



Oklahoma Association of Healthcare Engineers  
2019 Summer Regional Event

August 23, 2019





# Session 1: FGI 2018 Overview

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# 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

## 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

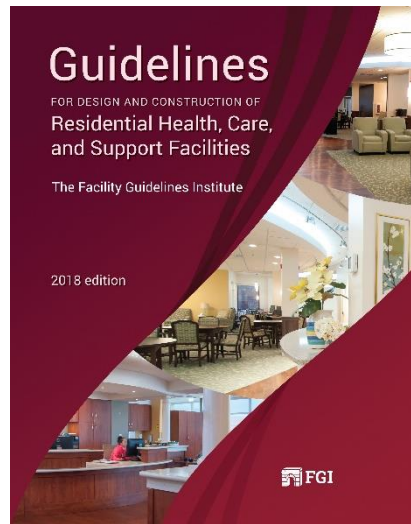
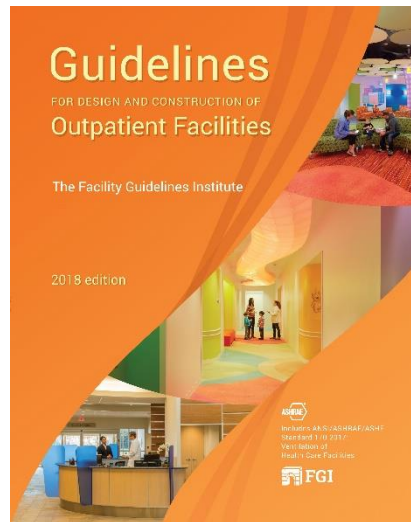
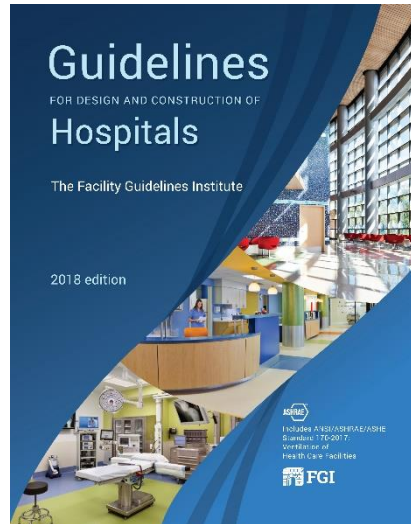
- Mechanical Associate at Professional Engineering Consultants
- EDAC and LEED Accredited.
- Responsibilities include the design of plumbing, heating, ventilation, and air conditioning (HVAC) systems from the initial concept stage to the final bid documents with extensive experience in healthcare.



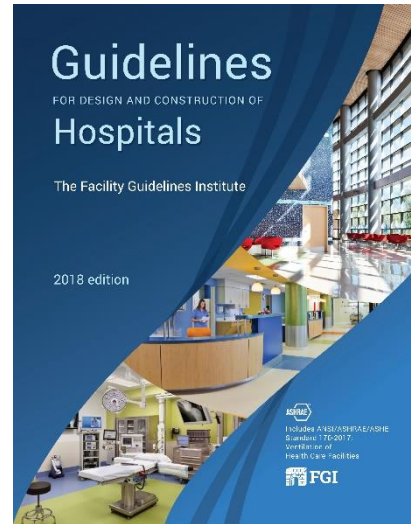
# Session 1: FGI 2018 Overview

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



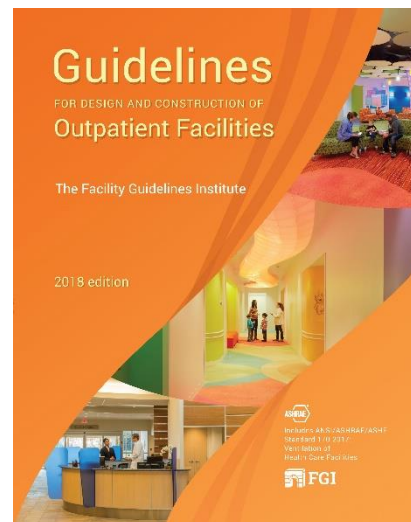


“...the most significant change to the 2018 edition of the *Guidelines* is that these important design standards are now presented as three independent documents.”



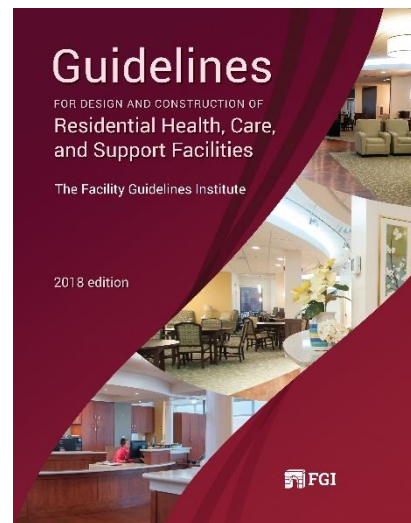
## Guidelines for Design and Construction of Hospitals

Provides standards for designing and constructing **hospital** facilities.



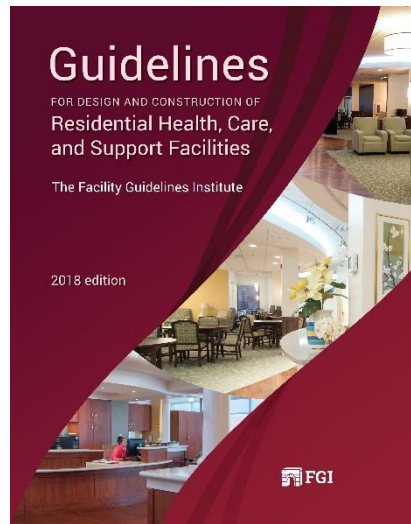
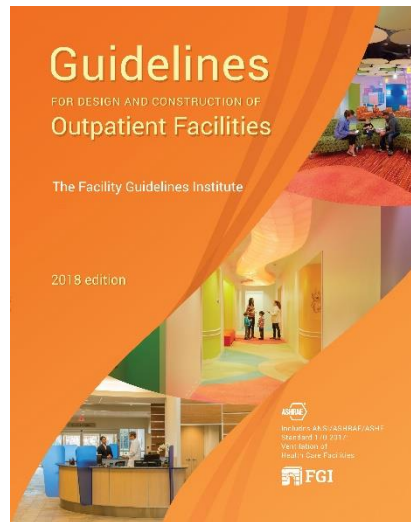
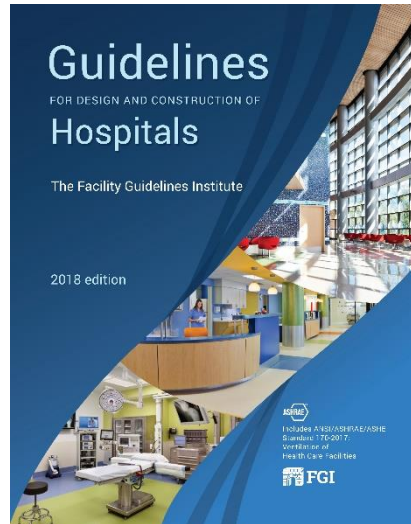
## Guidelines for Design and Construction of Outpatient Facilities

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*.

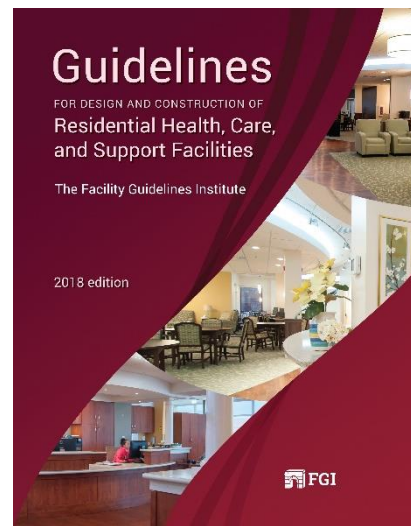
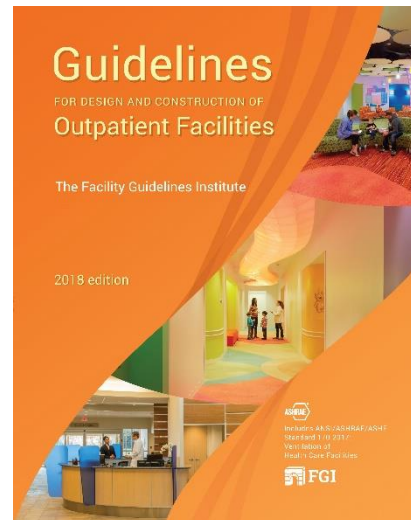
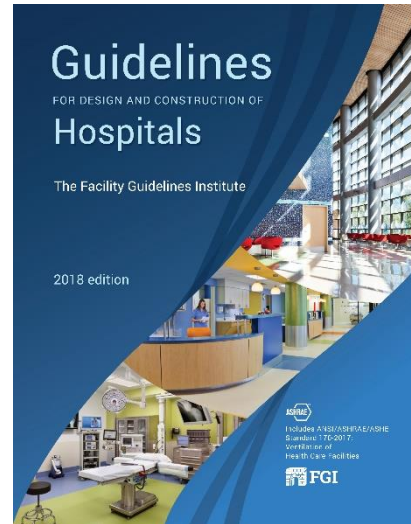
**Appendix** items are incorporated within the main body of the text.

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).





## 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

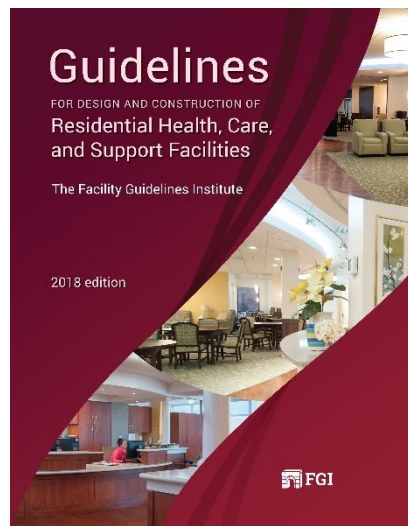
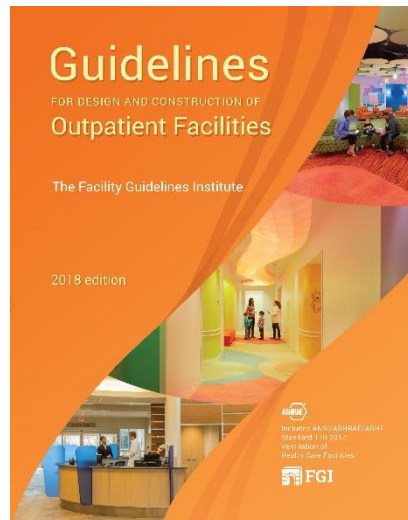
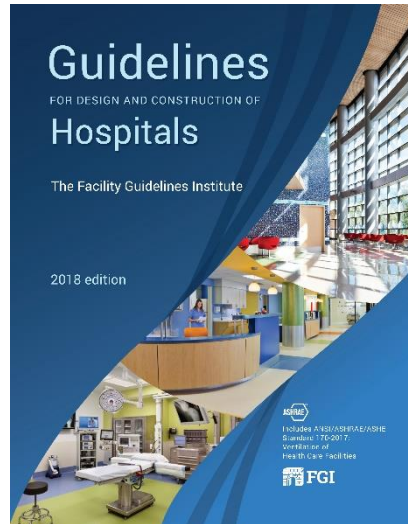
- Now classified according to use in Hospitals *Guidelines* and included separately in Outpatient *Guidelines*.

### 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.

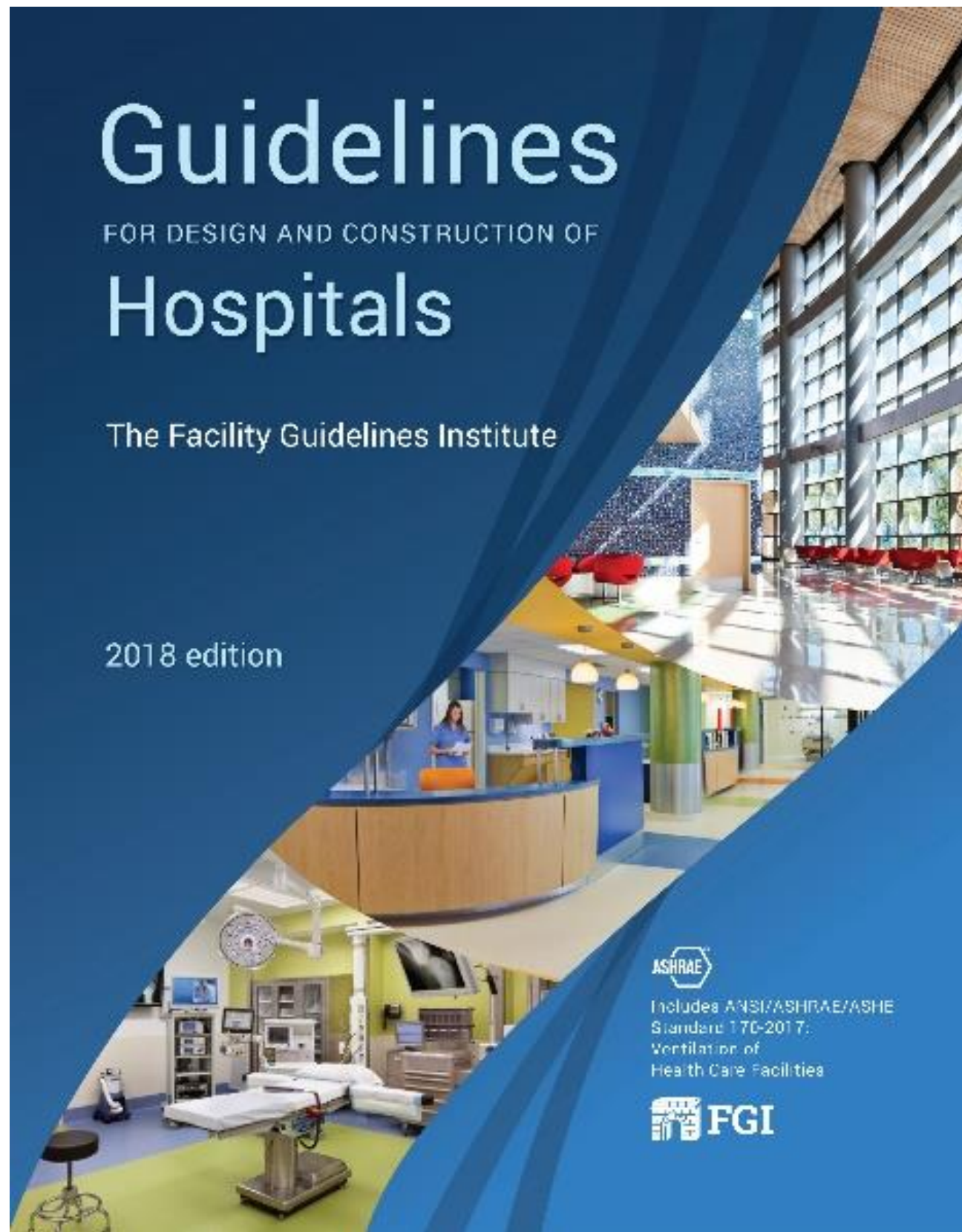
### Critical care unit patient rooms

- In new construction, all patient rooms in critical care units except NICUs will be single-patient rooms with potential 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.
- Table provided to quickly identify which procedures are to occur in which spaces.





