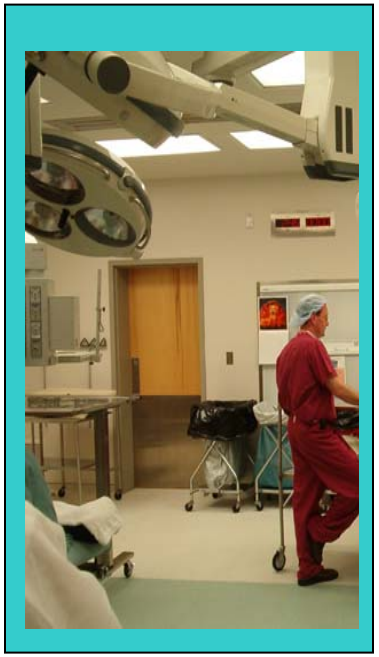
Section 2

Narrative

Guide Plates



THE SURGICAL SUITE

General Description, Function and Concepts

The VA Medical Center's Role as a Teaching Hospital

Most Veterans Affairs Medical Centers are affiliated with major medical schools. Residents from these schools as well as students in nursing and medical technology perform many functions within the Medical Center during their medical education. Because of the teaching mission of the VA, additional space is required in the Operating Room and staff support areas to accommodate the residents, faculty, and students. Also, surgical procedures may have a longer duration. This additional space and time must be kept in mind when determining the size and number of Operating Rooms and support spaces for a teaching hospital.

The Surgical Department

The Surgical Department is comprised of all areas required for patient surgical services. It includes the Surgical Suite (defined below), Post Anesthesia Care Unit (PACU), Phase II Recovery, Surgical Intensive Care Unit (SICU) and the Procedure Suite (including Cystoscopy and Endoscopy Procedure Rooms).

The Surgical Suite

The Surgical Suite is a group of spaces consisting of the individual Operating Rooms in which surgery is performed, plus all the required supporting areas. These supporting areas include a clean core, a semi-restricted corridor (previously termed peripheral corridor) and the following spaces:

1. Control and Communication Area; Patient Holding/ Prep;
2. Staff Lockers and Lounge, Toilets and Showers (LLTS) including the Auto-Valet scrub suit dispensing machines;
3. Anesthesia Workroom;
4. Scrub Areas for the staff;
5. Blood Gas Analysis Laboratory;
6. On-Site Sterilization serving a pod of Operating Rooms;
7. Equipment Storage Space;
8. Connection to the Supply Processing and Distribution (SPD) - usually mechanical cart lifts or elevators;

9. Medical Gas Storage Area;
10. Dedicated Housekeeping Aides Closets (HAC) for Clean Core and other areas within the Clean Core;
11. Dedicated Housekeeping Aides Closets (HAC) for Operating Rooms and areas directly served by the Semi-Restricted Corridor.
12. Appropriate Staff Offices, including Charge Nurse Office, and Surgical and Anesthesia Offices as required for supervision;
13. Other support areas as deemed appropriate.

Traffic within the Surgical Suite

Surgical Staff: There are two approved patterns of traffic flow for the surgical staff. One pattern is from the staff lockers/lounge through the semi-restricted corridor to the Scrub Stations and then into the individual Operating Rooms, with exit through the semi-restricted corridor. The second pattern of staff traffic is from the staff lockers/lounge directly into the clean core to the Scrub Stations and then into the individual Operating Rooms, with exit from the Operating Rooms through the semi-restricted corridor. Possible exceptions to this flow are the "circulators," who retrieve supplies and equipment from the clean core, and the supervising anesthesia staff, who are permitted to move from Operating Room to Operating Room via the clean core.

Patients: The patients are brought into the Operating Room from the Prep Area on a gurney. They are then transferred to the operating table. Following surgery, the patients are brought out of the Operating Room through the semi-restricted corridor and taken either to the PACU, Phase II Recovery or directly to the SICU.

