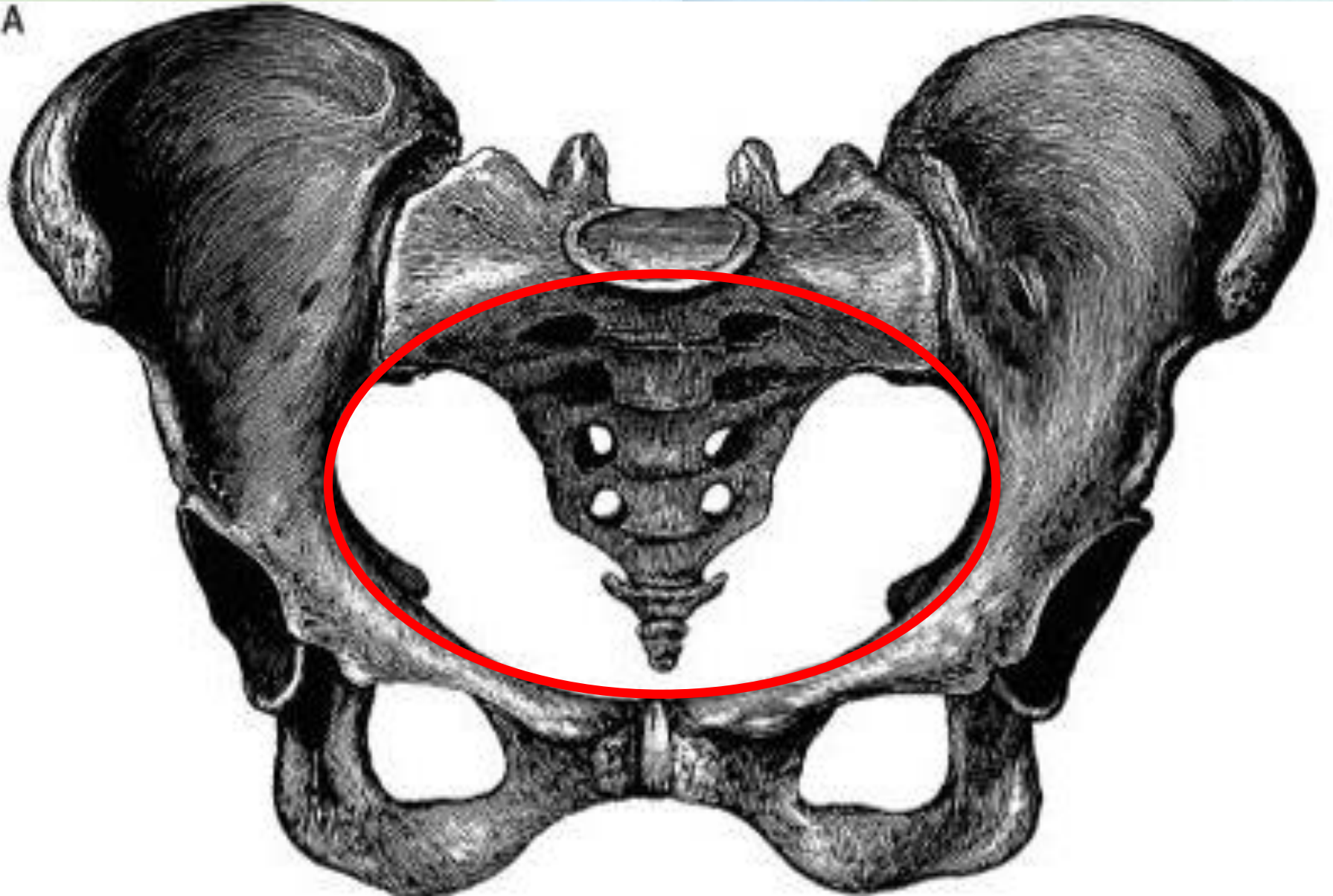


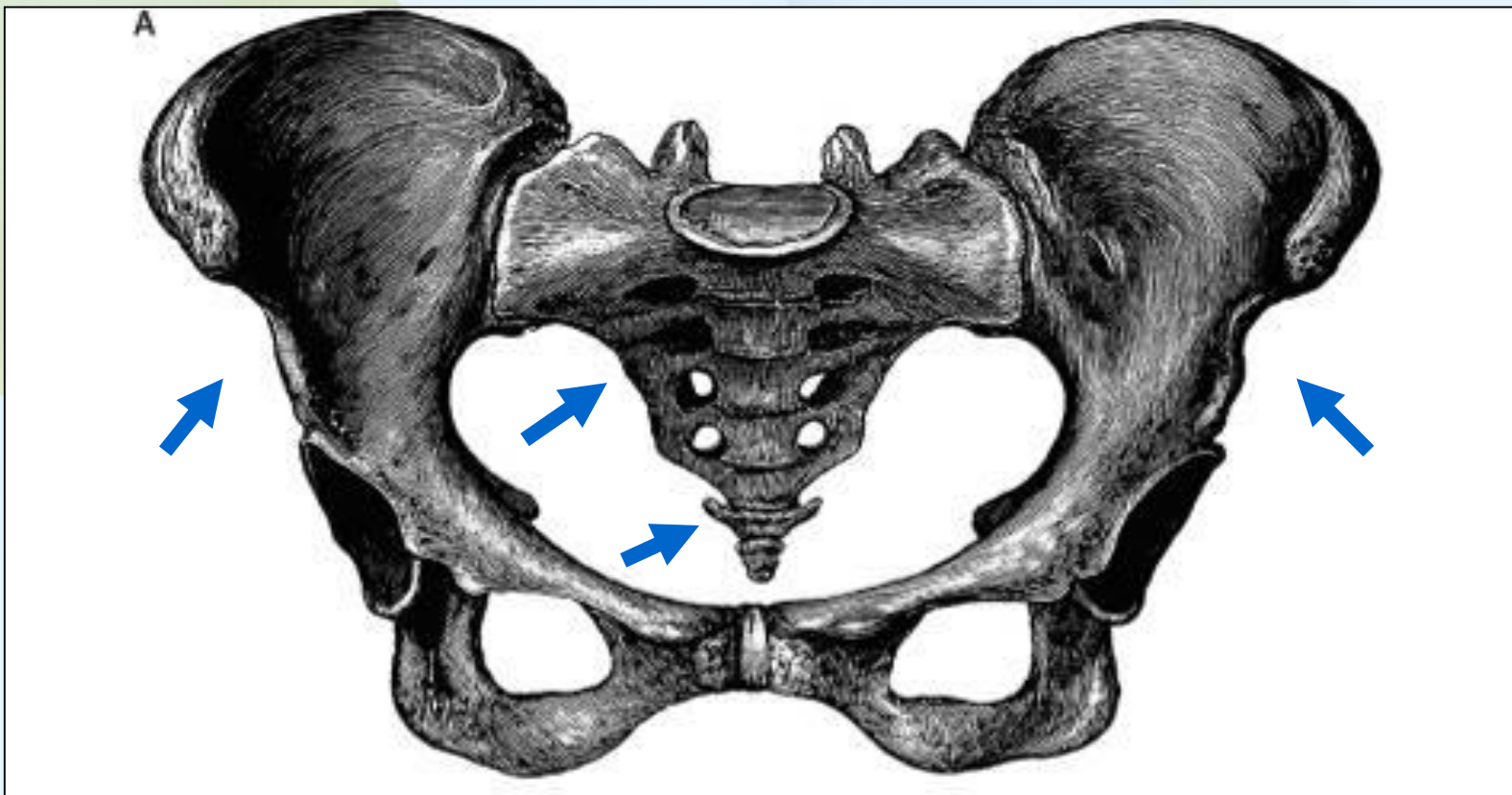
ANATOMY OF THE PELVIS

A



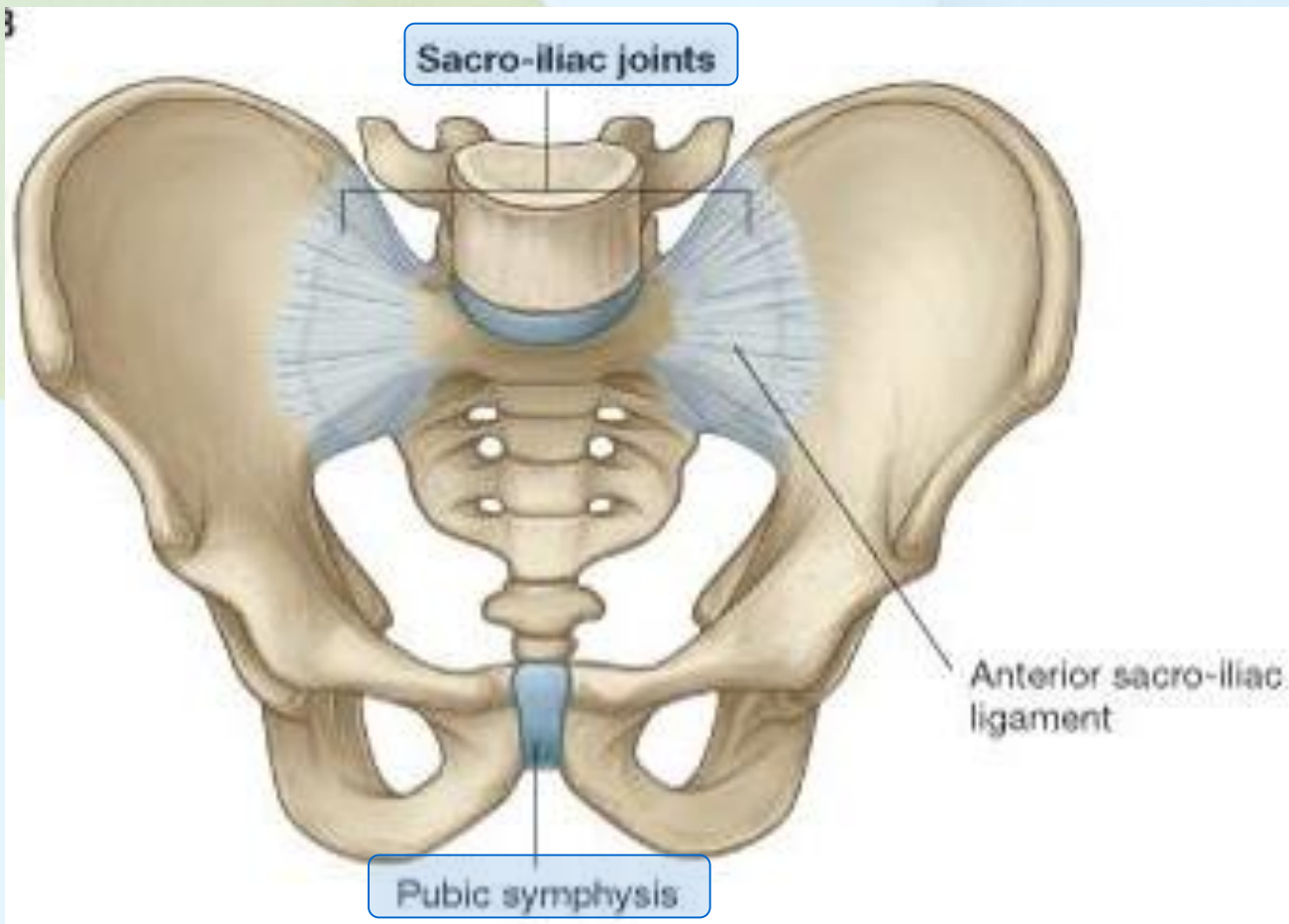
OBJECTIVES

- **At the end of the lecture, students should be able to:**
- Describe the anatomy of the pelvic wall, bones, joints & muscles.
- Describe the boundaries and subdivisions of the pelvis.
- Differentiate the different types of the female pelvis.
- Describe the pelvic floor.
- Describe the components & function of the pelvic diaphragm.
- List the arterial & nerve supply
- List the lymph & venous drainage of the pelvis.



The bony pelvis is composed of four bones:

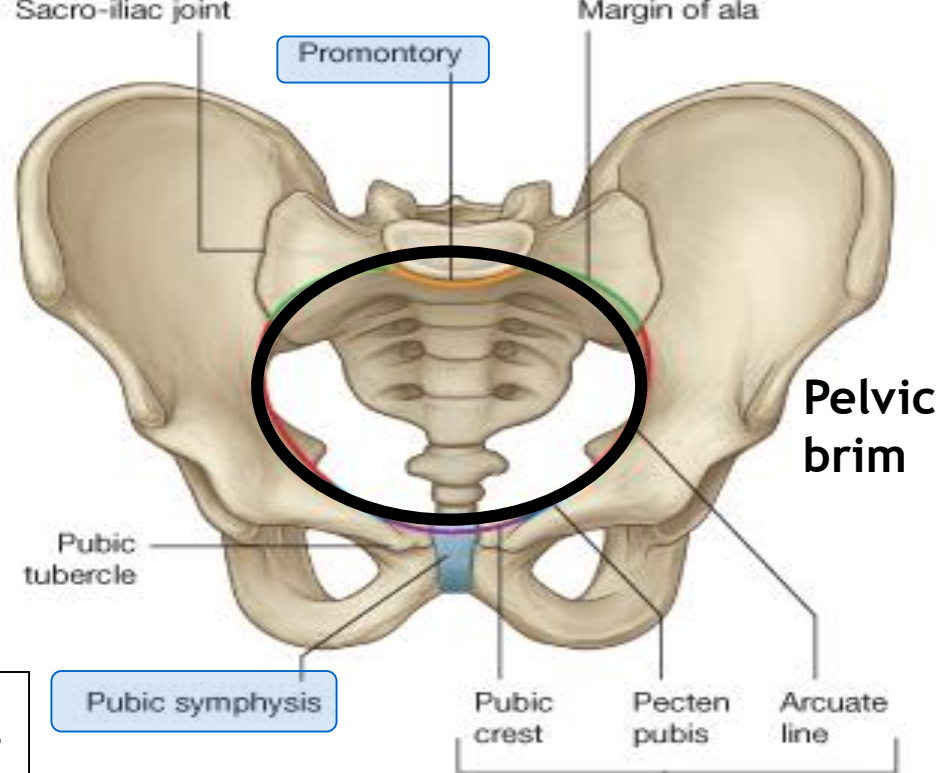
- Two **hip bones**, which form the anterior and lateral walls.
- **Sacrum** and **coccyx**, which form the posterior wall.
- These 4 bones are connected by 4 joints and lined by 4 muscles.
- The bony pelvis with its joints and muscles form a strong **basin-shaped** structure (with multiple foramina),
- The pelvis contains and protects the lower parts of the alimentary & urinary tracts & internal organs of reproduction.



FOUR JOINTS

- 1- Anteriorly:
Symphysis pubis (cartilaginous joint).
- 2- Posteriolaterally:
Two Sacroiliac joints. (Synovial joints)
- 3- Posteriorly:
Sacrococcygeal joint (cartilaginous),

The pelvis is divided into two parts by the **pelvic brim**. Above the brim is the **False or greater pelvis**, which is part of the abdominal cavity. Below the brim is the **True or lesser pelvis**.



The False pelvis is **bounded by:**

Posteriorly:

Lumbar vertebrae.