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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

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[Part 3: Ventilation of Hospitals](#)

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

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## Guidelines for Design and Construction of Hospitals

Provides standards for designing and constructing hospital facilities.

### Part 1: General

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### Chapter 1.2: Planning, Design, Construction, and Commissioning

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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

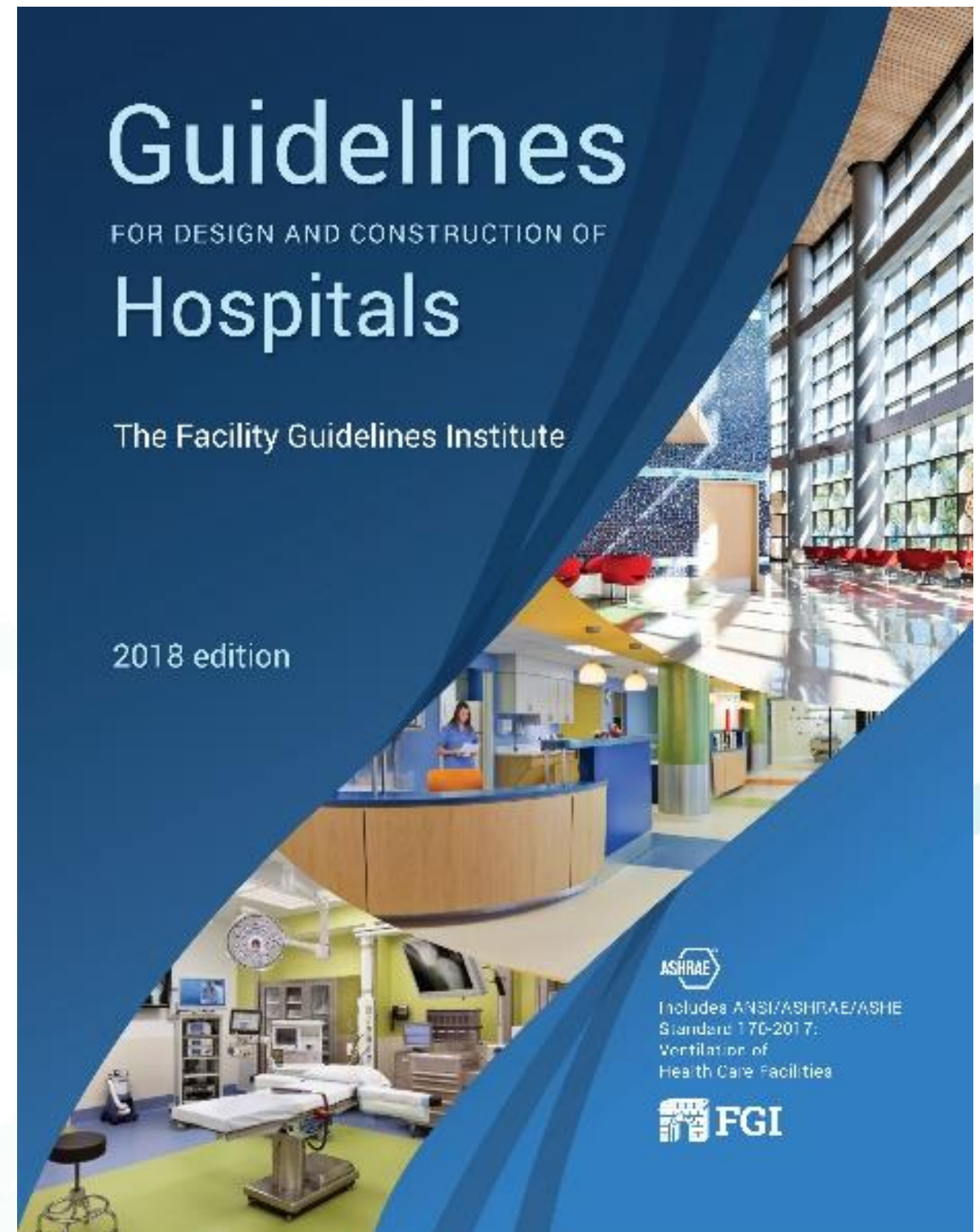
Section 1.3-1: General

Section 1.3-2: Location

**Section 1.3-3: Site Features**

**Section 1.3-4: Environmental Pollution Control**

Chapter 1.4: Equipment





## \* 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 inter-department 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

## 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



## 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.



## 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 Criteria for Sound Isolation of Exterior Shell in New Construction**

Exterior Site Noise Exposure Category				
	A	B	C	D
General description	Minimal	Moderate	Significant	Extreme
Outdoor day-night average sound level during ( $L_{dn}$ ) (dBA) <sup>1</sup>	< 65	65–69	70–74	≥ 75
Outdoor average hourly nominal maximum sound level ( $L_{01}$ ) <sup>2</sup> (dBA)	< 75	75–79	80–84	≥ 85
Design Criteria for Sound Isolation of Exterior Shell in New Construction <sup>3</sup>				
Minimum exterior shell composite sound transmission rating <sup>4, 5, 6</sup>	OITCc: 25 <i>or</i> STCc: 35	OITCc: 30 <i>or</i> STCc: 40	OITCc: 35 <i>or</i> STCc: 45	OITCc: 40 <i>or</i> STCc: 50

OITC - Outdoor–Indoor Transmission Class

STC – Sound Transmission Class

# OITC RATING

VERSUS

# STC RATING

COMPARING THE 2 TYPES OF SOUND RATINGS



<https://citiquiet.com/oitc-vs-stc-what-rating-system-should-i-rely-on/>



## 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)



## Guidelines for Design and Construction of Hospitals

Provides standards for designing and constructing hospital facilities.

### Part 2: Hospital Facility Types

#### Chapter 2.1: Common Elements for Hospitals

Section 2.1-1: General

[Section 2.1-2: Patient Care Units and Other Patient Care Areas](#)

[Section 2.1-3: Diagnostic and Treatment Areas](#)

Section 2.1-4: Patient Support Facilities

Section 2.1-5: General Support Facilities

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Section 2.1-7: Design and Construction Requirements

Section 2.1-8: Building Systems

Chapter 2.2: Specific Requirements for General Hospitals

Chapter 2.3: Specific Requirements for Freestanding Emergency Care Facilities

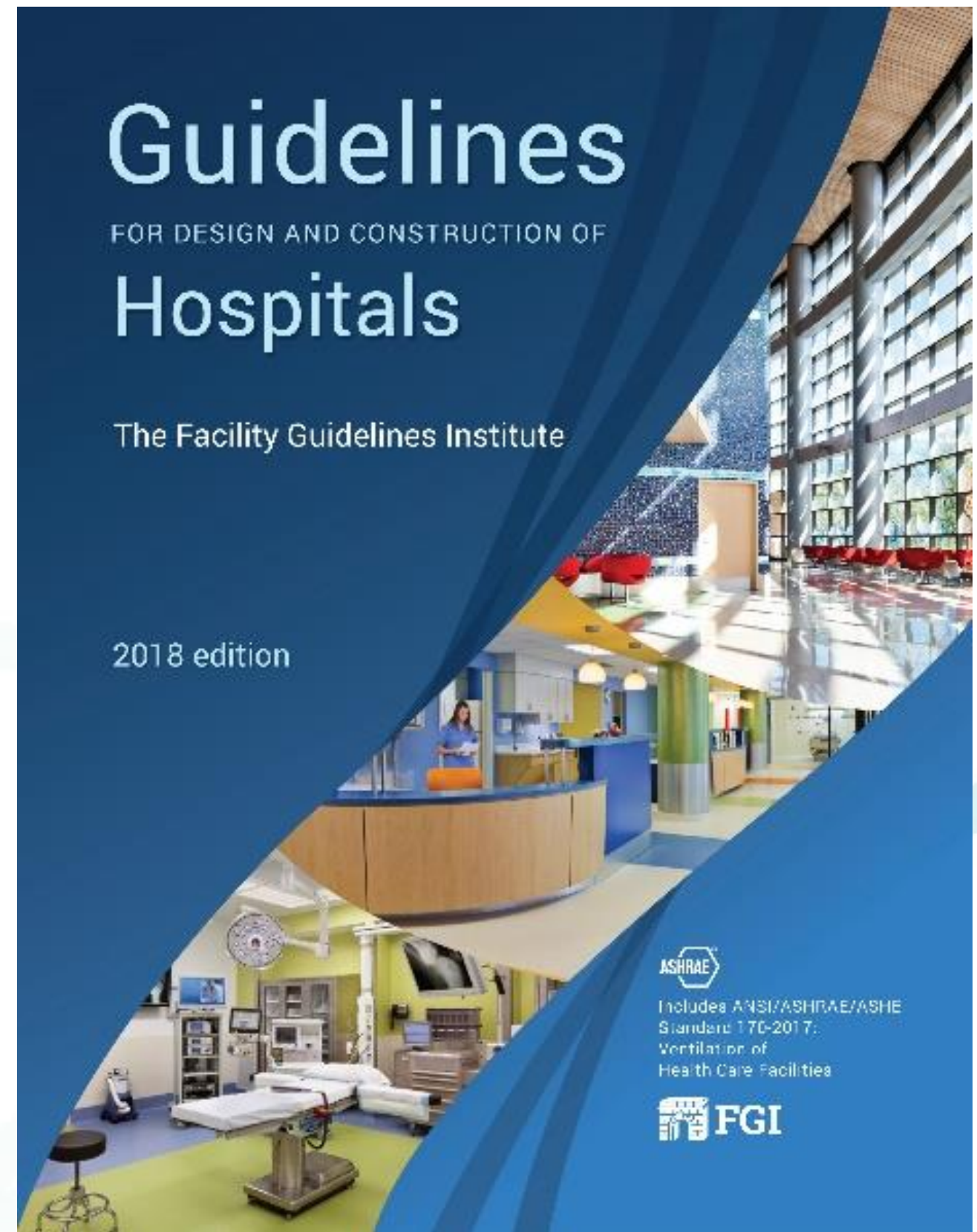
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Chapter 2.8: Specific Requirements for Mobile/Transportable Medical Units





## 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



## 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.

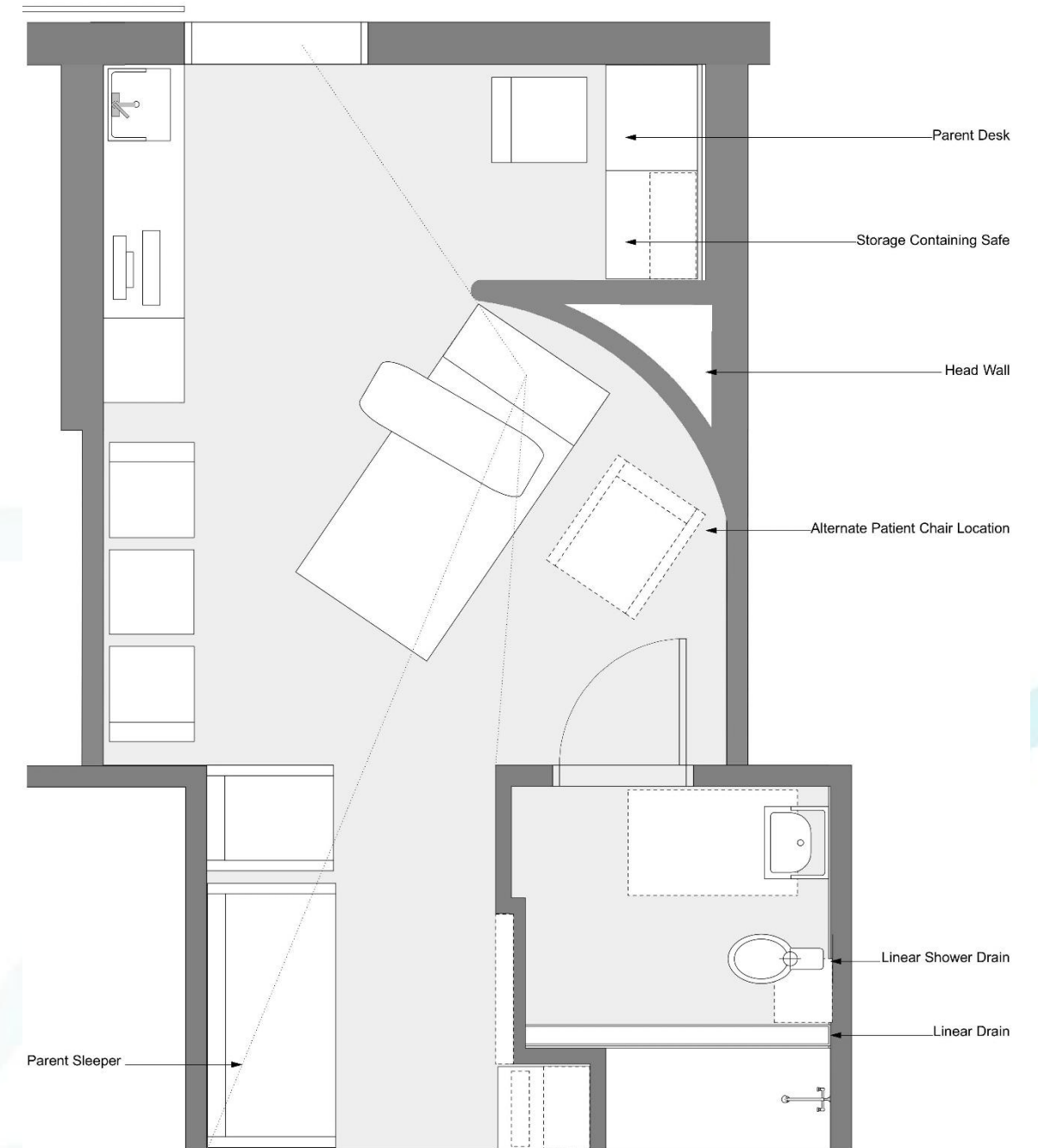
- Minimum 3 feet at sides, foot of bed (see notes in chapter about placement)

