allogeneic stem-cell transplant patients and intensive chemotherapy patients.

infection control risk assessment (ICRA): a determination of the potential risk of transmission of various infectious agents in the facility, a classification of those risks, and a list of required practices for mitigating those risks during construction or renovation.

immunocompromised patients: patients whose immune mechanisms are deficient because of immunologic disorders (e.g., human immunodeficiency virus [HIV] infection or congenital immune deficiency syndrome), chronic diseases (e.g., diabetes, cancer, emphysema, or cardiac failure), or immunosuppressive therapy (e.g., radiation, cytotoxic chemotherapy, anti-rejection medication, or steroids) (see CDC [2003] in Informative Annex B: Bibliography).

inpatient: a patient whose stay at the health care facility is anticipated to require twenty-four hours or more of patient care.

invasive imaging procedure room: a room in which radiographic imaging is used and in which instruments or devices are inserted into patients through the skin or body orifice under sterile conditions for diagnosis and/or treatment.

non-aspirating diffuser: a diffuser that has unidirectional downward airflow from the ceiling with minimum entrainment of room air. Classified as ASHRAE Group E, these diffusers generally have very low *average velocity*. For the purposes of this standard, the performance of these diffusers is to be measured in terms of average velocity.

protective environment room: a patient room that is designed according to this standard and intended to protect a *high risk immunocompromised patient* from human and environmental airborne pathogens.

triage: the process of determining the severity of the illness of or injury to patients so that those who have the most emergent illnesses/injuries can be treated immediately and those less severely injured can be treated later or in another area.

4. COMPLIANCE

4.1 Compliance Requirements

4.1.1 New Buildings. New buildings shall comply with the provisions of this standard.

4.1.2 Existing Buildings

4.1.2.1 Additions to Existing Buildings. Additions shall comply with the provisions of this standard.

4.1.2.2 Alterations to Existing Buildings. Portions of a heating, ventilating, and air-conditioning system and other systems and equipment that are being altered shall comply with the applicable requirements of this standard.

4.1.2.2.1 Heating, Ventilation, and Air-Conditioning System Alterations. Alterations to mechanical systems serving the building heating, cooling, or ventilating needs shall comply

with the requirements of Section 6, “Systems and Equipment,” applicable to those specific portions of the building and its systems that are being altered. Any new mechanical equipment installed in conjunction with the alteration as a direct replacement of existing mechanical equipment shall comply with the provisions of Sections 6.2, 6.4, 6.5, and 6.6.

4.1.2.2.2 Space Alterations. Alterations to spaces listed in Table 6-1 (see page 5) shall comply with the requirements of Section 6.7 and Section 7, “Space Ventilation,” applicable to those specific portions of the building and its systems that are being altered. Any alteration to existing health care space in a building that will continue to treat patients during construction shall comply with Sections 8.1, 8.3, 8.4, and 8.5.

4.2 Administrative Requirements. Administrative requirements relating to permit requirements, enforcement by the authority having jurisdiction, interpretations, claims of exemption, approved calculation methods, rights of approved calculation methods, and rights of appeal are specified by the authority having jurisdiction.

4.3 Compliance Documents

4.3.1 General. Compliance documents are those plans, specifications, engineering calculations, diagrams, reports, and other data that are approved as part of the permit by the authority having jurisdiction. The compliance documents shall include all specific construction-related requirements of the owner’s infection control risk assessment.

4.3.2 Construction Details. Compliance documents shall contain all pertinent data and features of the building, equipment, and systems in sufficient detail to allow a determination of compliance by the authority having jurisdiction and to indicate compliance with the requirements of this standard.

4.3.3 Supplemental Information. Supplemental information necessary to verify compliance with this standard, such as calculations, worksheets, compliance forms, vendor literature, or other data, shall be made available when required by the authority having jurisdiction.

4.4 Alternate Materials, Methods of Construction, or Design. The provisions of this standard are not intended to prevent the use of any material, method of construction, design, or building system not specifically prescribed herein, provided such construction, design, or building system has been approved by the authority having jurisdiction as meeting the intent of this standard.

4.5 Informative Appendices. The informative appendices to this standard and informative notes located within this standard contain recommendations, explanations, and other non-mandatory information and are not part of this standard.

4.6 Criteria Ranges. This standard often specifies a range of values that will comply with a specific requirement of the standard. If it is permitted by the authority having jurisdiction, compliance with this requirement may be achieved by the presentation of compliance documents that demonstrate a system’s ability to perform within the specified range.

5. PLANNING

Owners/managers of health care facilities shall prepare a detailed program that shall include the clinical service expected in each space, the specific equipment expected to be used in each space, and any special clinical needs for temperature, humidity, and pressure control. This program shall be prepared in the planning phase of design.

6. SYSTEMS AND EQUIPMENT

Air-handling and distribution systems are required to provide health care facilities not only with a comfortable environment but also with ventilation to dilute and remove contaminants, to provide conditioned air, and to assist in controlling the transmission of airborne infection. In order to meet these requirements, air-handling and distribution systems shall be designed according to the requirements of this standard.

6.1 Utilities

6.1.1 Ventilation Upon Loss of Electrical Power. The space ventilation and pressure relationship requirements of Table 7-1 (see page 7) shall be maintained for the following spaces, even in the event of loss of normal electrical power:

- a. All rooms
- b. PE rooms
- c. Class B & C Operating Rooms, including Delivery Rooms (Caesarean)

For further information, see NFPA 99 (2005), in Informative Annex B: Bibliography.