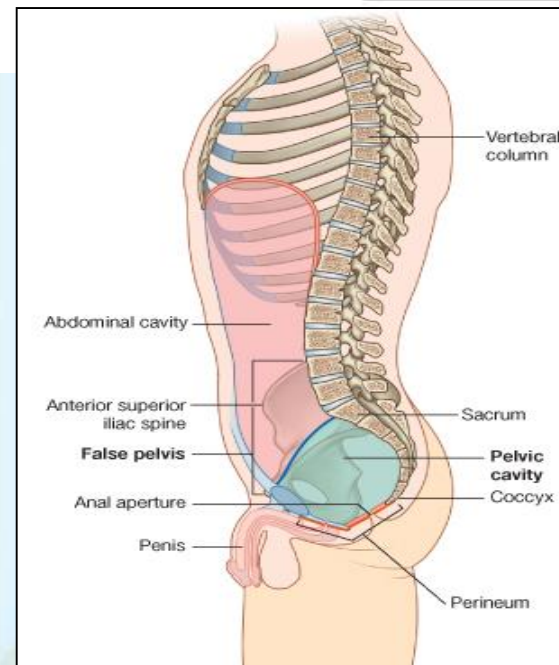
Laterally:

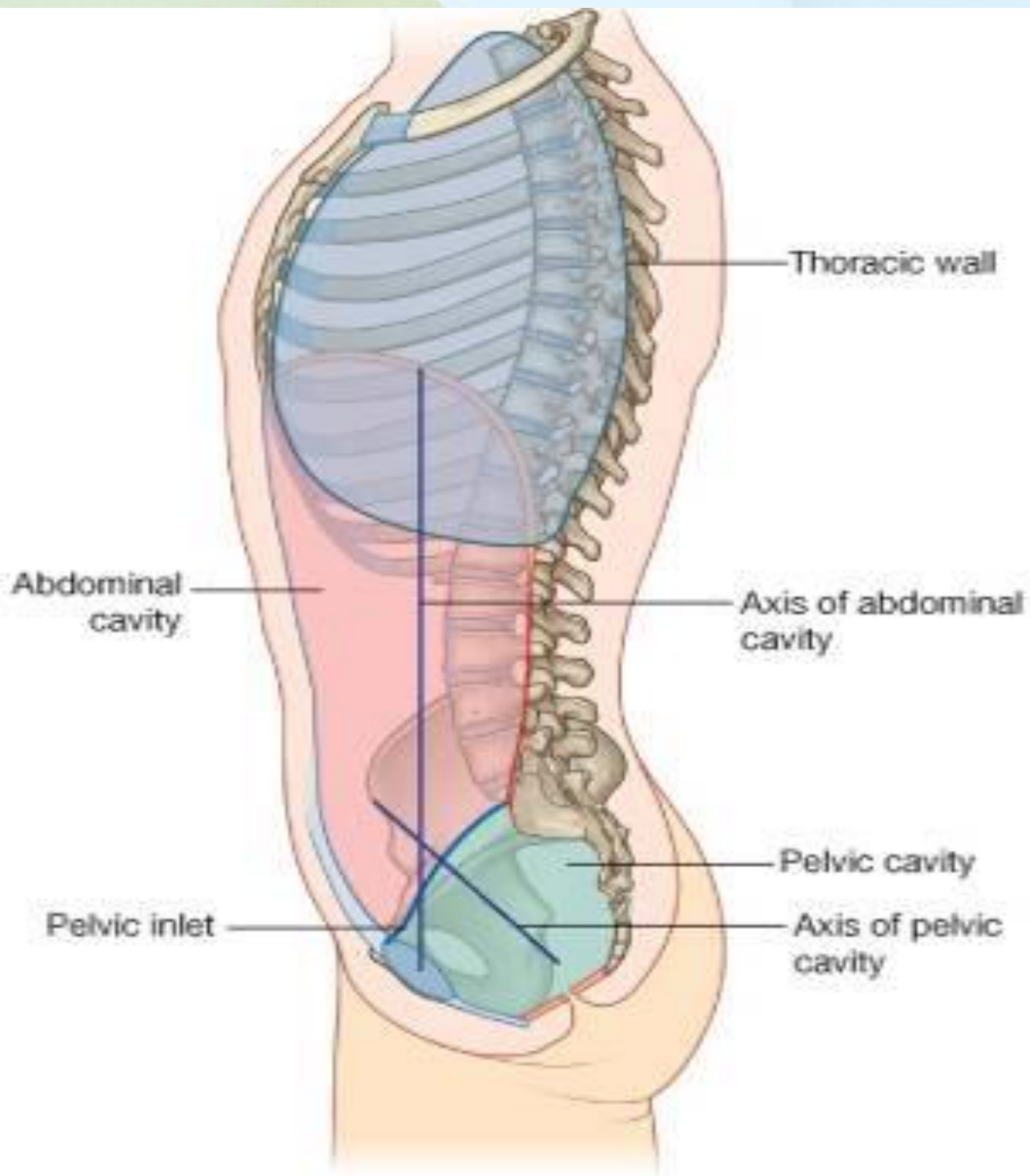
Iliac fossae and the iliacus muscle.

Anteriorly:

Lower part of the anterior abdominal wall.

It supports the abdominal contents.



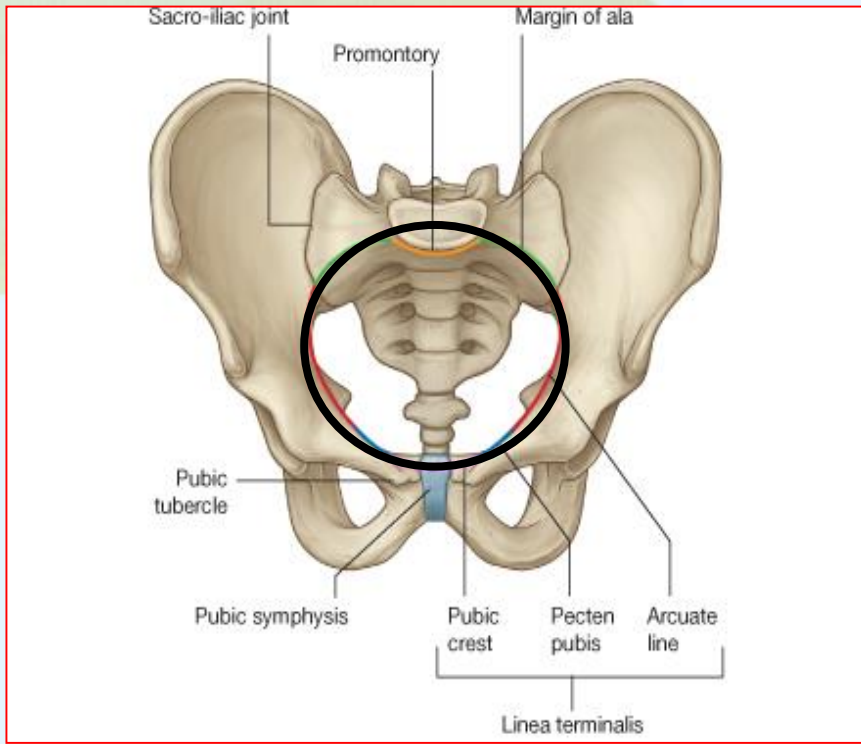


The True pelvis has:

- ❑ An **Inlet**.
- ❑ An **Outlet**.
- ❑ A **Cavity**:

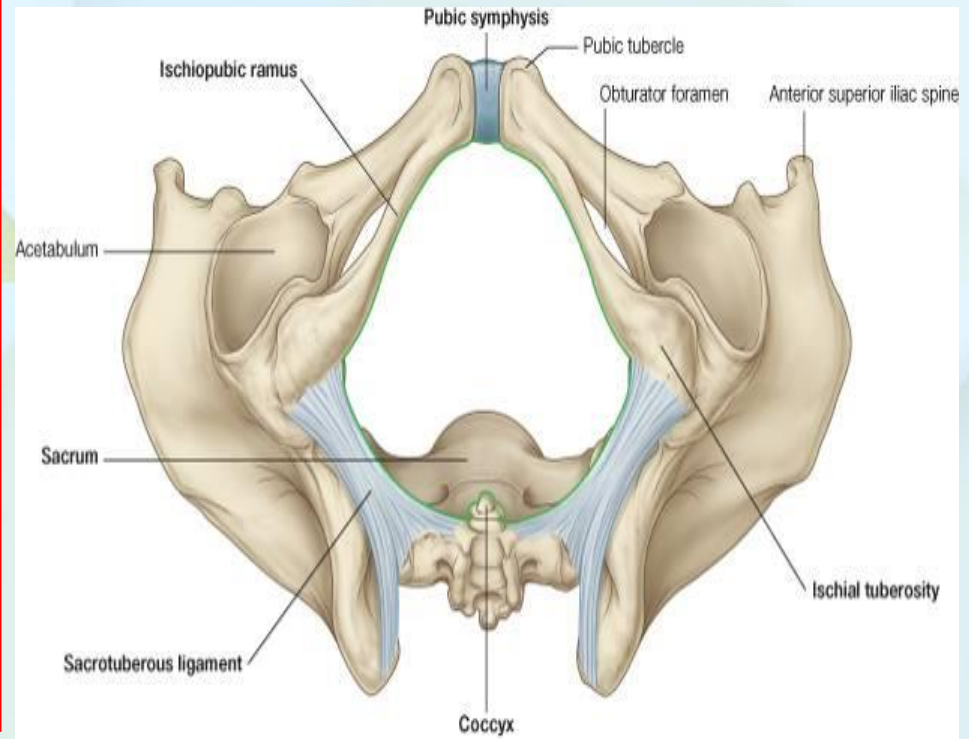
The cavity is a short, curved canal, with a shallow anterior wall and a deeper posterior wall. It lies between the inlet and the outlet.

PELVIC INLET



Anteriorly: Symphysis pubis.
Posteriorly: Promontory of sacrum, ala of sacrum.
Laterally: Ileopectineal (arcuate) lines.

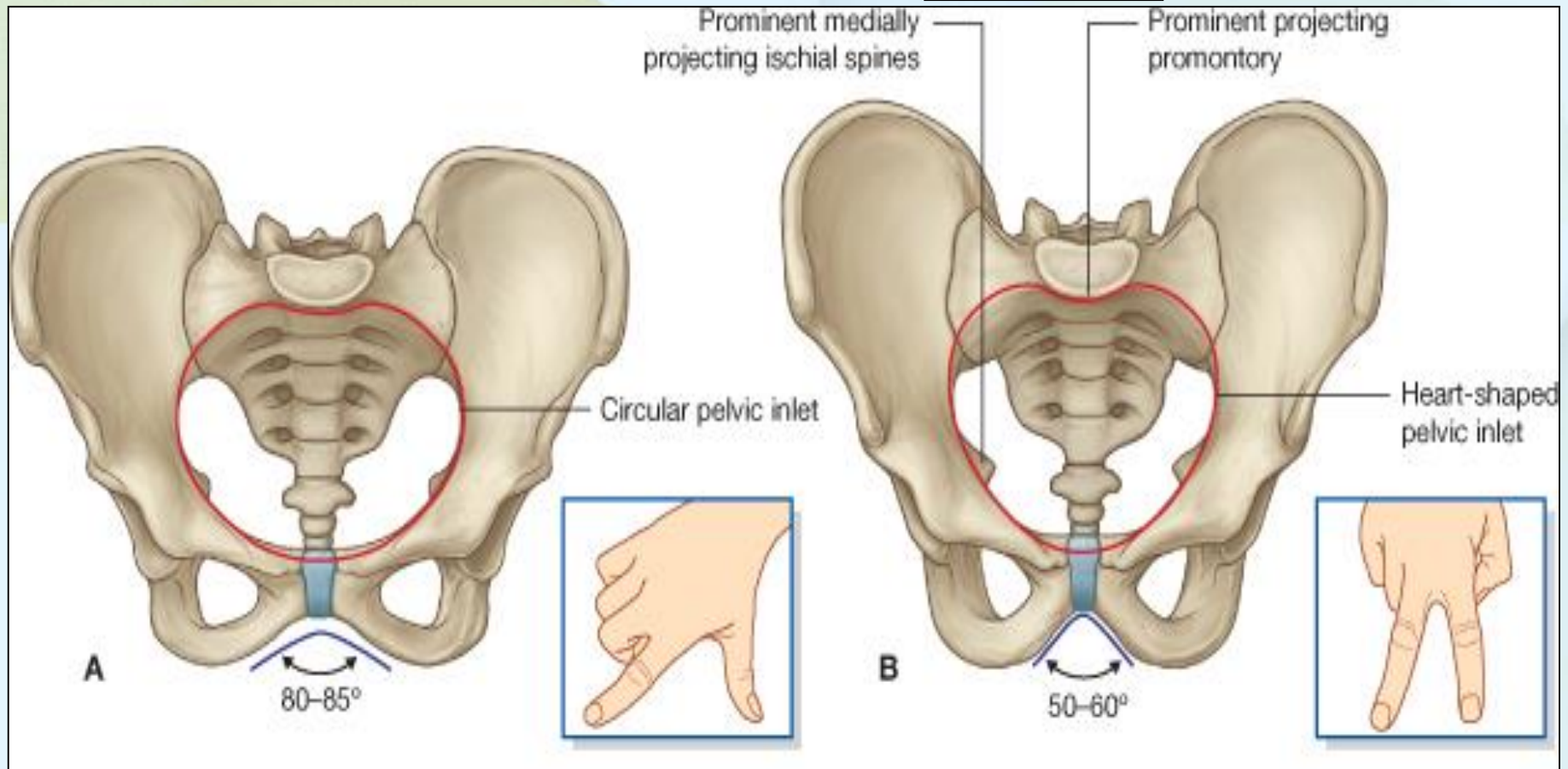
PELVIC OUTLET



Anteriorly: Symphysis pubis.
Posteriorly : **Coccyx,**
Anterolaterally: ischiopubic ramus
Posterolaterally: **Sacrotuberous ligament,**

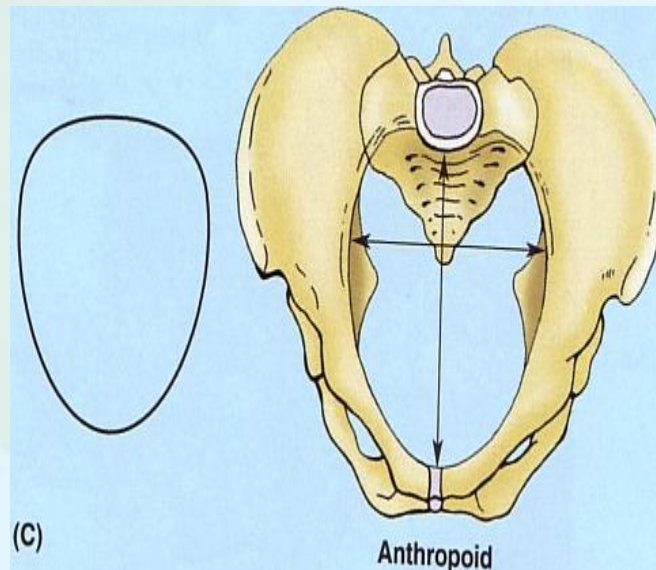
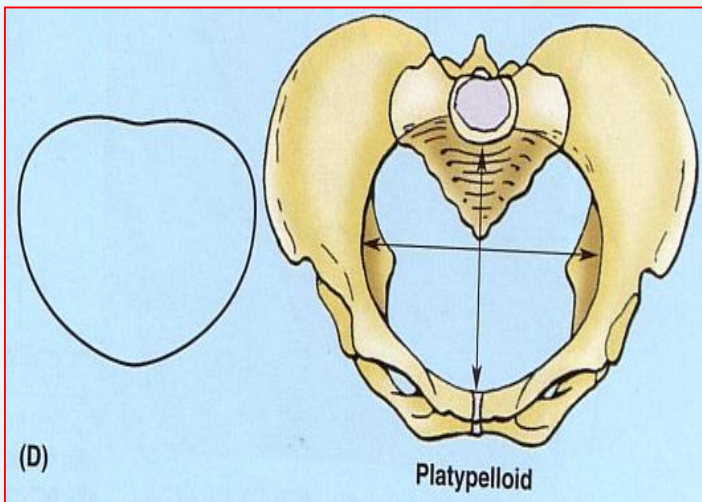
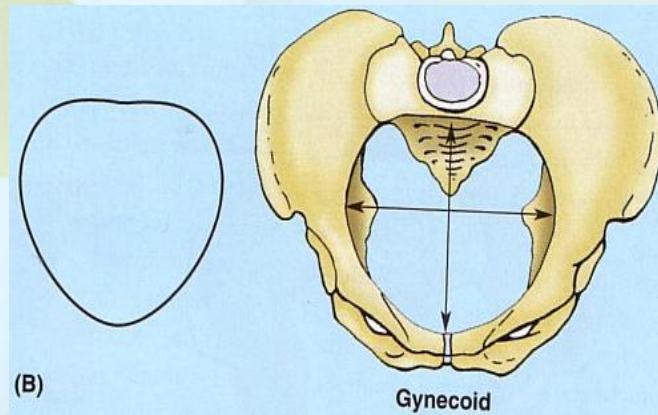
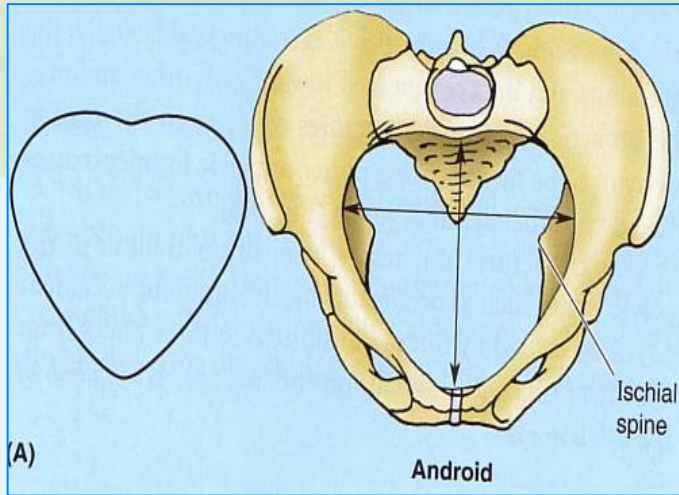
FEMALE