Case Carts: Case carts to be used in procedures are brought to the Operating Rooms via the clean core on a dedicated cart lift or dedicated clean elevator from the "clean" side of SPD. When the surgical procedure is completed, these case carts are returned via the semi-restricted corridor to the "soiled" side of SPD on another dedicated cart lift or dedicated soiled elevator. In the event that SPD is not located below the Surgical Suite, an alternative traffic pattern for the case carts must be established that isolates clean and soiled case cart traffic.

Linens: Linens are brought into the Operating Rooms by way of the semi-restricted corridor. Soiled linen is bagged and removed from the Operating Room via the semi-restricted corridor.

The "Sterile Field"

The term "sterile field" is used to describe the sterile zone in the Operating Room, which includes the space immediately surrounding the patient's incision. The term "sterile" indicates that no undesirable microorganisms are present. The hands of the scrub team are gloved and everything that enters this field must be sterile.

The operating table, the surgical instrument table, and special equipment to be used in the sterile field is cleaned prior to each case. X-ray machines, surgical microscopes, and other items that are difficult to clean are draped in sterilized plastic to maintain asepsis.

The anesthesiologist/nurse anesthetist remains outside of the sterile field and is separated from the sterile field by a sterile drape.

Maintaining Asepsis (Sterility)

With regard to asepsis, the three areas of concern (to minimize the number of undesirable organisms present) within the Surgical Suite are:

1. The "sterile field" itself as described above. Only fully scrubbed staff (known as the "scrub team") is permitted in this area in the center of each Operating Room.
2. Within the Operating Room, both the scrub team as well as the additional staff that are not in the sterile field must abide by strict rules established by the Medical Center.
3. Semi-restricted areas, including spaces such as the pre-op and patient holding areas, PACU, instrument workroom, non-sterile supply storage, staff lockers/lounges/toilets/showers, control desk, and surgery administration offices.

Internal Operating Room Circulation

It is critical to plan an Operating Room in such a way that a high level of sterile technique can be achieved.

The circulator places the packs on the instrument table from the side of the instrument table away from the sterile field. The scrub nurse unwraps the sterile instruments and places them on the surgical instrument table prior to the procedure. With the exception of some specialty surgical procedures, the surgical instrument table is positioned toward the foot of the operating table, but always within the sterile field. A single instrument table may be up to 8.0 feet (2440 mm) in length, or there could be more than one instrument table. Once the procedure starts, the scrub nurse constantly draws from this source to supply the surgeons during the operation. The circulator also assists the surgeon with devices used in the sterile field such as lasers.

No one walks between the operating room table and the surgical instrument table, except those in sterile garb who have thoroughly scrubbed. When portable X-ray equipment is used, space for these items must be considered. Surgical microscopes or video

monitors on carts and other large pieces of equipment (including robotics) may also be needed in an Operating Room, and space for them must be considered.

The Surgical Team in a VA Teaching Hospital

Surgeon: The surgical team leader, under whose supervision the operation is performed. Assisting the surgeon in major operations are one or more assistants, frequently the surgical residents. Under controlled teaching programs, medical students may also participate as assistants. The maximum number of surgeons and/or assistants is typically four: two on each side of the operating table.

Anesthesia Staff: Anesthesia is administered by the anesthesia staff, which can include anesthesiologists, anesthesia assistants, anesthesia residents, anesthesia technicians, and certified registered nurse anesthetists (CRNAs). One or more anesthesia staff may be assigned to each Operating Room. It is the responsibility of the anesthesia staff to consult with the patient before surgery and identify family/friends that will speak to the surgeon after the procedure, to administer the anesthetic agent before and during surgery, and to monitor the patient's vital signs. Anesthesia staff remain with the patient during the entire surgical procedure. Following the surgery, the patient remains under the care of the anesthesia staff and the assigned recovery room nurse until the patient has met the discharge criteria.

Nursing Staff: Every major surgical procedure performed in the Operating Room is staffed by at least one registered nurse and scrub personnel. The scrub person, together with the first assistant to the surgeon, is the main support person for the operating surgeon. The scrub personnel are responsible for the sterile supplies and instruments and for handing them to the surgeon. More complicated surgical procedures may require the presence of two scrub personnel, one assisting the surgeon at the operating room table and one responsible for the instruments at the instrument table.

