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Textbook on Operation Theater Nursing



Foreword
BC Bhagavan

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Operation Theater Environment

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GLOSSARY

- **Anesthesia supply room:** As the name suggests, the anesthesia supply room is a place where all equipment needed by the anesthesiologists are stored. Anesthesia machines, hoses, catheters, airway devices and other equipments are located in this area.
- **Equipment room:** The equipment room is used to store large apparatus such as the operating microscope, image intensifier and laser machine.
- **Housekeeping supply room:** The housekeeping supply room is the area where supplies used to decontaminate the surgical suites and those used in general operating room cleanup are stored.
- **Ostomy:** Constructing an artificial opening into an organ, e.g. gastrostomy (makes an opening from the stomach onto the surface of the abdomen).
- **Otomy:** Incising or dividing a structure, e.g. laparotomy (incising and opening the abdomen), tenotomy (dividing a tendon).
- **Postanesthesia care unit (PACU):** The postanesthesia care unit is located immediately adjacent to the operating room and is supervised by that departmental head nurse and administrative personnel. Patients are taken to the PACU immediately following surgery so that they can be continuously monitored, while emerging from general or light anesthesia.
- **Scrub sink area:** Scrub sink areas are found in various locations close to the operating suites. Caps, masks, antiseptic soap, scrub brushes and eyeglass defogging agents are located at each scrub station.
- **Sterile supply room:** The sterile supply room is a clean area and houses all sterilized and packaged instruments and the supplies that are needed for surgery.
- **Substerile rooms:** Substerile rooms are located between one or more operating suites. These rooms typically contain a refrigerator for small tissue grafts, medications and solutions.

INTRODUCTION

An operation theater (OT) complex is the 'heart' of any major surgical hospital. An OT, operating room (OR), surgery suite or a surgery center is a room within a hospital within which surgical and other operations are carried out. Operating theaters were so-called in the United Kingdom because, they traditionally consisted of semicircular amphitheaters to allow students to observe the medical procedures. The Old Operating Theatre in London is one of the oldest, dating back to 1822 (Oxford English Dictionary and Wikipedia).

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☛ SAFETY ENVIRONMENT IN OPERATION THEATER

The environment of OT must be free from any microorganism. It should provide safe and comfortable environment for the patient as well as theater personnel:

1. It should be away from the other areas.
2. The floor should have a smooth surface for easy washing and cleaning.
3. Any wire running across the floor should be avoided.
4. It should be in noise-free place.
5. Movement of staff in the OT must be kept to a minimum.
6. To maintain the sterilization of OT, it should be kept closed.

☛ PRINCIPLES OF OPERATION THEATER

1. Air conditioning is a must to have a filtered, continuous flow of air.
2. Doors and windows should be kept closed as much as possible.
3. Ward nurse should handover the patient to theater nurse with all details, case sheets, tags, site and side of surgery, blood to be transfused, premedication details. While shifting the patient, ward nurse must take care of the airway and intravenous (IV) line of the patient; must keep tongue depressor, swabs, airway in the trolley.
4. Patient should be shifted to theater always in a trolley. Patient should remove all jewelries and wear theater gowns, cap and feet covers.
5. Patient must be transferred from ward trolley to theater trolley, which should have modern accessories like oxygen, side guards, drip stand, oxygen masks, pulse oximeter placing area, tiltable couch, etc.
6. Patient's trolley and ward blankets should not be taken inside the OT.
7. Initially, patient should be kept in preoperative room and later should be shifted to theater. Anesthetist and surgeon, and also theater nurse should accompany the patient.
8. Theater nurse should confirm the consent form, case sheets, site and side of the surgery, etc.
9. Separate theater shoes should be worn by surgeons, anesthetists, theater nurses and assistants.
10. Unnecessary movements, talking loudly, laughing, commenting should be avoided; as patient may be awake, especially when spinal anesthesia is given.
11. All persons entering the theater should wear theater dress (pant and shirt), cap, mask, footwear or shoes (shoes are ideal). Material for dress should be smooth, non-woven fabric, which is easily boilable. Cap should cover and conceal hair, fully.
12. Clothes, dresses should be washed, cleaned, ironed and kept ready every day. Fresh, clean, cotton blanket should be used to the patient in theater.
13. Ideally all mobile phones should be switched off inside the theater.
14. Any public person or relative of the patient should not be allowed inside the theater. Selected people may be allowed only by prior permission from Medical Director of the hospital and from operating surgeon.
15. One senior nurse is made in charge of all activities in the theater like shifting patients, arranging theater tables, autoclave and other sterilization methods, cleaning the instruments, packing the instruments for autoclave, etc. She decides the duties of her junior nurses and makes a list of nurses for that day's surgical scrubbing. Operation theater assistants and technicians are also under her supervision and should follow her instructions strictly. She should be answerable for any default and problems in the theater occurred or created by her fellow nurses and theater boys.
16. Scrub nurse is the one, who washes to assist the surgeon, arranges the instrument table and gives instruments to surgeon during procedure. She should be well aware of the steps of surgery and instruments required. She should be alert, quick and understandable.
17. One nurse in each theater works as a circulating nurse, who provides additional instruments required during surgical procedure. She also takes care of the counting of the surgical mops and swabs used. Used mops or swabs should be kept hanging in mop rack or swab rack, which should be visible to the operating team. Name, procedure and number of mops collected and used should be written on a blackboard. Scrub

