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DEPARTMENT OF BIOMEDICAL ENGINEERING

VII Semester

OBT357 BIOTECHNOLOGY IN HEALTH CARE

UNIT- 4 OUT PATIENT & IN-PATIENT SERVICES

4.2 Surgical units, OT Medical units, G & Obs. units

4.2.1 Surgical units

Surgical units in a hospital setting can refer to various specialized areas, including the surgical intensive care unit (SICU), surgical wards, the surgical admissions unit, and the operating room itself. These units cater to different stages of surgical care, from pre-operative assessment and admission to post-operative recovery and intensive care.

A surgical unit is composed of several areas that facilitate the entire surgical process:

1. Pre-operative Area:

This is where the patient is prepared for surgery. Staff conduct a final check of the patient's vitals, medical history, and consent forms. Anesthesiologists may also meet with the patient to discuss anesthesia plans.

Functions and Activities:

- Patient Check-in and Vitals
- Medical Review and Final Preparation
- Anesthesia Consultation
- Administering Pre-operative Medications
- Family Communication

2. Operating Room (OR):

This is the core of the surgical unit, where the actual procedure takes place. ORs are equipped with a wide range of specialized medical equipment, including:

- **Operating Table:** A flexible table that can be adjusted to position the patient for the surgery.
- **Surgical Lights:** High-intensity, shadow-free lights to provide clear visibility.
- **Anesthesia Machine:** A device that delivers and monitors the patient's anesthesia.
- **Sterile Surgical Instruments:** A wide array of tools used by the surgical team.

3. Post-anesthesia Care Unit (PACU):

Also known as the recovery room, this is where patients are taken immediately after surgery. They are monitored closely as they recover from anesthesia. The PACU team ensures their breathing, heart rate, and blood pressure are stable before they are moved to a hospital room or discharged.

Functions and Activities:

- Immediate Post-operative Monitoring
- Pain Management
- Waking Up from Anesthesia
- Discharge Criteria

4. Surgical Sterilization and Supply Area:

This area is dedicated to cleaning, sterilizing, and packaging all surgical instruments and equipment. Strict protocols are followed to prevent infection, a critical component of patient safety in any surgical unit. The functions of the unit are,

- Decontamination
- Preparation and Packaging
- Sterilization
- Sterile Storage

4.2.1.1 Outpatient Services:

Outpatient services in a surgical unit are for procedures that do not require an overnight hospital stay. Patients arrive, have their surgery, recover in the Post-Anesthesia Care Unit (PACU), and are discharged home on the same day.

- **Examples:** This model is used for minor surgeries such as cataract removal, some biopsies, hernia repair, or certain laparoscopic procedures. The surgery itself is performed in a fully equipped operating room, but because the procedure is minimally invasive and recovery is rapid, a hospital admission is not necessary.

4.2.1.2 Inpatient Services:

Inpatient services in a surgical unit are for procedures that require a patient to be formally admitted to the hospital for at least one night. This is necessary for continuous monitoring and post-operative care.

- **Examples:** This is the standard for major surgeries like open-heart surgery, joint replacements, or organ transplants. These procedures are complex and require an extended recovery period with round-the-clock nursing care, pain management, and monitoring for complications, all of which are provided within the hospital.

4.2.2 O.T. Medical Units:

"O.T." almost always stands for **Operating Theatre** or **Operating Room**. An O.T. medical unit is not a single room but rather a highly specialized, integrated department within a hospital designed for all aspects of surgical care. This unit is a complex system of interconnected areas, each with a specific function to ensure the safety, efficiency, and sterility of surgical procedures.

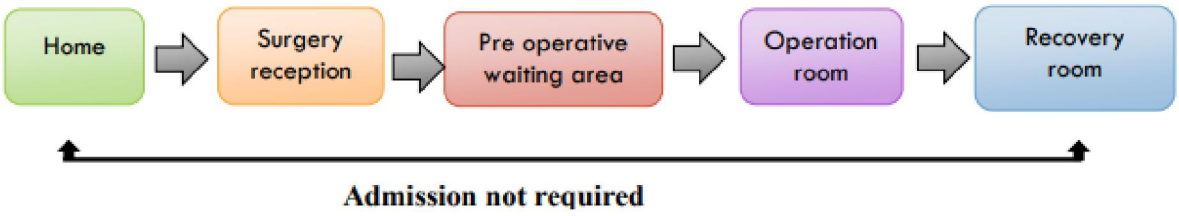
1. Pre-operative Area
2. The Operating Room (O.R.)
3. Post-Anesthesia Care Unit
4. Surgical Sterilization and Supply Area

Types:

- **Main Theaters**: For major surgeries.
- **Minor Theaters**: For less complex procedures.
- **Specialized Theaters**: For specific fields like orthopedics or neurosurgery.

4.2.2.1 Minor Operation Theatre: (Out patient -Service)

- Minor surgeries are mainly considered as outpatient procedures done on superficial tissues but not limited to requiring mostly under local anesthesia.
- Equipped with a microscope an anesthetic machine and all the other routine equipment used to operate minor eye cases, foreign body removal etc. removal of suture and diagnostic procedure such as biopsy can also be done. Minor surgery or day surgeries do not require patient admissions.
- Figure 1 shows the flow chart for day surgeries.



