Guidelines

FOR DESIGN AND CONSTRUCTION OF

Health Care Facilities

The Facility Guidelines Institute

2010 edition

Includes ANSI/ASHRAE/ASHE
Standard 170-2008,
Ventilation of
Health Care Facilities

FACILITY GUIDELINES INSTITUTE

With assistance from
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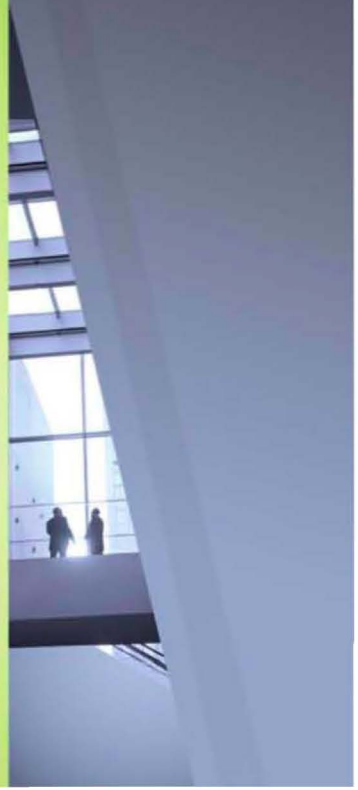

(1) A view window shall be provided to permit full view of the patient.

(2) The angle between the control and equipment centroid shall permit the control operator to see the patient's head.

(3) The control room shall be located to allow convenient film processing.

2.2-3.4.2.3 Patient toilet. A patient toilet shall be provided. It shall be convenient to the procedure room and, if directly accessible to the scan room, arranged so a patient can leave the toilet without having to reenter the scan room.

2.2-3.4.3 Diagnostic X-Ray

***2.2-3.4.3.1 Space requirements.** Radiography rooms shall be of a size to accommodate the functional program.

***2.2-3.4.3.2 Tomography and radiography/fluoroscopy rooms.** Separate toilets with hand-washing stations shall be provided with direct access from each dedicated gastrointestinal fluoroscopic room and to an adjacent passage so that a patient can leave the toilet without having to reenter the fluoroscopic room.

***2.2-3.4.3.3 Mammography rooms**

2.2-3.4.3.4 Shielded control alcove

(1) Each x-ray room shall include a shielded control alcove. For mammography machines with built-in shielding for the operator, omission of the alcove shall be permitted when approved by the certified physicist or state radiation protection agency.

(2) This area shall be provided with a view window designed to provide full view of the examination table and the patient at all times, including full view of the patient when the table is in the tilt position or the chest x-ray is in use.

2.2-3.4.3.5 Hand-washing station. A hand-washing station shall be provided within the procedure room unless the room is used only for routine screening such as chest x-rays where the patient is not physically handled by the staff.

*2.2-3.4.4 Magnetic Resonance Imaging (MRI)

2.2-3.4.4.1 Space requirements

(1) Space within the overall MRI suite shall be provided as necessary to accommodate the functional program and to meet the minimum technical siting requirements provided by the MRI equipment manufacturer.

(2) MRI suites as well as spaces around, above, and below (as applicable) shall be designed and configured to facilitate adherence to U.S. Food and Drug Administration requirements established to prevent unscreened individuals from entering the 5-gauss (0.5 millitesla) volume around the MRI equipment.

*(3) The MRI scanner room shall be large enough to accommodate equipment and to allow clearance in accordance with manufacturers' recommendations.

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A2.2-3.4.3.1 Radiography rooms should be a minimum of 180 square feet (16.72 square meters). (Dedicated chest x-ray may be smaller.)

A2.2-3.4.3.2 Tomography and radiography/fluoroscopy (R&F) rooms should be a minimum of 250 square feet (23.23 square meters).

A2.2-3.4.3.3 Mammography rooms should be a minimum of 100 square feet (9.29 square meters).

A2.2-3.4.4 Cryogen storage in the MRI suite. Cryogen storage may be required in areas where service to replenish supplies is not readily available.

a. If provided, the space should be a minimum of 50 square feet (4.65 square meters) to accommodate two large dewars of cryogen.
b. If provided, cryogen storage areas should be designed and constructed to protect occupants from pressure, thermal, and asphyxiation risks that arise from discharge of cryogenic gases.

A2.2-3.4.4.1 (3) If anesthesia support is anticipated, additional space, electrical outlets, and gas lines may be required.

2.2-3.4.4.2 Design configuration of the MRI suite

(1) Suites for MRI equipment shall be planned to conform to the four-zone screening and access control protocols identified in the American College of Radiology's "Guidance Document for Safe MR Practices."

(2) The layout shall include provisions for the following functions:

(a) Patient interviews and clinical screening
(b) Physical screening and changing areas (as indicated)
(c) Siting of ferromagnetic detection systems
(d) Access control
(e) Accommodation of site-specific clinical and operational requirements

(3) An anteroom visible from the control room shall be located outside the MRI scanner room so that patients, health care personnel, and other employees must pass through it before entering the scanning area and control room. This room shall be outside the restricted areas of the MRI's magnetic field.

*(4) Any area in which the magnetic field strength is equal to or greater than 5 gauss (0.5 millitesla) shall be physically restricted by the use of key locks or pass-key locking systems.

***2.2-3.4.4.3 Control room**

(1) A control room shall be provided with a full view of the patient within the MRI scanner.

(2) The control console shall be positioned so the operator has a full view of the approach and entrance to the MRI scanner room.

