

Theatre overview

- types of equipment
- theatre design
 - grounding
 - positive pressure
- types of surgeries
 - general
 - orthopaedic
 - neural
 - thoracic
 - abdominal
 - gynaecological
 - ENT
 - urology



13.6.1 Give an overview of an operating theatre

Unit B 13.6 Maintaining theatre and surgery equipment

Module 279 18 B Medical Instrumentation I

Operating Theater

An operating theater, also known as an operating room (OR) or operating suite, is a facility within a hospital where **surgical** operations are carried out in a **sterile** environment.

Historically, the term "operating theatre" referred to a non-sterile, tiered theater or amphitheater in which students and other spectators could watch surgeons perform surgery.



Types of equipment



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



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

Types of equipment



The **anaesthesia 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.



The **anaesthesia cart** is next to the anaesthesia machine. It contains the medications, equipment, and other supplies

Types of equipment



Sterile instruments to be used during surgery are arranged on a stainless steel table.



An electronic monitor which records the heart rate and respiratory rate

Types of equipment



The **pulse oximeter** attaches to the patient's finger with an elastic band aid. It measures the amount of oxygen contained in the blood.



An **electrocautery machine** uses high frequency electrical signals to cauterize or seal off blood vessels and may also be used to cut through tissue with a minimal amount of bleeding.

Theatre design: grounding

What is grounding?

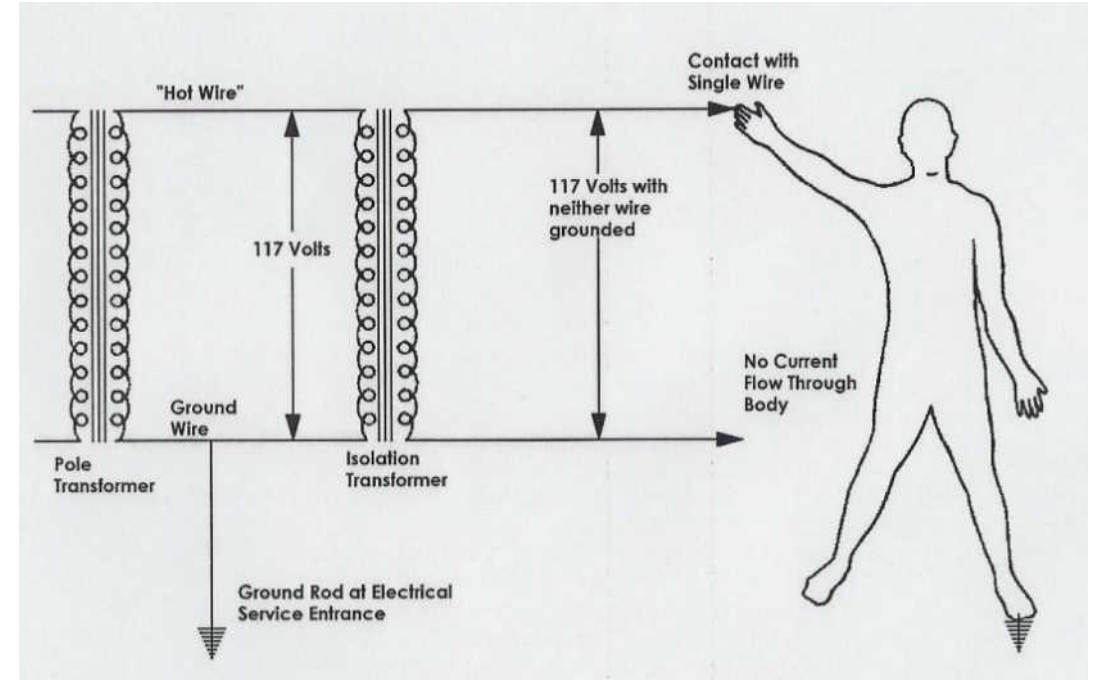
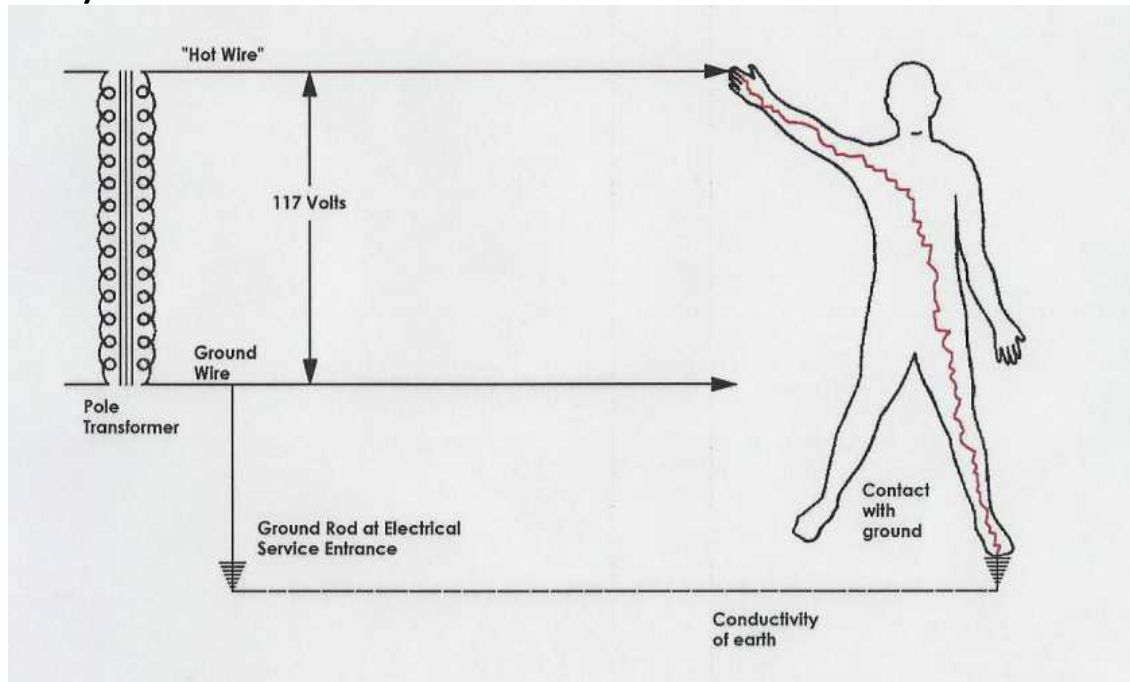
- a method of protection from electrical shock
- a ground is a conductive connection – between electrical circuit or equipment and ‘earth’
- grounding creates a low resistance path to earth



