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New Codes and Standards 2023
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Revisions of Imaging Room Classifications and Requirements for 2022

Course Number: AHCA 2023.05

Credit Designation: 1 LU/HSW

AIA CES Provider Number: E240

October 2, 2023

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AIA Learning Objectives

1 OBJECTIVE

Understand the drivers for room classification and the process employed to develop the classification system.

2 OBJECTIVE

Learn the fundamentals of the FGI 2022 Imaging Room Classification system, including implications for planning and design

3 OBJECTIVE

Review specific requirements for room classifications, such as room access, minimum clearances, finish requirements, and requirements of ASHRAE 170.

4 OBJECTIVE

Learn about proposed changes planned for FGI Guidelines 2026 revision cycle.

The views expressed in this presentation are the opinion of the speakers and may not be the official position of FGI or the Health Guidelines Revision Committee.

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Outline

1. FGI Document Organization
2. Anesthesia Work Zone
3. Imaging Room Classification and Types of Cases
    a. Class 1
    b. Class 2
    c. Class 3
4. Pre- and Post-Procedure Patient Care Stations
5. ASHRAE 170-2017 & 2021

Imaging Room FGI Document Organization

2014 edition

Imaging Document Organization

PRIMARILY DIAGNOSTIC	PRIMARILY INTERVENTIONAL	SPECIALIZED
IMAGING SERVICES	INTERVENTIONAL IMAGING	NUCLEAR MEDICINE
GENERAL	GENERAL	GENERAL
CT	PROCEDURE ROOM	GAMMA CAMERA
DIAGNOSTIC RADIOGRAPHY	PRE-PROCEDURE AND RECOVERY	PET
RADIOGRAPHY	I-MRI FACILITIES	SPECT
RAD / FLUORO	SUPPORT FOR PATIENT CARE	SUPPORT FOR PATIENT CARE
MAMMOGRAPHY	SUPPORT FOR IMAGING SERVICES	SUPPORT FOR NUC MED SERVICES
MAGNETIC RESONANCE	SUPPORT FOR STAFF	SUPPORT FOR STAFF
ULTRASOUND		SUPPORT AREAS FOR PATIENTS
SUPPORT FOR IMAGING SERVICES		SPECIAL DESIGN ELEMENTS
SUPPORT FOR STAFF		
SUPPORT FOR PATIENTS		

2018/22 editions

Imaging Document Organization

CLASS 1, 2, & 3
IMAGING SERVICES
GENERAL
IMAGING ROOMS
CT
RADIOGRAPHY FACILITIES
RADIOGRAPHY ROOM
FLUOROSCOPY ROOM
MAMMOGRAPHY ROOM
MAGNETIC RESONANCE
ULTRASOUND
NUCLEAR IMAGING SERVICES
GAMMA CAMERA
PET FACILITIES
SPECT FACILITIES
SUPPORT FOR IMAGING SERVICES
SUPPORT FOR STAFF
SUPPORT FOR PATIENTS

LOGIC (INTERVENTIONAL IMAGING)

Interventional imaging (cardiac cath, electrophysiology, interventional radiology, neuro-interventional) are all Class 2 or Class 3 fluoroscopy rooms.

Goal of consistent approach to support areas

ORGANIZATION

In the Hospital *Guidelines*, imaging requirements and appendices are located in the General Hospital chapter and referenced from other chapters.

In the Outpatient *Guidelines*, the imaging text is primarily located in the Common Elements chapter, which supports reference from specific outpatient facility chapters.

When Is it Appropriate to Use…

…a Class 1 Imaging Room rather than a Class 2 Imaging Room?

…a Class 2 Imaging Room rather than a Class 3 Imaging Room?

RISK ASSESSMENT

RISK ASSESSMENT

Class 1 (Diagnostic)
Non-Invasive

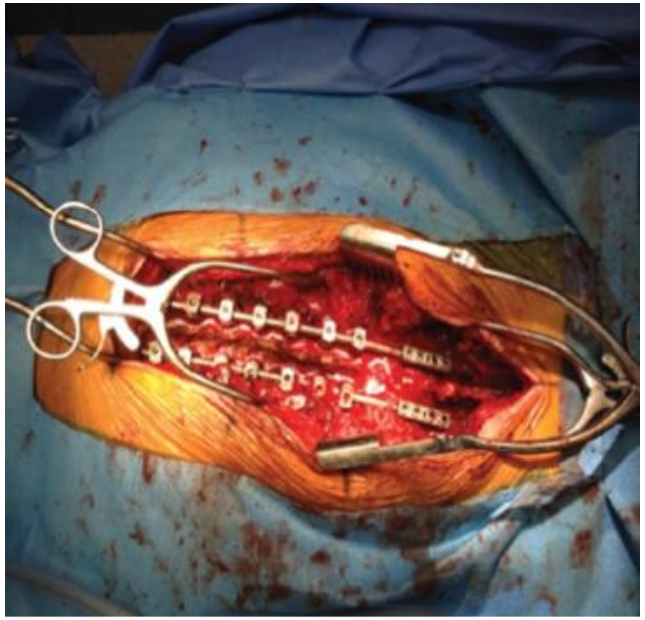
Class 2 Imaging (Treatment)
Patient care that may require sterile instruments but does not require OR environmental controls

Class 3 Imaging
Invasive Procedure

FGI 2022 Glossary

Invasive Procedure

An **invasive procedure** is one that is performed in an aseptic surgical field and penetrates the protective surfaces of a patient's body (e.g., subcutaneous tissue, mucous membranes, cornea).



Anesthesia Work Zone

Anesthesia Work Zone

When inhalation anesthetic will be used in an exam, procedure, or operating room, space to accommodate use of that equipment must be planned into the design. A focus of the 2018 HGRC was to establish minimum planning requirements for an anesthesia work zone.

A multidisciplinary team of the HGRC, which included an anesthesiologist, a surgeon, an operating room nurse, and an architect, explored the minimum space needed to safely set up anesthesia equipment and administer inhalation anesthetic during a procedure, including simulation of a surgery case in a real operating room.

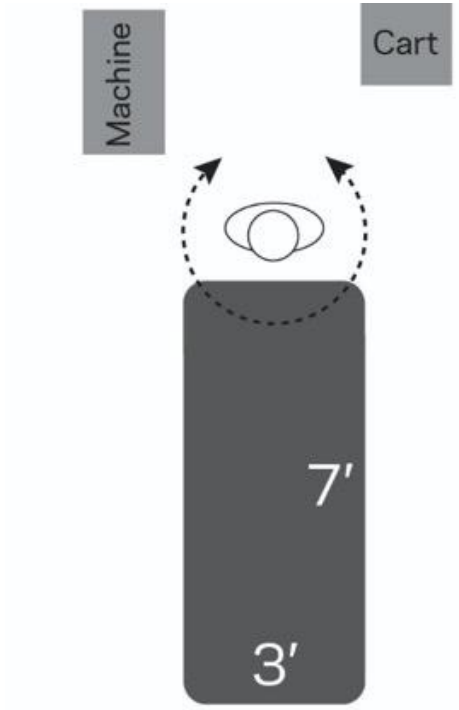
Anesthesia Work Zone

HGRC task group assigned to study anesthesia space needs prior to and during procedures

Key space determinants:

- Anesthesia machine and peripheral equipment
- Boom/supply connections
- Supply/medications cart
- Stool/chair
- Turning radius

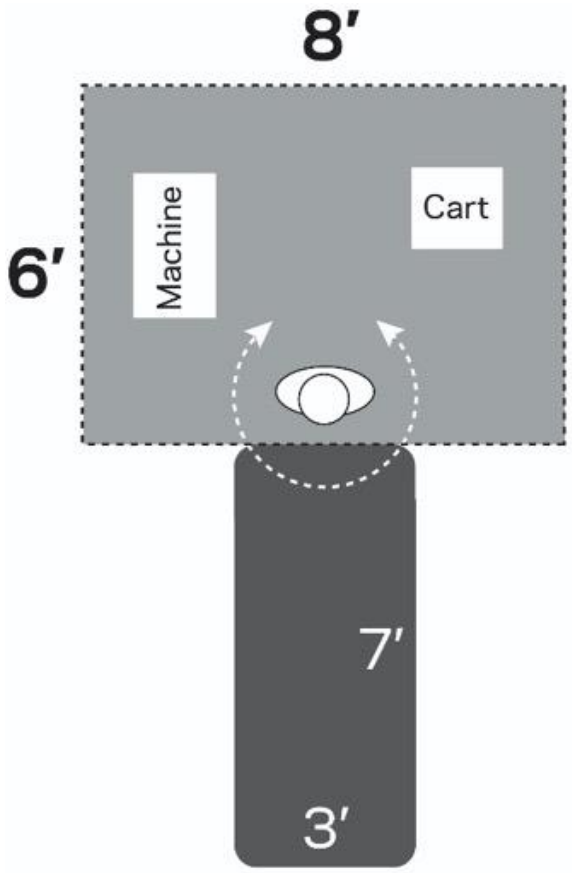
Anesthesia Equipment



Anesthesia work zone
Equipment

Anesthesia Work Zone

Setup Area



Anesthesia work zone
Setup area

Anesthesia Work Zone

Any procedure or operating room where general anesthesia will be administered using an anesthesia machine and supply carts **shall have 48 square feet at the head** of the table, gurney, or chair for an anesthesia work zone.

