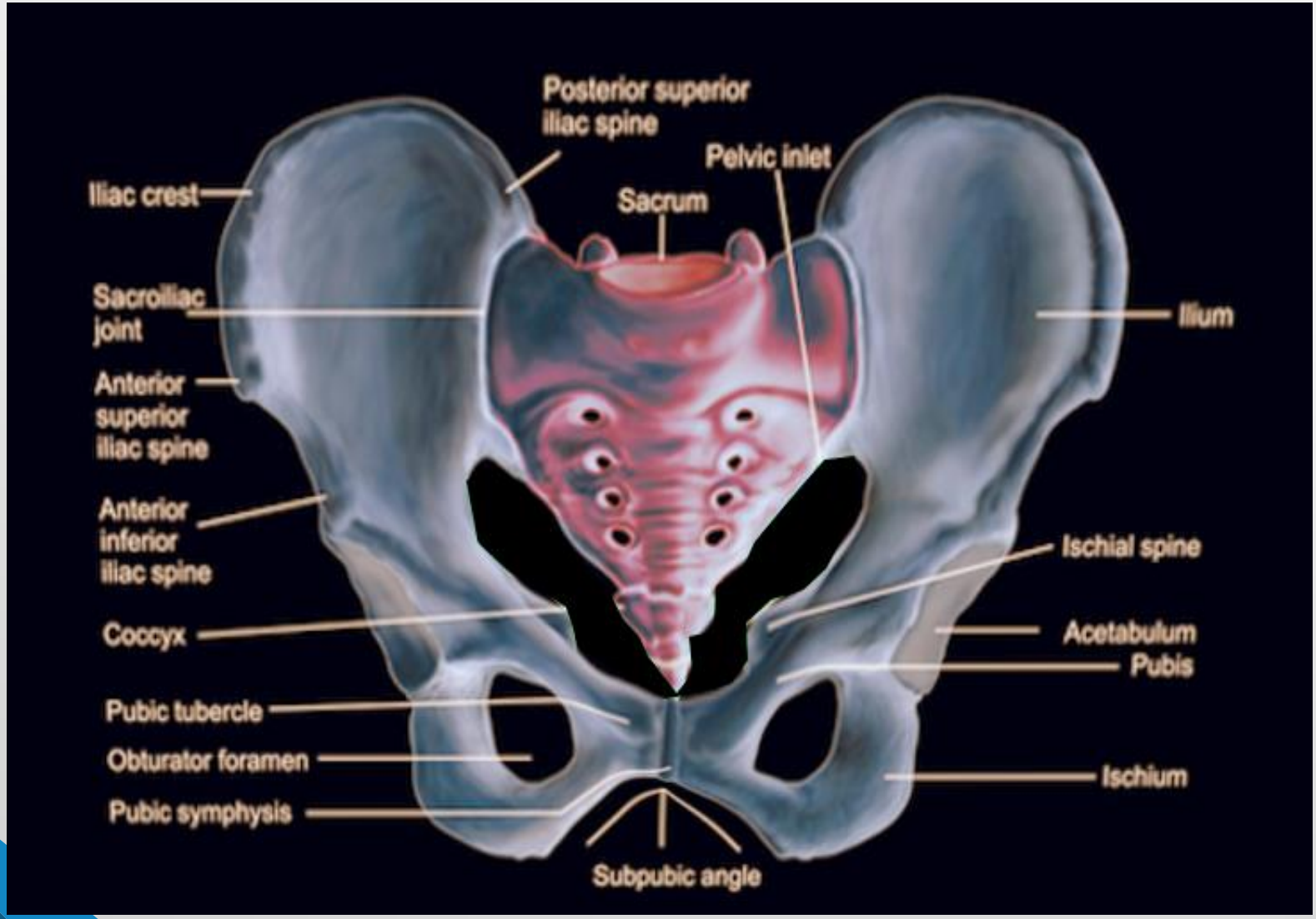

بسم الله الرحمن الرحيم

GROSS ANATOMY
PELVIC DIAPHRAGM

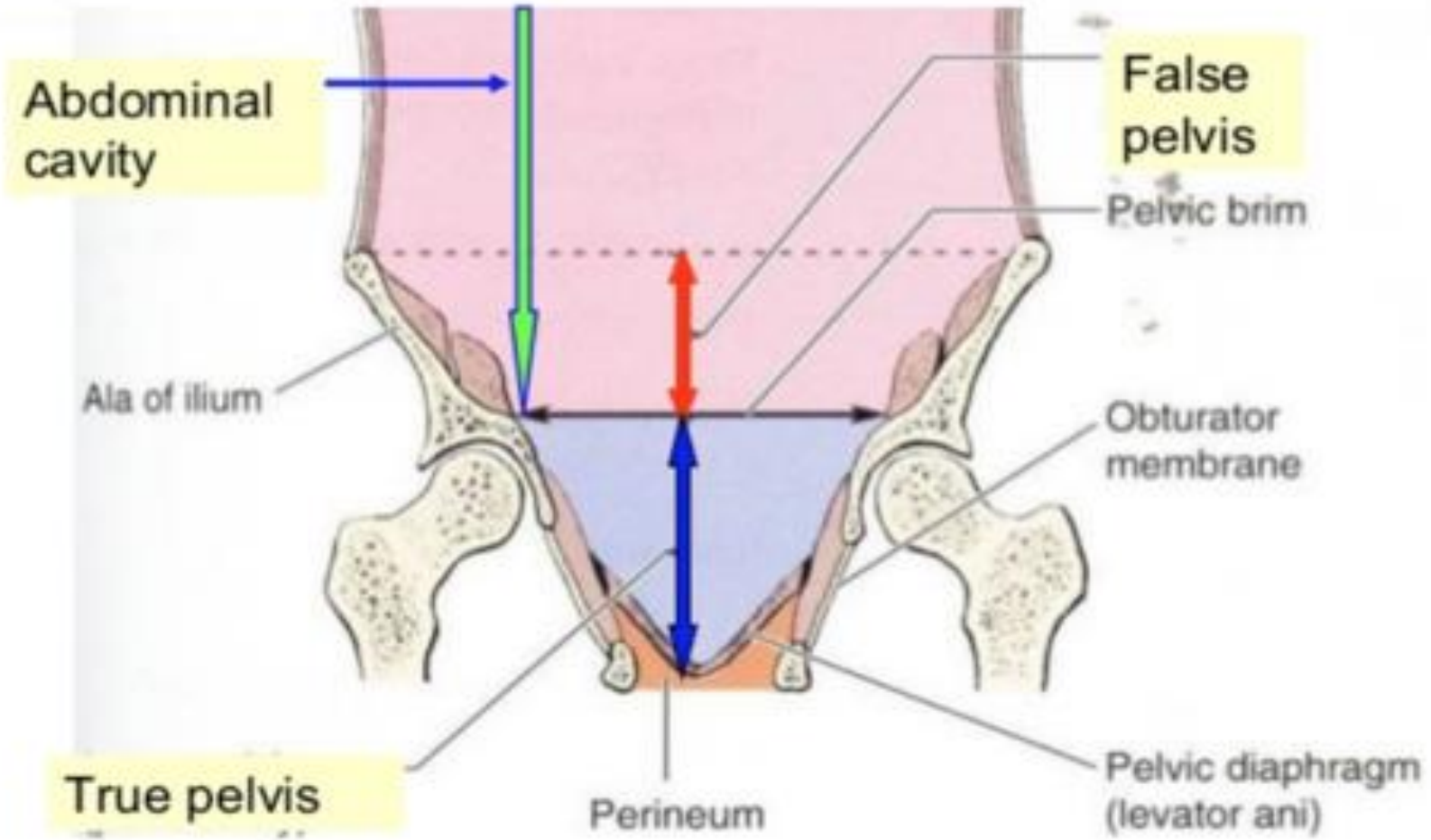
BY DR. MAHVISH JAVED

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)


Posterior superior iliac spine
Pelvic inlet
Iliac crest
Sacrum
Sacroiliac joint
Ilium
Anterior superior iliac spine
Anterior inferior iliac spine
Ischial spine
Coccyx
Acetabulum
Pubis
Pubic tubercle
Obturator foramen
Ischium
Pubic symphysis
Subpubic angle

TRUE & FALSE PELVIS



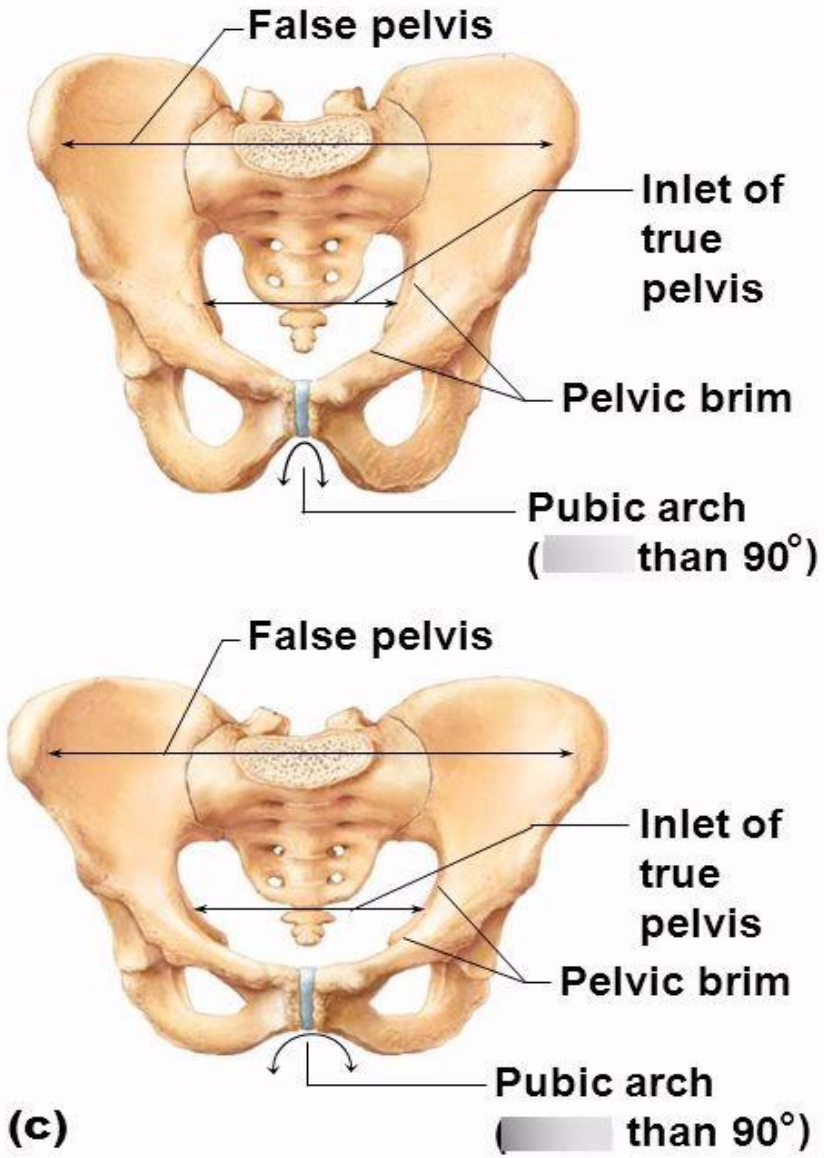
GREATER PELVIS(PELVIS MAJOR)

- Location of some abdominal viscera (ileum and sigmoid colon)
- Bounded by abdominal
- wall anteriorly,
- the iliac fossa posteriolaterally and
- L5 S1 vertebrae posteriorly
- False Pelvis

LESSER PELVIS (PELVIS MINOR)

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

Figure 5.26c The bony pelvis.



True vs. False Pelvis

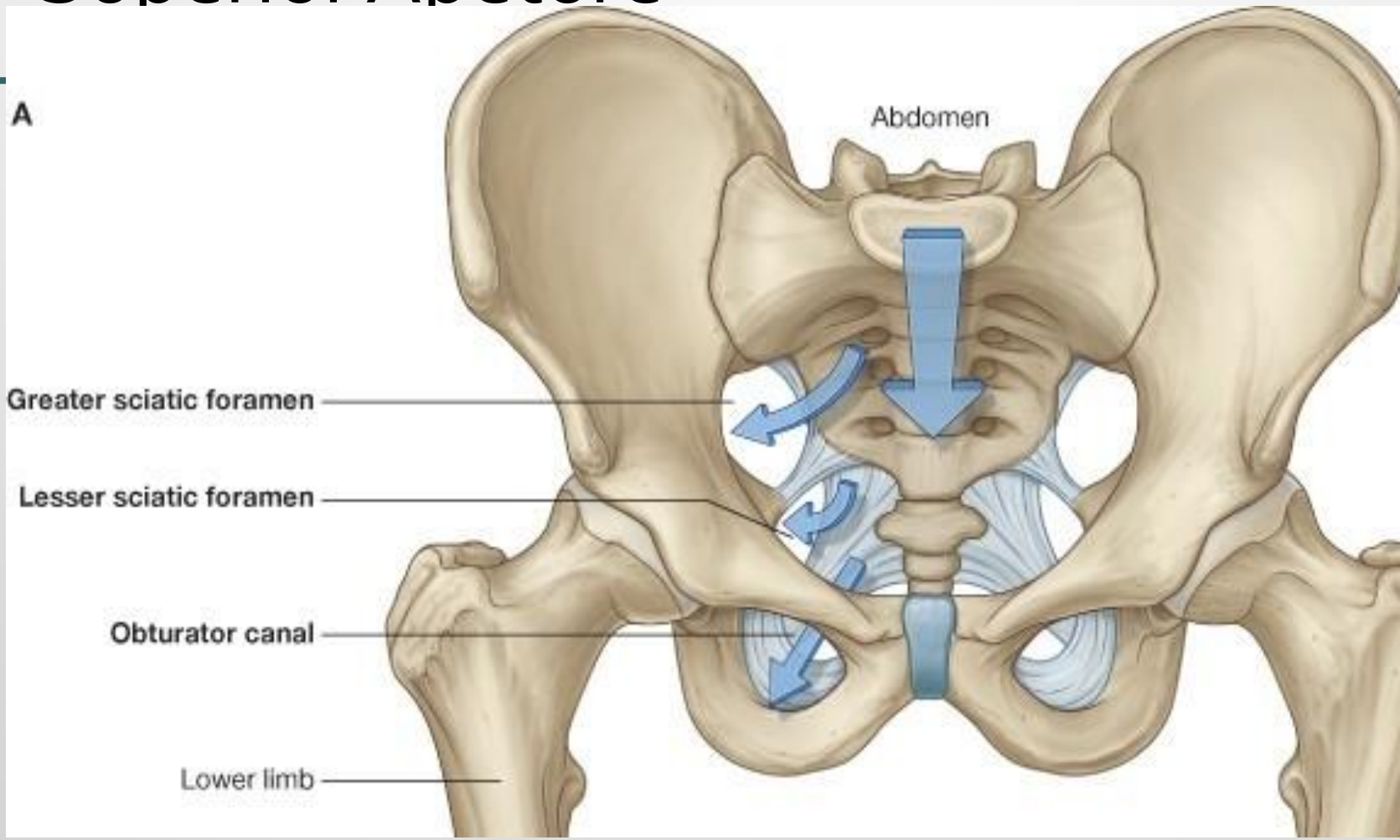
True

- Lies below pelvic brim
- Contains colon, rectum, bladder, ovaries and uterus
- Limited inferiorly by pelvic diaphragm