MALE

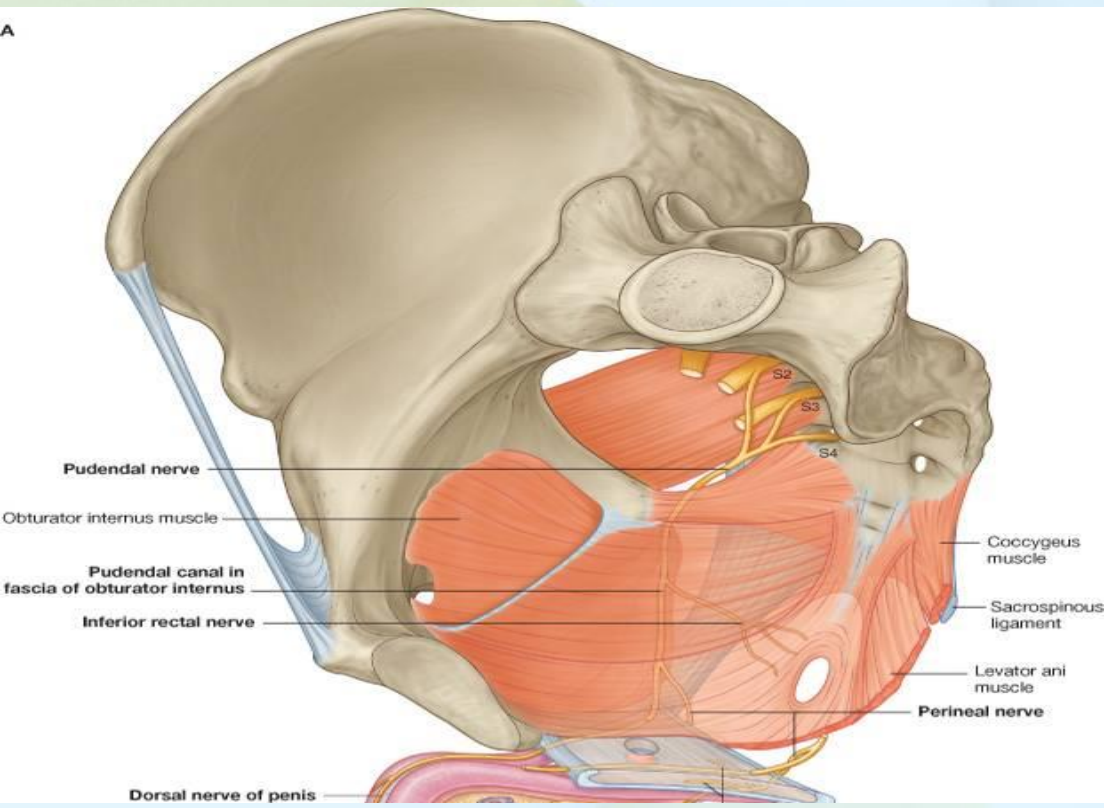


In female the Sacrum is usually wider and shorter.
Also, the *Angle of the pubic arch* is wider.
The promontory and the ischial spines are less projecting.

Types of Female Bony Pelvis

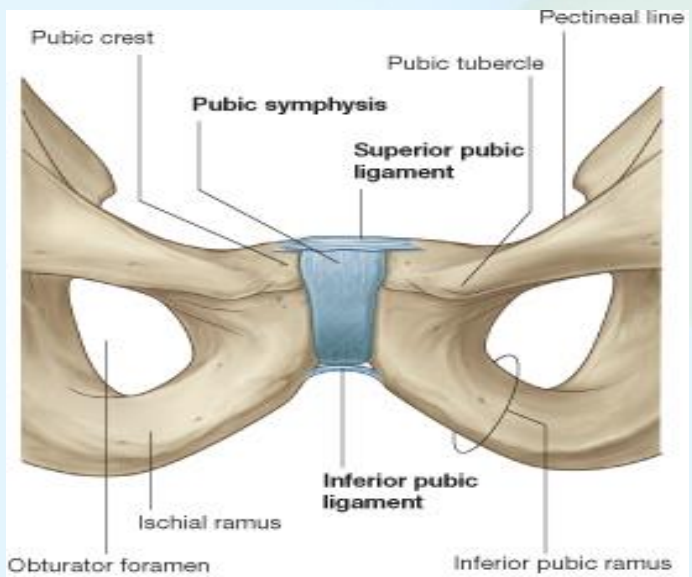


Information of the shape and dimensions of the female pelvis is of **great importance for obstetrics**, because it is the bony canal through which the child passes during birth.



Pelvic walls

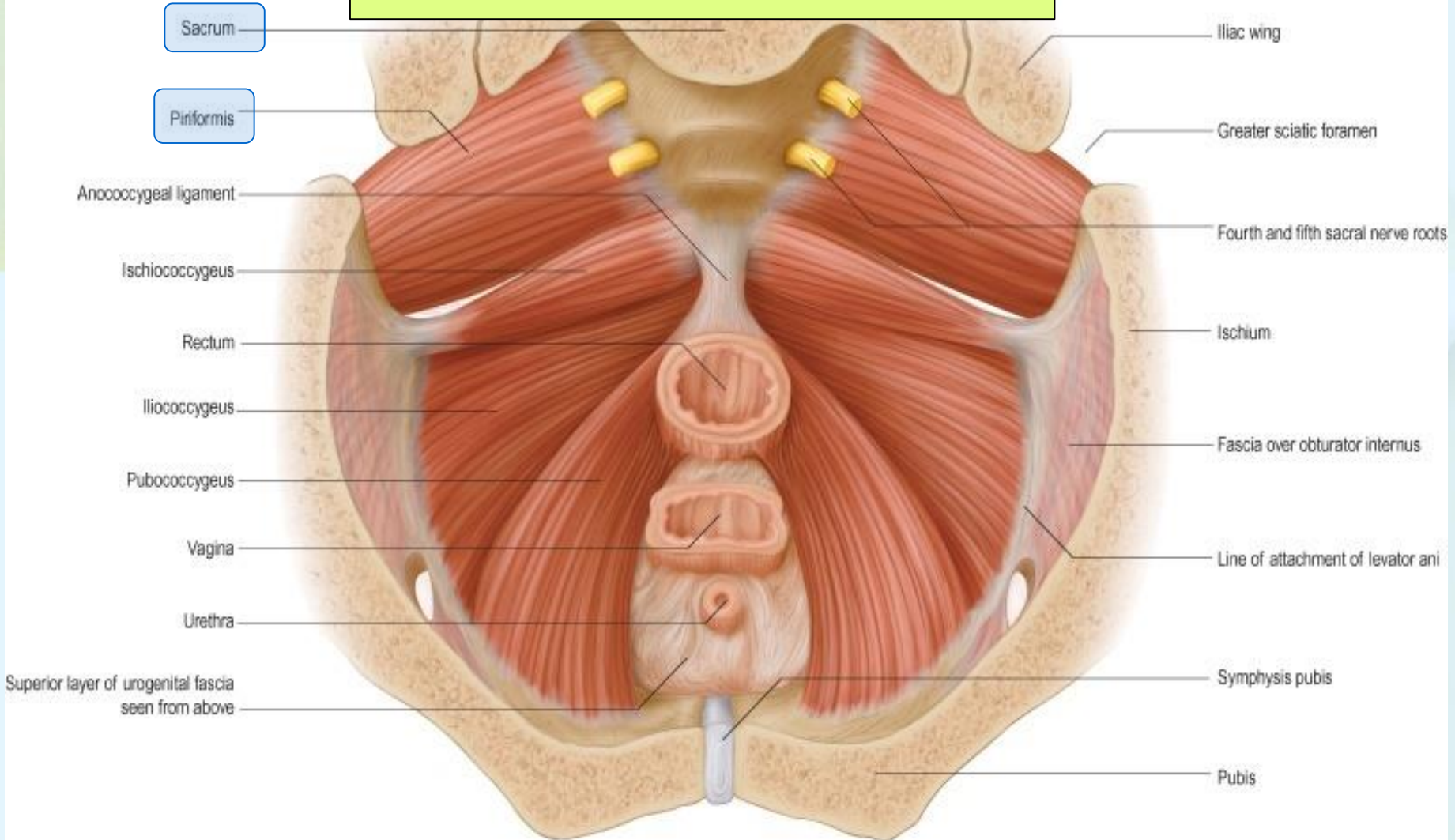
- The pelvis has 4 walls:
- Anterior.
- Posterior.
- Lateral.
- Inferior or floor.
- The walls are formed by bones and ligaments that are lined with muscles covered with fascia and parietal peritoneum.



ANTERIOR PELVIC WALL

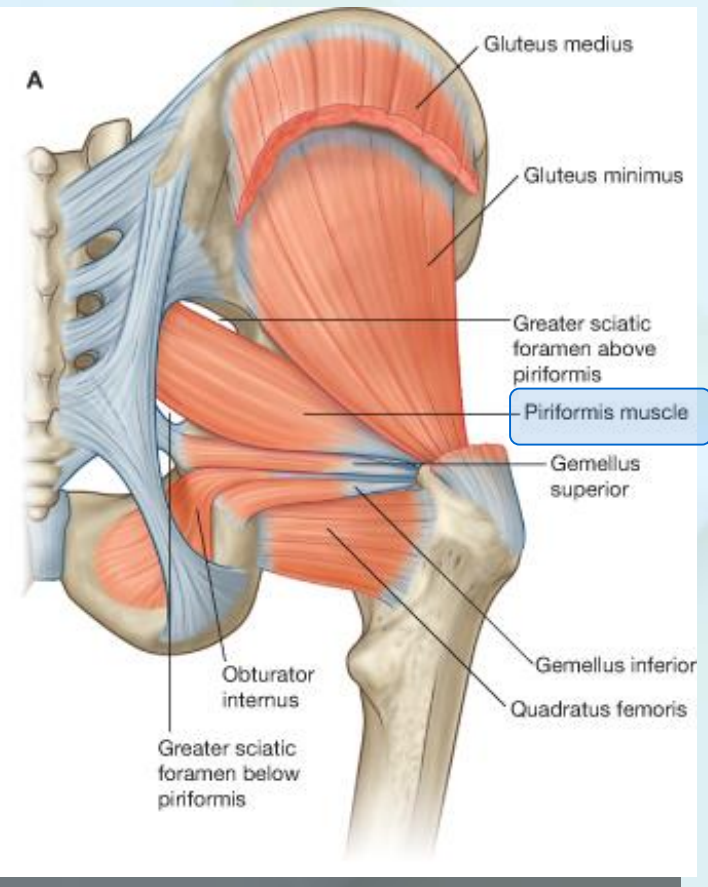
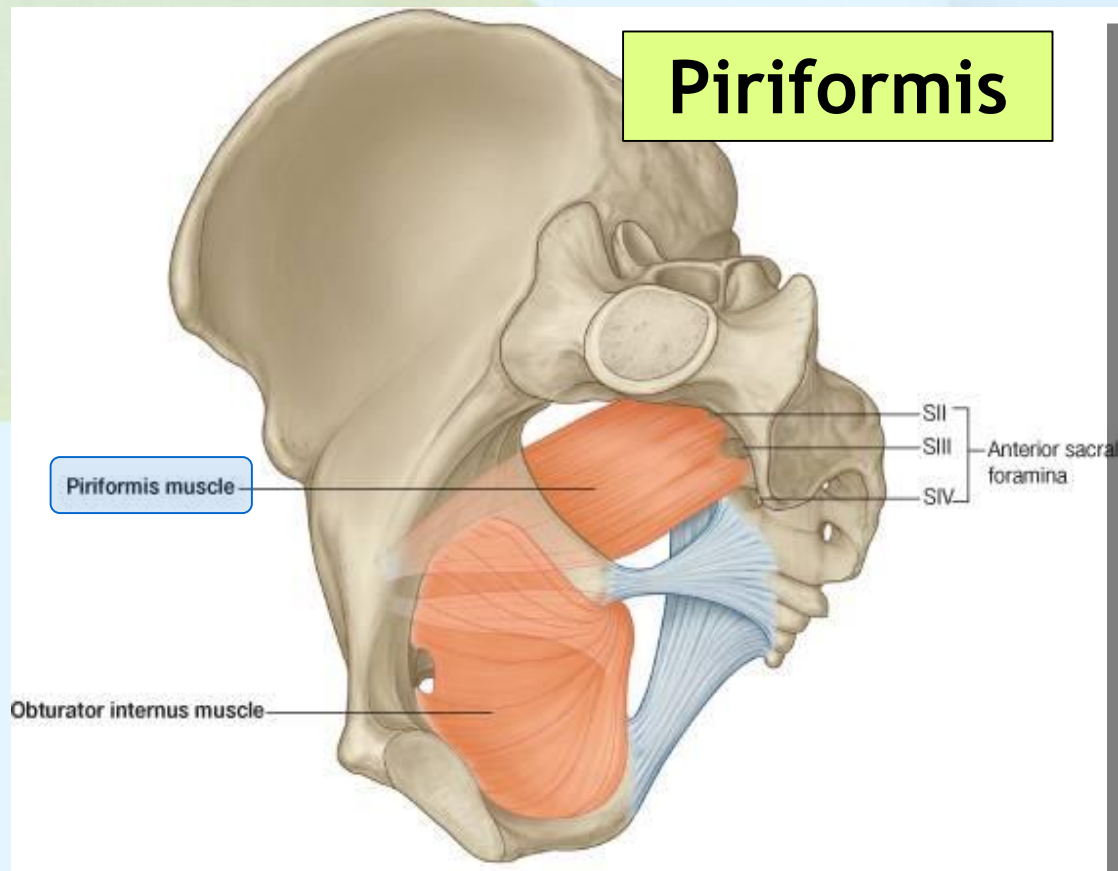
It is the shallowest wall and is formed by the posterior surfaces of the bodies of the pubic bones, the pubic rami, and the symphysis pubis.