The circulating nurse, known as the circulator, does not function within the sterile field, but performs many of the required tasks outside the sterile field. This person also acts as the "non-sterile" hands of the surgeons and scrub person, placing films in the X-ray view box, bringing required supplies, instruments and equipment into the Operating Room, maintaining surgical records in the Operating Room, etc. Although the surgeon performing the operation has the ultimate responsibility for the care of the patient in the Operating Room, it is the circulator who is responsible for maintenance of sterile conditions and is in charge of personnel. This person is the primary advocate ensuring that correct surgery is performed by confirming proper patient identification and surgical site(s), confirming that a history and physical is on the patient chart, and confirming that a signed surgical consent is present. The circulator also enters safety measures into the computer, records time out, and assures that the proper prosthetics, if required, are available.

Surgical Technician and/or Nursing Assistant: This individual has received special training in sterile technique and in assisting in the Operating Room. If appropriately trained, this individual may perform the same duties as a scrub person. This individual cannot serve as the circulator, as only a registered nurse may be assigned that function.

Perfusionist: In cardiovascular surgery, the patient's blood may have to bypass the heart to allow the surgeon to perform the required surgical procedure. The blood supply bypasses the heart and circulates through a heart-lung machine (which is both a mechanical pump and artificial lung) after which it is returned to the patient as oxygenated and purified blood. The perfusionist, who oversees this process, works in the Operating Room, usually at the side of the operating table, but well outside the sterile field area. The heart/lung machine must be connected to both a water supply and the electrical supply. Two perfusionists may be required for each cardiovascular operation, in the event that a cell-saver (auto-transfusion) device is used.

EEG Technician: This individual operates the electroencephalograph in the Neurosurgery Operating Room to record the brain waves of the patient. Usually this monitoring is required only in patients undergoing brain surgery. This individual operates the EEG machine outside of the sterile field.

Imaging Technician: The imaging technician is in-charge of taking either film or digital images when needed within the Surgical Suite.

X-ray Film: A portable X-ray unit is moved into the Operating Room whenever it is necessary to take an X-ray. The image is taken by the imaging technician and then developed by him/her in a darkroom installed within the Surgical Suite. If preferred by the radiology and surgical staff, films can be taken directly to the Radiology Department for processing. The X-ray films may then be interpreted by a radiologist who communicates the results to the surgeons waiting in the Operating Room over the intercom or telephone. If necessary, the films can then be returned to the Surgical Suite and placed on film illuminators.

Fluoroscopy: Some Operating Rooms may have radiographic equipment permanently installed within the room. An example of this is a ceiling mounted fluoroscopic unit used in vascular surgery. More often than not, portable radiology equipment is used. For these procedures, a portable c-arm unit is brought into the room along with a portable video cart. When imaging equipment is used in the Operating Room, staff is required to wear lead aprons or work from behind leaded glass shields. Often a single imaging machine will be used in several different Operating Rooms. The imaging technician (who is assigned to the surgical suite) will move the portable imaging equipment into each Operating Room when and where it is needed.

Digital Imaging: Many Operating Rooms now utilize digital images as well as X-ray film mounted on film illuminators. High quality digital images (including those generated on cat-scan and ultrasound machines can be viewed instantly on a CRT or boom mounted plasma screen within the sterile field of the Operating Room. This means that the surgeon does not have to leave the sterile field.

Orderly: The orderly is responsible for transporting patients to the Surgical Suite from other parts of the hospital. When a patient is very heavy, the orderly might assist in transferring the patient from the transporting gurney to the operating room table. The orderly also helps in moving equipment in and out of the Operating Room before the patient is brought into the room.

Charge Nurse: The charge nurse supervises all activities that occur within the individual Operating Rooms. The charge nurse is also available to temporarily replace the scrub nurse during long operations. The office of the charge nurse may be located within the clean core.

Nurse Manager: This nurse is the administrative supervisor of the entire Operating Room Suite. She/he is responsible for maintaining the scheduling of patients for operations, as well as purchasing and maintaining supplies and equipment for use in the Operating Room Suite. The office of the nurse manager is located inside the Surgical Suite.