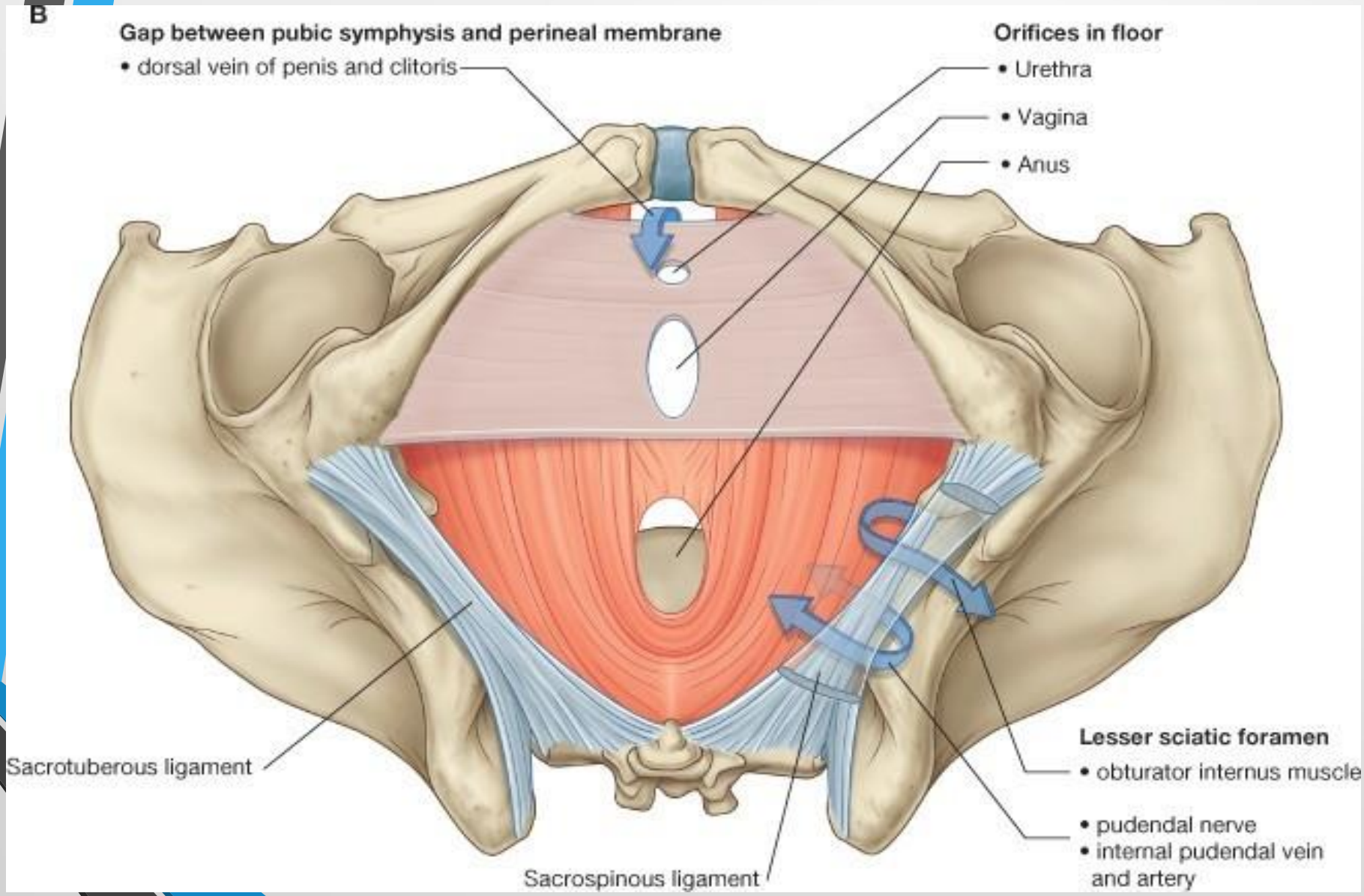
False

- Lies above pelvic brim/inlet
- Contains abdominal organs

Superior Apeture

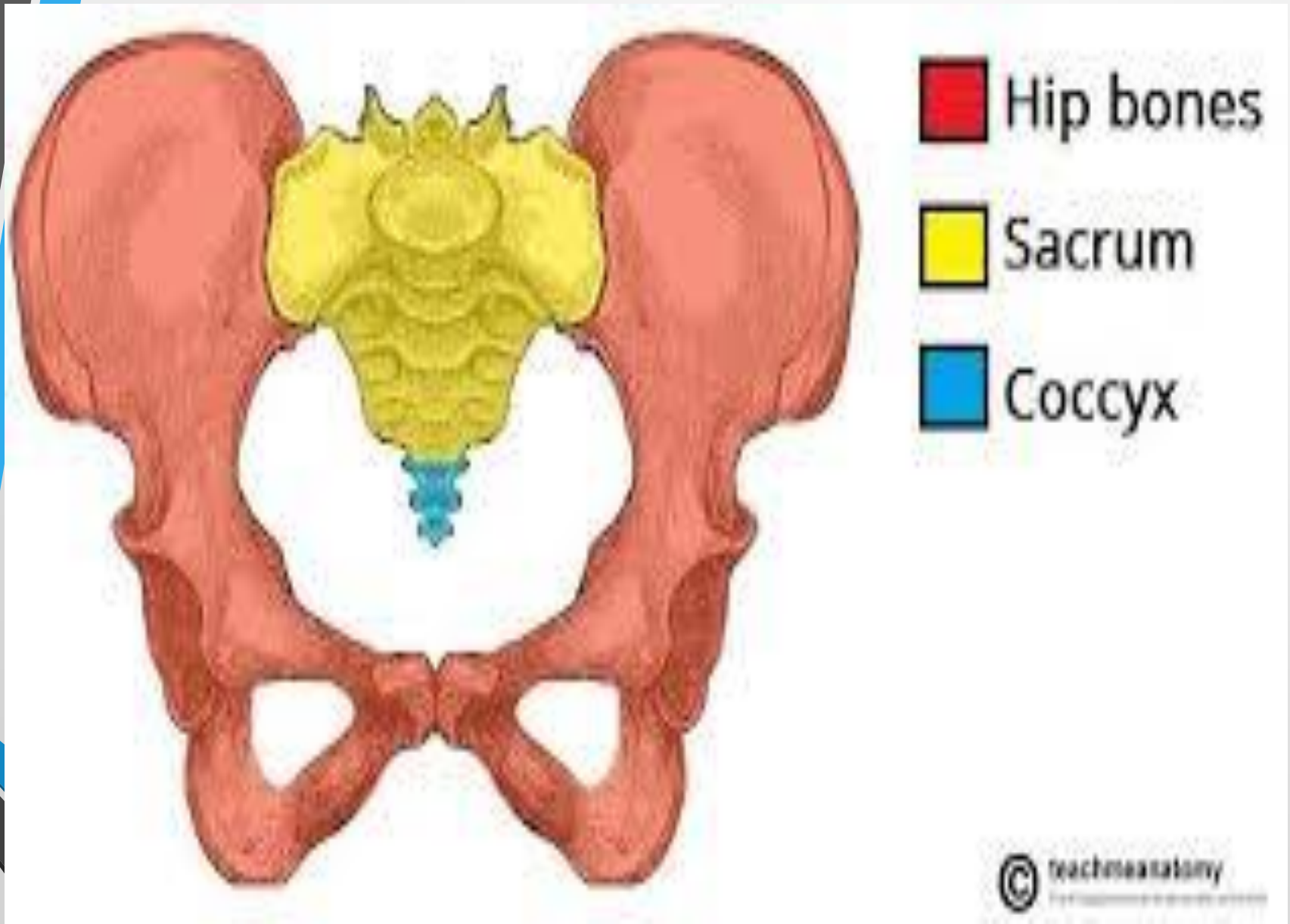


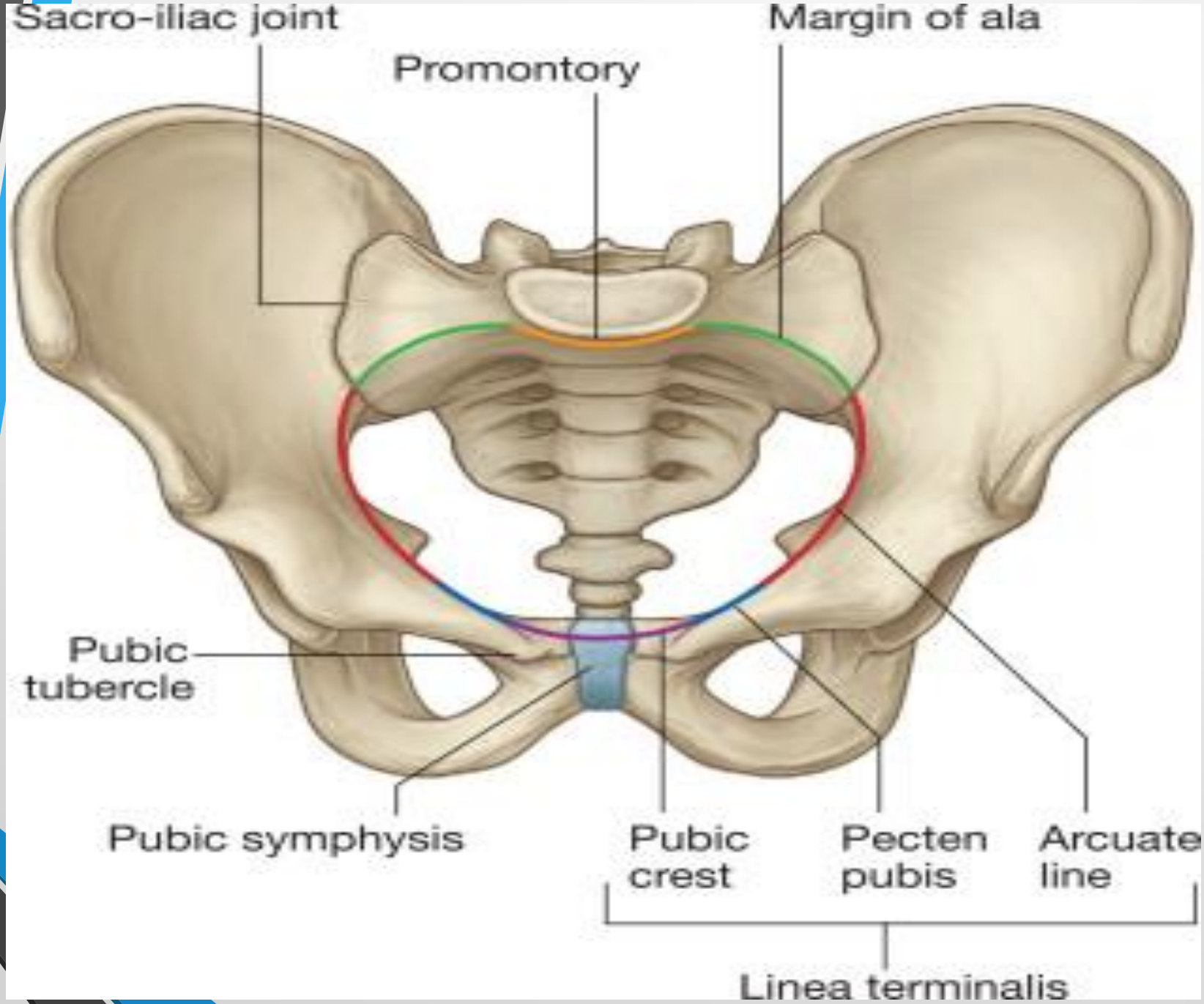
Inferior Pelvic Border



BONY PELVIC

- Innominate bone (Ilium, ischium and pubis)
- Sacrum
- Coccyx
- Joined anteriorly by pubic symphysis
- Posteriorly by sacro-iliac joint


Hip bones
Sacrum
Coccyx
© teachmeanatomy


Sacro-iliac joint
Promontory
Margin of ala
Pubic tubercle
Pubic symphysis
Pubic crest
Pecten pubis
Arcuate line
Linea terminalis

