



Oklahoma Association of Healthcare Engineers 2019 Fall Regional Event

October 11, 2019



2019 OAHE Fall Regional Event

8:30 - 10:00 SESSION 1: FGI 2018 OVERVIEW

This session will cover changes that occur in the 2018 version of the FGI guidelines and will introduce how to work with the guidelines. We also plan to use some specific departmental examples to illustrate new requirements. There will be an overview of several key issues that deserve a closer look in the 2018 Guidelines, and a look at the future of FGI.

10:15 – 11:45 SESSION 2: FGI 2018 FRONT-END DOCUMENTS DEEP DIVE

In this session we will walk through front-end documentation required for FGI 2018 in detail illustrating what needs to be completed when and by whom. We will illustrate several tools we've developed to help owners through this process.

12:15 - 1:45 SESSION 3: USP <797> & <800> OVERVIEW

In this session we would like to walk through USP <797>&<800> which was previously required to be in place in hospitals by December of this year. This is an important conversation including what is required, how it is applied, and how to ensure a successful project.

2:00 - 3:30 SESSION 4: PANEL DISCUSSION OVERVIEW

In this session, speakers from the day will be on stage to discuss a variety of topics relevant to FGI, Design, and Construction. Three main topics will be reviewed: Interior Design and FGI, the Future of Healthcare in Design and Construction, and how FGI Works in the Developing World: A Case Study --FGI Applied in Kenya. Audience participation is encouraged to ask any questions they may have from the day or otherwise.



AGENDA

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2. PANIC OF TRAFFIC JAM



BUT FIRST ..







Session 1: FGI 2018 Overview

Oklahoma Association of Healthcare Engineers <
2019 Fall Regional Event

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Dwayne Robinett, AIA

- Managing Director and Market Leader for HFG Architecture's Oklahoma Region.
- NCARB and LEED Accredited.
- Member of the American Institute of Architects, the American Society of Healthcare Engineers, and the Oklahoma Association of Healthcare Engineers.

Jessica Zvonek, PE

- Mechanical Associate at Professional Engineering Consultants
- EDAC and LEED Accredited.
- Responsibilities include the design of plumbing, heating, ventilation, and air conditioning (HVAC) systems from the initial concept stage to the final bid documents with extensive experience in healthcare.



INTRODUCTION





Session 1 Learning Objectives

- 1. RECOGNIZE KEY ORGANIZATIONAL CHANGES AND REQUIREMENTS TO SUCCESSFULLY APPLY GUIDELINES FOR DESIGN AND CONSTRUCTION OF HOSPITALS, 2018 EDITION
- 2. IDENTIFY AND EXPLAIN NEW INITIATIVES FOUND IN GUIDELINES FOR DESIGN AND CONSTRUCTION OF HOSPITALS, 2018 EDITION
- 3. DESCRIBE UPDATED VENTILATION REQUIREMENTS (ASHRAE 170 2017) FOR WHICH HOSPITALS NEED TO BE PREPARED AS COMPARED TO PREVIOUS REQUIREMENTS (ASHRAE 170 – 2008, NFPA 99 -2012 AND ASHRAE 170 - 2013, FGI 2014) IN GUIDELINES FOR DESIGN AND CONSTRUCTION OF HOSPITALS, 2018 EDITION
- 4. DESCRIBE UPDATED REQUIREMENTS FOR NURSE CALL, RECEPTACLES, AND MEDICAL GAS OUTLETS



AGENDA

Session 1: FGI 2018 Overview

- 1. FGI 2018 ORGANIZATIONAL STRUCTURE
- 2. HOSPITAL ITEMS OF SIGNIFICANCE
 - **KEY FRONT-END CONCEPTS** ٠
 - ACOUSTIC DESIGN
 - PATIENT CARE UNITS / PATIENT ROOMS ۲
 - TELEMEDICINE
 - OPERATING AND PROCEDURE ROOMS
- OUTPATIENT ITEMS OF SIGNIFICANCE З.
- VENTILATION AND SYSTEMS OVERVIEW 4.
- FUTURE OF FGI 5.
- QUESTIONS AND ANSWERS 6.



AGENDA











ACCORDING TO THE GUIDELINES...

"...the most significant change to the 2018 edition of the Guidelines is that these important design standards are now presented as three independent documents."









<u>Guidelines for Design and Construction of Hospitals</u>

Provides standards for designing and constructing hospital facilities.

<u>Guidelines for Design and Construction of Outpatient Facilities</u>

Provides standards for designing and constructing outpatient facilities.

Guidelines for Design and Construction of Residential Health, Care, and Support Facilities

Provides standards for designing and constructing residential facilities.











Basic Organization of the *Guidelines*

Main body

Part 1 contains chapters that address considerations applicable to all hospitals/outpatient facilities, except as modified in specific facility chapters in Part 2.

Part 2 addresses facilities where inpatient/outpatient care is provided, with chapters devoted to common elements.

Hospital Guidelines includes general hospitals, critical access hospitals, psychiatric hospitals, rehabilitation hospitals, and children's hospitals. Chapters on freestanding emergency departments and mobile/transportable medical units are also included.

Outpatient Guidelines includes specific requirements for outpatient facility types.

Part 3 contains the full text of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 170-2017: Ventilation of Health Care Facilities.

Appendix items are incorporated within the main body of the text.

An asterisk (*) preceding a section or paragraph number indicates that explanatory or educational material can be found in an appendix item located at the bottom of the page.

Appendix items are identified by the letter "A" preceding the section or paragraph number in the main text to which they relate.

Cross-references. Cross-references are used throughout the Guidelines: example: See Section 2.2-2.1.3 (Accommodations for Care of Patients of Size).



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Major Additions and Revisions of the 2018 Guidelines

Functional Programs

Changes include additional requirements for space programs.

Acoustics

Many new requirements and guidance for acoustics

Patients of Size

Many new requirements and guidance for patients of size

Sustainable Design

Sustainable design becomes a part of the *Guidelines*, though much of it is Appendix content.

Telemedicine

Telemedicine is now addressed in the *Guidelines*

Imaging Facilities

Now classified according to use in Hospitals Guidelines and included separately in Outpatient Guidelines.

Pre- and Post-Procedure Patient Care

Separate or combined areas. Minimums established for required ratios based on imaging rooms or procedure/Ors

Sterile processing

- One room processing facility no longer permitted except as an exception for small countertop, limited workflow SP facilities. Two-room minimum, including decontam. and clean workroom.
- Requirements and guidance for storage of clean instruments are also provided in Hospital and OP Guidelines









Major Additions and Revisions of the 2018 Guidelines

Technology distribution room

TDR space requirements revised to provide a minimum three-foot clearance on all sides of equipment racks vs. 2014 minimum of 12 feet by 14 feet for the TDR.

Critical care unit patient rooms

In new construction, all patient rooms in critical care units except NICUs will be single-patient rooms with potential ٠ exceptions for renovations.

Procedure and operating rooms

- Better alignment of requirements in room types where procedures occur based on levels of invasiveness and risk to patient.
- Addresses support spaces for patients. ٠
- Table provided to quickly identify which procedures are to occur in which spaces.





2018 edition

ASHRAE Includes ANSI/ASHRAE/ASHE Standard 170-2017: Ventilation of Health Care Facilities

Index

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Guidelines for Design and Construction of Hospitals

Provides standards for designing and constructing hospital facilities.

List of Tables 2018 Health Guidelines Revisions Major Additions and Revisions Glossary List of Acronyms Part 1: General Chapter 1.1: Introduction Chapter 1.2: Planning, Design, Construction, and Commissioning Chapter 1.3: Site Chapter 1.4: Equipment Part 2: Hospital Facility Types Chapter 2.1: Common Elements for Hospitals Chapter 2.2: Specific Requirements for General Hospitals Chapter 2.3: Specific Requirements for Freestanding Emergency Care Facilities Chapter 2.4: Specific Requirements for Critical Access Hospitals Chapter 2.5: Specific Requirements for Psychiatric Hospitals Chapter 2.6: Specific Requirements for Rehabilitation Hospitals Chapter 2.7: Specific Requirements for Children's Hospitals Chapter 2.8: Specific Requirements for Mobile/Transportable Medical Units Part 3: Ventilation of Hospitals ANSI/ASHRAE/ASHE Standard 170-2017 Ventilation of Health Care Facilities

<u>Guidelines for Design and Construction of Hospitals</u>

Provides standards for designing and constructing hospital facilities.

Part 1: General Chapter 1.1: Introduction Chapter 1.2: Planning, Design, Construction, and Commissioning Section 1.2-1: General Section 1.2-2: Functional Program Section 1.2-3: Space Program Section 1.2-4: Safety Risk Assessment (SRA) Section 1.2-5: Environment of Care Requirements Section 1.2-6: Planning and Design Considerations and Requirements Section 1.2-7: Renovation Section 1.2-8: Commissioning Section 1.2-9: Record Drawings and Manuals Chapter 1.3: Site Section 1.3-1: General Section 1.3-2: Location Section 1.3-3: Site Features Section 1.3-4: Environmental Pollution Control Chapter 1.4: Equipment



Guidelines

FOR DESIGN AND CONSTRUCTION OF

Hospitals

2018 edition

The Facility Guidelines Institute



Includes ANSI/ASHRAE/ASHE Standard 170-2017: Ventilation of Health Care Facilities



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* 1.2-1.2 Multidisciplinary Project Team

1.2-1.2.1 Multidisciplinary groups/persons (stakeholders) affected by and integral to the design shall be included in the project planning and implementation process.

A1.2-1.2 Project team

a. The multidisciplinary project team should be assembled as early as possible in the design process.

b. The multidisciplinary team should include administrators, clinicians, infection preventionists, architects and other design professionals, facility managers, safety officers, security managers, 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. Inclusion of patient advocates/consumers, A/E consultants, and construction specialists should be considered.

1.2-1.2.2 The scope and nature of the project shall dictate others to be involved on the project team.



* 1.2-3 Space Program

A space program, organized by department, now must be provided **separately** from the functional program.

Must include:

- Each room in the project
- Size of each room, including gross square footage and clear square footage.
- Must cite relevant paragraphs from the FGI Document

A1.2-3 Project gross floor area

a. Gross floor area for the project should be aggregated by department, and multiplying factors should be applied to reflect circulation and wall thicknesses within the department or functional area. This result is referred to as department gross square footage (DGSF).

b. DGSF for the project should be aggregated, and multiplying factors should be applied to reflect interdepartment circulation patterns, exterior wall thicknesses, engineering spaces, general storage spaces, vertical circulation, and any other areas not included within the intra-department calculations. This result is referred to as building gross square footage (BGSF) and reflects the overall size of the project.



* 1.2-6 Planning and Design Considerations and Requirements

Acoustic design plays a large role in the newest guidelines.

Must include :

- Accommodations for site exterior noise
- Considerations for facility noises that may reach nearby residences
- Surfaces
- Maximum room noise levels
- Speech privacy
- Building vibration



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Acoustic Design

The appendix in this section provides useful information that will help direct acoustical design efforts, including:

- Definitions
- Separate limits for daytime or nighttime
- Reference codes for acoustic design
- Guidance on how to address facility site noise when the hospital cannot operationally control the noise

Means of measurement may include:

- Exterior site observations •
- Sound-level monitoring surveys

Strategies may include:

Distance, Orientation, Shielding





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Acoustic Design – A1.2-6.1.2 Site Exterior Noise

This section provides design guidance on how to address environmental noise at a facility site

- May include on-site noise or off-site noise
- May be under hospital's operational control (plant, generators)
- May be under hospital's control, but with limited ability to control (helipad or heliport)
- May not be under hospital's control (roads, rail, airports, power plants, etc.)

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.









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Acoustic Design – 1.2-6.1.2 Site Exterior Noise

Various means are suggested to evaluate noise in order to better design for the local acoustical environment

- Four categories in which to classify environmental noise (A-D) •
- Table 1.2-3 and appendix table A1.2-b offer descriptions of sound categories

Table 1.2-3: Categorization of Hospital Sites by Exterior Ambient Sound with Design Criteri
for Sound Isolation of Exterior Shell in New Construction

Exterior Site Noise Exposure Category						
	Α	В	С	D		
General description	Minimal	Moderate	Significant	Extreme		
Outdoor day-night average	- 65	65 60	70.74	~ 75		
sound level during (L _{dn}) (dBA) ¹	< 05	65-69	/0-/4	215		
Outdoor average hourly nominal						
maximum sound level $(L_{01})^2$	< 75	75–79	80-84	≥ 85		
(dBA)						
Design Criteria for Sound Isolation of Exterior Shell in New Construction ³						
Minimum exterior shell	OITCe: 25	OITCc: 30	OITCe: 35	OITCc: 40		
composite sound transmission	or	or	or	or		
rating ^{4, 5, 6}	STCc: 35	STCc: 40	STCc: 45	STCc: 50		

OITC - Outdoor-Indoor Transmission Class

STC – Sound Transmission Class





STC RATING

VERSUS

COMPARING THE 2 TYPES OF SOUND RATINGS



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Acoustic Design – Interiors (1.2-6.4-7)

Design Criteria for Acoustic Surfaces

Normally occupied spaces in a hospital shall now require surfaces that help achieve minimum sound absorption coefficients. There are several important considerations

Other Design Criteria:

- Room Noise Levels (HVAC, etc.) (Table 1.2-5)
- Interior wall and floor/ceiling construction (Table 1.2-6)
- Speech privacy (Table 1.2-7)
- Vibration control
- Alarm fatigue top priority in hospitals; leads to patient stress •
- OR noise levels may be difficult to achieve due to HVAC systems noise
- Vibration produced by equipment & activities (i.e. footfall)



HOSPTIALS - PART 1







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2.1-2 – Patient Care Units and Other Patient Care Areas Accommodations for Patients of Size

- Not only "bariatric" but all patients of size
- The number of POS spaces is to be determined by hospital based on projected need.
- Special design requirements for POS include:
 - A.I.I. rooms
 - Space provisions
 - Exam / treatment rooms
 - Toilet rooms and bathing facilities, including patient lifts to assist caregivers







PART 2

HOSPTIALS -

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2.1-3 – Diagnostic and Treatment Areas 2.2-2 – Patient Care Units

Single Patient Exam Room: 120 SF clear floor area, 10 ft. min. dim.