Grounding in a patient care or anesthetizing location is an important safeguard against shock and electrocution. Proper grounding dissipates static charges and shunts fault currents and normal leakage currents away from attendants. Grounding of circuits must be performed as required in Article 250 of the NEC.

Theatre design: grounding

- An isolating transformer is needed to convert from the grounded power distribution system in the facility to an ungrounded electrical distribution system
- Connected electrical devices and equipment work just as if they were connected to a grounded system

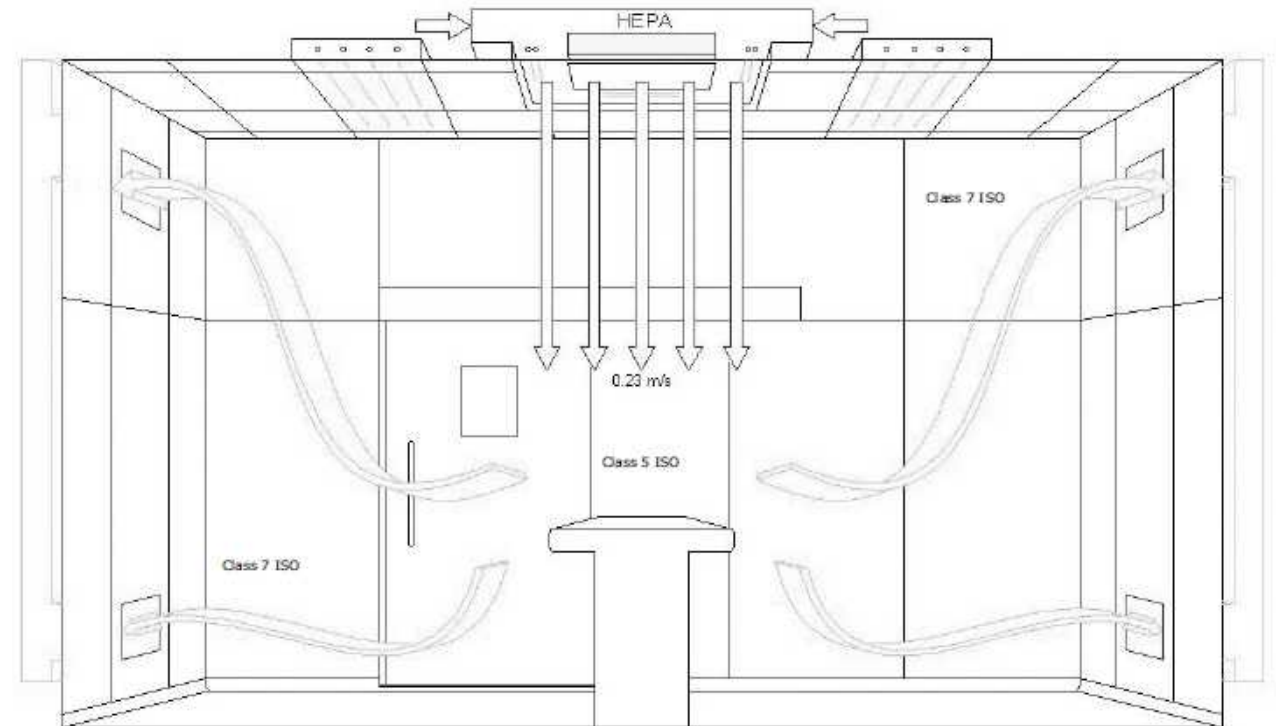
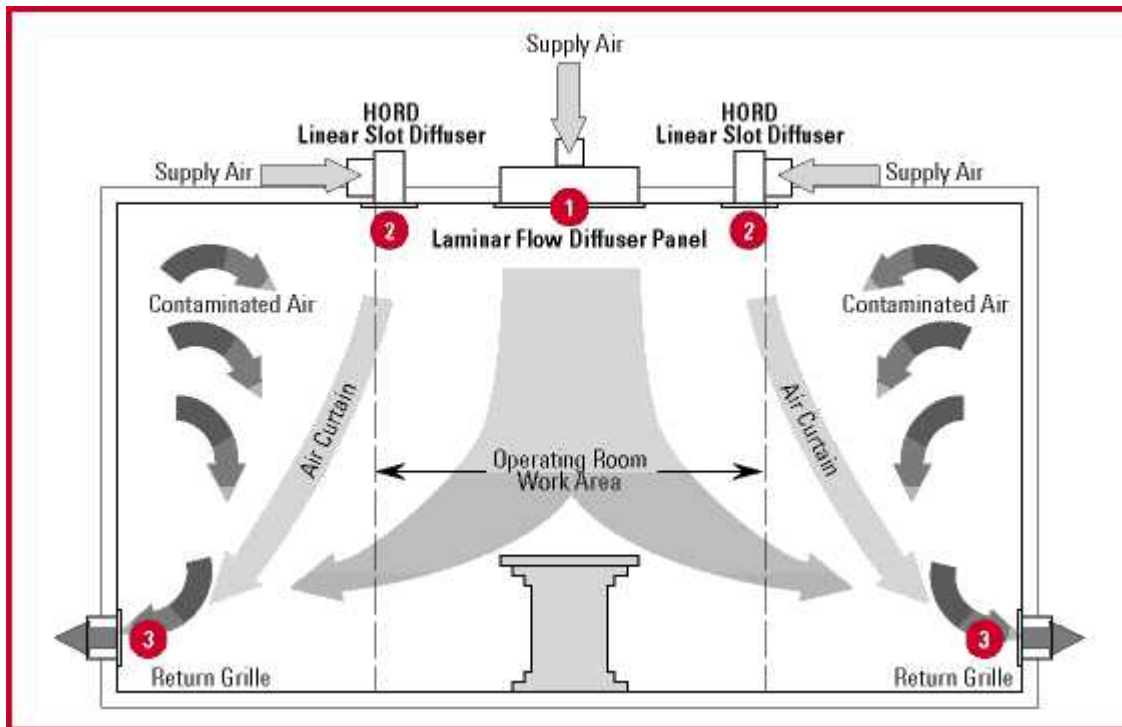


isolated power: no shock ! even though person is 'grounded'

Theatre design: positive air pressure

Positive pressure is used to keep contaminated air away from the patient who undergoes surgery.