6.1.2 Reserve Heating and Cooling Sources

6.1.2.1 Provide heat sources and essential accessories in number and arrangement sufficient to accommodate the facility needs, even when any one of the heat sources is not operating due to a breakdown or routine maintenance. The capacity of the remaining source(s) shall be sufficient to provide for sterilization and dietary purposes and to provide heating for operating, delivery, birthing, labor, recovery, emergency, intensive care, nursery, and inpatient rooms. (For further information, see AIA (2001) in Informative Annex B: Bibliography.)

Exception: Reserve capacity is not required if the ASHRAE 99% heating dry bulb temperature for the facility is greater than or equal to 25°F.

6.1.2.2 For central cooling systems greater than 400 tons peak cooling load, the number and arrangement of cooling sources and essential accessories shall be sufficient to support the owner's facility operation plan upon a breakdown or routine maintenance of any one of the cooling sources.

Exception: Reserve capacity is not required if the ASHRAE 1% cooling dry bulb temperature is less than or equal to 85°F.

6.2 Air-Handling Unit Design

6.2.1 Air-Handling Unit Casing. The casing of the air-handling unit shall be designed to prevent water intrusion, resist corrosion, and permit access for inspection and maintenance.

All airstream surfaces of air-handling units—e.g., interior surfaces and components—shall comply with Section 5.5 of *ANSI/ASHRAE Standard 62.1-2007, Ventilation for Acceptable Indoor Air Quality*. (For more information, see ANSI/ASHRAE Standard 62.1-2007 and ASHRAE position document *Minimizing Indoor Mold Problems through Management of Moisture in Building Systems*.)

6.3 Outdoor Air Intakes and Exhaust Discharges

6.3.1 Outdoor Air Intakes. Outdoor air intakes for air-handling units shall be located a minimum of 25 ft (8 m) from cooling towers and all exhaust and vent discharges. Outdoor air intakes shall be located such that the bottom of the air intake is at least six ft (2 m) above grade. Intakes on top of buildings shall be located a minimum of three ft (1 m) above roof level. New facilities with moderate-to-high risk of natural or man-made extraordinary incidents shall locate air intakes away from public access. All intakes shall be designed to prevent the entrainment of wind-driven rain, shall contain features for draining away precipitation, and shall be equipped with a birdscreen of mesh no smaller than 0.5 in. (13 mm).

6.3.2 Exhaust Discharges. Exhaust discharge outlets that discharge air from All rooms, bronchoscopy rooms, emergency department waiting rooms, nuclear medicine laboratories, radiology waiting, and laboratory chemical fume hoods shall

- a. be designed so that all ductwork in occupied spaces is under negative pressure;
- b. discharge in a vertical direction at least 10 ft (3 m) above roof level and shall be located not less than 10 ft horizontally from air intakes, openable windows/doors, or areas that are normally accessible to the public or maintenance personnel and that are higher in elevation than the exhaust discharge; and
- c. be located such that they minimize the recirculation of exhausted air back into the building.

6.4 Filtration. Filter banks shall be provided in accordance with Table 6-1. Each filter bank with an efficiency of greater than MERV 12 shall be provided with an installed manometer or differential pressure measuring device that is readily accessible and provides a reading of differential static pressure across the filter to indicate when the filter needs to be changed. (For further information, see AIA [2006] and CDC [2003] in Informative Annex B: Bibliography.)

6.4.1 First Filtration Bank. Filter Bank No. 1 shall be placed upstream of the heating and cooling coils such that all mixed air is filtered.

6.4.2 Second Filtration Bank. Filter Bank No. 2 shall be installed downstream of all wet air cooling coils and the supply fan. All second filter banks shall have sealing interface surfaces.

6.5 Heating and Cooling Systems

6.5.1 Cooling Coils and Drain Pans. Cooling coils and drain pans shall comply with the requirements of ANSI/ASHRAE Standard 62.1-2007.

TABLE 6-1 Minimum Filter Efficiencies

Space Designation (According to Function)	Filter Bank Number 1 (MERV) ^a	Filter Bank Number 2 (MERV) ^a
Classes B and C surgery; inpatient and ambulatory diagnostic and therapeutic radiology; inpatient delivery and recovery spaces	7	14
Inpatient care, treatment, and diagnosis, and those spaces providing direct service or clean supplies and clean processing (except as noted below); AII (rooms)	7	14
Protective environment rooms (PE)	7	17 (HEPA) ^c
Laboratories; Class A surgery and associated semi-restricted spaces	13 ^b	N/R*
Administrative; bulk storage; soiled holding spaces; food preparation spaces; and laundries	7	N/R
All other outpatient spaces	7	N/R
Skilled nursing facilities	7	N/R

* NR = not required

Note a: The minimum efficiency reporting value (MERV) is based on the method of testing described in *ANSI/ASHRAE Standard 52.2-2007, Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size* (see Informative Annex B: Bibliography).

Note b: Additional prefilters may be used to reduce maintenance for filters with efficiencies higher than MERV 7.

Note c: Filter Bank No. 2 may be a MERV 14 if a MERV 17 tertiary terminal filter is provided for these spaces.

TABLE 6-2 Supply Air Outlets

Space Designation (According to Function)	Supply Air Outlet Classification ^a
All class A, B, and C surgeries ^b	Primary supply diffusers Group E, non-aspirating additional supply diffusers, Group E
Protective environment (PE) rooms	Group E, non-aspirating
Wound intensive care units (burn units)	Group E, non-aspirating
Trauma rooms (crisis or shock)	Group E, non-aspirating
AII rooms	Group A or Group E
All other spaces	Group A or Group E

Note a: Refer to *2005 ASHRAE Handbook—Fundamentals*, Chapter 35, for definitions related to outlet classification and performance (see Informative Annex B: Bibliography).