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



## 2.1-3 – Diagnostic and Treatment Areas Telemedicine

### \*2.1-3.3 Accommodations for Telemedicine Services

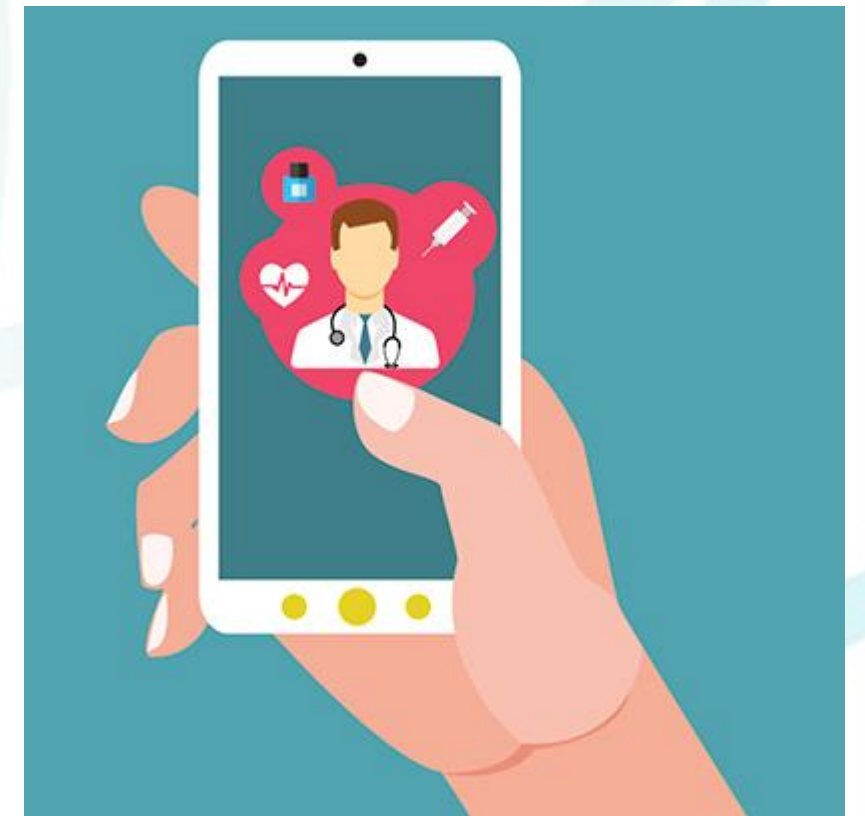
A2.1-3.3 Patient experience. Remote communications via electronic equipment, **although not a replacement for in-person care, may be offered as a supplement where in-person care is not available or medically necessary.** To assist in the adoption of telemedicine and maximize its benefits for elderly 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.



## 2.1-3 – Diagnostic and Treatment Areas Telemedicine

### 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.





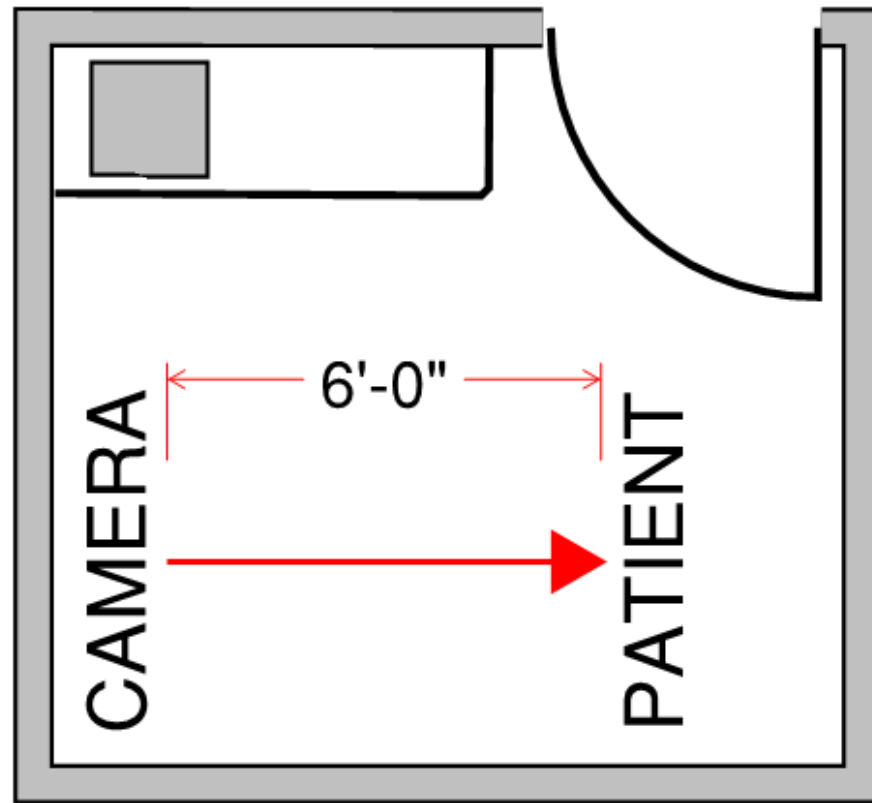
## 2.1-3 – Diagnostic and Treatment Areas Telemedicine