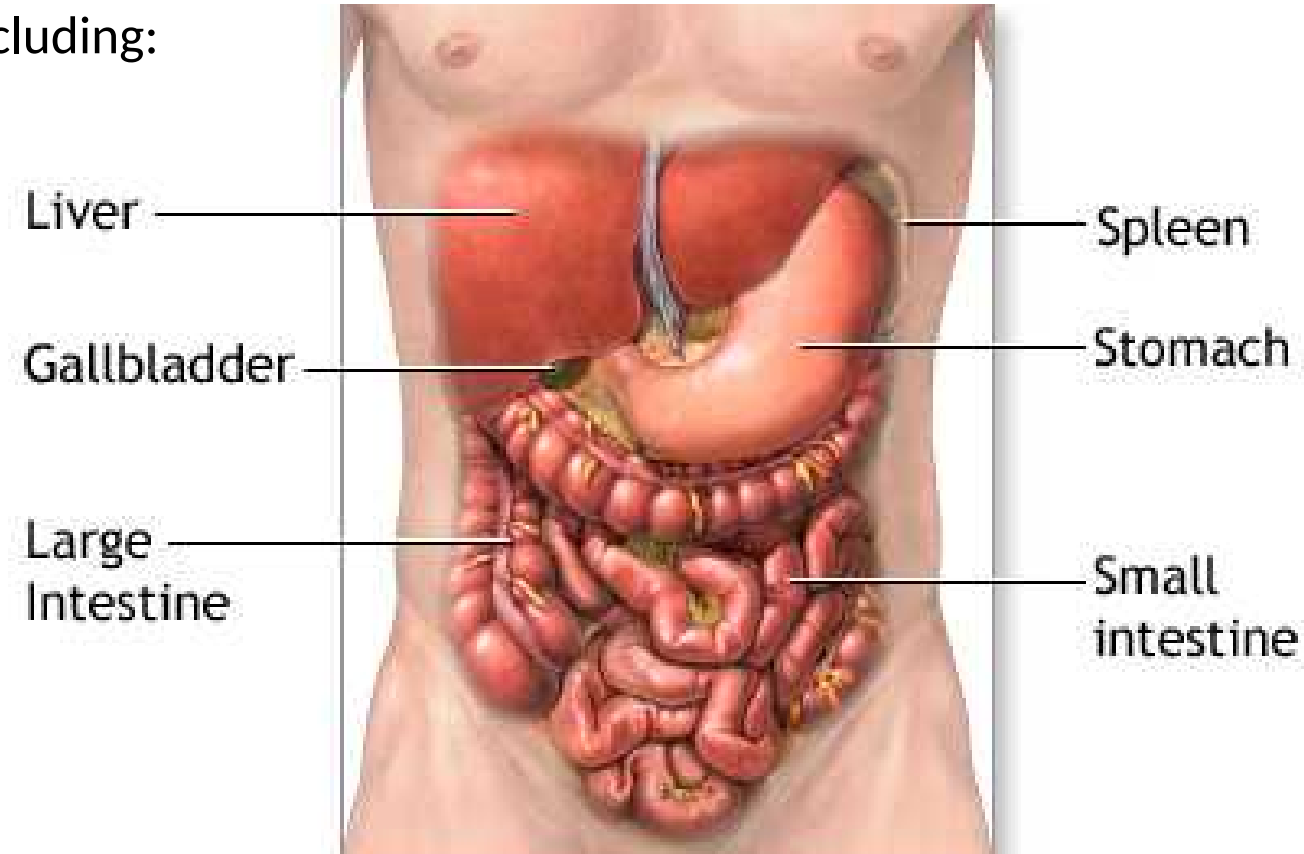
Positive pressure in a system is greater than the pressure in the environment that surrounds that system. If there is a leak from the positively pressured system (e.g. door is open) the air will move out of the operating room, rather than that dirty air from the environment to move in and contaminate the vulnerable patient.



Types of surgeries: General surgery

General surgery focuses on abdominal contents including:

- oesophagus
- stomach
- small bowel
- colon
- liver
- pancreas
- gallbladder
- bile ducts
- thyroid gland
- diseases involving the skin, breast, soft tissue and hernias



Types of surgeries: Orthopedic surgery

Orthopaedic Surgery or orthopaedics is concerned with conditions involving the musculoskeletal system, including:

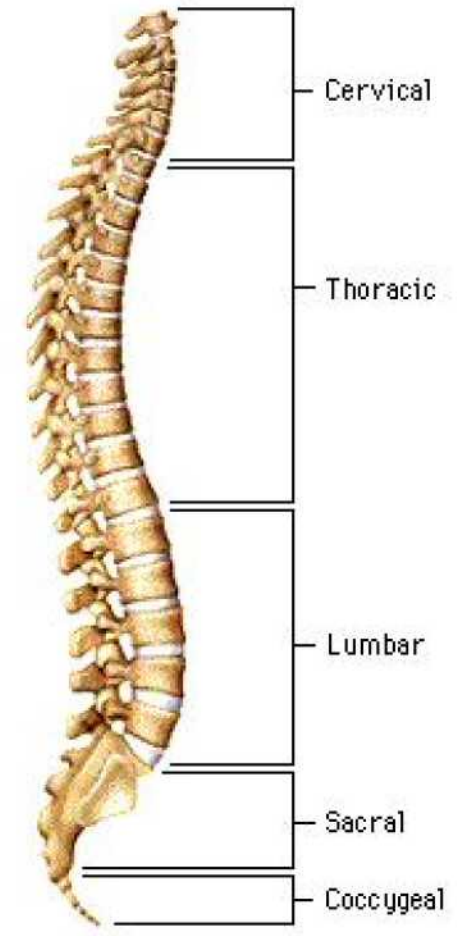
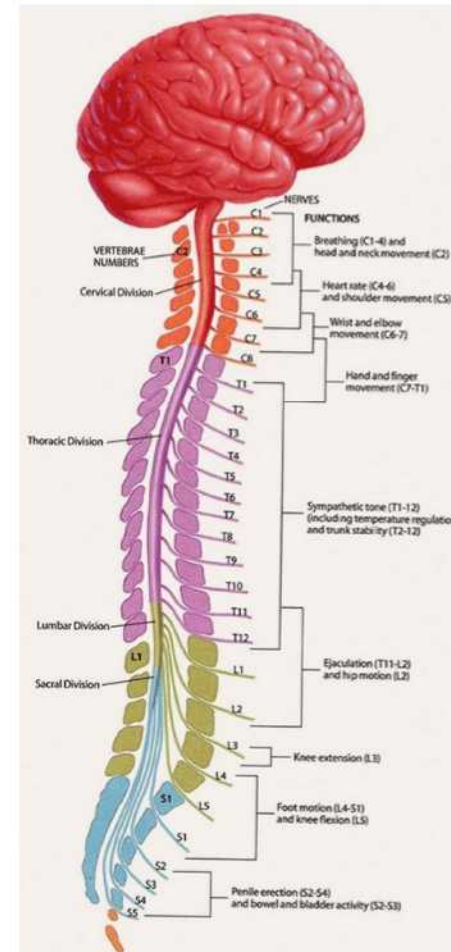
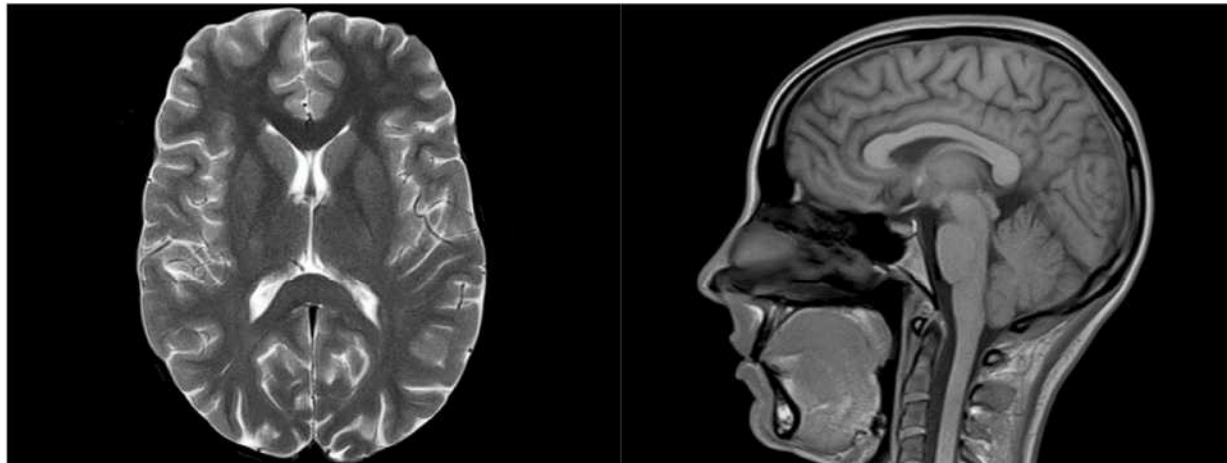
- musculoskeletal trauma
- sports injuries
- degenerative diseases
- infections
- tumors
- congenital disorders



Types of surgeries: Neuro-surgery

Neurosurgery (or neurological surgery) is concerned with the prevention, diagnosis, treatment, and rehabilitation of disorders which affect any portion of the nervous system including the

- brain
- spinal cord
- peripheral nerves
- and extra-cranial cerebrovascular system.