Note b: Surgeons may require alternate air-distribution systems for some specialized surgeries. Such systems shall be considered acceptable if they meet or exceed the requirements of this standard.

6.5.2 Radiant Cooling Systems. If radiant cooling panels are utilized, the chilled-water temperature shall always remain above the dew point temperature of the space.

6.5.3 Radiant Heating Systems. If radiant heating is provided for an AII room, a protective environment room, a wound intensive care unit (burn unit), or a room for any class of surgery, either flat and smooth radiant ceiling panels with exposed cleanable surfaces or radiant floor heating shall be used.

6.6 Humidifiers. When outdoor humidity and internal moisture sources are not sufficient to meet the requirements of Table 7-1, humidification shall be provided by means of the health-care facility air-handling systems. Locate humidifiers within air-handling units or ductwork to avoid moisture accumulation in downstream components, including filters and insulation. Chemical additives used for steam humidifiers serving health care facilities shall comply with FDA requirements.¹ Reservoir-type water humidifiers or evaporative-pan-type humidifiers shall not be used in ductwork or air-handling units in health care facilities. A humidity sensor shall be provided, located at a suitable distance downstream from the steam injection source. Controls shall be provided to limit duct humidity to a maximum value of

90% RH when the humidifier is operating. Humidifier steam control valves shall be designed so that they remain OFF whenever the air-handling unit is not in operation.

6.7 Air Distribution Systems

6.7.1 General. Maintain the pressure relationships required in Table 7-1 in all modes of HVAC system operation, except as noted in the table. Spaces listed in Table 7-1 that have required pressure relationships shall be served by fully ducted returns. The air-distribution design shall maintain the required space pressure relationships, taking into account recommended maximum filter loading, heating-season lowered airflow operation, and cooling-season higher airflow operation. Airstream surfaces of the air-distribution system downstream of Filter Bank No. 2, shall comply with Section 5.5 of ANSI/ASHRAE Standard 62.1-2007. The air-distribution system shall be provided with access doors, panels, or other means to allow convenient access for inspection and cleaning. (For further information, see ANSI/ASHRAE Standard 62.1.)

6.7.2 Air-Distribution Devices. All air-distribution devices shall meet the following requirements:

- a. Surfaces of air-distribution devices shall be suitable for cleaning. Supply air outlets in accordance with Table 6-2 shall be used.
- b. The supply diffusers in Classes B and C surgeries shall be designed and installed to allow for internal cleaning.
- c. Psychiatric, seclusion, and holding-patient rooms shall be designed with security diffusers, grilles, and registers.

7. SPACE VENTILATION

The ventilation requirements of this standard are minimums that provide control of environmental comfort, asepsis, and odor in health care facilities. However, because they are minimum requirements and because of the diversity of the population and variations in susceptibility and sensitivity, these requirements do not provide assured protection from discomfort, airborne transmission of contagions, and odors.

7.1 General Requirements. The following general requirements shall apply for space ventilation:

- 1. Spaces shall be ventilated according to Table 7-1.
 - a. Design of the ventilation system shall provide air movement that is generally from clean to less clean areas. If any form of variable-air-volume or load-shedding system is used for energy conservation, it shall not compromise the pressure balancing relationships or the minimum air changes required by the table. See Table 7-1 note (t) for additional information.
 - b. The ventilation rates in this table are intended to provide for comfort as well as for asepsis and odor control in areas of a health care facility that directly affect patient care. The air change rates specified are for supply in positive pressure rooms and for exhaust in negative pressure rooms. Ventilation rates for many areas not specified here can be found in ANSI/ASHRAE Standard 62.1 (see Informative Annex B: Bibliography). Where areas with prescribed rates in both Standard 62.1-2007 and Table 7-1 of this standard exist, the higher of the two air change rates shall be used.
 - c. For design purposes, the minimum number of total air changes indicated shall be either supplied for positive pressure rooms or exhausted for negative pressure rooms. For spaces that require a positive or negative pressure relationship, the number of air changes can be reduced when the space is unoccupied, provided that the required pressure relationship to adjoining spaces is maintained while the space is unoccupied and that the minimum number of air changes indicated is reestablished anytime the space becomes occupied. Air change rates in excess of the minimum values are expected in some cases in order to maintain room tempera-

ture and humidity conditions based upon the space cooling or heating load.

- 2. Air filtration for spaces shall comply with Table 6-1.
- 3. Supply air outlets for spaces shall comply with Table 6-2.
- 4. In AII rooms, protective environment rooms, wound intensive care units (burn units), and rooms for all classes of surgery, heating with supply air or radiant panels that meet the requirements of Section 6.5.3 shall be provided.

7.2 Additional Room Specific Requirements

7.2.1 Airborne Infection Isolation (AII) Rooms. Ventilation for AII rooms shall meet the following requirements whenever an infectious patient occupies the room:

- a. Each AII room shall comply with requirements of Tables 6-1, 6-2, and 7-1. AII rooms shall have a permanently installed device and/or mechanism to constantly monitor the differential air pressure between the room and adjacent spaces of the room when occupied by patients with an airborne infectious disease. A local visual means shall be provided to indicate whenever negative differential pressure is not maintained.
- b. All air from the AII room shall be exhausted directly to the outdoors.

Exception: AII rooms that are retrofitted from standard patient rooms from which it is impractical to exhaust directly outdoors may be ventilated with recirculated air from the room's exhaust, provided that the air first passes through a HEPA (MERV 17) filter.
- c. All exhaust air from the AII rooms, associated anterooms, and associated toilet rooms shall be discharged directly to the outdoors without mixing with exhaust air from any other non-AII room or exhaust system.
- d. Exhaust air grilles or registers in the patient room shall be located directly above the patient bed on the ceiling or on the wall near the head of the bed unless it can be demonstrated that such a location is not practical.
- e. The room envelope shall be sealed to limit leakage air flow at 0.01 in. wc (2.5 Pa) differential pressure across the envelope.
- f. Differential pressure between AII rooms and adjacent spaces that have a different function shall be a minimum of -0.01 in. wc (-2.5 Pa).

