Pelvis + Perineum
Pelvic Cavity

- Enclosed by bony, ligamentous and muscular wall
- Contains the urinary bladder, ureters, pelvic genital organs, rectum, blood vessels, lymphatics and nerves
- Pelvic inlet (superior pelvic aperture)
- Pelvic outlet (inferior pelvic aperture)
Superior Aperture

- Greater sciatic foramen
- Lesser sciatic foramen
- Obturator canal
- Lower limb
Inferior Pelvic Border

Gap between pubic symphysis and perineal membrane
- dorsal vein of penis and clitoris

Orifices in floor
- Urethra
- Vagina
- Anus

Lesser sciatic foramen
- obturator internus muscle
- pudendal nerve
- internal pudendal vein and artery

Sacrotuberous ligament
Sacrospinous ligament
Lesser (True) Pelvis (pelvis minor)

- Location of pelvic viscera – the urinary bladder and reproductive organs such as the uterus and ovaries
- Bounded by the hip bones, sacrum, and coccyx
- Limited inferiorly by the musculofascial pelvic diaphragm
Pelvic Walls and Floors

- **Anterior pelvic wall** – is formed primarily by the bodies and rami of the pubic bones and the pubic symphysis
- **Lateral pelvic walls** – formed by the hip bones and the obturator internus muscles
Anterior Pelvic Wall

- Piriformis muscle
- Obturator internus muscle
Pelvic Walls and Floor

- Posterior Pelvic Wall – formed by the sacrum and coccyx, adjacent parts of the ilia, and the S-I joints; piriformis muscle covers the area
Pelvic Floor

- Formed by the funnel shaped pelvic diaphragm – consists of the levator ani and coccygeus muscles and their fascia
- Stretches between the pubis anteriorly and the coccyx posteriorly and from one lateral pelvic wall to the other
Levator Ani

- Three parts – the pubococcygeus, the puborectalis and the iliococcygeus.
- Collectively they run from the body of the pubis, the tendinous arch of the obturator fascia and the ischial spine TO the perineal body, the coccyx, the anococcygeal ligament, the walls of the prostate or vagina, the rectum and the anal canal.
- Innervated by the nerve to levator ani from S4 and the inferior anal (rectal) nerve (from S2-S4) and the coccygeal plexus.
- Supports the pelvic viscera; raise the pelvic floor and assist the abdominal muscles in forced expiration activities.
Coccygeus Muscle

- Forms a small part of the pelvic diaphragm that supports the pelvic viscera, flexes the coccyx
Pelvic Diaphragm

- Obturator internus muscle
- Tendinous arch
- Obturator canal
- Iliococcygeus muscle
- Pubococcygeus muscle
- Puborectalis muscle
- Coccygeus muscle
- Sacrospinous ligament
- Anal aperture
- Urogenital hiatus
- Levator ani
Perineal Body

- Ischiocavernosus muscle
- Bulbospongiosus muscle
- Perineal body
- Suspensory ligament
- Superficial transverse perine
Viscera

- Urinary organs in the pelvis
- Ureters – muscular (smooth) tubes running from kidneys to bladder 25 to 30 cm long
- Bladder – a hollow container surrounded by a strong smooth muscular wall
- Temporary reservoir for urine
- Apex, Body, Fundus, Neck, Uvula
2. Identify the normal position and anatomical relationships of the pelvic viscera

Anteverted

Anteflexed
1. In males

- From the abdominal wall covers the superior and part of the posterior surface of the urinary bladder and superior tips of the seminal vesicles.
- Rectovesicular pouch between the bladder and the rectum - the most inferior extent of the peritoneum in the male.
- Attaches to the anterior aspect of the rectum.
Peritoneum

2. In females
   - Forms vesicouterine p
   - Deeper rectouterine p
     - the rectouterine pouch peritoneum.
Peritoneal reflections and their relationship to the pelvic contents.

- Most pelvic organs are subperitoneal
Fascia of the pelvis

1. Visceral fascia:
   covers organs, binds the pelvic viscera to each other and to the parietal fascia

2. Parietal fascia:
   covers the pelvic surfaces of muscles and lines the pelvic cavity
       a. superior parietal fascia is thickened at the neck of the urinary bladder to form the pubovesicular ligament (female) and the puboprostatic ligament (male),
       b. anchors neck of urinary bladder to the pubis.
       c. pubovesicular ligament in females, attaches to the vagina as well.
Ligaments supporting pelvic organs

**Peritoneal ligaments**
- Fundus
- Bladder
- Round ligament of uterus
- Uterine tube
- Broad ligament
- Lig. Of ovary
- Suspensory lig.