2.2-3.4.4.4 Hand-washing station. Hand-washing stations shall be provided convenient to the MRI scanner room, but need not be within the room.

***2.2-3.4.4.5 Patient preparation, holding, and recovery area or room.** This shall comply with Section 2.2-3.5.4, requirements for the same area or room under Section 2.2-3.5 (Interventional Imaging Services).

***2.2-3.4.4.6 Computer room.** A computer room shall be provided.

2.2-3.4.4.7 Equipment installation requirements

*(1) Power conditioning shall be provided as indicated by the MRI manufacturer's power requirements and specific facility conditions.

*(2) Magnetic shielding shall be provided at those sites where magnetic field hazards or interferences cannot be adequately controlled through facility planning.

APPENDIX

A2.2-3.4.4.2 (4) A risk of injury or death is posed by the penetration of areas in which the magnetic field strength is equal to or greater than 5 gauss by unscreened persons or ferromagnetic objects or equipment.

A2.2-3.4.4.3 Control rooms should be a minimum of 100 square feet (9.29 square meters), but may be larger depending on the vendor and magnet size.

A2.2-3.4.4.5 When patient holding areas are provided, they should be located near the MRI unit and should be large enough to accommodate stretcher(s). When anesthesia/sedation is provided, monitored induction/recovery areas with appropriate medical gas services should be provided (these areas may be incorporated with patient holding). All MRI providers should designate a code treatment area outside the MRI room.

A2.2-3.4.4.6 A computer room may range from 150 square feet (13.94 square meters) to 380 square feet (35.30 square meters) depending on the vendor and magnet strength. Self-contained air conditioning supplement is normally required.

A2.2-3.4.4.7 (1) Power conditioning and voltage regulation equipment as well as direct current (DC) may be required.

A2.2-3.4.4.7 (2) Magnetic shielding can often be avoided in new construction when suite design and planning are employed to mitigate magnetic field hazards. Magnetic shielding is not required for MRI equipment operation.

Magnetic shielding may be required to restrict the magnetic field plot. Radio frequency shielding may be required to attenuate stray radio frequencies. The area around, above and below the MRI suite shall be reviewed and evaluated for the following:

Possible occupancy by person(s) who could have pacemakers or other metal implants.

Equipment that can be disrupted by a magnetic field. Examples include but are not limited to personal computers, monitors, CT scanners, and nuclear cameras.

After reviewing and evaluating the surrounding space, appropriate magnetic shielding should be provided based upon the type of MRI scanner to be installed.

(3) For super-conducting MRI equipment, cryogen venting, emergency exhaust, and passive pressure relief systems shall be provided in accordance with the original equipment manufacturer's specifications.

2.2-3.4.4.8 Special design elements for the MRI scanner room

(1) General. Use of ferromagnetic materials that may interfere with the operation of the MRI scanner shall be avoided or minimized in MRI scanner rooms.

(2) Architectural details

(a) The floor structure shall be designed to support the weight of MRI scanner equipment and to prevent disruptive environmental vibrations. Floor loading along the pathway required for equipment removal and replacement shall also be considered.

(b) Wall, floor, and ceiling assemblies shall accommodate the installation of required radio frequency (RF)-shielded assemblies. All doors, windows, and penetrations into the RF-shielded enclosure shall be RF-shielded.

(c) In addition to RF shielding, individual sites may also require magnetic shielding on some or all surfaces to contain portions of the magnetic field not contained by the RF shield.

(d) A knock-out panel or roof hatch is recommended for delivery and removal of the MRI scanner.

(e) MRI rooms shall be marked with a lighted sign with a red light to indicate when the magnet is on.

(3) Surfaces, fixtures, and equipment

(a) Because of the dangers of magnetic fields, servicing finishes, fixtures, and equipment within the MRI scanner room is potentially hazardous. Finishes, fixtures, and equipment should be selected to minimize the need for maintenance and servicing.

(b) Facilities may wish to use finishes or markings to identify the critical values of the magnetic field surrounding the MRI scanner, including the 5-gauss exclusion zone or other magnetic field strength values that may impair the operation of equipment.

(c) Because MRI scanners are increasingly being used as an interventional platform for image-guided biopsies and procedures, changes in infection control provisions, equipment, and finishes brought about by changes in clinical use shall be considered.

(3) Ventilation requirements. An insulated cryogen quench exhaust pipe as well as room exhaust and pressure equalization shall be provided where superconducting MRI scanners are installed to protect occupants in the event of a cryogen breach.

2.2-3.4.5 Ultrasound

2.2-3.4.5.1 Space requirements. Space shall be provided as necessary to accommodate the functional program.

(1) Area. Rooms used for ultrasound examination/treatment shall have a minimum clear floor area of 120 square feet (11.15 square meters).

(2) Clearances. A minimum clear dimension of 3 feet (91.44 centimeters) shall be provided on three sides of the table/stretcher.

2.2-3.4.5.2 Hand-washing station. A hand-washing station shall be provided within the procedure room.

2.2-3.4.5.3 Patient toilet

(1) A patient toilet, directly accessible from the procedure room, shall be provided.

(2) The patient toilet shall be permitted to serve more than one procedure room.

2.2-3.4.6 Support Areas for Diagnostic Imaging Services

The spaces included in this section are common to the diagnostic imaging department and are minimum requirements unless stated otherwise.

2.2-3.4.6.1 Control desk and reception area

2.2-3.4.6.2 Offices for radiologist(s) and assistant(s). Offices shall include provisions for viewing, individual consultation, and charting of film.