7.2.2 Protective Environment (PE) Rooms. Ventilation for PE rooms shall meet the following requirements:

- a. The room envelope shall be sealed to limit leakage air flow at 0.01 in. wc (2.5 Pa) differential pressure across the envelope.
- b. Each PE room shall comply with the requirements of Tables 6-1, 6-2, and 7-1. PE rooms shall have a permanently installed device and/or mechanism to constantly monitor the differential air pressure between the room and adjacent spaces of the room when occupied by patients requiring a protective environment. A local visual means shall be provided to indicate whenever positive differential pressure is not maintained.

TABLE 7-1 Design Parameters

Function of Space	Pressure Relationship to Adjacent Areas (n)	Minimum Outdoor ach	Minimum Total ach	All Room Air Exhausted Directly to Outdoors (j)	Air Recirculated by Means of Room Units (a)	RH (k), %	Design Temperature (l), °F/°C
SURGERY AND CRITICAL CARE							
Classes B and C operating rooms, (m), (n), (o)	Positive	4	20	N/R	No	30-60	68-75/20-24
Operating/surgical cystoscopic rooms, (m), (n) (o)	Positive	4	20	N/R	No	30-60	68-75/20-24
Delivery room (Caesarean) (m), (n), (o)	Positive	4	20	N/R	No	30-60	68-75/20-24
Substerile service area	N/R	2	6	N/R	No	N/R	N/R
Recovery room	N/R	2	6	N/R	No	30-60	70-75/21-24
Critical and intensive care	Positive	2	6	N/R	No	30-60	70-75/21-24
Wound intensive care (burn unit)	Positive	2	6	N/R	No	40-60	70-75/21-24
Newborn intensive care	Positive	2	6	N/R	No	30-60	70-75/21-24
Treatment room (p)	N/R	2	6	N/R	N/R	30-60	70-75/21-24
Trauma room (crisis or shock) (c)	Positive	3	15	N/R	No	30-60	70-75/21-24
Medical/anesthesia gas storage (r)	Negative	N/R	8	Yes	N/R	N/R	N/R
Laser eye room	Positive	3	15	N/R	No	30-60	70-75/21-24
ER waiting rooms (q)	Negative	2	12	Yes	N/R	max 65	70-75/21-24
Triage	Negative	2	12	Yes	N/R	max 60	70-75/21-24
ER decontamination	Negative	2	12	Yes	No	N/R	N/R
Radiology waiting rooms (q)	Negative	2	12	Yes	N/R	max 60	70-75/21-24
Class A Operating/Procedure room (o), (d)	Positive	3	15	N/R	No	30-60	70-75/21-24
INPATIENT NURSING							
Patient room (s)	N/R	2	6	N/R	N/R	max 60	70-75/21-24
Toilet room	Negative	N/R	10	Yes	No	N/R	N/R
Newborn nursery suite	N/R	2	6	N/R	No	30-60	72-78/22-26
Protective environment room (f), (n), (t)	Positive	2	12	N/R	No	max 60	70-75/21-24
All room (e), (n), (u)	Negative	2	12	Yes	No	max 60	70-75/21-24
All isolation anteroom (t) (u)	N/R	N/R	10	Yes	No	N/R	N/R
Labor/delivery/recovery/postpartum (LDRP) (s)	N/R	2	6	N/R	N/R	max 60	70-75/21-24
Labor/delivery/recovery (LDR) (s)	N/R	2	6	N/R	N/R	max 60	70-75/21-24

Note: N/R = no requirement

TABLE 7-1 Design Parameters

Function of Space	Pressure Relationship to Adjacent Areas (n)	Minimum Outdoor ach	Minimum Total ach	All Room Air Exhausted Directly to Outdoors (j)	Air Recirculated by Means of Room Units (a)	RH (k), %	Design Temperature (l), °F/°C
Corridor	N/R	N/R	2	N/R	N/R	N/R	N/R
SKILLED NURSING FACILITY							
Resident room	N/R	2	2	N/R	N/R	N/R	70-75/21-24
Resident gathering/activity/dining	N/R	4	4	N/R	N/R	N/R	70-75/21-24
Physical therapy	Negative	2	6	N/R	N/R	N/R	70-75/21-24
Occupational therapy	N/R	2	6	N/R	N/R	N/R	70-75/21-24
Bathing room	Negative	N/R	10	Yes	N/R	N/R	70-75/21-24
RADIOLOGY (v)							
X-ray (diagnostic and treatment)	N/R	2	6	N/R	N/R	max 60	72-78/22-26
X-ray (surgery/critical care and catheterization)	Positive	3	15	N/R	No	max 60	70-75/21-24
Darkroom (g)	Negative	2	10	Yes	No	N/R	N/R
DIAGNOSTIC AND TREATMENT							
Bronchoscopy, sputum collection, and pentamidine administration (n)	Negative	2	12	Yes	No	N/R	68-73/20-23
Laboratory, general (v)	Negative	2	6	N/R	No	N/R	70-75/21-24
Laboratory, bacteriology (v)	Negative	2	6	Yes	No	N/R	70-75/21-24
Laboratory, biochemistry (v)	Negative	2	6	Yes	No	N/R	70-75/21-24
Laboratory, cytology (v)	Negative	2	6	Yes	No	N/R	70-75/21-24
Laboratory, glasswashing	Negative	2	10	Yes	No	N/R	N/R
Laboratory, histology (v)	Negative	2	6	Yes	No	N/R	70-75/21-24
Laboratory, microbiology (v)	Negative	2	6	Yes	No	N/R	70-75/21-24
Laboratory, nuclear medicine (v)	Negative	2	6	Yes	No	N/R	70-75/21-24
Laboratory, pathology (v)	Negative	2	6	Yes	No	N/R	70-75/21-24
Laboratory, serology (v)	Negative	2	6	Yes	No	N/R	70-75/21-24
Laboratory, sterilizing	Negative	2	10	Yes	No	N/R	70-75/21-24
Laboratory, media transfer (v)	Positive	2	4	N/R	No	N/R	70-75/21-24
Autopsy room (n)	Negative	2	12	Yes	No	N/R	68-75/20-24
Nonrefrigerated body-holding room (h)	Negative	N/R	10	Yes	No	N/R	70-75/21-24
Pharmacy (b)	Positive	2	4	N/R	N/R	N/R	N/R