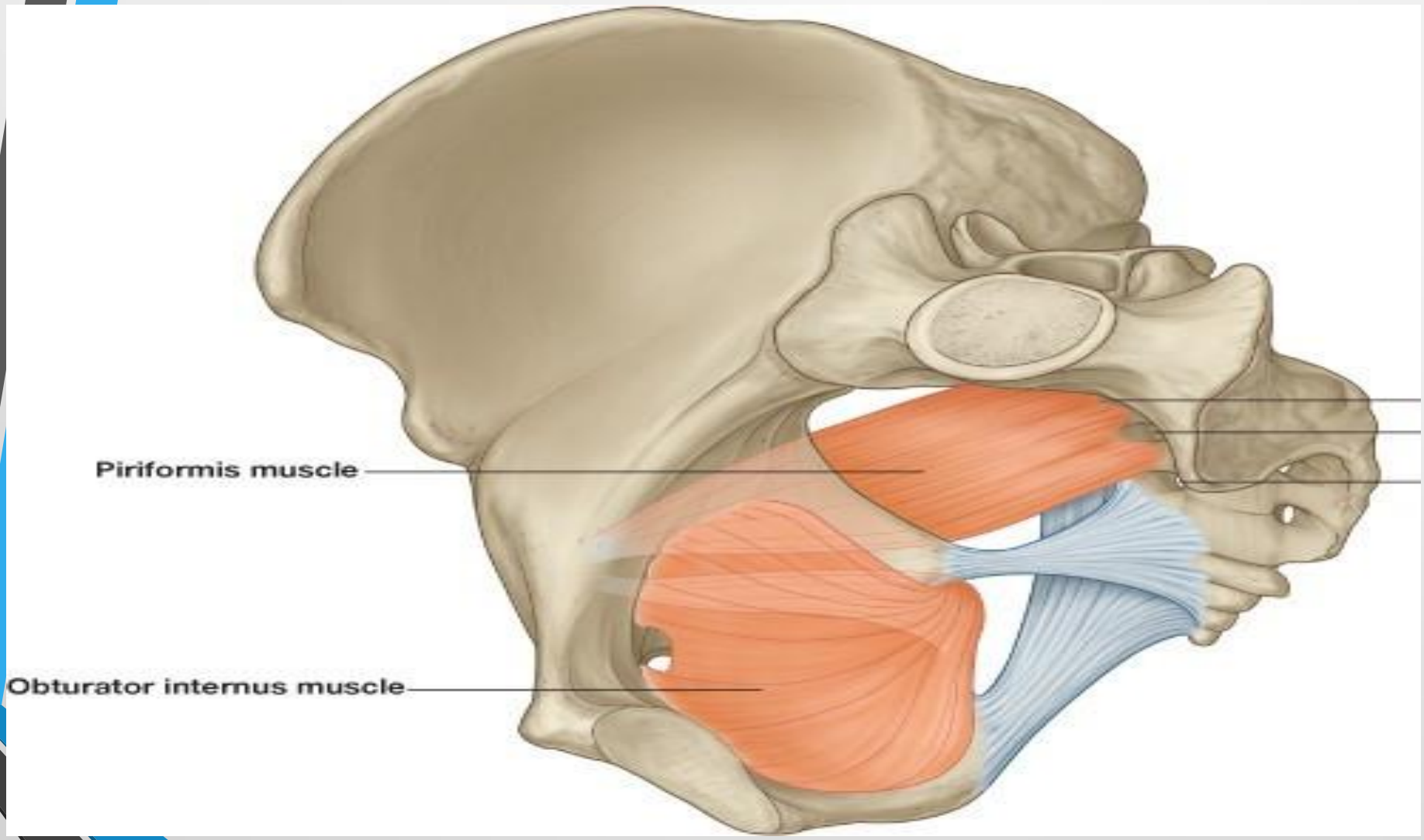
Pelvic Walls and Floors

- **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 (O: proximal surface of the ilium and ischium; obturator membrane I: greater trochanter of the femur)

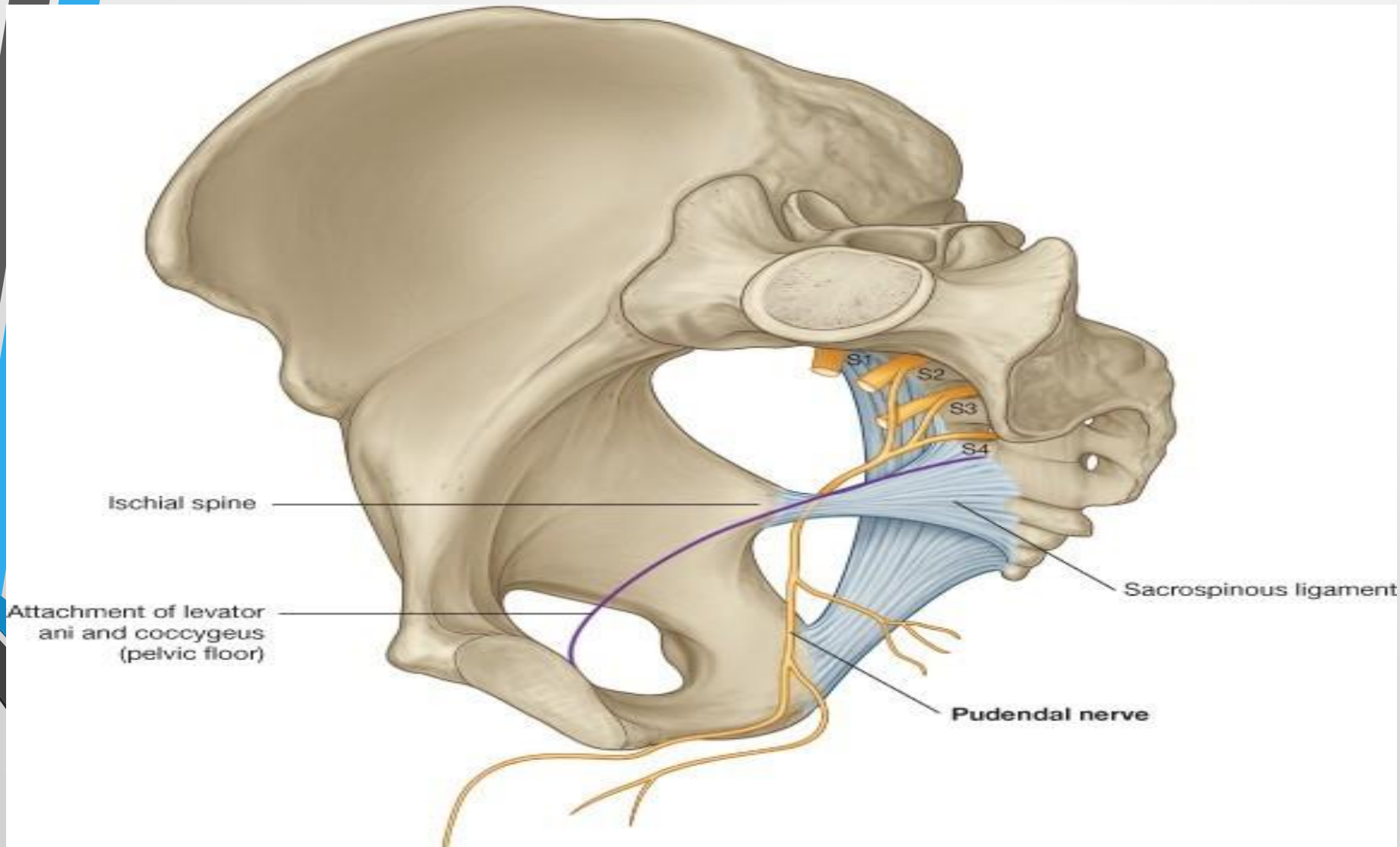
Pelvic Walls and Floor

- **Posterior Pelvic Wall** – formed by the sacrum and coccyx,
- adjacent parts of the ilia, and the S-I joints;
- piriformis muscle covers the area (O: pelvic surface of 2ndand 4thsacral segments, superior margin of the greater sciatic notch and sacrotuberous ligament, I: greator trochanter of femur)

