

**The University Of Jordan  
Faculty Of Medicine**



# **Anatomy Department**

## **UROGENITAL SYSTEM**

**By**

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# PELVIS

## **Learning Objectives**

1. Bony pelvis, its joints and ligaments
2. Pelvic Diameters
3. Muscles of Pelvis
4. Blood Supply Of pelvis
5. Nerve Supply Of the Pelvis
6. Lymph Drainage of the Pelvis
7. Peritoneum of Pelvis

# 1- Bony pelvis, its joints and ligaments

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**The bony pelvis is formed of 4 bones :**

Right and left hip bones, the sacrum, and coccyx.

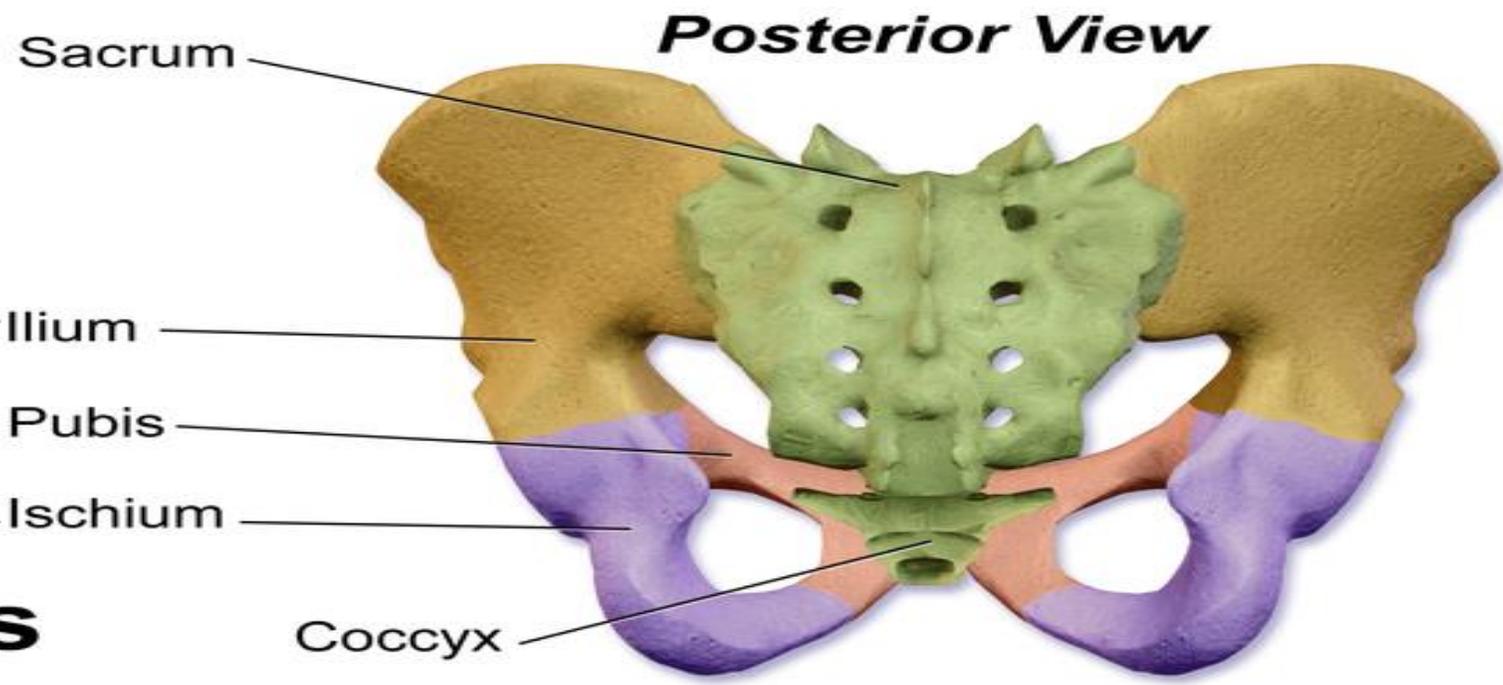
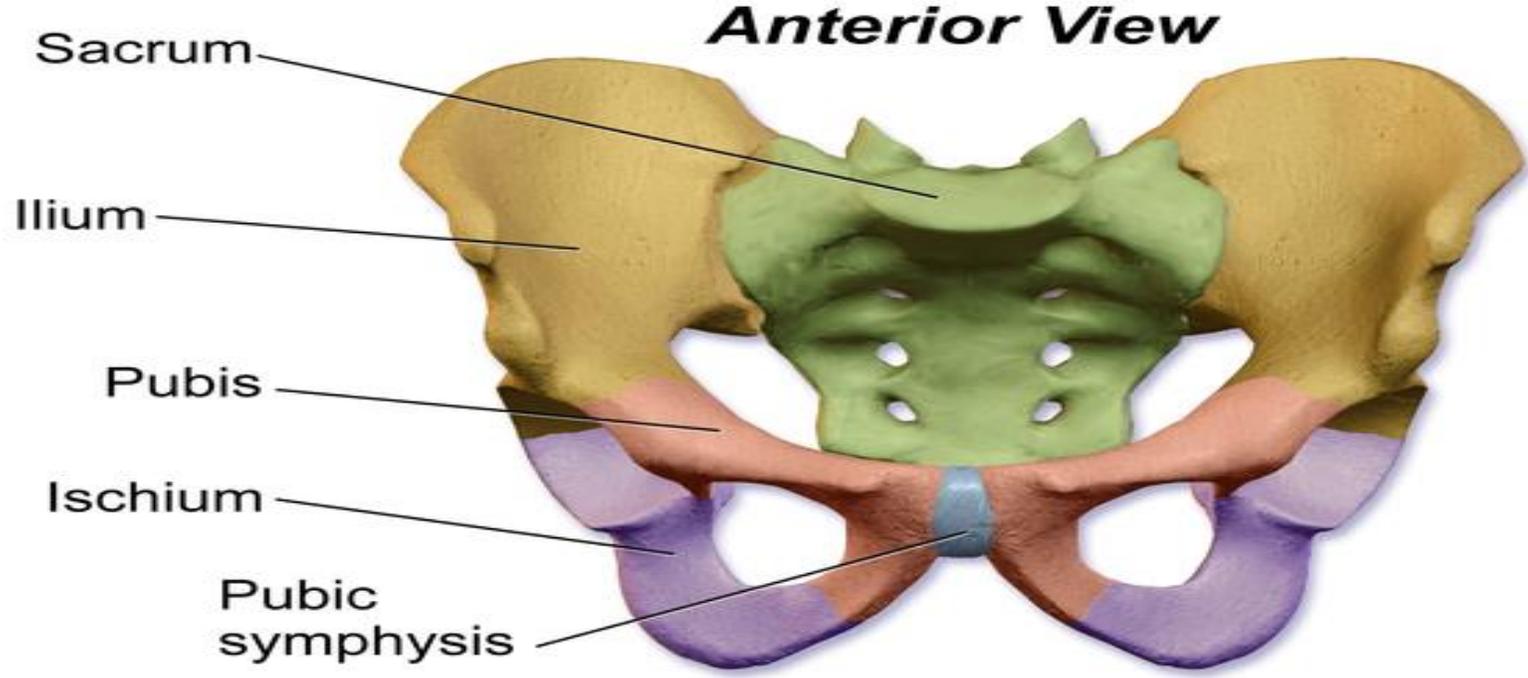
**They are united by 4 joints:**

2 Sacro-iliac joints (plane synovial )

Symphysis pubis and sacrococcygal joints (cartilaginous joints ).

**The pelvis is supported by 4 Ligament**

Iliolumbar, lumbosacral, sacrotuberous, and sacrospinous ligaments .