Types of surgeries: Thoracic surgery

Thoracic surgery deals with:

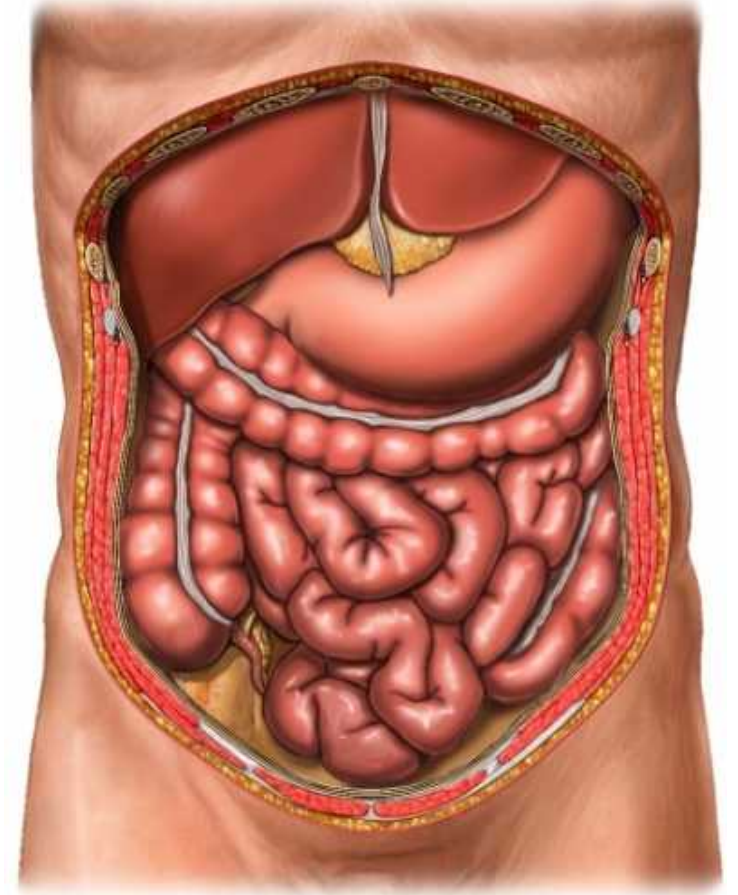
- Lung cancer, benign diseases and tumours of the lung
- Chest reconstruction after major trauma or surgery
- Lung volume reduction surgery for emphysema
- Oesophageal cancer and benign oesophageal diseases
- Oesophageal reconstruction
- Gastro-oesophageal reflux
- Mediastinal tumours and diseases
- Pleural diseases (including pneumothorax)
- Chest wall tumours
- Tracheal resection or stent insertion for airway narrowing
- Lung transplantation for end-stage diseases of the lung