4.2.2.2 Major Operation Theatre:

The OT are engaged with major surgeries conducted under the use of general anesthesia. The operation theatre is well equipped with all the necessary instruments and machinery. Please follow figure 2 for patient flow movements for major surgical procedure.

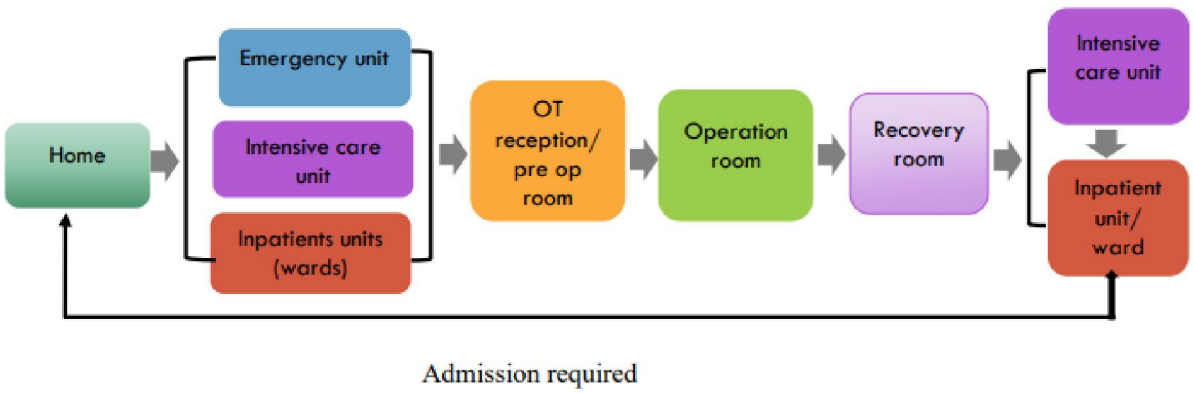


***Figure 2**: patient movement for major surgeries in theatre complex*

4.2.2.3 O.T. Medical Units in Outpatient Services:

In the context of outpatient and inpatient services, "O.T. Medical Units" most likely refers to Operating Theatre Medical Units (or operating rooms) used for surgical procedures for both outpatient (day surgery) and inpatient (requiring hospital admission) care. Below is a brief explanation of how O.T. Medical Units function in these contexts:

- Outpatient surgeries, often called day surgeries or ambulatory surgeries, are procedures where patients are ***discharged on the same day***, requiring no overnight hospital stay.
- OTs for outpatient services are equipped for minor or ***minimally invasive*** procedures, such as cataract surgery, arthroscopy, hernia repairs, or biopsies.
- These units prioritize efficiency, with quick turnover times and ***streamlined workflows*** to accommodate multiple patients daily.
- Include ***anesthesia machines*** for short-term sedation, basic surgical tools, and ***recovery areas*** (Post-Anesthesia Care Units, or PACUs) where patients are monitored briefly before discharge.
- **Patient Flow**: Patients arrive, undergo pre-op checks, have surgery in the OT, recover in the PACU, and are discharged with instructions, typically within hours.

4.2.2.4 O.T. Medical Units in Inpatient Services:

- Inpatient surgeries involve procedures where patients require hospital admission for post-operative care, often for complex or major surgeries.
- OTs for inpatient services handle **major surgeries**, such as open-heart surgery, organ transplants, or orthopedic reconstructions, requiring advanced equipment and longer operating times.
- **Features**: Include specialized tools like robotic surgical systems, advanced imaging (e.g., intraoperative MRI/CT), and comprehensive monitoring systems for complex cases.
- **Specialized OTs**: Some hospitals have dedicated theaters for specific inpatient procedures (e.g., neurosurgery or cardiac surgery) with tailored equipment.

- **Patient Flow**: Patients are admitted pre-surgery, undergo extensive pre-op preparation, have surgery in the OT, and are transferred to an inpatient ward or ICU for recovery, which may last days to weeks.

Examples in Practice:

- **Outpatient Example**: A patient undergoes a laparoscopic cholecystectomy (gallbladder removal) in an OT, recovers in the PACU for 2–4 hours, and is discharged with follow-up instructions.
- **Inpatient Example**: A patient undergoes coronary artery bypass grafting in a specialized OT, followed by recovery in the ICU and a week-long hospital stay.

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4.2.3 G & Obs. Units: (Gynecology and Obstetrics units)

- "G & Obs. units" refers to Gynecology and Obstetrics units, specialized medical departments within hospitals that provide care for women's reproductive health.
- Gynecology focuses on non-pregnant women, addressing issues like puberty, fertility, menopause, and other conditions of the reproductive organs.
- Obstetrics focuses on pregnancy and childbirth, covering prenatal care, labor, delivery, and postnatal care for mothers and their newborns, including managing high-risk pregnancies and babies.

4.2.3.1. Obstetrics Unit

Focused on pregnancy, childbirth, and the postpartum period.