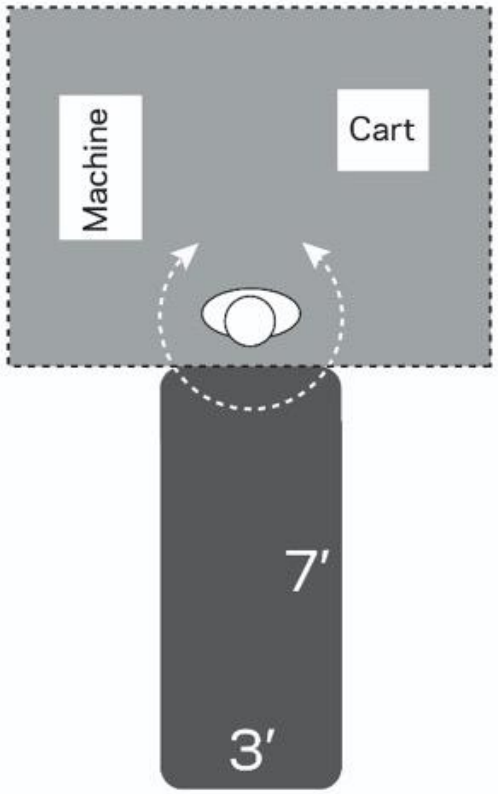
Clearance zone diagram

Anesthesia
(6′ x 8′ work zone)

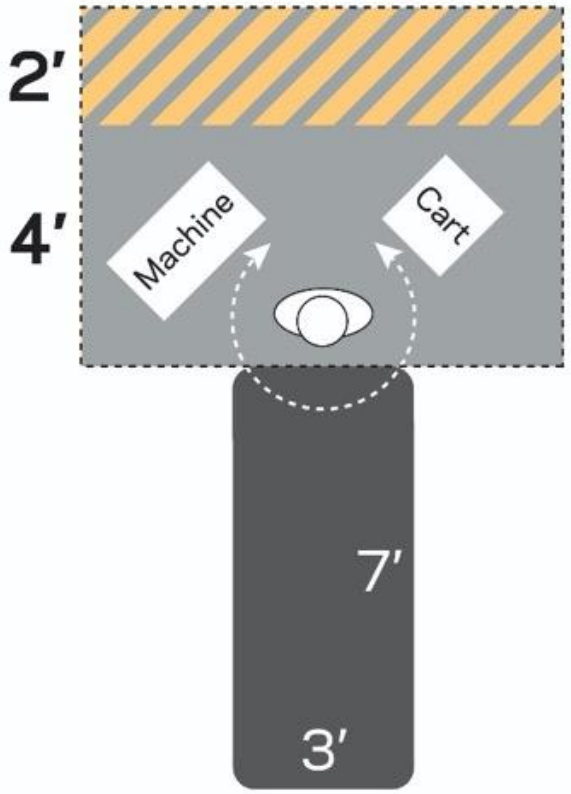
Patient area
(3′ x 7′ for planning purposes)

Work & Circulation

Anesthesia Work Zone

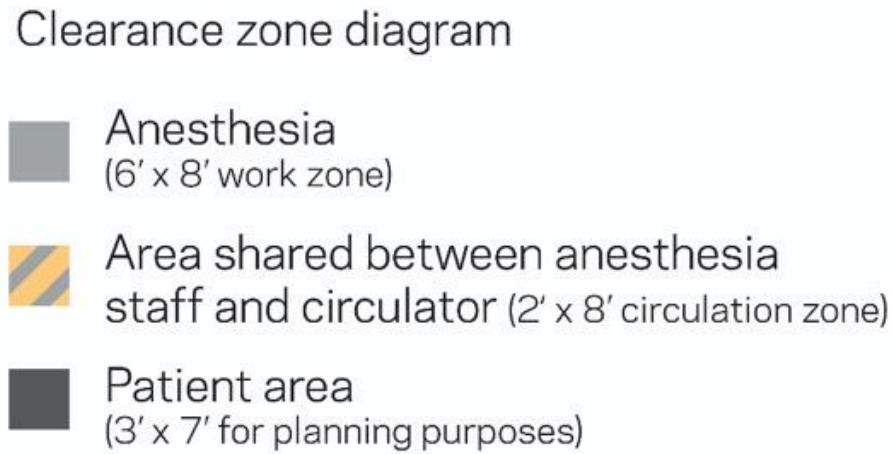


Anesthesia work zone
Setup area



Anesthesia work zone
Work & circulation

The anesthesia work zone is a **6’ x 8’ space** at the head of the table, but when the anesthesia care provider(s) are not actively setting up sedation of the patient, **2’ at the top of that zone can be used as part of the circulation pathway.**



Myth Busting

Anesthesia Work Zone

Anesthetic Techniques
• Local / topical • Regional • Intravenous • Inhalation

Levels of Anesthesia

• Conscious Sedation
  • Minimal sedation / anxiolysis
  • Moderate sedation / analgesia
  • Deep sedation / analgesia
• General

Neither anesthetic technique nor level of anesthesia achieved, by themselves, dictate either the level of procedural invasiveness, or the appropriate imaging setting (Class 1, Class 2, Class 3)

Imaging Room by Type & Use

Imaging Rooms

Room Definition

An imaging room is a room in which **imaging services are provided**.

Depending on what takes place in the imaging room, the room maybe used for diagnostic, therapeutic, or invasive procedures and, as such, should be designed to the same standards required for those same procedures when they take place in non-imaging settings.

Room Classification

- Advancements in technology, increased complexity of cases, and clinical scope creep place greater responsibility on the planner and designer to ask questions up front.
- Where previously the primary consideration in designing imaging rooms was selection of the imaging equipment, planning and design have now moved far past that to considering the types of procedures planned.

Application Guidance: *fgiguidelines.org*

During each *Guidelines* revision cycle, the Health Guidelines Revision Committee (the body responsible for updating *Guidelines for Design and Construction* content) strives to strengthen the *Guidelines* standards for new construction and renovation of areas where patient care is provided. However, **the question of where patient procedures can be performed is not one the *Guidelines* can precisely answer**, nor is the *Guidelines* language written with this intent.

The *Guidelines* requires health care organizations to develop a functional program and perform a **safety risk assessment** during the planning and design phases of every project. One of the primary objectives of using these owner-driven tools is to actively engage clinicians, infection preventionists, and other care providers in the planning and design processes. **Development of the functional program is the opportunity to identify the types of patient care to be provided as well as the spaces needed to support that care.**

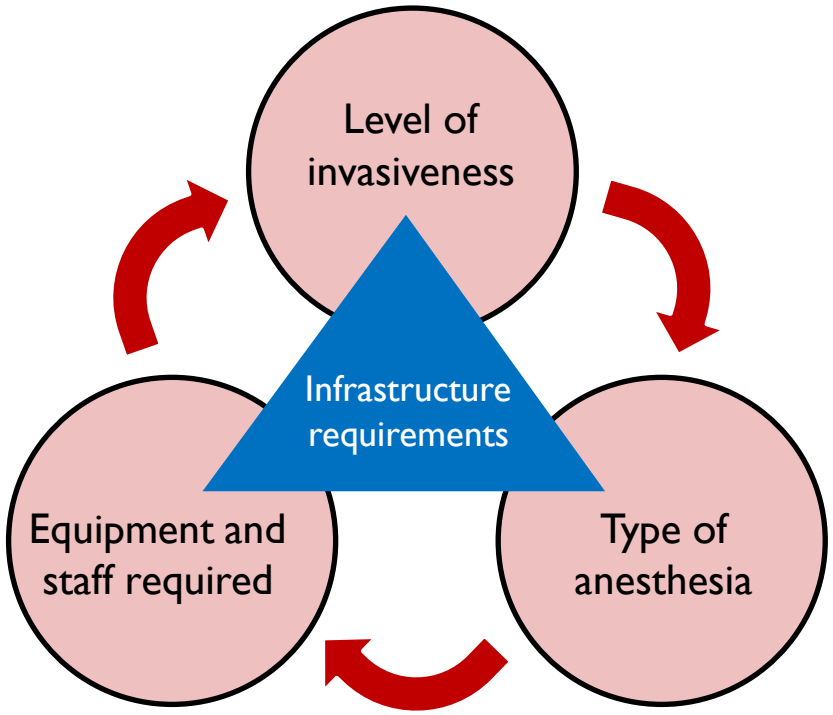
Performance of the safety risk assessment (SRA), particularly the infection control risk assessment (ICRA), will help the project team (including clinical and infection prevention staff as well as designers) determine how to allocate space for invasive and non-invasive procedures. In particular, the ICRA is essential to assure the new or renovated space will support the organization's infection prevention practices.

Implications: Room Classification

- The client / owner is responsible for preparing the safety risk assessment that ultimately dictates room classifications
- The planner, programmer, designer, user, client, infection preventionist, are to be active participants in the development of the safety risk assessment.
- The planner/designer must be prepared to facilitate this effort in order to plan, design, and construct appropriate room types.