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nurse and circulating nurse are fully in charge and responsible for swab counts. She also will be legally questioned and penalized along with the surgeon, if there is negligence in mop counts.

18. Theater nurse and OT assistant should accompany the patient, while handing over to postoperative nurse from OT.
19. Patient should be shifted outside the OT, once anesthetist confirms the fitness for shift. It is the anesthetist who decides when to shift, how to shift and how long the patient should be in the postoperative ward.

☛ DESIGNING OF OPERATION THEATER

Designing of an OT complex is a major exercise and is mainly intended to benefit the patient. The need for safety, convenience and economy will guide the planning of a modern OT complex, whatever the size, number or the specialty. The patient is the center point of a functioning OT complex. He/she is in isolation for varying times, away from his/her near and dear ones and is physically sick. Efforts are directed to maintain vital functions, prevent infections/promote healing with safety, comfort and economy.

The establishment and working of the OT needs specialized planning and execution, and is not a simple civil engineering work. A 'civil-mechanical-electrical-electronic-biomedical' combo effort driven and coordinated by the needs, preferences and safety of the medical/surgical team forms the basis for starting and maintaining an operation theater.

Anesthesiologists, by virtue of their knowledge of the intricacies of physiology, physics and biomedical aspects of medicine and constant proximity to the OT should preferably be involved from the early stages of planning of OTs.

☛ PURPOSE OF OPERATION THEATER

Operation theater complexes are designed and built to carry out investigative, diagnostic, therapeutic and palliative procedures of varying degrees of invasiveness. Many such setups are customized to the requirements based on size of hospital, patient turnover and may be specialty specific. The aim is to provide the maximum benefit for maximum number of patients arriving to the OT. Both the present as well as future needs should be kept in mind, while planning.

☛ ZONES OF OPERATION THEATER

The location and flow of the patients, the staff and the materials form the three broad groups to be considered during all stages of design. Four zones can be described in an OT complex, based on varying degrees of cleanliness, in which the bacteriological count progressively diminishes from the outer to the inner zones (operating area), and is maintained by a differential decreasing positive pressure ventilation gradient from the inner zone to the outer zone:

1. **Protective zone:** It includes:
   a. Change rooms for all medical and paramedical staff with conveniences.
   b. Transfer bay for patient, material and equipments.
   c. Rooms for administrative staff.
   d. Stores and records.
   e. Preoperative and postoperative rooms.
   f. Intensive care unit (ICU) and PACU.
   g. Sterile stores.
2. **Clean zone:** Connects protective zone to aseptic zone and has other areas also like:
   a. Stores and cleaner room.
   b. Equipment store room.
   c. Maintenance workshop.
   d. Kitchenette (pantry).
   e. Firefighting device room.
   f. Emergency exits.
   g. Service room for staff.
   h. Closed-circuit television (TV) control area.
3. **Aseptic zone:** Includes operation rooms (sterile).
4. **Disposal zone:** Disposal areas from each operating room and corridor lead to disposal zone.

Subareas (Excluding Operation Theater Place)

Preoperative Check in Area Reception

Preoperative check is important with respect to maintaining privacy, for changing from street clothes to gown and to provide lockers and lavatories for staff.