Note: N/R = no requirement

TABLE 7-1 Design Parameters

Function of Space	Pressure Relationship to Adjacent Areas (n)	Minimum Outdoor ach	Minimum Total ach	All Room Air Exhausted Directly to Outdoors (j)	Air Recirculated by Means of Room Units (a)	RH (k), %	Design Temperature (l), °F/°C
Examination room	N/R	2	6	N/R	N/R	max 60	70–75/21–24
Medication room	Positive	2	4	N/R	N/R	max 60	70–75/21–24
Endoscopy	Positive	2	15	N/R	No	30-60	68–73/20–23
Endoscope cleaning	Negative	2	10	Yes	No	N/R	N/R
Treatment room	N/R	2	6	N/R	N/R	max 60	70–75/21–24
Hydrotherapy	Negative	2	6	N/R	N/R	N/R	72–80/22–27
Physical therapy	Negative	2	6	N/R	N/R	Max 65	72–80/22–27
STERILIZING							
Sterilizer equipment room	Negative	N/R	10	Yes	No	N/R	N/R
CENTRAL MEDICAL AND SURGICAL SUPPLY							
Soiled or decontamination room	Negative	2	6	Yes	No	N/R	72–78/22–26
Clean workroom	Positive	2	4	N/R	No	max 60	72–78/22–26
Sterile storage	Positive	2	4	N/R	N/R	max 60	72–78/22–26
SERVICE							
Food preparation center (i)	N/R	2	10	N/R	No	N/R	72–78/22–26
Warewashing	Negative	N/R	10	Yes	No	N/R	N/R
Dietary storage	N/R	N/R	2	N/R	No	N/R	72–78/22–26
Laundry, general	Negative	2	10	Yes	No	N/R	N/R
Soiled linen sorting and storage	Negative	N/R	10	Yes	No	N/R	N/R
Clean linen storage	Positive	N/R	2	N/R	N/R	N/R	72–78/22–26
Linen and trash chute room	Negative	N/R	10	Yes	No	N/R	N/R
Bedpan room	Negative	N/R	10	Yes	No	N/R	N/R
Bathroom	Negative	N/R	10	Yes	No	N/R	N/R
Janitor's closet	Negative	N/R	10	Yes	No	N/R	72–78/22–26
SUPPORT SPACE							
Soiled workroom or soiled holding	Negative	2	10	Yes	No	N/R	N/R
Clean workroom or clean holding	Positive	2	4	N/R	N/R	N/R	N/R
Hazardous material storage	Negative	2	10	Yes	No	N/R	N/R

Note: N/R = no requirement

Table 7-1 Notes:

- a. Recirculating room HVAC units (with heating or cooling coils) are acceptable to achieve the required air change rates. Because of the cleaning difficulty and the potential for buildup of contamination, recirculating room units shall not be used in areas marked "No." Isolation and intensive care unit rooms may be ventilated by reheat induction units in which only the primary air supplied from a central system passes through the reheat unit. Gravity-type heating or cooling units, such as radiators or convectors, shall not be used in operating rooms and other special care areas.
- b. Pharmacy compounding areas may have additional air change and filtering requirements beyond the minimum of this table depending on the type of pharmacy, the regulatory requirements (which may include adoption of USP 797), the associated level of risk of the work (see USP 797), and the equipment utilized in the spaces.
- c. The term *trauma room* as used herein is a first aid room and/or emergency room used for general initial treatment of accident victims. The operating room within the trauma center that is routinely used for emergency surgery is considered to be an operating room by this Standard.
- d. Pressure relationships need not be maintained when the room is unoccupied.
- e. Some isolation rooms may be provided with a separate anteroom, but an ante room is not required by this standard.
- f. Protective environment rooms are those used for high-risk immunocompromised patients. Such rooms are positively pressurized relative to all adjoining spaces to protect the patient.
- g. Exception: All air need not be exhausted if darkroom equipment has a scavenging exhaust duct attached and meets ventilation standards regarding NIOSH, OSHA, and local employee exposure limits.^{2, 3}
- h. A nonrefrigerated body-holding room is applicable only to facilities that do not perform autopsies on-site and use the space for short periods while waiting for the body to be transferred.
- i. Minimum total air changes per hour (ach) shall be that required to provide proper makeup air to kitchen exhaust systems as specified in ANSI/ASHRAE Standard 154.⁴ In some cases, excess exfiltration or infiltration to or from exit corridors compromises the exit corridor restrictions of NFPA 90A,⁵ the pressure requirements of NFPA 96,⁶ or the maximum defined in the table. During operation, a reduction to the number of air changes to any extent required for odor control shall be permitted when the space is not in use. (See AIA [2006] in Informative Annex B: Bibliography.)
- j. In some areas with potential contamination and/or odor problems, exhaust air shall be discharged directly to the outdoors and not recirculated to other areas. Individual circumstances may require special consideration for air exhausted to the outdoors, for example, intensive care units in which patients with pulmonary infection are treated and rooms for burn patients. To satisfy exhaust needs, constant replacement air from the outdoors is necessary when the system is in operation.
- k. The RH ranges listed are the minimum and maximum limits where control is specifically needed.
- l. Systems shall be capable of maintaining the rooms within the range during normal operation. Lower or higher temperature shall be permitted when patients' comfort and/or medical conditions require those conditions.
- m. National Institute for Occupational Safety and Health (NIOSH) criteria documents regarding occupational exposure to waste anesthetic gases and vapors, and control of occupational exposure to nitrous oxide⁷ indicate a need for both local exhaust (scavenging) systems and general ventilation of the areas in which the respective gases are utilized. Refer to NFPA 99 for other requirements.⁸
- n. If monitoring device alarms are installed, allowances shall be made to prevent nuisance alarms. Short term excursions from required pressure relationships shall be allowed while doors are moving or temporarily open. Simple visual methods such as smoke trail, ball-in-tube, or flutterstrip shall be permitted for verification of airflow direction. Recirculating devices with HEPA filters shall be permitted in existing facilities as interim, supplemental environmental controls to meet requirements for the control of airborne infectious agents. The design of either portable or fixed systems should prevent stagnation and short circuiting of airflow. The design of such systems shall also allow for easy access for scheduled preventative maintenance and cleaning.
- o. Surgeons or surgical procedures may require room temperatures, ventilation rates, humidity ranges, and/or air distribution methods that exceed the minimum indicated ranges.
- p. Treatment rooms used for bronchoscopy shall be treated as bronchoscopy rooms. Treatment rooms used for procedures with nitrous oxide shall contain provisions for exhausting anesthetic waste gases.
- q. In a recirculating ventilation system, HEPA filters shall be permitted instead of exhausting the air from these spaces to the outdoors provided the return air passes through the HEPA filters before it is introduced into any other spaces. This requirement applies only to waiting rooms programmed to hold patients awaiting chest x-rays for diagnosis of respiratory disease.
- r. See NFPA 99 for further requirements.⁸
- s. For patient rooms, labor/delivery/recovery rooms, and labor/delivery/recovery/postpartum rooms, four total ach shall be permitted when supplemental heating and/or cooling systems (radiant heating and cooling, baseboard heating, etc.) are used.
- t. The protective environment airflow design specifications protect the patient from common environmental airborne infectious microbes (i.e., Aspergillus spores). Recirculation HEPA filters shall be permitted to increase the equivalent room air exchanges; however, the outdoor air changes are still required. Constant volume airflow is required for consistent ventilation for the protected environment. If the design criteria indicate that AII is necessary for protective environment patients, an anteroom should be provided. Rooms with reversible airflow provisions for the purpose of switching between protective environment and AII functions shall not be permitted.
- u. The AII room described in this standard shall be used for isolating the airborne spread of infectious diseases, such as measles, varicella, or tuberculosis. The design of AII rooms shall include the provision for normal patient care during periods not requiring isolation precautions. Supplemental recirculating devices using HEPA filters shall be permitted in the patient room to increase the equivalent room air exchanges; however, the outdoor air changes are still required. AII rooms that are retrofitted from standard patient rooms from which it is impractical to exhaust directly outside may be recirculated with air from the AII room, provided that the air first passes through a HEPA filter. HEPA filtered exhaust air from AII rooms may mix with exhaust air that serves non-AII spaces prior to being discharged directly outdoors. Rooms with reversible airflow provisions for the purpose of switching between protective environment and AII functions shall not be permitted. See the guidelines in Informative Annex B: Bibliography for more information.
- v. When required, appropriate hoods and exhaust devices for the removal of noxious gases or chemical vapors shall be provided in accordance with NFPA 99.⁸

- c. Air distribution patterns within the protective environment room shall conform to the following:
 - Supply air diffusers shall be above the patient bed, unless it can be demonstrated that such a location is not practical. Diffuser design shall limit air velocity at the patient bed to reduce patient discomfort. (See *ANSI/ASHRAE Standard 55-2004, Thermal Environmental Conditions for Human Occupancy*, in Informative Annex B: Bibliography.)
 - Return/exhaust grilles or registers shall be located near the patient room door.
- d. Differential pressure between any dissimilar adjacent spaces shall be a minimum of +0.01 in. wc (+2.5 Pa).
- e. PE rooms retrofitted from standard patient rooms may be ventilated with recirculated air, provided that air first passes through a HEPA filter and the room complies with parts “a” through “d” of this section.

7.3 Critical Care Units

7.3.1 Wound Intensive Care Units (Burn Units). Burn unit patient rooms that require humidifiers to comply with Table 7-1 shall be provided with individual humidity control.

7.4 Surgery Rooms

7.4.1 Class B and C Operating Rooms. Operating rooms shall be maintained at a positive pressure with respect to all adjoining spaces at all times. A pressure differential shall be maintained at a value of at least +0.01 in. wc (2.5 Pa). Operating rooms shall be provided with primary supply diffusers that are designed as follows:

- a. The airflow shall be unidirectional, downwards, and the *average velocity* of the diffusers shall be 25 to 35 cfm/ft² (127 L/s/m² to 178 L/s/m²). The diffusers shall be concentrated to provide an airflow pattern over the patient and surgical team. (see Memarzadeh [2002] and Memarzadeh [2004] in Informative Annex B: Bibliography.)
- b. The area of the primary supply diffuser array shall extend a minimum of 12 in. (305 mm) beyond the footprint of the surgical table on each side. No more than 30% of the primary supply diffuser array area shall be used for non-diffuser uses such as lights, gas columns, etc. Additional supply diffusers may be required to provide additional ventilation to the operating room to achieve the environmental requirements of Table 7-1 relating to temperature, humidity, etc.