Minimum 3 feet at sides, foot of bed (see notes in • chapter about placement)

Multiple Patient Exam Room: 80 SF clear *per station*

- 5 feet between beds
- 4 feet between beds/walls

SAFE Room: same as single patient exam room

- Private shower •
- A room for consultation, family, support services, and law enforcement shall be readily accessible
- Additional req's in chapter...



PART 2

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*2.1-3.3 Accommodations for Telemedicine Services

A bay, cubicle, or room shall be provided for telemedicine services.

A2.1-3.3 Patient experience. Remote communications via electronic equipment, although not a replacement for in-person care, may be offered as a supplement where in-person care is not available or medically necessary. To assist in the adoption of telemedicine and maximize its benefits for elderly patients, those unaccustomed to electronic communication, and those with vision, hearing, or cognitive impairments, care should be given to remove technological barriers and provide telemedicine endpoints that facilitate natural communication for the widest range of participants. Facilities and systems used for telemedicine communications should strive to maintain the level of safety, privacy, quality of care, and patient experience that would be expected for in-person communication.



HOSPTIALS - PART 2



A2.1-3.3.1 Telemedicine service types

a. Services may include one-on-one interactions, consultations with a patient and family members (e.g., pediatric or elderly patients), examinations supported by a telemedicine presenter located with the patient, or specialty services such as dermatology or orthopedics. ...to achieve a functional design, it is important to know what services will be provided.





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A2.1-3.3.2 Design considerations for telemedicine

- Be careful with camera placement. Eye-to-eye camera angle important.
- Provide adequate HVAC • and electrical support based on equipment
- b. Architectural details
- Doors should allow for maximum privacy
- Doors should not be placed ulletbehind the patient





https://youtu.be/s6M1yc3FTAM

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- Equipment based on exam type
- Lighting should be both direct & indirect, from sides of patient
- Room color can affect quality \bullet of exam





HOSPTIALS - PART 2

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Patient Care Stations (PCS)

The number of required patient care stations is defined by the Guidelines.

- When combined into one area, provide at least 2 PCS per Class 2 and Class 3 imaging, procedure, or operating room.
- If separate:
 - Pre-Procedure Room or Area: 1 PCS / imaging, procedure, or OR.
 - Phase I PACU: 1 PCS / Class 3 imaging or OR (was 1.5 PACU / OR)
 - Phase II Recovery Room or Area: 1 Phase II PCS per Class 2 or Class 3 imaging, procedure, or OR





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Patient Care Stations (PCS)

- Where cubicles are used, the following minimum clearances shall be provided:
 - 3 feet between the sides of patient beds/gurneys/lounge chairs and adjacent walls or partitions (was 4 feet)
 - 2 feet between the foot of patient beds/gurneys/lounge chairs and the cubicle curtain (was 3 feet)
 - Where bays or cubicles face each other, an aisle with a minimum clearance of 8 feet independent of the foot clearance between patient stations or other fixed objects shall be provided





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Patient Care Stations (PCS)

- Where bays are used, the following minimum clearances shall be provided:
 - 5 feet between the sides of patient beds/gurneys/lounge chairs
 - 3 feet between the sides of patient beds/gurneys/lounge chairs and adjacent walls or partitions (was 4 feet)
 - 2 feet between the foot of patient beds/gurneys/lounge chairs and the cubicle curtain (was 3 feet)



PART 2

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Patient Care Stations (PCS)

Where single-patient rooms are used, 3 feet shall be provided • between the sides and foot of beds/gurneys/lounge chairs and adjacent walls or partitions.





<u>Guidelines for Design and Construction of Hospitals</u>

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Part 2: Hospital Facility Types

Chapter 2.1: Common Elements for Hospitals

Chapter 2.2: Specific Requirements for General Hospitals

Section 2.2-1: General

Section 2.2-2: Patient Care Units

Section 2.2-3: Diagnostic and Treatment Facilities

Section 2.2-4: Patient Support Facilities

Section 2.2-5: General Support Facilities

Section 2.2-6: Public and Administrative Areas

Section 2.2-7: Design and Construction Requirements

Section 2.2-8: Building Systems

Chapter 2.3: Specific Requirements for Freestanding Emergency Care Facilities

Chapter 2.4: Specific Requirements for Critical Access Hospitals

Chapter 2.5: Specific Requirements for Psychiatric Hospitals

Chapter 2.6: Specific Requirements for Rehabilitation Hospitals

Chapter 2.7: Specific Requirements for Children's Hospitals

Chapter 2.8: Specific Requirements for Mobile/Transportable Medical Units

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Procedures 2.2-3.3.3 Operating Rooms 2.2-3.3.2 Procedure Room

Governing body to complete a clinical assessment of procedures to determine the appropriate room type and location and document this in the functional program.

-	Use	Design Requirements ²			
Room		Room Type	Location	Surfaces	
Exam or treatment room	Patient care that may require high- level disinfected or sterile instruments but does not require the environmental controls of a procedure room	Unrestricted area	Accessed from an unrestricted area	<i>Flooring:</i> cleanable and wear-resistant for the location; stable, firm, and slip-resistant <i>Wall finishes:</i> washable <i>Ceiling:</i> cleanable with routine housekeeping equipment; lay- in ceiling permitted	
Procedure room	Patient care that requires high-level disinfection of the room, sterile instruments, and some environmental controls but does not require the environmental controls of an operating room Endoscopic procedures	Semi- restricted area	Accessed from an unrestricted or a semi- restricted area	 <i>Flooring:</i> cleanable and wear-resistant for the location; stable, firm, and slip-resistant <i>Floor and wall base assemblies in cystoscopy, urology, and endoscopy procedure rooms and endoscope processing room:</i> monolithic floor with integral coved wall base carried up the wall a minimum of 6 inches <i>Wall finishes:</i> washable <i>Wall finishes in endoscopy procedure room and endoscope processing room:</i> washable; free of fissures, open joints, or crevices <i>Ceiling:</i> smooth and without crevices, scrubbable, non-absorptive, non-perforated; capable of withstanding cleaning chemicals; lay-in ceiling permitted if gasketed or each ceiling tile weighs at least one pound per square foot and no perforated, tegular, serrated, or highly textured tiles 	
Operating room	Invasive procedures ³ Any procedure during which the patient will require physiological monitoring and is anticipated to require active life support	Restricted area	Accessed from a semi- restricted area	 <i>Flooring:</i> cleanable and wear-resistant for the location; stable, firm, and slip-resistant <i>Floor and wall base assemblies:</i> monolithic floor with integral coved wall base carried up the wall a minimum of 6 inches <i>Wall finishes:</i> washable; free of fissures, open joints, or crevices <i>Ceiling:</i> monolithic, scrubbable, capable of withstanding cleaning and/or disinfecting chemicals, gasketed access openings 	



nd Operating Room Classification

Procedures 2.2-3.3.3 Operating Rooms 2.2-3.3.2 Procedure Room

Examination room: A room with a bed, gurney, 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 examinations).

Table 2.2-1: Examination/Treatment, Procedure, and Operating Room Classification¹

Room	Use	Design Requirements ²			
		Room Type	Location	Surfaces	
Exam or treatment room	Patient care that may require high- level disinfected or sterile instruments but does not require the environmental controls of a procedure room	Unrestricted area	Accessed from an unrestricted area	<i>Flooring:</i> cleanable and wear-resistant for stable, firm, and slip-resistant <i>Wall finishes:</i> washable <i>Ceiling:</i> cleanable with routine housekeep in ceiling permitted	



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Procedures 2.2-3.3.3 Operating Rooms 2.2-3.3.2 Procedure Room

Procedure room: A room designated for the performance of patient care that requires high-level disinfection or sterile instruments and some environmental controls but is not required to be performed with the environmental controls of an operating room.

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Procedure room	Patient care that requires high-level disinfection of the room, sterile instruments, and some environmental controls but does not require the environmental controls of an operating room Endoscopic procedures	Semi- restricted area	Accessed from an unrestricted or a semi- restricted area	 <i>Flooring:</i> cleanable and wear-resistant for stable, firm, and slip-resistant <i>Floor and wall base assemblies in cystosco endoscopy procedure rooms and endosco room:</i> monolithic floor with integral coved up the wall a minimum of 6 inches <i>Wall finishes:</i> washable <i>Wall finishes in endoscopy procedure room processing room:</i> washable; free of fissure crevices <i>Ceiling:</i> smooth and without crevices, scrue absorptive, non-perforated; capable of with chemicals; lay-in ceiling permitted if gasket tile weighs at least one pound per square perforated, tegular, serrated, or highly text



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the location;

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ibbable, nonthstanding cleaning eted or each ceiling foot and no tured tiles
Procedures 2.2-3.3.3 Operating Rooms 2.2-3.3.2 Procedure Room

Operating room (OR): A room in the surgical suite that meets the requirements of a restricted area and is designated and equipped for performing invasive procedures.

Hybrid operating room: A room that meets the definition of an operating room and has permanently installed equipment to enable diagnostic imaging before, during, and after surgical procedures. Note: Imaging equipment may include MRI, fixed single-plane and bi-plane tomographic imaging systems, and computed tomography equipment. Use of portable imaging technology does not make an OR a hybrid operating room.

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Operating room	Invasive procedures ³ Any procedure during which the patient will require physiological monitoring and is anticipated to require active life support	Restricted area	Accessed from a semi- restricted area	 <i>Flooring:</i> cleanable and wear-resistant for stable, firm, and slip-resistant <i>Floor and wall base assemblies:</i> monolith integral coved wall base carried up the winches <i>Wall finishes:</i> washable; free of fissures, or crevices <i>Ceiling:</i> monolithic, scrubbable, capable or cleaning and/or disinfecting chemicals, groupenings



or the location:

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open joints, or

of withstanding asketed access

Procedures 2.2-3.3.3 Operating Rooms

*Operating rooms are where invasive procedures are to be performed

- Minimum OR size is 400 SF clear
- Image guided surgery (or other procedures requiring large equipment or more personnel) requires 600 SF clear (renovations: 500 SF w/ 20 ft clear dim possible)
- No longer are "clear dimensions" required, however minimum clearances are now established as:
 - 8.5 ft on each side of the operating table, gurney, • or procedural chair
 - 6 ft at the head. This dimension shall result in an anesthesia work zone with a clear floor area of 6 ft x 8 ft



7 ft at the foot

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Procedures 2.2-3.3.2 Procedure Room

Governing body to complete a clinical assessment of procedures to determine the appropriate room type and location and document this in the functional program.

A2.2-3.3.2.1 (1) (c) Procedures that require different pressure relationships cannot be provided in the same procedure room; if these rooms are also used for other procedures, the other procedures must be able to be performed in the same pressure environment.

Table 2.2-1: Examination/Treatment, Procedure, and Operating Room Classification¹

Deem	llan			Design Requirements ²
Room	Use	Room Type	Location	Surfaces
Exam or treatment room	Patient care that may require high- level disinfected or sterile instruments but does not require the environmental controls of a procedure room	Unrestricted area	Accessed from an unrestricted area	<i>Flooring:</i> cleanable and wear-resistant for the location; stable, firm, and slip-resistant <i>Wall finishes:</i> washable <i>Ceiling:</i> cleanable with routine housekeeping equipment; lay- in ceiling permitted
Procedure room	Patient care that requires high-level disinfection of the room, sterile instruments, and some environmental controls but does not require the environmental controls of an operating room Endoscopic procedures	Semi- restricted area	Accessed from an unrestricted or a semi- restricted area	 <i>Flooring:</i> cleanable and wear-resistant for the location; stable, firm, and slip-resistant <i>Floor and wall base assemblies in cystoscopy, urology, and endoscopy procedure rooms and endoscope processing room:</i> monolithic floor with integral coved wall base carried up the wall a minimum of 6 inches <i>Wall finishes:</i> washable <i>Wall finishes in endoscopy procedure room and endoscope processing room:</i> washable; free of fissures, open joints, or crevices <i>Ceiling:</i> smooth and without crevices, scrubbable, non-absorptive, non-perforated; capable of withstanding cleaning chemicals; lay-in ceiling permitted if gasketed or each ceiling tile weighs at least one pound per square foot and no perforated, tegular, serrated, or highly textured tiles
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Procedures 2.2-3.3.2 Procedure Room

Procedure rooms shall be a minimum clear floor area of 130 SF, unless anesthesia is administered using anesthesia machine and supply carts which shall have a minimum clear floor area of 160 SF

Clearance requirements are

- 3.5 ft. on each side of gurney/chair
- 3 ft at the head and foot
- *Where an anesthesia machine and associated supply cart are used, the clearance at the head shall be 6 ft

A2.2-3.3.2.1 (1) (c) Procedures that require different pressure relationships cannot be provided in the same procedure room; if these rooms are also used for other procedures, the other procedures must be able to be performed in the same pressure environment.