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 behind the patient



## 2.1-3 – Diagnostic and Treatment Areas Telemedicine



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

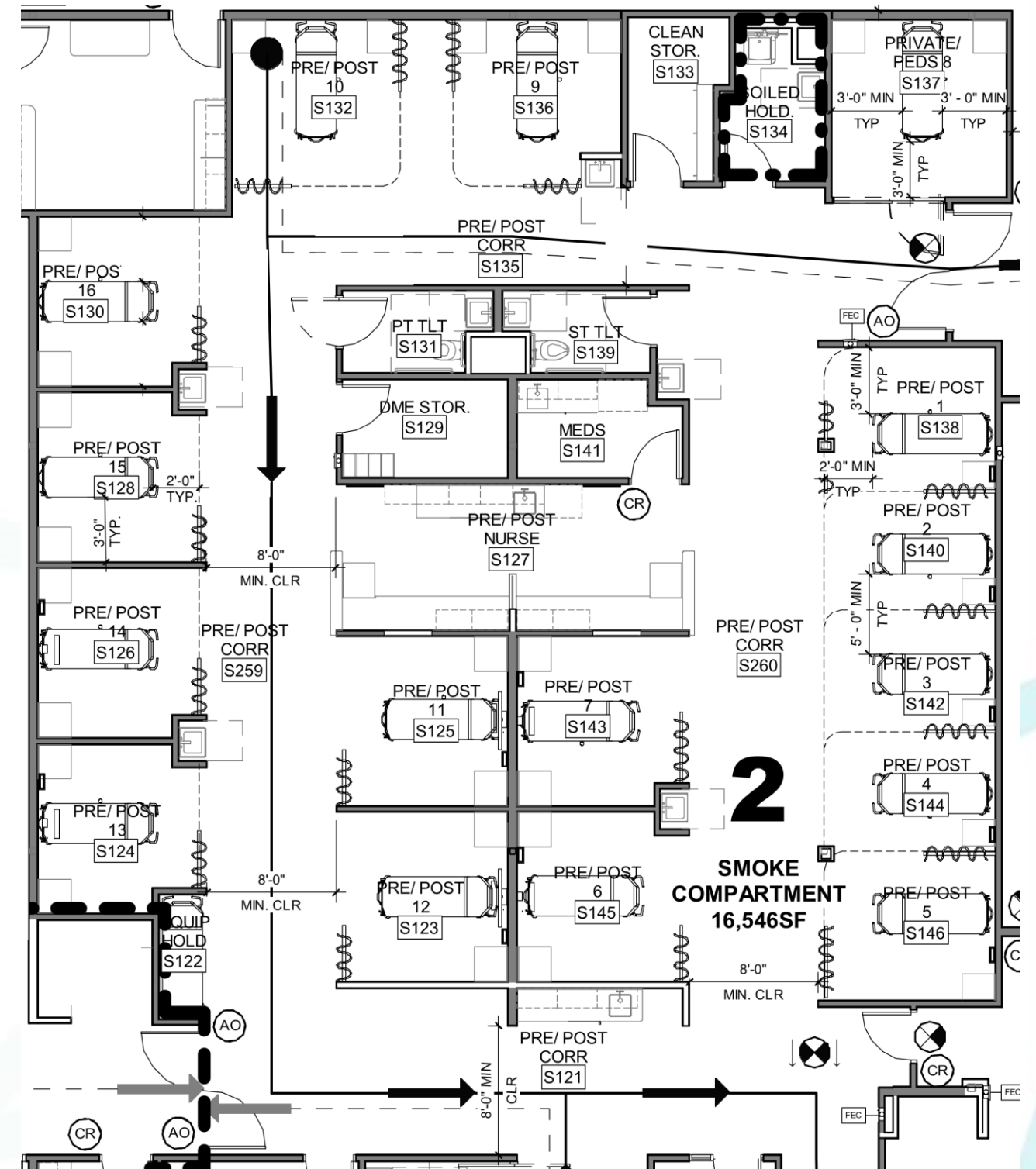


## 2.1-3.4 – Diagnostic and Treatment Areas Pre- and Post-Procedure Patient Care

### 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

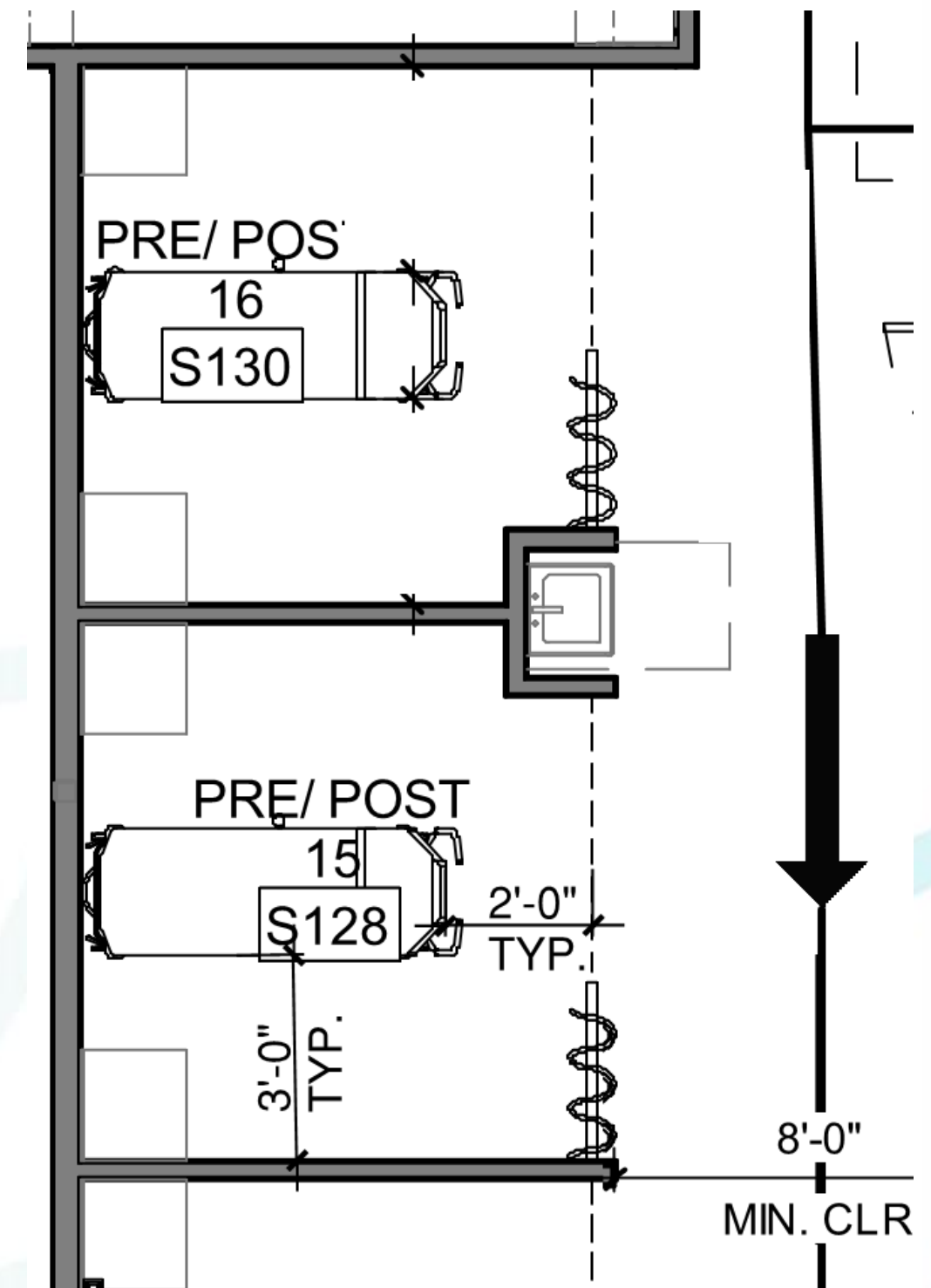




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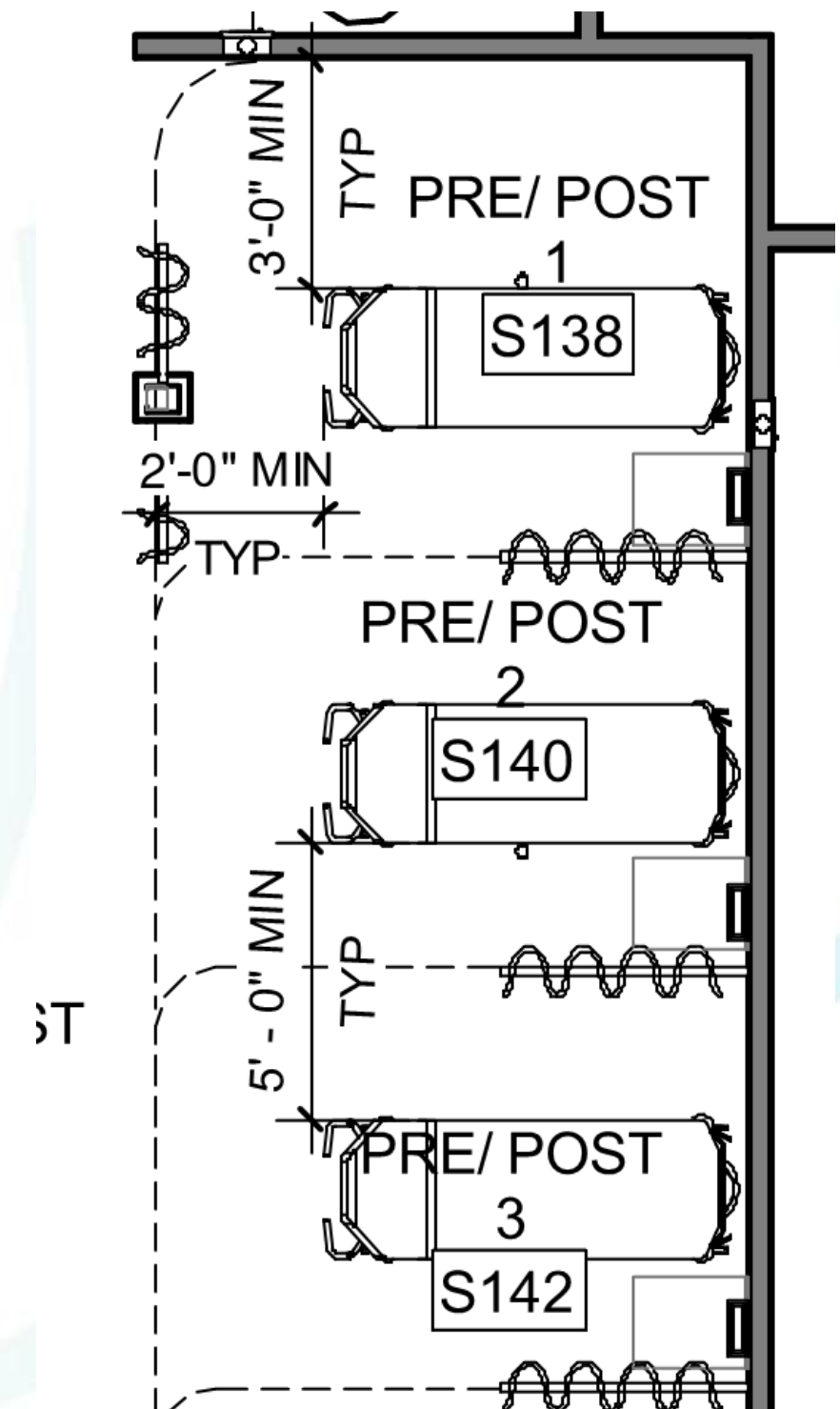
- Where cubicles are used, the following minimum clearances shall be provided:
  - 3 feet between the sides of patient beds/gurneys/lounge chairs and adjacent walls or partitions (*was 4 feet*)
  - 2 feet between the foot of patient beds/gurneys/lounge chairs and the cubicle curtain (*was 3 feet*)
 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



## 2.1-3.4 – Diagnostic and Treatment Areas Pre- and Post-Procedure Patient Care

### Patient Care Stations (PCS)

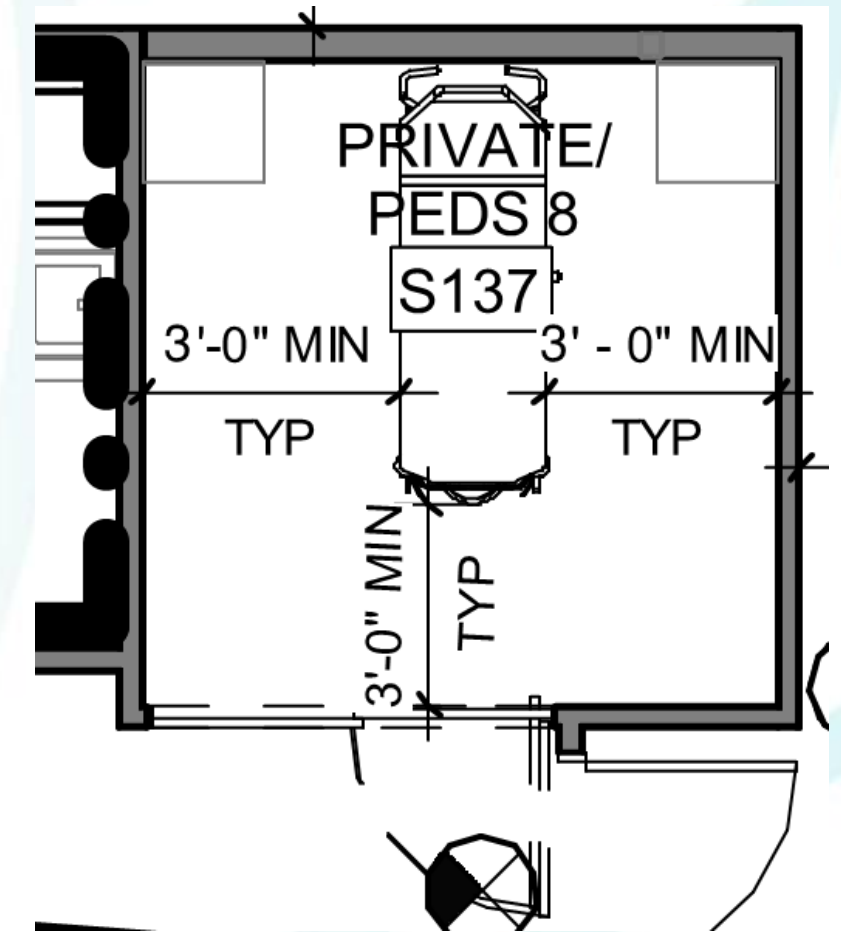
- Where bays are used, the following minimum clearances shall be provided:
  - 5 feet between the sides of patient beds/gurneys/lounge chairs
  - 3 feet between the sides of patient beds/gurneys/lounge chairs and adjacent walls or partitions (*was 4 feet*)
  - 2 feet between the foot of patient beds/gurneys/lounge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



## 2.1-3.4 – Diagnostic and Treatment Areas Pre- and Post-Procedure Patient Care

### 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.

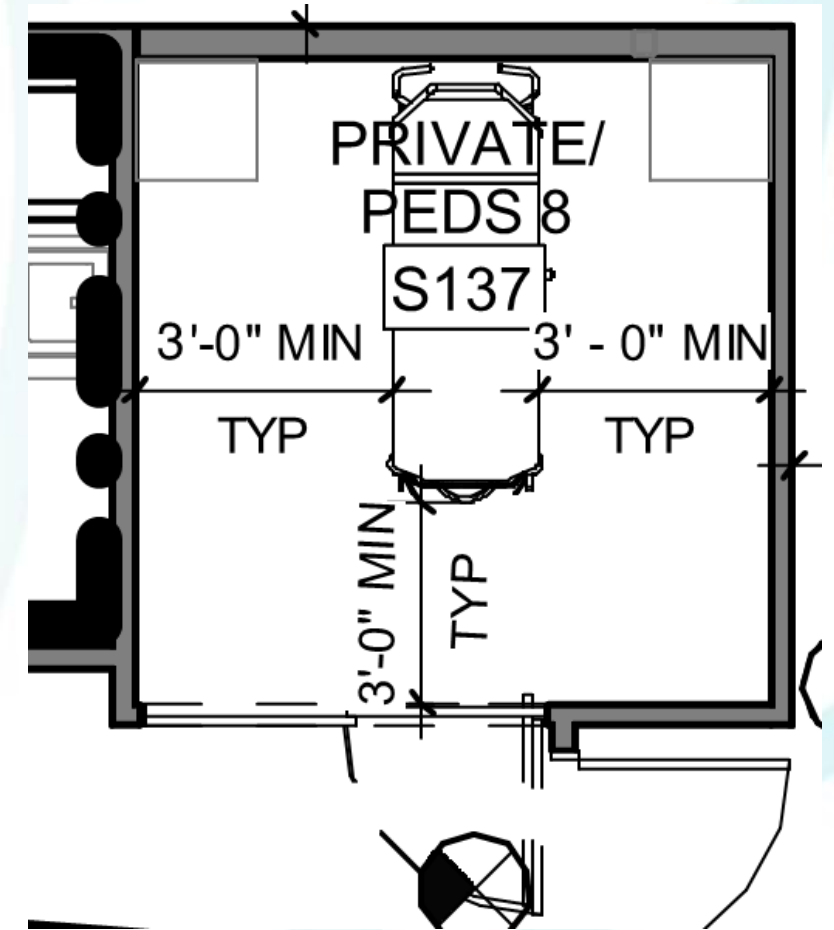




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#### Chapter 2.2: Specific Requirements for General Hospitals

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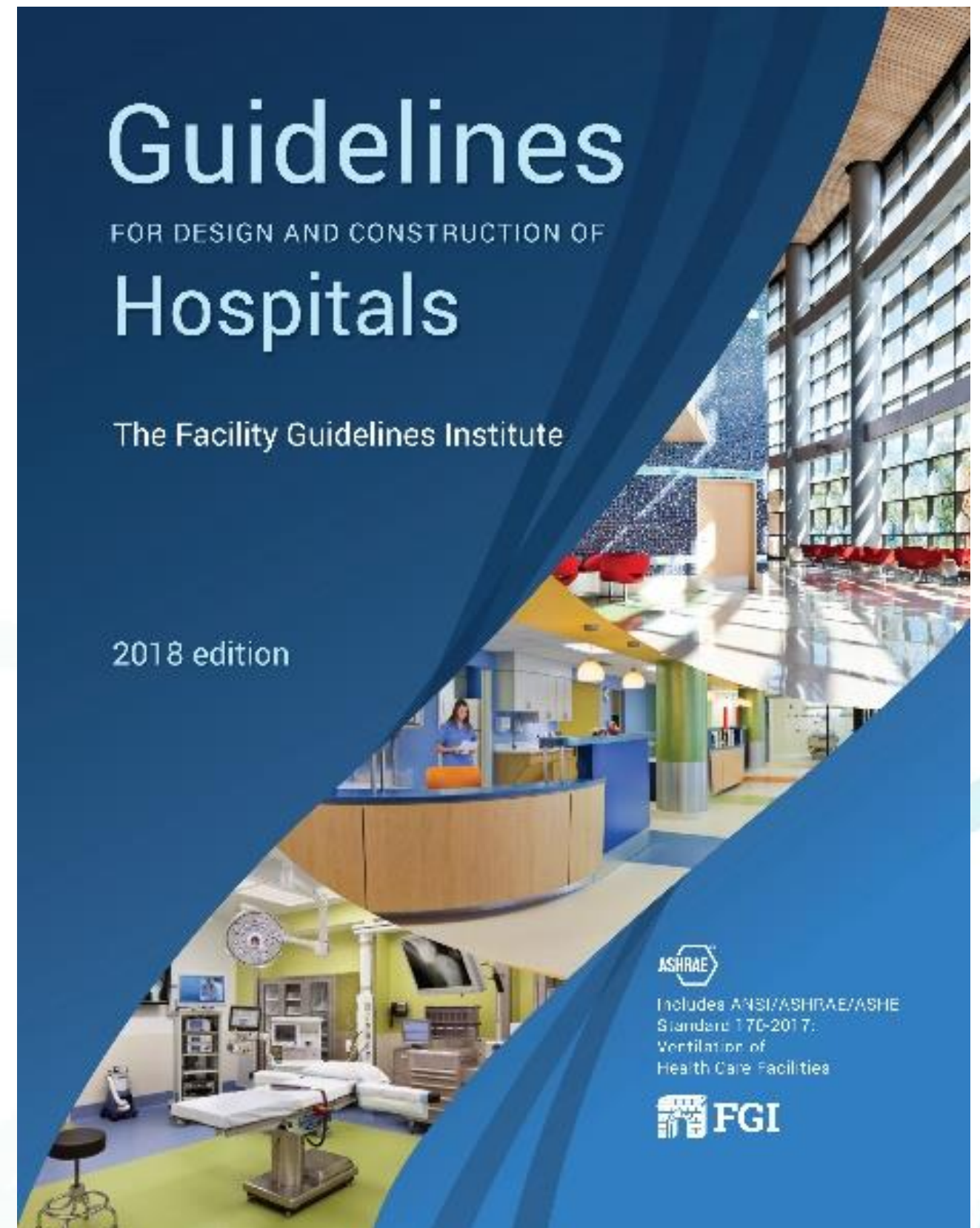
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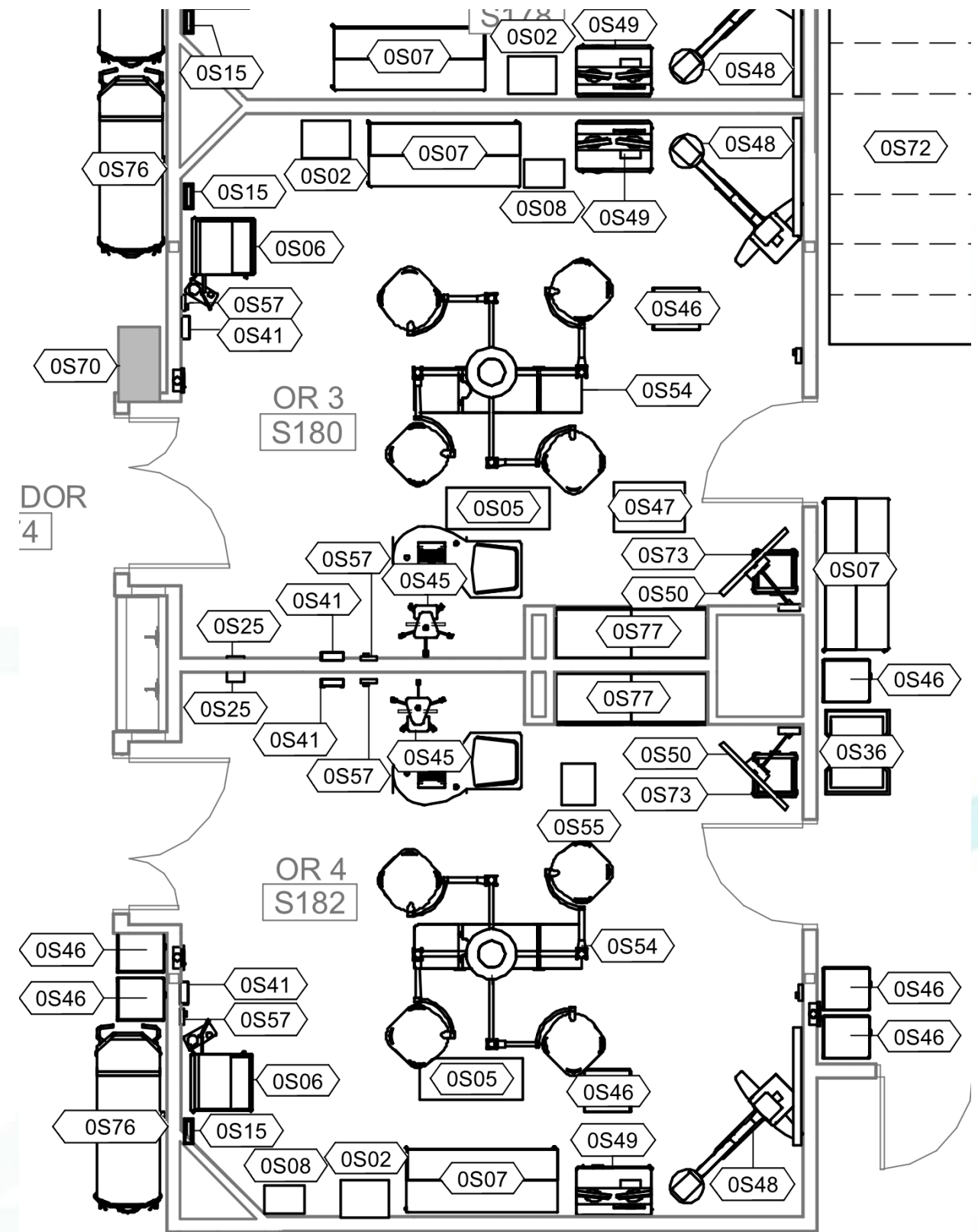