**Pelvic visceral ligaments**
- Bladder
- Pubocervical lig.
- Transverse cervical lig.
- Cervix
- Sacrocervical lig.
- Rectum
- Pubocervical lig.
- Sacrocervical lig.
- Ureter
- Uterine art.
Spaces within the fascia

Retropubic space:

- fascial plane between bladder and pubic symphysis which allows for expansion of the bladder and access to the bladder and the prostate without entering the peritoneal cavity.
Rules:
1. All pelvic organs are supplied by branches of the internal iliac artery except the ovaries and the upper third of the rectum.
2. Venous drainage follows the arterial supply, including the portal tributary, the inferior mesenteric vein.
3. Portal caval anastomoses are found at the inferior rectal veins.
Lymphatic drainage of pelvis and perineum

Rules:

- Lymphatics drain toward lymph nodes along internal iliac veins, except for the ovary (para-aortic nodes), and superior portion of the rectum (inferior mesenteric nodes).
- Perineum drains to superficial inguinal nodes.
Nerve supply of Pelvic Organs

Diagram showing the nerve supply to the pelvic organs, including the aortic plexus, lumbar sympathetic trunk, hypogastric plexus, common iliac artery, external iliac artery, internal iliac artery, right and left pelvic plexuses, piriformis muscle, coccygeus muscle, obturator nerve, S1, S2, S3, S4, median sacral artery, and pelvic sympathetic trunk.
Perineum

- Inferior to the pelvic outlet and separated from the pelvic cavity by the pelvic diaphragm (Levator ani and coccygeus muscles)

- Bounded by
  - pubic symphysis anteriorly;
  - inferior pubic and ischial rami anterolaterally;
  - ischial tuberosity laterally;
  - sacrotuberous ligament posterolaterally;
  - sacrum and coccyx posteriorly
Perineum

- Two Triangles
  - **Anal** triangle (posterior) contains the anus
  - **Urogenital** triangle (anterior) contains the root of the scrotum and penis in males or the external genitalia in females

- The **perineal membrane** stretches between the two sides of the pubic arch and covers the anterior part of the outlet

- The **perineal body** is an irregular fibromuscular mass located between the anal canal and the perineal membrane
Triangles

Perineum of Male
Regions [Triangles] and Surface Topography

- Urogenital triangle
- Anal triangle
- Tip of coccyx
- Pubic symphysis
- Ischiopubic ramus
- Ischial tuberosity
- Tip of coccyx
Perineal Membrane

- Pubic symphysis
- Inferior pubic ligament
- Ischiopubic ramus
- Obturator foramen
- Ischial tuberosity
- Perineal membrane
Perineal Body

- Suspensory ligament
- Ischiocavernosus muscle
- Bulbospongiosus muscle
- Perineal body
- Superficial transverse perineum
Perineum-Female
Perineum - Male
Perineum

- **Muscles**
  - **Bulbospongiosus**
    - Females – O. central tendon of perineum, I. dorsum of clitoris, urogenital diaphragm;
    - Males – O. central tendon of perineum and bulb of penis; I. root of penis;
    - A: compress vagina orifice / urethra;
    - N: perineal nerve, pudendal nerve
  - **Ischiocavernosus**
    - O. ramus of ischium, I. near pubic symphysis;
    - F: maintains erection of penis or clitoris
Muscles

A

Ischiocavernosus muscle
Bubospongiosus muscle
Suspensory ligament
Perineal body
Superficial transverse perineal muscle

B

Fundiform ligament of penis
Ischiocavernosus muscle
Suspensory ligament of penis
Bubospongiosus muscle
Perineal body
Superficial transverse perineal muscle
Midline raphe
**Perineum**

- **Muscles**
- **External anal sphincter** (skeletal muscle)  
  N: Inferior Anal Nerve (S2-S4)  
  – inhibits voiding
- **Internal Anal Sphincter** – smooth muscle  
  sympathetic supply (S2,S3,S4) – inhibits voiding
Superficial Transverse Perineal

- O: Ischial tuberosity
- I: Perineal body
- A: Support perineal body
- N: Pudendal nerve
External Urethral Sphincter

- O: Ischial tuberosity
- I: surround urethra
- A: compress urethra to maintain urine continence
- N: Pudenal (S2-S4)
Deep Transverse Perineal

- **O:** Medial Aspect of Ischial Ramus
- **I:** Pineal Body
- **A:** Stabilizes position of the perineal body
- **N:** Pudendal N (S2-S4)
Pudendal canal

Pelvis and Perineum Frontal Section
Pudendal canal & content

Pelvic Wall Blood Vessels and Nerves
Male or Female