A2.2-3.3.2.2 (2) (b) Anesthesia work zone. On the outside edge of the anesthesia work zone, 2 ft x 8 ft may serve as part of the circulation pathway.



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2.1-5.1.2 – Facilities for On-Site Sterile Processing Two-Room Sterile Processing Facility

On-site Facilities

- Must be a two-room configuration in most instances (one room with one-way traffic flow was previously permitted)
- The sterile processing facility must meet the requirements of a semi-restricted area, and layed out to provide a oneway traffic pattern
 - Decontam and Clean Work room clearances are based on equipment used, plus space for work counters, sinks, receptacles, documentation areas, etc.
- Limited sterilization equipment such as a tabletop unit is permitted to be located in a single room as long as it includes a decontam and clean work area.
- Sterile storage is permitted to be in the clean workroom or a separate room





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PART

HOSPTIALS

Now classified according to use in Hospitals Guidelines and included separately in Outpatient Guidelines. Per Guidelines, this is intended to aid in easier adaptation of new technologies and equipment.

- Class 1 (unrestricted area) for services that use a natural orifice entry (noninvasive)
- Class 2 (semi-restricted area) for diagnostic and therapeutic procedures
- Class 3 (restricted area) for invasive procedures and any Class 2 procedure during which the patient will require physiological monitoring and is anticipated to require life support.
- Class 2 and 3 rooms should have a physically separate control room

Table 2.2-2: Classification of Room Types for Imaging Services

Room	llse		_	Design Requirements ²
		Room Type	Location	Surfaces
Class 1 imaging room	Diagnostic radiography, fluoroscopy, mammography, computed tomography (CT), ultrasound, magnetic resonance imaging (MRI), and other imaging modalities Services that use natural orifice entry and do not pierce or penetrate natural protective membranes	Unrestricted area	Accessed from an unrestricted area	<i>Flooring:</i> cleanable and wear-resistant for the location; stable, firm, and slip-resistant <i>Wall finishes:</i> washable <i>Ceiling:</i> cleanable with routine housekeeping equipment; lay-in ceiling permitted
Class 2 imaging room	Diagnostic and therapeutic procedures such as coronary, neurological, or peripheral angiography Electrophysiology procedures	Semi- restricted area	Accessed from an unrestricted or a semi- restricted area	 <i>Flooring:</i> cleanable and wear-resistant for the location; stable, firm, and slip-resistant <i>Floor and wall base assemblies:</i> monolithic floor with integral coved wall base carried up the wall a minimum of 6 inches <i>Wall finishes:</i> washable; free of fissures, open joints, or crevices <i>Ceiling:</i> smooth and without crevices, scrubbable, non-absorptive, non-perforated; capable of withstanding cleaning chemicals; lay-in ceiling permitted if gasketed or each ceiling tile weighs at least one pound per square foot and no perforated, tegular, serrated, or highly textured tiles
Class 3 imaging room	Invasive procedures ³ Any Class 2 procedure during which the patient will require physiological monitoring and is anticipated to require active life support	Restricted area	Accessed from a semi- restricted area	<i>Flooring:</i> cleanable and wear-resistant for the location; stable, firm, and slip-resistant <i>Floor and wall base assemblies:</i> monolithic floor with integral coved wall base carried up the wall a minimum of 6 inches <i>Wall finishes:</i> washable; free of fissures, open joints, or crevices <i>Ceiling:</i> monolithic, scrubbable, capable of withstanding cleaning and/or disinfecting chemicals, gasketed access openings



HOSPTIALS - PART 2

Table 2.2-2: Classification of Room Types for Imaging Services¹

	Beem	llan			Design Requirements
	Room	Use	Room Type	Location	
	Class 1 imaging room	Diagnostic radiography, fluoroscopy, mammography, computed tomography (CT), ultrasound, magnetic resonance imaging (MRI), and other imaging modalities Services that use natural orifice entry and do not pierce or penetrate natural protective membranes	Unrestricted area	Accessed from an unrestricted area	<i>Flooring:</i> cleanable and stable, firm, and slip-re <i>Wall finishes:</i> washable <i>Ceiling:</i> cleanable with equipment; lay-in ceilin
•		Also: nuclear medicine, use of contrast agent, ultrasound procedures; "outpatient" procedures			



PART 2

HOSPTIALS –

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Surfaces

d wear-resistant for the location; esistant

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routine housekeeping ng permitted

Class 2 imaging room	Diagnostic and therapeutic procedures such as coronary, neurological, or peripheral angiography	Semi- restricted area	Accessed from an unrestricted or a semi- restricted	<i>Flooring:</i> cleanable and stable, firm, and slip-re <i>Floor and wall base ass</i> integral coved wall base of 6 inches
	Interventional Imaging: image- guided biopsies, or other minimally-invasive procedures requiring imaging assistance. Spaces must have infrastructure for medical gases, emergency power, and infection control.		area	<i>Wall finishes:</i> washable crevices <i>Ceiling:</i> smooth and wir absorptive, non-perfora cleaning chemicals; lay or each ceiling tile weig square foot and no per highly textured tiles



HOSPTIALS - PART 2

l wear-resistant for the location; esistant

semblies: monolithic floor with e carried up the wall a minimum

e; free of fissures, open joints, or

thout crevices, scrubbable, nonated; capable of withstanding -in ceiling permitted if gasketed ghs at least one pound per forated, tegular, serrated, or

Class 3 imaging room	Invasive procedures ³ Any Class 2 procedure during which the patient will require physiological monitoring and is anticipated to require active life support	Restricted area	Accessed from a semi- restricted area	<i>Flooring:</i> cleanable and stable, firm, and slip-ro <i>Floor and wall base as</i> integral coved wall base of 6 inches
	<i>'Class 3' imaging facilities are surgical environments, and may have been thought of as "hybrid ORs" or "intraoperative imaging."</i>			crevices <i>Ceiling:</i> monolithic, scr cleaning and/or disinfe openings

¹This table includes a brief description of the imaging services performed in these room types and a summary of some applicable requirements that appear elsewhere in the 2018 Guidelines for Design and Construction of Hospitals. The table has been provided to help users determine when a Class 1, Class 2, or Class 3 imaging room is required for a project.

²Other design requirements that apply to these imaging room types include, but are not limited to, ventilation, lighting, and sound transmission requirements...

³"Invasive procedure" is defined in the glossary.



d wear-resistant for the location; esistant

semblies: monolithic floor with se carried up the wall a minimum

e; free of fissures, open joints, or

rubbable, capable of withstanding ecting chemicals, gasketed access

Procedures 2.2-3.4.2 Imaging Rooms

2.2-3.4.2.1 General

(1) The requirements in this section shall apply to imaging rooms for all modalities except where indicated.

Where an imaging room will be used for Class 1 and Class 2 procedures, the more stringent requirements for the higher class room shall be followed.

(3) Where imaging procedures meeting Class 3 criteria are performed, a room(s) that meets the requirements for the applicable imaging suite and for an operating room (see Section 2.2-3.3.3, Operating Rooms) shall be provided. An operating room that meets the requirements in Section 2.2-3.3.4 (Hybrid Operating Room) shall be permitted to meet this requirement.

* 2.2-3.4.2.6 Multiple-modality devices. Where two or more individual imaging or therapy modalities are integrated into one imaging device (e.g., PET/CT, SPECT/CT or PET/MRI), the minimum design requirements for that room shall include the design criteria for each individual contributing modality.



Guidelines FOR DESIGN AND CONSTRUCTION OF **Outpatient Facilities**

The Facility Guidelines Institute

2018 edition

FGI FGI

Guidelines for Design and Construction of Outpatient Facilities

Provides standards for designing and constructing outpatient facilities.

Major Additions and Revisions

Glossary List of Acronyms Part 1: General Chapter 1.1: Introduction Chapter 1.2: Planning, Design, Construction, and Commissioning Chapter 1.3: Site Chapter 1.4: Equipment Part 2: Outpatient Facility Types Chapter 2.1: Common Elements for Outpatient Facilities Chapter 2.2: Specific Requirements for General and Specialty Medical Services Facilities Chapter 2.3: Specific Requirements for Outpatient Imaging Facilities Chapter 2.4: Specific Requirements for Birth Centers Chapter 2.5: Specific Requirements for Urgent Care Centers Chapter 2.6: Specific Requirements for Infusion Centers Chapter 2.7: Specific Requirements for Outpatient Surgery Facilities Chapter 2.8: Specific Requirements for Freestanding Emerg. Care Facilities Chapter 2.9: Specific Requirements for Endoscopy Facilities Chapter 2.10: Specific Requirements for Renal Dialysis Centers Chapter 2.11: Specific Requirements for Outpatient Psychiatric Facilities Chapter 2.12: Specific Requirements for Rehabilitation Therapy Facilities Chapter 2.13: Specific Requirements for Mobile/Transportable Medical Units Chapter 2.14: Specific Requirements for Dental Facilities

Part 3: Ventilation of Hospitals Index



2018 OVERVIEW

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ANSI/ASHRAE/ASHE Standard 170-2017 Ventilation of Outpatient Facilities

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Guidelines for Design and Construction of Outpatient Facilities

Outpatient *Guidelines* are applied as:

- Specific outpatient project types in facility type chapters in Part 2
 - Part 1 applies to all facility types
 - Requirements in Chapter 2.1, Common Elements for Outpatient Facilities, apply only when crossreferenced in the facility chapter.
- Note, per Guidelines, cross-references to the common elements often begin with "where provided," which allows for **flexible application** in facility design to fit particular services provided.



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Major Additions and Revisions of the 2018 *Guidelines* Facilities Chapters

Freestanding Diagnostic and Treatment Facilities (Outpatient Imaging Facility)

- In Guidelines since 1990
- Major overhaul in 2018 to become outpatient imaging center with reference to common elements and rad. therapy requirements.

Urgent Care Centers

Revised to allow more flexible design.

Outpatient Surgery Centers

- Procedure and operating room requirements were moved into the common elements chapter, where they can be easily cross reference from other chapters
- Descriptions of unrestricted, semi restricted, and restricted areas were updated to correlate with AORN requirements,
- Support areas were reorganized to clarify their location in the outpatient surgery facility: in the semi-restricted area, directly accessible to the semi-restricted area, or elsewhere in the facility.
- Operating Rooms of 255 SF require the following clearances:
 - 6 ft on each side, 5 ft at head and foot
- Operating Rooms of 270 SF require the following clearances:
 - 6 ft on each side, 5 ft at the foot
 - Anesthesia work zones require 6 ft by 8 ft clear at head of operating table.
- Operating Rooms of 400 SF requires a sterile field of:
 - 8 ft each side, 6 ft at head, 7 ft at foot of operating table
 - Anesthesia work zone requires the same 6 ft x 8 ft clear at head of operating table.

Endoscopy

- Procedure room reduced from 200 SF to 180 SF.
- Processing rooms updated to match sterile processing requirements (dirty to clean)



FGI Guidelines Resources

Fgiguidelines.org

- Design Guide for the Built Environment of Behavioral Health Facilities lacksquare
- FGI Acoustics Working Group (AWG) 2011 white paper ullet
- Articles by FGI HGRC members in peer-reviewed journals lacksquare
- Articles elaborating on changes to the Guidelines ullet

Madcad.com (electronic version) FGI Errata

Presentations on the 2018 Guidelines from the 2017 HCD Conference + Expo https://www.fgiguidelines.org/resource/presentations-2018-guidelines-2017-hcd-conference-expo/#

Other Resources Referenced in this Presentation:

https://www.metrasens.com/2018-fgi-guidelines-what-you-need-to-know/



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1.1-8 Codes, Standards, and Other Documents Referenced in the Guidelines

Academy of Nutrition and Dietetics (www.eatright.org)

Pediatric Nutrition Dietetic Practice Group. Infant Feedings: Guidelines for Preparation of Human Milk and Formula in Health Care Facilities, 2nd ed. (2011)

U.S. Access Board (www.access-board.gov)

Also see Americans with Disabilities Act. Uniform Federal Accessibility Standards (UFAS) (www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-aba-standards/ufas)

Acoustical Society of America (www.acousticalsociety.org)

ANSI/ASA S2.71: Guide to the Evaluation of Human Exposure to Vibration in Buildings (2012) ANSI/ASA S3.5: *Methods for Calculation of the Speech Intelligibility Index* (2017) ANSI/ASA S12.9: Quantities and Procedures for Description and Measurement of Environmental Sound, Part 2: "Measurement of Long-Term, Wide-Area Sound" (2013)

Acoustics Research Council, Acoustics Working Group

"Sound & Vibration: Design for Health Care Facilities" (2010) (https://fgireadonly.madcad.com/library/FGI-SoundVibration-2010/)

Agency for Healthcare Research and Quality (www.ahrq.gov)

"Conveniently Located 'Napping Rooms' Provide Opportunity for Night- and Extended-Shift Providers to Rest, Leading to Less Fatigue and Better Performance." AHRQ Health Care Innovations Exchange (2014). (https://www.healthdesign.org/knowledge-repository/conveniently-located-napping-rooms%E2%80%9D-provide-opportunitynight-and-extended)

American Architectural Manufacturers Association

AAMA 501.8: Standard Test Method for Determination of Resistance to Human Impact of Window Systems Intended for Use in Psychiatric Applications (2014)

American College of Emergency Physicians (www.acep.org)

"Geriatric Emergency Department Guidelines" (https://www.acep.org/geriEDguidelines/#sm.0002dkhsf298el310tl2bxtwo6drf)

American College of Radiology (www.acr.org)