# Procedures

## 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





# 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 Classification<sup>1</sup>**

Room	Use	Design Requirements <sup>2</sup>		
		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	<p><i>Flooring:</i> cleanable and wear-resistant for the location; stable, firm, and slip-resistant</p> <p><i>Wall finishes:</i> washable</p> <p><i>Ceiling:</i> cleanable with routine housekeeping equipment; lay-in ceiling permitted</p>
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	<p><i>Flooring:</i> cleanable and wear-resistant for the location; stable, firm, and slip-resistant</p> <p><i>Floor and wall base assemblies in cystoscopy, urology, and endoscopy procedure rooms and endoscope processing room:</i> monolithic floor with integral covered wall base carried up the wall a minimum of 6 inches</p> <p><i>Wall finishes:</i> washable</p> <p><i>Wall finishes in endoscopy procedure room and endoscope processing room:</i> washable; free of fissures, open joints, or crevices</p> <p><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</p>
Operating room	Invasive procedures <sup>3</sup>  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	<p><i>Flooring:</i> cleanable and wear-resistant for the location; stable, firm, and slip-resistant</p> <p><i>Floor and wall base assemblies:</i> monolithic floor with integral covered wall base carried up the wall a minimum of 6 inches</p> <p><i>Wall finishes:</i> washable; free of fissures, open joints, or crevices</p> <p><i>Ceiling:</i> monolithic, scrubbable, capable of withstanding cleaning and/or disinfecting chemicals, gasketed access openings</p>

# 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

A2.2-3.3.2.2 (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.

**Table 2.2-1: Examination/Treatment, Procedure, and Operating Room Classification<sup>1</sup>**

Room	Use	Design Requirements <sup>2</sup>		
		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	<p><i>Flooring:</i> cleanable and wear-resistant for the location; stable, firm, and slip-resistant</p> <p><i>Wall finishes:</i> washable</p> <p><i>Ceiling:</i> cleanable with routine housekeeping equipment; lay-in ceiling permitted</p>
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	<p><i>Flooring:</i> cleanable and wear-resistant for the location; stable, firm, and slip-resistant</p> <p><i>Floor and wall base assemblies in cystoscopy, urology, and endoscopy procedure rooms and endoscope processing room:</i> monolithic floor with integral covered wall base carried up the wall a minimum of 6 inches</p> <p><i>Wall finishes:</i> washable</p> <p><i>Wall finishes in endoscopy procedure room and endoscope processing room:</i> washable; free of fissures, open joints, or crevices</p> <p><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</p>
Operating room	Invasive procedures <sup>3</sup>  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	<p><i>Flooring:</i> cleanable and wear-resistant for the location; stable, firm, and slip-resistant</p> <p><i>Floor and wall base assemblies:</i> monolithic floor with integral covered wall base carried up the wall a minimum of 6 inches</p> <p><i>Wall finishes:</i> washable; free of fissures, open joints, or crevices</p> <p><i>Ceiling:</i> monolithic, scrubbable, capable of withstanding cleaning and/or disinfecting chemicals, gasketed access openings</p>

# Procedures

## 2.2-3.4 Imaging Services

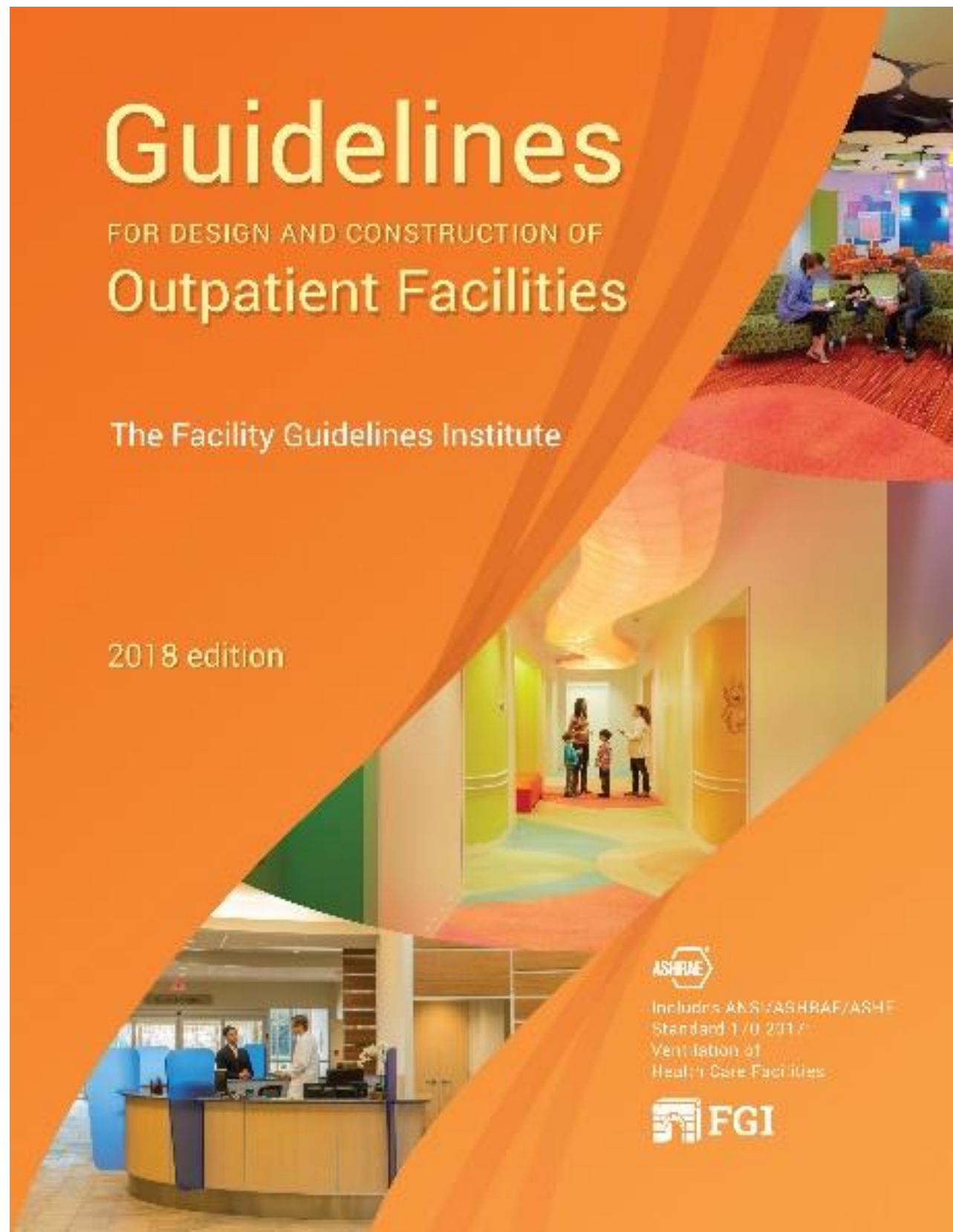
Now classified according to use in Hospitals *Guidelines* and included separately in Outpatient *Guidelines*. Per *Guidelines*, this is intended to aid in easier adaptation of new technologies and equipment.

- 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<sup>1</sup>**

Room	Use	Design Requirements <sup>2</sup>		
		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 <sup>3</sup>  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





## 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

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

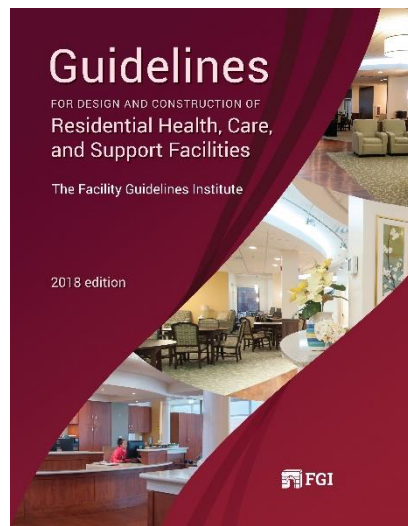
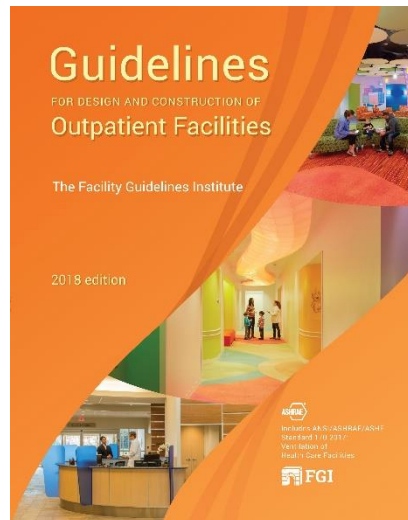
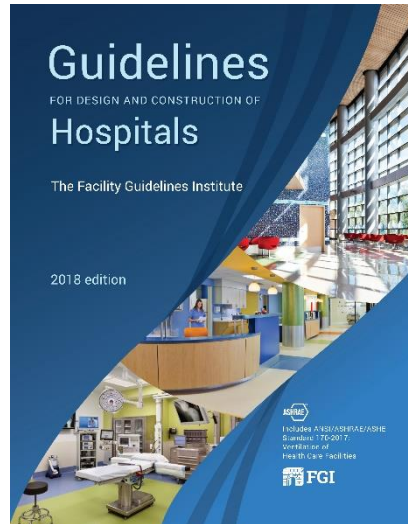
Index

## 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 cross-referenced 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.





## 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

### Fgiguideines.org

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

Madcad.com (electronic version)

FGI Errata

Presentations on the 2018 Guidelines from the 2017 HCD Conference + Expo

<https://www.fgiguideines.org/resource/presentations-2018-guidelines-2017-hcd-conference-expo/#>

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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](http://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](http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1910))

**U.S. Pharmacopeia Convention** ([www.usp.org](http://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-site-profiles-24-innovative-nursing-driven-models-of-hea.html>).

**Society for Experiential Graphic Design** ([segd.org](http://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](https://segd.org/sites/default/files/segd_hj_00_full_workbook_1.pdf))

**Telecommunications Industry Association** ([tiaonline.org](http://tiaonline.org))

TIA 607: *Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises*, Revision C (2015)

**Underwriters Laboratories** (UL) ([www.ul.com](http://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/](http://www.withseniorsinmind.org/))

*Senior Living Sustainability Guide* ([www.withseniorsinmind.org/what-we-do/](http://www.withseniorsinmind.org/what-we-do/))

## 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	ASHRAE 170 (2017) FGI 2018 / New OSDH Requirement
<b>Ventilation Upon Loss of Electrical Power</b>	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	Ventilation shall be required for the following spaces: <> All rooms <> PE rooms <> Class B & C Operating rooms, including Caesarean
<b>Reserve Heating</b>	Capacity of back up/reserve sources shall be sufficient to provide for sterilization and dietary purposes and to provide heat for operating, delivery, birthing, labor, recovery, emergency, intensive care, nursery, and inpatient rooms.	Capacity of back up/reserve sources shall be sufficient to provide for <b>domestic hot water</b> , sterilization and dietary purposes and to provide heat for operating, delivery, birthing, labor, recovery, emergency, intensive care, nursery, and inpatient rooms.	Capacity of back up/reserve sources shall be sufficient to provide for <b>domestic hot water</b> , sterilization and dietary purposes and to provide heat for operating, delivery, birthing, labor, recovery, emergency, intensive care, nursery, and inpatient rooms.
<b>Reserve Cooling</b>	Greater than 400 tons of cooling there shall be more than one chiller for redundancy to maintain facility operation plan.	Greater than 400 tons of cooling there shall be more than one chiller for redundancy to maintain facility operation plan.	Greater than 400 tons of cooling there shall be more than one chiller for redundancy to maintain facility operation plan.
<b>Outdoor Air Intakes</b>	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 air intakes shall be: <> 25' away from exhaust and vents <> 6' above grade <> 3' above roof  <b><u>Exception: Gas fired package air handling does not have to meet the 25' distance between OSA intake and unit flue.</u></b>
<b>Filters:</b>	<> 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.  <b>*Refer to Table 6.4 Minimum Filter Efficiencies</b>	<> MERV 12 filters and above shall have differential pressure device. <> Filter 1 shall be upstream of coil. <> Filter 2 shall be downstream of coil.  <b>*Refer to Table 6.4 Minimum Filter Efficiencies</b>
<b>Humidifiers:</b>	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.	<b>Steam humidifiers shall be used.</b> 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. <b>Duct takeoffs shall not be within the absorption distance.</b>	<b>Steam humidifiers shall be used.</b> 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. <b>Duct takeoffs shall not be within the absorption distance. <u>Requirements for Steam humidifiers vs Adiabatic Atomizing Humidifiers provided.</u></b>

NOTE: This table is not representative of all ASHRAE 170 requirements.