Determining Requirements…

An understanding of the following is required to inform the planning of diagnostic, surgical, and interventional spaces.



*Level of **invasiveness**, likelihood of infection*
*Type of **anesthesia** used to conduct procedure*
*Number of **staff** expected in the room during procedure*
***Equipment** needed to support procedure*

Which, in turn, determines:

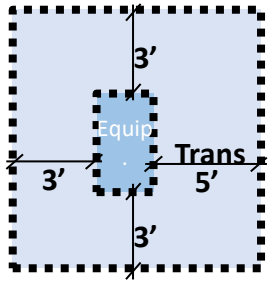
- *Room **classification***
  - *Class 1*
  - *Class 2*
  - *Class 3*
- *Room **size***
- *Room **finishes***
- *Room infrastructure (**MEP** systems)*

Imaging Classification - Table 2.2-2 (H) & 2.1-5 (OP)

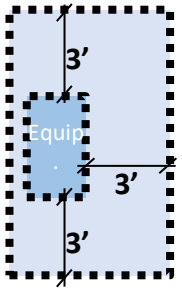
Room Type	Use	Environmental Controls		
		Location	Ventilation (excerpted from ASHRAE 170)	Surfaces
Class 1 Imaging	Diagnostic radiography, fluoroscopy, mammography, computed tomography (CT), ultrasound, magnetic resonance imaging (MRI), and other imaging modalities Services that utilize natural orifice entry and do not pierce or penetrate natural protective membranes	Accessed from an **unrestricted** area	Air changes per hour Pressurization Diffuser requirements	Ceilings: Floor: Wall finishes:
Class 2 Imaging	Diagnostic and therapeutic procedures such as coronary, neurological, or peripheral angiography **Electrophysiology procedures**	Accessed from an **unrestricted** or a **semi-restricted** area	Air changes per hour Pressurization Diffuser requirements	Ceilings: Floor: Wall finishes:
Class 3 Imaging Hybrid OR	**Invasive** procedures* Any Class 2 procedure during which the patient will require physiological monitoring and is anticipated to require active life support	Accessed from a **semi-restricted** area	Air changes per hour Pressurization Diffuser requirements	Ceilings: Floor: Wall finishes:

2022 *Guidelines* minimum room sizes

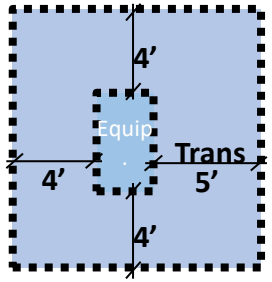
Room Type
Class 1 Imaging
Class 2 Imaging
Class 3 Imaging Hybrid OR



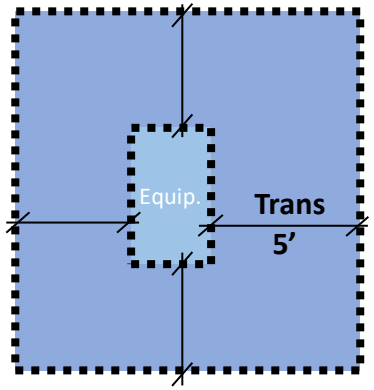
Class 1 Imaging
(3’ on all sides; 5’ on transfer side)



Class 1 Imaging
Mammography, Ultrasound
(3’ on all circulating sides)



Class 2 Imaging
(4’ on all sides; 5’ on transfer side)



Class 3 Imaging
(4’ on all circulating sides)
Meets requirements of OR for Image Guided Surgery

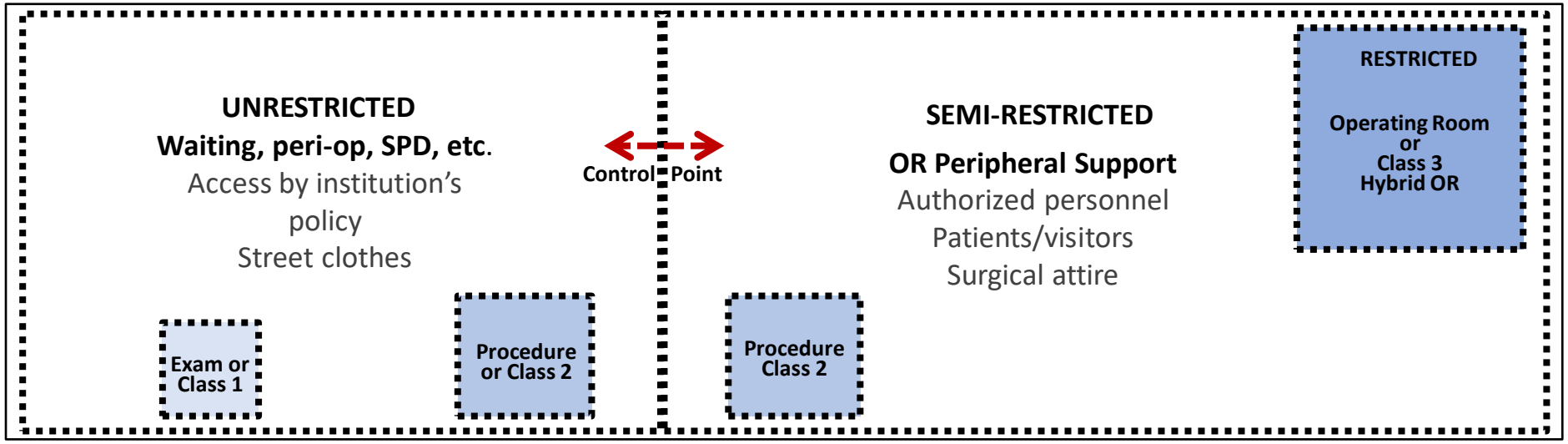
ALL imaging rooms shall be sized and configured, at minimum, to comply with manufacturer’s recommendations for installation and service.

Room Location

2.2-3.3 Surgical Services

2.2-3.3.1.1 Location and Layout

*(4) The surgical **department** shall be divided into **three** designated areas—unrestricted, semi-restricted, and restricted—defined by the physical activities performed in each area.



Class 1 Imaging Room

Definition

- 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

Class 1 Imaging Room

Types of Cases

Class 1 (Diagnostic Imaging)

- May serve both outpatients and inpatients
- May use contrast (oral or IV)
- May use sedation / anesthesia for exam (with medical gas and emergency power provisions of Class 2)

Class 1 Imaging Room

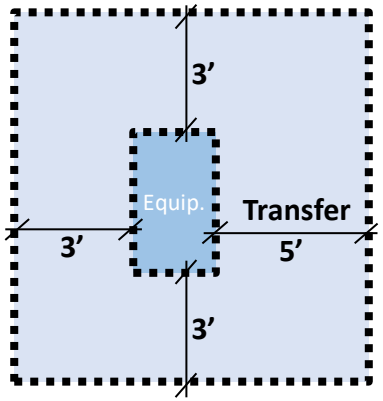
Requirements

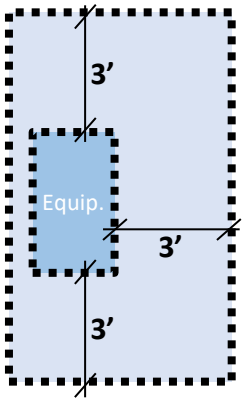
Room Type	Use	Environmental Controls		
		Location	Ventilation (excerpted from ASHRAE 170)	Surfaces
Class 1 Imaging	Diagnostic radiography, fluoroscopy, mammography, computed tomography (CT), ultrasound, magnetic resonance imaging (MRI), and other imaging modalities Services that utilize natural orifice entry and do not pierce or penetrate natural protective membranes	Accessed from an **unrestricted** area	6 total ACH (2 OACH) No pressure requirement Standard diffuser and return array	**Ceilings:** Cleanable with routine housekeeping equipment; lay-in ceiling permitted **Floor:** Cleanable and wear-resistant for the location; stable, firm, and slip-resistant **Walls:** Washable

Class 1 Imaging Room

Clearances

Imaging rooms shall be sized and configured, at minimum, to comply with the manufacturer's recommendations for installation, service, and maintenance.





Mammography, Ultrasound
(3' on all circulating sides)

Transfer side clearance may be omitted for small mobile Ultrasound or similar

No stipulated room **SF areas** for Class 1 imaging rooms

Standard clearance:

- 3' on all sides of patient table/bed/couch, gantry, or assembly
- 3' clearance can be omitted when equipment is mounted/placed against a wall
- 5' clearance on transfer side (H); 4' clearance on transfer side (O)
- Interpretation of transfer is per room functional design

Class 2 Imaging Room

Room Definition

- Diagnostic and therapeutic procedures such as coronary, neurological, or peripheral angiography
- Electrophysiology procedures

Class 2 Imaging Room

Types of Cases

Class 2 (Moderate Acuity / Interventional Imaging)

- May serve both outpatients and inpatients
- May use contrast (oral or IV)
- May use sedation / anesthesia for patient
- May conduct image-guided biopsies / procedures (e.g., MRI-guided breast biopsy or cardiac catheterization)

Gray area procedures (e.g., TAVRs)—which may begin as Class 2 but, if complications arise, may turn into Class 3 procedures—should be prospectively risk-assessed by the enterprise and classified per risk assessment.