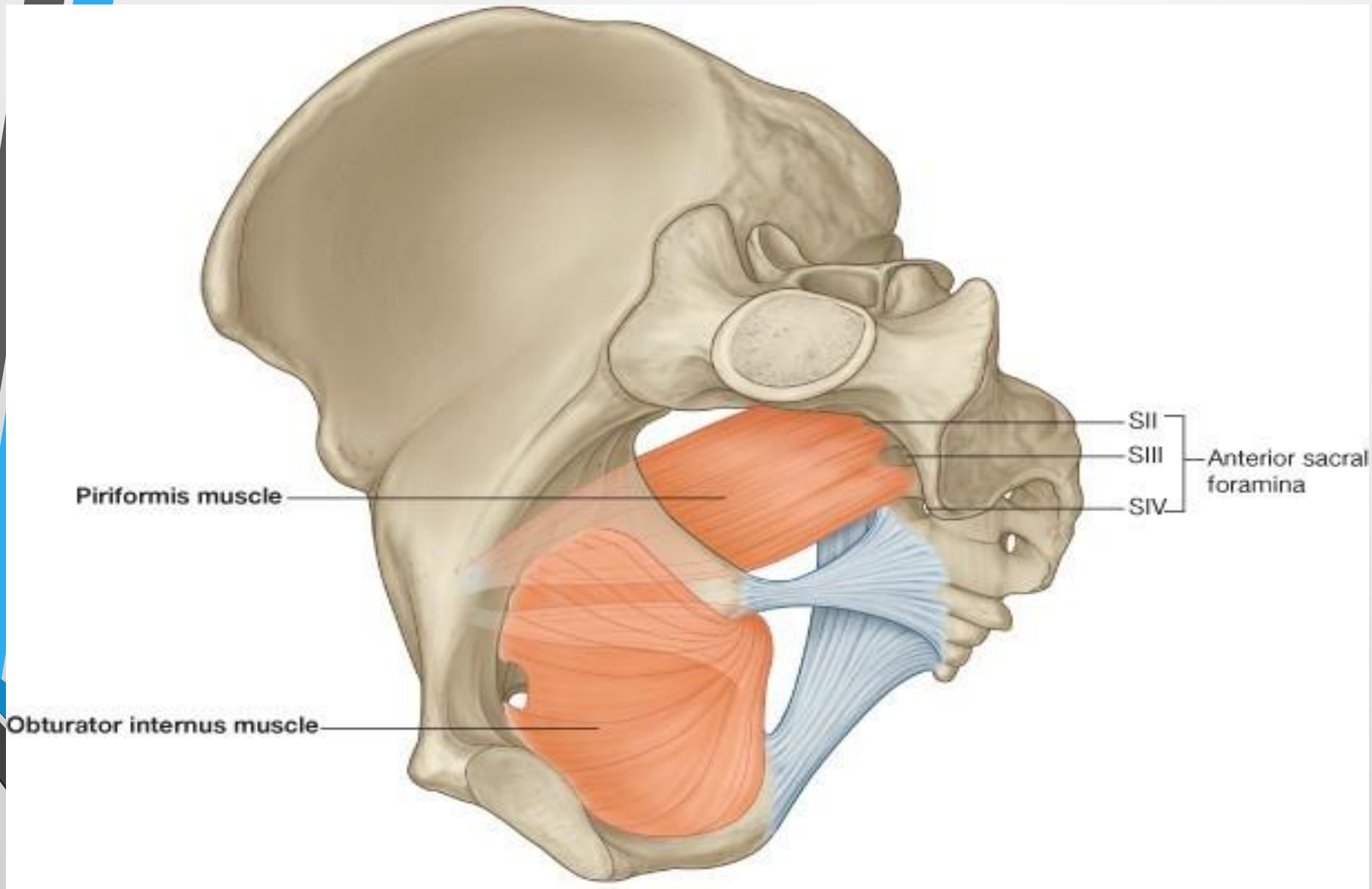
Anterior Pelvic Wall

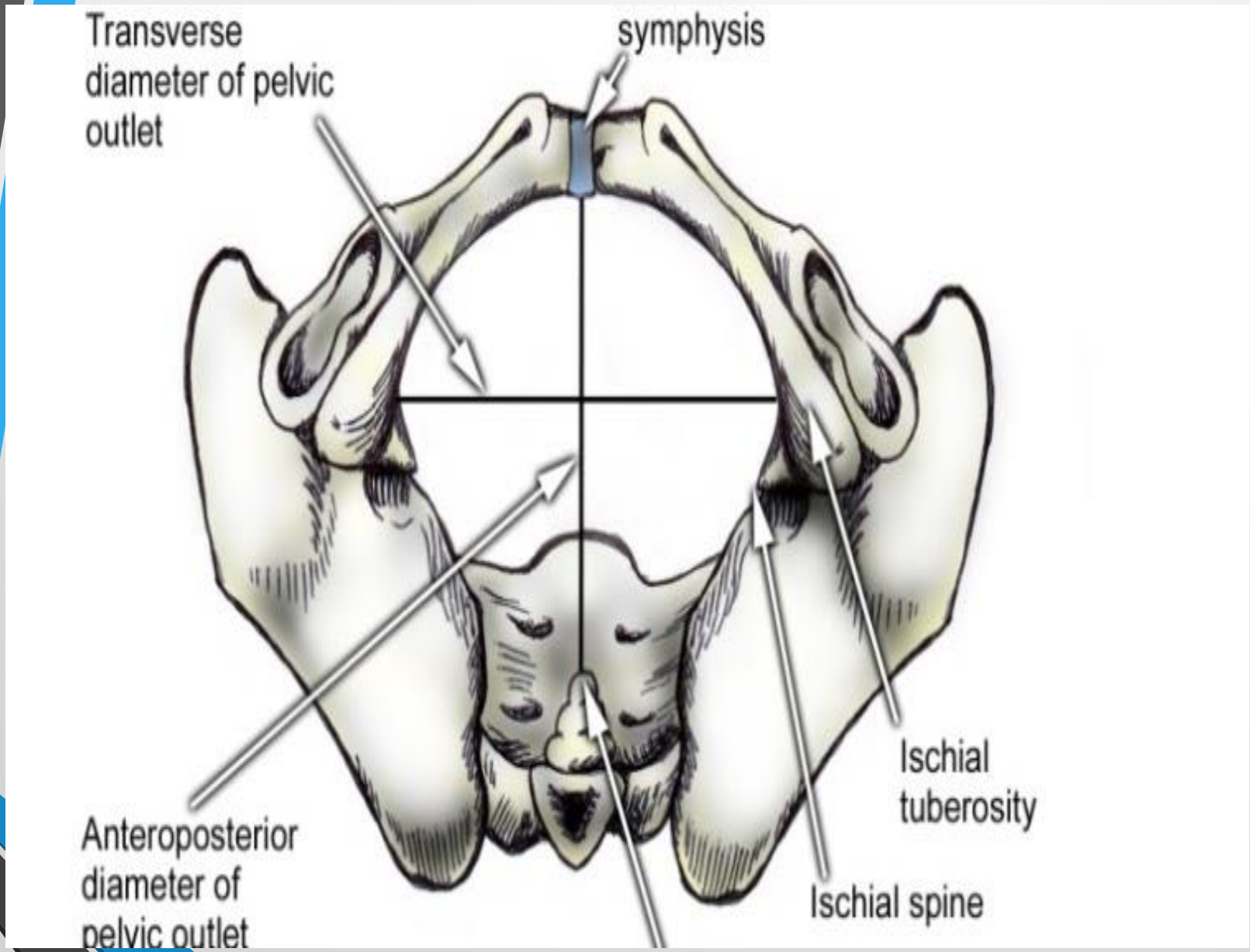


Posterior Pelvic Wall



Posterior Pelvic Wall

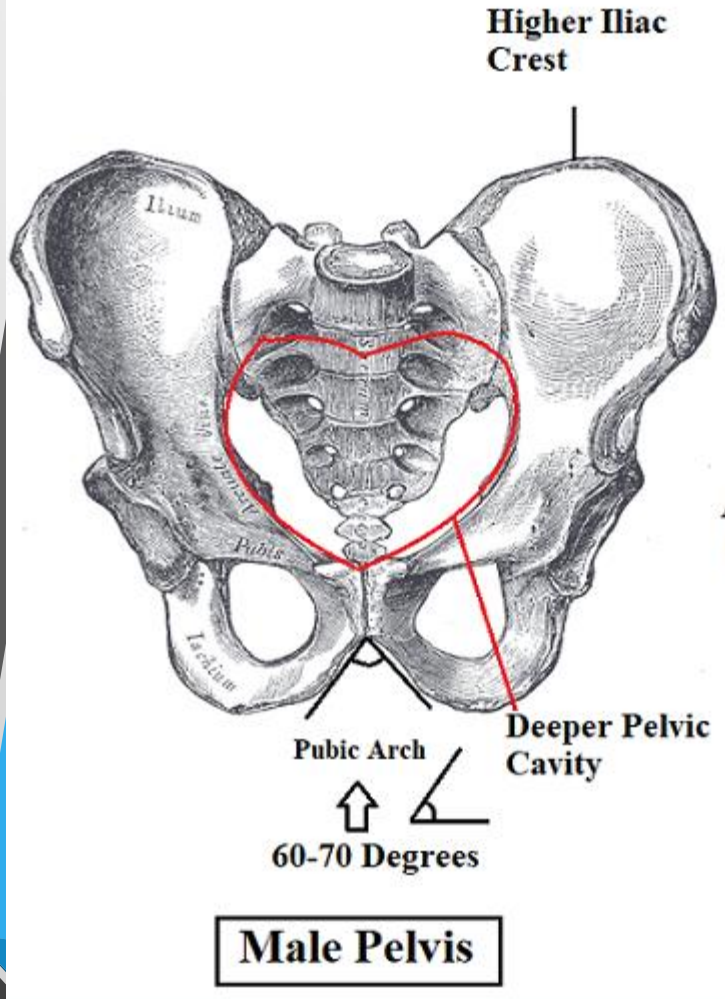


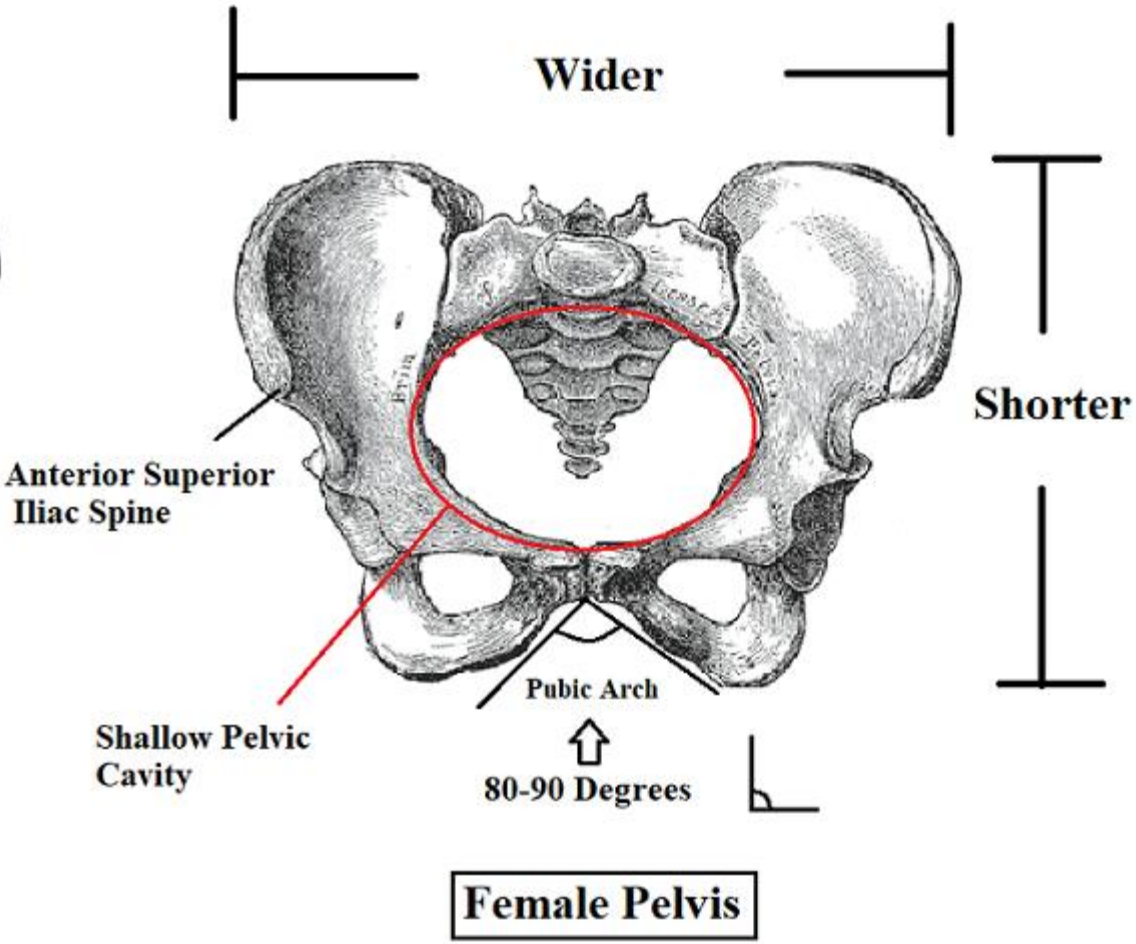

Transverse diameter of pelvic outlet
symphysis
Ischial tuberosity
Ischial spine
Anteroposterior diameter of pelvic outlet

Comparison of Male and Female Bony Pelves

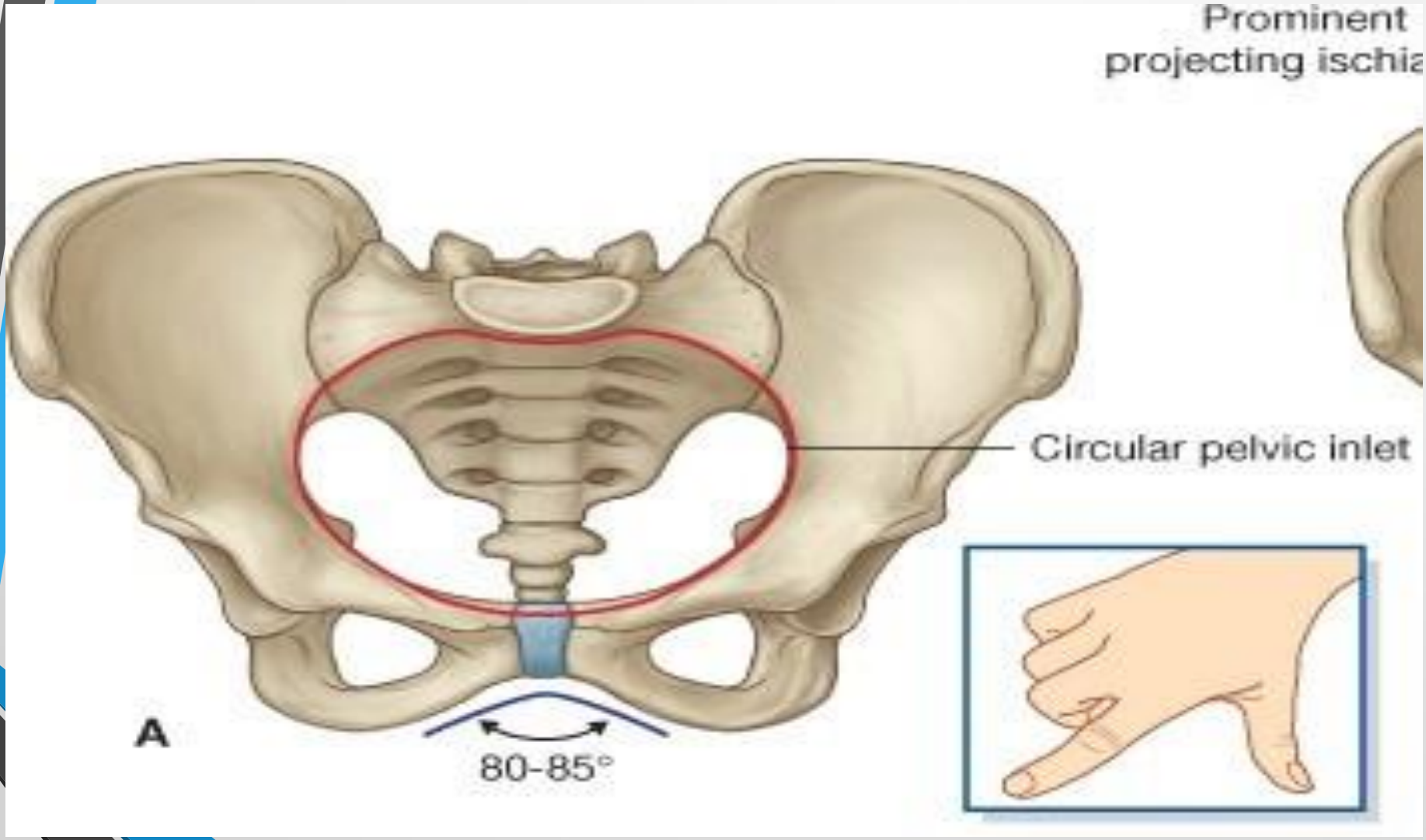
Bony Pelvis	Male	Female
General structure	Thick and heavy	Thin and light
Greater pelvis (pelvis major)	Deep	Shallow
Lesser pelvis (pelvis minor)	Narrow and deep, tapering	Wide and shallow, cylindrical
Pelvic inlet (superior pelvic aperture)	Heartshaped, narrow	Oval and rounded; wide
Pelvic outlet (inferior pelvic aperture)	Comparatively small	Comparatively large
Pubic arch and subpubic angle	Narrow (< 70Â°)	Wide (> 80Â°)
Obturator foramen	Round	Oval
Acetabulum	Large	Small
Greater sciatic notch	Narrow (~ 70Â°); inverted V	Almost 90Â°

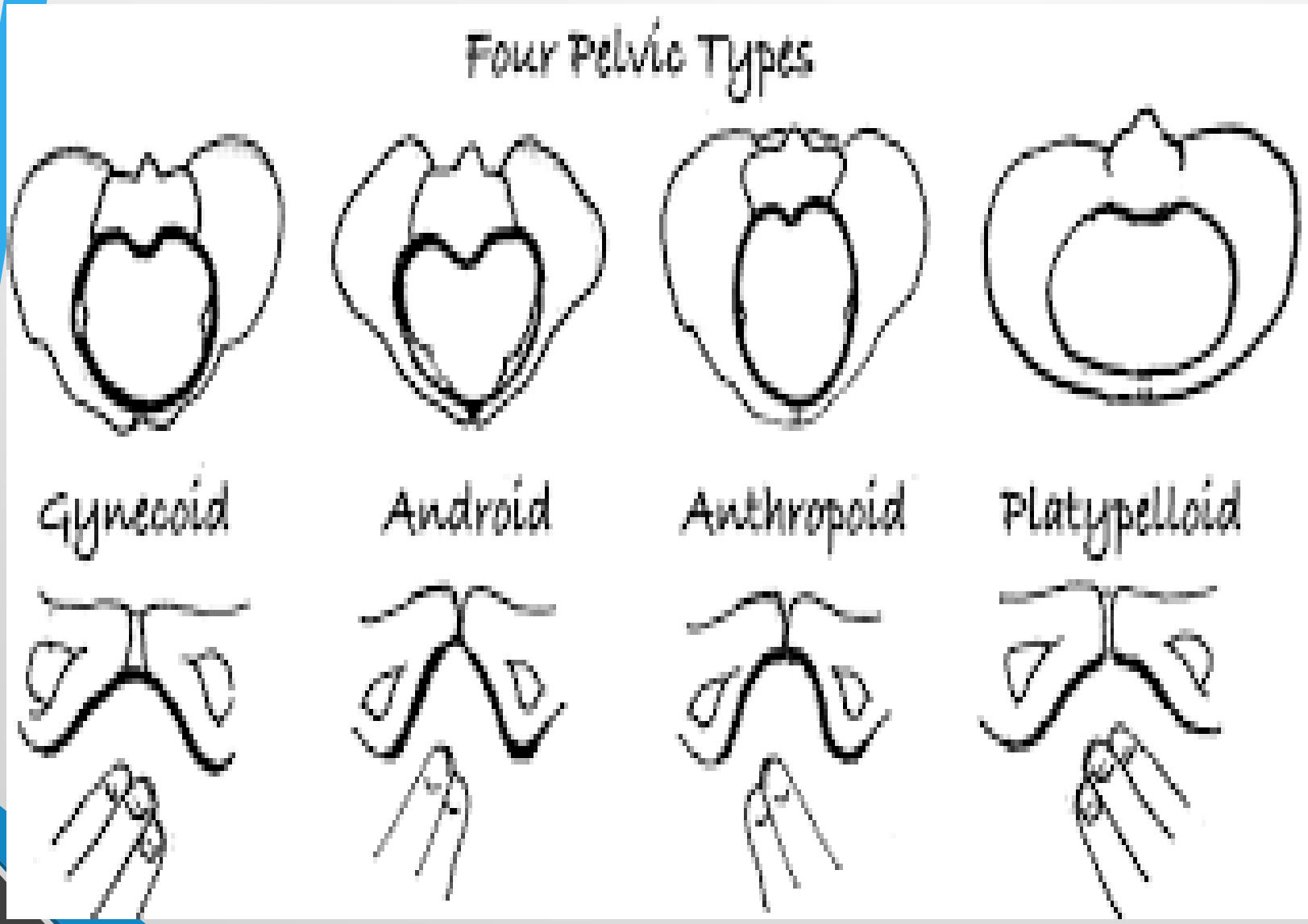
The obturator foramen is oval or triangular in the female and round in the male