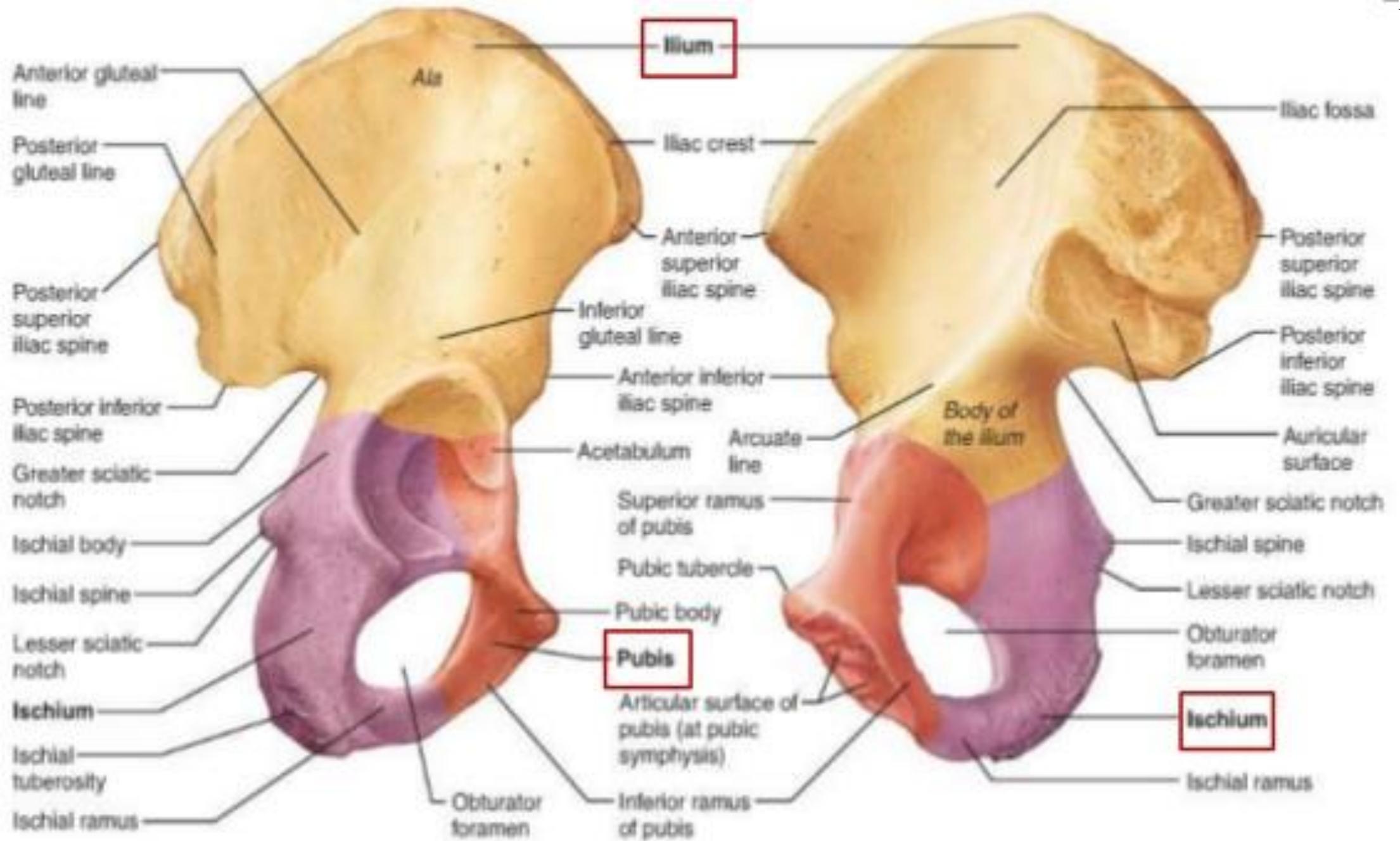


Hip bone

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# **The Pelvis**



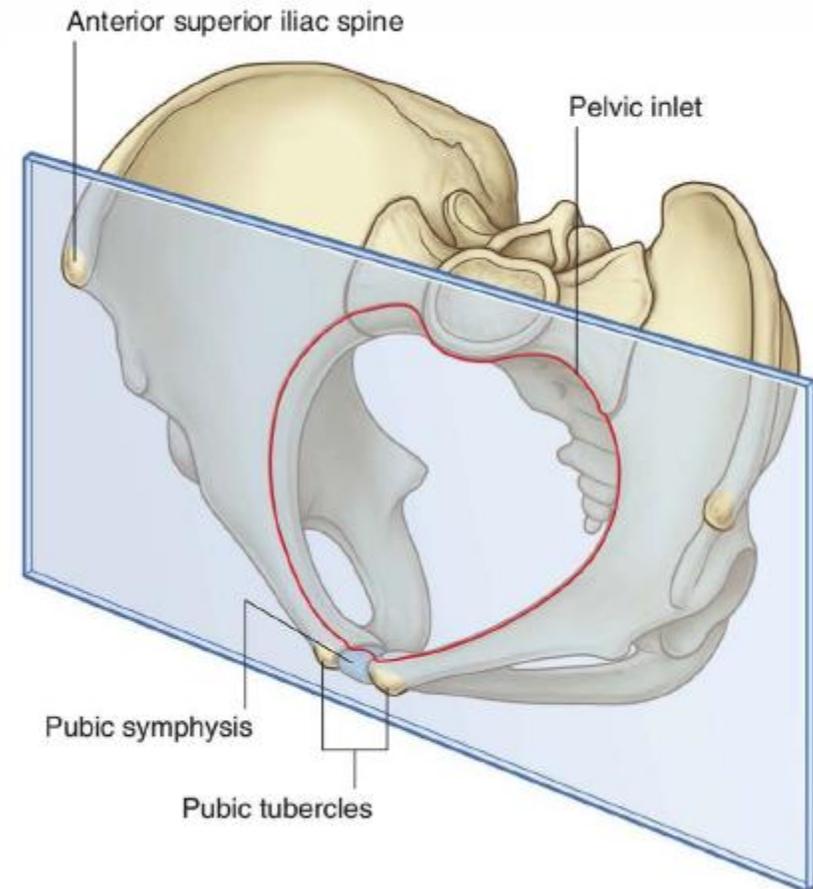
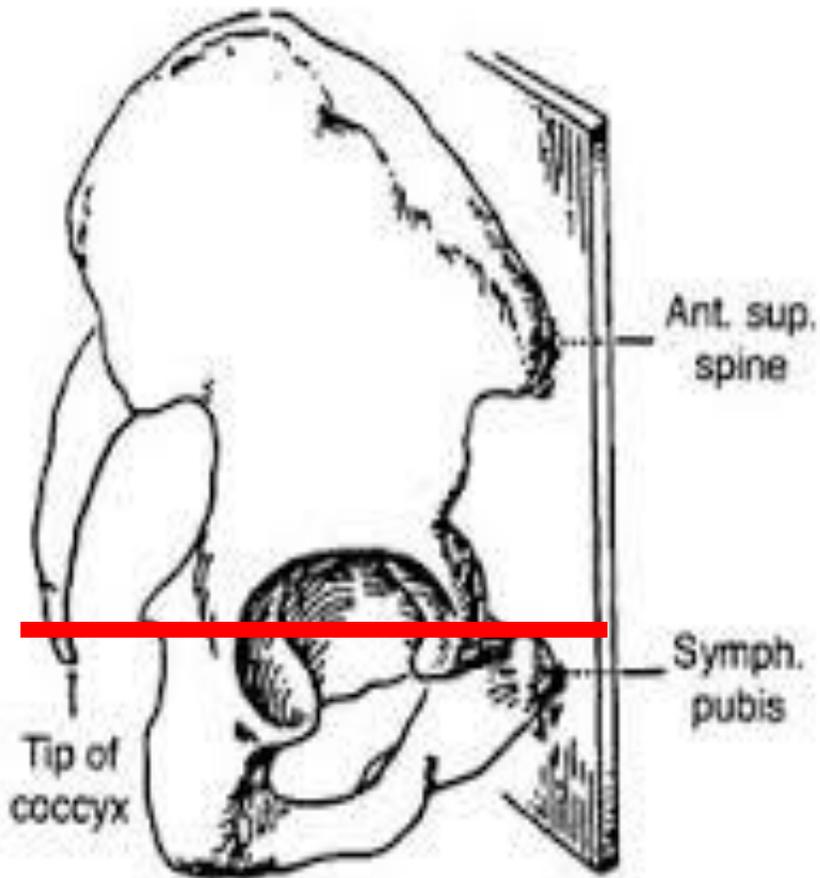
(a) Lateral view, right hip bone

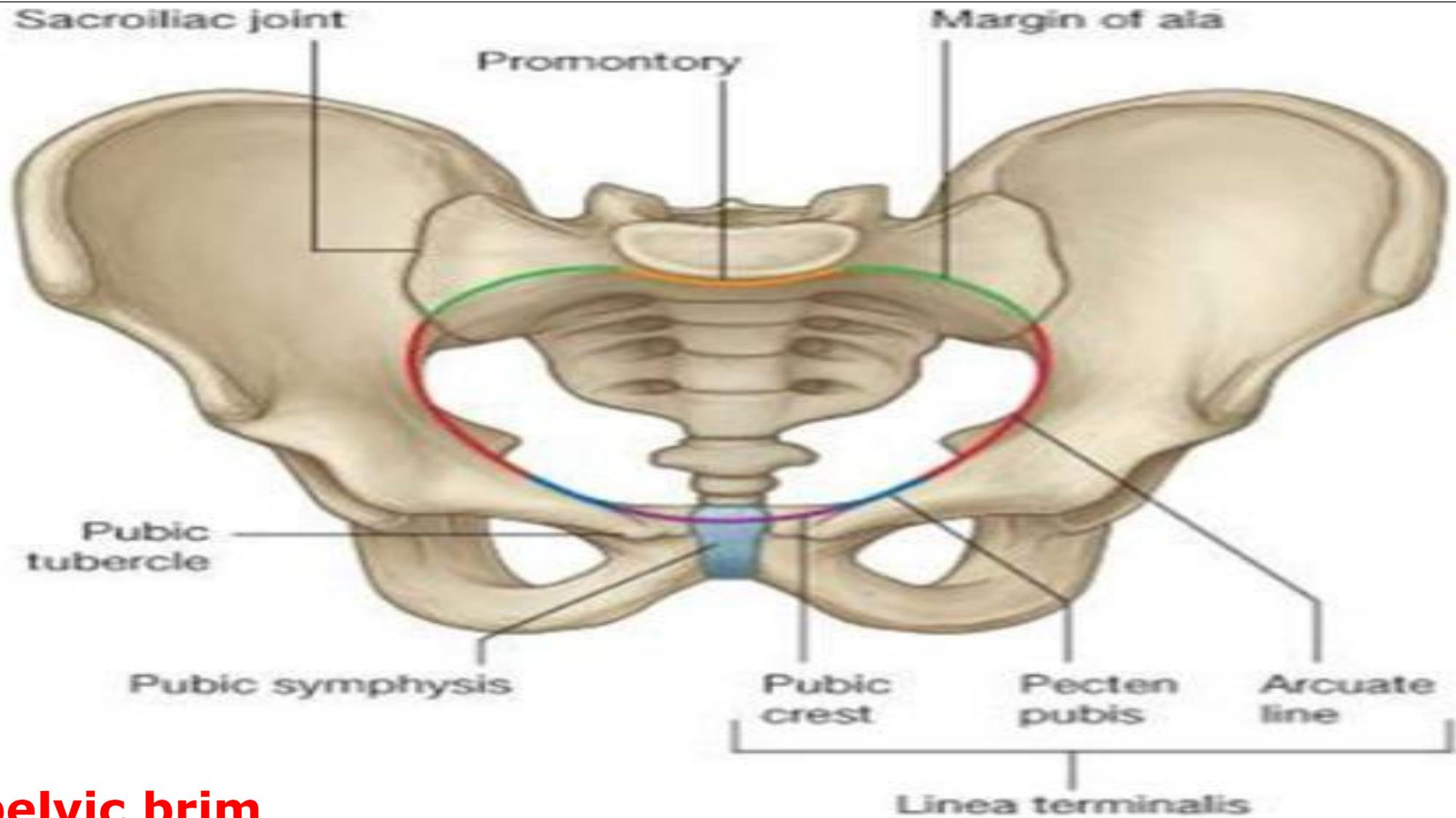
(b) Medial view, right hip bone

## Normal position of the pelvis

In erect posture, the pelvis lies with the anterior superior iliac spine and pubic tubercles in the same vertical plane

The ischial spine and upper border of symphysis pubis in the same horizontal plan.