- **Antenatal Care (ANC) Unit** – routine check-ups, ultrasound, counseling, and monitoring of maternal and fetal health.
- **Labor and Delivery (L&D) Unit** – facilities for normal and complicated deliveries, fetal monitoring, pain relief options, and emergency care.
- **Operation Theatre (OT)** – for Cesarean sections and high-risk obstetric surgeries.

- **Postnatal Ward** – monitoring mother and newborn after delivery.
- **High-Risk Pregnancy Unit** – management of complications like preeclampsia, gestational diabetes, placenta previa, etc.
- **Neonatal Intensive Care Unit (NICU)** (often attached) – care for premature or critically ill newborns.

4.2.3.2. Gynecology Unit:

Deals with the female reproductive system, excluding pregnancy.

- **Outpatient Clinic** – routine check-ups, diagnosis, and treatment of menstrual problems, infertility, infections, menopause issues, etc.
- **Gynecological Surgery Unit** – hysterectomy, laparoscopic surgeries, fibroid removal, ovarian cystectomy, etc.
- **Oncology Unit** – screening, diagnosis, and management of gynecological cancers (cervical, ovarian, uterine, etc.).
- **Family Planning / Contraceptive Unit** – counseling, IUD insertion, sterilization procedures.
- **Infertility & Reproductive Medicine Unit** – ovulation induction, IUI, IVF, and assisted reproductive technologies.
- **Urogynecology Unit** – management of pelvic floor disorders, urinary incontinence, and prolapse.

4.2.3.3. Combined/Support Units:

- **Ultrasound & Imaging Unit** – obstetric and gynecologic scans.
- **Emergency Unit** – for acute gynecological emergencies (ectopic pregnancy, ruptured cysts, obstetric hemorrhage, etc.).
- **Preventive & Screening Services** – Pap smear, HPV testing, breast examination.
- **Counseling & Education Unit** – prenatal classes, breastfeeding counseling, genetic counseling.

4.2.3.4 Outpatient Gynecology and Obstetrics Services:

- Outpatient services involve consultations, diagnostics, and minor procedures where patients visit the unit and return home the same day without hospital admission.
- **Services Provided**:
  - **Gynecology**:
    - ✓ Routine exams (e.g., Pap smears, pelvic exams).
    - ✓ Diagnostic procedures (e.g., colposcopy, ultrasound for ovarian cysts).
    - ✓ Minor surgeries in O.T. (e.g., hysteroscopy, D&C, tubal ligation).
    - ✓ Management of conditions like PCOS or menopausal symptoms via medication or counseling.
  - **Obstetrics**:
    - ✓ Prenatal checkups (e.g., ultrasound, blood tests, fetal heart monitoring).
    - ✓ Management of low-risk pregnancies.
    - ✓ Minor procedures (e.g., cervical cerclage for incompetent cervix).
- **O.T. Role in Outpatient Care**:
  - Dedicated OTs for minimally invasive procedures (e.g., laparoscopy for endometriosis, polypectomy).
  - Equipped with hysteroscopes, laparoscopes, ultrasound, and local/regional anesthesia systems.
  - Quick turnover with recovery in Post-Anesthesia Care Units (PACUs) for 1–4 hours.
  - Example: A patient undergoes a hysteroscopy to remove a uterine polyp, recovers briefly, and is discharged.
- **Patient Flow**:
  - Patients book appointments, receive consultations or diagnostics, undergo minor procedures if needed, and return home with follow-up plans.

- ❒ **Example**: A pregnant woman visits for a routine ultrasound, receives results, and schedules her next prenatal visit.

4.2.3.5 Inpatient Gynecology and Obstetrics Services:

- **Definition**: Inpatient services involve hospital admission for complex treatments, major surgeries, or high-risk pregnancy management, requiring overnight stays or longer.
- **Services Provided**:
  - **Gynecology**:
    - ✓ Major surgeries (e.g., hysterectomy, myomectomy, ovarian tumor removal).
    - ✓ Treatment for gynecologic cancers (e.g., staging surgeries for endometrial cancer).
    - ✓ Management of severe conditions (e.g., pelvic inflammatory disease requiring IV antibiotics).
  - **Obstetrics**:
    - ✓ Labor and delivery (vaginal births or C-sections).
    - ✓ Management of high-risk pregnancies (e.g., preeclampsia, preterm labor).
    - ✓ Postpartum care for complications (e.g., hemorrhage, infections).
- **O.T. Role in Inpatient Care**:
  - ✓ Advanced OTs for complex surgeries (e.g., C-sections, hysterectomies) with robotic systems, fetal monitors, and emergency equipment (e.g., blood transfusion kits).
  - ✓ Often located near labor wards, NICUs, or ICUs for immediate post-op care.
  - ✓ Example: A patient undergoes a C-section due to fetal distress, followed by recovery in a maternity ward.

- **Patient Flow**: Patients are admitted, undergo pre-op preparation or labor monitoring, receive treatment or surgery, and recover in wards (maternity, surgical, or ICU) for days to weeks.
- **Example**: A woman with fibroids undergoes a hysterectomy, stays 2–3 days in a surgical ward, and is discharged with follow-up care.

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