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Holding Area

Holding area is planned for IV line insertion, preparation, catheter/gastric tube insertion, connection of monitors and shall have O_2 and suction lines. Facility for cardiopulmonary resuscitation (CPR) should be available in this area.

Induction Room (Anesthetic Room)

Induction room should have all facilities as in OT, but there is controversy as to its need. One for each OT is required; ideally each is a duplicate of the other in each floor. The anesthetic room will provide a more tranquil atmosphere to the patient than the OT. It should provide space for anesthetic trolleys and equipment, and should be located with direct access to circulation corridors and ready access to the operating room. It should also allow cleaning, testing and storing of anesthesia equipment. It should contain work benches, sink(s). It should have sufficient power outlets and medical gas panels for testing of equipment.

Postanesthesia Care Unit

The unit is preferably adjacent to the recovery room. These should contain a medication station, hand washing station, nurse station, storage space for stretchers, supplies and monitors/equipment and gas suction outlets and ventilator. Additionally 80 square feet (7.43 m^2) for each patient bed, clearance of 5 feet (1.5 m) between beds and 4 feet (1.22 m) between patient bed sides and adjacent walls, should be planned.

Staff Room

Men and women change dress from street cloth to OT attire; lockers and lavatory are essential; restroom, TV, etc. are desirable.

Sanitary Facility for Staff

One wash basin and one Western closet (WC) should be provided for 8–10 persons. Showers and their number is a matter of local decision. Inclusion of toilet facilities in changing rooms is not acceptable; they should be located in an adjacent space.

Anesthesia Gas/Cylinder Manifold Room/Storage Area

A definite area has to be designated. It should be in a cool, clean room that is constructed of fire resistant materials. Conductive flooring must be present, but is not required if non-inflammable gases are stored. Adequate ventilation to allow leaking gases to escape, safety labels and separate places for empty and full cylinders are to be allocated.

Offices for Staff Nurse and Anesthesia Staff

The office should allow access to both unrestricted and semi-restricted areas, as frequent communication with public is needed.

Restrooms

Pleasant and quiet rest for staff should be arranged either as one large room for all grades of staff or as separate rooms; both have merits. Comfortable chairs, one writing table, a book case, etc. may be arranged.

Laboratory

A small laboratory with refrigerator should be arranged for pathologist.

Seminar Room

Since staff cannot leave an OT complex easily, it is better to have a seminar room within the OT complex. Intradepartmental discussions, teaching and training sessions for staff (with audiovisual aids) may be conducted here.

Store Room

Store room is designed to store large, but less-frequently used equipment in the OT. There should be storage space for special equipment after cleaning.

Theater Sterile Supply Unit

Within this area, following are desirable:

1. Temperature between 180°C and 22°C, humidity of 40%–50% is the aim.
2. Air conditioned with 10°C–12°C air exchanges per hour.

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3. Storage of sterile drapes, sponges, gloves, gowns and other items ready to use.
4. Option to store in from one side and remove from other side.
5. Proper inventory to prevent running out of stock.

Scrub Room

Scrub room is planned to be built within the restricted area. Elbow-operated or infrared sensor-operated taps/water source is ideal. It is essential to have non-slippery flooring in this area.

☛ OPERATION THEATER SETUP

1. Floor of OT should be mopped up with 1% hypochlorite solution.
2. OT should be near to surgical wards and the main lifts or ramp.
3. It should be within easy access of the trauma and emergency ward and radiology department.
4. OT should have a double door entrance and double door exit into the clean corridor.
5. There should be a separate store for OT to keep sutures, dressings, needles and other articles used in surgery.
6. There should be a separate space to keep the dirty drapes, linen, instruments and waste products, at the end of the procedure.
7. All the doors should be well sealed for proper fumigation of OT.
8. OT must have an adequate power points, emergency electricity, piped gases, etc.
9. Cardiac resuscitation equipment (DC-shock, defibrillator) must be readily available.
10. The temperature should range between 19°C and 22°C with humidity of 45%–55%.
11. OT table should be adjustable with all the working parts and compatible to C-arm.
12. Cushion of OT table should be easy to clean and in good repair.
13. There should be ceiling light and should be adjustable, sealed and cleaned with a facility of light handles, so that surgeon and scrub team can adjust it (Fig. 3.1).