POSTERIOR PELVIC WALL



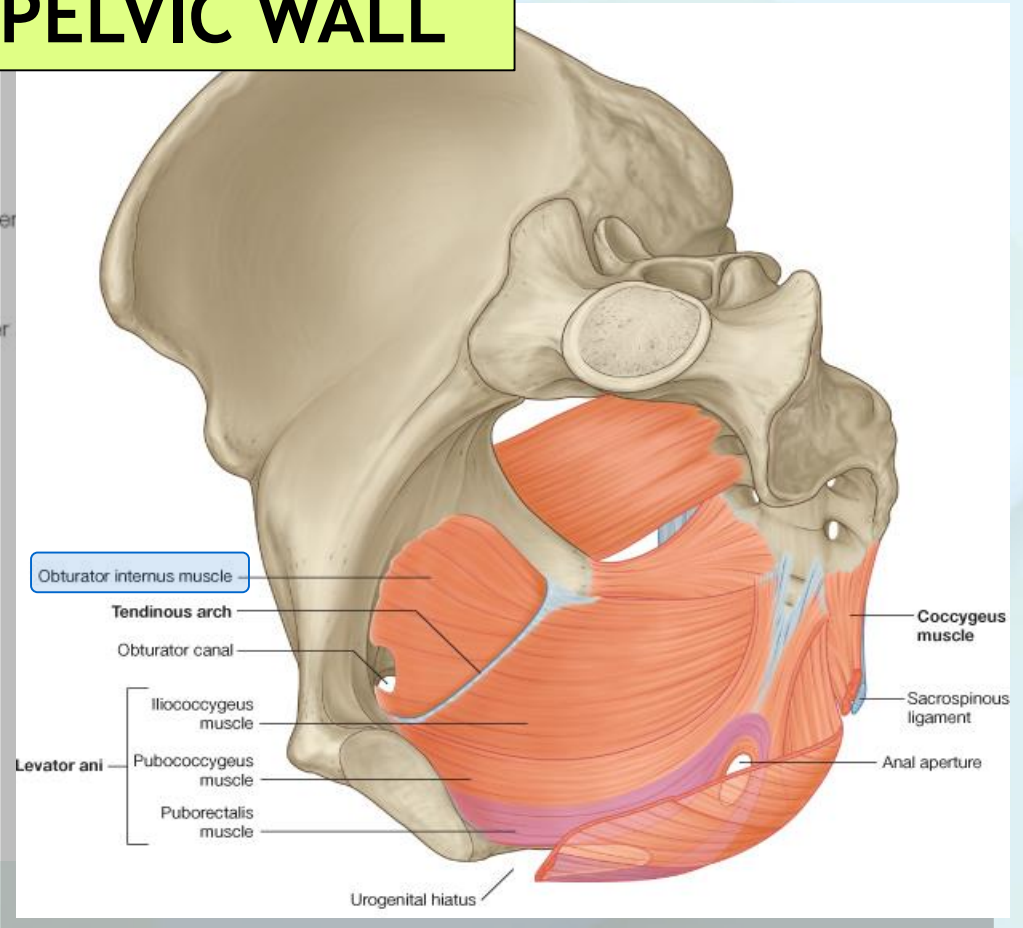
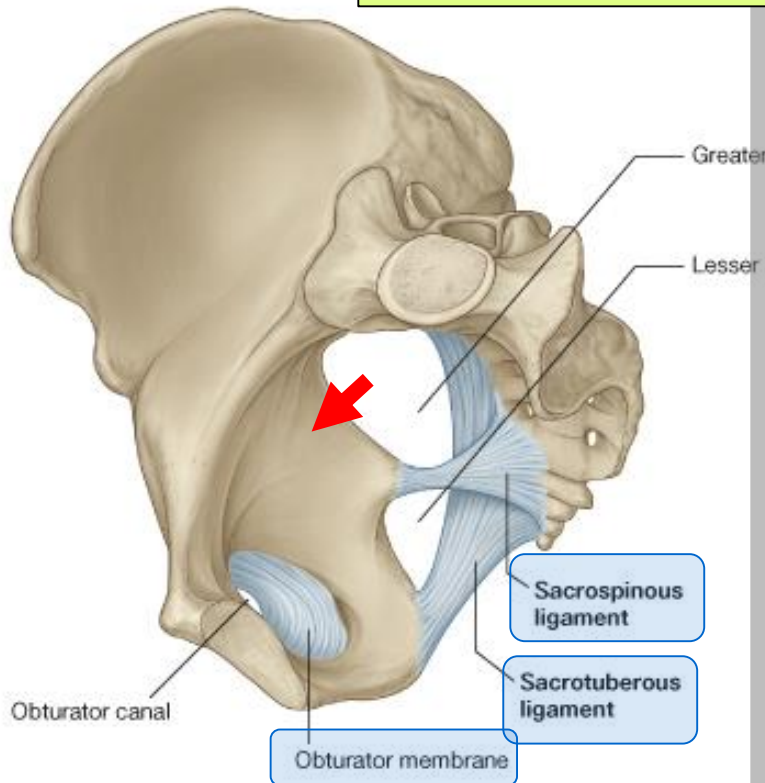
It is large and formed by sacrum, coccyx, piriformis muscles and their covering of parietal pelvic fascia.

Piriformis



- **Origin:** Pelvic surface of the middle 3 sacral vertebrae.
- It leaves the pelvis through the greater sciatic foramen.
- **Insertion:** Greater trochanter of the femur.
- **Action:** Lateral rotator of the femur at the hip joint.
- **Nerve supply:** Sacral plexus.

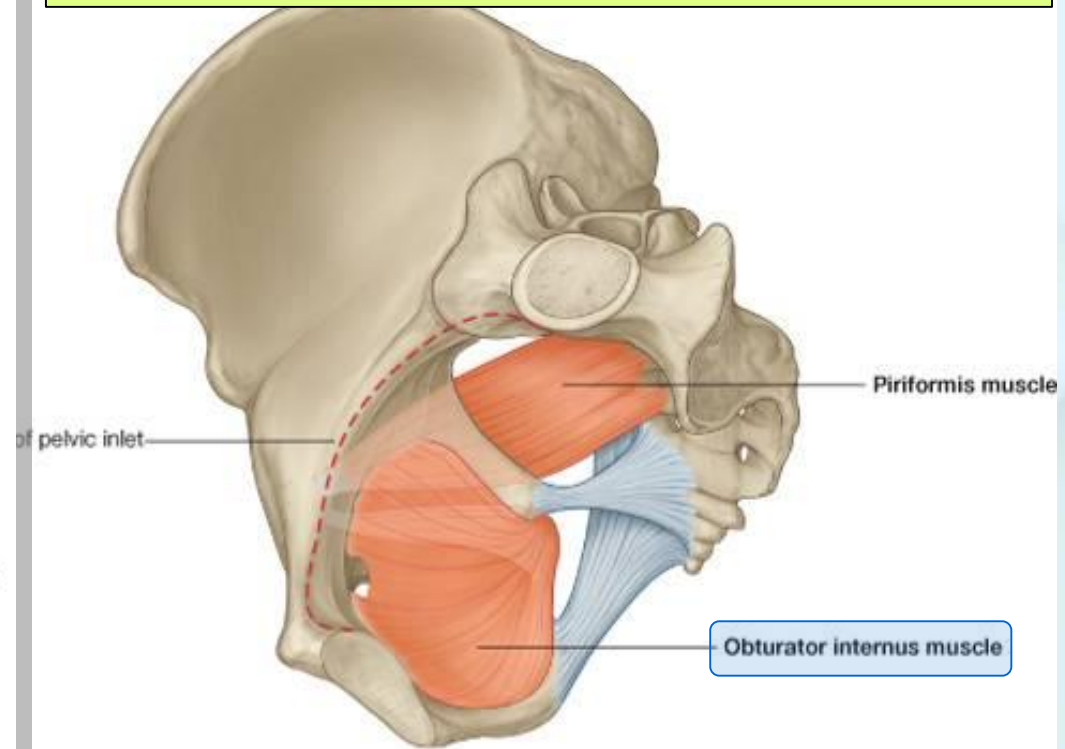
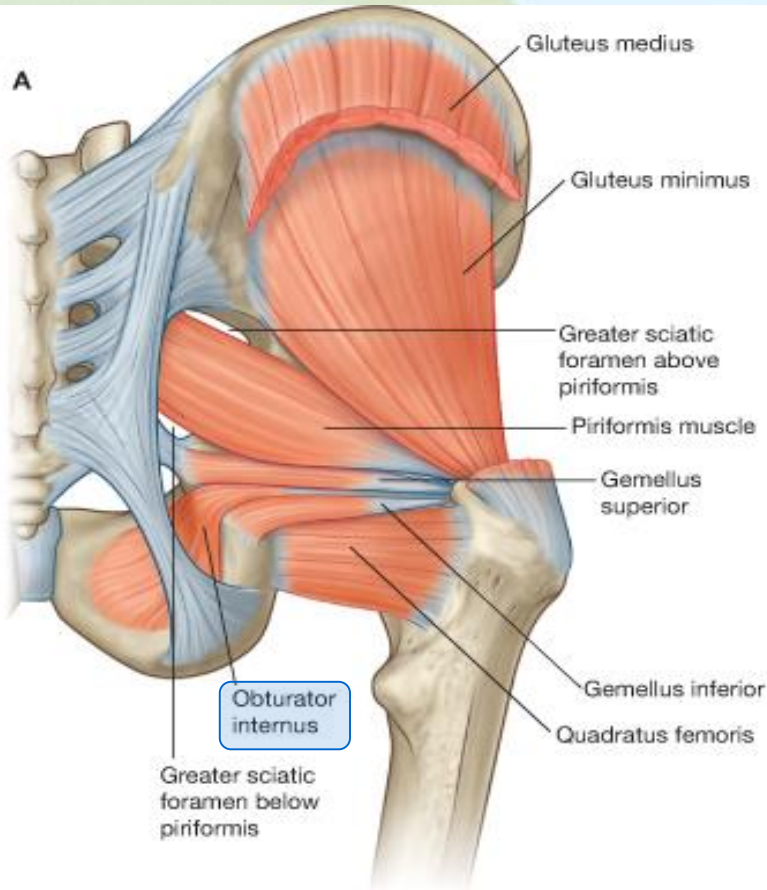
LATERAL PELVIC WALL



It is formed by:

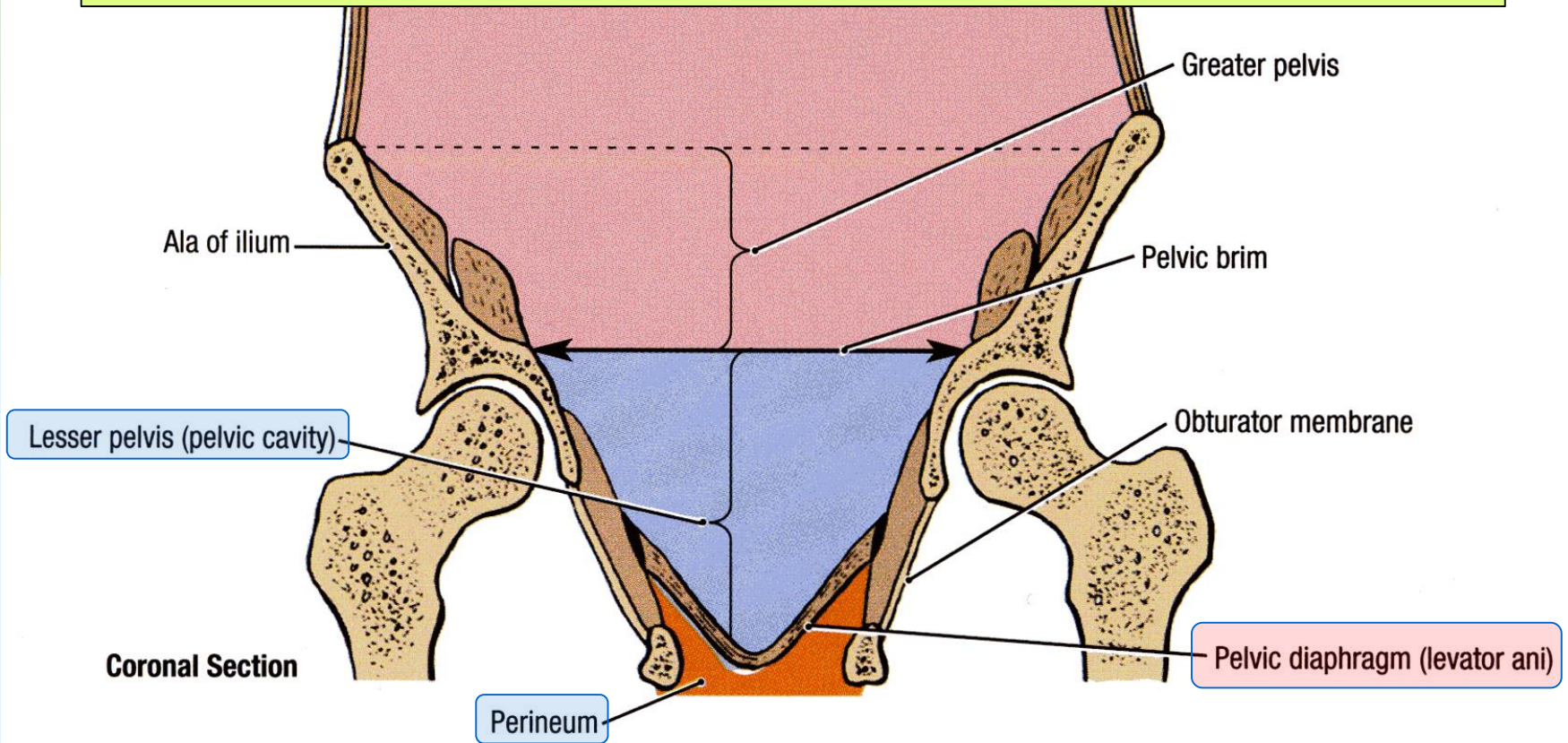
- 1- Part of the hip bone below the pelvic inlet,
- 2- Obturator internus and its covering fascia & the obturator fascia.
- 3- Sacrotuberous ligament.
- 4- Sacrospinous ligament.

Obturator Internus



- **Origin:** Inner surface of the obturator membrane and the hip bone.
- **Insertion:** It leaves the pelvis through the lesser sciatic foramen to be inserted into the greater trochanter of the femur.
- **Action:** Lateral rotator of the femur at the hip joint.
- **Nerve supply:** Nerve to obturator internus.