Surgical Room Pathologist: The surgical pathologist does not function within the clean core area or within the individual Operating Rooms. Tissue specimens removed from a patient are sent to the surgical pathologist, who prepares and examines the tissue in a frozen section laboratory within Pathology. The pathologist then electronically communicates his/her findings to the surgeon.

Consultant: If the operating surgeon desires a consultation for a patient under anesthesia or during the operation, he/she may request that a consultant come to the Operating Room to examine the patient. In most instances, the individual consulted is an internist or cardiologist. This individual usually does not work within the sterile field but examines the physiologic data regarding the patient and presents his advice regarding additional appropriate treatment.

Visitors / Technical Support: In most hospitals affiliated with a Medical School, visitors may be invited into the Operating Room to view a particular type of operative procedure. Technical support personnel may be invited into the Operating Room to consult on the use of specialized equipment. In all cases, the patient must have given prior consent to the presence of these non-surgical staff in order to maintain patient privacy and follow HIPAA regulations. These individuals must be appropriately attired. They also wear head covering and shoe covers, but not necessary gloves, since they do not work within the sterile field. It is the circulator's responsibility to monitor the visitors and technical support personnel activities.

Bio-medical Engineering Technician: It is desirable to have a bio-medical technician assigned to the Surgical Suite. This technician's home base should be a small office/lab (near the Operating Rooms), approximately 120 net square feet (11.16 net square meters) where tests, maintenance, and repairs of equipment used in the Operating Rooms can be performed.

Housekeeping Staff (Operating Rooms): Specially trained housekeeping staff is assigned to decontaminate and sterilize the Operating Rooms and equipment after each procedure. They work out of a dedicated housekeeping closet accessed from the semi-restricted corridor.

PLANNING CRITERIA

The following is a list of basic planning criteria, which are desirable as standards for the Surgical Suite. For further information, see Technical Information Library (TIL), Space Planning Criteria for VA Facilities - Handbook 7610.

Size of Holding, Prep and Phase II Recovery Areas

The inpatient or outpatient is brought into the Prep Area, or Holding Room, prior to the surgical procedure. Last minute consultations with the patient by the staff take place here. Shunts for IV solutions may be inserted here. To comply with HIPAA requirements, patient areas must provide acoustical and visual privacy at all times.

Prep Areas and Phase II Recovery Spaces can be three-walled with a cubicle curtain, but it is recommended that they be four-walled rooms with a minimum dimension of 9.0 feet (2.72 meters) wide and 12.0 feet (3.66 meters) deep. The door to the corridor may be a 4.0 feet (1.22 meters) swinging door or a sliding glass door with breakaway hardware.

It is recommended that the ratio of 1 Prep Room to 1 Operating Room and 1.5 Phase II Recovery Rooms to 1 Operating Room be provided.

The Phase II Recovery Room is utilized for recovery of the patient after the PACU and/or for ambulatory surgery patients who come directly from the surgery. The Prep Area should be co-located with the Phase II Recovery Room to provide maximum flexibility for the patient room assignment. Since most surgical procedures are started in the morning, the Prep Area can occupy underutilized Phase II Recovery Space in the morning but the same area can be used for additional Phase II recovery in the afternoon.

Size of Operating Rooms

General Comments: In renovation situations, there may not be sufficient space to provide the recommended sizes of Operating Rooms. In such instances, concurrence of the VA Surgical Office should be obtained before proceeding further in the design process. Recessed wall storage cabinets, if requested, should be in addition to the square footage noted for each Operating Room. These cabinets should be used for storage of routine supplies only. When the provision of substantial numbers of storage cabinets in each Operating Room is the desire of the local staff, then the space in the clean core reserved for exchange carts with sterile supplies on them can be reduced.

General Operating Room: This includes Operating Rooms for general surgery, ENT surgery, eye surgery, neurosurgery, orthopedic surgery and plastic surgery. Ideally, a General Operating Room should be 650 net square feet (60.45 net square meters) with a minimum dimension of 25.0 feet (7.63 meters), but not less than 450 net square feet (41.85 net square meters) with a minimum dimension of 21.0 feet (6.41 meters), but not less than 600 net square feet (55.80 net square meters). For Cardiac Operating Rooms, minimum is 700 net square feet (65.11 net square meters).