Scrub Room

1. Scrub room should open into the OT with two doors; one leading to OT and one to the corridor.
2. Sink with taps can be manipulated with the elbow, and soap holders can be manipulated by foot pedals or by elbow.
3. There must be brushes for cleaning finger nails.
4. Removal of personal clothing: Remove clothes and wear gown or OT dress in changing room.

☛ TYPES OF OPERATION THEATER

There are three main categories of operating theaters:

1. The single theater suite with OT, scrub-up and gowning, anesthesia room, trolley preparation, utility and exit bay plus staff change and limited ancillary accommodation.
2. The twin theaters suite with facilities similar to, but with duplicated ancillary accommodation immediate to each OT, sometimes sharing a small postanesthesia recovery area.
3. OT complexes of three or more OTs, with ancillary accommodation including postanesthesia recovery, reception, porter's desk, sterile store and staff change.

☛ PHYSICAL/ARCHITECTURAL PRINCIPLES IN PLANNING AN OT

Location

Low rise buildings limited to two or three stories high are preferred because of maximum advantage of natural light and ventilation as appropriate can be derived. The OT should be separate from general 'traffic' and air movement of rest of the hospital, OT, surgical wards, ICU, accident and emergency department (A and E), radiological department (X-ray) should be closely related, and access is also required to sterilizing and disinfecting unit (SDU) and laboratory facilities. The location of the operation complex in a multistory building is planned on the first floor, connecting to surgical and other wards on the same floor. Adequate electric lift is planned for vertical movement from casualty on the ground floor and ENT, orthopedics, ophthalmology and other wards on the floors above:

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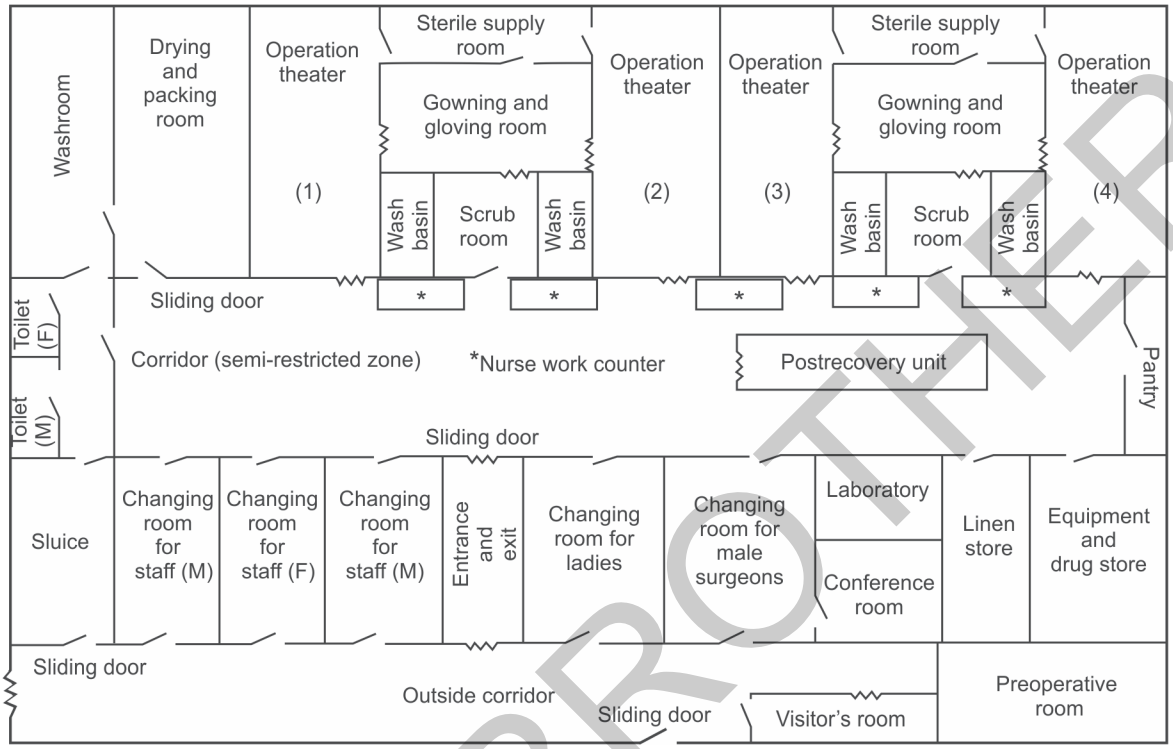