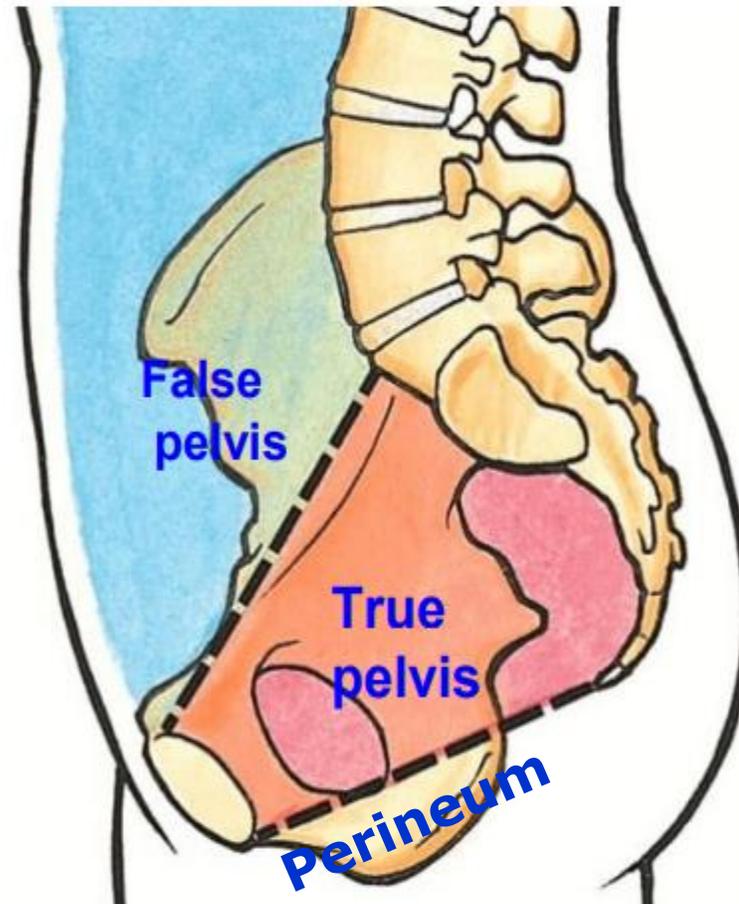
## **The pelvic brim**

An oblique plane extends from the sacral promontory to the upper margin of symphysis pubis.

# Pelvis

## Greater Pelvis (False Pelvis)

Anterosuperior to pelvic brim  
It is a part of the abdomen



## Lesser Pelvis ( True pelvis)

Posteriorinferior to pelvic brim  
The term pelvis means the lesser pelvis

**Pelvis**  
**ABOVE** By pelvic diaphragm

**Perineum**  
**BELOW** By pelvic diaphragm

True Pelvis

```
graph TD; TP[True Pelvis] --- A[A-Inlet]; TP --- B[B- Outlet]; TP --- C[C- Cavity]
```

A-Inlet

B- Outlet

C- Cavity

## A- Pelvic inlet (pelvic Brim):

### □ Shape:

**Male** : Triangular or heart-shaped

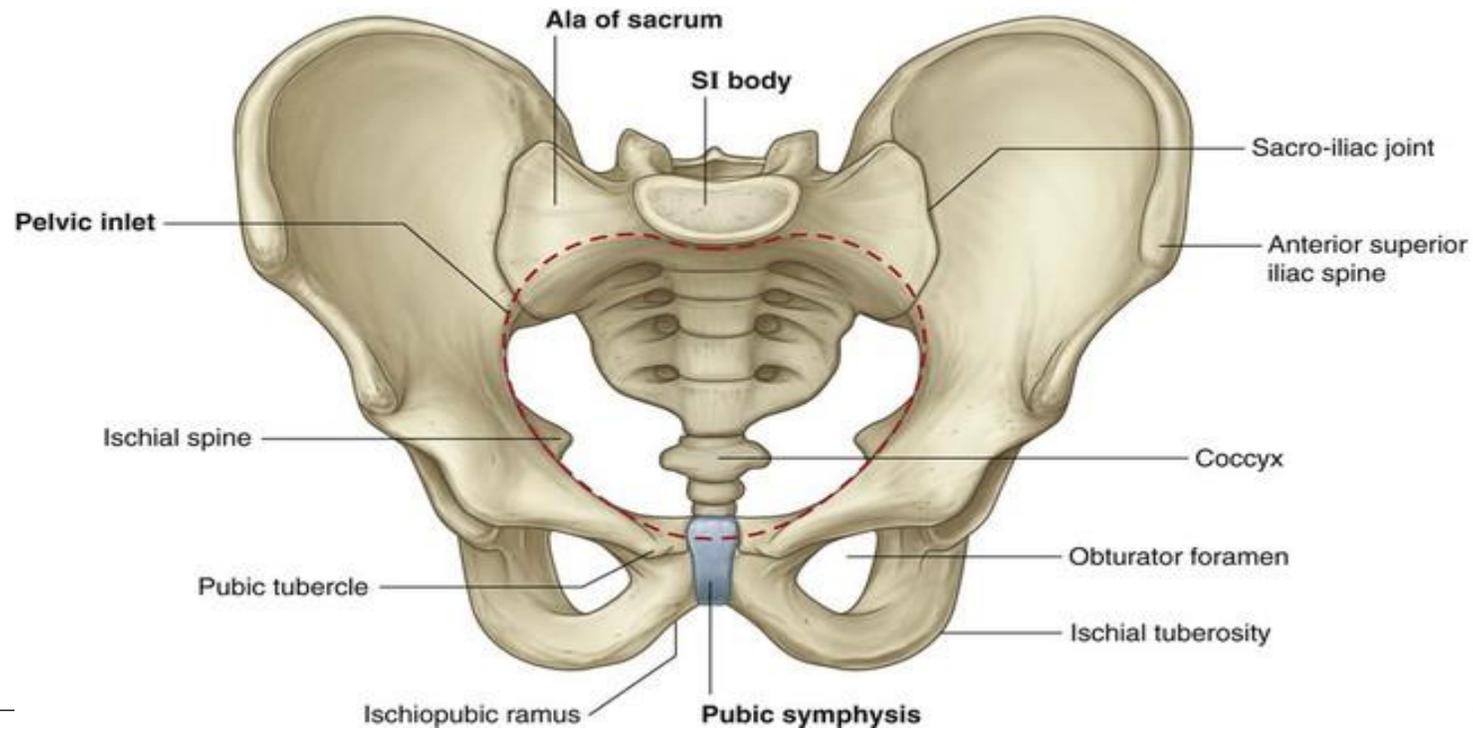
**Females** : Transversely oval

### □ Formation:

**Anteriorly** : symphysis pubis

**Posteriorly** : Sacral promontory

**On either sides** : Ala of sacrum , arcuate line, pectineal line, pubic crest



## □ Diameters :

### Anteroposterior diameter:

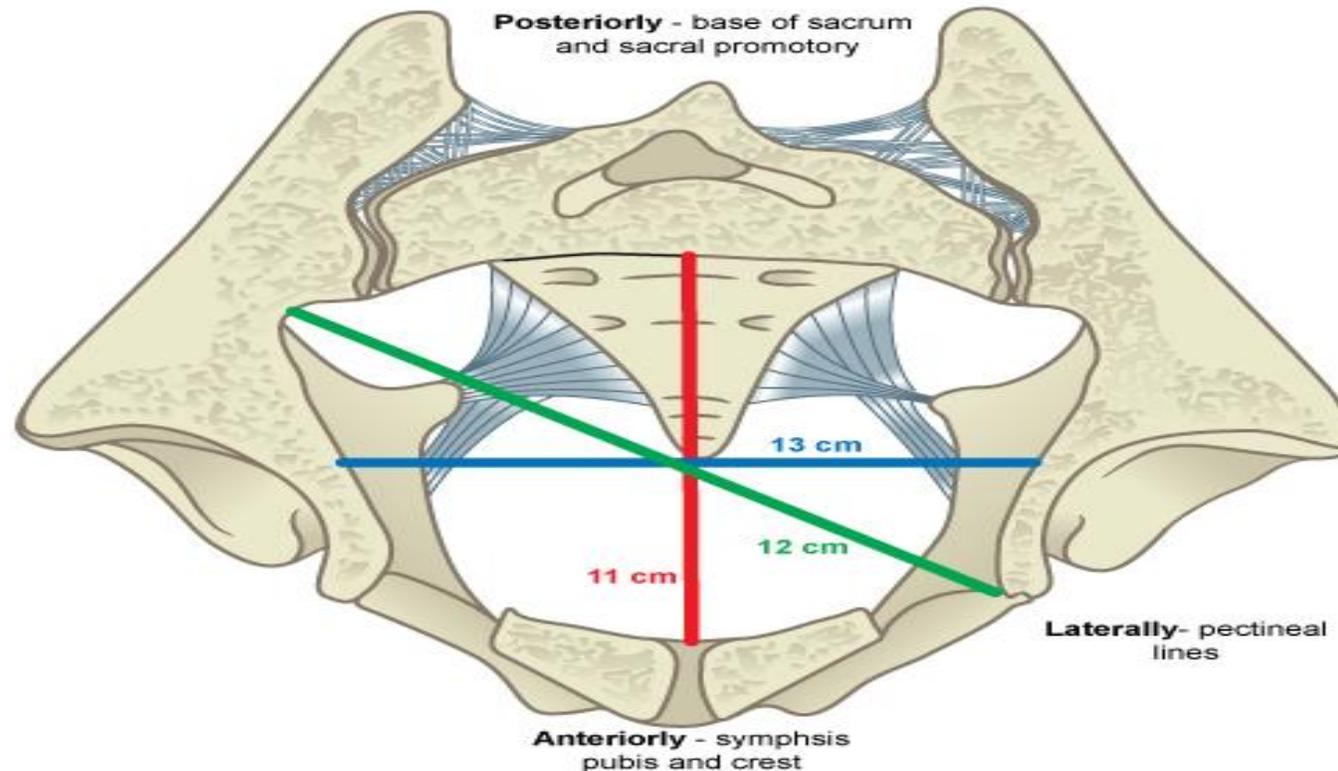
From sacral promontory to upper border of symphysis pubis (4 inches).