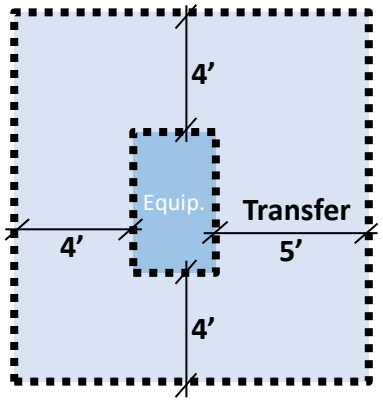
Class 2 Imaging Room

Requirements

Room Type	Use	Environmental Controls		
		Location	Ventilation (excerpted from ASHRAE 170)	Surfaces
Class 2 Imaging	Diagnostic and therapeutic procedures such as coronary, neurological, or peripheral angiography Electrophysiology procedures	Accessed from an **unrestricted** or a **semi-restricted** area	15 total ACH (3 OACH) Positive pressure for catheterization No pressure requirements for other rooms Standard diffuser and return array	**Ceiling:** Smooth and without crevices, scrubbable, non-absorptive, non-perforated; capable of withstanding cleaning chemicals; without crevices; 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 **Flooring:** Cleanable and wear-resistant for the location; stable, firm, and slip-resistant **Floor and wall base assemblies:** Monolithic floor with integral coved wall base carried up the wall a minimum of 6 inches **Wall finishes:** Washable; free of fissures, open joints, or crevices

Class 2 Imaging Room

Clearances



Imaging rooms shall be sized and configured, at minimum, to comply with the manufacturer’s recommendations for installation, service, and maintenance.

Transfer side clearance may be omitted for small mobile Ultrasound or similar

No stipulated room **SF areas** for Class 2 imaging rooms

Standard clearance:

- 4’ on all sides of patient table/bed/couch, gantry, or assembly
- 4’ clearance can be omitted when equipment is mounted/placed against a wall
- 5’ clearance on transfer side (H); 4’ clearance on transfer side (O)
- Interpretation of transfer is per room functional design

Class 3

Room Definition

Invasive procedures*

Any **Class 2 procedure** during which the patient will require **physiological monitoring and is anticipated to require active life support**

A room that **meets the definition of an operating room** and is also equipped to **enable diagnostic imaging before, during, and after surgical procedures**.

Imaging equipment may be **permanently installed in the room** and may include MRI, fixed single-plane and bi-plane tomographic imaging systems, and computed tomography equipment.

Note: *Use of portable imaging technology does not make an OR a Class 3 Imaging Room*

Control Room

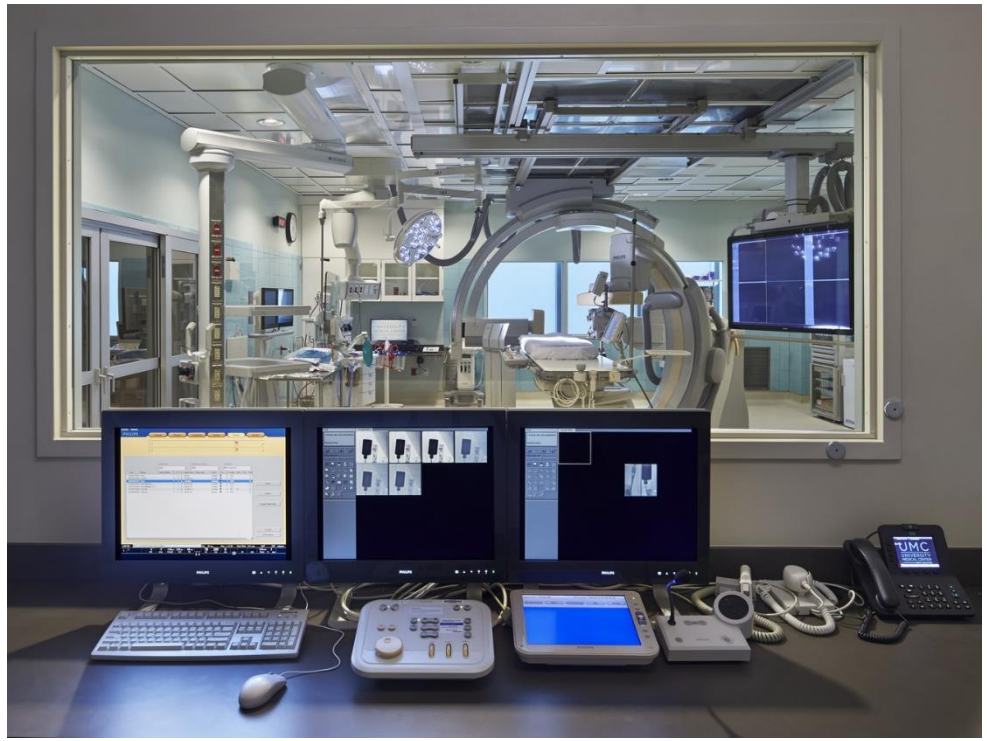
The control alcove or room shall be, **at minimum, sized** and configured in compliance with the manufacturer's recommendations for installation, service, and maintenance.

The room shall be **physically separated from the imaging room with walls and a door.**

The door shall not be required **where the control room serves only one imaging room and is built, maintained, and controlled** the same as the imaging room.

A control room shall be permitted **to serve more than one** imaging room.

The control room shall have view panels that provide for a view of the patient and the surgical team.



Class 3 | Hybrid ORs

Types of Cases

Surgical Specialty			
Cardiovascular	**Cardiothoracic**	**Neurovascular**	**Other**
Abdominal aortic aneurysm repair	Transcatheter valve replacement (TAVR)	Coil embolization or microsurgical clipping of cerebral aneurysms	Hemorrhage control in trauma patients
Aortic stent grafting	Percutaneous removal of cardiac device leads	Intracranial stenting of cerebral arteries	High-risk obstetrics
Carotid stent grafting	Minimally invasive endoscopic bypass surgery	Cerebral balloon angioplasty	Orthopedic trauma
Endovascular aortic repair (EVAR)	Minimally invasive direct coronary artery bypass grafting	Micro neurosurgical resection of brain tumors	
Thoracic endovascular aortic repair (TEVAR)	Robotically enhanced minimally invasive direct coronary artery bypass	Combined carotid surgical cutdown followed by endovascular coiling for bypass of tortuous anatomy	
	Pediatric aortic and pulmonary stenosis	Combined arteriovenous malformation embolization followed by micro neurosurgical resection.	
	Hypoplastic left heart syndrome treatment	Cerebral vascular tumors	
	Off-pump coronary artery bypass	Spinal vascular tumors	
	Atrial fibrillation/flutter ablation		
	Hybrid Maze		

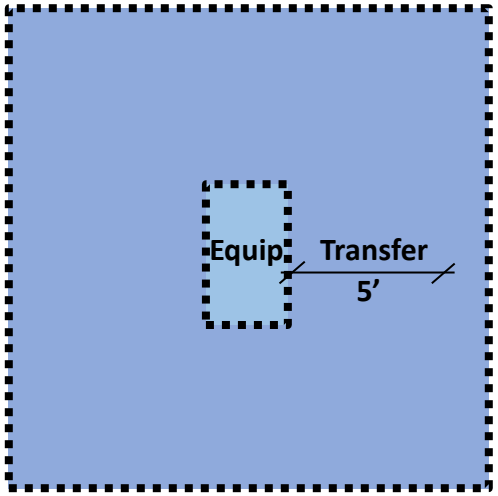
Class 3 | Hybrid ORs

Requirements

Room Type	Use	Environmental Controls		
		Location	Ventilation (excerpted from ASHRAE 170)	Surfaces
Class 3 Imaging Hybrid Operating Room	**Invasive** procedures* Any **Class 2 procedure** during which the patient will require **physiological monitoring and is anticipated to require active life support**	Accessed from a **semi-restricted** area	**20 total ACH (4 OACH)** Positive pressure Primary supply diffuser array extend a minimum of 12 in. beyond the footprint of the surgical table on each side At least two low sidewall return or exhaust grilles spaced at opposite corners or as far apart as possible	**Ceiling:** Monolithic, scrubbable, capable of withstanding cleaning and/or disinfecting chemicals, gasketed access openings **Flooring:** Cleanable and wear-resistant for the location; stable, firm, and slip-resistant **Floor and wall base assemblies:** Monolithic floor with integral coved wall base carried up the wall a minimum of 6 inches **Wall finishes:** Washable; free of fissures, open joints, or crevices

Class 3 Imaging Room

Clearances

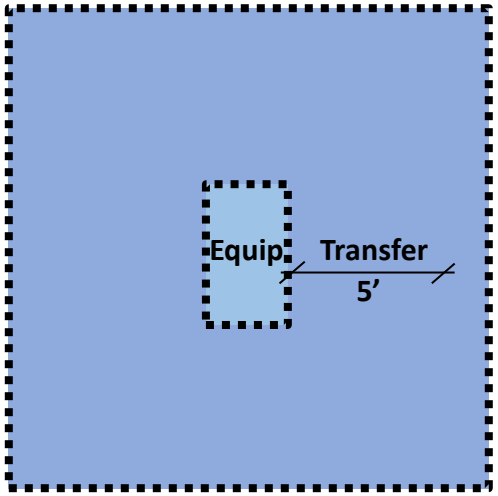


2.2-3.5.2.1 Where a Class 3 imaging room is provided, it shall meet the requirements of one of the following:

(a) Section 2.2-3.4.4 (Hybrid Operating Room)
OR
(b) The applicable imaging modality and Section 2.2-3.4.3 (Operating Rooms), except for Section 2.2-3.4.3.2(1) (Space requirements—[Standard] operating room).