Fig. 3.1: Operation theater setup

1. Zone wise distribution of the area, so as to avoid crisscross movements of men and machines.
2. Adequate and appropriate space allotted as per utility of the area.
3. Provision for emergency exit.
4. Provision for ventilation, temperature control, keeping in mind the need for laminar flow, high-efficiency, particulate air (HEPA) filter air conditioner, etc.

Operation Rooms

The number and size can be as per the requirement, but recommended size is 6.5 m × 6.5 m × 3.5 m. Glass windows can be planned on one side only.

Doors

Main door to the OT complex has to be of adequate width (1.2–1.5 m). The doors of each OT should be spring-loaded flap type, but sliding doors are preferred as no air currents are generated. All fittings in OT should be flush type and made of steel.

The surface/flooring must be slip resistant, strong and impervious with minimum joints (e.g. mosaic with copper plates for antistatic effect) or joint less conductive tiles/terrazzo, linoleum, etc. The recommended minimum conductivity is 1 μS/m and maximum is 10 μS/m.

Presently, the need for antistatic flooring has diminished; as the flammable anesthetic agents are no longer in use.

Walls

Laminated polyester or smooth paint provides seamless wall; tiles can break and epoxy paint can chip out. Collusion corners to be covered with steel or aluminum plates, color of paint should allow reflection of light and yet soothing to eyes. Light color (light blue or green) washable paint will be ideal. A semi-matt wall surface reflects less light than a highly gloss finish and is less tiring to the eyes of OT team.

Operation Table

One operation table per OT (Fig. 3.2).

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Fig. 3.2: OT table setup in the operation theater

Electric Point

Adequate electric points on the wall (at < 1.5 m height from the floor) will be discussed later.

X-ray Illuminators

There should be X-ray film illuminators preferably recessed into the wall.

Scrub Area

Scrub area has to be planned for at least two to three persons in each OT as given below:

1. There has to be a preparation room in clean zone.
2. Corridors not less than 2.85 m width for easy movement of men, stretcher and machines.
3. Separate corridors for uses other than going into OT.
4. Rooms for different persons working in OT and for different purpose (it should be as per zone and size).
5. Gas and suction (control, supply and emergency stock) for all OTs and areas, where patients are retained. Oxygen, gas and suction pipe to be connected with central facility and standby local facility should also be available.
6. Provision for adequate and continuous water supply: Besides normal supply of available water at the rate of 400 liters per bed per day, a separate reserve emergency over-head tank should be provided for OT. Elbow taps have to be 10 cm above wash basins.
7. Proper drainage system.
8. Preoperative area with reception, with separate designated area for pediatric patients, is desirable.
9. Adequate illumination with shadowless lamps of 70,000–120,000 lumens intensity for assessing patient color and tissue visibility.
10. The safety in working place is essential and fire extinguishers have to be planned in appropriate zone.
11. Provision for expansion of the OT complex should be borne in mind during planning stages itself.

Recommendations on the number of OTs required, it is observed that out of all surgical beds of the hospital, 50% of patients are expected to undergo surgery. Thus for 100 beds, with average length of stay of 10 days for each patient, 10 operations per day can be performed.

VENTILATION IN OPERATION THEATER

Ventilation should be on the principle that the direction of air flow is from the OT toward the main entrance. There should be no interchange of air movement between one OT and another. Efficient ventilation will control temperature and humidity in OT, dilute the contamination by microorganisms and anesthetic agents. There are two types of air conditioning systems: recirculating and non-recirculating.

Non-recirculating systems heat/cool the air as desired and convey it into the operating room with ideally 20 air exchange per hour. Air is then exhausted to outside. Anesthetic agents in the OT air are also automatically removed. These are thus ideal, but are expensive.

The circulating system takes some or all of the air, adjusts the temperature and circulates air back to the room.

Broad Recommendations

1. Around 20–30 air exchanges per hour for recirculated air.
2. Only up to 80% recirculation of air to prevent buildup of anesthetic and other gases.
3. Ultraclean laminar air flow: The filtered air delivery must be 90% efficient in removing particles more than 0.5 mm.