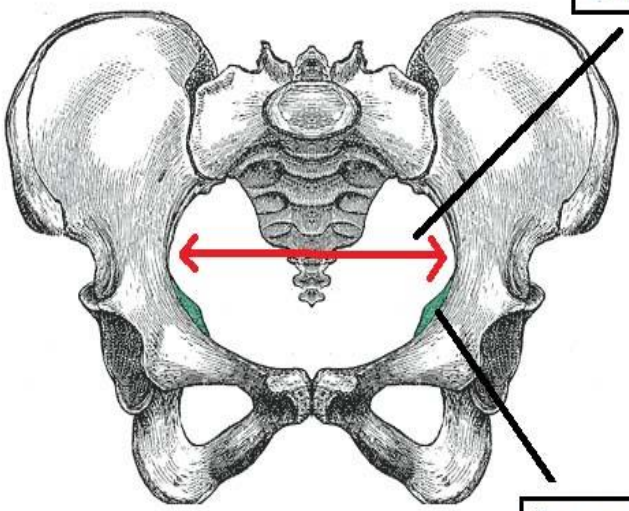


Female Pelvis




Four Pelvic Types
Gynecoid
Android
Anthropoid
Platypelloid

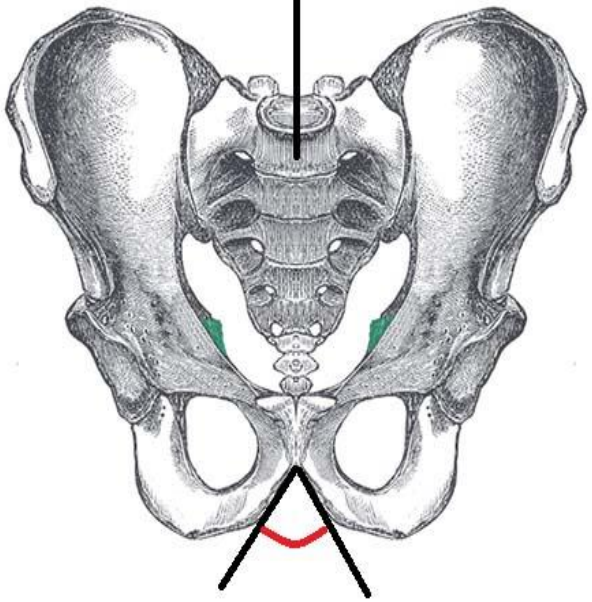
Gynaecoid Pelvis



Wider and broader

Less prominant ischial spines

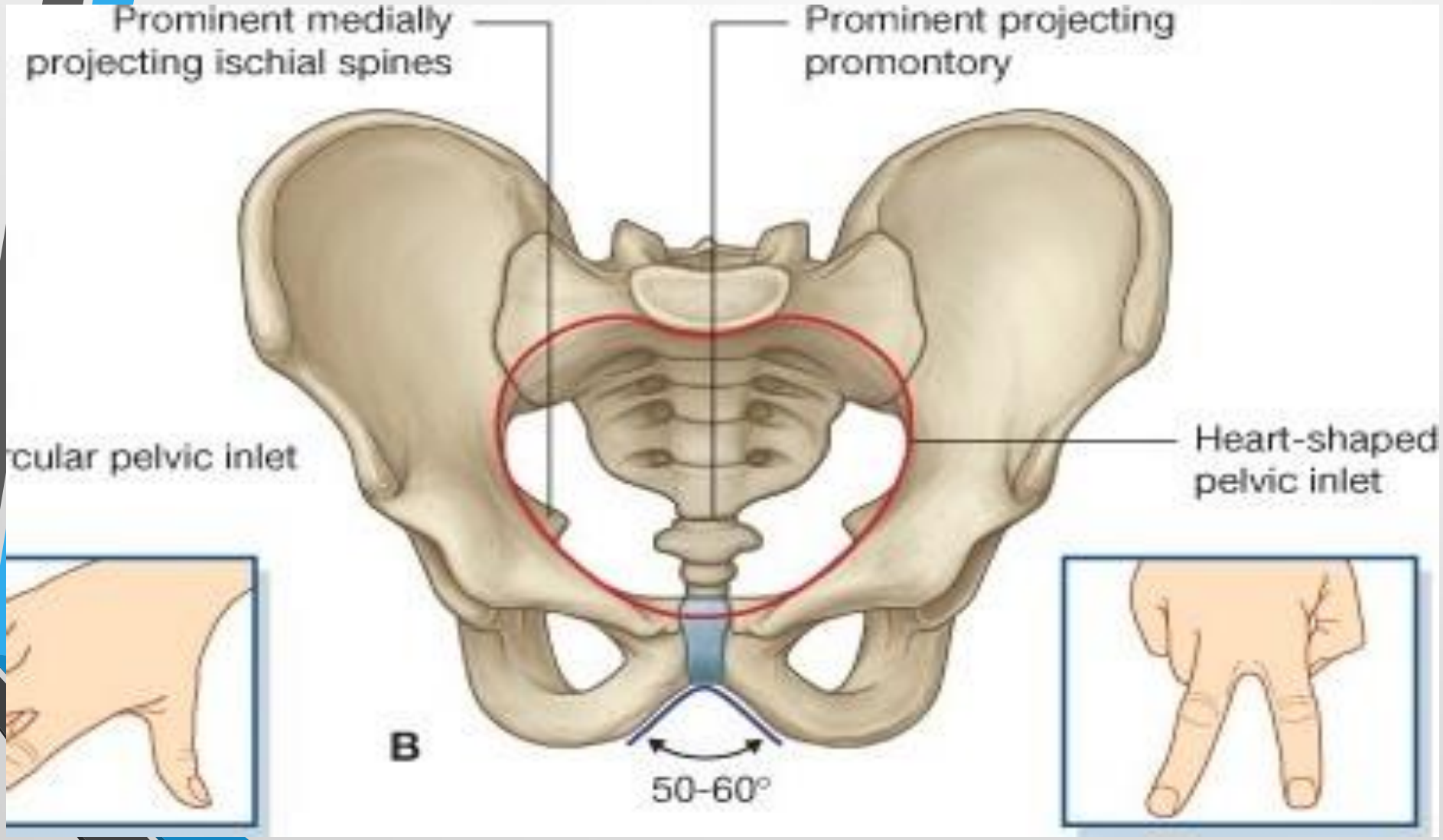
Android Pelvis



Longer sacrum

More narrow sub-pubic arch

Male Pelvis


Prominent medially projecting ischial spines
Prominent projecting promontory
rcular pelvic inlet
Heart-shaped pelvic inlet
B
50-60°

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

Pelvic Diaphragm:

- Funnel-shaped.
- There are three components:

1. Levator ani muscles (largest component).
2. Coccygeus muscle.
3. Fascia coverings of the muscles.

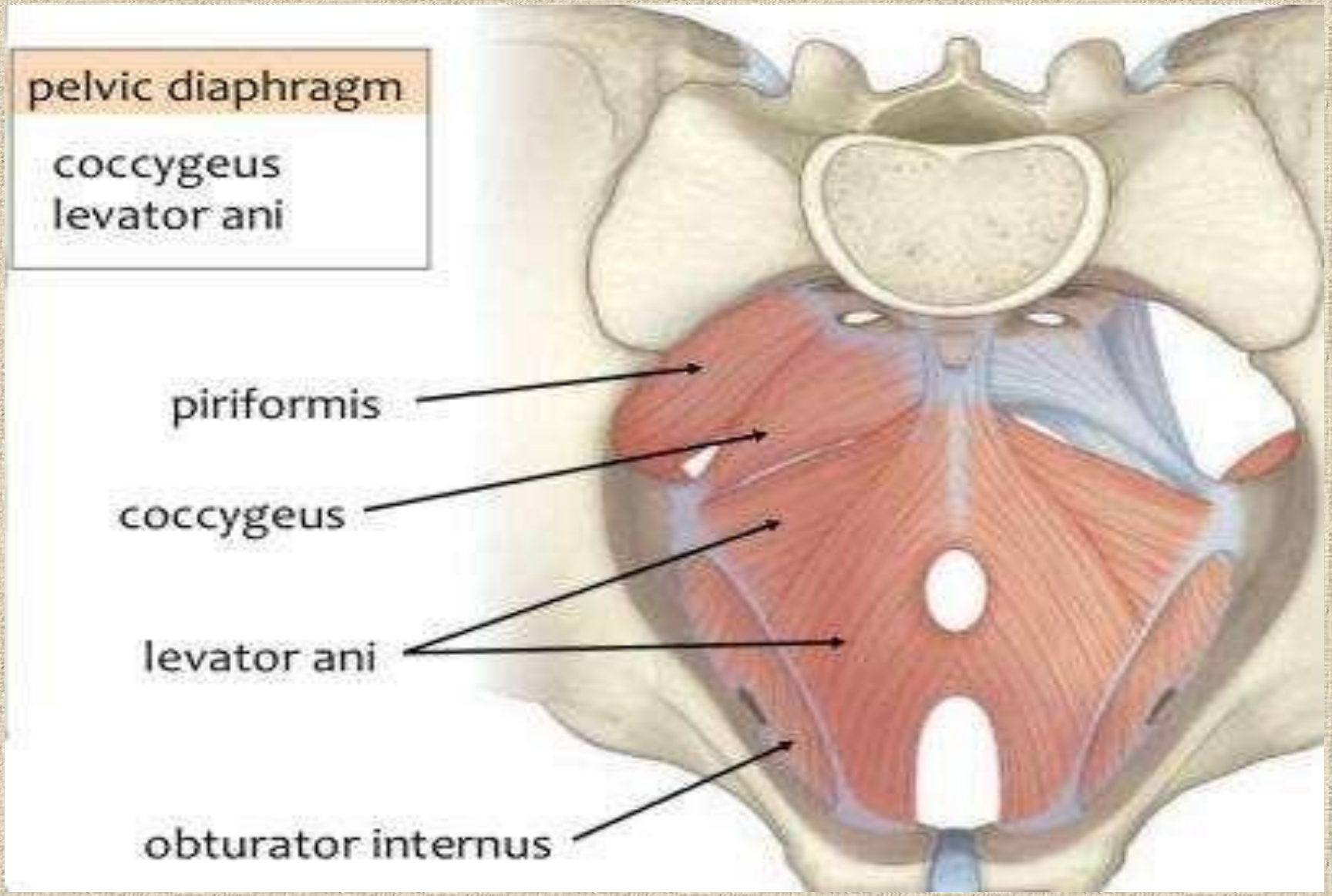


Fig. Coccygeus Muscle

1. Levator Ani Muscles:

- It is a broad sheet of sub-muscles.
- It is composed of three separate paired muscles.

  a. Pubo-coccygeus muscle.

  b. Pubo-rectalis muscle.

  c. Illio-coccygeus muscle.

- Acting together they raise the pelvic floor and assist the abdominal muscles in forced expiration activities

a. Pubo-coccygeus :

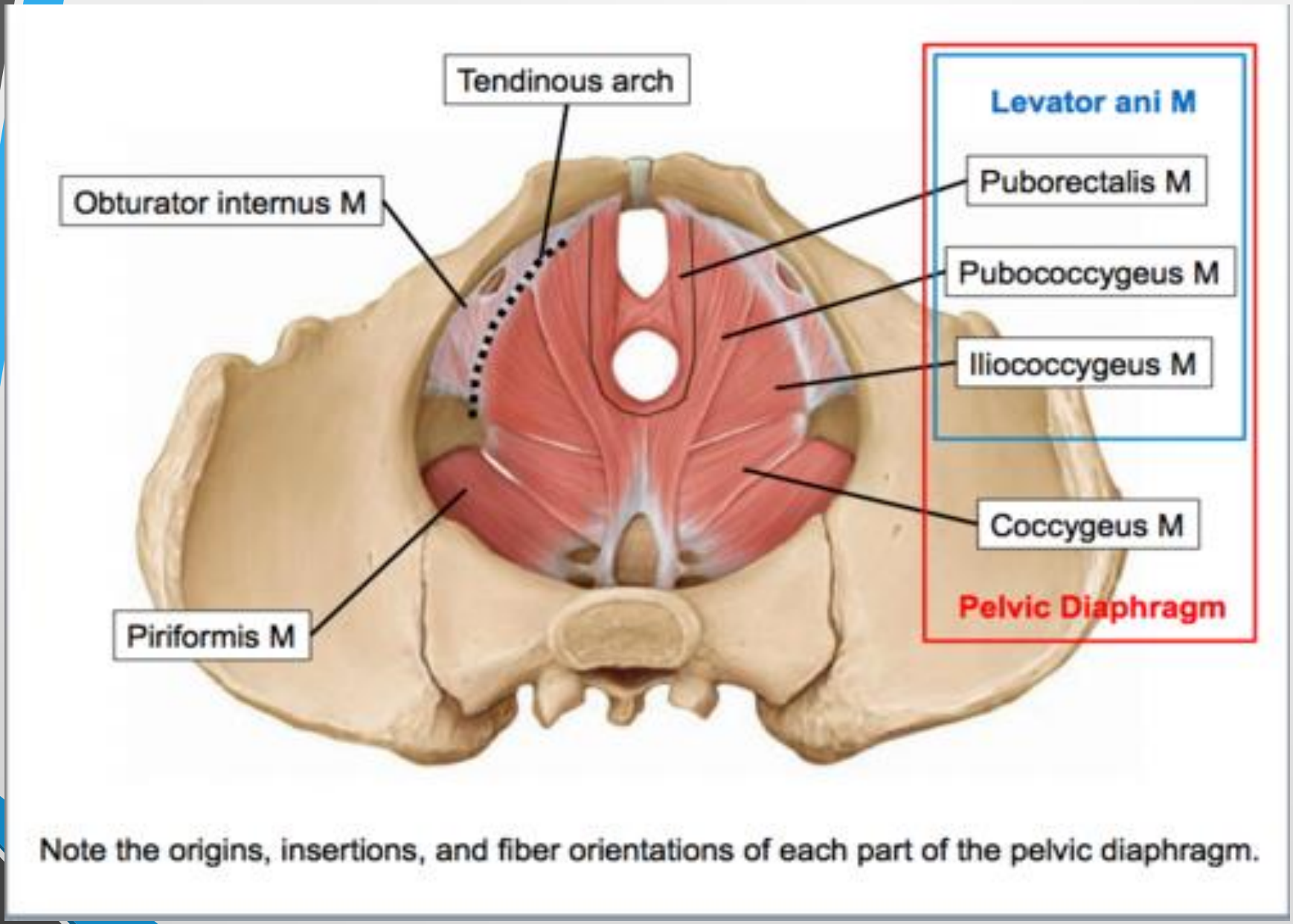
- The muscle fibres of the pubococcygeus arise from the body of the **pubic bone** and the anterior aspect of the **tendinous arch**.
- The fibres travel around the margin of the urogenital hiatus and run posteriomedially,attaching at the **coccyx** and **anococcygeal ligament**.
- As the fibres run inferiorly and medially, some fibres divide and loop around the prostate in males (**levator prostatae**) and around the vagina in females (**pubovaginalis**).