Class 3 Imaging Room

Clearances



Section 2.2-3.4.4 (Hybrid Operating Room)

- The manufacturer’s recommended clearances for installation, service, and maintenance shall be provided.
- A clearance of at least 5 feet (1.52 meters) shall be provided on at least one designated patient transfer side of the patient table/bed/couch.
- Be sized to accommodate the personnel and equipment planned to be in the room during procedures.
- Have a minimum clear floor area of 600 square feet (55.74 square meters) with a minimum clear dimension of 20 feet (6.10 meters).
- Fixed encroachments no greater than 12” outside of sterile field and limited to 10% of wall

Applicable imaging modality and Section 2.2-3.4.3 (Operating Rooms)

- Specific requirements of Imaging Room in question

  AND

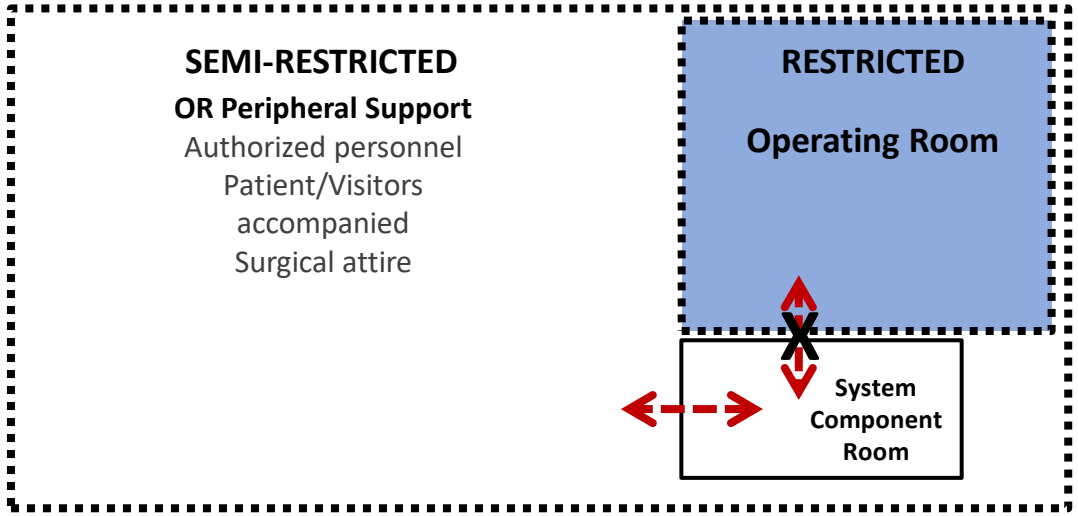
- All requirements presented under Hybrid Operating Room

System Component Room Location

***2.2-3.5.2.5 (1) (b)** For Class 2 imaging rooms, the system component room shall be permitted to open into the imaging room provided no procedures meeting the definition of “procedural fluoroscopy” are performed in the imaging room

***2.2-3.5.2.5 (1) (c)** For Class 3 imaging rooms, the system component room shall not open into the imaging room or any restricted space.

A2.2-3.5.2.5 (1)(c) System component room maintenance access. If equipment requires technicians to view the imaging equipment during maintenance, a window between the system component room and the imaging room or a closed-circuit video camera can be used to provide this access.



Imaging Room Type Comparison

Room Types

	Procedure Room Type	Use	Procedure Room Type	Use
1	Class 1 Imaging Room	Diagnostic radiography, fluoroscopy, mammography, computed tomography (CT), ultrasound, magnetic resonance imaging (MRI), and other imaging modalities Services that utilize natural orifice entry and do not pierce or penetrate natural protective membranes	Exam/ Treatment Room	A room designated for the performance of patient care that may require high-level disinfected or sterile instruments but is **not required to be performed with the environmental controls of a procedure room.**
2	Class 2 Imaging Room	Diagnostic and therapeutic procedures such as coronary, neurological, or peripheral angiography Electrophysiology procedures	Procedure Room	A room designated for the performance of patient care that requires high-level disinfection or sterile instruments and some environmental controls **but is not required to be performed with the environmental controls of an operating room.**
3	Class 3 Imaging Room	**Invasive** procedures* Any Class 2 procedure during which the patient will require physiological monitoring and is anticipated to require active life support	Operating Room	A room that meets the requirements of a restricted area, is designated and equipped for performing surgical or other invasive procedures, and has the **environmental controls for an OR as indicated in ASHRAE 170.** An aseptic field is required for all procedures performed in an OR.

Class 1 Imaging | Exam/Treatment Comparison

Room Type	Use	Environmental Controls		
		Location	Ventilation (excerpted from ASHRAE 170)	Surfaces
Class 1 Imaging Room	Diagnostic radiography, fluoroscopy, mammography, computed tomography (CT), ultrasound, magnetic resonance imaging (MRI), and other imaging modalities Services that utilize natural orifice entry and do not pierce or penetrate natural protective membranes	Accessed from an **unrestricted** area	4 total ACH (2 OACH) for general exam room 6 total ACH (2 OACH) for exam rooms programmed for use by patients with undiagnosed gastrointestinal symptoms, respiratory symptoms, or skin symptoms 6 total ACH (2 OACH) for class 1 imaging rooms No pressure requirement Standard diffuser and return array	**Ceilings:** Cleanable with routine housekeeping equipment; lay-in ceiling permitted **Floor:** Cleanable and wear-resistant for the location; stable, firm, and slip-resistant **Walls:** Washable
Exam Room 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**			

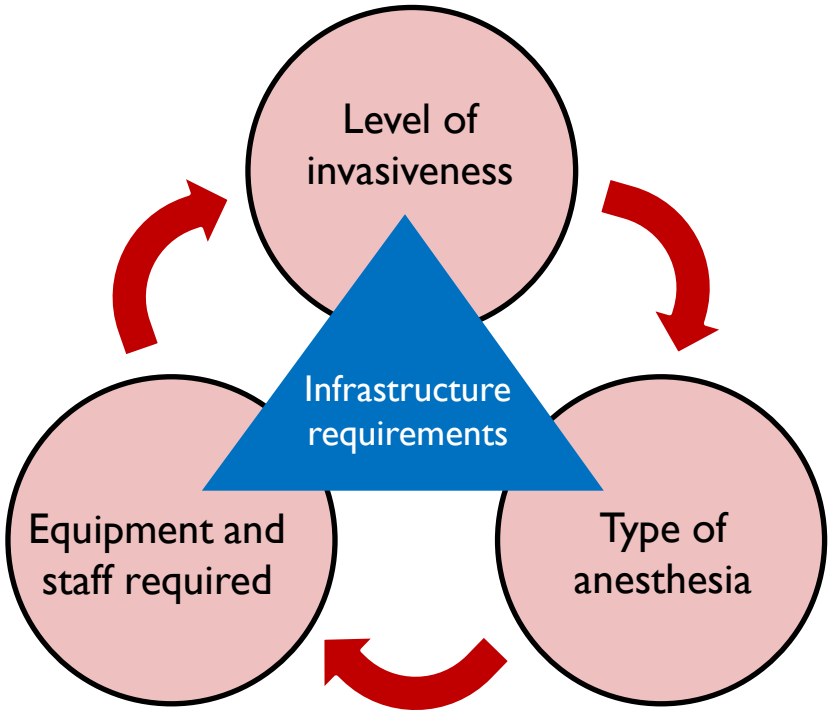
Class 2 Imaging | Procedure Comparison

Room Type	Use	Environmental Controls		
		Location	Ventilation (excerpted from ASHRAE 170)	Surfaces
Class 2 Imaging Room	Diagnostic and therapeutic procedures such as coronary, neurological, or peripheral angiography Electrophysiology procedures	Accessed from an **unrestricted** or a **semi-restricted** area	15 total ACH (3 OACH) Positive pressure for catheterization No pressure requirements for other imaging rooms Standard diffuser and return array	**Ceilings:** Smooth and without crevices, scrubbable, non-absorptive, non-perforated; capable of withstanding cleaning chemicals; without crevices; 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. **Flooring:** Cleanable and wear-resistant for the location; stable, firm, and slip-resistant **Floor and wall base assemblies for class 2 imaging, cystoscopy, urology, and endoscopy procedure rooms:** Monolithic with an integral coved wall base that is carried up the wall a minimum of 6' **Wall finishes:** Free of fissures, open joints, or crevices that may retain or permit passage of dirt particles
Procedure Room	Patient care that requires high-level disinfection or sterile instruments and some environmental controls **but does not require the environmental controls of an operating room**			