INFERIOR PELVIC WALL, OR PELVIC FLOOR

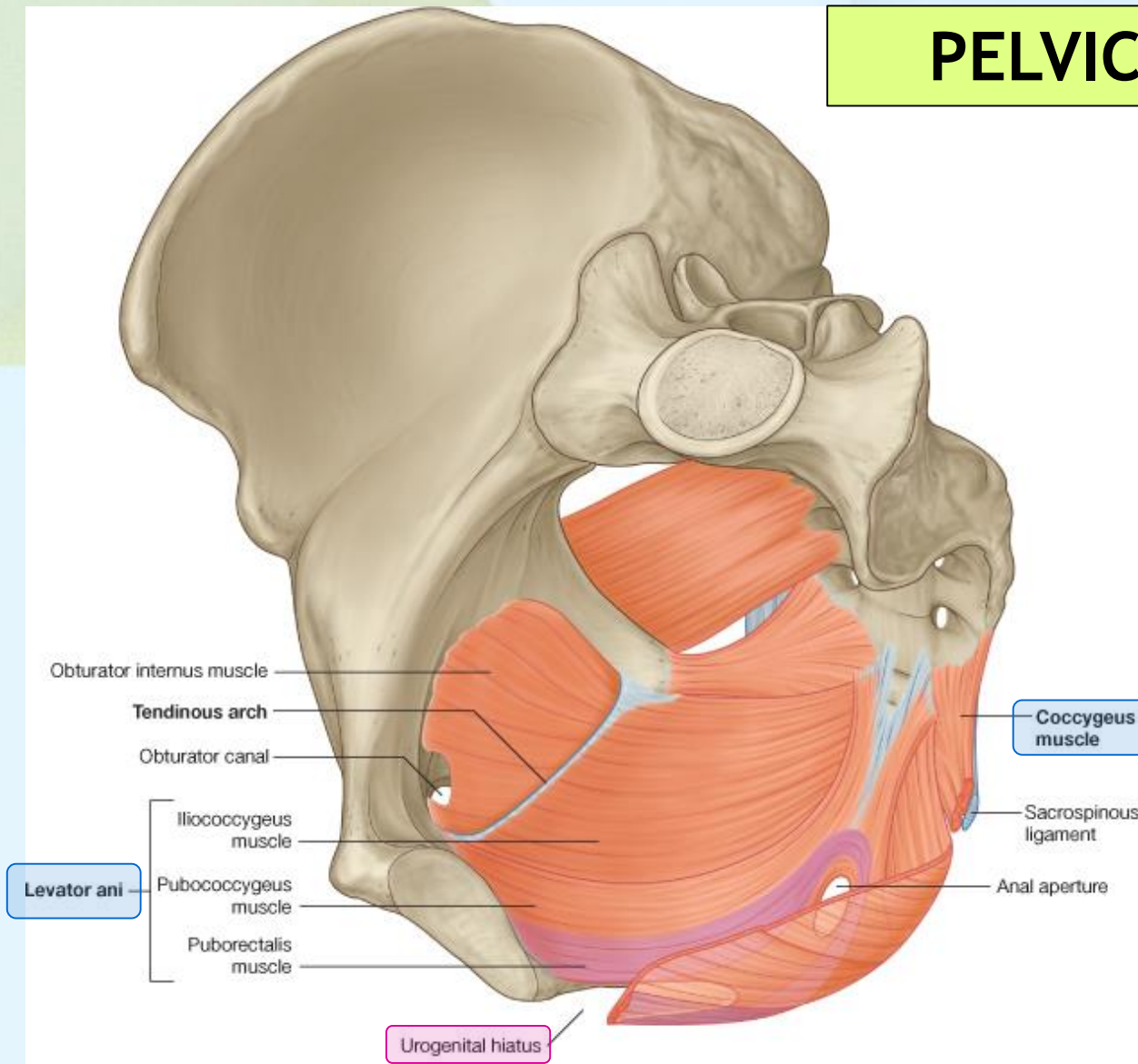


- Basin-like structure which supports the pelvic viscera and is formed by the **pelvic diaphragm**.
- It stretches across the true pelvis and divides it into:
 - **Main (true) pelvic cavity above**, which contains the pelvic viscera, &
 - **Perineum below** which carries the external genital organs.

PELVIC DIAPHRAGM

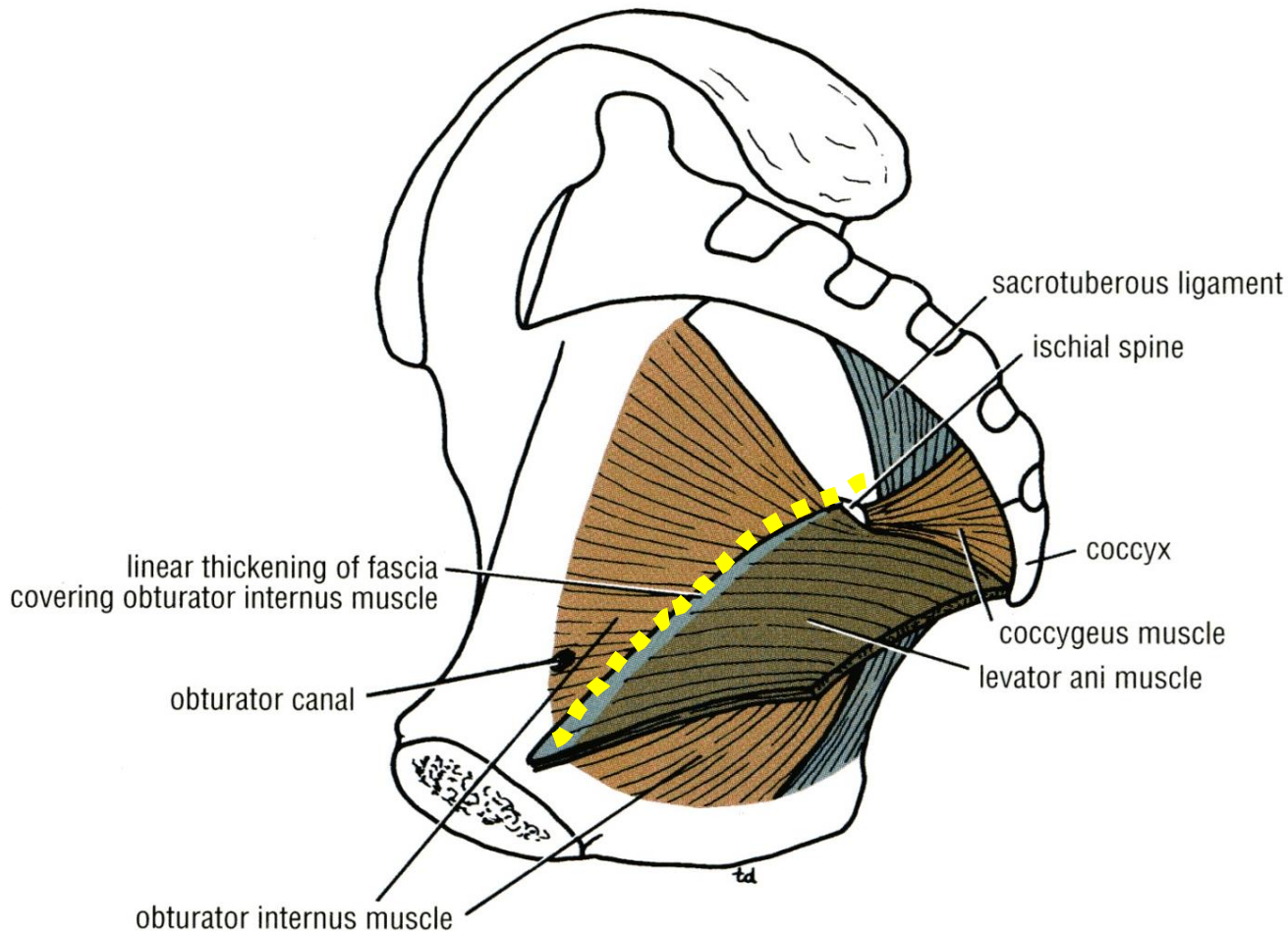
It is formed by the **levator ani** and the **coccygeus muscles** and their covering fasciae.

It is *incomplete anteriorly* to allow passage of the urethra in males and urethra and vagina in females.



LEVATORES ANI MUSCLES

It is a wide thin sheet-like muscle .



ORIGIN:

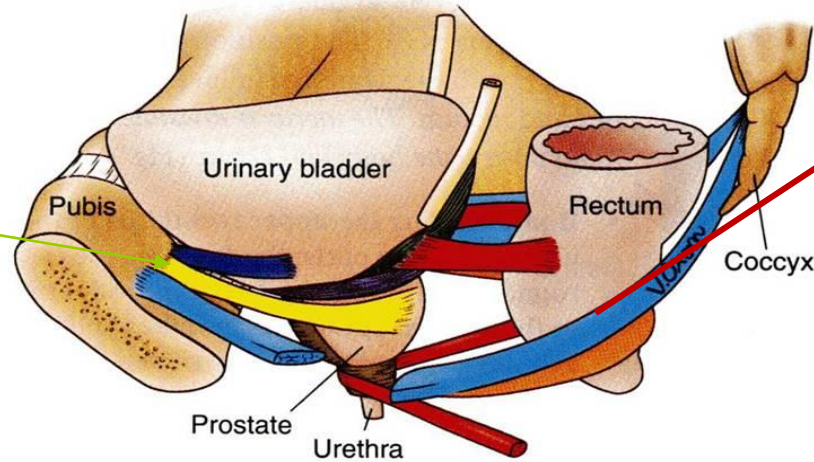
1. Back of the body of the pubis
2. Tendinous arch of the obturator fascia
3. Spine of the ischium.

Its fibers are divided into 3 parts:

- 1- Pubococcygeus.
- 2- Iliococcygeus.
- 3- Puborectalis.

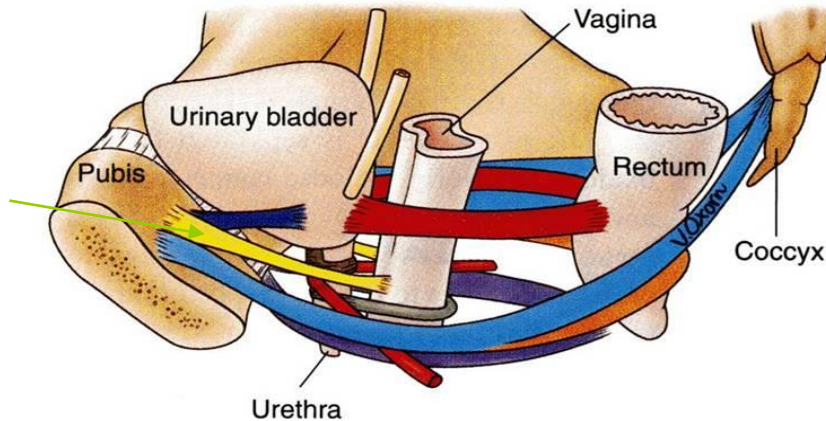
LEVATORES ANI MUSCLES - ANTERIOR FIBERS

Male



levator prostatae

Female



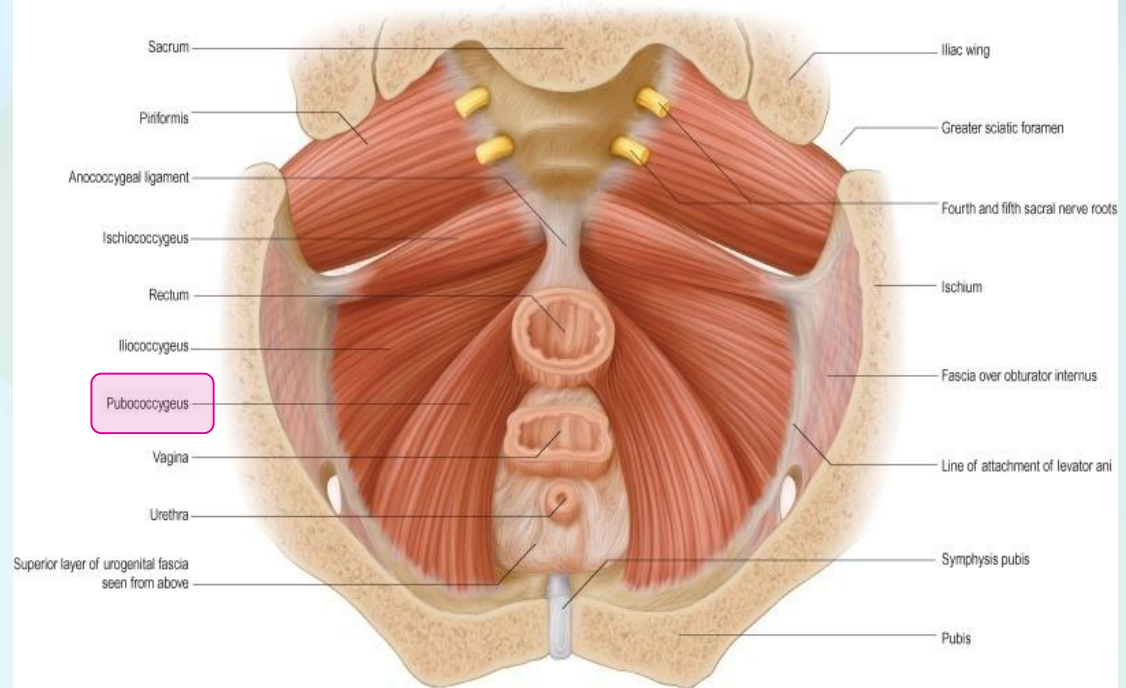
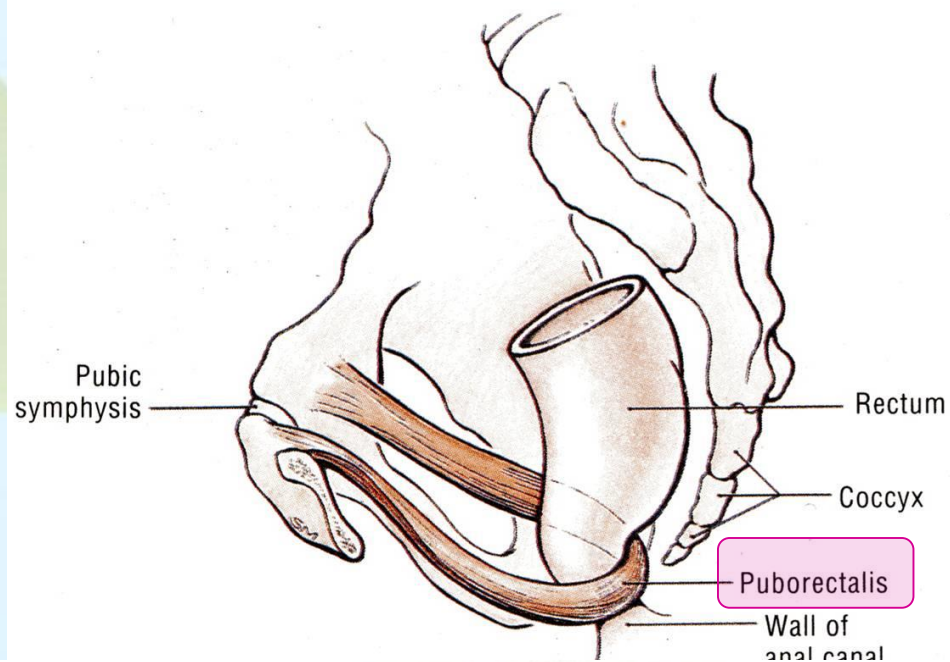
sphincter vaginae

- 1- Pubococcygeus.
- originates from the posterior surface of the body of the pubis
- inserted into the **perineal body** (and coccyx.
- supports the prostate (or constricts the vagina)
- stabilizes the perineal body
- forms a sling around the prostate or the vagina