## 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	ASHRAE 170 (2017) FGI 2018 / New OSDH Requirement
<b>Exhaust Discharge:</b>	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	<p>&lt;&gt; 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</p> <p><i>*Cooling Towers drifts shall be located away from air intakes and meet exhaust requirements.</i></p>	<p>&lt;&gt; Discharge air from All rooms, bronchoscopy rooms, <u>sputum collection rooms, pentamidine administration rooms</u>, emergency department <u>public</u> waiting rooms, nuclear medicine laboratories, radiology waiting <u>(of patients awaiting chest x-rays for respiratory disease), pharmacy hazardous drug</u>, and laboratory chemical fume hoods shall: Have ductwork under negative pressure; <del>Discharge 10' above roof level;</del> be located to minimize recirculation of air back into building</p> <p>&lt;&gt; Cooling Towers drifts shall be located away from air intakes and meet exhaust requirements.</p> <p><u>&lt;&gt; Exhaust discharge of All rooms, bronchoscopy, sputum collection, pharmacy hazardous-drug, and laboratory chemical fume hoods shall be 10' above the roof and discharge in a vertical direction.</u></p> <p><u>&lt;&gt; Laboratory chemical fume hoods shall discharge with a stack velocity of a minimum of 2500 fpm.</u></p> <p><u>&lt;&gt; All rooms, bronchoscopy, sputum collection, laboratory chemical fume hoods shall be located a minimum of 25 ft horizontally from outdoor air intakes, openable windows/doors, and areas accessible to the public.</u></p>
<b>Ductwork:</b>	Spaces listed in Table 7-1 Design Parameters that have required pressure relationships shall be served by fully ducted returns.	<p><i>Smoke and Fire Dampers shall be located on design drawings and provided with access to all dampers.</i></p> <p>Spaces listed in Table 7.1 Design Parameters that have required pressure relationships shall be served by fully ducted returns <b>and exhaust as well as the following areas:</b></p> <p>&lt;&gt; <i>Surgery and critical care recovery rooms, critical and intensive care areas, intermediate care areas, and wound intensive care units (burn units).</i></p> <p>&lt;&gt; <i>Inpatient facilities patient care areas.</i></p>	<p><i>Smoke and Fire Dampers shall be located on design drawings and provided with access to all dampers.</i></p> <p>Spaces listed in Table 8.1 Design Parameters that have required pressure relationships shall be served by fully ducted returns <b>and exhaust as well as the following areas:</b></p> <p>&lt;&gt; <i>Surgery and critical care recovery rooms, critical and intensive care areas, intermediate care areas, and wound intensive care units (burn units).</i></p> <p>&lt;&gt; <i>Inpatient facilities patient care areas.</i></p>
<b>Supply Diffusers:</b>	<p>&lt;&gt; Operating room diffusers shall allow for internal cleaning.</p> <p>&lt;&gt; Psychiatric, seclusion, and holding-patient rooms shall be designed with security diffusers, grilles, and registers.</p> <p><i>*Refer to Table 6-2 Supply Air Outlets</i></p>	<p>&lt;&gt; Operating room diffusers shall allow for internal cleaning.</p> <p>&lt;&gt; Psychiatric, seclusion, and holding-patient rooms shall be designed with security diffusers, grilles, and registers.</p> <p><i>*Refer to Table 6.7.2 Supply Air Outlets</i></p>	<p>&lt;&gt; Operating room diffusers shall allow for internal cleaning.</p> <p>&lt;&gt; Psychiatric, seclusion, and holding-patient rooms shall be designed with security diffusers, grilles, and registers.</p> <p><i>*Refer to Table 6.7.2 Supply Air Outlets</i></p>

NOTE: This table is not representative of all ASHRAE 170 requirements.

## 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	ASHRAE 170 (2017) FGI 2018 / New OSDH Requirement
<b>Energy Recovery Systems:</b>	N/A	<p>&lt;&gt; Energy Recovery systems shall be located upstream of Filter Bank No. 2.</p> <p>&lt;&gt; Energy Recovery systems with air leakage potential shall be designed to have no more than 5% of the total supply airstream consisting of exhaust air.</p> <p>&lt;&gt; All rooms or combination All/PE rooms shall not be utilized for energy recovery.</p>	<p>&lt;&gt; Energy Recovery systems shall be located upstream of Filter Bank No. 2.</p> <p>&lt;&gt; Energy Recovery systems with air leakage potential shall be designed to have no more than 5% of the total supply airstream consisting of exhaust air.</p> <p>&lt;&gt; All rooms or combination All/PE rooms shall not be utilized for energy recovery.</p>
<b>Space Ventilation:</b>	<p>&lt;&gt; Movement of air shall be designed from generally clean to less clean areas.</p> <p>&lt;&gt; Ventilation rates are intended for comfort, asepsis, and odour control.</p> <p>*Refer to Table 7-1 Design Parameters</p>	<p>&lt;&gt; Movement of air shall be designed from generally clean to less clean areas.</p> <p>&lt;&gt; Ventilation rates are intended for comfort, asepsis, and odour control.</p> <p>&lt;&gt; Spaces permitted to be recirculated by room units shall: not receive nonfiltered, non conditioned outside air; serve only a single space; provide a minimum of MERV 6 filter.</p> <p>&lt;&gt; 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.</p> <p>*Refer to Table 7.1 Design Parameters</p>	<p>&lt;&gt; Movement of air shall be designed from generally clean to less clean areas.</p> <p>&lt;&gt; Ventilation rates are intended for comfort, asepsis, and odour control.</p> <p>&lt;&gt; Spaces permitted to be recirculated by room units shall: not receive nonfiltered, non conditioned outside air; serve only a single space; provide a minimum of MERV 6 filter.</p> <p>&lt;&gt; 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.</p> <p><u>*Refer to Table 8.1 Design Parameters</u></p>
<b>Airborne Infection Isolation (All) Rooms:</b>	<p>&lt;&gt; A pressure monitor device shall be installed locally to indicate (-) 0.01" wc negative differential is maintained when occupied by patients with airborne diseases.</p> <p>&lt;&gt; Air is exhausted directly outdoors without mixing with non-All rooms.</p> <p>&lt;&gt; Exhaust grilles shall be located directly over patient beds or on the wall near the patient head.</p>	<p>&lt;&gt; A pressure monitor device shall be installed locally to indicate (-) 0.01" wc negative differential is maintained when occupied by patients with airborne diseases.</p> <p>&lt;&gt; Air is exhausted directly outdoors without mixing with non-All rooms.</p> <p>&lt;&gt; Exhaust grilles shall be located directly over patient beds or on the wall near the patient head.</p> <p>&lt;&gt; 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.</p> <p>&lt;&gt; When an All is not utilized for an airborne disease patient, it must still remain negative. Reversible airflow controls are not allowed.</p>	<p>&lt;&gt; A pressure monitor device shall be installed locally to indicate (-) 0.01" wc negative differential is maintained when occupied by patients with airborne diseases.</p> <p>&lt;&gt; Air is exhausted directly outdoors without mixing with non-All rooms.</p> <p>&lt;&gt; Exhaust grilles shall be located directly over patient beds or on the wall near the patient head.</p> <p>&lt;&gt; 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.</p> <p>&lt;&gt; When an All is not utilized for an airborne disease patient, it must still remain negative. Reversible airflow controls are not allowed.</p>

NOTE: This table is not representative of all ASHRAE 170 requirements.

## 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	ASHRAE 170 (2017) FGI 2018 / New OSDH Requirement
<b>Protective Environment (PE) rooms:</b>	<p>&lt;&gt; A pressure monitor device shall be installed locally to indicate (+) 0.01" wc positive differential is maintained when occupied by patients requiring a protective environment.</p> <p>&lt;&gt; Supply diffusers shall be located directly over patient beds, and return/exhaust grilles located near the patient room door.</p>	<p>&lt;&gt; A pressure monitor device shall be installed locally to indicate (+) 0.01" wc positive differential is maintained when occupied by patients requiring a protective environment.</p> <p>&lt;&gt; Supply diffusers shall be located directly over patient beds, and return/exhaust grilles located near the patient room door.</p> <p>&lt;&gt; When Ante rooms accompany a PE room, the PE room shall be positive to the Ante room, and the Ante room shall be positive to the corridor.</p> <p>&lt;&gt; When a PE room is not utilized for a patient needing a protective environment, it must still remain positive and shall be constant volume. Reversible airflow controls are not allowed.</p>	<p>&lt;&gt; A pressure monitor device shall be installed locally to indicate (+) 0.01" wc positive differential is maintained when occupied by patients requiring a protective environment.</p> <p>&lt;&gt; Supply diffusers shall be located directly over patient beds, and return/exhaust grilles located near the patient room door.</p> <p>&lt;&gt; When Ante rooms accompany a PE room, the PE room shall be positive to the Ante room, and the Ante room shall be positive to the corridor.</p> <p>&lt;&gt; When a PE room is not utilized for a patient needing a protective environment, it must still remain positive and shall be constant volume. Reversible airflow controls are not allowed.</p>
<b>Combination Airborne Infectious Isolation/Protective Environment (AII/PE) rooms:</b>	N/A	<p>&lt;&gt; Supply air diffusers shall be located above patient bed with exhaust grilles located near patient room door.</p> <p>&lt;&gt; 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.</p> <p>&lt;&gt; 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.</p>	<p>&lt;&gt; Supply air diffusers shall be located above patient bed with exhaust grilles located near patient room door.</p> <p>&lt;&gt; 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.</p> <p>&lt;&gt; 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.</p>
<b>Critical Care Units:</b>	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 Intensive Care Units (Burn Units) that require humidifiers to comply with Table 8.1 shall be provided with individual humidity control.

NOTE: This table is not representative of all ASHRAE 170 requirements.



## 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	ASHRAE 170 (2017) FGI 2018 / New OSDH Requirement
<b>Operating Rooms:</b>	<p>&lt;&gt; Surgry rooms shall maintain a (+) 0.01" wc positive differential to all adjacent spaces.</p> <p>&lt;&gt; 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.</p> <p>&lt;&gt; Rooms shall have (2) low sidewall return or exhaust grilles at opposite corners approximately 8" above finished floor.</p>	<p>&lt;&gt; Surgry rooms shall maintain a (+) 0.01" wc positive differential to all adjacent spaces <b>and each room shall have individual temperature control.</b></p> <p>&lt;&gt; 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.</p> <p>&lt;&gt; Rooms shall have (2) low sidewall return or exhaust grilles at opposite corners approximately 8" above finished floor. <b>In addition to the required low wall grilles, grilles may also be placed high on the walls.</b></p>	<p>&lt;&gt; Surgry rooms shall maintain a (+) 0.01" wc positive differential to all adjacent spaces <b>and each room shall have individual temperature control.</b></p> <p>&lt;&gt; 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.</p> <p>&lt;&gt; Rooms shall have (2) low sidewall return or exhaust grilles at opposite corners approximately 8" above finished floor. <b>In addition to the required low wall grilles, grilles may also be placed high on the walls. &lt;u&gt;Additional supply diffusers shall be permitted within the room outside of the primary array to provide additional environmental requirements.&lt;/u&gt;</b></p>
<b>Imaging Procedures Rooms:</b>	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.	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.
<b>Morgue and Autopsy Rooms:</b>	<> 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. <b>&lt;&gt; A differential pressure between the morgue and autopsy and adjacent spaces shall maintain a (-) 0.01" wc negative pressure.</b>	<> 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. <b>&lt;&gt; A differential pressure between the morgue and autopsy and adjacent spaces shall maintain a (-) 0.01" wc negative pressure.</b>
<b>Bronchoscopy Rooms:</b>	N/A	<p><b>&lt;&gt; A differential pressure between the bronchoscopy procedure or sputum induction room and adjacent spaces shall maintain a (-) 0.01" wc negative pressure.</b></p> <p><b>&lt;&gt; Local exhaust shall be provided for sputum collection procedures.</b></p>	<p><b>&lt;&gt; A differential pressure between the bronchoscopy procedure or sputum induction room and adjacent spaces shall maintain a (-) 0.01" wc negative pressure.</b></p> <p><b>&lt;&gt; Local exhaust shall be provided for sputum collection procedures.</b></p>

NOTE: This table is not representative of all ASHRAE 170 requirements.

**Table 6.4 Minimum Filter Efficiencies**

Space Designation (According to Function)	Filter Bank No. 1 (MERV) <sup>a</sup>	Filter Bank No. 2 (MERV) <sup>a</sup>
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); All (rooms)	7	14
Protective environment (PE) rooms	7	HEPA <sup>c,d</sup>
Laboratory work areas, <b>procedure rooms</b> , and associated semirestricted spaces	13 <sup>b</sup>	NR
Administrative; bulk storage; soiled holding spaces; food preparation spaces; and laundries	7	NR
All other outpatient spaces	7	NR
Nursing facilities	13	NR
<b>Psychiatric hospitals</b>	7	NR
<b>Resident care, treatment, and support areas in inpatient hospice facilities</b>	13	NR
<b>Resident care, treatment, and support areas in assisted living facilities</b>	7	NR

NR = not required

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.

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]).

← The new FGI 2018 requirements have more requirements than CMS.



The new FGI 2018 requirements have more requirements than CMS. →

**Table 6.7.2 Supply Air Outlets**

Space Designation (According to Function)	Supply Air Outlet Classification <sup>a</sup>
Operating rooms (ORs) <sup>b</sup> , <b>procedure rooms</b>	<b>Supply diffusers within the primary supply diffuser array: Group E, nonaspirating</b> <b>Additional supply diffusers within the room: Group E</b>
Protective environment (PE) rooms	Group E, nonaspirating
Wound intensive care units (burn units)	Group E, nonaspirating
Trauma rooms (crisis or shock)	Group E, nonaspirating
All rooms	Group A or Group E
<b>Single-bed patient or resident rooms<sup>c</sup></b>	Group A, Group D, or Group E
<b>All other patient care or resident care spaces</b>	Group A or Group E
All other spaces	<b>No requirement</b>

a. **Informative Note:** Refer to the 2017 *ASHRAE Handbook—Fundamentals*, Chapter 20 (ASHRAE [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 7<sup>4</sup>.
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.



Table 7.1 Design Parameters—Hospital Spaces

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
<b>SURGERY AND CRITICAL CARE</b>							
Critical and intensive care	NR	2	6	NR	No	30–60	70–75/21–24
Delivery room (Caesarean) (m), (o)	Positive	4	20	NR	No	20–60	68–75/20–24
Emergency department decontamination	Negative	2	12	Yes	No	NR	NR
Emergency department exam/treatment room (p)	NR	2	6	NR	NR	Max 60	70–75/21–24
Emergency department public waiting area	Negative	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/anaesthesia 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	20–60	68–75/20–24
Operating/surgical cystoscopic rooms (m), (o)	Positive	4	20	NR	No	20–60	68–75/20–24
Procedure room (o), (d)	Positive	3	15	NR	No	20–60	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	20–60	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
<b>INPATIENT NURSING</b>							
All anteroom (u)	(e)	NR	10	Yes	No	NR	NR
All room (u)	Negative	2	12	Yes	No	Max 60	70–75/21–24
Combination All/PE anteroom	(e)	NR	10	Yes	No	NR	NR
Combination All/PE room	Positive	2	12	Yes	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 (LDRP) (s)	NR	2	6	NR	NR	Max 60	70–75/21–24
Newborn nursery suite	NR	2	6	NR	No	30–60	72–78/22–26
Nourishment area or room	NR	NR	2	NR	NR	NR	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
<b>NURSING FACILITY</b>							
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
<b>RADIOLOGY</b>							
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
<b>DIAGNOSTIC AND TREATMENT</b>							
Autopsy room	Negative	2	12	Yes	No	NR	68–75/20–24
Bronchoscopy, sputum collection, and pentamidine administration	Negative	2	12	Yes	No	NR	68–73/20–23
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
Endoscopy 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, histology (f), (v)	Negative	2	6	Yes	NR	NR	70–75/21–24

Note: NR = no requirement

New Space Types – New Requirements

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.