Kanal, Emanuel, et al. "ACR Guidance Document on MR Safe Practices," Journal of Magnetic Resonance Imaging 37:501-30 (2013). www.ismrm.org/smrt/files/24011 ftp.pdf

American College of Surgeons (www.facs.org)

ACS Committee on Trauma. "Descriptions of Trauma Center Levels and Their Roles in a Trauma System," Chapter 2 in Resources for Optimal Care of the Injured Patient (2014)



2019 OAHE FALL REGIONAL EVENT

American Institute of Steel Construction (www.aisc.org) Design Guide 11: Vibrations of Steel-Framed Structural Systems Due to Human Activity, 2nd ed. (2016)

American National Standards Institute (www.ansi.org)

ANSI S1.1: Acoustical Terminology (2013)

American Society of Civil Engineers/Structural Engineering Institute (www.asce.org) ASCE/SEI 7-16: Minimum Design Loads for Buildings and Other Structures (2016)

American Society for Healthcare Engineering (ASHE) (www.ashe.org) *Health Facility Commissioning Guidelines* (2010)

American Society of Heating, Refrigerating and Air-Conditioning Engineers (www.ashrae.org)

ASHRAE Guideline 12: Minimizing the Risk of *Legionellosis Associated with Building Water Systems* (2000) ASHRAE Handbook—HVAC Applications (2017) ANSI/ASHRAE/IES Standard 90.1: Energy Standard for Buildings Except Low-Rise Residential Buildings (2016) ANSI/ASHRAE/ASHE Standard 170: Ventilation of Health Care Facilities (2017) ANSI/ASHRAE Standard 188: Legionellosis: Risk Management for Building Water Systems (2015) ANSI/ASHRAE/ASHE Standard 189.3: Design, Construction and Operation of Sustainable High-Performance Health Care Facilities (2017) Thermal Guidelines for Data Processing Environments, 4th ed. (2015)

American Society of Mechanical Engineers (www.asme.org) ANSI/ASME A17.1/CSA B44: Safety Code for Elevators and Escalators (2016) ANSI/ASME A17.3: Safety Code for Existing Elevators and Escalators (2015)

American Society for Testing and Materials (www.astm.org)

D1193-06: Standard Specification for Reagent Water (2011)

E1130-16: Standard Test Method for Objective Measurement of Speech Privacy in Open Plan Spaces Using Articulation Index (2016) E2638-10: Standard Test Method for Objective Measurement of the Speech Privacy Provided by a Closed Room (2010) F1233-08: Standard Test Method for Security Glazing Materials and Systems (2013)

American Water Works Association (www.awwa.org)

AWWA M14: Backflow Prevention and Cross-Connection Control: Recommended Practices, 4th ed. (2015)



2019 OAHE FALL REGIONAL EVENT

Americans with Disabilities Act, U.S. Department of Justice, Civil Rights Division (www.ada.gov). Also see U.S. Access Board. ADA Standards for Accessible Design (2010)

ASSE International (www.asse-plumbing.org) ASSE 1070: Performance Requirements for Water Temperature Limiting Devices (2015)

Association for the Advancement of Medical Instrumentation (www.aami.org)

ANSI/AAMI/ISO 13959: Water for Hemodialysis and Related Therapies (2014) ANSI/AAMI/ISO 26722: Water Treatment Equipment for Hemodialysis and Related Therapies (2014)

Business and Institutional Furniture Manufacturers Association (www.bifma.org)

BIFMA Standards Overview (www.bifma.org/standards/index.html)

Cambridge Sound Management (www.cambridgesound.com)

Horrall, T. R. "Optimum Masking Sound—White or Pink?" (Cambridge Sound Management, 2013).

The Center for Health Design (www.healthdesign.org)

Calkins, M. P., et al. "Contribution of the Designed Environment to Fall Risk in Hospitals" (2012). (https://www.healthdesign.org/chd/research/contributiondesigned-environment-fall-risk-hospitals)

Joseph, A., et al. "Designing for Patient Safety: Developing Methods to Integrate Patient Safety Concerns in the Design Process" (2012). (https://www.healthdesign.org/chd/research/designing-patient-safety-developing-methods-integrate-patient-safety-concerns-design-pr) Safety Risk Assessment Toolkit (www.healthdesign.org/sra)

Centers for Disease Control and Prevention (www.cdc.gov)

Biosafety in Microbiological and Biomedical Laboratories, 5th ed. (December 2009) (www.cdc.gov/biosafety/publications) "Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health-Care Settings, 2005." Morbidity and Mortality Weekly Report 2005:54 (No. RR-17). (www.cdc.gov/mmwr/PDF/rr/rr5417.pdf)

"Guidelines for Environmental Infection Control in Health-Care Facilities" (2003) (https://www.cdc.gov/infectioncontrol/guidelines/environmental/index.html) "Primary Containment for Biohazards: Selection, Installation and Use of Biological Safety Cabinets," Appendix A to Biosafety in Microbiological and Biomedical Laboratories (www.cdc.gov/biosafety/publications/index.htm)

Centers for Medicare & Medicaid Services (www.cms.gov)

Clinical Laboratory Improvement Amendments (CLIA) (www.cms.gov/Regulations-and-Guidance/Legislation/CLIA/index.html)



Committee to Establish Recommended Standards for Newborn ICU Design

Recommended Standards for Newborn ICU Design, 8th ed. (2013) (https://www.researchgate.net/profile/Robert_White16/publication/236087482_Recommended_standards_for_newborn_ICU_design_eighth_edition/links/02 e7e533357e9eaf11000000/Recommended-standards-for-newborn-ICU-design-eighth-edition.pdf)

Concrete Reinforcing Steel Institute (CRSI) (www.crsi.org) Design Guide for Vibrations of Reinforced Concrete Floor Systems, 1st ed. (2014)

U.S. Department of Housing and Urban Development (www.hud.gov) The Noise Guidebook (2009) (https://www.hudexchange.info/resource/313/hud-noise-guidebook)

U.S. Department of Veterans Affairs, National Center for Patient Safety (www.va.gov) "Falls Prevention Toolkit" (https://www.patientsafety.va.gov/professionals/onthejob/falls.asp)

Facility Guidelines Institute (www.fgiguidelines.org) "Patient Handling and Movement Assessments: A White Paper" (2010) Hunt, J. M., and D. M. Sine. "Behavioral Health Design Guide" (2017)

Federal Aviation Administration (www.faa.gov) Advisory Circular 150/5390-2C: Heliport Design (2012) (www.faa.gov/documentLibrary/media/Advisory Circular/150 5390 2c.pdf)

Federal Emergency Management Agency (www.fema.gov) FEMA P-750: NEHRP [National Earthquake Hazards Reduction Program] Recommended Seismic Provisions for New Buildings and Other Structures (2009) (www.fema.gov/media-library-data/20130726-1730-25045-1580/femap 750.pdf)

U.S. Food and Drug Administration (www.fda.gov)

"Food Code" (2013) (www.fda.gov/Food/GuidanceRegulation/RetailFoodProtection/FoodCode/ucm374275.htm) "HACCP [Hazardous Analysis Critical Control Point] Principles & Application Guidelines" (https://www.fda.gov/Food/GuidanceRegulation/HACCP/ucm2006801.htm#guide)

Green Guide for Health Care[™] (www.gghc.org)



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Illuminating Engineering Society (www.ies.org)

ANSI/IES RP-28: Lighting and the Visual Environment for Seniors and the Low Vision Population (2016) ANSI/IES RP-29: Lighting for Hospitals and Healthcare Facilities (2016)

Industrial Safety Equipment Association (www.safetyequipment.org)

ANSI/ISEA Z358.1: American National Standard for Emergency Eyewash and Shower Equipment (2014)

International Association for Healthcare Security & Safety (www.iahss.org) Security Design Guidelines for Healthcare Facilities (2016)

International Code Council (www.iccsafe.org)

ICC A117.1: Accessible and Usable Buildings and Facilities (2017) International Building Code (2018) International Green Construction Code (2012) International Plumbing Code (2015)

International Electrotechnical Commission (www.iec.ch)

IEC Standard 60601-2-33: Medical electrical equipment – Part 2-33: Particular requirements for the basic safety and essential performance of magnetic resonance equipment for medical diagnosis (2010)

International Organization for Standardization (www.iso.org)

ISO 7731: Ergonomics—Danger signals for public and work areas—Auditory danger signals (2003) ISO 9921: Ergonomics—Assessment of speech communication (2003) ISO 11143: Dentistry—Amalgam separators (2008)

The Joint Commission (www.jointcommission.org)

"Improving Patient and Worker Safety: Opportunities for Synergy, Collaboration, and Innovation." (2012) Sentinel Event Alert, Issue 48, "Health Care Worker Fatigue and Patient Safety" (2011)

National Council on Radiation Protection & Measurements (www.ncrponline.org)

Report No. 102: Medical X-Ray, Electron Beam and Gamma-Ray Protection for Energies Up to 50 MeV (Equipment Design, Performance and Use) (1989) Report No. 116: Limitation of Exposure to Ionizing Radiation (1993) Report No. 144: Radiation Protection for Particle Accelerator Facilities (2003) Report No. 147: Structural Shielding Design for Medical X-Ray Imaging Facilities (2004) Report No. 151: Structural Shielding Design and Evaluation for Megavoltage X- and Gamma-Ray Radiotherapy Facilities (2005)



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National Fire Protection Association (www.nfpa.org)

NFPA 10: Standard for Portable Fire Extinguishers (2018)
NFPA 13: Standard for the Installation of Sprinkler Systems (2016)
NFPA 30: Flammable and Combustible Liquids Code (2015)
NFPA 70: National Electrical Code® (2017)
NFPA 72: National Fire Alarm and Signaling Code (2016)
NFPA 82: Standard on Incinerators and Waste and Linen Handling Systems and Equipment (2014)
NFPA 90A: Standard for the Installation of Air-Conditioning and Ventilating Systems (2018)
NFPA 99: Health Care Facilities Code (2015)
NFPA 101: Life Safety Code® (2015)
NFPA 110: Standard for Emergency and Standby Power Systems (2016)
NFPA 111: Standard on Stored Electrical Energy Emergency and Standby Power Systems (2016)

NFPA 400: Hazardous Materials Code (2016)

National Institute of Occupational Safety and Health (www.cdc.gov/niosh) DHHS (NIOSH) Publication 97-111: "Selecting, Evaluating, and Using Sharps Disposal Containers" (January 1998) (www.cdc.gov/niosh/docs/97-111)

National Research Council Canada, Institute for Research in Construction (www.nrc-cnrc.gc.ca) Bradley, J. S. "Acoustical Design for Open-Plan Offices," Construction Technology Update No. 63 (October 2004). (https://www.nrc-cnrc.gc.ca/ctusc/files/doc/ctu-sc/ctu-n63_eng.pdf)

New York State Office of Mental Health (www.omh.ny.gov) Patient Safety Standards, Materials and Systems Guidelines, 18th ed. (2017) (www.omh.ny.gov/omhweb/patient_safety_standards)

Noise and Vibration Control Engineering Vér, I. L., and L. L. Beranek. *Noise and Vibration Control Engineering: Principles and Applications*, 2nd ed. (Wiley, 2005)

Nuclear Regulatory Commission (www.nrc.gov/reading-rm/doc-collections/cfr/) *Code of Federal Regulations*, Title 10—Energy, Chapter 1—Nuclear Regulatory Commission Part 20 (10 CFR 20), Standards for Protection Against Radiation Part 35 (10 CFR 35), Medical Use of Byproduct Material *Code of Federal Regulations*, Title 40—Protection of Environment, Chapter 1—Environmental Protection Agency Part 60 (40 CFR 60), Standards of Performance for New Stationary Sources



Occupational Safety and Health Administration, U.S. Department of Labor (www.osha.gov) Code of Federal Regulations, Title 29—OSHA Regulations, Part 1910 (29 CFR 1910): Occupational Safety and Health Standards (www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1910)

U.S. Pharmacopeia Convention (www.usp.org)

U.S. Pharmacopeia-National Formulary (USP-NF) general chapters: <795>: Pharmaceutical Compounding—Nonsterile Preparations <797>: Pharmaceutical Compounding—Sterile Compounding <800>: Hazardous Drugs—Handling in Healthcare Settings <1066>: Physical Environments that Promote Safe Medication Use

The Robert Wood Johnson Foundation

Joynt, J., and B. Kimball, Innovative Care Delivery Models: Identifying New Models that Effectively Leverage Nurses (Health Workforce Solutions, 2008). See "New Website Profiles 24 Innovative Nursing – Driven Models of Health Care Delivery" (https://www.rwjf.org/en/library/research/2009/03/new-web-siteprofiles-24-innovative-nursing-driven-models-of-hea.html).

Society for Experiential Graphic Design (segd.org)

"Universal Symbols in Health Care: Developing a Symbols-Based Wayfinding System: Implementation Guidebook" (https://segd.org/sites/default/files/segd_hj_00_full_workbook_1.pdf)

Telecommunications Industry Association (tiaonline.org) TIA 607: Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises, Revision C (2015)

Underwriters Laboratories (UL) (www.ul.com) UL 1069: Standard for Hospital Signaling and Nurse Call Equipment (2007)

Vertical Transportation Handbook Strakosch, G. R., and R. S. Caporale. Vertical Transportation Handbook, 4th ed. (Wiley, 2010).

