

INTERIOR DESIGNING FOR GENERAL OPERATION THEATER

(AN ARCHITECTURAL APPROACH)

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Abstract: As per the Rural Health Statistics (RHS), India takes care of its 1.3 billion people through a health infrastructure network of a total of 25,308 Primary Health Centers (PHC's) , 5,396 Community Health Centers (CHC's) and 763 district hospital across the country.[1] According to IS Code 1984, one Operation Theater (OT) is required per 50 beds. OT is the most foremost part of the hospital. Interior designing of a General Operation Theater is a major exercise. It helps to meet the convenience to the patient's. There is a real need for safety, security, advancement, should be constructed with, proper material selection, maintain the environment, and possible modulation. This paper is about the steps taken to transform the interior of the General Operation Theater in the multi-speciality hospital and its impact in the psychology of the Doctor's, Nurse's and Patient's. It focuses on this approach and helps to add the modulation in the interior of the general OT.

Keywords: Interior Designing, Material Selection, Hospital Standards, user friendly.

Introduction:

A hospital is a health care institution providing patient treatment with specialized medical and nursing staff and medical equipment. According to World Health Statics 2014, Patient to Bed Ratio is 1000:0.5. Hospital consists of several units: Out Patient Department (O.P.D), In Patient Department (I.P.D), Operation Theater (O.T) and Intensive Care Unit (I.C.U).

1) Operation Theater is a facility with in a hospital, where surgical environment are carried out in a sterile environment. It is a heart of any hospital. It is consist of 3 zones:

A) Outermost Protective Zone : It includes changing room for patient and staff, Scrub room , mini - cafeteria, lounges, lockers rooms , conference room , control room , toilet , store room , reception and transfer of patients.

B) Inner Clean Zone : It includes Pre O.T , Post O.T , Storage area , waiting area , Central Sterile Service Department (CSSD) , plaster room, room for blood storage, mobile X-ray, dark room, staff room, anesthetic and OT sister room and work room to receive OT unsterile theatre instruments.

C) Innermost Aseptic Sterile Zone: Staff and doctors scrub here and wear gowns. The taps are three feet apart. There is an anesthetic induction room and supply room for sterile instruments. The OT set up is here. The HEPA filters maintain sterility.

2) **General OT:** This includes operation theatres for Ophthalmology, District hospital OTs, FRU OT and all other basic surgical disciplines. Day surgery is the admission of selected patients to hospital for a planned surgical procedure, returning home on the same day, would fall under the category of general OT. [2]

A) The operating table in the center of the room can be raised, lowered, and tilted in any direction.

B) The operating room lights are over the table to provide bright light, without shadows, during surgery.

C) The anesthesia machine is at the head of the operating table. This machine has tubes that connect to the patient to assist him or her in breathing during surgery, and built-in monitors that help control the mixture of gases in the breathing circuit.

- D) The anesthesia cart is next to the anesthesia machine. It contains the medications, equipment, and other supplies that the anesthesiologist may need.
- E) Sterile instruments to be used during surgery are arranged on a stainless steel table.

3) Lacking Among the Architects: [3]

- A) The AHU of each OT should be **dedicated one** and should not be linked to air conditioning of any other area for all OT constructed.
- B) Window & split A/c **should not** be used in any type of OT because they are pure re circulating units and have convenient pockets for microbial growth which cannot be sealed.
- C) The O.T should be constructed according to the standards.
- D) There should be proper linkage among the surroundings.

4) Case Study:

4.1) **APOLLO INDERAPRASTH HOSPITAL, DELHI:** It is a 650 bedded multi-speciality hospital. It has 14 no. of O.T, all are connected by 2.5mt wide corridor. Having attached C.S.S.D department, fully air- conditioned, Placed at the end of the wings, having all necessary required services.

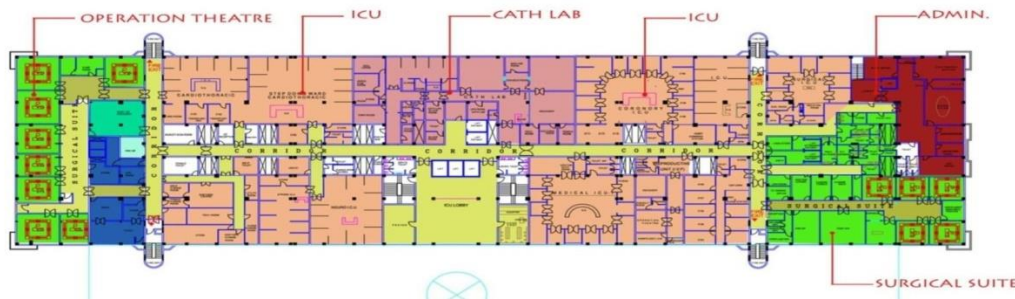


Figure 1- show OT and their surroundings.