The puborectalis

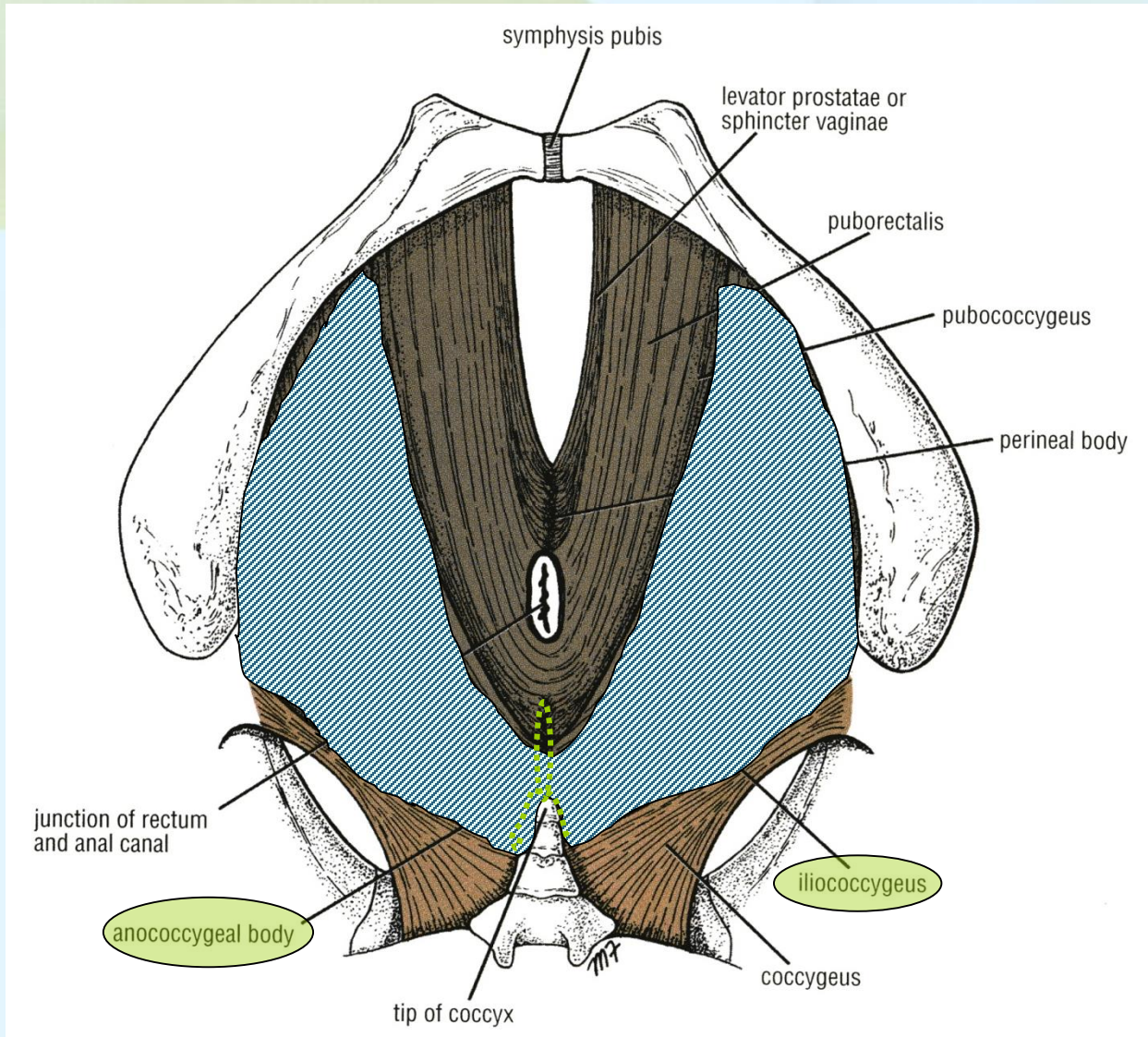
forms a sling around the recto-anal Junction.

It has a very important role in maintaining fecal continence.



LEVATORES ANI MUSCLES Intermediate Part

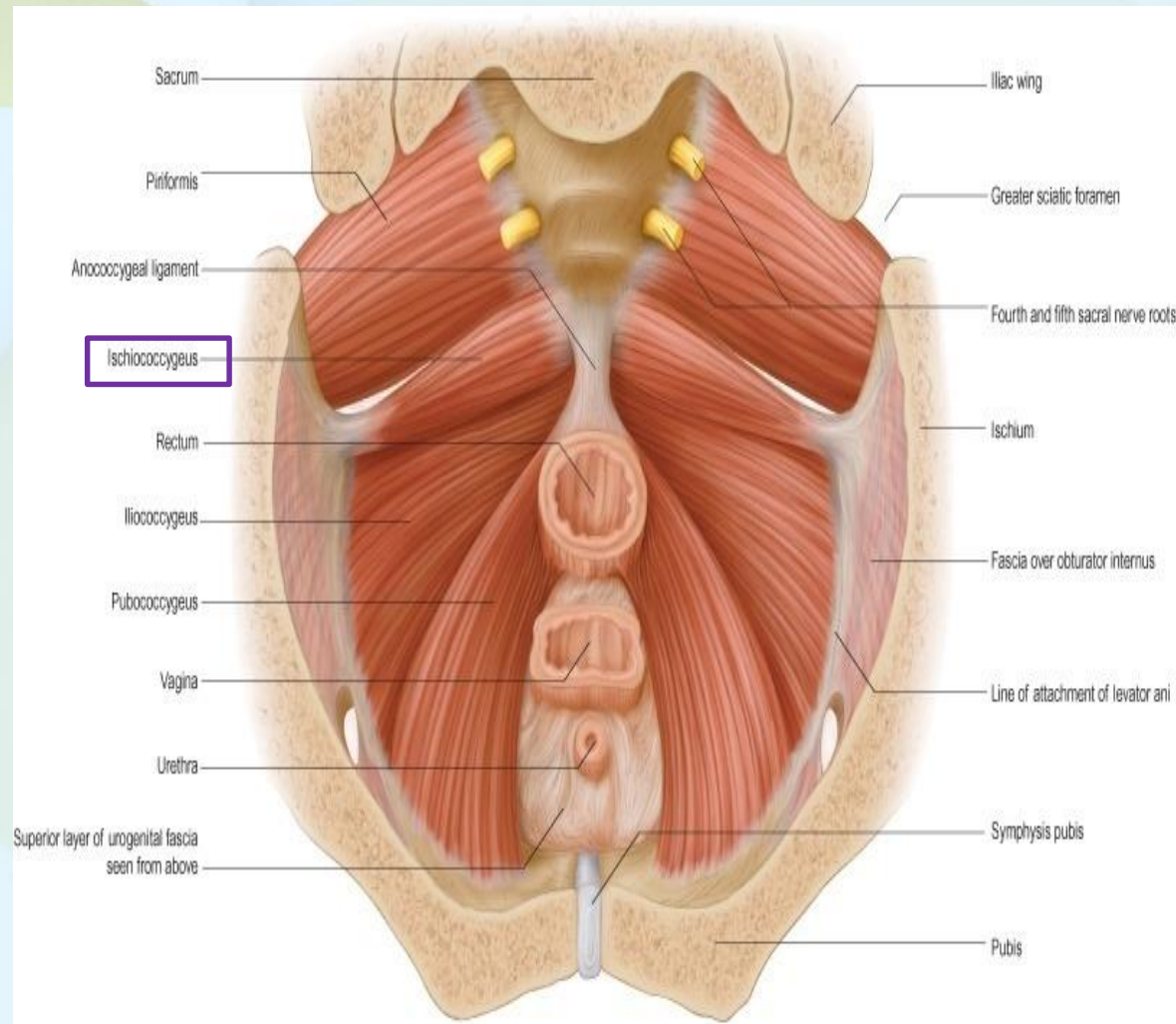
- **Iliococcygeus**
- inserted into the anococcygeal body and the coccyx



Posterior part

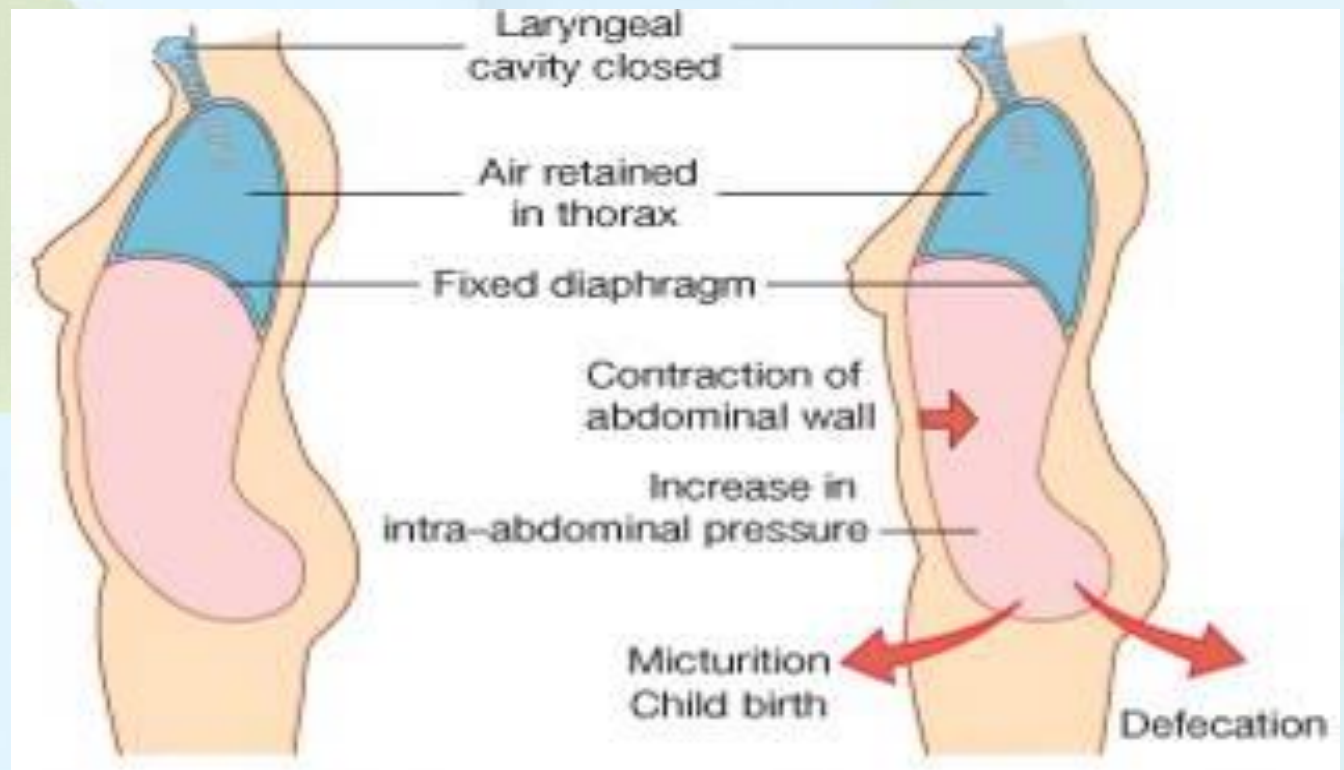
Ischiococcygeus

Arises from the ischial spine and inserted into the anococcygeal body & coccyx



Nerve supply to levator ani:

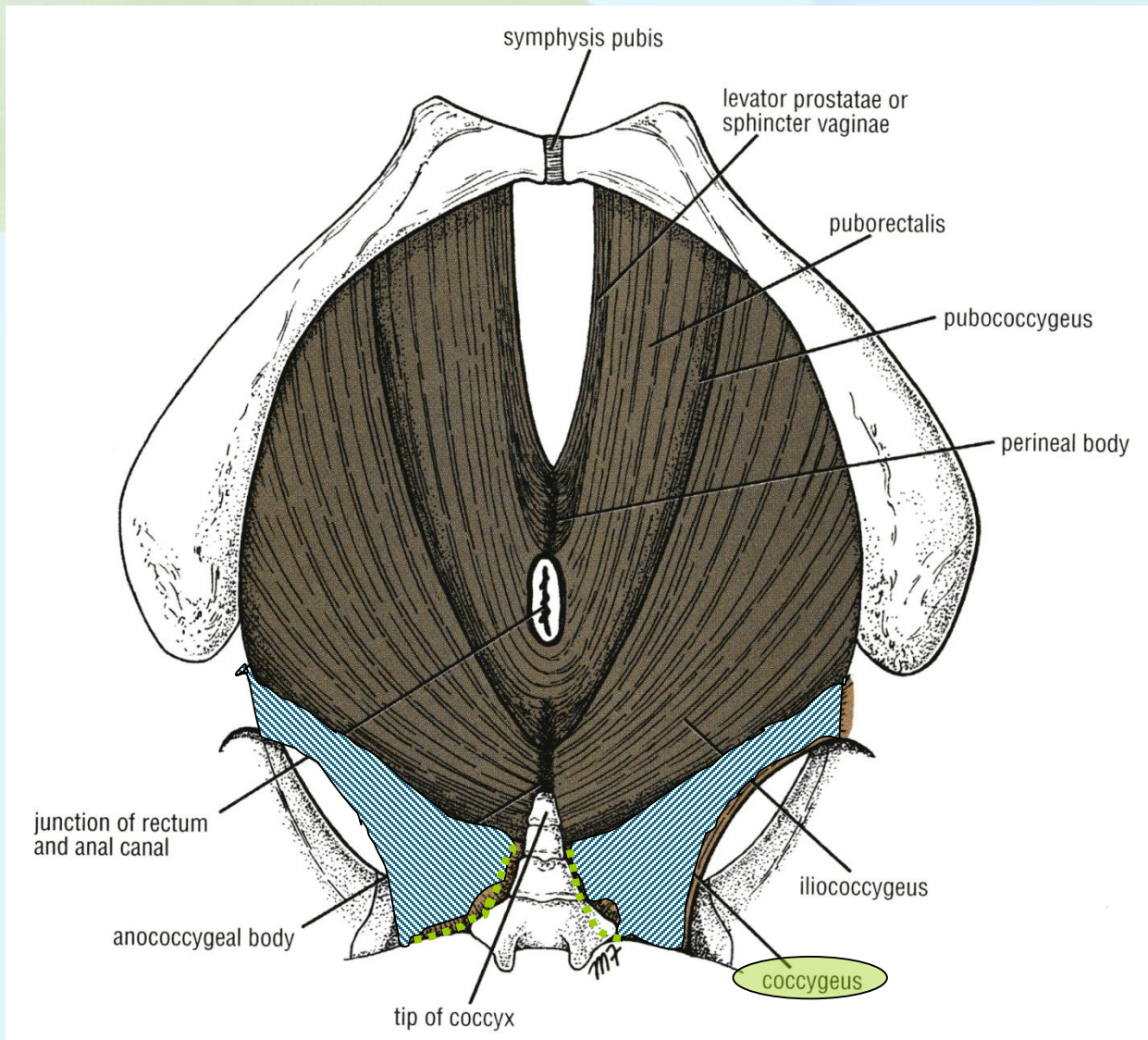
1. perineal branch of the fourth sacral nerve
2. perineal branch of the pudendal nerve.



Actions of levator ani:

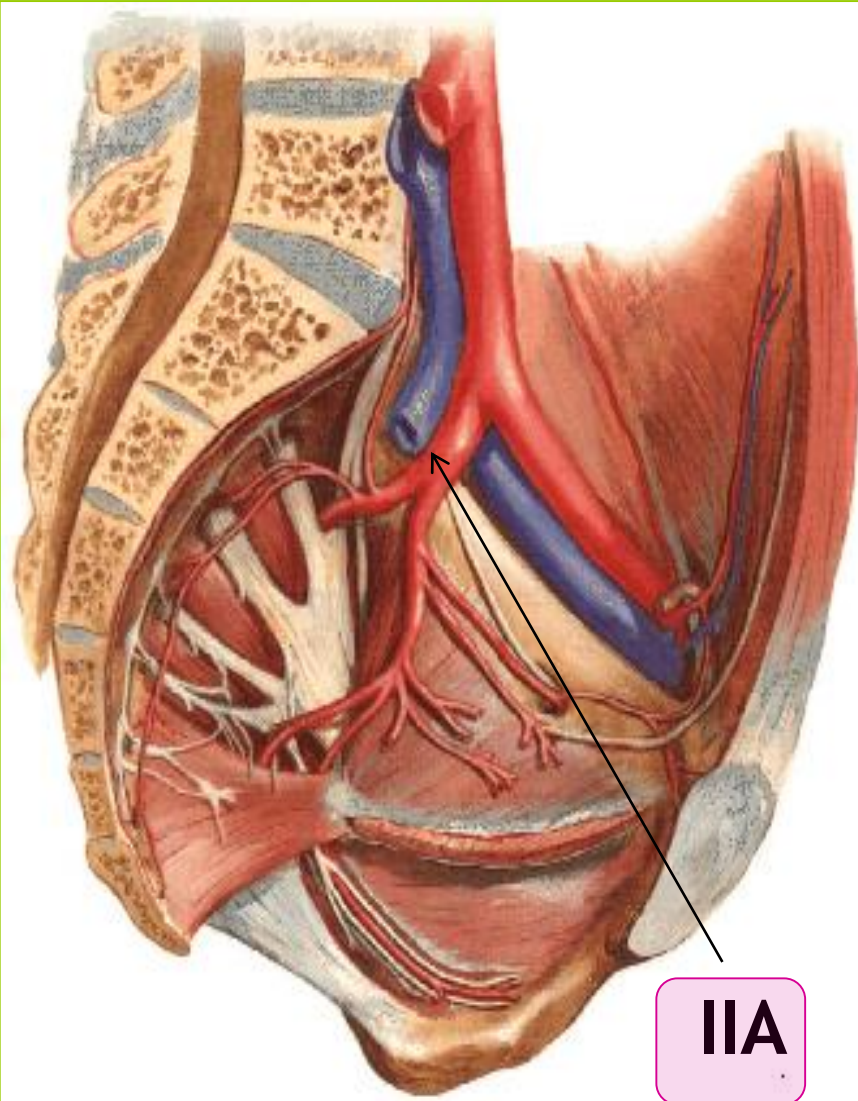
1. The muscles of the two sides form an efficient muscular sling that supports and maintains the pelvic viscera in position.
2. They resist the rise in intra pelvic pressure during the straining and expulsive efforts of the abdominal muscles (as in coughing).
3. They have a very important role in maintaining fecal continence.
4. They serve as a vaginal sphincter in the female.