### Oblique diameter:

From the sacro-iliac joint to the opposite iliopubic eminence (4.5 inches).

### Transverse diameter:

Between the 2 arcuate lines (5 inches). **It is the widest diameter.**



## B- Pelvic Outlet :

### □ Formation:

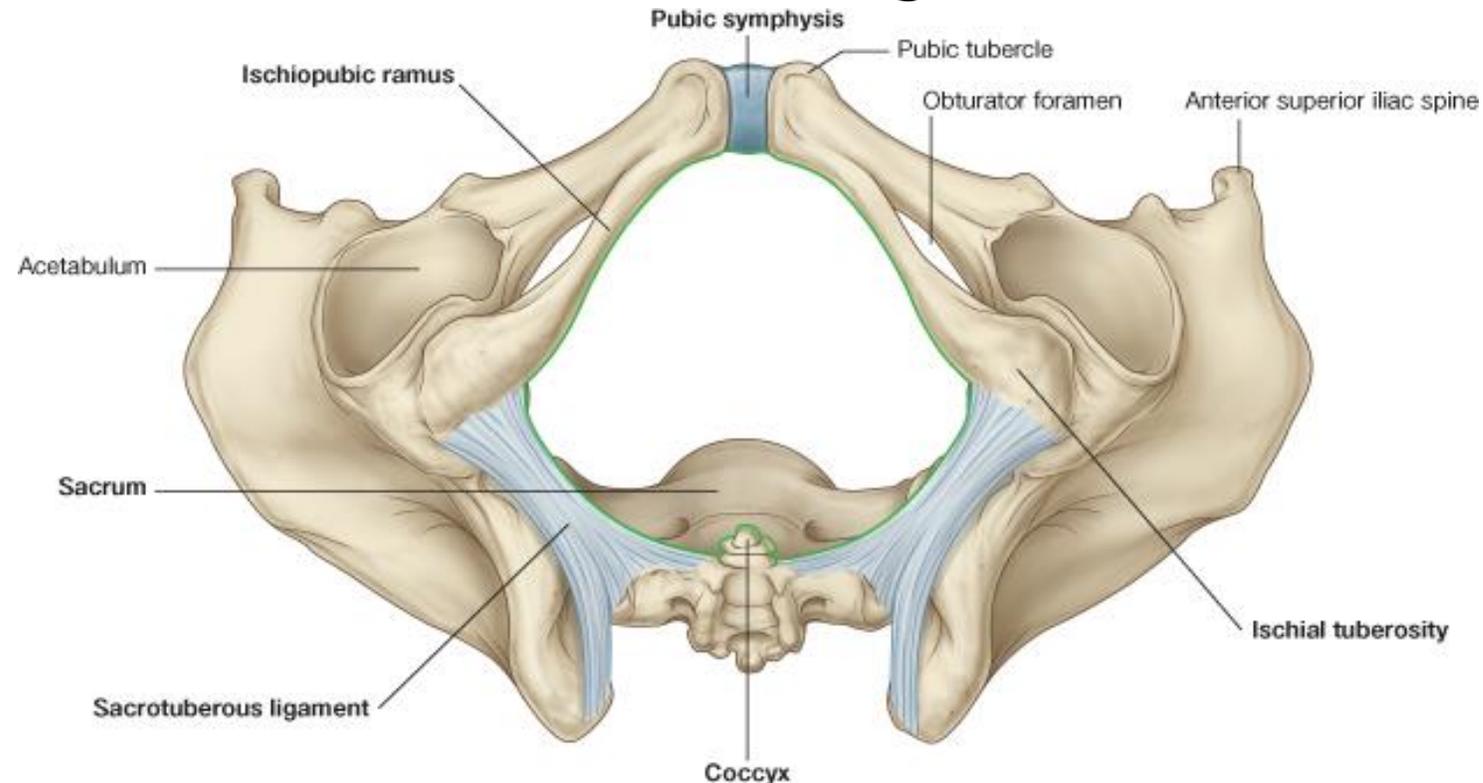
**Anteriorly:** Pubic Arch.

**Posteriorly :** Coccyx.

**Lateral angles :** Ischial tuberosities.

**Anterolateral sides :** Ischiopubic rami

**Posterolateral sides :** Sacrotuberous ligaments



## ❑ Diameters :

### Anteroposterior diameter:

Between the coccyx and lower border symphysis pubis (5 inches).

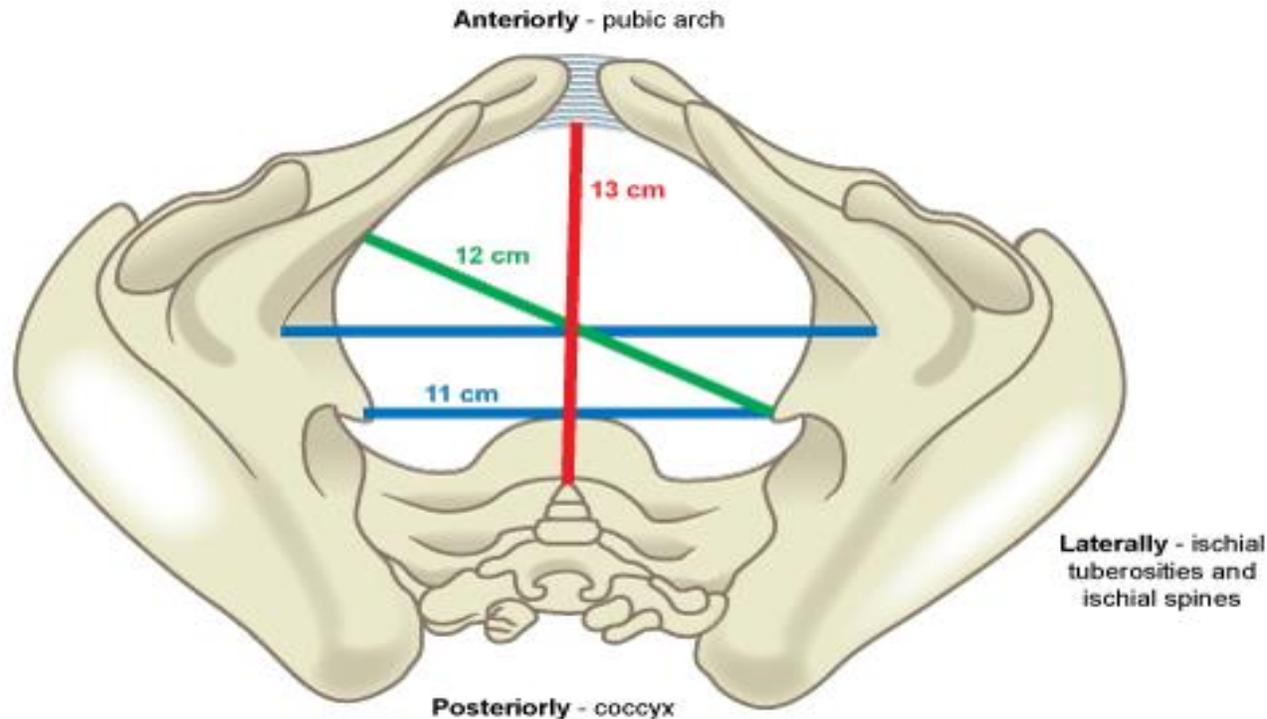
It is the **widest diameter** at the outlet.

### Oblique diameter :

From the midpoint of the sacrotuberous ligament to junction of the pubic and ischial rami of the opposite side (4.5 inches).

### Transverse diameter :

Between the 2 ischial tuberosities (4 inches).



## C- Pelvic Cavity

### Anterior wall :

Is short (2 inches) Formed by bodies of pubic bones and symphysis pubis.