4.2) **TEERTHANKAR MAHAVEER HOSPITAL, MORADABAD:** It is a 1000 bedded hospital. It has 8 no. of O.T, all are connected by 3mt wide corridor, having attached C.S.S.D department, placed opposite to each other, having all necessary required services.

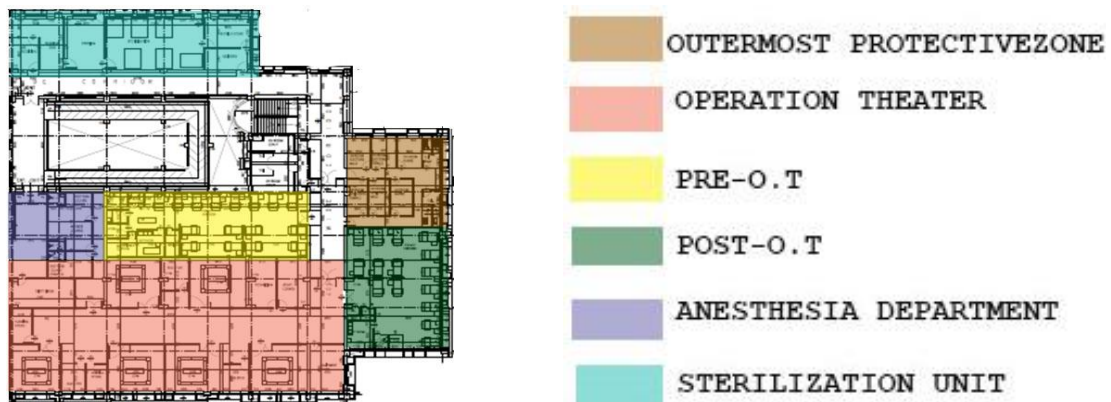


Figure 2- Showing OT and their surroundings.

5) Analysis:

Designing and Material Selection:

5.1) Flooring: The flooring should be non-porous, smooth, and flawless (without corners), and should be easily cleanable repeatedly. The flooring should be used in the O.T are -

A) Anti- Static Flooring: These are the type of floor, which safeguards an individual or equipment from an **Electro-Static Discharge (ESD)**. This type of flooring should be used in an O.T because O.T rely on heavy electronic machinery and conduct static. So, to avoid static, precautions should be taken.

Types- Vinyl tile, ESD conductive adhesive, carpet tile , Epoxy coating, mats and runners , ESD rubber flooring.

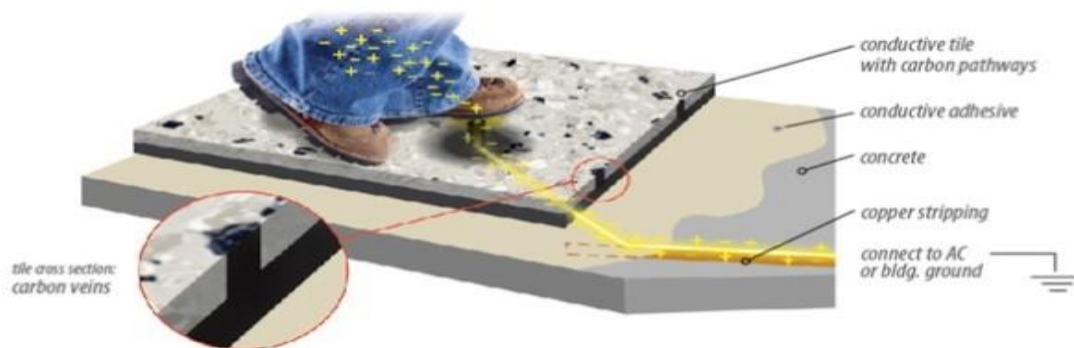


Figure 3-Flooring of O.T

5.2) Wall and Ceiling: The wall and ceiling panel can be made with-

A) 1.6mm thick EGP steel panels backed by 12mm thick Gypsum.

B) Stainless steel SS202 or SS304 panels.

C) High-pressure Laminate panels OR brick wall with antibacterial, anti-fungal paint finishing.

5.3) Door: Automatic/ Hermitically Sealed/Touch free (preferable).

These types of doors are used at the entrance of the Operation Theater, because of cleanliness and safety purpose. On the entrance Doctors can just push it with upper body and fingers will not come in the touch of the handle of door.



Figure 4- Hermitically sealed door



Figure 5- Automatic sealed door

5.4) General Lights : Clean room lights - The lights are used in the areas where high light intensity require, needs protection from moisture and dust and ensure sterility.



Figure 6- showing ceiling lights of OT.