COCCYGEUS MUSCLE



- small triangular muscle.
- **Origin:**
- Ischial spine.
- **Insertion:**
- Lower end of sacrum and coccyx
- **Action:**
- Assist the levator ani in supporting the pelvic viscera
- **Nerve supply:**
- branches of the 4th and 5th sacral nerves

Arteries of the Pelvis



(I) Internal iliac artery(IIA):

- One of the 2 terminal branch of the Common iliac artery.
- Arises in front of the sacroiliac joint
- It descends downward & backwards over the pelvic inlet.
- It divides at the upper border of the greater sciatic foramen into:
- **Anterior & Posterior divisions.**

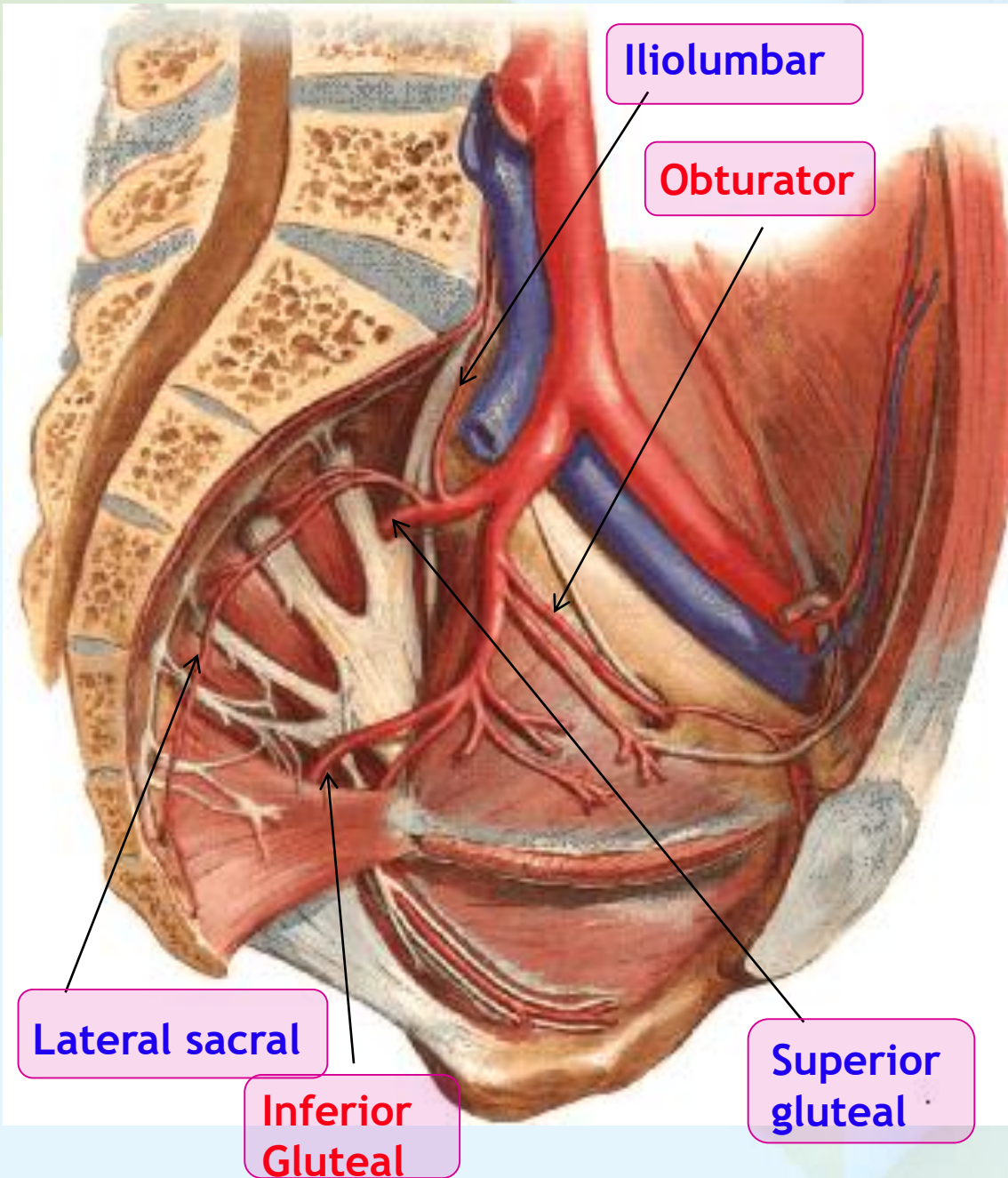
Posterior division Supplies:

1. Posterior abdominal wall.
2. Posterior pelvic wall.
3. Gluteal region.

Anterior division supplies:

1. Gluteal region.
2. Perineum.
3. Pelvic viscera.
4. Medial (adductor) region of thigh
5. The fetus (through the umbilical arteries).

Parietal Branches



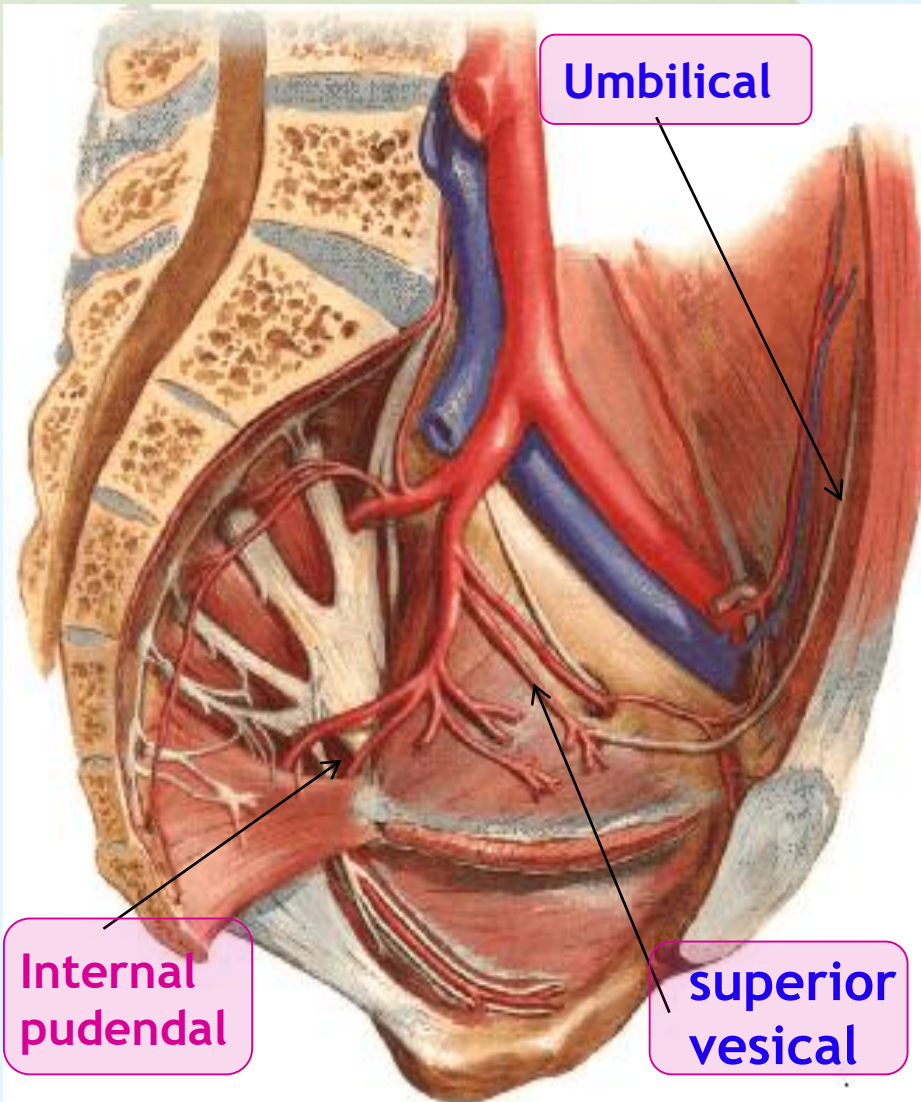
- From posterior division:

1. Iliolumbar artery.
2. Lateral sacral arteries (2 branches.)
3. Superior gluteal artery.

- From anterior division:

1. Obturator artery.
2. Inferior Gluteal artery.

Visceral Branches (all from **anterior division**)



Umbilical artery :

Gives the **superior vesical artery:**
The distal part of this artery fibrosed and forms the **Medial Umbilical Ligament.**

Inferior Vesical artery in male or vaginal in femal:

- In the male it supplies, the Prostate and the Seminal Vesicles.
- It also gives the artery of the Vas Deferens.
- Middle rectal artery
- Internal pudendal artery
- It is the main arterial supply to the **perineum.**

Visceral Branches (in Female)

Vaginal artery:

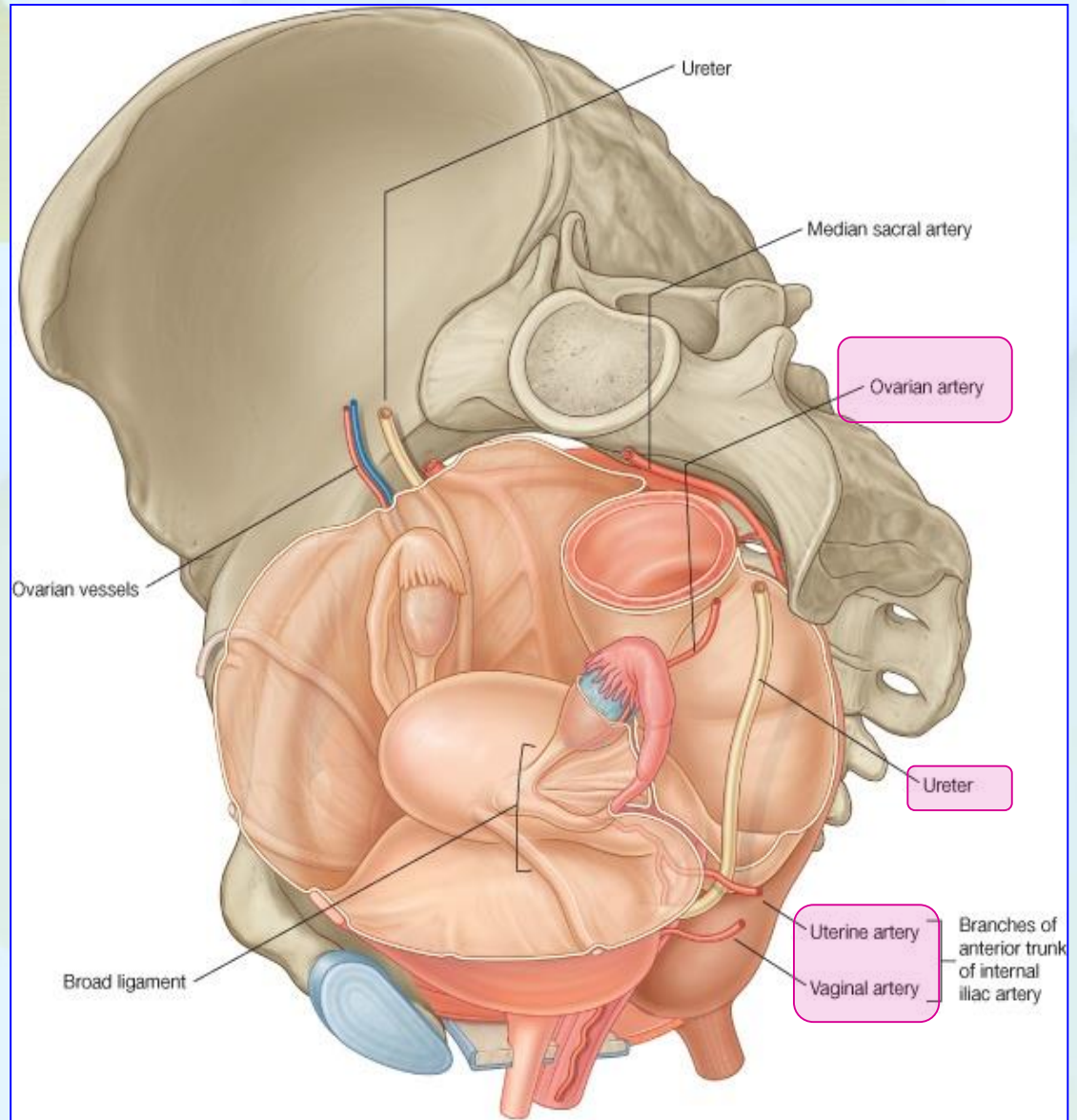
Replaces the inferior vesical artery.

Uterine artery:.

Crosses the Ureter superiorly and supplies the uterus & uterine tubes.