Class 3 Imaging | Operating Room Comparison

Room Type	Use	Environmental Controls		
		Location	Ventilation (excerpted from ASHRAE 170)	Surfaces
Class 3 Imaging room (Hybrid Operating Room)	**Invasive** procedures* Any **Class 2 procedure** during which the patient will require **physiological monitoring and is anticipated to require active life support**	Accessed from a **semi-restricted** area	**20 total ACH (4 OACH)** Positive pressure Primary supply diffuser array extend a minimum of 12 in. beyond the footprint of the surgical table on each side At least two low sidewall return or exhaust grilles spaced at opposite corners or as far apart as possible	**Ceilings:** Monolithic, scrubbable, capable of withstanding cleaning and/or disinfecting chemicals, gasketed access openings **Flooring:** Cleanable and wear-resistant for the location; stable, firm, and slip-resistant **Floor and wall base assemblies**: Monolithic with an integral coved wall base that is carried up the wall a minimum of 6’ **Wall finishes:** Free of fissures, open joints, or crevices that may retain or permit passage of dirt particles
Operating Room	**Invasive procedures*** Any **procedure** during which the patient will require **physiological monitoring and is anticipated to require active life support**			

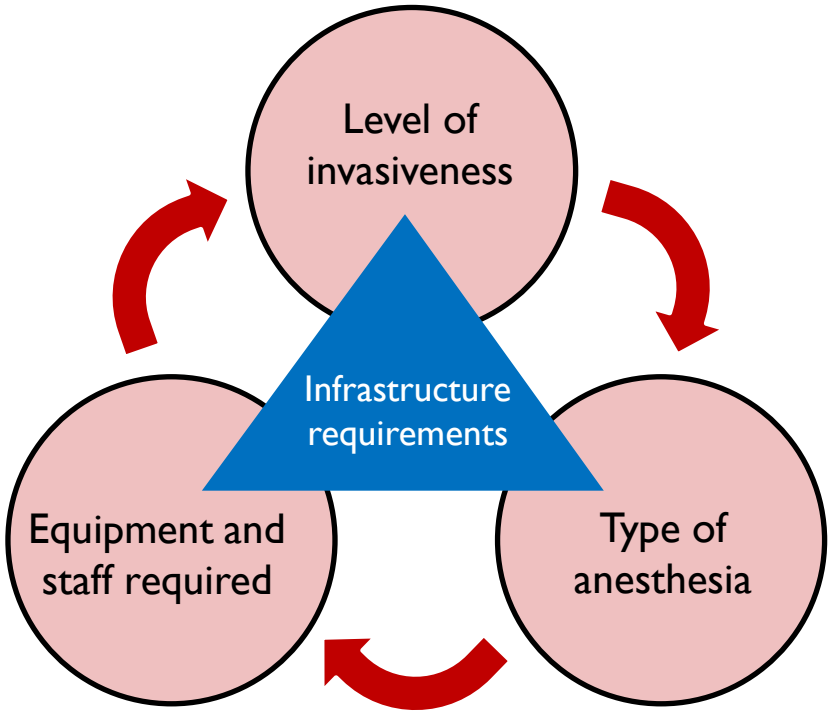
Determining Room by Use



Room Type Summary

	Level of Invasiveness	Risk of Infection	Sterility of Environment	Infrastructure Finishes
Class 1	Non Invasive	Low	4-6 ACH	Low
Class 2	Limited		15 ACH	
Class 3	Invasive, Any	High	20 ACH	High

Determining Room Size



Room Type Summary

	Staff Required	Type of Anesthesia	Amt of Equipment	Min Room Size
Class 1	Low	None	Limited	3’ Clearances
Class 2	Limited	Varies		4’ Clearances
Class 3	High	General Anesthesia	High	Min 20’ Clearances

Pre- and Post-Procedure Care

1. Pre- and post-procedure patient care areas shall be designed to support how services are provided in the facility.
2. The following arrangements shall be permitted provided all patient care stations combined in the same area **meet the most restrictive requirements of the areas** to be combined.
    a) Combination of pre- and post-procedure patient care stations in one patient care area
    b) Separate pre-procedure patient care area and post-procedure (Phase II) recovery area
    c) Three separate areas: pre-procedure patient care, Phase I post-anesthesia care unit (PACU), and Phase II recovery area

Pre- and Post-Procedure Care

OPTION	REQUIREMENT	TOTAL
Combination of pre- and post-procedure patient care stations in one patient care area	COMBINED PATIENT CARE SPACE 1 Pre-Post Care Area Per Operating Room, Class 2 or Class 3 Imaging Room 1 PACU Per Operating Room or Class 3 Imaging Room	**2**
Separate pre-procedure patient care area and post-procedure (Phase II) recovery area	PRE-PROCEDURE CARE SPACE 1 Pre-Procedure Care Area Per Operating Room, Class 2 or Class 3 Imaging Room POST-PROCEDURE CARE SPACE 1 PACU Care Area Per Operating Room or Class 3 Imaging Room 1 PHASE II Care Area Per Operating Room, Class 2 or Class 3 Imaging Room	**3**
Three separate areas: pre-procedure patient care, Phase I post-anesthesia care unit (PACU), and Phase II recovery area	PRE-PROCEDURE CARE SPACE 1 Pre-Procedure Care Area Per Operating Room, Class 2 or Class 3 Imaging Room PACU 1 PACU Care Area Per Operating Room or Class 3 Imaging Room POST-PROCEDURE CARE SPACE 1 PHASE II Care Area Per Operating Room, Class 2 or Class 3 Imaging Room	**3**

Note: Proposals have been submitted for FGI 2026 Edition to reduce or eliminate minimum requirements

ASHRAE 170-2017 & 2021

FGI 2018 & Standard 170-2017

FGI is revised & published every 4 years.
In between editions the following are published:

- Errata
- Interpretations

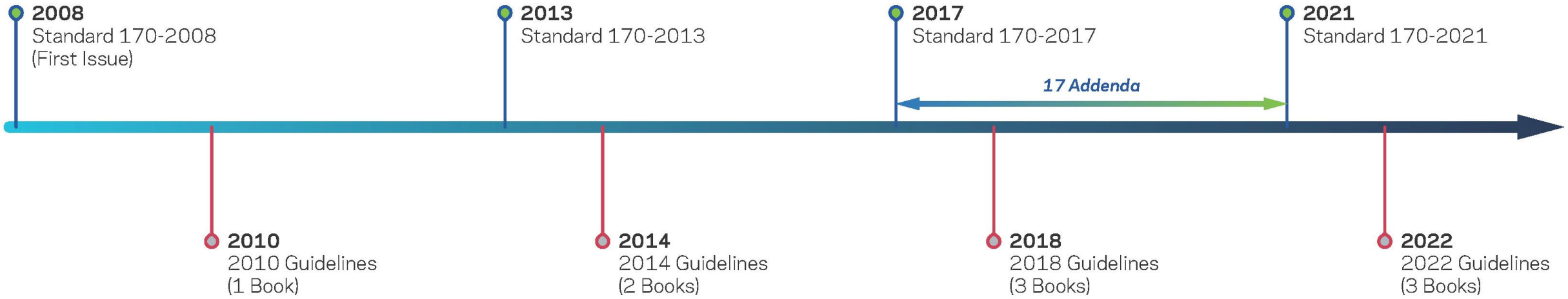
Standard 170 is a Continuous Maintenance Document.

- Approved Addenda become part of the standard

"ASHRAE keeps Standard 170 under a continuous maintenance process, which permits official changes to be made at any point over the life cycle of the document. It is the intention of FGI that addenda to 170 issued by ASHRAE after publication of the 2017 edition shall be considered part of the 2018 *Guidelines* documents."

Excerpt from 2018 FGI

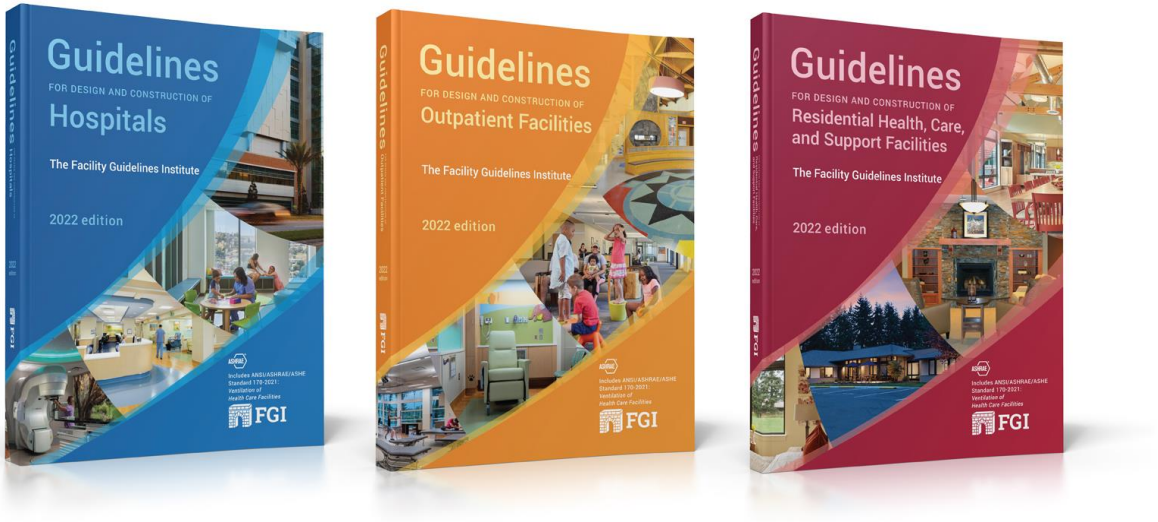
History


2008
Standard 170-2008
(First Issue)
2013
Standard 170-2013
2017
Standard 170-2017
17 Addenda
2021
Standard 170-2021
2010
2010 Guidelines
(1 Book)
2014
2014 Guidelines
(2 Books)
2018
2018 Guidelines
(3 Books)
2022
2022 Guidelines
(3 Books)

FGI 2022 & Standard 170-2021

FGI 2022 is in three books:

- Hospital
- Outpatient
- Residential



Standard 170 is included in its entirety in each book.