Table 7.1 Design Parameters—Hospital Spaces (Continued)

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
<b>DIAGNOSTIC AND TREATMENT</b>							
Laboratory work area, media transfer (f), (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
<b>STERILIZING</b>							
Sterilizer equipment room	Negative	NR	10	Yes	No	NR	NR
<b>STERILE PROCESSING DEPARTMENT<sup>z</sup></b>							
Clean workroom	Positive	2	4	NR	No	Max 60	68–73/20–23
Decontamination room	Negative	2	6	Yes	No	NR	60–73/16–23
Sterile storage room	Positive	2	4	NR	NR	Max 60	Max 75/24
<b>SERVICE</b>							
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
<b>SUPPORT SPACE</b>							
Clean workroom or clean holding	Positive	2	4	NR	NR	NR	NR
Hazardous material storage	Negative	2	10	Yes	No	NR	NR
Soiled workroom or soiled holding	Negative	2	10	Yes	No	NR	NR

Note: NR = no requirement

Normative Notes for Table 7.1:

- a. Except where indicated by a "No" in this column, recirculating room HVAC units (with heating or cooling coils) are acceptable for providing that portion of the minimum total air changes per hour that is permitted by Section 7.1 (subparagraph [a][5]). Because of the cleaning difficulty and potential for buildup of contamination, recirculating room units shall not be used in areas marked "No." Recirculating devices with high-efficiency particulate air (HEPA) filters shall be permitted in existing facilities as interim, supplemental environmental controls to meet requirements for the control of airborne infectious agents. The design of either portable or fixed systems should prevent stagnation and short circuiting of airflow. The design of such systems shall also allow for easy access for scheduled preventative maintenance and cleaning.
- b. Pharmacy compounding areas may have additional air change, differential pressure, and filtering requirements beyond the minimum of this table, depending on the type of pharmacy, the regulatory requirements (which may include adoption of USP-797), the associated level of risk of the work, and the equipment used in the spaces. **Informative Note:** See USP (2017a) in Appendix B.
- c. The term *trauma room* as used herein is a first-aid room and/or emergency department room used for general initial treatment of accident victims. The OR within the trauma center that is routinely used for emergency surgery is considered to be an OR by this standard.
- d. Pressure relationships need not be maintained when the room is unoccupied.
- e. See Section 7.2 and its subsections for pressure relationship requirements.
- f. Higher ventilation rates above the total ach listed shall be used when dictated by the laboratory program requirements and the hazard level of the potential contaminants in each laboratory work area. Lower total ach ventilation rates shall be permitted when a Hazard Assessment performed as part of an effective Laboratory Ventilation Management Plan per ANSI/AIHA/ASSE Z9.5, *American National Standard for Laboratory Ventilation*,<sup>3</sup> determines that either (a) acceptable exposure concentrations in the laboratory work area can be achieved with a lower minimum total ach ventilation rate than is listed in Table 7.1 or (b) a demand control approach with active sensing of contaminants or appropriate surrogates is used as described in *ASHRAE Handbook—HVAC Applications*, Chapter 16, "Laboratories" (**Informative Note:** See ASHRAE [2015] in Informative Appendix B).
- g. All air need not be exhausted if darkroom equipment has a scavenging exhaust duct attached and meets ventilation standards regarding NIOSH<sup>5</sup>, OSHA, and local employee exposure limits.
- h. A nonrefrigerated body-holding room is applicable only to facilities that do not perform autopsies on-site and use the space for short periods while waiting for the body to be transferred.
- i. Minimum total air changes per hour (ach) shall be that required to provide proper makeup air to kitchen exhaust systems as specified in ANSI/ASHRAE Standard 154<sup>6</sup>. In some cases, excess exfiltration or infiltration to or from exit corridors compromises the exit corridor restrictions of NFPA 90A<sup>7</sup>, the pressure requirements of NFPA 96<sup>8</sup>, or the maximum defined in the table. During operation, a reduction in the number of air changes to any extent required for odor control shall be permitted when the space is not in use.
- j. In some areas with potential contamination and/or odor problems, exhaust air shall be discharged directly to the outdoors and not recirculated to other areas. Individual circumstances may require special consideration for air exhausted to the outdoors. To satisfy exhaust needs, constant replacement air from the outdoors is necessary when the system is in operation.
- k. The RH ranges listed are the minimum and/or maximum allowable at any point within the design temperature range required for that space.
- l. Systems shall be capable of maintaining the rooms within the range during normal operation. Lower or higher temperature shall be permitted when patients' comfort and/or medical conditions require those conditions.
- m. National Institute for Occupational Safety and Health (NIOSH) criteria documents<sup>9</sup> regarding occupational exposure to waste anesthetic gases and vapors and control of occupational exposure to nitrous oxide indicate a need for both local exhaust (scavenging) systems and general ventilation of the areas in which the respective gases are used. Refer to NFPA 99<sup>10</sup> for other requirements.
- n. If pressure-monitoring device alarms are installed, allowances shall be made to prevent nuisance alarms. Short-term excursions from required pressure relationships shall be allowed while doors are moving or temporarily open. Simple visual methods such as smoke trail, ball-in-tube, or flutterstrip shall be permitted for verification of airflow direction.
- o. Surgeons or surgical procedures may require room temperatures, ventilation rates, humidity ranges, and/or air distribution methods that exceed the minimum indicated ranges.
- p. Treatment rooms used for bronchoscopy shall be treated as bronchoscopy rooms. Treatment rooms used for procedures with nitrous oxide shall contain provisions for exhausting anesthetic waste gases.
- q. In a recirculating ventilation system, HEPA filters shall be permitted instead of exhausting the air from these spaces to the outdoors, provided that the return air passes through the HEPA filters before it is introduced into any other spaces. The entire minimum total air changes per hour of recirculating airflow shall pass through HEPA filters. When these areas are open to larger, nonwaiting spaces, the exhaust air volume shall be calculated based on the seating area of the waiting area. **Informative Note:** The intent here is to not require the volume calculation to include a very large space (e.g., an atrium) just because a waiting area opens onto it.
- r. See NFPA 99<sup>10</sup> for further requirements.
- s. For intermediate care, labor/delivery/recovery rooms, and labor/delivery/recovery/postpartum rooms, four total ach shall be permitted when supplemental heating and/or cooling systems (radiant heating and cooling, baseboard heating, etc.) are used.
- t. The protective environment airflow design specifications protect the patient from common environmental airborne infectious microbes (i.e., *Aspergillus* spores). Recirculation HEPA filters shall be permitted to increase the equivalent room air exchanges; however, the outdoor air changes are still required. Constant-volume airflow is required for consistent ventilation for the protected environment. The pressure relationship to adjacent areas shall remain unchanged if the protective environment (PE) room is used as a normal patient room. Rooms with reversible airflow provisions for the purpose of switching between protective environment and All functions shall not be permitted.
- u. The All room described in this standard shall be used for isolating the airborne spread of infectious diseases, such as measles, varicella, or tuberculosis. Supplemental recirculating devices using HEPA filters shall be permitted in the All room to increase the equivalent room air exchanges; however, the minimum outdoor air changes of Table 7.1 are still required. All rooms that are retrofitted from standard patient rooms from which it is impractical to exhaust directly outdoors may be recirculated with air from the All room, provided that air first passes through a HEPA filter. When the All 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 change rate shall be 6 ach.
- v. Room temperature ranges that exceed the minimum indicated range shall be permitted if required by the laboratory program or laboratory equipment.
- w. The requirement that all room air is exhausted directly to outdoors applies only to radiology waiting rooms programmed to hold patients who are waiting for chest x-rays for diagnosis of respiratory disease.
- x. If the planned space is designated in the organization's operational plan to be used for both bronchoscopy and gastrointestinal endoscopy, the design parameters for "bronchoscopy, sputum collection, and pentamidine administration" shall be used.
- y. For single-bed patient rooms using Group D diffusers, a minimum of six total ach shall be provided and calculated based on the volume from finished floor to 6 ft (1.83 m) above the floor.
- z. See AAMI Standard ST79<sup>11</sup> for additional information for these spaces.
- aa. Examination rooms programmed for use by patients with undiagnosed gastrointestinal symptoms, undiagnosed respiratory symptoms, or undiagnosed skin symptoms.



**Table 2.1-2 Locations for Nurse Call Devices in Hospitals\***

KEY: ● Required □ Optional

Section	Location	Patient Station	Bath Station	Staff Assistance Station	Emergency Call Station	Nurse Master Station	Duty Station	Notes
<b>NURSING UNITS</b>								
2.1-2.2.6	Patient toilet room		●					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	●						
<b>SUPPORT AREAS</b>								
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						●	
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						□	
<b>DIAGNOSTIC &amp; TREATMENT AREAS</b>								
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 endoscopy)			●	●	□		2, 4
Table 2.2-2	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			●	●			2
2.5-3.4.3.2	ECT pre-procedure patient care station							
2.5-3.4.3.3	ECT recovery patient care station							

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.

- Changed from optional to required
- Changed from optional to no recommendation
- Changed from required to optional
- Changed from no recommendation to required
- Changed from required to no recommendation

Added areas

**Table 2.1-3: Locations for Nurse Call Devices in Outpatient Facilities<sup>1,2</sup>**

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

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

Section	Location	Number of Single Receptacles <sup>1</sup>	Receptacle Locations
<b>PATIENT BED LOCATIONS</b>			
2.1-2.4.2	All room <sup>2</sup>	12	2 at each side of the head of the bed 2 on all other walls 1 for a television, if used 1 for each motorized bed
2.2-2.2.2	Medical/surgical unit patient room <sup>2</sup>		
2.2-2.2.4.4	Protective environment room <sup>2</sup>		
2.2-2.5.2	Intermediate care unit patient room		
2.2-2.9.2.2	Postpartum unit patient room <sup>2</sup>		
2.2-2.11.2	Pediatric and adolescent unit patient room <sup>2</sup>		
2.6-2.2.2	Rehabilitation unit patient room	16	Convenient <sup>3</sup> to head of bed with one on each wall
2.2-2.6.2	Critical care unit (CCU) patient room		
2.2-2.7.2	Pediatric critical care unit patient room		
2.2-2.8.2	Neonatal intensive care unit (NICU) patient care station	16	8 convenient <sup>3</sup> to head of mother's bed 4 convenient <sup>3</sup> to each bassinet with one on each wall
2.2-2.9.3	LDR/LDRP room		
2.2-2.10.3.1	Newborn nursery patient care station	4	Convenient <sup>3</sup> to each bassinet
2.2-2.10.3.2	Continuing care nursery patient care station	5	Convenient <sup>3</sup> 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	
<b>DIAGNOSTIC AND TREATMENT AREAS</b>			
2.1-3.2 Table 2.2-2	Examination room Class 1 imaging room	8	4 convenient <sup>3</sup> to head of gurney or bed or on each lateral side of the imaging gantry
2.2-2.9.11	Cesarean delivery room	30 <sup>4</sup>	16 convenient <sup>3</sup> 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 <sup>3</sup> to head of gurney or bed
2.2-3.1.3.3	Triage room or area in the emergency department	6	Convenient <sup>3</sup> 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 <sup>3</sup> to head of gurney or bed
2.2-3.1.3.6 (4)	Trauma/resuscitation emergency room	16	Convenient <sup>3</sup> to head of gurney or bed
2.2-3.2.2	Observation unit patient care station	8	4 convenient <sup>3</sup> to head of gurney or bed
2.2-3.3.2 Table 2.2-2	Procedure room (including endoscopy) Class 2 imaging room	12 <sup>4</sup>	8 convenient <sup>3</sup> to table placement with at least one on each wall
2.2-3.3.3 Table 2.2-2	Operating room Class 3 imaging room	36 <sup>4</sup>	16 convenient <sup>3</sup> to table placement 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.)
<b>POST-ANESTHESIA CARE LOCATIONS</b>			
2.1-3.4.4	Phase I post-anesthetic care (PACU) patient care station	8	Convenient <sup>3</sup> to head of gurney or bed
2.1-3.4.5	Phase II recovery patient care station	4	Convenient <sup>3</sup> to gurney, lounge chair, or bed

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

**Table 2.1-1: Electrical Receptacles for Patient Care Areas in Outpatient Facilities**

Section	Room Type	Number of Single Receptacles <sup>1</sup>	Receptacle Locations <sup>2</sup>
<b>PATIENT CARE AND DIAGNOSTIC AREAS</b>			
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	12 <sup>3</sup>	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	36 <sup>3</sup>	12 convenient to table placement 2 on each wall
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)

Total count now aligns with NEC

Split out ED treatment room

Total count now aligns with NEC

**Table 2.1-3 Station Outlets for Oxygen, Vacuum (Suction), Medical Air, and Instrument Air Systems in Hospitals<sup>1</sup>**