With Seniors in Mind (www.withseniorsinmind.org/) Senior Living Sustainability Guide (www.withseniorsinmind.org/what-we-do/)



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Requirements:	ASHRAE 170 (2008) NFPA 99 (2012) / Current CMS Requirement	ASHRAE 170 (2013) FGI 2014 / Current OSDH Requirement	
Ventilation Upon Loss of Electrical Power	Ventilation shall be required for the following spaces: <> All rooms <> PE rooms <> Class B & C Operating rooms, including Caesarean	Ventilation shall be required for the following spaces: <> All rooms <> PE rooms <> Class B & C Operating rooms, including Caesarean	Ventila <> All <> PE (<> Clas
Reserve Heating	Capacity of back up/reserve sources shall be sufficient to provide for sterilization and diatary purposes and to provide heat for operating, delivery, birthing, labor, recovery, emergency, intensive care, nursery, and inpaitient rooms.	Capacity of back up/reserve sources shall be sufficient to provide for domestic hot water, sterilization and diatary purposes and to provide heat for operating, delivery, birthing, labor, recovery, emergency, intensive care, nursery, and inpaitient rooms.	Capacit domest heat fo intensiv
Reserve Cooling	Greater than 400 tons of cooling there shall be more than one chiller for redundnacy to maintain facility operation plan.	Greater than 400 tons of cooling there shall be more than one chiller for redundnacy to maintain facility operation plan.	Greate redund
Outdoor Air Intakes	Outside air intakes shall be: <> 25' away from exhaust and vents <> 6' above grade <> 3' above roof	Outside air intakes shall be: <> 25' away from exhaust and vents <> 6' above grade <> 3' above roof	Outside <> 25' <> 6' a <> 3' a <u>Excepti</u> distanc
Filters:	<> MERV 12 filters and above shall have differential pressure device. <> Filter 1 shall be upstream of coil. <> Filter 2 shall be downstream of coil. *Refer to Table 6-1 Minimum Filter Efficiencies	<> MERV 12 filters and above shall have differential pressure device. <> Filter 1 shall be upstream of coil. <> Filter 2 shall be downstream of coil. *Refer to Table 6.4 Minimum Filter Efficiencies	<> MEI <> Filte <> Filte *Refer
Humidifiers:	Locate humidity sensor a suitable distance downstream from steam injection source. Controls shall limit duct humidity to a max of 90% RH. Steam valve shall remain off when AHU is not in operation.	Steam humidifiers shall be used. Locate humidity sensor a suitable distance downstream from steam injection source. Controls shall limit duct humidity to a max of 90% RH. Steam valve shall remain off when AHU is not in operation. Duct takeoffs shall not be within the absorption distance.	Steam I distance duct hu AHU is distance <u>Humidi</u>



ASHRAE 17(

ASHRAE 170 (2017)

FGI 2018 / New OSDH Requirement

ion shall be required for the following spaces: ooms ooms

B & C Operating rooms, including Caesarean

of back up/reserve sources shall be sufficient to provide for ic hot water, sterilization and diatary purposes and to provide operating, delivery, birthing, labor, recovery, emergency, e care, nursery, and inpaitient rooms.

than 400 tons of cooling there shall be more than one chiller for nacy to maintain facility operation plan.

air intakes shall be: away from exhaust and vents oove grade bove roof

on: Gas fired package air handling does not have to meet the 25 e between OSA intake and unit flue.

RV 12 filters and above shall have differential pressure device. r 1 shall be upstream of coil.

r 2 shall be downstream of coil.

o Table 6.4 Minimum Filter Efficiencies

umidifiers shall be used. Locate humidity sensor a suitable downstream from steam injection source. Controls shall limit midity to a max of 90% RH. Steam valve shall remain off when not in operation. Duct takeoffs shall not be within the absorption Requirements for Steam humidifiers vs Adiabatic Atomizing fiers provided.

	Updated	ASHRAE 170 Requirements per FGI 2018	
Requirements:	ASHRAE 170 (2008) NFPA 99 (2012) / Current CMS Requirement	ASHRAE 170 (2013) FGI 2014 / Current OSDH Requirement	
Exhaust Discharge:	Discharge air from All rooms, bronchoscopy rooms, emergency department waiting rooms, nuclear medicine laboratories, radiology waiting, and laboratory chemical fume hoods shall: have ductwork under negative pressure; discharge 10' above roof level; be located to minimize recirculation of air back into building	<> Discharge air from All rooms, bronchoscopy rooms, emergency department waiting rooms, nuclear medicine laboratories, radiology waiting, and laboratory chemical fume hoods shall: have ductwork under negative pressure; discharge 10' above roof level; be located to minimize recirculation of air back into building *Cooling Towers drifts shall be located away from air intakes and meet exhaust requirements.	<> Discharg rooms, pen public wait (of patients hazardous ductwork u located to r <> Cooling exhaust rec <> Exhaust pharmacy H be 10' abov <> Laborate of a minimu <> All room fume hood outdoor ain the public.
Ductwork:	Spaces listed in Table 7-1 Design Parameters that have required pressure relationshiops shall be served by fully ducted returns.	Smoke and Fire Dampers shall be located on design drawings and provided with access to all dampers. Spaces listed in Table 7.1 Design Parameters that have required pressure relationships shall be served by fully ducted returns and exhaust as well as the following areas: <> Surgery and critical care recovery rooms, critical and intensive care areas, intermediate care areas, and wound intensive care units (burn units). <> Inpatient facilities patient care areas.	Smoke and provided w Spaces liste relationship as the follo <> Surgery areas, inter units). <> Inpatier
Supply Diffusers:	<> Operating room diffusers shall allow for internal cleaning. <> Psychiatric, seclusion, and holding-patient rooms shall be designed with security diffusers, grilles, and registers. *Refer to Table 6-2 Supply Air Outlets	<> Operating room diffusers shall allow for internal cleaning. <> Psychiatric, seclusion, and holding-patient rooms shall be designed with security diffusers, grilles, and registers. *Refer to Table 6.7.2 Supply Air Outlets	<> Operatir <> Psychiat with securit *Refer to T



ASHRAE 17

ASHRAE 170 (2017) FGI 2018 / New OSDH Requirement

e air from All rooms, bronchoscopy rooms<u>, sputum collectio</u> tamidine administration rooms, emergency department ing rooms, nuclear medicine laboratories, radiology waiting awaiting chest x-rays for respiratory disease), pharmacy drug, and laboratory chemical fume hoods shall: Have nder negative pressure; -Discharge 10' above roof level; be minimize recirculation of air back into building Γowers drifts shall be located away from air intakes and meet uirements. discharge of All rooms, bronchoscopy, sputum collection, azardous-drug, and laboratory chemical fume hoods shall e the roof and discharge in a vertical direction. bry chemical fume hoods shall discharge with a stack velocity um of 2500 fpm. s, bronchoscopy, sputum collection, laboratory chemical

s shall be lcoated a minimum of 25 ft horizontally form intakes, openable windows/doors, and areas accessible to

Fire Dampers shall be located on design drawings and ith access to all dampers.

ed in Table 8.1 Design Parameters that have required pressure os shall be served by fully ducted returns and exhaust as well wing areas:

and critical care recovery rooms, critical and intensive care mediate care areas, and wound intensive care units (burn

nt facilities patient care areas.

ng room diffusers shall allow for internal cleaning. ric, seclusion, and holding-patient rooms shall be designed ty diffusers, grilles, and registers.

able 6.7.2 Supply Air Outlets

Requirements:	ASHRAE 170 (2008)	ASHRAE 170 (2013)	
Energy Recovery Systems:	N/A	 <> Energy Recovery systems shall be located upstream of Filter Bank No. <> Energy Recovery systems with air leakage potential shall be designed to have no more than 5% of the total supply airsteram consisting of exhaust air. <> All rooms or combination All/PE rooms shall not be utilized for energy recovery. 	<> Ene 2. <> Ene to have exhaus <> All energy
Space Ventilation:	<> Movement of air shall be designed from gernerally clean to less clean areas. <> Ventilation rates are intended for comfort, asepsis, and odoer control. *Refer to Table 7-1 Design Parameters	<> Movement of air shall be designed from gernerally clean to less clean areas. <> Ventilation rates are intended for comfort, asepsis, and odoer control. <> Spaces permited to be reciculated by room units shall: not receive nonfiltered, non conditioned outside air; serve only a single space; provide a minumum of MERV 6 filter. <> Outdoor air quantity of AHU's serving multiple spaces can be calculated by the sum of individual space requirements or per the ASHRAE 62.1 method. *Refer to Table7.1 Design Parameters	<> Mov areas. <> Ven control <> Spa nonfilte provide <> Out calculat ASHRA
Airborne Infection Isolation (AII) Rooms:	<> A pressure monitor device shall be installed locally to indicate (-) 0.01" wc negative differential is maintained when occupied by patients with airborne diseases. <> Air is exhausted directly outdoors without mixing with with non-All rooms. <> Exhaust grilles shall be located directly over patient beds or on the wall near the patient head.	 <> A pressure monitor device shall be installed locally to indicate (-) 0.01" we negative differential is maintained when occupied by patients with airborne diseases. <> Air is exhausted directly outdoors without mixing with with non-All rooms. <> Exhaust grilles shall be located directly over patient beds or on the wall near the patient head. <> When Ante rooms accompany an All room, the All room shall be negative to the Ante room, and the Ante room shall be negative to the corridor. <> When an All is not utilized for an airborne disease patient, it must still remain negative. Reversable airflow controls are not allowed. 	<> A pr wc neg airborn <> Air is rooms. <> Exha wall ne <> Wh negativ corrido <> Whe remain



ASHRAE 17

ASHRAE 170 (2017) FGI 2018 / New OSDH Requirement

rgy Recovery systems shall be located upstream of Filter Bank No.

rgy Recovery systems with air leakage potential shall be designed no more than 5% of the total supply airsteram consisting of air.

ooms or combination AII/PE rooms shall not be utilized for recovery.

vement of air shall be designed from gernerally clean to less clean

tilation rates are intended for comfort, asepsis, and odoer

ces permited to be reciculated by room units shall: not receive red, non conditioned outside air; serve only a single space; a minumum of MERV 6 filter.

door air quantity of AHU's serving multiple spaces can be ed by the sum of individual space requirements or per the 62.1 method.

to Table8.1 Design Parameters

essure monitor device shall be installed locally to indicate (-) 0.01 ative differential is maintained when occupied by patients with e diseases.

exhausted directly outdoors without mixing with with non-All

ust grilles shall be located directly over patient beds or on the ar the patient head.

en Ante rooms accompany an All room, the All room shall be e to the Ante room, and the Ante room shall be negative to the

en an All is not utilized for an airborne disease patient, it must still negative. Reversable airflow controls are not allowed.

	Updated	ASHRAE 170 Requirements per FGI 2018	
Requirements:	ASHRAE 170 (2008) NFPA 99 (2012) / Current CMS Requirement	ASHRAE 170 (2013) FGI 2014 / Current OSDH Requirement	
Protective Environment (PE) rooms:	<> A pressure monitor device shall be installed locally to indicate (+) 0.01" wc positive differential is maintained when occupied by patients requireing a protective environment. <> Supply diffusers shall be located directly over patient beds, and return/exhaust grilles lcoated near the patient room door.	<> A pressure monitor device shall be installed locally to indicate (+) 0.01" wc positive differential is maintained when occupied by patients requireing a protective environment. <> Supply diffusers shall be located directly over patient beds, and return/exhaust grilles located near the patient room door. <> When Ante rooms accompany a PE room, the PE room shall be positive to the Ante room, and the Ante room shall be poitive to the corridor. <> When a PE room is not utilized for a patient needing a protective environiment, it must still remain positive and shall be constant volume. Reversable airflow controls are not allowed.	<> A pr 0.01" w require <> Supp return/ <> Wh positive corrido <> Whe enviror Reversa
Combination Airborn Infectious Isolation/Protectiv e Environment (AII/PE) rooms:	N/A	<> Supply air diffusers shall be lcoated above patient bed with exhaust grilles located near patient room door. <> Two pressure monitor devices shall be installed locally to indicate the required pressure is maintained at both the AII/PE door to the Ante room and at the Ante room to the corridor. <> Ante room pressurization will either be positive to both the AII/PE room and corridor or negative to both the AII/PE room and corridor depending on what is required and defined by the hospital.	<> Supp grilles I <> Two require and at <> Anto room a depend
Critical Care Units:	Wound Intensive Care Units (Burn Units) that require humidifiers to comply with Table 7-1 shall be provided with individual humidity control.	Wound Intensive Care Units (Burn Units) that require humidifiers to comply with Table 7.1 shall be provided with individual humidity control.	Wound comply
NOTE: This table is not r	epresentative of all ASHRAE 170 requirements.		





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ASHRAE 170 (2017) FGI 2018 / New OSDH Requirement

essure monitor device shall be installed locally to indicate (+) c positive differential is maintained when occupied by patients ing a protective environment.

oly diffusers shall be located directly over patient beds, and exhaust grilles lcoated near the patient room door.

en Ante rooms accompany a PE room, the PE room shall be to the Ante room, and the Ante room shall be poitive to the

en a PE room is not utilized for a patient needing a protective iment, it must still remain positive and shall be constant volume. ble airflow controls are not allowed.

oly air diffusers shall be lcoated above patient bed with exhaust ocated near patient room door.

pressure monitor devices shall be installed locally to indicate the d pressure is maintained at both the AII/PE door to the Ante room the Ante room to the corridor.

room pressurization will either be positive to both the AII/PE nd corridor or negative to both the AII/PE room and corridor ling on what is required and defined by the hospital.

Intensive Care Units (Burn Units) that require humidifiers to with Table 8.1 shall be provided with individual humidity control.