Types of surgeries: Abdominal surgery

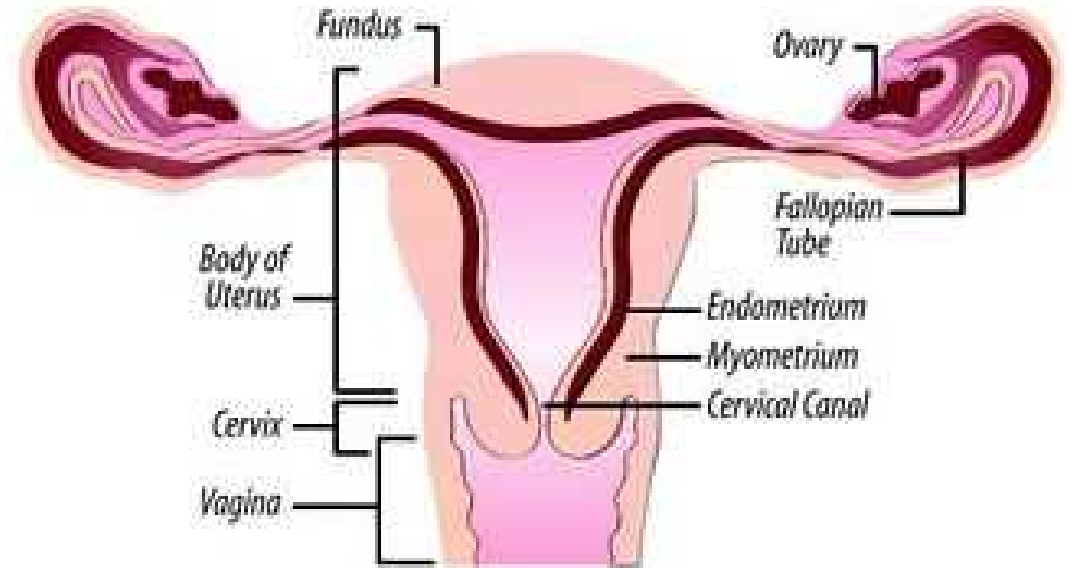
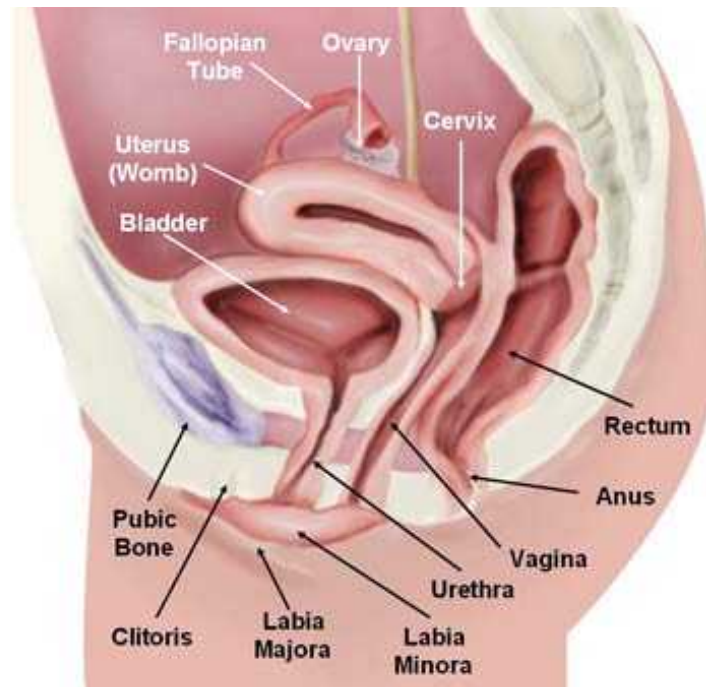
Abdominal surgery broadly covers surgical procedures that involve opening the abdomen. Surgery of each abdominal organ is dealt with separately in connection with the description of that organ (stomach, kidney, liver, etc.). Diseases affecting the abdominal cavity are dealt with generally under their own names (e.g. appendicitis).

- Appendectomy—Surgical opening of the abdominal cavity and removal of the appendix.