Special Purpose Operating Room: This room is mainly for cardiovascular surgery, but may be used for any other special surgery which requires this larger room. The Special Purpose Operating Room should not be larger than 800 net square feet (74.40 net square meters) with a minimum dimension of 26.0 feet (7.93 meters).

Ceiling Height in an Operating Room

The finished ceiling height of an Operating Room should be 10.0 feet (3.05 meters) above the floor. Any height less than this is considered a compromise that is not acceptable.

Post Anesthesia Care Unit (PACU)

The PACU is utilized immediately after surgery for patients recovering from anesthesia. Patient vital signs are monitored until the patient regains consciousness and discharge criteria are met. At this time, the patient may be transferred to the appropriate post-operative unit.

PACUs are typically arranged with patient cubicles around a Central Nursing Station. The minimum width of each cubicle should be 9.0 feet (2.75 meters). It is recommended that the ratio of one PACU station to one Operating Room be used. The ratio of PACU stations may be increased based on the surgical load or if other departments utilize the PACU for recovery of their patients.

Clean Core

Operating Rooms are grouped around a clean core. The clean core is used for sterile supply storage. This is the cleanest area of the entire Operating Suite. Only staff wearing appropriate surgical attire should be allowed in the clean core. Sterile supplies are retrieved from the clean core by the circulator. If supplies are to be stored on multiple exchange carts brought up from SPD each day, the clean core must be sized to accommodate these carts. When the provision of substantial numbers of storage cabinets in each Operating Room is the desire of the local staff, then the space in the clean core reserved for exchange carts with sterile supplies on them can be reduced. Case carts are held in a clean staging area until required at the start of the surgical procedure. Many facilities also utilize automated supply units, which store and electronically track usage of supplies.

Sterile supplies are transported to the clean core via dedicated elevators from the clean side of SPD. An optional dedicated stairway may be included if SPD is vertically separated from the clean core by no more than two floors.

In renovation situations where space is not available to create a true clean core, one corridor outside the Operating Room may be considered a clean space where sterile supplies are stored. Appropriate staff and materials flow must be followed to maintain the separation of clean and soiled traffic. However, this arrangement should only be considered for a small complement of Operating Rooms.

Supplies may be bar-coded or may utilize a more recent technology involving radio-frequency identification (RFID) chips. Both systems are designed to monitor use of supplies and to allow computerized reorder to maintain the appropriate inventory. In addition, scanning the bar code (or tracking supplies with RFID chips) provides a more complete system for charging for supplies used during a surgical procedure. It also expedites the removal of stored items in the Operating Room when their shelf life has expired.

Case Carts

Case carts are used to bring sterile materials and instruments from SPD to the Operating Room. A typical case cart contains specific items required for each specific case, including all required surgical instruments and other supplies. On some occasions, more complicated procedures require several case carts. Some case carts may remain in the Operating Room during the procedure. After the operation is completed, all the case carts and used supplies are removed from the room via the semi-restricted corridor.

On-Site Sterilization

Sterilizers for flash sterilization of instruments should be located as close as possible to the Operating Rooms, preferably in a shared space adjacent to the Operating Rooms with immediate access from the semi-restricted corridor for service. Surgical instruments needing flash sterilization are carried by the circulator in a tray from the Operating Room, through the semi-restricted corridor, into the Sterilizing/Decontamination Room, and then returned to the Operating Room. Sterilizers may be steam, electric or plasma. A minimum of two Sub Sterile Rooms with on-site sterilizers should be provided in each core of a Surgical Suite. A minimum of 3'-8"(1.1 meters) door width should be provided to the on-site sterilization area to accommodate equipment movement in and out of the room.

Scrub Alcoves

There are two alternative locations for scrub sink alcoves. In the alternative most typically seen in existing VA surgical suites, the scrub sink alcoves are located within the clean core. The appropriately attired staff exits the staff lockers/lounge directly into the clean core, use the scrub sinks, and then enter the Operating Room. In the other alternative, the scrub sink alcoves are located in the semi-restricted corridor. This alternative reduces traffic through the clean core and is the current industry standard. As ties to Medical Schools increase and more surgical residents are trained at the VA, the preferred arrangement for new Surgical Suites should reflect the current industry standard.

