Introduction to Operation Theatre (OT)

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What is an Operation Theatre (OT)?

- An OT (also called Operating Room) is a facility within a hospital in which surgical operations are carried out.
- It is designed to maintain a sterile environment, to reduce risk of infection and to support complex surgical procedures safely.
- Modern OTs combine multiple systems: surgical equipment, anesthesia, ventilation, monitoring, staff, etc.

Why OTs are Critical

- Surgical interventions involve exposure of internal body tissues → high risk of infection.
- OT ensures controlled environmental parameters: temperature, humidity, airflow, pressure.
- Supports multidisciplinary teamwork (surgeons, anesthetists, nurses, technologists) under sterile conditions.
- Enhances patient safety and improves surgical outcomes.

Types of Operation Theatres

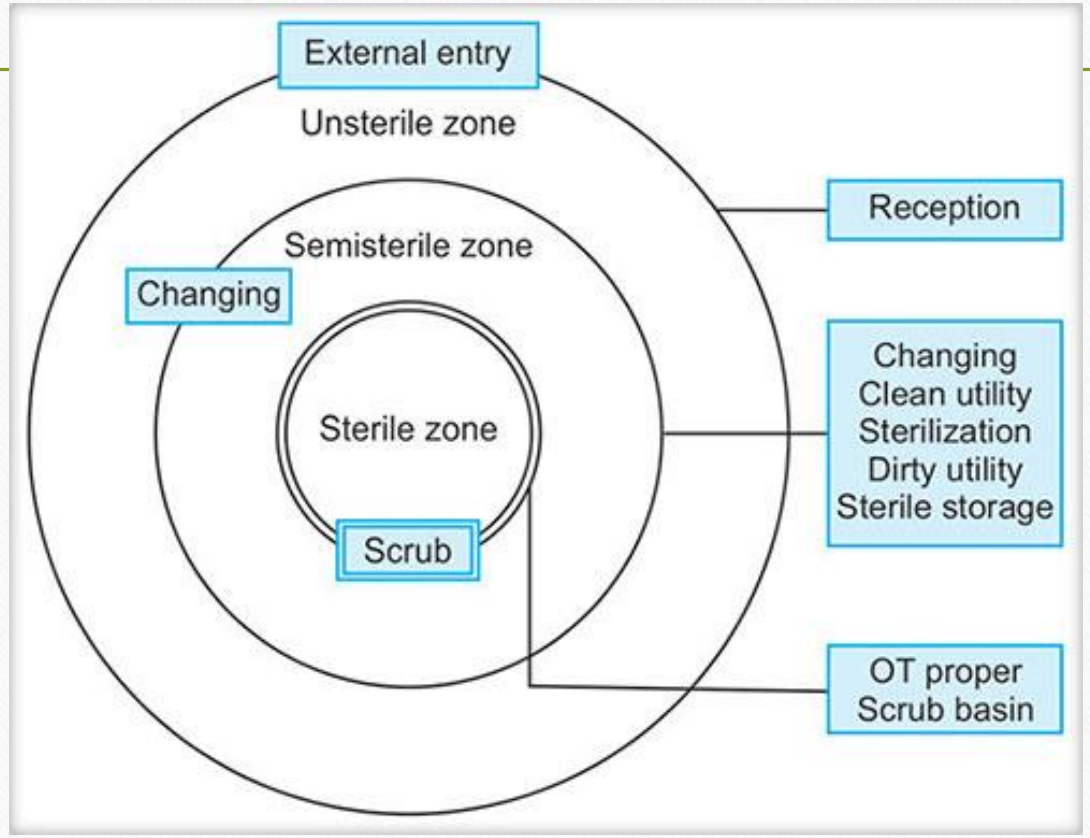
Type	Description
General OT	Used for broad, common surgical procedures (abdominal, general surgery).
Specialty OT	Designed for specific types: Cardiac, Neuro, Orthopedics, Eye, ENT etc.
Emergency OT	Available 24/7, for urgent/trauma cases that can't wait.
Minor OT	For smaller, less complex operations (minor procedures).