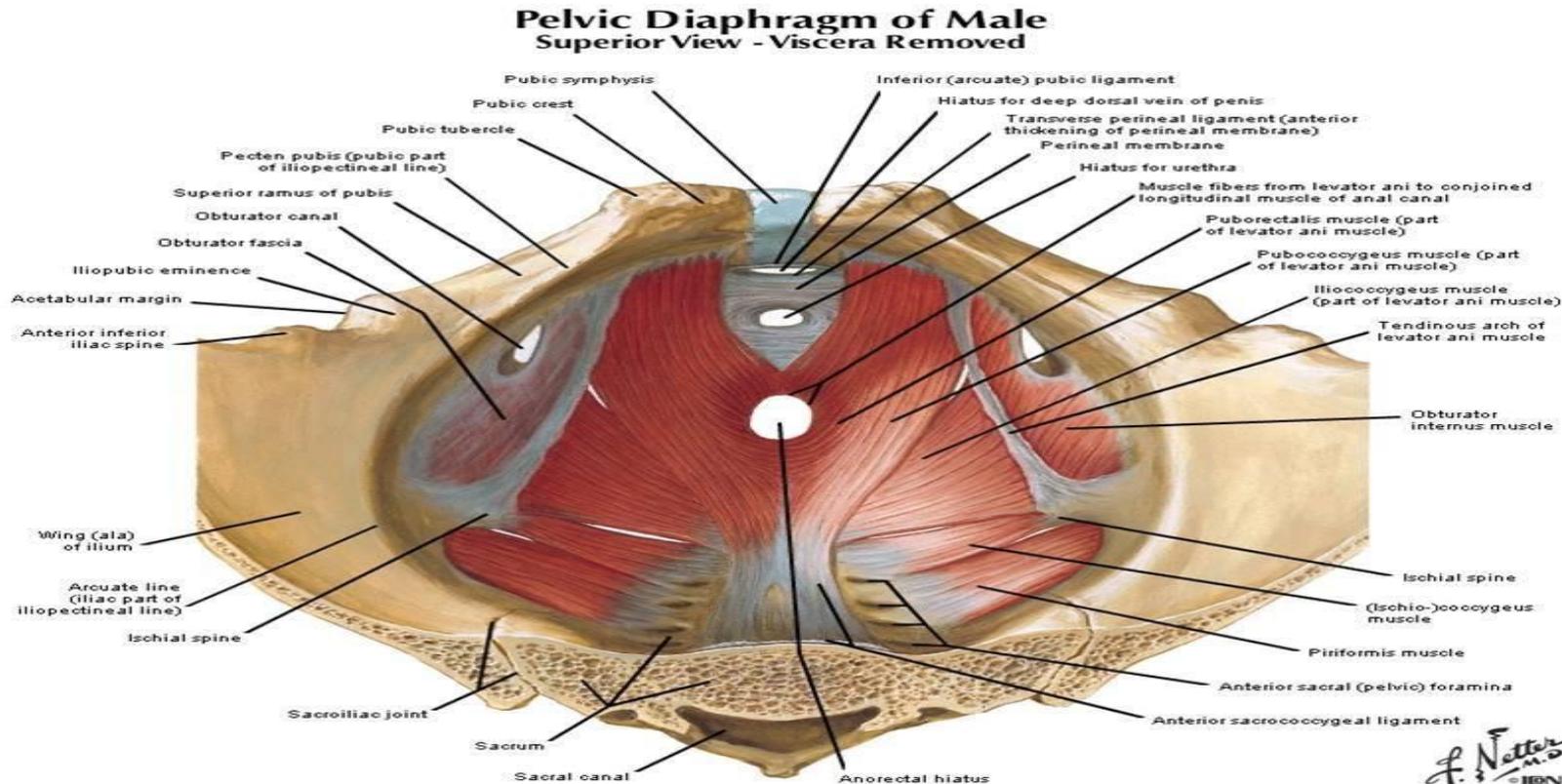
### Posterior wall :

Is long (6 inches), Formed of the sacrum and coccyx

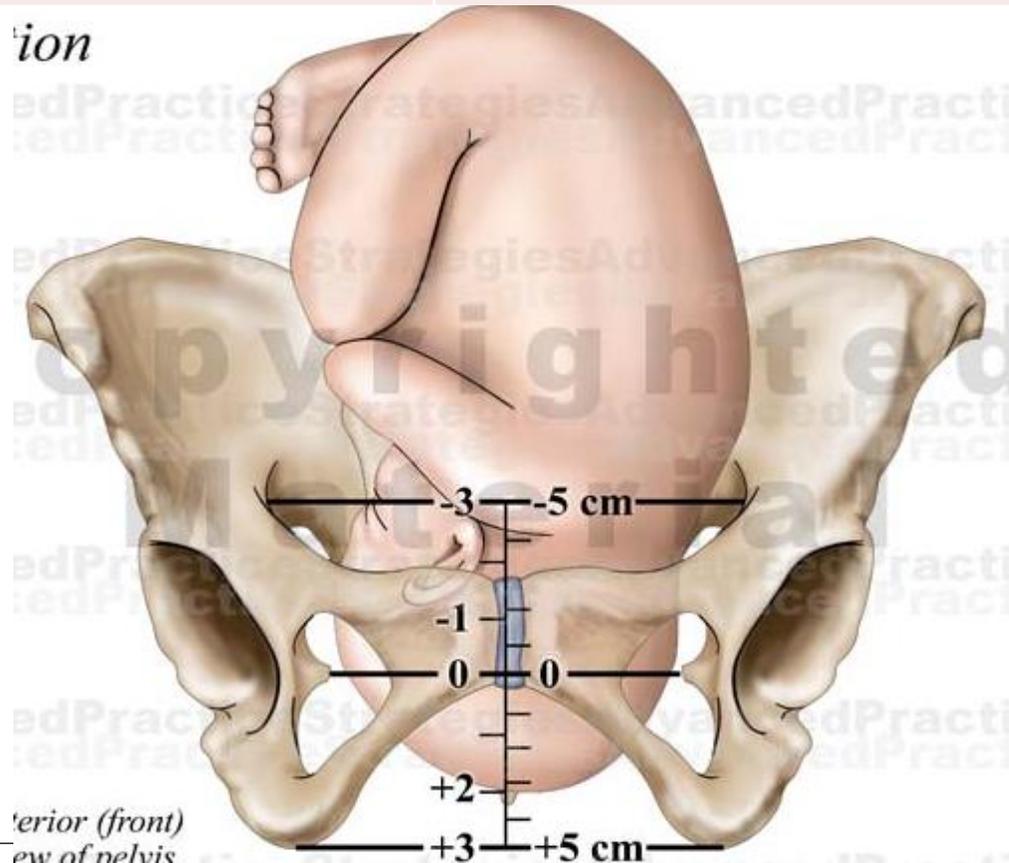
### Lateral walls:

Pelvic surface of parts of pubis, ischium and ilium.

**Subdivisions:** By pelvic diaphragm (levator ani and coccygeus muscles),It divided into pelvis above and perineum below.

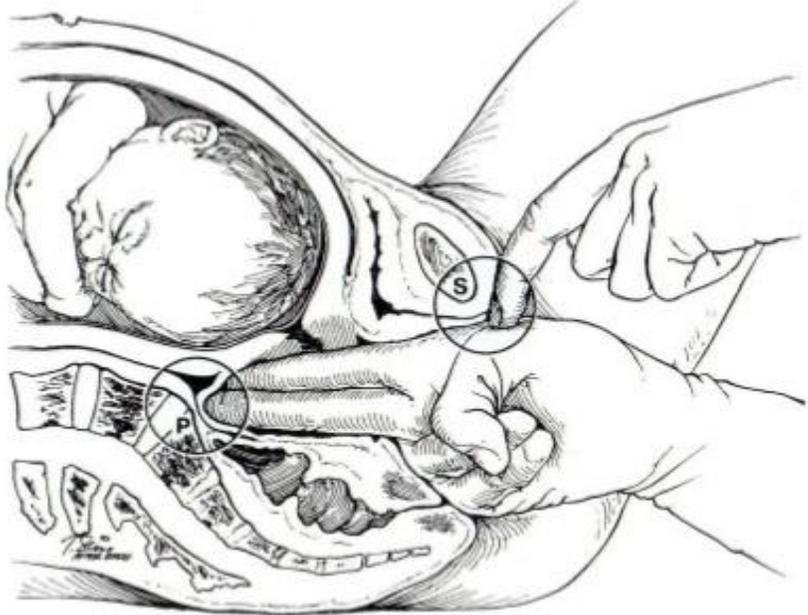


	Anteroposterior diameter	Oblique diameter	Transverse diameter
Inlet	4	4 1/2	<b>5</b>
Mid-cavity	4 1/2	4 1/2	4 1/2
Outlet	<b>5</b>	4 1/2	4

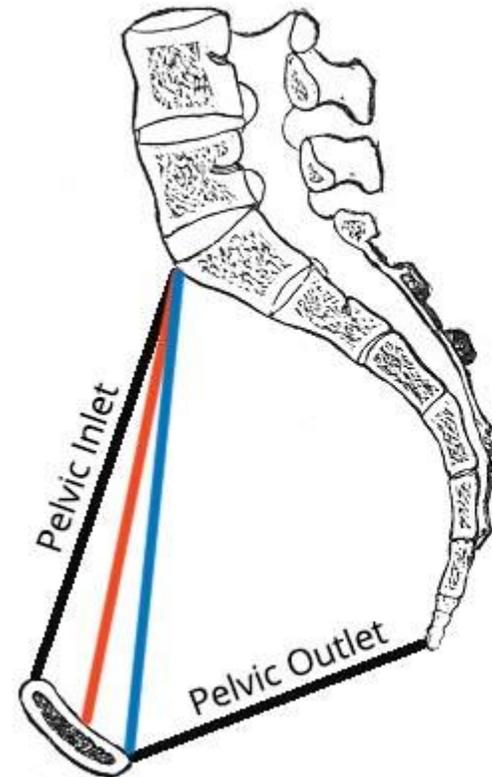


**Diagonal conjugate** : It is the distance between promontory of sacrum and the lower border of the symphysis pubis. Shorter diagonal conjugate indicates contracted pelvis.  
**Obstetric conjugate**: between promontory of sacrum and most bulging point on the back of symphysis pubis. It is less than Diagonal conjugate by 1.5 to 2 cm