Section	Location	Oxygen	Vacuum	Medical Air	WAGD <sup>2</sup>	Instrument Air
<b>PATIENT CARE UNITS</b>						
2.1-2.4.2	Airborne infection isolation room	1/bed	1/bed	—	—	—
2.2-2.2.2	Patient room (medical/surgical)	1/bed	1/bed	— <sup>3</sup>	—	—
2.2-2.2.4.4	Protective environment room	1/bed	1/bed	—	—	—
2.2-2.5.2	Intermediate care room	2/bed	2/bed	1/bed	—	—
2.2-2.6.2	Critical care patient room	3/bed	3/bed	1/bed	—	—
2.2-2.6.4.2	Airborne infection isolation (critical care)					
2.2-2.7.2	Pediatric critical care room					
2.2-2.8.2	Neonatal intensive care unit (NICU) infant care bed	3/infant care bed	3/infant care bed	3/infant care bed	—	—
2.2-2.9.2	Antepartum and postpartum unit	1/bed	1/bed	—	—	—
2.2-2.9.3	Labor/delivery/recovery (LDR)					
2.2-2.9.3	Labor/delivery/recovery/postpartum (LDRP)					
2.2-2.9.3.9	Infant resuscitation space <sup>4</sup> (LDR/LDRP)	3/bassinet	3/bassinet	3/bassinet	—	—
2.2-2.9.11	Cesarean delivery room	2/room	4/room	1/room	—	—
2.2-2.9.11.1	Infant resuscitation space <sup>4</sup> (cesarean delivery)	3/bassinet	3/bassinet	3/bassinet	—	—
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 <sup>5</sup>	1/bassinet <sup>5</sup>	1/bassinet <sup>5</sup>	—	—
2.2-2.10.3.2	Continuing care nursery	1/bassinet	1/bassinet	1/bassinet	—	—
2.2-2.11.2	Pediatric and adolescent patient room	1/bed	1/bed	1/bed	—	—
2.2-2.12.2	Psychiatric patient room	—	—	—	—	—
2.2-2.12.4.3	Seclusion treatment room (psychiatric unit[HL1])	—	—	—	—	—
<b>DIAGNOSTIC AND TREATMENT LOCATIONS</b>						
2.1-3.2	Examination room or emergency department treatment room	1/room	1/room	—	—	—
2.1-3.4.4	Phase I post-anesthesia (PACU) patient care station	2/station	3/station	1/station	—	—
2.1-3.4.5	Phase II recovery patient care station	1/station	1/station	—	—	—
2.2-3.1.2.6	Treatment room for basic emergency services	1/gurney	1/gurney	—	—	—
2.2-3.1.3.3	Triage area (emergency department)	1/station	1/station	—	—	—
2.2-3.1.3.6	Emergency department treatment room or area	1/gurney	1/gurney	1/gurney	—	—
2.2-3.1.3.6 (4)	Trauma/resuscitation room	2/gurney	3/gurney	1/gurney	—	—
	Plaster and cast room	1/room	1/room	—	—	—
2.2-3.2.2	Observation unit patient care station	1/station	1/station	—	—	—
Table 2.2-2	Class 1 imaging room	1/room	1/room	—	—	—
2.2-3.3.2	Procedure room	2/room	2/room	1/room	—	—
Table 2.2-2	Class 2 imaging room	2/room	5/room	1/room	1/room	1/room
2.2-3.3.3	Operating room					
Table 2.2-2	Class 3 imaging room					
2.2-3.11.2	Endoscopy procedure room	1	3	—	—	—
2.2-3.11.3	Endoscopy pre- and post-procedure patient care area	0 <sup>3</sup>	0 <sup>3</sup>	—	—	—
2.2-3.13.4	Hyperbaric suite pre-procedure patient care area	2	2	—	—	—
2.5-3.4.2.2	Electroconvulsive therapy treatment room	1 <sup>3</sup>	1 <sup>3</sup>	—	—	—

Was required in 2014

3/bed in 2014

<b>GENERAL SUPPORT FACILITIES</b>						
2.1-5.1.2.2 (2)	Two-room sterile processing: Decontamination room	—	—	—	—	1 <sup>3,10,11</sup>
2.1-5.1.2.2 (3)	Two-room sterile processing: Clean workroom	—	—	—	—	— <sup>3,10,11</sup>
2.1-5.1.2.3 (2)	One-room sterile processing: Decontamination area	—	—	—	—	— <sup>3,10,11</sup>
2.1-5.1.2.3 (3)		Clean work area	—	—	—	— <sup>3,10,11</sup>
2.1-5.7.2.2	Autopsy room	—	1 per workstation	—	—	—
2.2-3.11.4.2	Endoscope processing room decontamination area	—	—	— <sup>3</sup>	—	— <sup>3,9,11</sup>
2.2-3.11.4.3	Endoscope processing room clean work area	—	—	— <sup>3</sup>	—	— <sup>3,9,11</sup>

Added separate instrument air requirement

Support facilities added

Added areas

**Table 2.1-2: Station Outlets for Oxygen, Vacuum, Medical Air, and Instrument Air Systems in Outpatient Facilities**

Section	Location	Oxygen	Vacuum	Medical Air	Instrument Air
<b>PATIENT CARE AND DIAGNOSTIC AREAS</b>					
2.1-3.2.2	Procedure room	1 <sup>3</sup>	1 <sup>3</sup>	—	—
Table 2.1-4	Class 2 imaging room	2	2	1 <sup>3</sup>	—
2.1-3.2.3.2 (1)(a)	Operating room (255-square-foot OR)	1 <sup>3</sup>	1 <sup>3</sup>	—	—
2.1-3.2.3.2 (1)(b)-(c)	Operating rooms <sup>2</sup>	2	3	1 <sup>3</sup>	—
Table 2.1-4	Class 3 imaging room <sup>2</sup>	—	—	—	—
2.1-3.3.2	Airborne infection isolation room	0 <sup>3</sup>	0 <sup>3</sup>	—	—
2.1-3.7.4	Phase I post-anesthesia recovery (PACU) patient care station	1	1	—	—
2.1-3.7.5	Phase II recovery patient care station	0 <sup>3</sup>	0 <sup>3</sup>	—	—
—	Cast room	0 <sup>3</sup>	0 <sup>3</sup>	—	—
2.4-2.2	Birth room	1 <sup>3</sup>	1 <sup>3</sup>	—	—
2.8-3.4.2	Treatment room (emergency facility)	1	1	—	—
2.8-6.2.2	Triage area (emergency facility)—per station	1	1	—	—
2.8-3.4.4	Trauma/resuscitation room (emergency facility)—per gurney	2	2	1	—
2.9-3.2.2	Endoscopy procedure room	1	3	—	—
2.11-3.2.9.2 (2)	Electroconvulsive therapy treatment room	1 <sup>3</sup>	1 <sup>3</sup>	—	—
<b>PATIENT SUPPORT FACILITIES</b>					
2.1-4.3.2.2 (2)	Sterile processing decontamination room	—	—	—	1 <sup>3,4,5</sup>
2.1-4.3.2.2 (3)	Sterile processing clean workroom	—	—	—	— <sup>1,4,5</sup>
2.1-4.3.2.3	One-room sterile processing room	—	—	—	— <sup>1,4,5</sup>
2.9-4.3.2	Endoscope processing room—decontamination area	—	— <sup>3</sup>	—	— <sup>1,3,5</sup>
2.9-4.3.3	Endoscope processing room—clean work area	—	— <sup>3</sup>	—	— <sup>1,3,5</sup>

Added separate instrument air requirement

Added support facilities



# The Future of FGI

1. Implementation of FGI in Oklahoma, Texas and Kansas
2. 2022 REVISION PROCESS
3. 2022 REVISION TOPICS

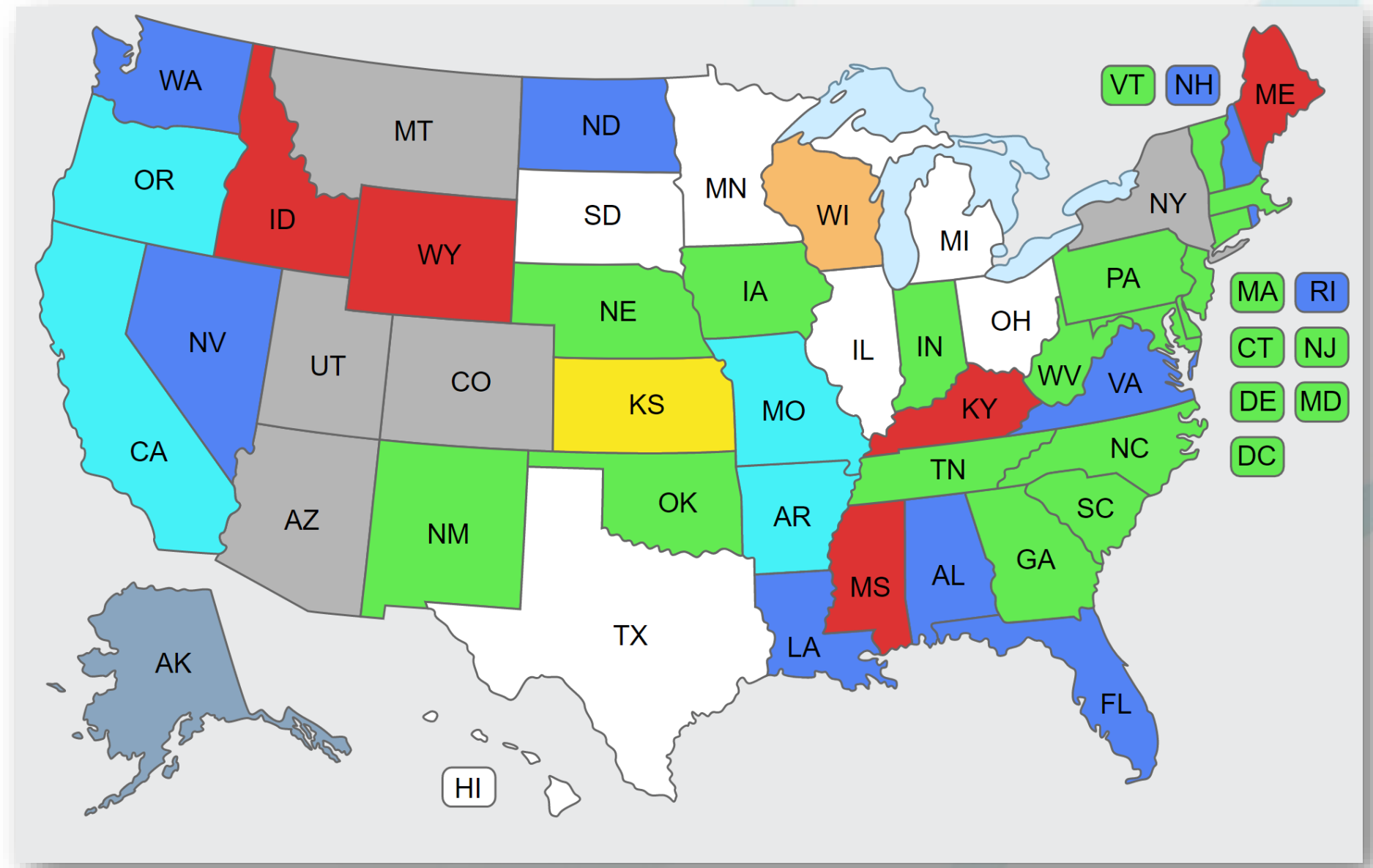
## FGI Guidelines Adoption Map

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

### KEY

2018	<span style="color: green;">■</span>
2014	<span style="color: blue;">■</span>
2010	<span style="color: gray;">■</span>
2006	<span style="color: red;">■</span>
2001	<span style="color: lightblue;">■</span>
1996-97	<span style="color: yellow;">■</span>
Equivalency*	<span style="color: cyan;">■</span>
HVAC only	<span style="color: orange;">■</span>

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



<https://www.fgiguideines.org/guidelines/state-adoption-fgi-guidelines/>

# Health Guidelines Revision Committee (HGRC)



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

# Benefit-Cost Committee

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







## 2022 Public Feedback

- 1<sup>st</sup> 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
- 2<sup>nd</sup> 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.

# 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

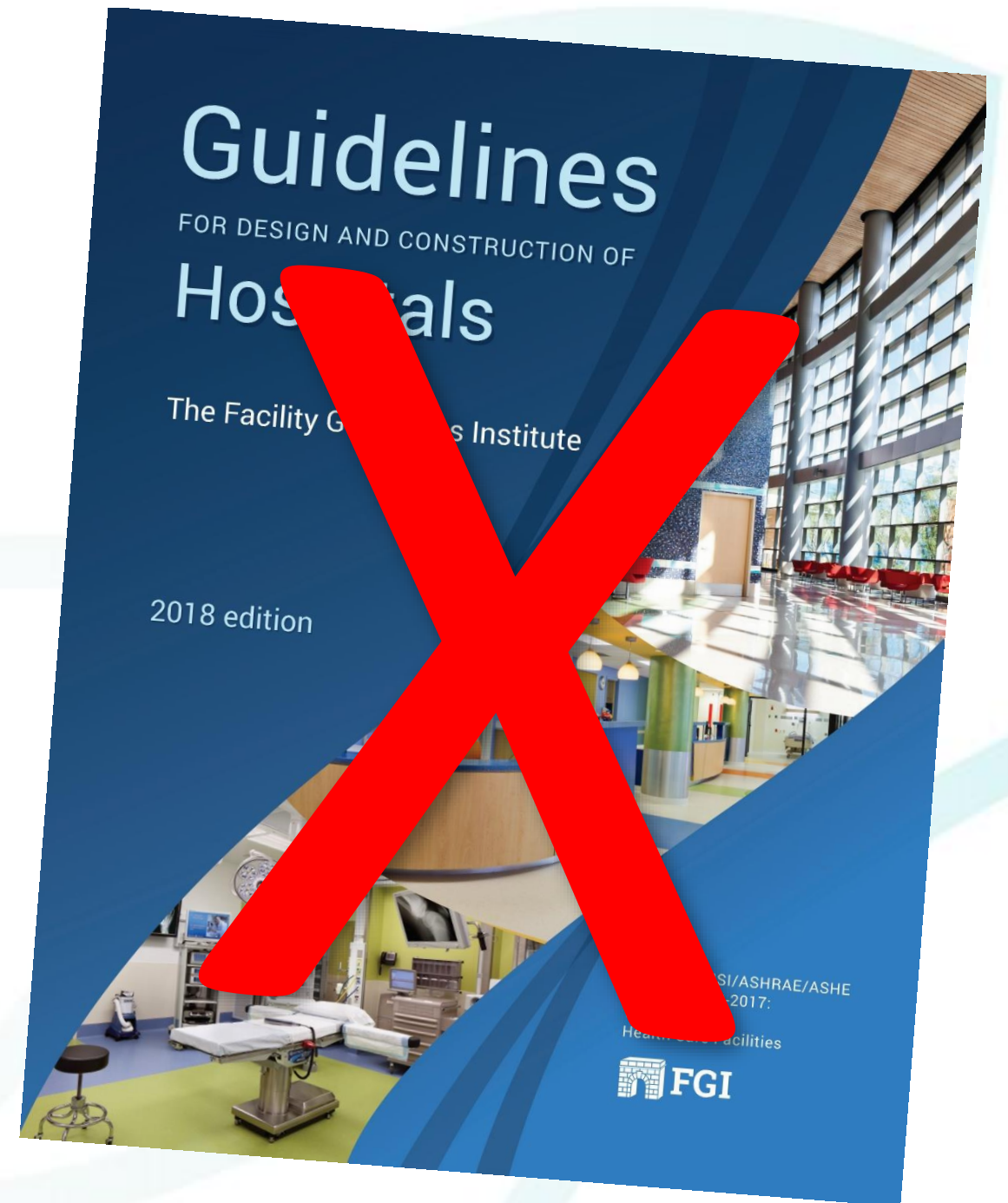


- Lighting
- Nurse call devices, electrical receptacles and med/gas outlets
- Palliative design
- Pediatrics
- Rural health
- Technology

# 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





# Session 1

## Contact Information

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2019 Summer Regional Event



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