Layout & Zones in an OT

- **Unrestricted Zone**
- → Entry for everyone, e.g. reception, corridors; non-sterile clothing allowed.
- **Semi-Restricted Zone**
- → Staff changing rooms, scrub areas. Clean attire required.
- **Restricted Zone**
- → The OT itself; only fully scrubbed, gown-gloved personnel allowed.
- **Typical layout**
- → Central surgical table, surgical lights above, anesthesia station at head, instrument tables nearby, utility/storage areas, scrub sinks outside or adjacent.

Operating Room

Zones of Operation theatre



Environmental Controls

- **Air Handling / Ventilation**

  → HEPA filters, laminar airflow in many modern OTs; positive pressure to keep outside air out.

- **Temperature & Humidity**

  → Optimal OT temp often around 20-24 °C; humidity control to reduce condensation, microbial growth.

- **Lighting**

  → Bright overhead surgical lights, shadow-free, sometimes backup lighting systems.

- **Surface materials**

  → Walls, ceilings, floors made of easy-to-clean, non-porous, anti-microbial / anti-static materials.

Key Equipment in OT

- Surgical table (adjustable in height, tilt)
- Surgical lights (ceiling mounted, movable arms)
- Anesthesia machine + ventilator + gas supply lines (O_2, N_2CO, etc.)
- Patient monitoring devices (ECG, pulse oximeter, BP, temperature)
- Suction equipment, cautery devices, sterile instrument tables

Sterility & Aseptic Technique

- Hand hygiene / Scrubbing: Duration, technique.
- Surgical gowns, gloves, masks, caps, shoe covers: Proper donning and doffing.
- Sterilization of instruments: Autoclave, chemical sterilization, etc.
- Sterile draping of patient and instrument fields.
- Maintenance of sterile field: No breach, minimal movement, limiting doors opening.
- Air quality: Laminar flow, HEPA, positive pressure, air exchange

Safety Protocols & Procedures

- Surgical safety checklist (WHO or local hospital policy) before incision.
- Time-out: Confirm patient identity, procedure, site, consent.
- Sponge / instrument counts before and after surgery.
- Electrical safety: Cables, grounding, backup power.
- Fire safety: flammable agents (alcohol prep etc.), oxygen control, emergency protocols.
- Management of emergencies (e.g. cardiac arrest, allergic reaction) in the OT

Infection Prevention

- Routine cleaning protocols: daily & terminal cleaning after cases.
- Fumigation or UV decontamination in some settings.
- Proper waste disposal: sharps, biomedical waste.
- Antibiotic prophylaxis policies.
- Surveillance: microbial cultures, air particle counts, environmental monitoring.

Operation Theatre Team & Roles

- Surgeon: Performs the surgery.
- Anesthesiologist: Manages patient's anesthesia, vital signs.
- Scrub Nurse / Surgical Assistant: Hands instruments, maintains sterile field.
- Circulating Nurse: Supplies, documentation, non-sterile tasks, monitoring.
- OT Technician / Support Staff: Instrument prep, equipment maintenance.
- Others: Observers, trainees, sterile processing department

WHO checklist

SIGN IN

Anaesthetist and assistant
(Before induction of anaesthesia)

Patient confirmation
- Name
- Procedure
- Site marked

Allergies?

Anaesthetic safety
- Airway plan
- Antibiotics

E-issue blood available?

Stop before you block

TIME OUT

Introductions

Team: Confirm patient's
- Name
- Procedure
- Site and side
- Imaging
- Allergies

Surgeon
- Significant blood loss?

Team
- Diathermy on
- Antibiotics given
- Specimen plan
- Warming on
- VTE prophylaxis on

Anyone not happy to start?

SIGN OUT

Whole theatre team
- Procedure recorded as…
- Counts correct
- Specimens labelled
- Packs removed / labelled
- Lines flushed
- Equipment problems

Post op plan
- Specific concerns?
- VTE and antibiotic plan
- Daycase?

Challenges & Considerations

- Cost of setting up and maintaining high-spec OTs.
- Ensuring sterility consistently (human error, staff training).
- Equipment breakdown and maintenance.
- Adherence to protocol under pressure (emergency cases).
- Balancing cost-vs-benefit in resource-limited settings.

Summary

- OT is central to surgical care: infrastructure + environment + team + protocol = safe outcomes.
- Sterility, environmental controls, staff training are non-negotiable.
- Learning, Training and Implementation is the Key to Success