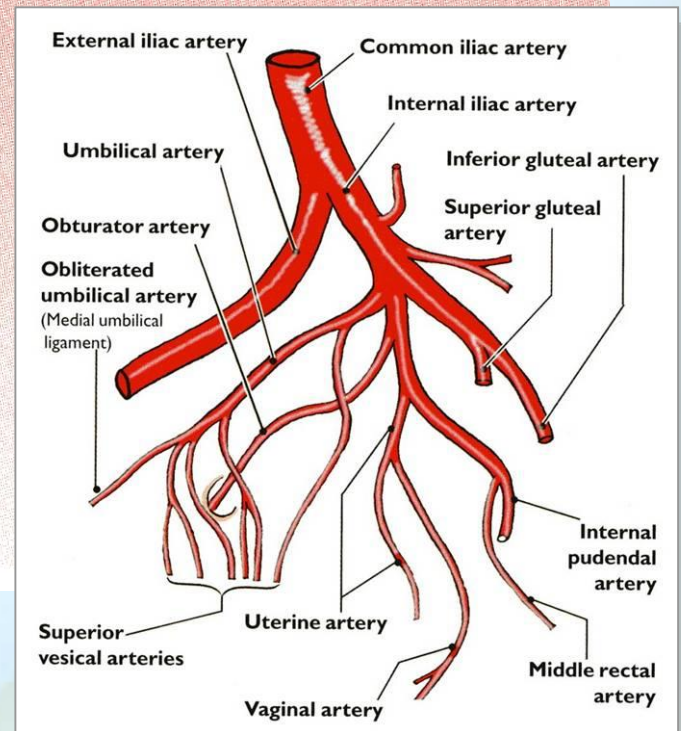
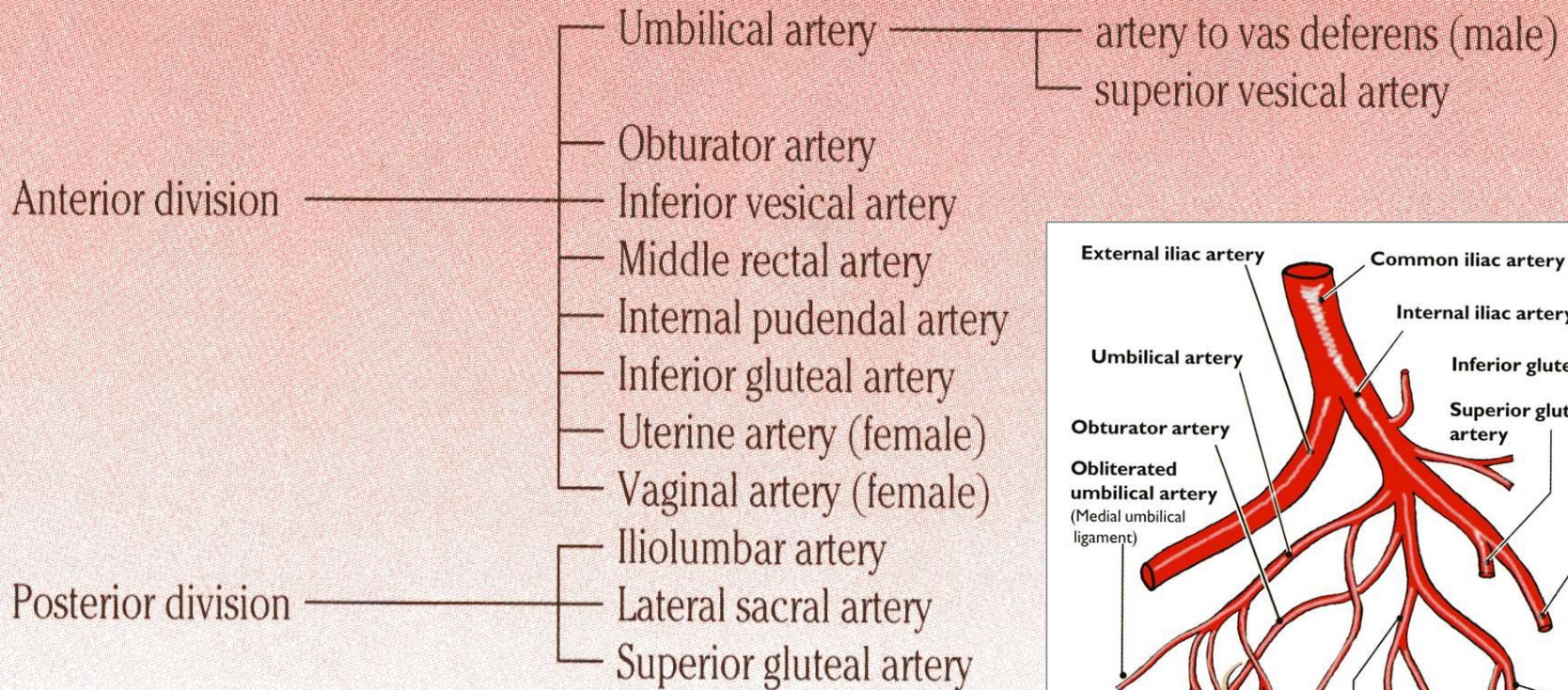
(II) Ovarian artery:

Arises from the abdominal aorta.



IN BRIEF...

Diagram 6-1 Branches of the Internal Iliac Artery



Venous Drainage

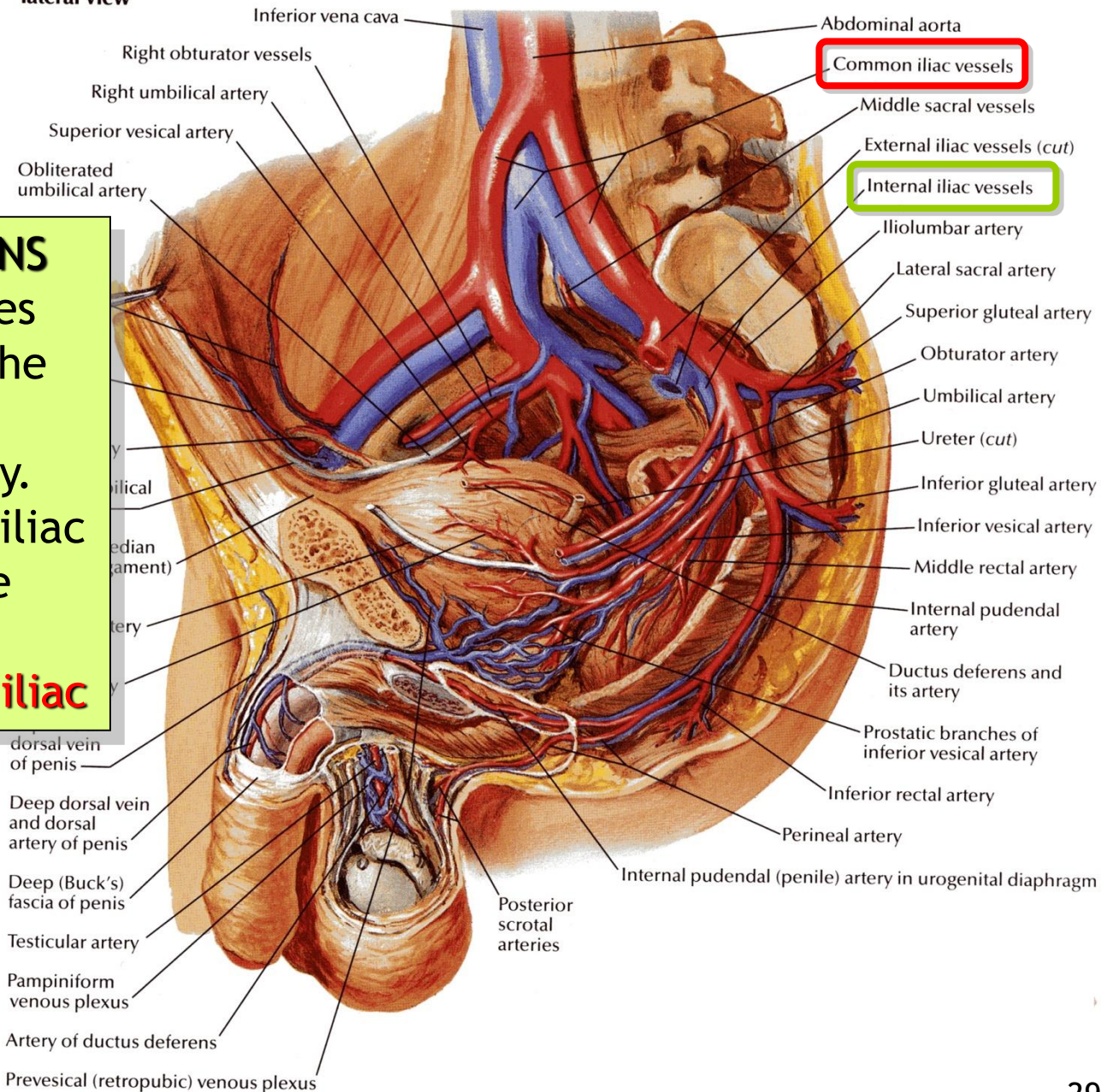
INTERNAL ILIAC VEINS

- It collect tributaries corresponding to the branches of the internal iliac artery.
- joins the external iliac vein in front of the sacroiliac joint to form the **common iliac vein**

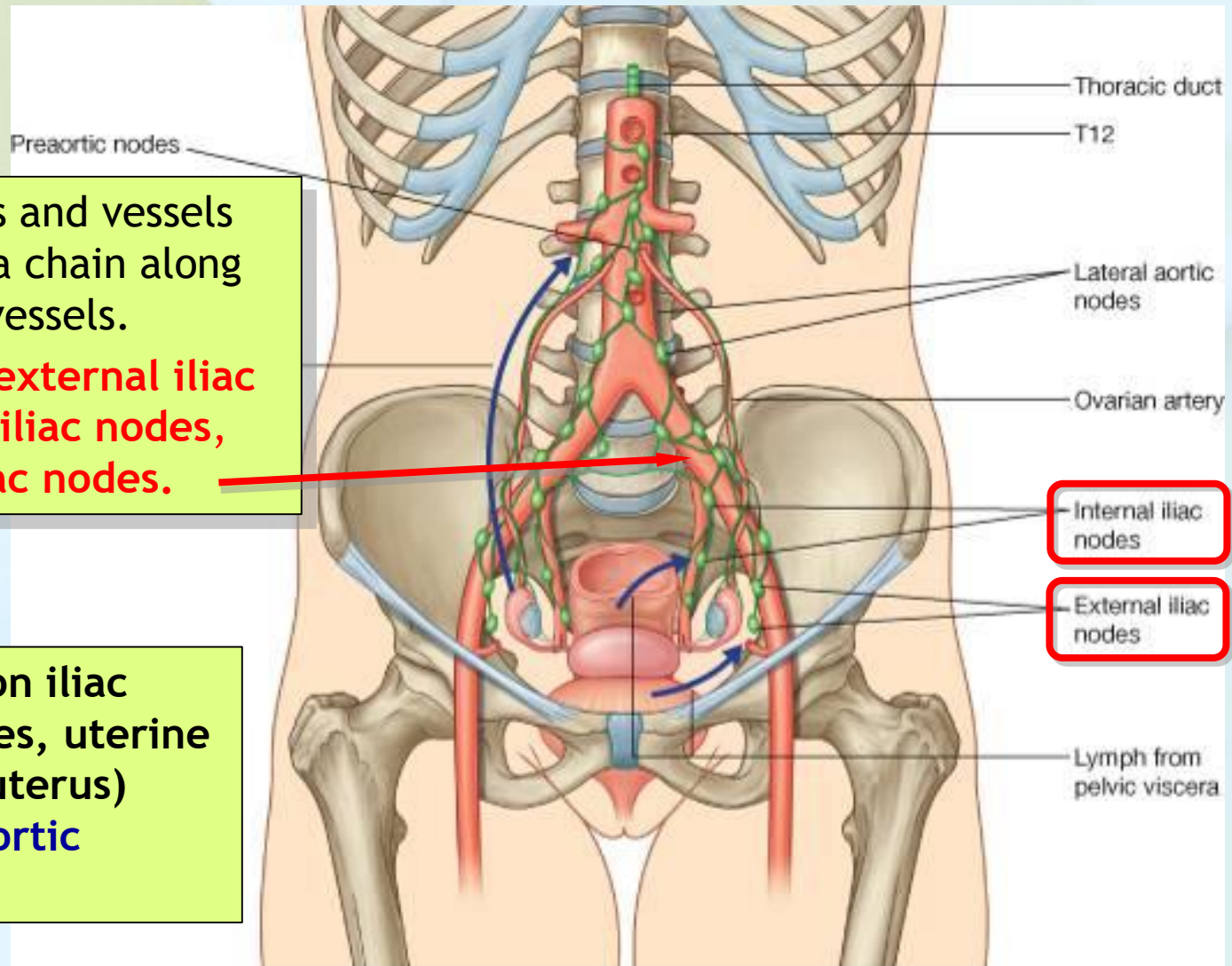
Ovarian vein:

- Right vein drains into IVC
- Left vein drains into left renal Vein.

Left paramedian section:
lateral view



LYMPHATICS OF THE PELVIS

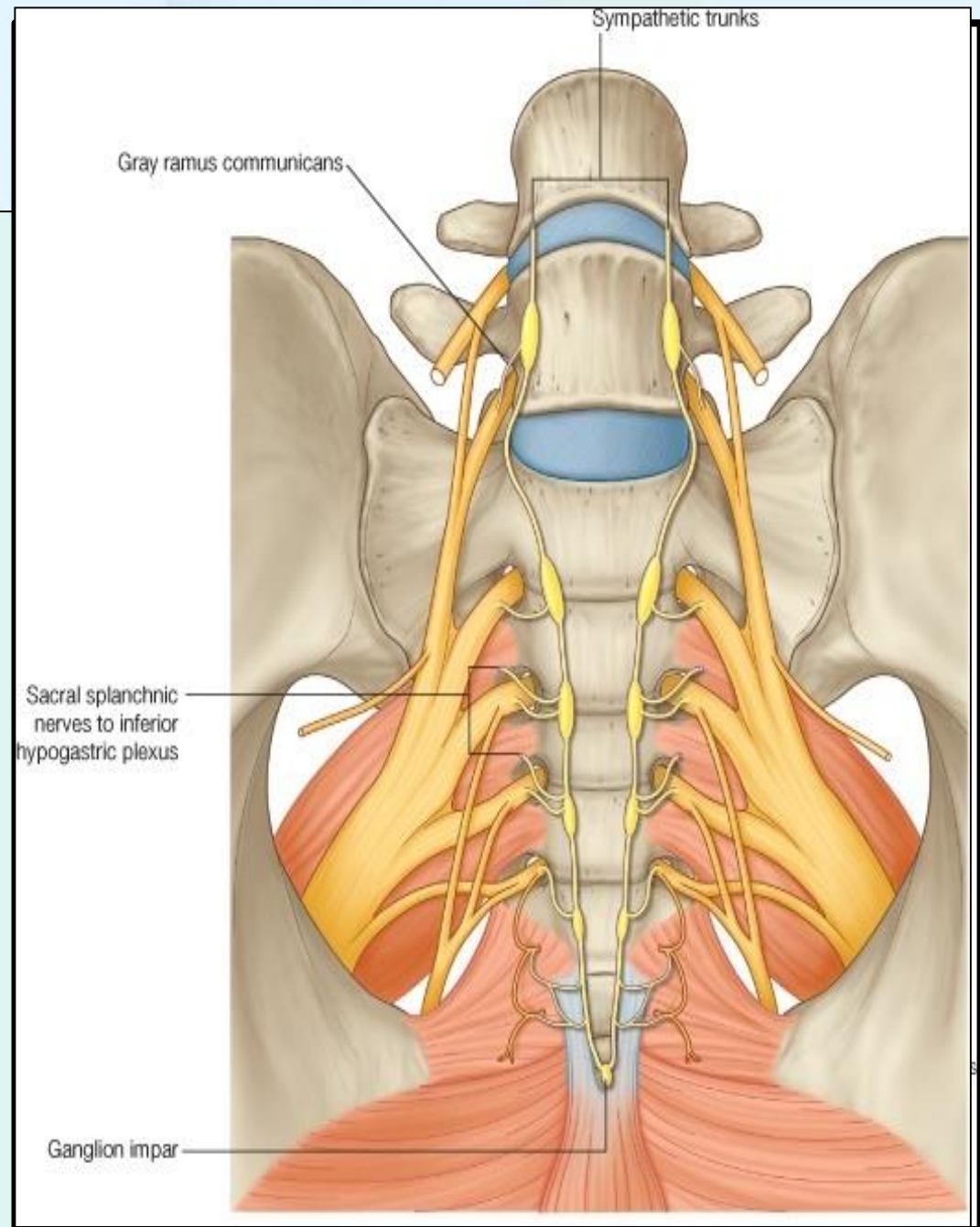


- The lymph nodes and vessels are arranged in a chain along the main blood vessels.
- Thus, there are **external iliac nodes**, **internal iliac nodes**, and **common iliac nodes**.

lymph from Common iliac nodes & the (Ovaries, uterine tubes & fundus of uterus) passes to **Lateral aortic (paraortic) nodes**.

Nerve Supply

- **Somatic:**
- **Sacral plexus**
- **Autonomic:**
- **Sympathetic:**
- **Pelvic part of sympathetic trunk:** The 2 sympathetic trunks unite inferiorly in front of the coccyx and form a single ganglion (**Ganglion impar**).
- **II- Superior & Inferior Hypogastric plexuses**
- **Parasympathetic:**
- **Pelvic splanchnic nerves**
(From S 2 , 3 & 4)



Thank You