b. Pubo-rectalis :

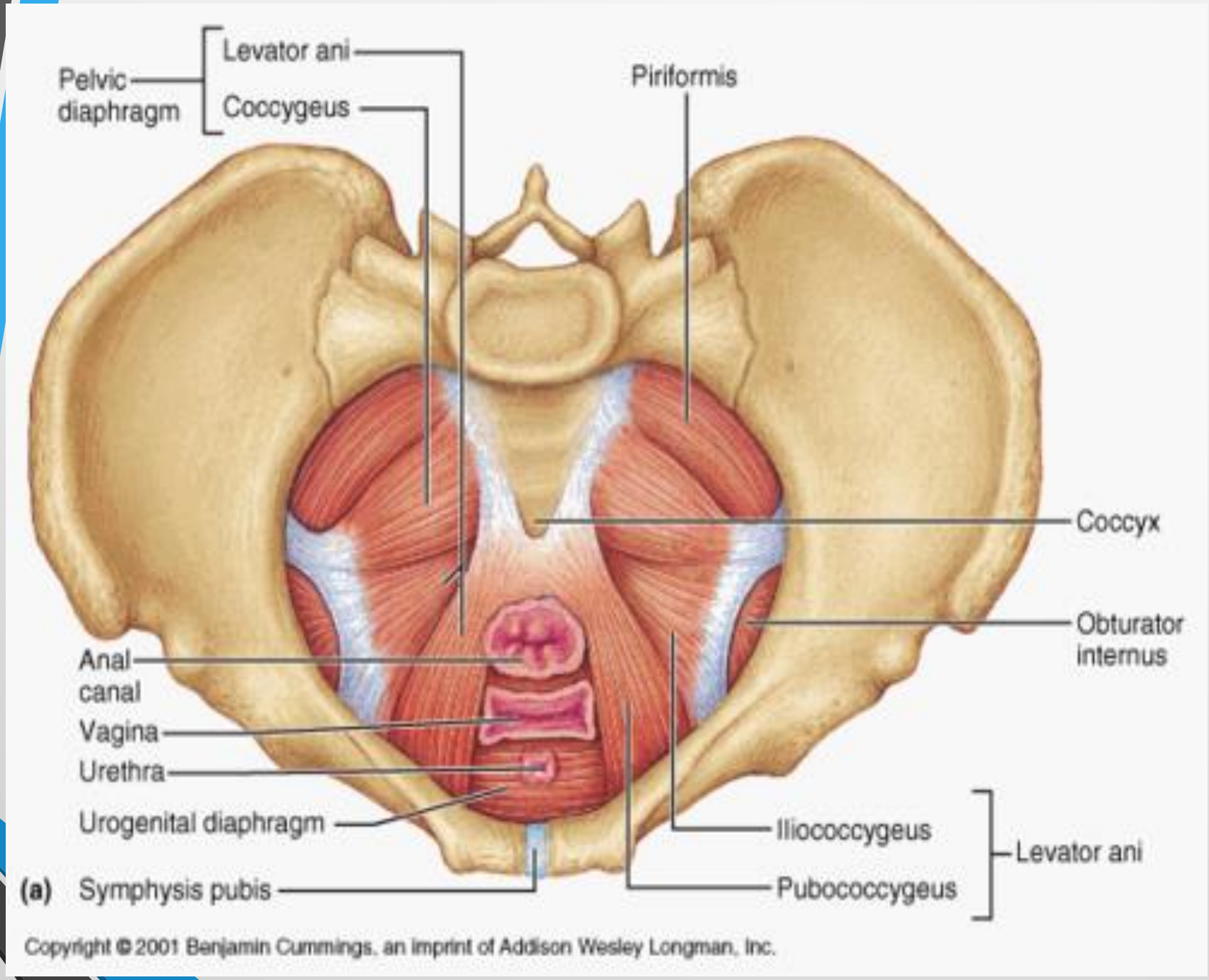
- The puborectalis muscle is a U-shaped sling, extending from the bodies of the pubic bones, past the **urogenital hiatus**, around the anal canal.
- Its tonic contraction bends the canal anteriorly, creating the anorectal angle (90degrees) at the **anorectal junction** (where the rectum meets the anus).
- The main function of this thick muscle is to maintain faecal continence – during defecation this muscle relaxes.

c. Illeococcygeus :

- The iliococcygeus has thin muscle fibres.
- Starts anteriorly at the **ischial spines** and posterior aspect of the **tendinous arch**.
- They attach posteriorly to the coccyx and the anococcygeal ligament.

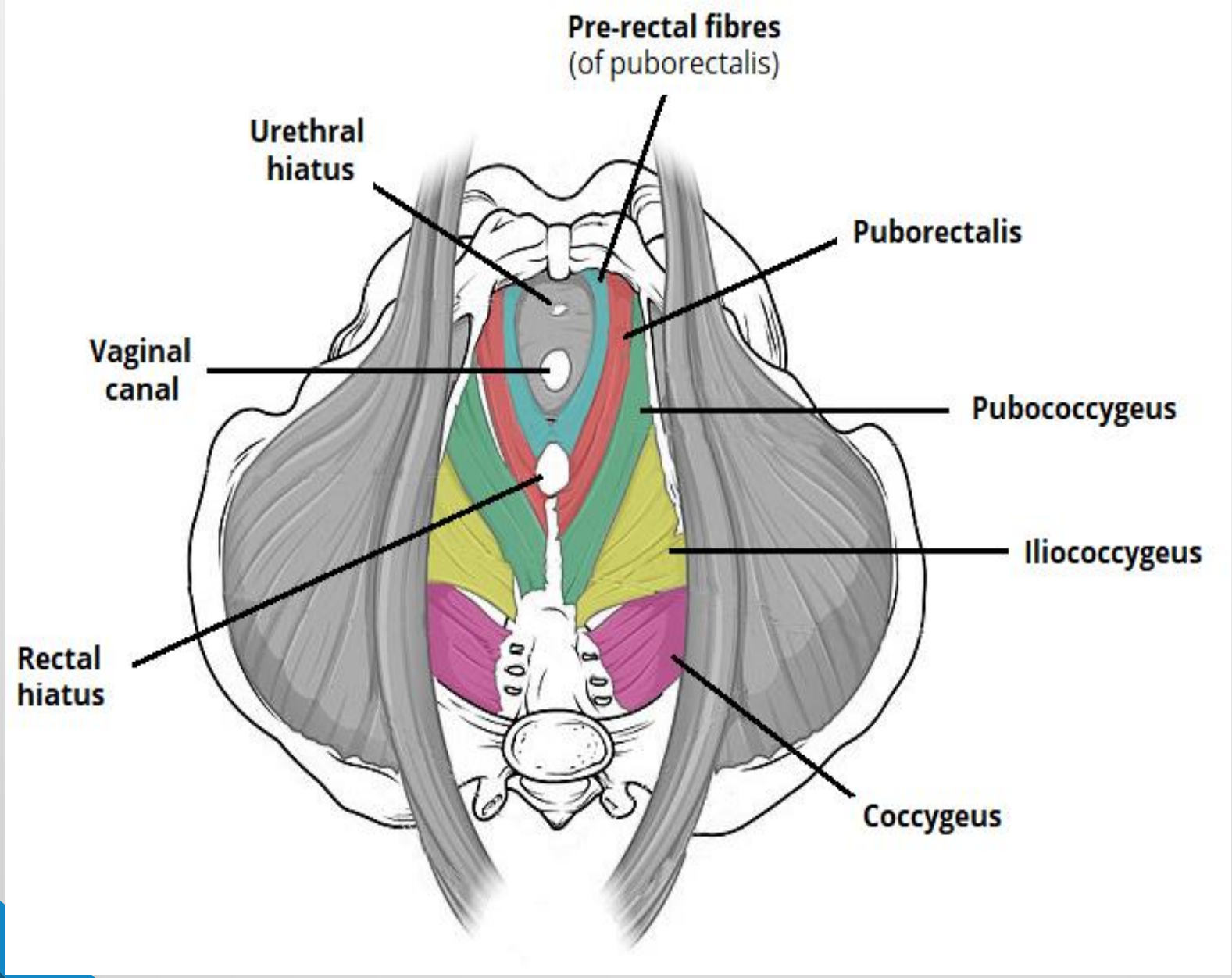


Note the origins, insertions, and fiber orientations of each part of the pelvic diaphragm.