All surgical team members must thoroughly wash (scrub) their hands prior to each surgical intervention. It is desirable to have at least one scrub sink adjacent to the Operating Room, with an observation window above it, so that at least one member of the surgical team can monitor the patient and the general status of the Operating Room prior to entering the room. Transfer of the patient to the operating table and induction of anesthesia takes place while the surgical team scrubs for the operation.

Even though the use of alcohol gels is taking the place of traditional scrubbing at surgical scrub sinks, scrub sinks are still required since some surgical staff members are allergic to the gels.

Provide laser shades at all window openings into all Operating Rooms. This includes the scrub area and all observation windows in Operating Room doors and Control Rooms.

HVAC System in the Operating Room

This Design Guide continues to recommend 100 % outside air for Surgical HVAC systems. Air change CFM requirements are increased to a minimum of 20 air changes per hour. This increase reflects the fact that a minimum of 20 air changes are necessary in modern surgical rooms to handle the generated cooling load.

VA experience, based on historical data collection of surgical performance measures, demonstrates the VA systems and practices provide outcomes equivalent to the best in the industry. The VA ventilation system provides equivalent performance to the system recommended by the American Society of Heating, Refrigerating & Air-Conditioning Engineers (ASHRAE) standard which is more commonly used. The ASHRAE system requires a minimum of 5 air changes of outside air, 20 air changes of recirculated air, for a minimum total of 25 total air changes in the surgical room. It is recognized that design guides should be tools for discussion for architects, engineers, designers and health care professionals to use in fashioning facilities to best meet local needs, under the umbrella of providing the best environment possible for Veterans' health care. Therefore, VA is expanding its data collection on surgical infection rates and energy usage. Until such time as further study leads to revision of current VA standards, the 100 % outside air requirement remains in effect.

Supply Air: In addition to keeping the remaining Operating Room as clean as possible, the air supply system must be designed to minimize the entrance of airborne bacteria into the sterile field as well as the area occupied by the anesthesiology staff. This is accomplished by washing these areas with a vertical column of slow moving sterile air emanating from a supply air plenum directly above the operating table. In addition to this plenum, a surrounding array of slot diffusers is adjusted to direct the air at an outward angle toward the perimeter of the Operating Room. A pseudo-laminar flow system is the desired result.

It is highly desirable to identify the supply air zone described above by installing a patch of flooring material that is a different color from the rest of the room. This patch should be located in the center of the Operating Room by aligning it with the slot diffusers above. This will indicate the sterile field.

Air supplied to the Operating Room as mentioned above is supplemented with additional clean air entering the Operating Room from the clean core. Operating Rooms and Clean Corridors shall both be maintained under positive pressure.

Exhaust Air/Return Air: During an operation, all of the space from the floor itself to a distance 15" (380 mm) above is considered contaminated. Therefore, all exhaust/return grilles must be positioned low on the wall approximately 18" (460 mm) above floor. The Operating Room exhaust system should include a minimum of two low exhaust/return air grills located in opposite corners to minimize recirculation of contaminated air within the Operating Room.

Power Requirements

As many as possible of the 110 volt outlets for equipment should be mounted on articulating columns. This will minimize tripping hazards at the floor of the operating room. A set of three dedicated 110-volt electrical outlets should also be placed at the center of each wall of the operating room at 18" above the floor. All electrical outlets in the operating room should be on dedicated circuits and powered from the nearest isolated power panel mounted in two opposite corners of the room. Due to the increasing use of lasers, it is very important that one 208-volt outlet is provided in each OR. The overall design of the power distribution system must accommodate the use of lasers in all operating rooms at the same time.

Communication Systems in the Operating Room

Intercom, telephone and computer systems are all required in the operating rooms. In addition, a "code blue" system is required in the event of a cardiac arrest summoning designated staff to the OR from other areas of the hospital. It is highly desirable for the articulating utility column serving the anesthesia machine to have a telephone mounted on it since the anesthesia staff cannot leave the head of the table. This will allow him/her to summon assistance from the chief anesthesiologist when required or to request a replacement when a break is needed.