- Caesarean section (also known as C-section) is a surgical procedure in which one or more incisions are made through a mother's abdomen (laparotomy) and uterus (hysterectomy) to deliver one or more babies.
- Exploratory laparotomy—This refers to the opening of the abdominal cavity for direct examination of its contents, for example, to locate a source of bleeding or trauma. It may or may not be followed by repair or removal of the primary problem.



Types of surgeries: gynaecological

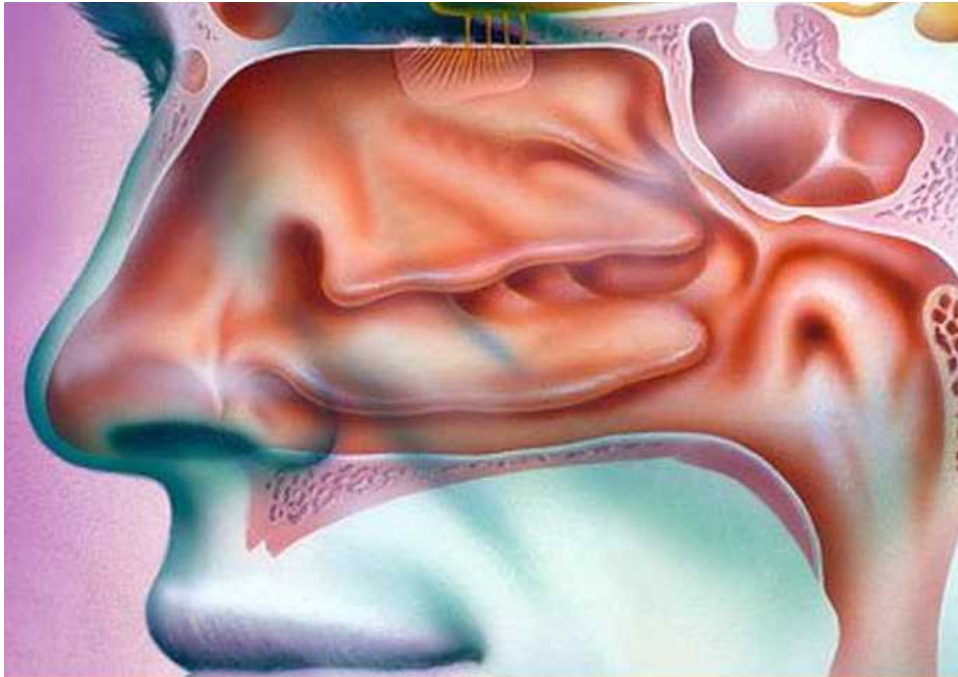
Gynecological surgery refers to surgery on the female reproductive system. (ovaries, uterus, vagina)