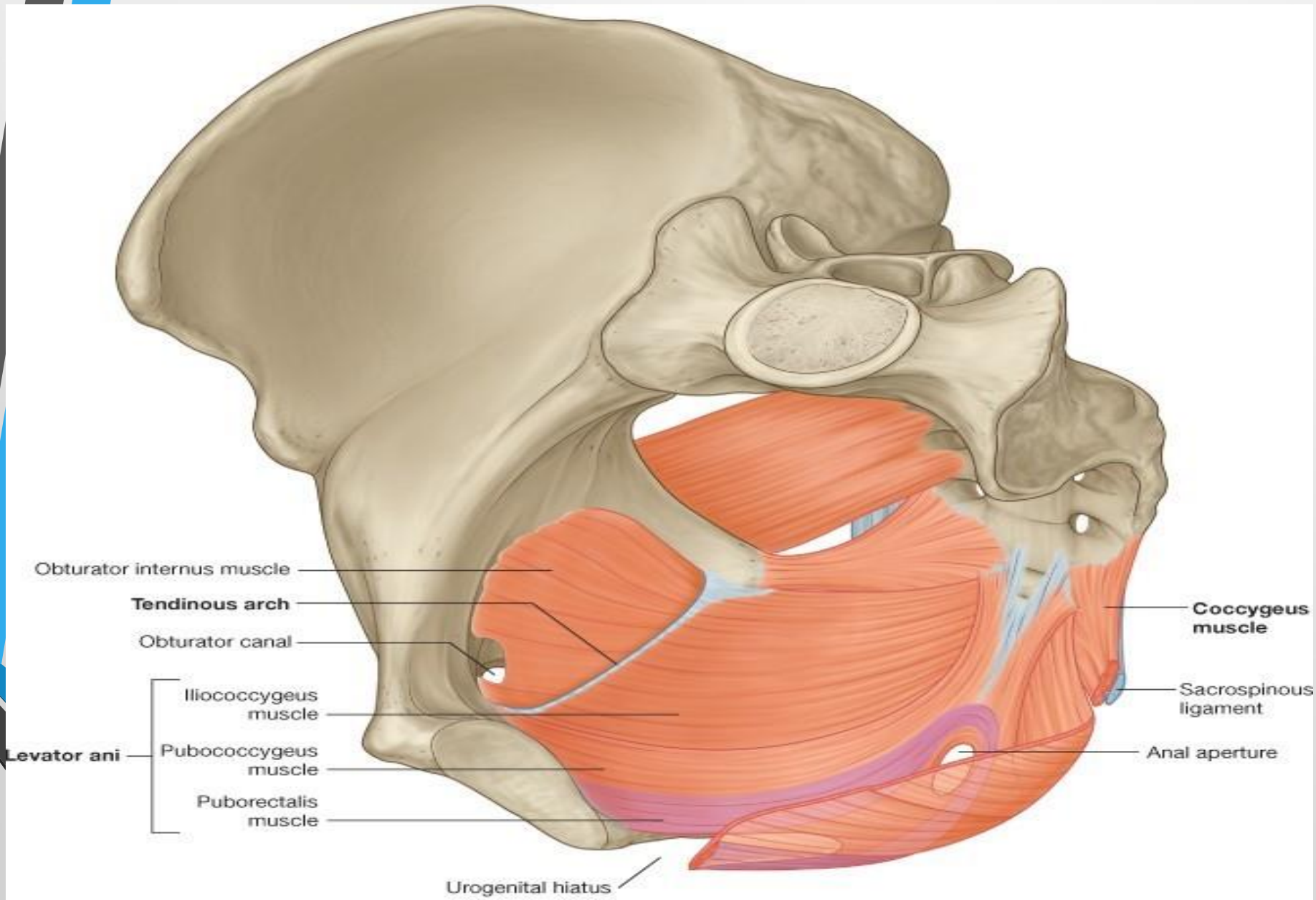


2. Coccygeus:

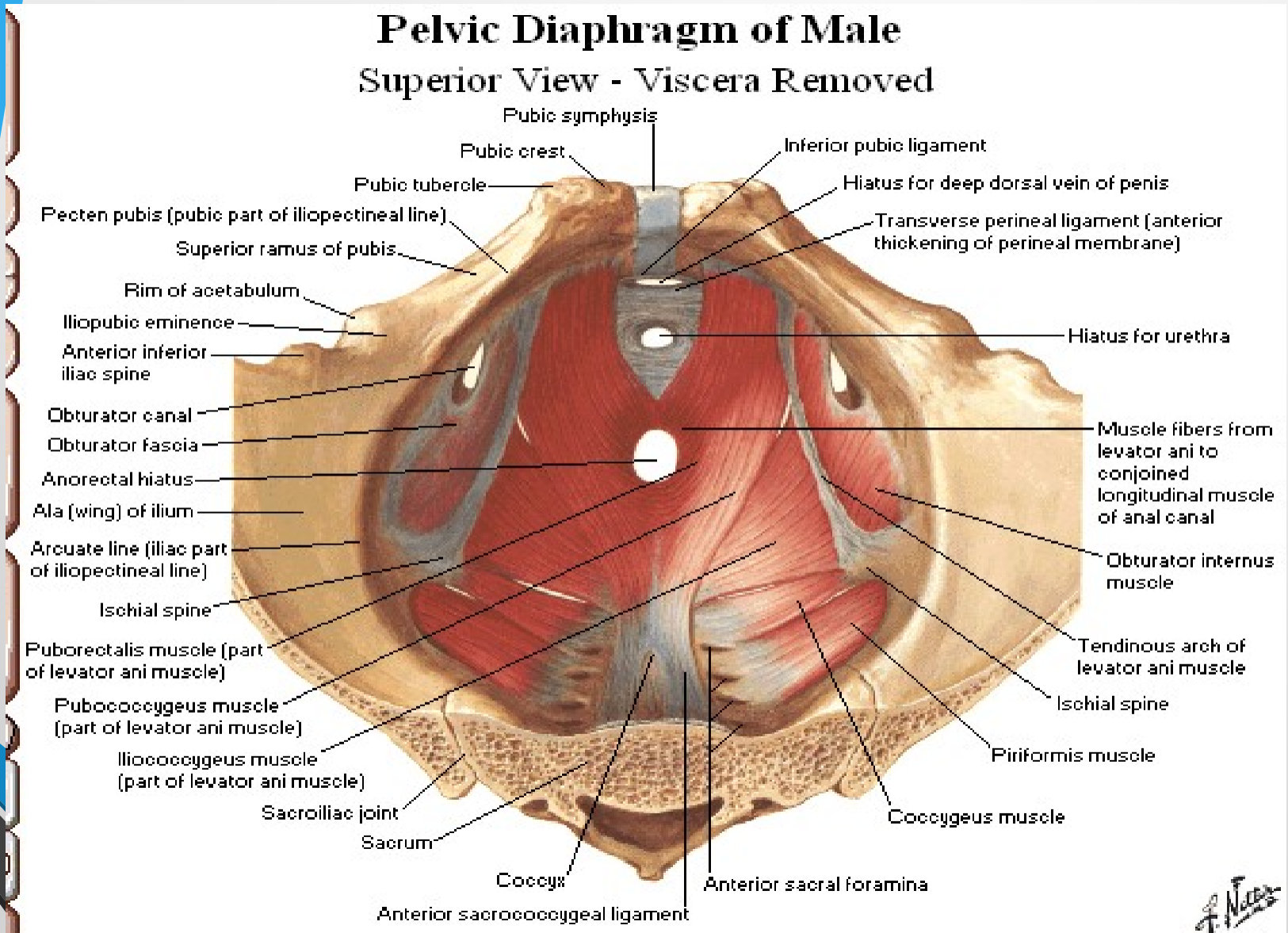
- The coccygeus is the smaller part.
- The levator ani muscles situated anteriorly.
- It originates from the **ischial spines** and travels to the lateral aspect of the sacrum and coccyx, along the **sacrospinous** ligament.
- Supports the Pelvic Viscera and flexes the coccyx.


Pre-rectal fibres
(of puborectalis)
Urethral hiatus
Puborectalis
Vaginal canal
Pubococcygeus
Iliococcygeus
Rectal hiatus
Coccygeus