Standard 170 mirrors the books with our Chapters 7-9

- Ch 7 Inpatient
- Ch 8 Outpatient
- Ch 9 Residential

Standard 170-2017 & 2021 Summation

- Revised Glossary definitions, including definition of “invasive procedure’
- Clarification of Class 1/ Class 2/ Class 3 imaging in coordination with FGI
- Improved guidance on space ventilation requirements needed for anesthetic gas use
- Addition of new columns in the ventilation tables to prescribe filtration requirement and designate unoccupied turndown
- Extensive revisions to air filtration requirements

Addendum l OR & Imaging Definitions

Coordinating with FGI - Extensive revisions to Definitions

- Redefine Invasive Procedure
- Define Hybrid Operating Room
- Define Class 1 / Class 2 / Class 3 Imaging

Standard 170-2017

Addendum I

Invasive

Invasive Procedure definitions

***invasive procedure*:** a procedure that is performed in an aseptic surgical field and penetrates the protective surfaces of a patient's body (e.g., subcutaneous tissue, mucous membranes, cornea). An invasive procedure may fall into one or more of the following categories:

a. ~~c. generally requires~~ Requires entry into or opening of a sterile body cavity~~; and~~ (i.e., cranium, chest, abdomen, pelvis, joint spaces). ~~penetrates the protective surfaces of a patient's body (e.g., skin, mucous membranes, cornea);~~

b. ~~d. may involve~~ Involves insertion of an indwelling foreign body. ~~is performed in an aseptic surgical field (i.e., a procedure site);~~

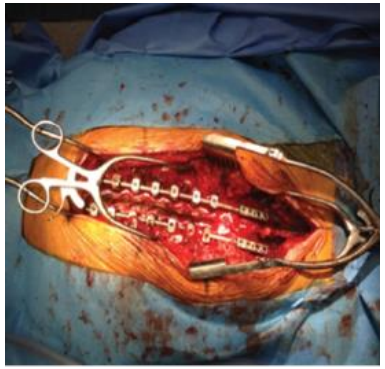
c. Includes excision and grafting of burns that cover more than 20 percent of total body area.

d. Does not begin as an open procedure but has a recognized measurable risk of requiring conversion to an open procedure.

~~***invasive imaging procedure room:*** a room in which radio-graphic imaging is used and in which instruments or devices are inserted into patients through the skin or body orifice under sterile conditions for diagnosis and/or treatment.~~

[…]

invasive fluoroscopy: therapeutic or diagnostic invasive procedures that require fluoroscopic imaging (e.g., cardiac catheterization, interventional angiography, cardiac stenting, or implantation of devices). ***Note:*** These procedures are typically performed in a restricted or semi-restricted area, based on the classification of the imaging procedure being performed. Refer also to Class 2 Imaging Room for cardiac catheterization, interventional angiography and Class 3 for cardiac stenting, or implantation of devices.



Standard 170-2017

Addendum l

Anesthetic Gas Use

Requirements when using inhalation or anesthetic gases

De-linked space from Anesthetic gas use!

7. Unless a higher ventilation rate is stipulated in Table 7.1 or elsewhere in this standard, wherever anesthetic gases are administered outside of an operating room, procedure room, or Class 2 and Class 3 imaging rooms, ventilation shall be provided at a minimum rate of 2 outdoor ach and 6 total ach. (***Informative Notes:*** [1] Refer to NFPA 99 for WAGD piping and gas scavenging requirements. [2] "Anesthetic gases" commonly refers to nitrous oxide and xenon but may also include halogenated volatile anesthetic agents such as desflurane, sevoflurane, and isoflurane.)

7.4.3 Imaging Procedure Rooms. If invasive procedures occur in this type of room, ventilation shall be provided in accordance with the ventilation requirements for procedure rooms. If anesthetic gases are administered, ventilation shall be provided in accordance with the ventilation requirements for operating rooms.

Standard 170-2017

Addendum l

Imaging Room Classification

Class 1 / Class 2 / Class 3 Imaging definitions

Class 1 Imaging Room: Diagnostic radiography, fluoroscopy, mammography, computed tomography (CT), ultrasound, magnetic resonance imaging (MRI), nuclear medicine and other imaging modalities including services that use natural orifice entry and do not pierce or penetrate natural protective membranes.

Class 2 Imaging Room: Diagnostic and therapeutic procedures such as coronary, neurological, or peripheral angiography including electrophysiology, cardiac catheterization and interventional angiography and similar procedures.

Class 3 Imaging Room: Invasive procedures including cardiac stenting, implantation of devices in an Invasive Fluoroscopy and any other Class 2 procedure during which the patient will require physiological monitoring and is anticipated to require active life support.

Function of Space (dd)	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)	Unoccupied Turndown	Minimum Filter Efficiencies (bb)	Design Relative Humidity (k), %	Design Temperature (l), °F/°C
DIAGNOSTIC AND TREATMENT									
~~Imaging (diagnostic and treatment)~~ Class 1 imaging room *(FGI 2.2-3.4.2.4(1)(b)(i))*	NR	2	6	NR	NR	Yes	8/14	max 60	72–78/22–26
~~Interventional imaging procedure room (2.2-3.5.2)~~ Class 2 imaging room (d), (p) *(FGI 2.2-3.4.2.4(1)(b)(ii))*	Positive	3	15	NR	No	Yes	8/14	max 60	70–75/21–24
Class 3 imaging room (m), (o) *(FGI 2.2-3.4.2.4(1)(b)(iii))*	~~Positive~~	~~4~~	~~20~~	~~NR~~	~~No~~	~~Yes~~	8/16 (xx)	~~max 60~~	~~68–75/20–24~~
~~Interventional and intraoperative MRI procedure room (2.2-3.5.2)~~ ***replaced by Class 2***	~~Positive~~	~~3~~	~~15~~	~~NR~~	~~No~~	~~Yes~~	~~8/14~~	~~max 60~~	~~70–75/21–24~~
~~Nuclear medicine treatment procedure room (2.2-3.6.1)~~ ***replaced by Class 1 & negative is NR due to NO open isotopes***	~~Negative~~	~~2~~	~~6~~	~~Yes~~	~~NR~~	~~Yes~~	~~8/14~~	~~NR~~	~~70–75/21–24~~

Standard 170-2017

Addendum m Operating Room Definitions

Operating Room definitions

~~*operating room (OR)*:* a room in the surgical suite that meets the requirements of a restricted area and is designated and equipped for performing surgical or other invasive procedures. An aseptic field is required for all procedures performed in an OR. Any form of anesthesia may be administered in an OR if proper anesthesia gas administration devices are present and waste anesthesia gas disposal systems are provided.~~

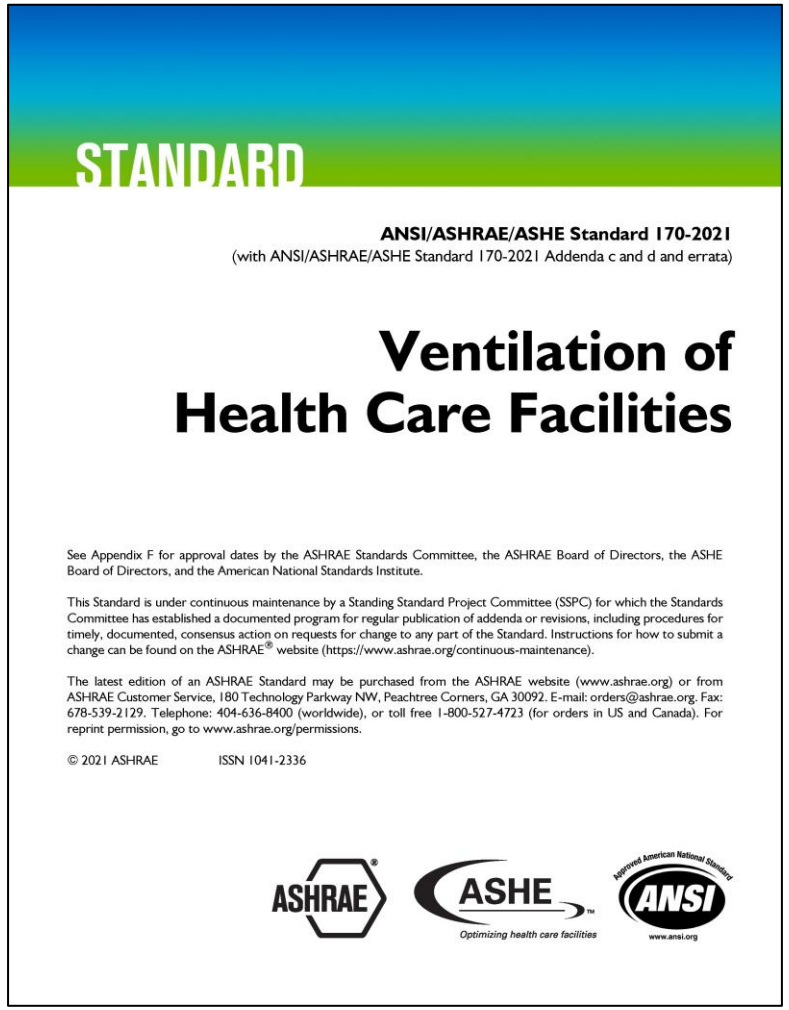
Operating room (OR): A room in the surgical suite that meets the requirements of a restricted area and is designated and equipped for performing invasive procedures.