	Updated	ASHRAE 170 Requirements per FGI 2018	
Requirements:	ASHRAE 170 (2008) NFPA 99 (2012) / Current CMS Requirement	ASHRAE 170 (2013) FGI 2014 / Current OSDH Requirement	
Operating Rooms:	<> Surgry rooms shall maintain a (+) 0.01" wc positive differential to all adjacent spaces. <> Surgery supply difusers shall be laminar flow diffusers delivering air between 25-35 ft/min covering a minimum of 70% of the patient bed and 12" around the patient bed. <> Rooms shall have (2) low sidewall return or exhaust grilles at opposite corners approximately 8" above finished floor.	<> Surgry rooms shall maintain a (+) 0.01" wc positive differential to all adjacent spaces and each room shall have individual temperature control. <> Surgery supply difusers shall be laminar flow diffusers delivering air between 25-35 ft/min covering a minimum of 70% of the patient bed and 12" around the patient bed. <> Rooms shall have (2) low sidewall return or exhaust grilles at opposite corners approximately 8" above finished floor. In addition to the required low wall grilles, grilles may also be placed high on the walls.	<> Sur adjace contro <> Sur betwe 12" ar <> Ro corner requir <> Ad <u>outsid</u>
Imaging Procedures Rooms:	If invasive procedures take place it shall be designed as Class A surgery, if anesthesia gas is used it shall be designed as Class B or C surgery.	If invasive procedures take place it shall be designed as Class A surgery, if anesthesia gas is used it shall be designed as Class B or C surgery.	lf inva anestł
Morgue and Autopsy Rooms:	<> Low sidewall exhaust shall be provided or exhaust removed through an autopsy table and shall be exhausted directly outdoors without mixing with any other exhaust systems.	<> Low sidewall exhaust shall be provided or exhaust removed through an autopsy table and shall be exhausted directly outdoors without mixing with any other exhaust systems. <> A differential pressure between the morgue and autopsy and adjacent spaces shall maintain a (-) 0.01" wc negative pressure.	<> Lov an aut with a <> A d spaces
Bronchoscopy Rooms:	N/A	<> A differential pressure between the bronchoscopy procedure or sputum induction room and adjacent spaces shall maintain a (-) 0.01" wc negative pressure. <> Local exhaust shall be provided for sputum collection procedures.	<> A d sputur negati <> Loo



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ASHRAE 170 (2017) FGI 2018 / New OSDH Requirement

rgry rooms shall maintain a (+) 0.01" wc positive differential to all ent spaces and each room shall have individual temperature ol.

rgery supply difusers shall be laminar flow diffusers delivering air en 25-35 ft/min covering a minimum of 70% of the patient bed and ound the patient bed.

oms shall have (2) low sidewall return or exhaust grilles at opposite rs approximately 8" above finished floor. In addition to the

ed low wall grilles, grilles may also be placed high on the walls. Iditonal supply diffusers shall be permiteed within the room le of the primary array to provide additional environmental ements.

sive procedures take place it shall be designed as Class A surgery, if nesia gas is used it shall be designed as Class B or C surgery.

w sidewall exhaust shall be provided or exhaust removed through topsy table and shall be exhausted directly outdoors without mixing iny other exhaust systems.

lifferential pressure between the morgue and autopsy and adjacent s shall maintain a (-) 0.01" wc negative pressure.

lifferential pressure between the bronchoscopy procedure or m induction room and adjacent spaces shall maintain a (-) 0.01" wc ve pressure.

cal exhaust shall be provided for sputum collection procedures.

Table 6.4 Minimum Filter Efficiencies

Space Designation (According to Function)	Filter Bank No. 1 (MERV) ^a	Filter Bank No. 2 (MERV) ^a
Operating rooms (ORs); 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 (PE) rooms	7	HEPA ^{c,d}
Laboratory work areas, procedure rooms, and associated semirestricted spaces	13 ^b	NR
Administrative; bulk storage; soiled holding spaces; food preparation spaces; and laundries	7	NR
All other outpatient spaces	7	NR
Nursing facilities	13	NR
Psychiatric hospitals	7	NR
Resident care, treatment, and support areas in inpatient hospice facilities	13	NR
Resident care, treatment, and support areas in assisted living facilities	7	NR

The new FGI 2018 requirements have more requirements than CMS.

a. Informative Note: The minimum efficiency reporting value (MERV) is based on the method of testing described in ANSI/ASHRAE Standard 52.2 (ASHRAE [2017a]).

b. Additional prefilters may be used to reduce maintenance for filters with efficiencies higher than MERV 7.

c. As an alternative, MERV-14 rated filters may be used in Filter Bank No. 2 if a tertiary terminal HEPA filter is provided for these spaces.

The new FGI 2018 requirements have

more requirements than CMS.

d. Informative Note: High-efficiency particulate air (HEPA) filters are those filters that remove at least 99.97% of 0.3 micron-sized particles at the rated flow in accordance with the testing methods of IEST RP-CC001.6 (IEST [2016]).

Table 6.7.2 Supply Air Outlets

Sup
Supp nona
Add
Grou
No r
(

RAE [2017c]), for definitions related to outlet classification and performance. 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.

c. Air distribution systems using Group D diffusers shall meet the following requirements:

1. The system shall be designed according to "Design Guidelines" in System Performance Evaluation and Design Guidelines for Displacement Ventilation, Chapter 74. 2. The supply diffuser shall be located where it cannot be permanently blocked (Informative Note: e.g., opposite the foot of the bed). 3. The room return/exhaust grille shall be located in the ceiling, approximately above the head of the patient bed.

4. The transfer grille to the toilet room shall be located above the occupied zone.



Operating rooms (ORs); 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 (PE) rooms	7	HEPA ^{c,d}
Laboratory work areas, procedure rooms, and associated semirestricted spaces	13 ^b	NR
Administrative; bulk storage; soiled holding spaces; food preparation spaces; and laundries	7	NR
All other outpatient spaces	7	NR
Nursing facilities	13	NR
Psychiatric hospitals	7	NR
Resident care, treatment, and support areas in inpatient hospice facilities	13	NR
Resident care, treatment, and support areas in assisted living facilities	7	NR
NB - extractional		



ply Air Outlet Classification^a

ply diffusers within the primary supply diffuser array: Group E, aspirating

litional supply diffusers within the room: Group E

up E, nonaspirating

up E, nonaspirating

up E, nonaspirating

up A or Group E

up A, Group D, or Group E

up A or Group E

equirement

New Space Types – New Requirements

Tab	le 7.1	Design	Para	eters-	-Hospital	Spa
				·		

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)	Design Relative Humidity (k), %	Design Temperature (l), °F/°C
DIAGNOSTIC AND TREATMENT	m tet						
Laboratory work area, media transfer (1), (v)	Positive	2	4	NR	NR	NR	70-75/21-24
Laboratory work area, microbiology (f), (v)	Negative	2	6	Yes	NR	NR	70-75/21-24
Laboratory work area, nuclear medicine (f), (v)	Negative	2	6	Yes	NR	NR	70-75/21-24
Laboratory work area, pathology (f), (v)	Negative	2	6	Yes	NR	NR	70-75/21-24
Laboratory work area, serology (f), (v)	Negative	2	6	Yes	NR	NR	70-75/21-24
Laboratory work area, sterilizing (f)	Negative	2	10	Yes	NR	NR	70-75/21-24
Medication room	NR	2	4	NR	NR	Max 60	70-75/21-24
Nonrefrigerated body-holding room (h)	Negative	NR	10	Yes	No	NR	70-75/21-24
Nuclear medicine hot lab	Negative	NR	6	Yes	No	NR	70-75/21-24
Nuclear medicine treatment room	Negative	2	6	Yes	NR	NR	70-75/21-24
Pharmacy (b)	Positive	2	4	NR	NR	NR	NR
Physical therapy	Negative	2	6	NR	NR	Max 65	72-80/22-27
Special examination room (aa)	NR	2	6	NR	NR	Max 60	70-75/21-24
Treatment room	NR	2	6	NR	NR	Max 60	70-75/21-24
STERILIZING							
Sterilizer equipment room	Negative	NR	10	Yes	No	NR	NR
STERILE PROCESSING DEPARTMENT ^z							
Clean workroom	Positive	2	4	NR	No	Max 60	68-73/20-23
Decontamination room	Negative	2	6	Yes	No	NR	<mark>60-73</mark> /16-23
Sterile storage room	Positive	2	4	NR	NR	Max 60	Max 75/24
SERVICE							
Bathroom	Negative	NR	10	Yes	No	NR	72-78/22-26
Bedpan room	Negative	NR	10	Yes	No	NR	NR
Clean linen storage	Positive	NR	2	NR	NR	NR	72-78/22-26
Dietary storage	NR	NR	2	NR	No	NR	72-78/22-26
Food preparation center (i)	NR	2	10	NR	No	NR	72-78/22-26
Janitor's closet	Negative	NR	10	Yes	No	NR	NR
Laundry, general	Negative	2	10	Yes	No	NR	NR
Linen and trash chute room	Negative	NR	10	Yes	No	NR	NR
Soiled linen sorting and storage	Negative	NR	10	Yes	No	NR	NR
Warewashing	Negative	NR	10	Yes	No	NR	NR
SUPPORT SPACE							
Clean workroom or clean holding	Positive	2	4	NR	NR	NR	NR
Hazardous material storage	Negative	2	10	Ves	No	NR	NR
Soiled workroom or soiled helding	Negative	2	10	Vas	No	NR	NR
Note: NP = no requirement	wegative	2	10	1 05	NO	NK	NK
Normative Notes for Table 7.1: a. Except where indicated by a "No" in this column, recircul HYAC units (with heating or cooling coils) are acceptable ing that portion of the minimum total air changes per hour mitted by Section 7.1 (subparagraph [al[5]). Because of th difficulty and potential for buildudp of contamination, re room units shall not be used in areas marked "No." Re devices with high-efficiency particulate air (HEPA) filte permitted in existing facilities as interim, supplemental env controls to most rominments for the correct of sciences	ating room for provid- that is per- the cleaning circulating restrict circulating restrict circulating restrict the heat inflitra restrict circulating restrict the per- inflitra restrict circulating restrict restalle the per- inflitra restrict restalle the per- inflitra restrict re	num total air chan e proper makeup i ASHRAE Standar tion to or from e tions of NFPA 90/ maximum defined mber of air change mitted when the sp on areas with prot	ges per hour (acl ir to kitchen exh d 154 ⁶ . In some xit corridors con A ⁷ , the pressure r in the table. Duri s to any extent re vace is not in use.	a) shall be that required sust systems as specified cases, excess exfiltration promises the exfiltration promises the exit corric equirements of NFPA 9 mg operation, a reduction juired for odor control sh ion and/or odor problem	to r. See NFPA 99 in s. For intermed delivery/reco lor ted when sup 8, ing and coolii to t. The protectiv all patient from (i.e., <i>Aspergil</i> a, to to increme	¹⁰ for further requirement iate care, labor/deliver very/postpartum rooms, plemental heating and/on rg, baseboard heating, et e environment airflow d common environmenta <i>lus</i> spores). Recirculatio e the equivalent room of the environmental second second second results of the second second second results of the second second second results of the second secon	nts. y/recovery rooms, and labor/ four total ach shall be permit- cooling systems (radiant heat- ic.) are used. lesign specifications protect the airborne infectious microbes n HEPA filters shall be permit- rechonges: bouwer, the out-

- ance and cleaning. harmacy compounding areas may have additional air change, differ sure, and filtering requir ements beyond the minimum of is table, depending on the type of pharmacy, the regulatory require ents (which may include adoption of USP-797), the associated vel of risk of the work, and the equipment used in the spaces. *Infor-tative Note:* See USP (2017a) in Appendix B. room as used herein is a first-aid room and/or em
- oom used for general initial treatment of accider ims. The OR within the trauma center that is routinely used for o be an OR by th
- ntilation rates above the total ach listed shall be used whe program requirements and the hazard level its in each laboratory work area. Lower total lation rates shall be n med as part of an effective Laboratory Ventilation Mana Plan per ANSI/AIHA/ASSE Z9.5, American National Standard for atory Ventilation¹³ determines that either (a) acceptable expo re concentrations in the laboratory work area can be achieved with a wer minimum total ach ventilation rate than is listed in Table 7.1 or p. lower minimum total ach ventilation rate than is listed in Table 7.1 or p. (b) a demand control approach with active sensing of contaminats or appropriate surrogates is used as described in ASIRAE Handbook— HVAC Applications, Chapter (b, "Laboratorise" (Informative Note: q. See ASIRAE [2015] in Informative Appendix B). g. All air need not be exhausted if darkroom equipment has a seaveng-ing exhaust duct attached and meets ventilation standards regarding NIOSH⁶. OSHA, and local employee exposure limits. A noncerfrigerated body-holding room is applicable only to facilities that do not perform autopsics on-site and use the space for short peri-ods while waiting for the body to be transferred.