Gynecological surgery is usually performed by gynaecologists. It includes procedures for benign conditions, cancer, infertility, and incontinence.

Types of surgeries: ENT

ENT surgeons diagnose and treat conditions of the ears, nose, throat, head and neck, and undertake some cosmetic procedures.



Ears

- Hearing loss, ear discharge, earache, balance disorders

Nose

- Nasal blockage/deformity, cosmetic surgery, sinusitis, ..

Throat

- Tonsillitis, snoring, hoarse voice, swallowing disorders,..

Head and neck

- Neck swellings, thyroid disorders, salivary gland diseases

Cosmetic Procedures

- Rhinoplasty, otoplasty

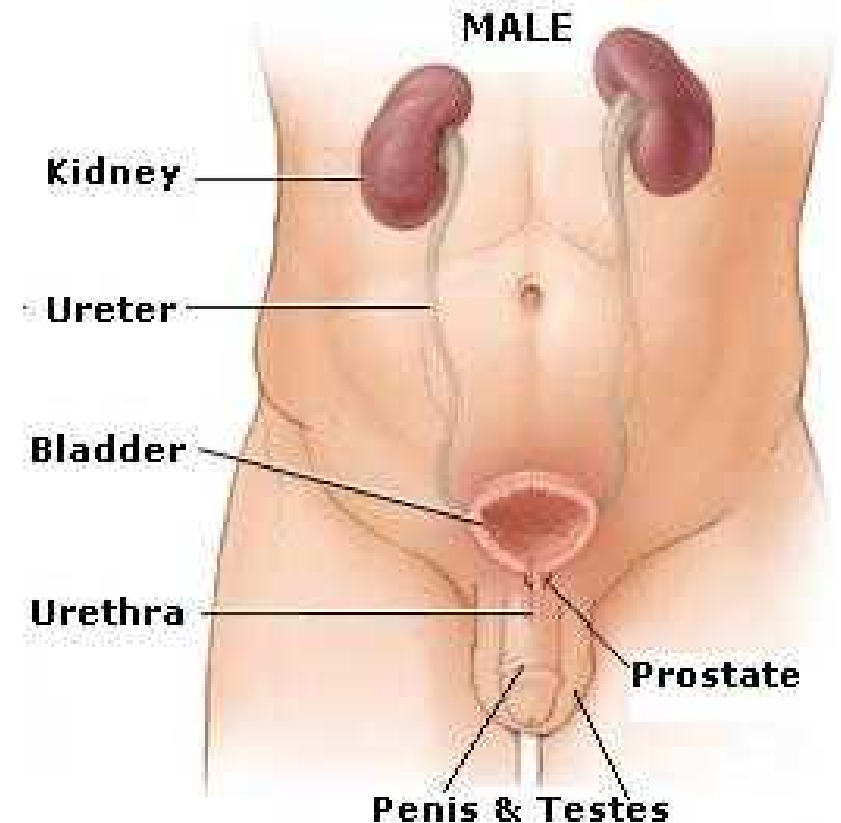
Children

- Tonsillectomy, obstructive sleep apnoea

Types of surgeries: Urology

Urology ("urine"), also known as genitourinary surgery, focuses on the surgical and medical diseases of the male and female **urinary tract** system and the male reproductive organs. The organs under the domain of urology include the kidneys, adrenal glands, ureters, urinary bladder, urethra, and the male reproductive organs (testes, epididymis, vas deferens, seminal vesicles, prostate and penis). The urinary and reproductive tracts are closely linked, and disorders of one often affect the other.

Urology combines the management of medical (i.e., non-surgical) conditions such as urinary tract infections with the management of surgical conditions such as bladder or prostate cancer, kidney stones, etc.



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