Gurney Alcove

Surgical patients are brought into the operating room on a gurney or on a combination gurney/recovery room bed. In some cases such as eye surgery, a recovery bed is used instead of a standard operating table for the procedure. Normally, the patient is transferred to the operating table in the room and the gurney is removed from the OR. An alcove should be provided directly outside the operating room in the semi-restricted corridor where the vehicle is parked during the procedure. After surgery, the patient is placed back on the gurney and moved to the Recovery Area. The patient may be transferred to a hospital bed at this point. There are occasions when a patient is transferred directly from the operating room onto a hospital bed and taken directly to the Surgical Intensive Care Unit. The gurney alcove outside each OR should be large enough to accommodate a standard hospital bed in its maximum configuration with IV poles, etc. attached. For this reason the alcove should measure 4'-0" (1.2 meters) wide by 10'-0" (3.04 meters) long.

Housekeeping Aids Closet (HAC)

Operating rooms are thoroughly cleaned at the end of each surgical day. The room also must be cleaned between each case.

Dedicated housekeeping closets are required in the main areas of the surgical suite. This requirement is based upon differing levels of asepsis in these main areas. One HAC is located in the Clean Core and is used only for cleaning that area. One HAC is accessed from the semi-restricted corridor. It is used for cleaning all of the operating rooms and balance of the Surgical Suite. One HAC is located in the PACU.

Doors

The entrance from the semi-restricted corridor, from which patients are moved in and out of the operating room, should be at least 6'-0" (1.82 meters) wide with a pair of doors, each measuring 3'-0" (.914 meter) wide, or set of doors with one leaf of 4'-0" (1.21 meters) and the other 2'-0" (.6 meter) wide. It is important that the corridor doors are located in such a way as to permit the bed or gurney to move as directly as possible from the corridor to the side of the operating room table. For this reason, these doors are best located toward the foot of the operating table away from the anesthesia equipment. If lead lining in the walls of any/or each of the operating rooms is required by a qualified physicist, then it is mandatory that the doors into these rooms have automatic door openers. Automatic doors must be swinging doors operated by push plates. For doors between the Clean Core and the operating rooms, a double acting door, 3'-8" (1.17 meters) wide, is required.

Radiographic Equipment

Cardiovascular and Neurosurgery Operating Rooms may have fixed radiographic equipment installed within the room. Orthopedic and other operating rooms may use mobile x-ray machines including both sheet film and C-arm units. When not in use in the operating rooms, they are usually stored in alcoves in the semi-restricted corridor so they can be efficiently moved in and out of the operating rooms. Image intensification is utilized in fluoroscopic procedures and is provided by ceiling mounted or cart mounted video monitors.

Plaster and Splint Room

A storage area for orthopedic equipment is directly accessible from the Orthopedic Operating Room. This room provides storage for expendable cast and splint equipment, as well as for some of the special equipment required for attachment to the orthopedic operating room table. In addition, this serves as a preparation and workroom for the mixing of plaster. A stainless steel counter and sink is required with a plaster trap below the sink.

Heart/Lung Bypass Machine Room

In cardiovascular surgery, the patient's blood may have to bypass the heart to permit the surgeons to perform the required procedure. The blood supply bypasses the heart, circulates through a mechanical pump (called the heart/lung machine) and then returns oxygenated blood to the patient. The heart lung machine is stored in the Heart Lung Prep Room adjacent to and directly accessible from the Cardiac Operating Room. Particular attention should be given to the width of the doorway so the Heart/Lung machine will fit through it.

Accessory supplies required for bypass procedures also are stored in the Heart/Lung Prep Room. The room is sufficiently large to allow breakdown, essential cleanup and storage of parts, and to accommodate at least two heart/lung machines, one of which provides back up function in case of mechanical failure of the other machine. Clean bypass machines are transported to the Cardiovascular Operating Room via the Clean Core. Soiled bypass machines are moved from the Cardiovascular Operating Room to the Heart Lung Prep Room where they are cleaned.