Function of Space SURGERY AND CRITICAL CARE Critical and intensive care Delivery room (Caesarcan) (m), (o) Emergency department decontamination Emergency department exam/treatment room (p)	Pressure Relationship to Adjacent Areas (n) NR Positive NR NR NR Ngative	Minimum Outdoor ach 2 4 2	Minimum Total ach	Exhausted Directly to Outdoors (j)	Air Recirculated by Means of Room Units (a)	Relative Humidity (k), %	Design Temperature (l °F/°C
Function of Space SURGERY AND CRITICAL CARE Critical and intensive care Delivery room (Caesarean) (m), (o) Emergency department decontamination Emergency department exam/treatment room (p)	Adjacent Areas (n) NR Positive Negative NR Negative	Outdoor ach	Total ach	to Outdoors (j)	Room Units (a)	%	°F/°C
SURGERY AND CRITICAL CARE Critical and intensive care Delivery room (Caesarean) (m), (o) Emergency department decontamination Emergency department exam/treatment room (p)	NR Positive Negative NR Negative	2 4 2	6				
Critical and intensive care Delivery room (Caesarean) (m), (o) Emergency department decontamination Emergency department exam/treatment room (p)	NR Positive Negative NR Negative	2 4 2	6				
Delivery room (Caesarean) (m), (o) Emergency department decontamination Emergency department exam/treatment room (p)	Positive Negative NR Negative	4		NR	No	30-60	70-75/21-24
Emergency department decontamination Emergency department exam/treatment room (p)	Negative NR Negative	2	20	NR	No	20-60	68-75/20-24
Emergency department exam/treatment room (p)	NR Negative		12	Yes	No	NR	NR
5 J I	Negative	2	6	NR	NR	Max 60	70-75/21-24
Emergency department public waiting area		2	12	Yes (q)	NR	Max 65	70-75/21-24
Intermediate care (s)	NR	2	6	NR	NR	Max 60	70-75/21-24
Laser eye room	Positive	3	15	NR	No	20-60	70-75/21-24
Medical/anesthesia gas storage (r)	Negative	NR	8	Yes	NR	NR	NR
Newborn intensive care	Positive	2	6	NR	No	30-60	72-78/22-26
Operating room (m), (o)	Positive	4	20	NR	No	<mark>20</mark> –60	68-75/20-24
Operating/surgical cystoscopic rooms (m), (o)	Positive	4	20	NR	No	<mark>20</mark> –60	68-75/20-24
Procedure room (o), (d)	Positive	3	15	NR	No	<mark>20</mark> –60	70-75/21-24
Radiology waiting rooms	Negative	2	12	Yes (q), (w)	NR	Max 60	70-75/21-24
Recovery room	NR	2	6	NR	No	<mark>20</mark> -60	70-75/21-24
Substerile service area	NR	2	6	NR	No	NR	NR
Trauma room (crisis or shock) (c)	Positive	3	15	NR	No	20-60	70-75/21-24
Treatment room (p)	NR	2	6	NR	NR	20-60	70-75/21-24
Triage	Negative	2	12	Yes (q)	NR	Max 60	70-75/21-24
Wound intensive care (burn unit)	NR	2	6	NR	No	40-60	70-75/21-24
NPATIENT NURSING							
AII anteroom (u)	(e)	NR	10	Yes	No	NR	NR
All room (u)	Negative	2	12	Ves	No	Max 60	70-75/21-24
Combination AII/PE anteroom	(c)	~ NR	10	Yes	No	NR	NR
Combination AII/PE room	Rositiva	2	12	Vac	No	Max 60	70 75/21 24
Continued care nursery	N/R	2	6	N/R	No	30-60	72-78/22-26
Labor/delivery/recovery (LDR) (s)	NR	2	6	NR	NR	Max 60	70-75/21-24
Labor/delivery/recovery/postpartum (LDPP) (c)	NP	2	6	NR	NP	Max 60	70 75/21 24
Newhorn nursery suite	NR	2	6	NR	No	30_60	72-78/22-26
Neurishment and an new	NR	ND	2	NR	NP	50-00	ND
Nourishment area or room	NR	NK	2	NK	NK	NK	NR
Patient corridor	NR	NR	2	NR	NR	NR	NR
Patient room	NR	2	4 (y)	NR	NR	Max 60	70-75/21-24
PE anteroom (t)	(e)	NR	10	NR	No	NR	NR
Protective environment room (t)	Positive	2	12	NR	No	Max 60	70-75/21-24
Toilet room	Negative	NR	10	Yes	No	NR	NR
NURSING FACILITY							
Bathing room	Negative	NR	10	Yes	No	NR	70-75/21-24
Occupational therapy	NR	2	6	NR	NR	NR	70-75/21-24
Physical therapy	Negative	2	6	NR	NR	NR	70-75/21-24
Resident gathering/activity/dining	NR	4	4	NR	NR	NR	70-75/21-24
Resident room	NR	2	2	NR	NR	NR	70-75/21-24
Resident unit corridor	NR	NR	4	NR	NR.	NR	NR
RADIOLOGY							
Darkroom (g)	Negative	2	10	Yes	No	NR	NR
X-ray (diagnostic and treatment)	NR	2	6	NR	NR	Max 60	72-78/22-26
X-ray (surgery/critical care and catheterization)	Positive	3	15	NR	No	Max 60	70-75/21-24
DIAGNOSTIC AND TREATMENT							
Autopsy room	Negative	2	12	Yes	No	NR	68-75/20-24
Bronchoscopy, sputum collection,	Negative	2	12	Yes	No	NR	68-73/20-23
and pentamidine administration							
Dialysis treatment area	NR	2	6	NR	NR	NR	72-78/22-26
Dialyzer reprocessing room	Negative	NR	10	Yes	No	NR	NR
ECT procedure room	NR	2	4	NR	NR	Max 60	72-78/22-26
Endoscope cleaning	Negative	2	10	Yes	No	NR	NR
Gastrointestinal endoscopy procedure room (x)	NR	2	6	NR	No	20-60	68-73/20-23
General examination room	NR	2	4	NR	NR	Max 60	70-75/21-24
Hydrotherapy	Negative	2	6	NR	NR	NR	72-80/22-27
Laboratory work area, bacteriology (f), (v)	Negative	2	6	Yes	NR	NR	70-75/21-24
Laboratory work area, biochemistry (f), (v)	Negative	2	6	Yes	NR	NR	70-75/21-24
Laboratory work area, cytology (f), (v)	Negative	2	6	Yes	NR	NR	70-75/21-24
Laboratory work area, general (f). (v)	Negative	2	6	NR	NR	NR	70-75/21-24
Laboratory work area, glasswashing (f)	Negative	2	10	Yes	NR	NR	NR
Laboratory work area biotalogy (f)	Negative	2	6	Vac	NID	ND	70, 75/21, 24

2017 ASHRAE 170

No longer required to have pressure relationships, but CMS still requires that they do.

Humidity range is 20% to 60%; but CMS still requires 30% to 60%.

Less ACH now required, but CMS still requires higher.

Laboratories no longer have a requirement to be circulated by room units, but CMS still requires that they cannot.



Note: NR = no reg

ASHRAE 1

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ces (Continued

controls to meet requirements for the control of atroome infectiou agents. The design of either portable or fixed systems should prever stagnation and short circuiting of airflow. The design of such system shall also allow for easy access for scheduled preventative mainte mance and cleaning.

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. To satisfy exhaust eeds, constant replacement air from the outdoors is necessary when

he system is in operation The RH ranges listed are the minimum and/or maximum allowable at any point within the design temperature range required for that space

- Systems shall be capable of maintaining the rooms within the range during normal operation. Lower or higher temperature shall be per-mitted when patients' comfort and/or medical conditions require ational Institute for Occupational Safety and Health (NIOSH) crite
- ria documents⁹ regarding occupational exposure to waste anesthetic gases and vapors and control of occupational exposure to nitrous oxide indicate a need for both local exhaust (seavinging) systems and general ventilation of the areas in which the respective gases are used. Refer to NFPA 90¹⁰ for other requirements.
- general ventuation of the areas in which the respective gases are used. Kefer to NFPA 59¹⁰ for other requirements. If pressure-monitoring device alarms are installed, allowances shall be made to prevent nuisance alarms. Short-term excursions from equired 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.

- ball-n-tube, or fluiterstrip shall be permitted for verification of article strip shall be percented in the organization's operational endoscopy waiting crones programmed to hold patients with exceed the minimum indicated ranges.
 In a recirculating verifiation system, HEPA filters shall be permitted in the ouse of for both bronchoscopy, sputum collection, shall contain provisions for exhusting an exteribut waste gases.
 In a recirculating verifiation system, HEPA filters shall be permitted in the return air passes through the HEPA filters shall be permitted that the return air passes through the HEPA filters shall be permitted to a transmission of the sating area of the sating area of the set of the sating area of the

- door air changes are still required. Constant-volume airflow required for consistent ventilation for the protected environment. Th pressure relationship to adjacent areas shall remain unchanged if the protective environment (PE) room is used as a normal patient roo Rooms with reversible airflow prov sions for the purpose of switch between protective environment and AII functions shall not be pe
- The AII room described in this standard shall be used for isolati the airborne spread of infectious diseases, such as measles, varicella, or tuberculosis. Supplemental recrivating devices using HEPA fil-ters shall be permitted in the AII room to increase the equivalent room air exchanges; however, the minimum outdoor air changes of Table 7.1 are still required. AII rooms that are retrofitted from stan-dard patient rooms from which it is impractical to exhaust directly outdoors may be recirculated with air from the AII room, provided that air first passes through a HEPA filter. When the AII room is not used for airborne infection isolation, the pressure relationship to adjacent areas, when measured with the door closed, shall remain unchanged, and the minimum total air changer rate shall be 6 ach. Room temperature ranges that exceed the minimum indicated range fool to be the start and the minimum to the behavior. the airborne spread of infectious diseases, such as measles,
- shall be permitted if
- nent that all room air is exhausted directly

Table 2.1-2 Locations for Nurse Call Devices in Hospitals'

Optional KEV-Required

Section	Location	Patient Station	Bath Station	Staff Assistance Station	Emergency Call Station	Nurse Master Station	Duty Station	Notes
NURSING UNIT	s							
2.1-2.2.6	Patient toilet room		٠					2
2.2-2.2.2	Medical/surgical unit patient bed	•		•	•			1, 2, 3, 4
2.2-2.6.2	Critical care unit patient bed	•		•	•			1, 2, 4, 5
2.2-2.8.2	NICU							
2.2-2.9.3	LDR/LDRP room	•		•	•			1, 2, 3, 4
2.2-2.10.3.1	Newborn nursery			•	•			
2.2-2.10.3.2	Continuing care nursery							
2.5-2.2.2	Psychiatric patient bedroom	•		•				2
2.5-2.4.2	Alzheimer's and other dementia unit	•						
	patient bedroom							
SUPPORT AREA	S							
2.1-2.8.2	Nurse/control station					•		
2.1-2.8.5	Multipurpose room							
2.1-2.8.8	Medication safety zone						•	
2.1-2.8.9	Nourishment area or room							
2.1-2.8.11.2	Clean workroom						•	
2.1-2.8.11.3	Clean supply room							
2.1-2.8.12.2	Soiled workroom						٠	
2.1-2.8.12.3	Soiled holding room							
2.1-2.8.13.1	Clean linen storage							
2.1-2.8.13.2	Equipment storage room							
2.1-2.9.1	Staff lounge							
DIAGNOSTIC &	TREATMENT AREAS							
2.1-2.4.3	Seclusion room			•	•			
2.1-3.2	Examination room			•	•			
Table 2.2-2	Class 1 imaging room							
2.1-3.4.3	Pre-procedure patient care room or area	•		•	•			1, 2
2.1-3.4.4	Phase I post-anesthetic (PACU) patient care station			•	•			2, 4
2.1-3.4.5	Phase II recovery patient care station	•		•	•			1, 2
2.2-2.9.11	Cesarean delivery room			•	•			2
2.2-3.1.3.6	Emergency treatment room, triage area	•		•				1, 2, 4
2.2-3.2.2	Observation unit patient care station			•	•			
2.2-3.3.2	Procedure room (including			•	•			2,4
Table 2.2-2	endoscopy) Class 2 imaging room							
2.2-3.3.3	Operating room			•	•			2
Table 2.2-2	Class 3 imaging room							
2.2-3.4.10	Imaging waiting and changing area, including toilet room							2
2.5-3.4.2.2	Electroconvulsive therapy (ECT) treatment room ECT pre-procedure patient care			•	•			2
2.5-3.4.3.2	station							







Changed from no recommendation to required

Changed from required to no recommendation

Hard copy shows bath stations and staff call instead of staff call and emergency call station in these columns. The electronic version has been updated. 2014 matches more closely with the electronic version.