## Vaginal Examination to Determine Diagonal Conjugate



Obstetric Conjugate = Subtracts 1.5 – 2.0 cm from Diagonal Conjugate



- Obstetric Conjugate
- Diagonal Conjugate

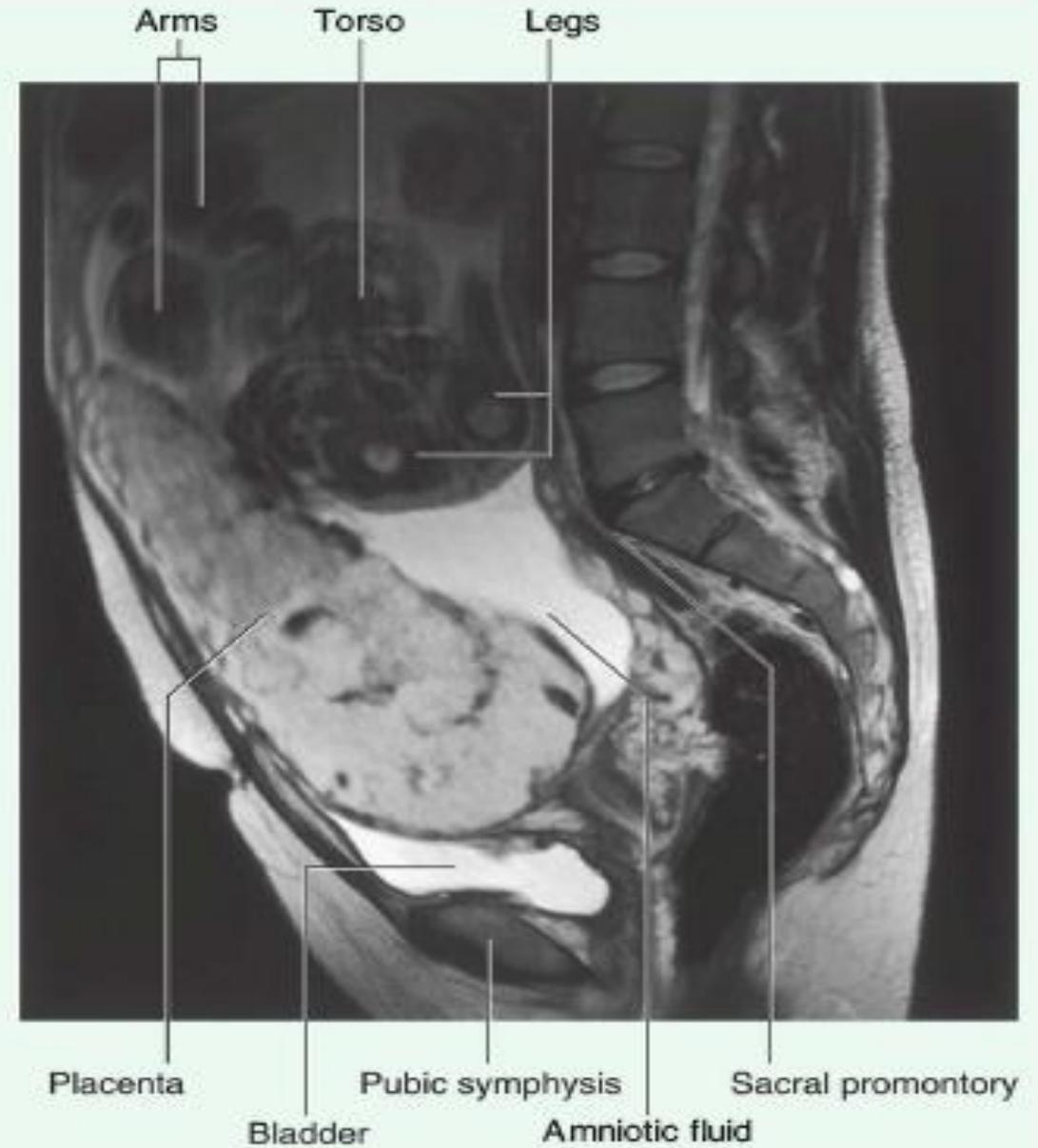
## In the clinic

### Pelvic measurements in obstetrics

Transverse and sagittal measurements of a woman's pelvic inlet and outlet can help in predicting the likelihood of a successful vaginal delivery. These measurements include:

- the sagittal inlet (between the promontory and the top of the pubic symphysis),
- the maximum transverse diameter of the inlet,
- the bispinous outlet (the distance between ischial spines), and
- the sagittal outlet (the distance between the tip of the coccyx and the inferior margin of the pubic symphysis).

These measurements can be obtained using magnetic resonance imaging, which carries no radiation risk for the fetus or mother (Fig. 5.33).



**Fig. 5.33** Sagittal T2-weighted magnetic resonance image of the lower abdomen and pelvis of a pregnant woman.

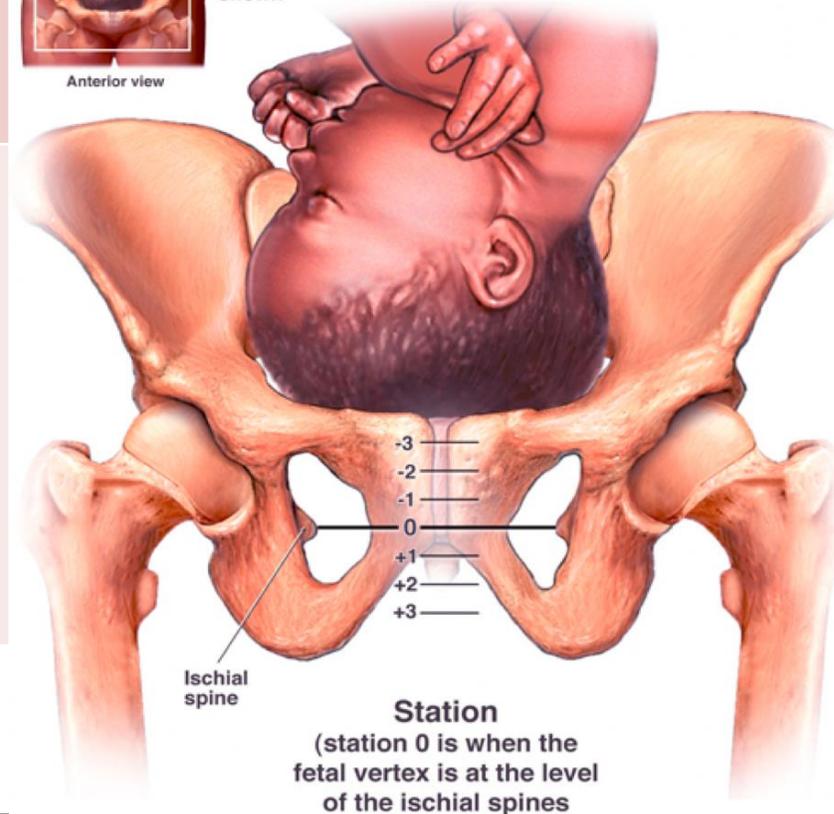
# Fetal head stations

**Reed Only  
See next slide**

	Head position	Bony landmark
-2	Fixed to pelvic inlet	Above ischial spines
-1	Small segment of fetal head in pelvic inlet	
<b>0</b>	<b>Large segment of fetal head in pelvic inlet</b>	<b>At ischial spines</b>
+1	Fetal head in plane of greatest dimension	Below ischial spines (head visible at the introitus).
+2	Fetal head in plane of least dimension	
+3	Fetal head in the pelvic outlet	