The room shall be provided with at least two low sidewall return or exhaust grilles spaced at opposite corners or as far apart as possible, with the bottom of these grilles installed approximately 8 in. (203 mm) above the floor.

7.4.2 Sterilization Rooms. Steam that escapes from a steam sterilizer shall be exhausted using an exhaust hood or other suitable means. Ethylene oxide that escapes from a gas sterilizer shall be exhausted using an exhaust hood or other suitable means.

7.4.3 Imaging Procedure Rooms. If invasive procedures occur in this type of room, ventilation shall be provided in

accordance with the ventilation requirements for Class A surgery. If anesthetic gases are administered, ventilation shall be provided in accordance with the ventilation requirements for Class B or C surgery.

7.5 Support Spaces

7.5.1 Morgue and Autopsy Rooms. Low sidewall exhaust grilles shall be provided unless exhaust air is removed through an autopsy table designed for this purpose. All exhaust air from autopsy, nonrefrigerated body-holding, and morgue rooms shall be discharged directly to the outdoors without mixing with air from any other room or exhaust system.

8. PLANNING, CONSTRUCTION, AND SYSTEM STARTUP

8.1 Overview. For HVAC systems serving surgery and critical care spaces, compliance with this standard requires preparation of an acceptance testing plan.

8.2 Planning for the HVAC Services in a New Facility. Design documents for new construction shall meet the following requirements:

- a. *General Mechanical Equipment Rooms.* The access to mechanical rooms shall be planned to avoid the intrusion of maintenance personnel into surgical and critical care patient spaces.
- b. *Mechanical Room Layout.* Mechanical room layout shall include sufficient space for access to equipment for operation, maintenance, and replacement. Floors in mechanical rooms shall be sealed, including sealing around all penetrations, when they are above surgical suites and critical care.
- c. *Maintenance/Repair Personnel Access.* Safe and practical means of accessing equipment shall be provided. Clearance is required at all service points to mechanical equipment to allow personnel access and working space. The access to mechanical equipment shall be planned to make it unnecessary for maintenance personnel to intrude into surgical or critical care rooms.
- d. *Cooling Towers.* Cooling towers shall be located so that drift is directed away from air-handling unit intakes. They shall meet the requirements of Section 6.3.2.

8.3 Planning for the HVAC Services in an Existing Facility. If any existing air-handling equipment is reused, the designer shall evaluate the capacity of the equipment to determine whether it will meet the requirements of this standard for the remodeled space.

8.4 Planning for Infection Control During Remodeling of an Existing Facility. Prior to beginning modifications or remodeling of HVAC systems in an existing facility, an owner shall conduct an infection control risk assessment (ICRA). The ICRA shall establish those procedures required to minimize the disruption of facility operation and the distribution of dust, odors and particulates.

8.5 Documentation of New or Remodeled HVAC Systems. Owners shall retain an acceptance testing report for their files. In addition, the design shall include requirements for operations and maintenance staff training that is sufficient for the staff to keep all HVAC equipment in a condition that will maintain the original design intent for ventilation. Training of operating staff shall include an explanation of the design intent. The training materials shall include, at a minimum, the following:

- a. O&M procedures
- b. Temperature and pressure control operation in all modes
- c. Acceptable tolerances for system temperatures and pressures
- d. Procedures for operations under emergency power or other abnormal conditions that have been considered in the facility design.

8.6 Duct Cleanliness. The duct supply system shall meet the following requirements for cleanliness:

- a. The duct system shall be free of construction debris. New supply duct system installations shall comply with level “B,” the Intermediate Level of SMACNA Duct Cleanliness for New Construction Guidelines.⁹
- b. The supply diffusers in the Class B & C operating rooms shall be opened and cleaned before the space is used.
- c. The permanent HVAC systems shall not be operated unless protection from contamination of the air distribution system is provided.

9. NORMATIVE REFERENCES

- ¹ Code of Federal Regulations: 21CFR 173.310 (April 1999), US Dept. of Health and Human Services, Food and Drug Administration.
- ² DHHS (NIOSH) Publication No. 94-100 (NIOSH Alert) *Controlling Exposures to Nitrous Oxide During Anesthetic Administration*, National Institute for Occupational Safety and Health (CDC), Atlanta, GA.
- ³ OSHA [1994]. Computerized information system. Washington, DC: U.S. Department of Labor, Occupational Safety and Health Administration.
- ⁴ ANSI/ASHRAE Standard 154-2003 *Ventilation for Commercial Cooking Operations*, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Atlanta, GA.
- ⁵ NFPA 90A. National Fire Protection Association 1 Batterymarch Park, Quincy, MA 02169.
- ⁶ NFPA 96. National Fire Protection Association 1 Batterymarch Park, Quincy, MA 02169.
- ⁷ NIOSH Critical Documents. National Institute for Occupational Safety and Health, available at the Centers for Disease Control and Prevention (CDC) web site: http://www.cdc.gov/niosh/pubs/criteria_date_desc_nopubnumbers.html
- ⁸ NFPA 99-2005: *Standard for Health Care Facilities*. National Fire Protection Association 1 Batterymarch Park, Quincy, Massachusetts USA 02169
- ⁹ SMACNA *Duct Cleanliness for New Construction Guidelines*, (2000), Chantilly, VA 20151.