Table 2.1-3: Locations for Nurse Call Devices in Outpatient Facilities^{1,2}

Section	Location	Patient Station	Staff Assistance Station	Emergenc <u>y</u> Call Station	Notes
PATIENT CARE AND	DIAGNOSTIC AREAS				
2.1-3.2.2 Table 2.1-4	Procedure room (including endoscopy) Class 2 imaging room		•	•	2, 3
2.1-3.2.3 Table 2.1-4	Operating room Class 3 imaging room		•	•	2
2.1-3.7.3 2.1-3.7.5	Pre-procedure patient care station Phase II recovery patient care station	•	•	•	1, 2
2.1-3.7.4	Phase I post-anesthesia recovery (PACU) patient care station	•	•	•	2, 3
2.8-3.4.2 2.8-6.2.2	Emergency treatment room Emergency triage area	•	•		1, 2, 3
2.10-3.10.2	Dialysis facility patient toilet room		•	•	1
2.11-3.2.9.2 (2) 2.11-3.2.9.3 (2)	Electroconvulsive therapy (ECT) room ECT recovery patient care station		•	•	2



Nurse Cal

-GI Updates



Added areas

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Table 2.1-1 Electrical Receptacles for Patient Care Areas in Hospitals

Section	Location	Number of Single Receptacles ¹	Receptacle Locations
PATIENT BED LOG	CATIONS		
2.1-2.4.2	AII room ²	12	2 at each side of the head of the bed
2.2-2.2.2	Medical/surgical unit patient room ²		2 on all other walls
2.2-2.2.4.4	Protective environment room ²		1 for a television, if used
2.2-2.5.2	Intermediate care unit patient room		1 for each motorized bed
2.2-2.9.2.2	Postpartum unit patient room ²		
2.2-2.11.2	Pediatric and adolescent unit patient room ²		
2.6-2.2.2	Rehabilitation unit patient room		
2.2-2.6.2	Critical care unit (CCU) patient room	16	Convenient? to head of bed with one on each
2.2-2.7.2	Pediatric critical care unit patient room		wall
2.2-2.8.2	Neonatal intensive care unit (NICU) patient care station		
2.2-2.9.3	LDR/LDRP room	16	8 convenient ³ to head of mother's bed 4 convenient ³ to each bassinet with one on each wall
2.2-2.10.3.1	Newborn nursery patient care station	4	Convenient3 to each bassinet
2.2-2.10.3.2	Continuing care nursery patient care station	5	Convenient ³ 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.)
2.5-2.2.2	Psychiatric nursing unit	No minimum	
DIAGNOSTIC AN	D TREATMENT AREAS		•
2.1-3.2	Examination room	8	4 convenient3 to head of gurney or bed or on
Table 2.2-2	Class 1 imaging room		each lateral side of the imaging gantry
2,2-2,9,11	Cesarean delivery room	304	16 convenient ³ to table placement 2 on each wall 6 in the infant care area
2.2-3.1.2.6	Treatment room for basic emergency services	12	Convenient ³ to head of gurney or bed
2.2-3.1.3.3	Triage room or area in the emergency department	6	Convenient' to head of gurney or bed (At least 50% of these outlets shall be connected to emergency system power and be so labeled.)
2.2-3.1.3.6 (2) and (3)	Emergency department treatment room	12	Convenient' to head of gurney or bed
2.2-3.1.3.6 (4)	Trauma/resuscitation emergency room	16	Convenient? to head of gurney or bed
2.2-3.2.2	Observation unit patient care station	8	4 convenients to head of gurney or bed
2.2-3.3.2	Procedure room (including endoscopy)	124	8 convenients to table placement with at least
Table 2.2-2	Class 2 imaging room		one on each wall
2.2-3.3.3	Operating room	364	16 convenient? to table placement
Table 2.2-2	Class 3 imaging room		2 on each wall
2.2-3.10.2	Hemodialysis patient care stations	8	4 on each side of a patient bed or lounge chair. (Two on each side of the bed shall be
			connected to emergency power.)
POST-ANESTHESI	A CARE LOCATIONS		connected to emergency power.)
POST-ANESTHESI 2.1=3.4.4	A CARE LOCATIONS Phase I post-anesthetic care (PACU) patient care station	8	Convenient ² to head of gurney or bed

Added areas that previously had minimums per NEC. Category 1 and 2 patient bed location minimums are still per NEC.

Section	Room Type	Number of Single Receptacles ¹	Receptacle Locations ²	
PATIENT CARE	AND DIAGNOSTIC AREAS			
2.1-3.2.1 Table 2.1-4	Examination room/observation room Class 1 imaging room	8	4 convenient to head of exam table or gurney or on each lateral side of the imaging gantry	
2.1-3.2.2 Table 2.1-4	Procedure room (including endoscopy) Class 2 imaging room	123	8 convenient to table placement At least 1 on each wall	
2.1-3.2.3 Table 2.1-4	Operating room Class 3 imaging room	363	12 convenient to table placement 2 on each wall	Total count nov aligns with NEC
2.1-3.7.3 2.1-3.7.5	Pre-procedure patient care station Phase II recovery patient care station	4	Convenient to gurney, lounge chair, or bed	
2.1-3.7.4	Phase I post-anesthesia recovery (PACU) patient care station	8	Convenient to head of gurney or bed	
2.4-2.2	Birthing room	8	4 convenient to head of the mother's bed	
2.8-3.4.2	Treatment room (emergency facility)	12	4 convenient to head of exam table or gurney	
2.8-3.4.4	Trauma/resuscitation room (emergency facility)	16	Convenient to head of gurney or bed	
2.8-6.2.2	Triage area (emergency facility)	6	Convenient to head of gurney or bed (at least 3 outlets connected to emergency system power and so labeled)	
2.10-3.2.2	Hemodialysis patient care station	8	4 on each side of a patient bed or lounge chair (2 on each side of the bed connected to emergency power)	

Split out ED treatment room

Total count now aligns with NEC



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Table 2.1-3 Station Outlets for Oxygen, Vacuum (Suction), Medical Air, and Instrument Air Systems in Hospitals'

Section	Location	Oxygen	Vacuum	Medical Air	WAGD ²	Instrument	Was required in 2014									
PATIENT CARE UNI	5					Air										
2.1-2.4.2	Airborne infection isolation room	1/bed	1/bed	<u> </u>	Ι_											
2.2-2.2.2	Patient room (medical/surgical)	1/bed	1/bed		+ _		3/bed in 2014									
2.2-2.2.4.4	Protective environment room	1/bed	1/bed		<u> </u>											
2.2-2.5.2	Intermediate care room	2/bed	2/bed	1/bed	+ _		GENERAL SUPP	ORT FACILITIES								Added
2.2-2.6.2	Critical care patient room	3/bed	3/bed	1/bed	+ _		2.1-5.1.2.2 (2	2) Two-room st	erile processing:	_	[_			1 9, 10, 11	
2.2-2.6.4.2	Airborne infection isolation (critical care)		0.000					Decontamina	ation room							require
2.2-2.7.2	Pediatric critical care room	1					2.1-5.1.2.2 (3	Two-room st workroom	erile processing: Clean	-	-		-	-	9,10,11	
2.2-2.8.2	Neonatal intensive care unit (NICU) infant care hed	3/infant care bed	3/infant care bed	3/infant care bed	ı —	-	2.1-5.1.2.3 (2	One-room sto Decontar	erile processing: mination area	-	-	_	-	-	9,10,11	
2.2-2.9.2	Antepartum and postpartum unit	1/bed	1/bed		+ _		2.1-5.1.2.3 (3	Clean we	ork area							
2.2-2.9.3	Labor/delivery/recovery (LDR)		1.000				2.1-5.7.2.2	Autopsy root	m	—	1 per workstation		—		-	
2.2-2.9.3	Labor/delivery/recovery/nostpartum (LDRP)	1					2.2-3.11.4.2	Endoscope p	rocessing room decontamination		-	_,	-		8, 9, 11	
2.2.2.9.3.9	Infant resuscitation space ⁴ (LDR/LDRP)	3/bassinet	3/bassinet	3/bassinet	<u>+</u>		2.2-3.11.4.3	Endoscope p	rocessing room clean work area	<u> </u>		*	<u> </u>	<u> </u>	8, 9, 11	
2 2-2 9 11	Cesarean delivery room	2/room	4/room	1/room									1		-	
2.2-2.9.11 1	Infant resuscitation space ⁴ (cesarean delivery)	3/bassinet	3/bassinet	3/bassinet					Su	pport facilities	added					
2.2-2.9.11.11	Recovery space for cesarean delivery	1/bed	3/bed	1/bed	+											
2.2-2.10.3.1	Newborn nursery	1/bassinet ^s	1/bassinet ^s	1/bassinct ^s							Added areas					
2.2-2.10.3.2	Continuing care nursery	1/bassinet	1/bassinet	1/bassinet	+				Table 2.1-2: Station	Outlets for Oxy	gen, Vacuum, M	ledical Air	, and In	strume	nt Air S	ystems in
2.2-2.11.2	Pediatric and adolescent patient room	1/bed	1/bed	1/bed					Outpatient Facilities	8						-
2.2-2.11.2	Psychiatric patient room	Inted	Inted	Inted					Section		Location		Oxygen	Vacuum	Medical Ai	r Instrument Air
2.2-2.12.4.3	Seclusion treatment room (psychiatric	-							PATIENT CARE AND DIAGNO	DSTIC AREAS			11	11		1
2,2-2,12,4,5	unit[HL1])								2.1-5.2.2 Table 2.1_4	Class 2 imaging	room		2	2	11	
DIAGNOSTIC AND	REATMENT LOCATIONS								$2 1_3 2 3 2 (1)(a)$	Operating room	255_square_foot O	D)	11	11	1	
2.1-3.2	Examination room or emergency department	1/room	1/room	—	_	<u> </u>			2.1-3.2.3.2(1)(b)-(c)	Operating rooms	255-square-root O.	K)	2	3	11	
	treatment room								Table 2.1-4	Class 3 imaging	room ²		2	5	1	
2.1-3.4.4	Phase I post-anesthesia (PACU) patient care	2/station	3/station	1/station	_	-			2.1-3.3.2	Airborne infectio	n isolation room		03	03		_
	station								2.1-3.7.4	Phase I post-anes	sthesia recovery (PA	ACU)	1	1		—
2.1-3.4.5	Phase II recovery patient care station	1/station	1/station6	—	—	-				patient care statio	on					
2.2-3.1.2.6	Treatment room for basic emergency services	1/gurney	1/gurney	—	_	-			2.1-3.7.5	Phase II recovery	patient care station	n	03	03		
2.2-3.1.3.3	Triage area (emergency department)	1/station	1/station	—	_				_	Cast room			03	03		—
2.2-3.1.3.6	Emergency department treatment room or	1/gurney	1/gurney	1/gurney	—	-			2.4-2.2	Birthing room			11	11		
	area								2.8-3.4.2	Treatment room	(emergency facility	7)	1	1		
2.2-3.1.3.6 (4)	Trauma/resuscitation room	2/gurney	3/gurney	1/gurney	—	-			2.8-6.2.2	Triage area (eme	rgency facility)-p	er station	1	1		
	Plaster and cast room	1/room	1/room		_	-			2.8-3.4.4	Trauma/resuscita	tion room (emerger	ncy facility)	2	2	1	
2.2-3.2.2	Observation unit patient care station	1/station	1/station	—	—	-			20222	per gurney	1		1	2		
Table 2.2-2	Class 1 imaging room	1/room	1/room	—	—	-			2.9-3.2.2	Endoscopy proce	a tharany treatment	troom	1	3		
2.2-3.3.2	Procedure room	2/room	2/room	1/room	—	-	Adde	d separate	2.11-3.2.9.2 (2)	Electroconvulsiv	e merapy treatment	t ioom	1.	1.		
Table 2.2-2	Class 2 imaging room	21		1/		1/	- instru	ment air	2.1-4.3.2.2 (2)	Sterile processing	decontamination	room	_	_		11,4,5
2.2-3.3.3 Table 2.2-2	Operating room	2/room	5/room	1/room	1/room	1/room 4	requi	rement	2.1-4.3.2.2 (3)	Sterile processing	g clean workroom					1, 4, 5
2 2-3 11 2	Endoscopy procedure room	1	3		_	_										
2.2-3.11.3	Endoscopy procedure room	07	07						2.1-4.3.2.3	One-room sterile	processing room			_		1, 4, 5
212-01110	care area	0							2.9-4.3.2	Endoscope proce	ssing room—decor	ntamination	—	3	—	1, 3, 5
2.2-3.13.4	Hyperbaric suite pre-procedure patient care	2	2	_	_				29433	area Endoscone proce	ssing roomclean	work area		3		1, 3. 5
	area								2.7-7.3.3		and automate for	lition				
2.5-3.4.2.2	Electroconvulsive therapy treatment room	1*	1*	I — T	_	-				Ad	ued support faci	liities				



HFG architecture

separate nent air ment

The Future of FGI

- Implementation of FGI in Oklahoma, Texas and Kansas 1.
- 2022 REVISION PROCESS 2.
- 2022 REVISION TOPICS З.

FGI Guidelines Adoption Map

Oklahoma will begin applying the 2018 FGI Guidelines to hospitals and outpatient surgery facilities on September 13th, 2019

KEY

2018	
2014	
2010	
2006	
2001	
1996–97	
Equivalency*	
HVAC only	

*Guidelines may be applied as an equivalency to state rules.







Health Guidelines Revision Committee (HGRC)



"Select multidisciplinary consensus body of about 100 clinicians, administrators, architects, engineers, and representatives from authorities having jurisdiction" (FGI).





2019 OAHE FALL REGIONAL EVENT

Benefit-Cost Committee

"Evaluates the impact of changes to requirements in the *Guidelines*" (FGI)





2019 OAHE FALL REGIONAL EVENT



2022 Public Feedback

- > 1st Opportunity for Feedback Public Proposal Period ended July 1, 2019
 - Feedback to suggestions for changes to the current baseline text and development of materials on operational and best-practice recommendations. November 1, 2018 – June 30, 2019
- > 2nd Opportunity for Feedback on the new language is open to the public following the release of the draft of the 2022 Guidelines in the summer of 2020.



2019 OAHE FALL REGIONAL EVENT

2022 Topic Groups

Based on industry trends and user feedback and inquiries

- Acoustics and vibration
- Behavioral health
- Behavioral health in the ED
- Emergency preparedness, resiliency and business continuity
- ➤ Inclusive environments (formerly, Geriatrics)
- Infection prevention and control



- ➤ Lighting
- Nurse call devices, electrical receptacles and med/gas outlets
- Palliative design
- > Pediatrics
- ➢ Rural health
- > Technology



2019 OAHE FALL REGIONAL EVENT
Publication of 2022 *Guidelines*

Every 4 Years there is a Revision Cycle of Guidelines

- ➤ The 2022 *Guideline* draft will be released to the public in summer 2020
- ➢ Final publication is estimated for the end of 2021





2019 OAHE FALL REGIONAL EVENT

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Session 1

Contact Information

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