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

Standard 170-2017

Standard 170-2021

- Standard 170-2021 includes 6 Addenda


STANDARD

ANSI/ASHRAE/ASHE Standard 170-2021
(with ANSI/ASHRAE/ASHE Standard 170-2021 Addenda c and d and errata)

Ventilation of Health Care Facilities

See Appendix F for approval dates by the ASHRAE Standards Committee, the ASHRAE Board of Directors, the ASHE Board of Directors, and the American National Standards Institute.

This Standard is under continuous maintenance by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the Standard. Instructions for how to submit a change can be found on the ASHRAE® website (https://www.ashrae.org/continuous-maintenance).

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ASHRAE ASHE Optimizing health care facilities Approved American National Standard ANSI www.ansi.org

ANSI/ASHRAE/ASHE Standard 170-2021

- Addenda c to Standard 170-2021 (July 30, 2021)
- Addendum d to Standard 170-2021 (October 29, 2021)
- Addendum e to Standard 170-2021 (September 30, 2022)
- Addendum f to Standard 170-2021 (July 5, 2022)
- Addendum g to Standard 170-2021 (September 30, 2022)
- Addendum h to Standard 170-2021 (September 30, 2022)

Go to: *https://www.ashrae.org/technical-resources/standards-and-guidelines/standards-addenda*

Addendum d

Hospital & Outpatient

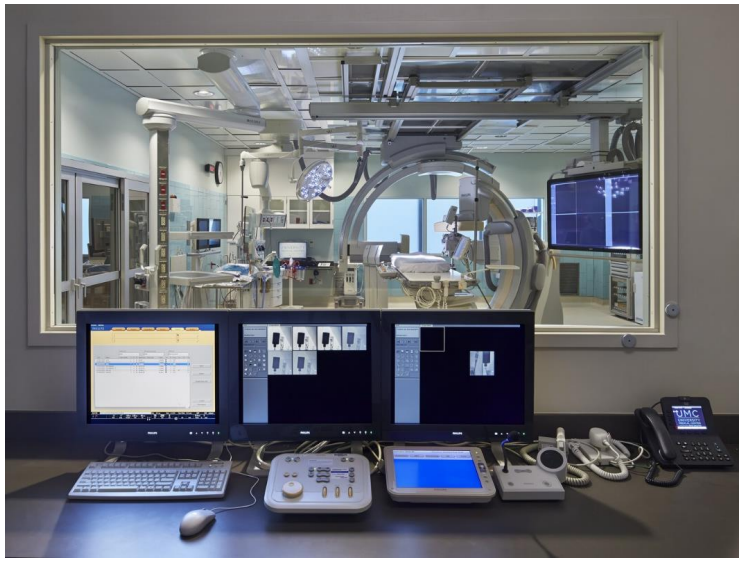
Alignment of definition with FGI 2022

Class 1 imaging room: an imaging room designated for the performance of patient care activities, including diagnostic radiography, fluoroscopy, mammography, computed tomography (CT), ultrasound, magnetic resonance imaging (MRI), nuclear medicine, and other imaging modalities, including services that use natural orifice entry and do not pierce or penetrate natural protective membranes.

Class 2 imaging room: an imaging room designated for the performance of patient care activities, including diagnostic and therapeutic procedures such as coronary, neurological, or peripheral angiography, including electrophysiology, cardiac catheterization, and interventional angiography and similar procedures.

Class 3 imaging room: an imaging room designated for the performance of patient care activities, including invasive procedures ~~including cardiac stenting, implantation of devices in an invasive fluoroscopy,~~ and any other Class 2 procedure during which the patient will require physiological monitoring and is anticipated to require active life support.

procedural ~~***invasive***~~ ***fluoroscopy:*** therapeutic or diagnostic ~~invasive~~ procedures that require fluoroscopic imaging (e.g., cardiac catheterization, interventional angiography, cardiac stenting, or implantation of devices). (***Informative Note:*** These procedures are typically performed in a restricted or semirestricted area based on the classification of the imaging procedure being performed. ~~Refer also to *Class 2 imaging room* for cardiac catheterization or interventional angiography and *Class 3 imaging room* for cardiac stenting or implantation of devices.~~)



Standard 170-2021

Addendum h

Outpatient

Added Unoccupied Turndown column and corrections of AIIR filtration

Table 8-1 Design Parameters—Specialized Outpatient Spaces

Function of Space (f)	Pressure Relationship to Adjacent Areas (n)	Minimum Outdoor ach	Minimum Total ach	AII Room Air Exhausted Directly to Outdoors (j)	Air Recirculated by Means of Room Units (a)	Unoccupied Turndown	Minimum Filter Efficiencies (c)	Design Relative Humidity (k), %	Design Temperature (l), °F/°C
DIAGNOSTIC AND TREATMENT									
Class 1 imaging room *(FGI 2.1–3.5.2.4[1][b][i])* (ff)	NR (hh)	2	6	NR (hh)	NR	Yes	MERV-8	Max 60	72–78/22–26
Class 2 imaging room *(FGI 2.1–3.5.2.4[1][b][ii])* (d), (p), (ff)	Positive	3	15	NR	No	Yes	MERV-14	20–60	70–75/21–24
Class 3 imaging room *(FGI 2.1–3.5.2.4[1][b][ii])* (m), (o), (ff)	Positive	4	20	NR	No	Yes	MERV-16 (dd)	20–60	68–75/20–24
Diagnostic imaging waiting *(FGI 2.1–3.5.10.4)* (g)	Negative	2	12	Yes (q), (r)	NR	Yes (ii)	MERV-8	Max 60	70–75/21–24
AII anteroom *(FGI 2.1–3.3.2.3)* (i)	(e)	NR	10	Yes	No	Yes	MERV-8	NR	NR
AII room *(FGI 2.1–3.3.2)* (i)	Negative	2	12	Yes	No	Yes	MERV-~~8~~14	Max 60	70–75/21–24
PE anteroom *(FGI 1.2–4.2.2.1[1])* (n) (w)	(e)	NR	10	NR	No	No	HEPA	NR	NR
Protective environment room *(FGI 1.2–4.2.2.1[1])* (n) (w)	Positive	2	12	NR	No	No	HEPA	Max 60	70–75/21–24
Cancer treatment area *(FGI 2.6–3.1)*	NR	2	6	NR	NR	Yes	MERV-8	Max 60	70–75/21–24
Dialysis treatment area *(FGI 2.10–3.2)*	NR	2	6	NR	NR	Yes	MERV-8	NR	72–78/22–26
Dialyzer reprocessing room *(FGI 2.10–3.8.12)*	Negative	NR	10 (jj)	Yes	No	Yes (ii)	MERV-8	NR	NR
Bronchoscopy *(FGI 2.1–3.2.2.1)* (n) (x)	Negative	2	12	Yes	No	Yes	MERV-14	NR	68–73/20–23

Standard 170-2021

A Look Ahead: 2026 Edition

2026 FGI Guidelines: Hospital

Room Classification

Proposed removal of Invasive Procedure terminology and clearer instruction that SRA is the controlling decision point on room classification.

~~Hybrid OR~~

Proposed sunsetting of Hybrid OR terminology with clarification that Class 3 Imaging Room is a Hybrid OR. Eliminates extraneous language and references.

2026 FGI Guidelines: Outpatient

Consolidation

Proposed complete consolidation of Imaging text into chapter on Imaging Facilities, eliminating difficult document referencing / navigation.

Class 3 Requirements

Proposed alignment between Hospital and Outpatient documents with respect to sizing and clearance requirements for Class 3 Imaging Rooms.

2026 FGI Guidelines: H+OP

Class 2 and 3 Delineation

Objective is to reverse logic of a design decision guiding a clinical decision.

FIRST: Clinical safety risk analysis to assess needs and define proper environment

SECOND: Use of FGI Guidelines to define room requirements

FGI intends to publish tools to aid teams in process of ascertaining proper environment

Draft 2026 ed and related publications will provide updates

Thank you for your attention!