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4. Positive air pressure system in OT: It should ensure a positive pressure of 5 cm H_2O from ceiling of OT downwards and outwards, to push out air from OT.
5. Relative humidity of 40%–60% to be maintained.
6. Temperature between 200°C and 240°C, temperature should not be adjusted for the comfort of OT personnel, but for the requirement of patient, especially in pediatric, geriatric, burns, neonatal cases, etc.

Pendant Services

Two ceiling pendants for pipeline services should be designed; one for surgical team and one for anesthetist.

Anesthetic pendant should be retractable and have limited lateral movement and provide a shelf for monitoring equipment. It should have oxygen, nitrous oxide, four bar pressure medical compressed air, medical vacuum, scavenging terminal outlets and at least four electric sockets.

Piped Gases in the OT

1. Automatic/semi-automatic fail safe manifold room to be designed.
2. Two outlets for O_2 and suction, and one for N_2O are a minimum in each OT.
3. Pipeline supply system should be able to cut off from mainline if the problem occurs anywhere along the delivery hosing/tubing.

Scavenging

The method of scavenging should be decided during planning stage of OT. States United/International Standards are available for scavenging, but it is ideal to plan the type of system (active/passive) and number and location of scavenging outlets beforehand.

☛ ELECTRICAL SUPPLY IN OPERATION THEATER

All electrical equipments in the OT need proper grounding. In the past, isolated power systems were preferred when explosive agents were being used. They have the advantage of a transformer using grounded electricity and there is no risk to the patient or machines, if a machine gets faulty.

The grounded systems, as used at homes, offer protection from macroshock, but devices may lose power without warning. Life support systems, if in use, could be disturbed.

Following criteria are ideal with respect to electricity in OT complex:

1. Use of circuit breakers/interrupters is desirable if there is an overload or ground fault.
2. Power line of 220 volts.
3. Suspended ceiling outlets should have locking plugs to avoid accidental disconnection.
4. Insulation around ceiling electrical power sources should withstand frequent bending and flexing. They should not develop cracks and should not damage wires. Wires inside rigid or retractable ceiling service column can help to some extent.
5. Wall outlets to be installed 1.5 m above ground (as already mentioned).
6. Use of explosion-proof plugs.
7. Multiple outlets from different electrical line sources should be available.
8. Electrical load calculation should be based on equipments likely to be used and appropriate current carrying capacity cords to be used.
9. Emergency power: OT electrical networks need to be connected to the emergency generators with automatic two-way changeover facility.

☛ LIGHTING IN OPERATION THEATER

Some natural daylight is preferred by staff, where possible, high level windows, which give a visual appreciation of the 'outside world', can be considered in the OT.

General Lighting

Color-corrected fluorescent lamps (recessed or surface ceiling mounted) to produce even illumination of at least 500 lux at working height, with minimal glare are preferred. Means of dimming may be needed during endoscopies. To minimize eye fatigue, the ratio of intensity of general room lighting to that at the surgical site should not exceed 1:5, preferably 1:3. This contrast should be maintained in corridors and scrub areas, as well as in the room itself, so that the

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surgeon becomes accustomed to the light before entering the sterile field. Color and hue of the lights also should be consistent:

1. About 2,000 lux light is needed to assess the patient's color.
2. White and glistening/shiny body tissues need less light than dark and dull tissues.

Operating Area

Overhead light should be shadowless and give 25,000–125,000 lux of light (50,000–100,000 lux at the center and at least 15,000 lux at the periphery):

1. About 10–12 inches of focus of light gives adequate illumination both at depth as well as surface of body.
2. Lights should be freely movable both in horizontal and vertical ranges. Pendant systems are preferred. OT light should produce blue white color of daylight at spectral energy range of 50,000 K (35,000–67,000 K acceptable).
3. Halogen lights produce less heat and hence preferred. OT light should not produce more than 25,000 mW/cm^2 of radiant energy. Elimination of heat by dichroic reflectors (cold mirrors) with heat absorbing reflectors or filters should be available along with the luminaire.
4. An auxiliary light for a second surgical site is often beneficial.
5. Uninterruptible power supply (UPS) of adequate capacity to be installed after considering OT light, anesthesia machine, monitors, cautery, etc. until the backup generator takes over.
6. In endoscopic OTs, a reduced lighting is sometimes recommended. A grazing light over the floor can be helpful.