(This annex is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

INFORMATIVE ANNEX A

A1. O&M IN HEALTH CARE FACILITIES

The following operations and maintenance procedures are recommended for health care facilities.

A1.1 Operating Rooms. Each operating room should be tested for positive pressure semi-annually or on an effective preventative maintenance schedule. When HEPA filters are present within the diffuser of operating rooms, the filter should be replaced based on pressure drop.

A1.2 Protective Environment (PE) Rooms. PE rooms should remain under positive pressure with respect to all adjoining rooms whenever an immunocompromised patient is present. PE rooms should be tested for positive pressure daily when an immunocompromised patient is present. When HEPA filters are present within the diffuser of protective environment rooms, the filter should be replaced based on pressure drop.

A1.3 Airborne Infection Isolation (AII) Rooms. AII rooms should remain under negative pressure relative to all adjoining rooms whenever an infectious patient is present. They should be tested for negative pressure daily whenever an infectious patient is present.

A1.4 Filters. Final filters and filter frames should be visually inspected for pressure drop and for bypass monthly. Filters should be replaced based on pressure drop with filters that provide the efficiencies specified in Table 6-1.

A2. SPECIAL MAINTENANCE FOR HVAC UNITS

The following special maintenance procedures are recommended for health care facilities.

A2.1 Fan-Coil Unit and Heat Pumps. The fan-coil unit and heat pump filters serving patient rooms should be inspected monthly or on an effective preventative maintenance cycle for pressure drop and replaced when that pressure drop causes a reduction in air flow. Fan-coil unit and heat pump drain pans under cooling coils should be cleaned monthly, or on an effective preventative maintenance cycle.

A2.2 Fin-Tube Radiation Units, Induction Units and Convection Units. Fin-tube radiation units, induction units and convection units serving patient rooms should be cleaned quarterly, or on an effective preventative maintenance cycle.

A2.3 Fan-Powered Terminal Units. Fan-powered terminal unit filters serving patient rooms should be inspected monthly or on an effective preventative maintenance cycle for pressure drop and replaced when the pressure drop causes a reduction in air flow.

(This annex is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

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NOTICE

INSTRUCTIONS FOR SUBMITTING A PROPOSED CHANGE TO THIS STANDARD UNDER CONTINUOUS MAINTENANCE

This standard is maintained under continuous maintenance procedures by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. SSPC consideration will be given to proposed changes within 13 months of receipt by the manager of standards (MOS).

Proposed changes must be submitted to the MOS in the latest published format available from the MOS. However, the MOS may accept proposed changes in an earlier published format if the MOS concludes that the differences are immaterial to the proposed change submittal. If the MOS concludes that a current form must be utilized, the proposer may be given up to 20 additional days to resubmit the proposed changes in the current format.

ELECTRONIC PREPARATION/SUBMISSION OF FORM FOR PROPOSING CHANGES

An electronic version of each change, which must comply with the instructions in the Notice and the Form, is the preferred form of submittal to ASHRAE Headquarters at the address shown below. The electronic format facilitates both paper-based and computer-based processing. Submittal in paper form is acceptable. The following instructions apply to change proposals submitted in electronic form.

Use the appropriate file format for your word processor and save the file in either a recent version of Microsoft Word (preferred) or another commonly used word-processing program. Please save each change proposal file with a different name (for example, "prop01.doc," "prop02.doc," etc.). If supplemental background documents to support changes submitted are included, it is preferred that they also be in electronic form as word-processed or scanned documents.

ASHRAE will accept the following as equivalent to the signature required on the change submittal form to convey non-exclusive copyright:

Files attached to an e-mail:	Electronic signature on change submittal form (as a picture; *.tif, or *.wpg).
Files on a CD:	Electronic signature on change submittal form (as a picture; *.tif, or *.wpg) or a letter with submitter's signature accompanying the CD or sent by facsimile (single letter may cover all of proponent's proposed changes).

Submit an e-mail or a CD containing the change proposal files to:

Manager of Standards

ASHRAE

1791 Tullie Circle, NE

Atlanta, GA 30329-2305

E-mail: change.proposal@ashrae.org

(Alternatively, mail paper versions to ASHRAE address or fax to 404-321-5478.)

The form and instructions for electronic submittal may be obtained from the Standards section of ASHRAE's Home Page, www.ashrae.org, or by contacting a Standards Secretary, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. Phone: 404-636-8400. Fax: 404-321-5478. E-mail: standards.section@ashrae.org.



FORM FOR SUBMITTAL OF PROPOSED CHANGE TO AN ASHRAE STANDARD UNDER CONTINUOUS MAINTENANCE

NOTE: Use a separate form for each comment. Submittals (Microsoft Word preferred) may be attached to e-mail (preferred), submitted on a CD, or submitted in paper by mail or fax to ASHRAE, Manager of Standards, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: change.proposal@ashrae.org. Fax: +1-404/321-5478.

1. Submitter:

Affiliation: _____

Address: _____ City: _____ State: _____ Zip: _____ Country: _____

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2. Number and year of standard:

3. Page number and clause (section), subclause, or paragraph number:

4. I propose to: Change to read as follows Delete and substitute as follows
(check one) Add new text as follows Delete without substitution

Use underscores to show material to be added (added) and strike through material to be deleted (~~deleted~~). Use additional pages if needed.

5. Proposed change:

6. Reason and substantiation:

7. Will the proposed change increase the cost of engineering or construction? If yes, provide a brief explanation as to why the increase is justified.

Check if additional pages are attached. Number of additional pages: _____

Check if attachments or referenced materials cited in this proposal accompany this proposed change. Please verify that all attachments and references are relevant, current, and clearly labeled to avoid processing and review delays. *Please list your attachments here:*

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