Area shown

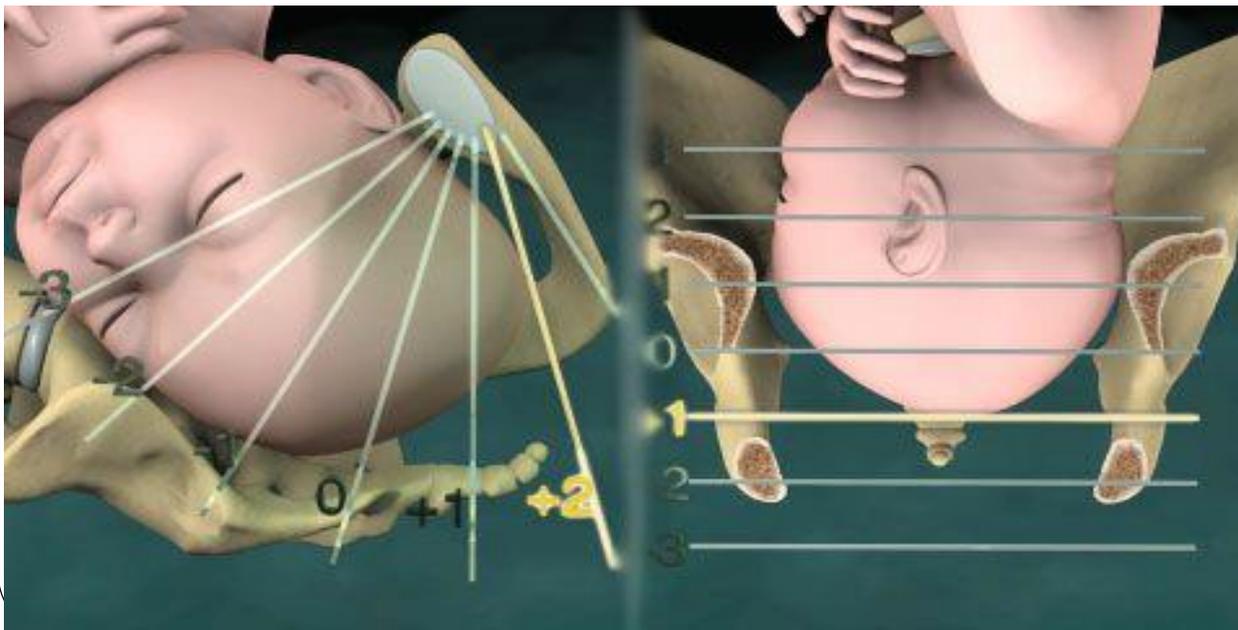
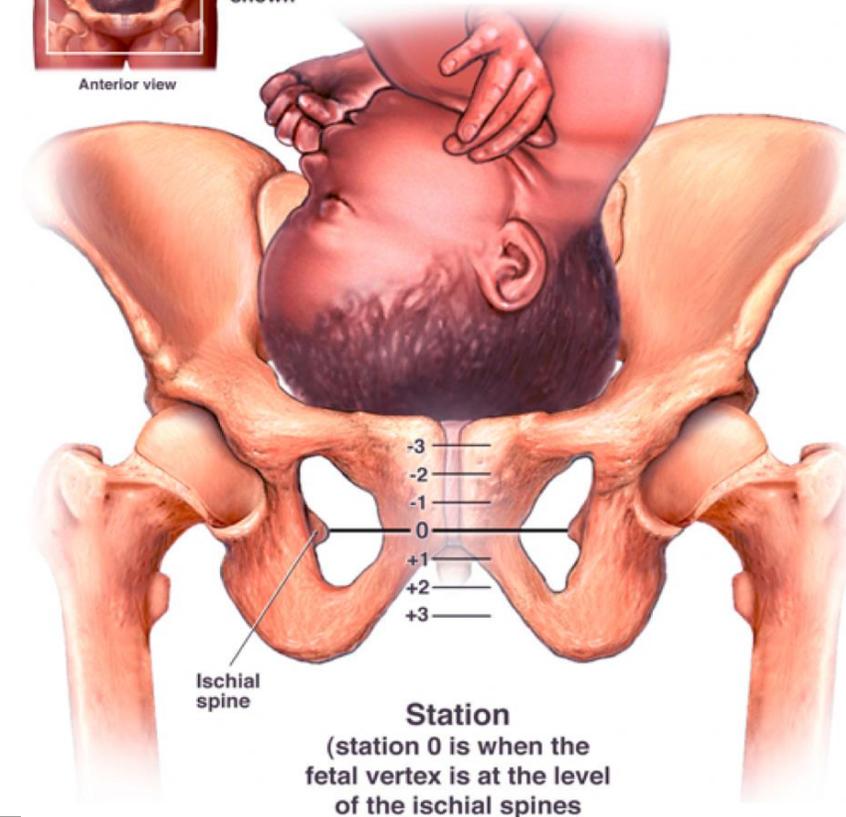


# Fetal head stations

	Bony landmark
-2	Above ischial spines
-1	
<b>0</b>	<b>At ischial spines</b>
+1	Below ischial spines (head visible at the introitus).
+2	
+3	

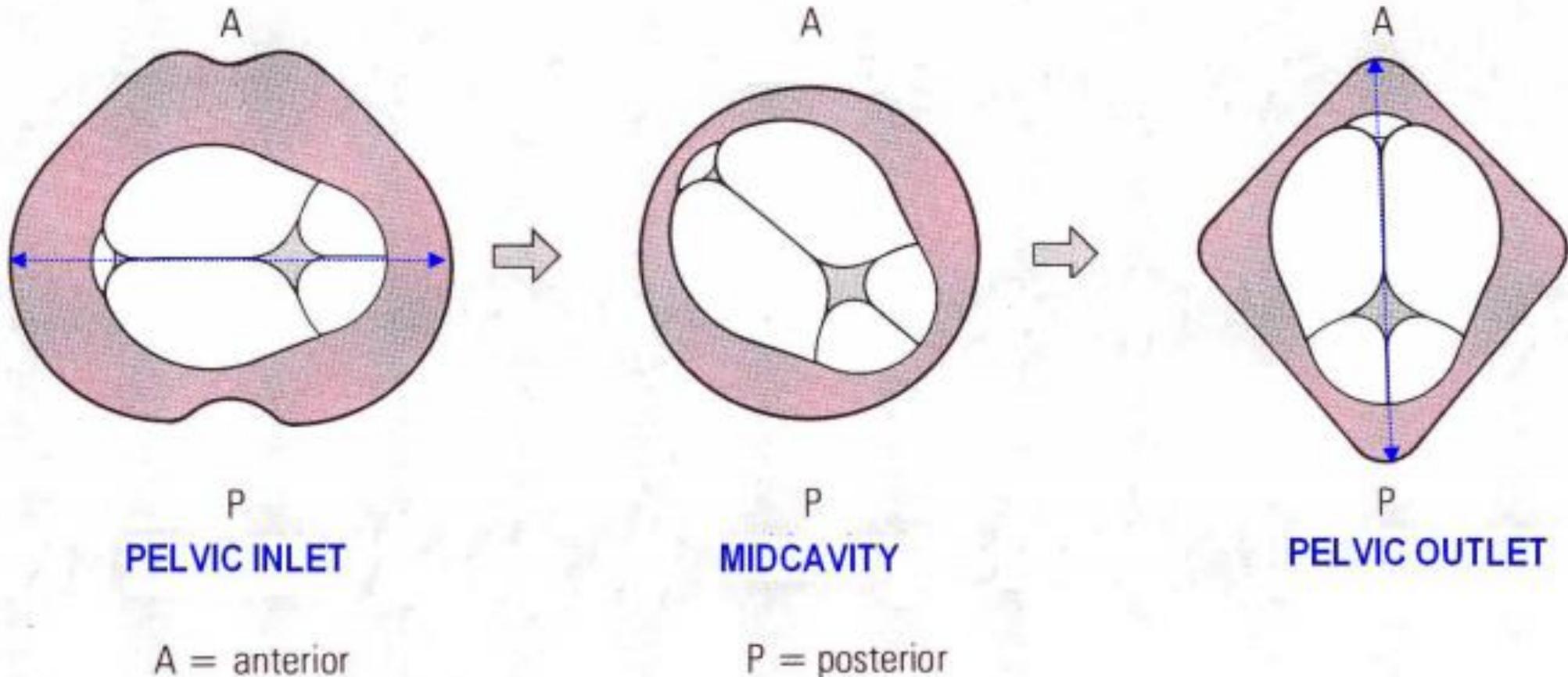


Area shown



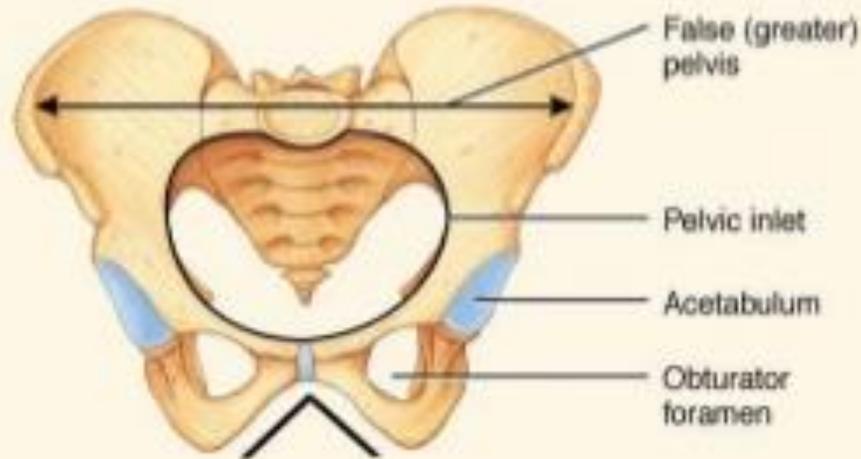
## Rotation of head during labour

- Widest diameter of pelvic canal changes from **transverse diameter** at **pelvic inlet** to **AP diameter** at **pelvic outlet**
- To obtain best fit of fetal head, the longest diameter of the fetal head passes through the widest diameter of the pelvis.
- Therefore the head must rotate during labour