ANESTHETIC EQUIPMENTS AND MONITORING NEEDS

At least one anesthesiologist should be in the team involved in planning an OT. It is imperative that certain mandatory considerations with respect to the anesthetic equipment and monitors be planned during the planning and design stage itself. Personal practice and cost preferences may influence the plans.

Communications

Telephones, intercom and code warning signals are desirable inside the OT. One phone per OT and one exclusively for use of anesthesia personnel is desirable. Intercom to connect to control desk, pathology and other OTs as well as use of paging receivers (beeps) is also ideal. A code signal, when activated, signals an emergency state such as cardiac arrest or need for immediate assistance.

Catering

Basic services such as preparation of beverages and some snacks, use of vending machines may be planned, augmented by provision of hot and cold meals from main hospital kitchen.

Cleaning

The construction materials selected for the OT complex should aim at minimizing maintenance and cleaning costs.

Data Management

Customized network connections should be put in place or a conduit should be planned. A well-designed system can provide automated records, materials management, quality improvement and assessment, laboratory tracking, etc. The software for OT management is costly and hospitals are generally slow to adapt to changes. Customized OT software can be designed for individual needs.

Operating Theater Satellite Pharmacy

Access to the OT areas and outside should be possible. It should have a laminar flow hood, a refrigerator, space for drug storage, locked containers for controlled substances, computer, desk area for paper work and pharmaceutical literature. Special kits for specific surgeries may also be arranged. The pharmacy may open for 1–24 hours based on need, but it is desirable that an after hour system is planned.

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STATUTORY REGULATIONS

The design and planning of an OT complex will need compliance with mandatory regulations related to local administration such as Municipal Corporation, Government, Pollution Control Board, Fire Safety Department, Water supply and Drainage Department, etc.

Usual Areas of Deficiency in OTs (Existing OTs)

1. No reception area.
2. No separate rooms for surgeons, anesthesiologist, junior doctor and OT attendants.
3. Not enough number of change rooms for different class of people.
4. Inappropriate size and type of doors.
5. Lack of laminar flow and mandatory air exchange systems in OT.
6. Lack of standard OT protocol.
7. No separate central sterile supply department (CSSD).
8. Waiting area and recovery area are not well equipped and lack basic amenities.

Authority for Standardization

Recommendations are available in various surgical, anesthetic and nursing manuals with regard to the planning and establishment of OT complexes. The hospital can get accredited by the Joint Commission on Accreditation of Healthcare Organization (JCAHO), a professionally sponsored program that stimulates a high quality of patient care in healthcare facilities. There is also an accreditation option that is available for ambulatory surgery centers [Accreditation Association for Ambulatory Healthcare: (AAAH), the Department of Health and Social Security (DHSS)] in UK has publications containing information on planning for new health buildings and for upgrading existing buildings.

FUMIGATION OF OPERATION THEATER

Fumigation is a process of disinfection by exposure to the fumes of vaporized germicides. Formalin (formaldehyde) is commonly used agent to sterilize the OT and wards. It is a strong irritant to eyes, mucous membrane and skin.

That is why it is neutralized with ammonia. The exposure period is 3–6 hours. After fumigation, all the doors must be kept closed. Then it is used for the operation.

The main aim is to give a sterilized environment to the patient. By this process all the articles, which are used in OT are also sterilized.

CONCLUSION

In the present era of evidence-based medicine, it becomes imperative to give maximum importance to planning an operation theater complex. Within the limitations of finance and space, the best results can be obtained and anesthesiologist with multiple roles inside the operation theater complex should be consulted in the process. Efforts should be made to conform to the standards laid down by local bodies and international agencies, as healthcare facilities in India are now catering to more and more international clientele. However, new OTs and hospitals that are being established cannot be expected to fulfill all theoretical requirements, as new ideas are constantly being developed. By the time they are incorporated into buildings, fresh ones take their place on the drawing board.

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- Surgical interventions and procedures are well-explained, illustrated with diagrams and tables for better understanding.
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- All the chapters in this text are systematically organized; student-friendly approach is used.

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