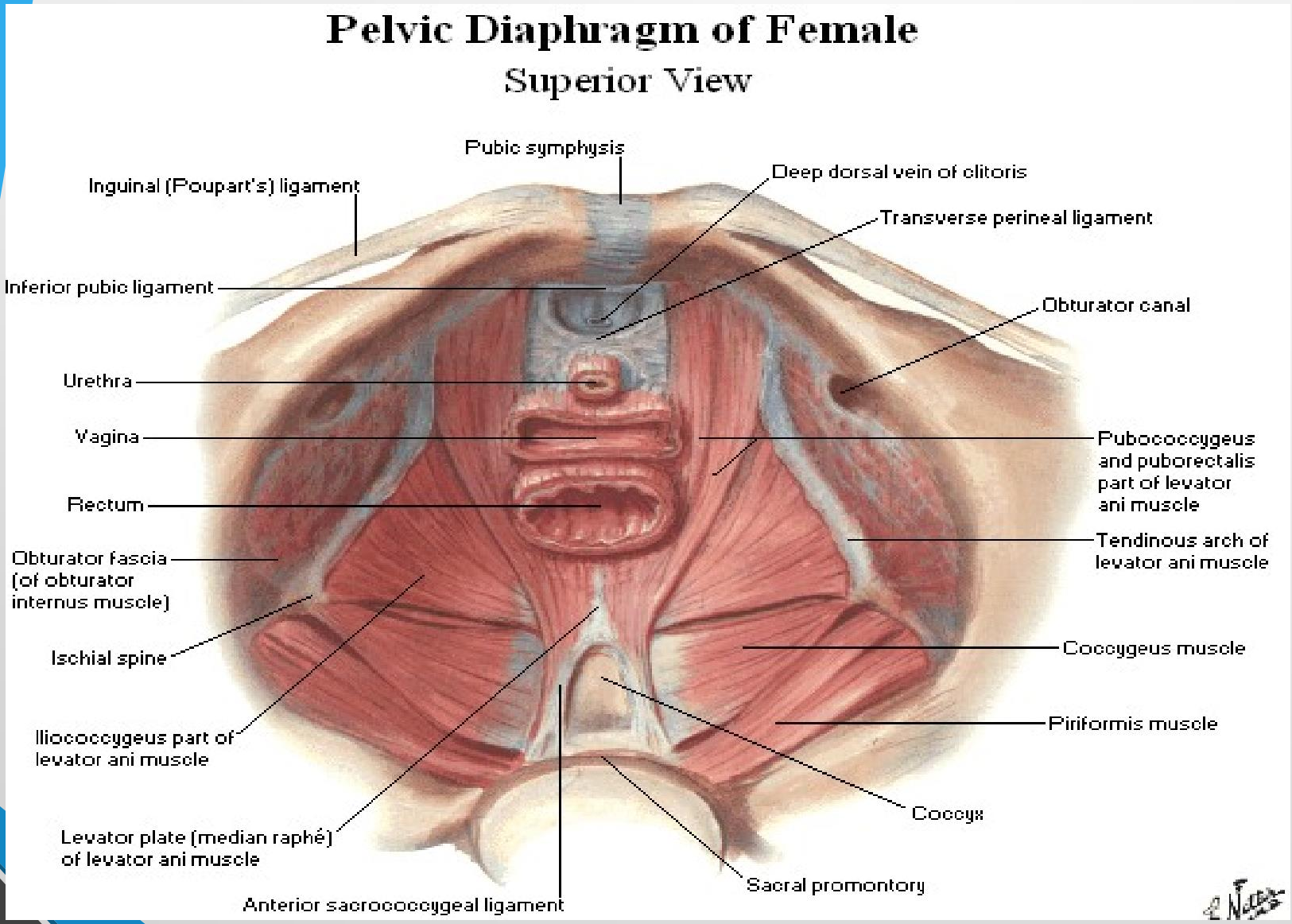
PELVIC DIAPHRAGM



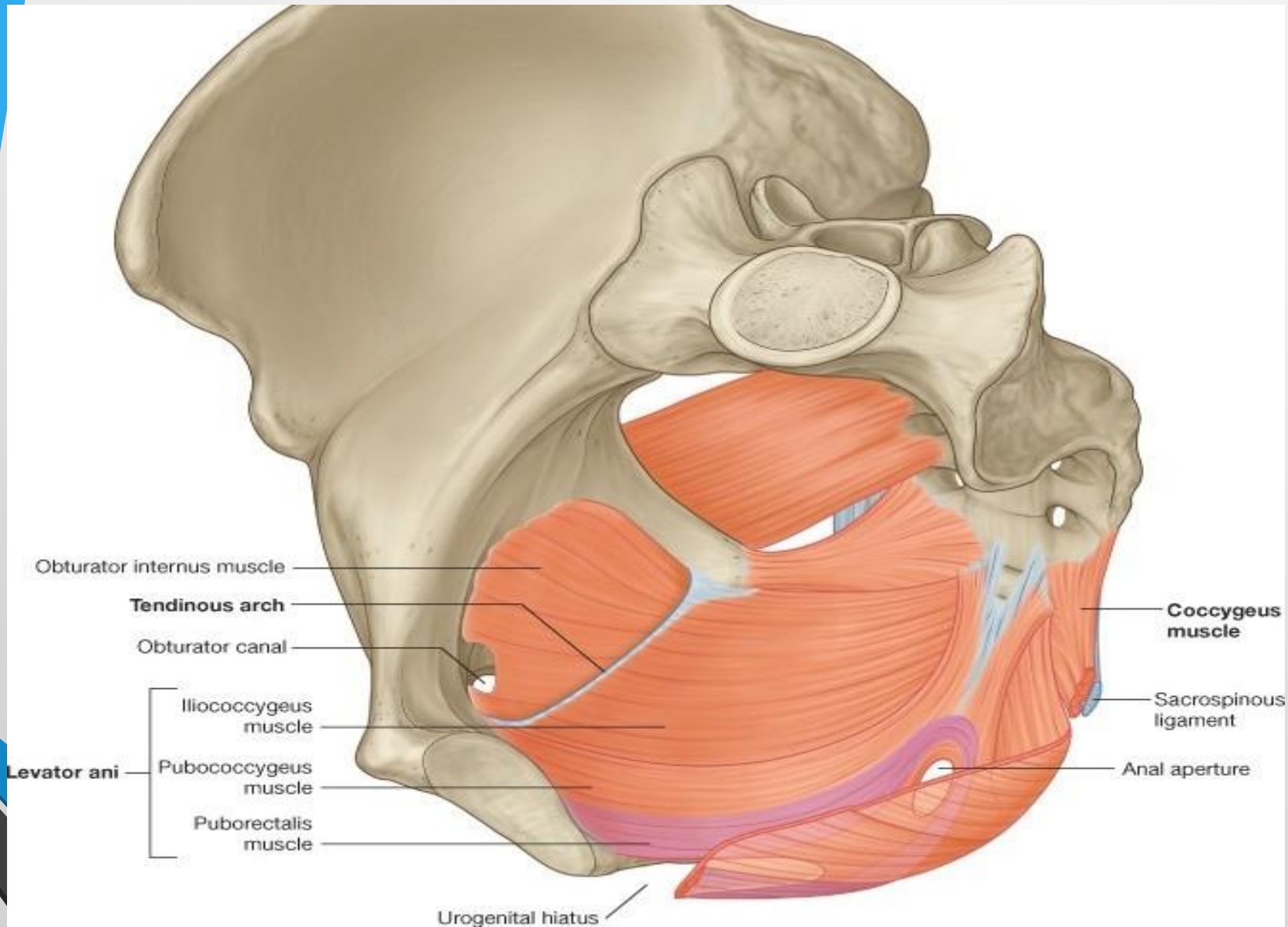
Pelvic Floor - Male



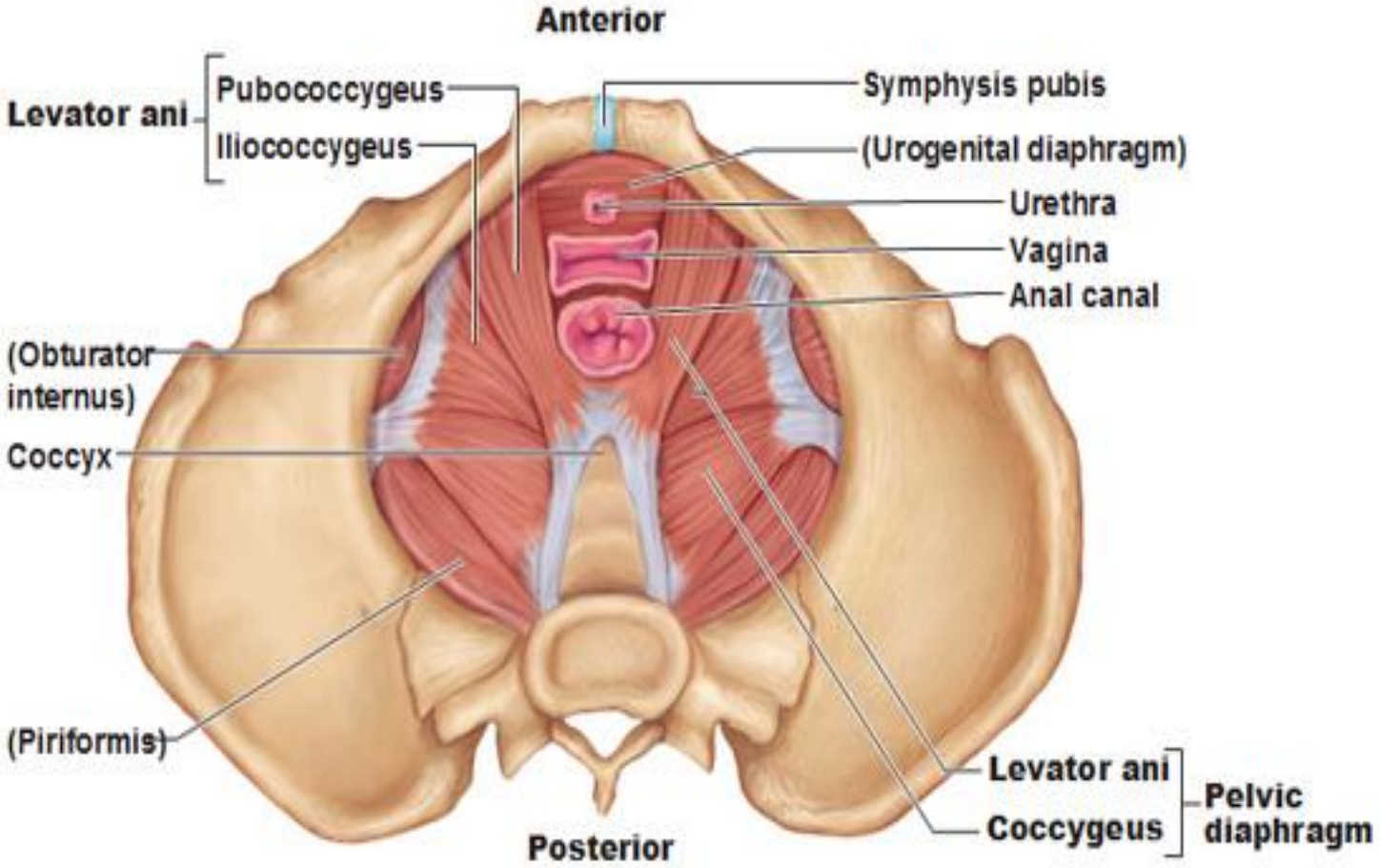
Pelvic Floor - Female



Pelvic Floor- Lateral Inferior



The Pelvic Diaphragm = the deepest muscle layer



Superior View of Female Pelvis

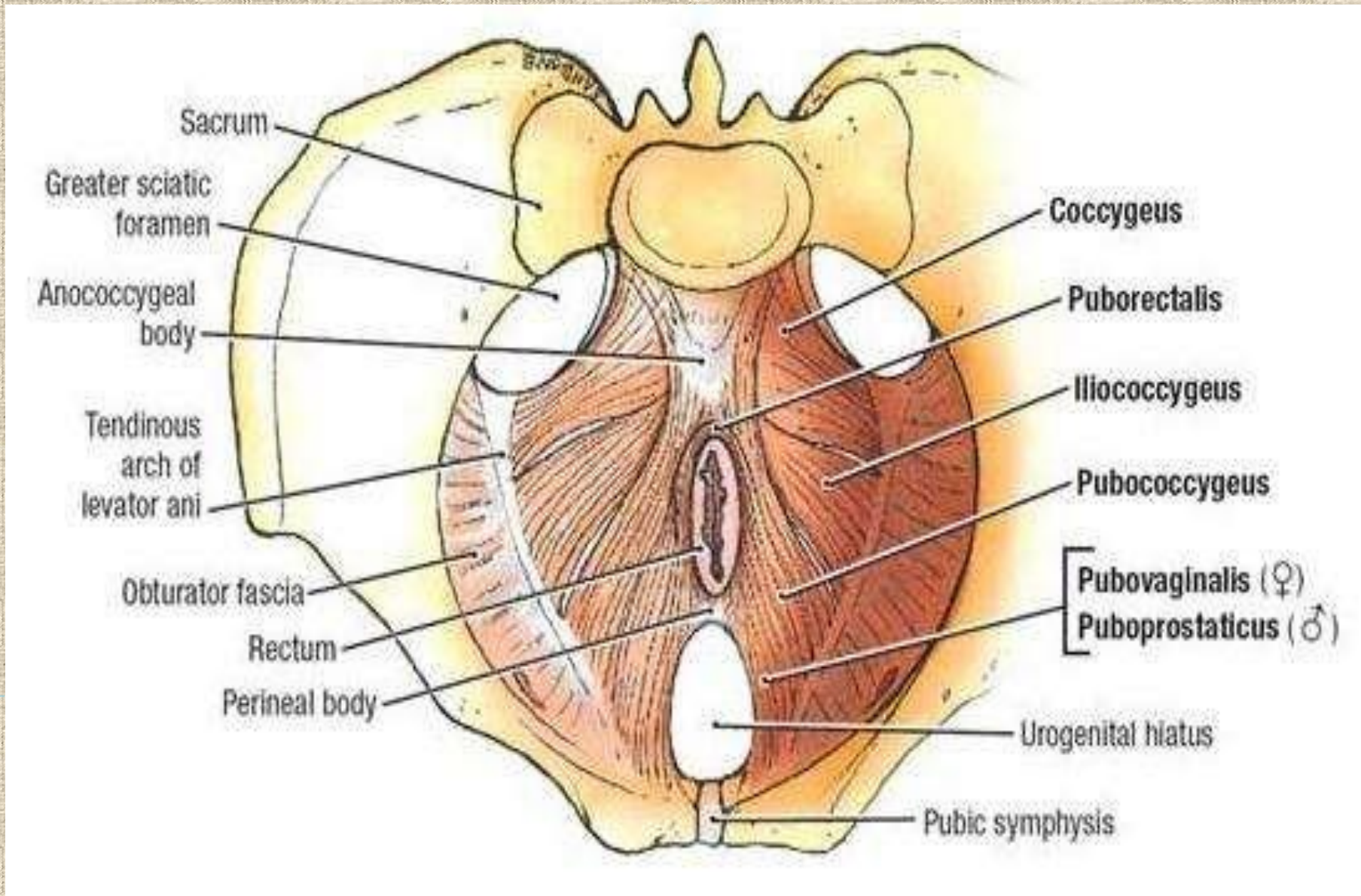


Fig. Puborectalis Muscle

The **pelvic fasciae** are the fascia of the pelvis and can be divided into:

(a) the fascial sheaths of

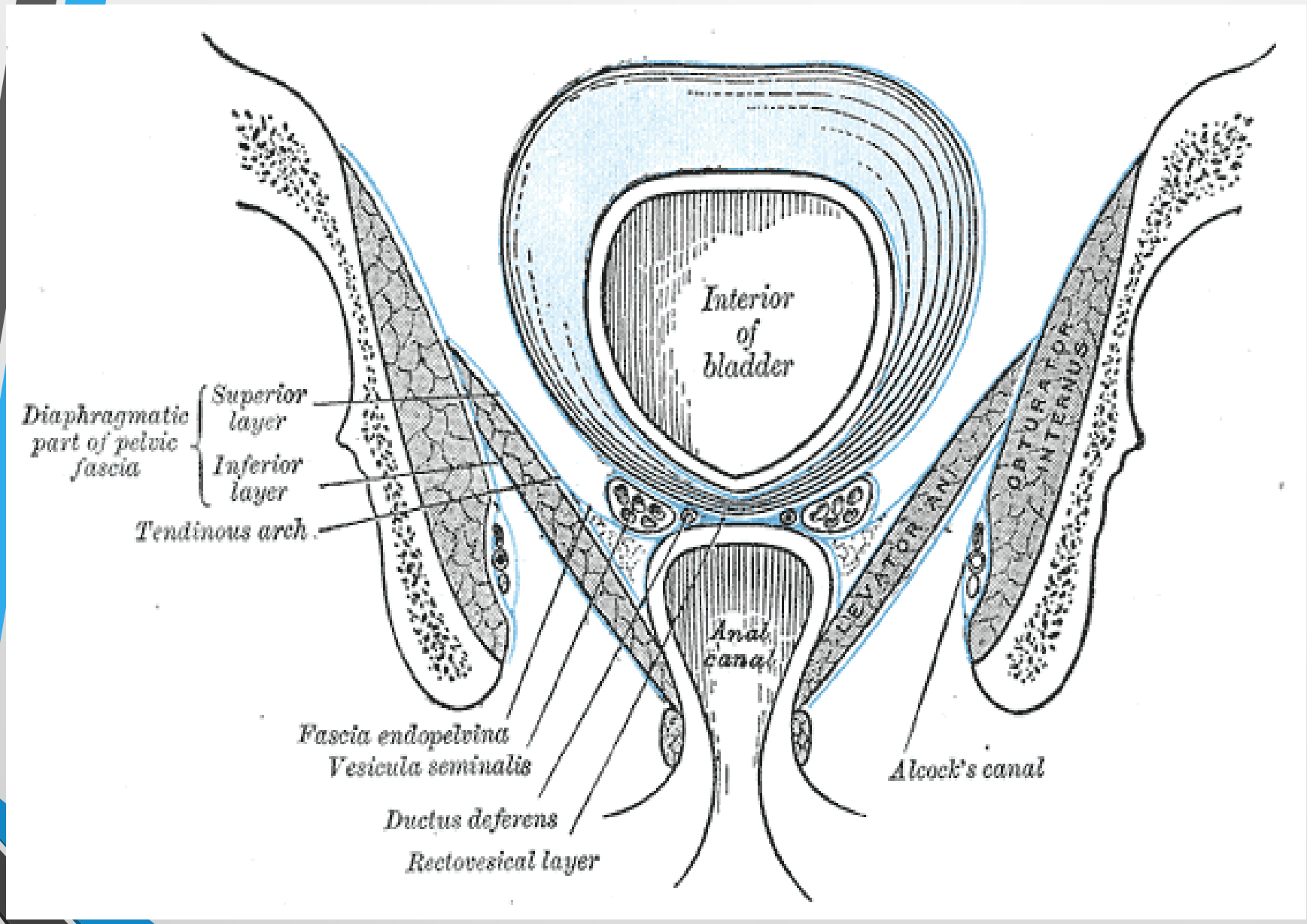
the Obturator internus muscle (Fascia of the Obturator internus)

the Piriformis muscle (Fascia of the Piriformis)

the pelvic floor

(b) fascia associated with the organs of the pelvi

The parietal pelvic fascia is a part of the general lining of the abdominal and pelvic walls. It contributes to the floor of the pelvis as the superior and inferior fasciae of the pelvic diaphragm, and it lines the lateral pelvic wall as the obturator fascia. The obturator fascia lines the obturator internus, and, below the origin of the levator ani, it forms the lateral wall of the ischiorectal fossa. In this wall, a fascial tunnel, the pudendal canal, houses the internal pudendal vessels and the pudendal nerve.


Interior of bladder
Diaphragmatic part of pelvic fascia
Superior layer
Inferior layer
Tendinous arch
Anal canal
LEVATOR AN.
OBTURATOR INTERNUS
Fascia endopelvina
Vesicula seminalis
Ductus deferens
Rectovesical layer
Alcock's canal

The visceral pelvic fascia is the extraperitoneal tissue that ensheathes the pelvic organs and vessels.

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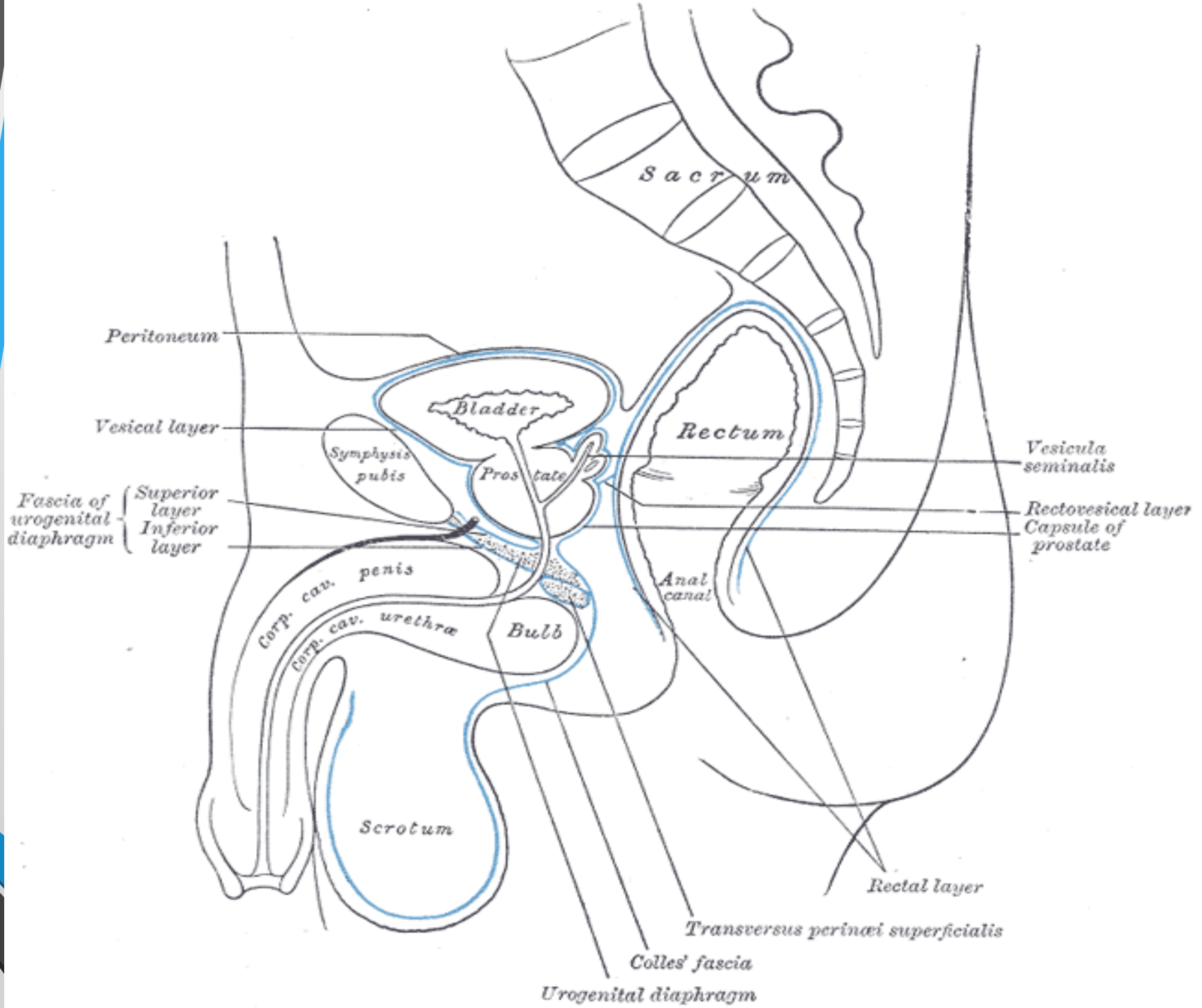
Sacrum
Peritoneum
Vesical layer
Bladder
Rectum
Symphysis pubis
Prostate
Vesicula seminalis
Fascia of urogenital diaphragm
Superior layer
Inferior layer
Rectovesical layer
Capsule of prostate
Corp. cav. penis
Anal canal
Corp. cav. urethræ
Bulb
Scrotum
Rectal layer
Transversus perinæi superficialis
Colles' fascia
Urogenital diaphragm

NERVES OF PELVIS

- Sacral plexus (to pelvic mm., viscera and perineum)
  - Posterior pelvic wall on anterior surface of **piriformis m.**
  - ♣Anterior rami of L4-L5 and S1-S4
  - ♣L4-L5 form lumbosacral trunk
  - ♣**Pudendal n**. (S2-S4) leaves via greater sciatic foramen within Alcock's canal,
    - **inferior to piriformis** and passes into the lesser sciatic foramen
    - -.
  - ♣Inferior rectal n.
  - ♣Dorsal n. of penis or clitoris
  - ♣Perineal n.
  - ♣Nerves to piriformis m.
  - ♣Perforating cutaneous n.

♣Sacral plexus

- ♣Sacral plexus leaves the pelvis through greater sciatic foramen (N468)
  - ♣Sciatic n. (L4-5, S1-3)
  - ♣Superior gluteal n. (L4-5, S1)
  - ♣Inferior gluteal n. (L5, S1-2)
  - ♣Nerve to obturator internus m. (L5, S1-2)
  - ♣Nerve to quadratus femoris m. (L5, S1)
  - ♣Posterior cutaneous n. of thigh (S1-3)

The nerve supply to the perineum originates from three main sources:

- The Genito-femoral Nerve (L1,L2).
- The pudendal nerve
- The perineal branch of the posterior femoral nerve

THANK YOU

Perineal Body