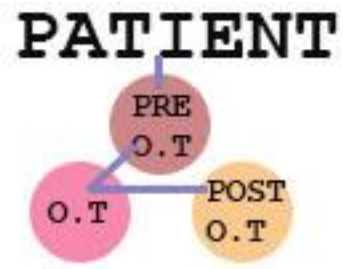
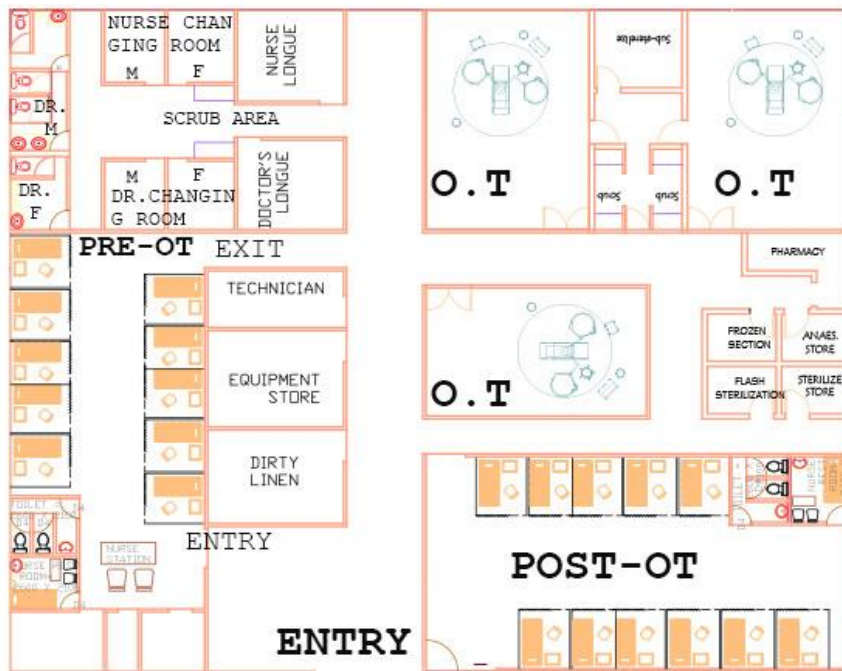
5.5) Taps: Automatic or Centara pillar cock or Automatic or Foot operated scrub sink.

These are the types of taps used in the scrub room and in the O.T. These taps are used so that hands cannot be come in contact with the handle of the tap, and for sterile purpose.



Figure 7- show Automatic Tap

5.6) TYPICAL LAYOUT:

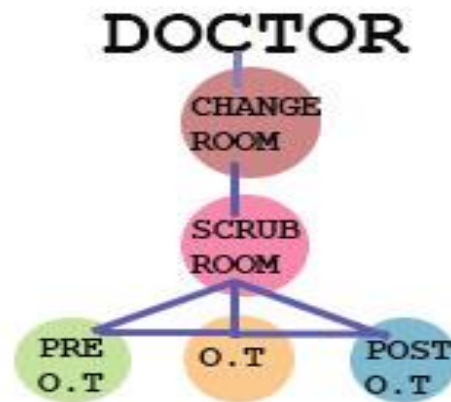


5.7) INDOOR ENVIRONMENT: [3]

A) TEMPERATURE: The temperature should be maintained at $21^{\circ}\text{C} \pm 3^{\circ}\text{C}$ inside the O.T with the **relative humidity between 20-60 %**.

B) AIR CHANGE: The total Air change per hour should be **20**, according to international guidelines. It may vary according to the location.

And the fresh air component of the air change is required to be minimum **4** air changes out of total minimum **20** air changes.



6) KEY FINDING:

- All the OT's are general.
- Blood bank, laboratories are far from OT.
- The cleanliness is not up to the mark.
- Tiles are used in OT.
- No acoustic treatment is applied in walls or ceiling.
- The temperature is not maintained.

7) SUGGESTIONS:

- OT's should be modular.
- OT should be designed by keeping in mind the surroundings. Blood bank, laboratories, intensive care unit should not be far from OT.
- Appropriate devices to monitor and display the temperature conditions inside the OT may be installed.
- Anti- static flooring should be used.
- There should be OT complexes. (This includes Pre-OT, OT, Post OT, I.C.U, scrub room, doctor's lounge, nurse lounge, and washroom).



Figure 9 - OT complex

8) CONCLUSION:

In today's world, it becomes crucial to give maximum value to planning of General Operation Theater. Within the limitation of money and space, the best result can be obtained. Attempt should be made to follow to the standards made by local bodies and international guidelines, as health care facilities in India are now regale to more and more international constituency. Although new OT's and hospital that are being constructed cannot be expected to achieve all basic theoretical requirements. So, new advancement is constantly being evolved. By the time they are integrating into buildings, modern ones take their place on the drawing board.

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