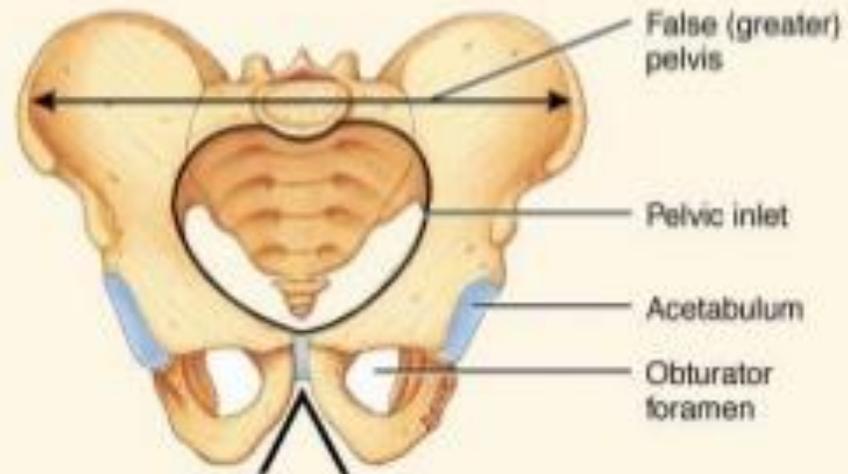


## Sex Differentiation in the Pelvis

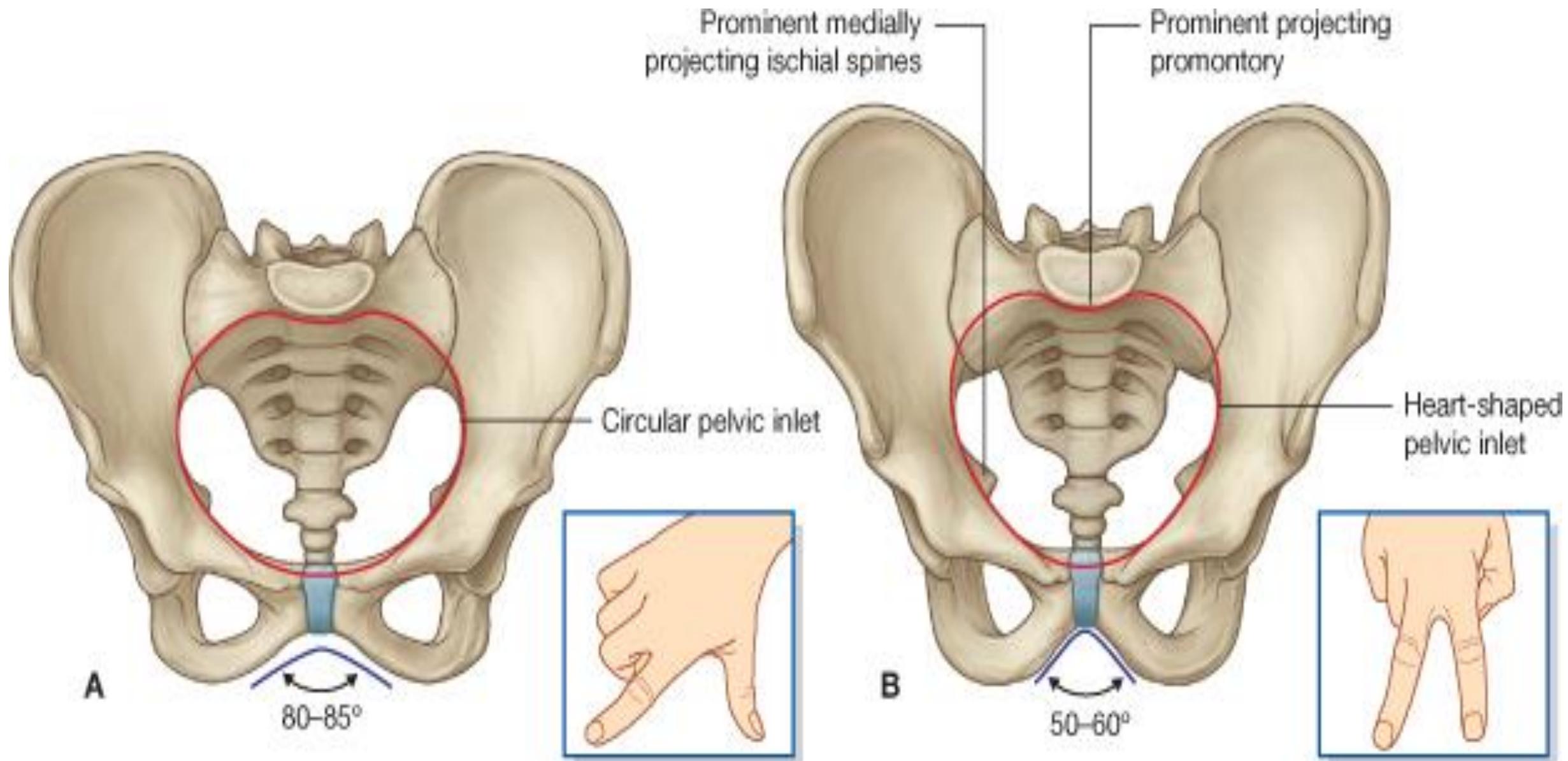
		Female	Male
1	<b>Inlet</b>	Wider, transversely oval	Smaller, heart shaped
2	<b>Cavity</b>	Wider, shallower	Narrow, deeper
3	<b>Outlet</b>	Larger	Smaller
4	<b>Subpubic angle</b>	Wide Angle	Acute angle
5	<b>Ischial tuberosities</b>	Are everted externally	Are turned in
6	<b>Sacrum</b>	Wider, shorter	Narrower, longer
7	<b>Side of pubic arch</b>	everted externally	Not everted



Pubic arch (wider)



Pubic arch (narrower)



## Types of Female pelvis

### Gynaecoid pelvis:

it is the typical female pelvis previously described.

### Android pelvis:

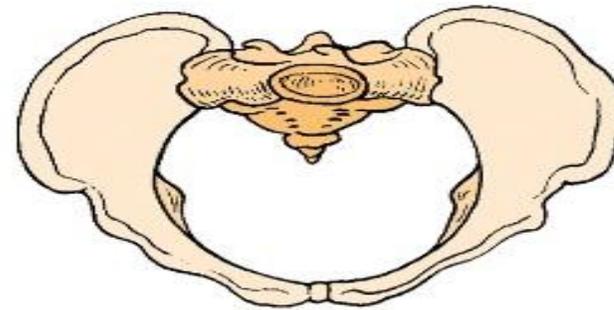
it is the female pelvis with some male features.

### Anthropoid pelvis:

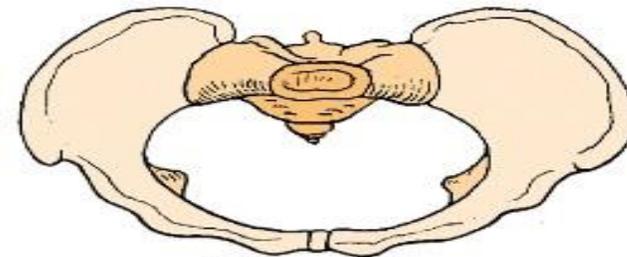
it simulates the pelvis of apes. It has **Small transverse diameter** and long anteroposterior diameter.

### Platypelloid pelvis:

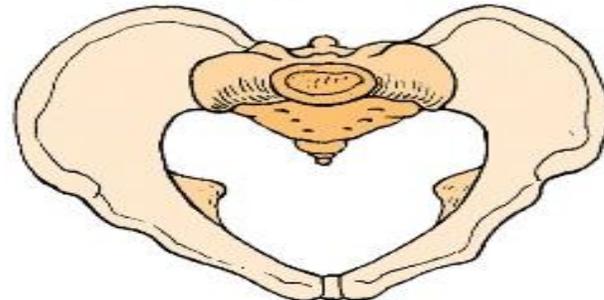
it is a flat pelvis in which the inlet has **Larger transverse diameter** much than the anteroposterior diameter.



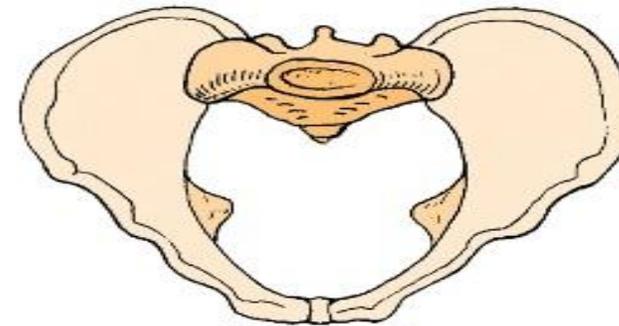
Gynecoid



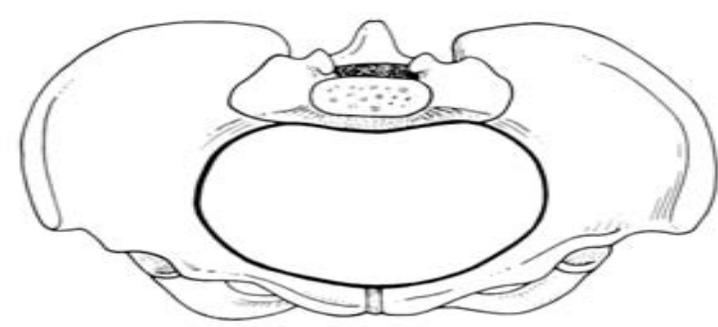
Platypelloid



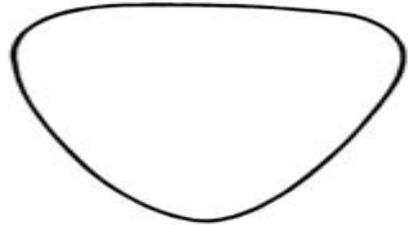
Android



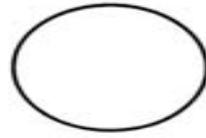
Anthropoid



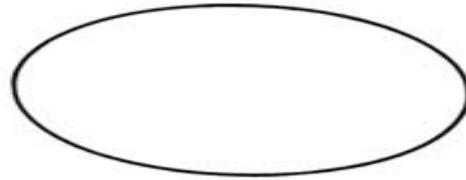
(a) Gynaecoid



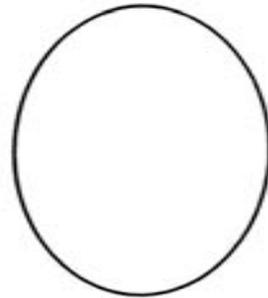
(c) Android



(b) Generally contracted



(d) Platypelloid



(f) Anthropoid

**Gynaecoid pelvis:**

Normal

**Android pelvis:**

Like Male

**Anthropoid pelvis:**

Like apes. Small transverse diameter

**Platypelloid pelvis:**

It is a flat pelvis Larger transverse diameter

## Fracture Pelvis

If the pelvis breaks at any one point, the fracture will be stable and no displacement will occur.

If two breaks occur in the pelvis the fracture will be unstable and displacement will occur

**Coccydynia** : is common and is usually caused by direct trauma to the coccyx, as in falling down a flight of concrete steps.

## Complications of Pelvic Fractures

- Injury to Male urethra and urinary bladder
- Rectum rarely damaged
- Bleeding from blood vessels injury
- Injury to nerves especially sciatic nerve in fracture include greater sciatic notch



# **2-Joints and ligaments Of The Pelvis**

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## 1) Pubic Symphysis:

It is a secondary cartilaginous joint between the two pubic bones.

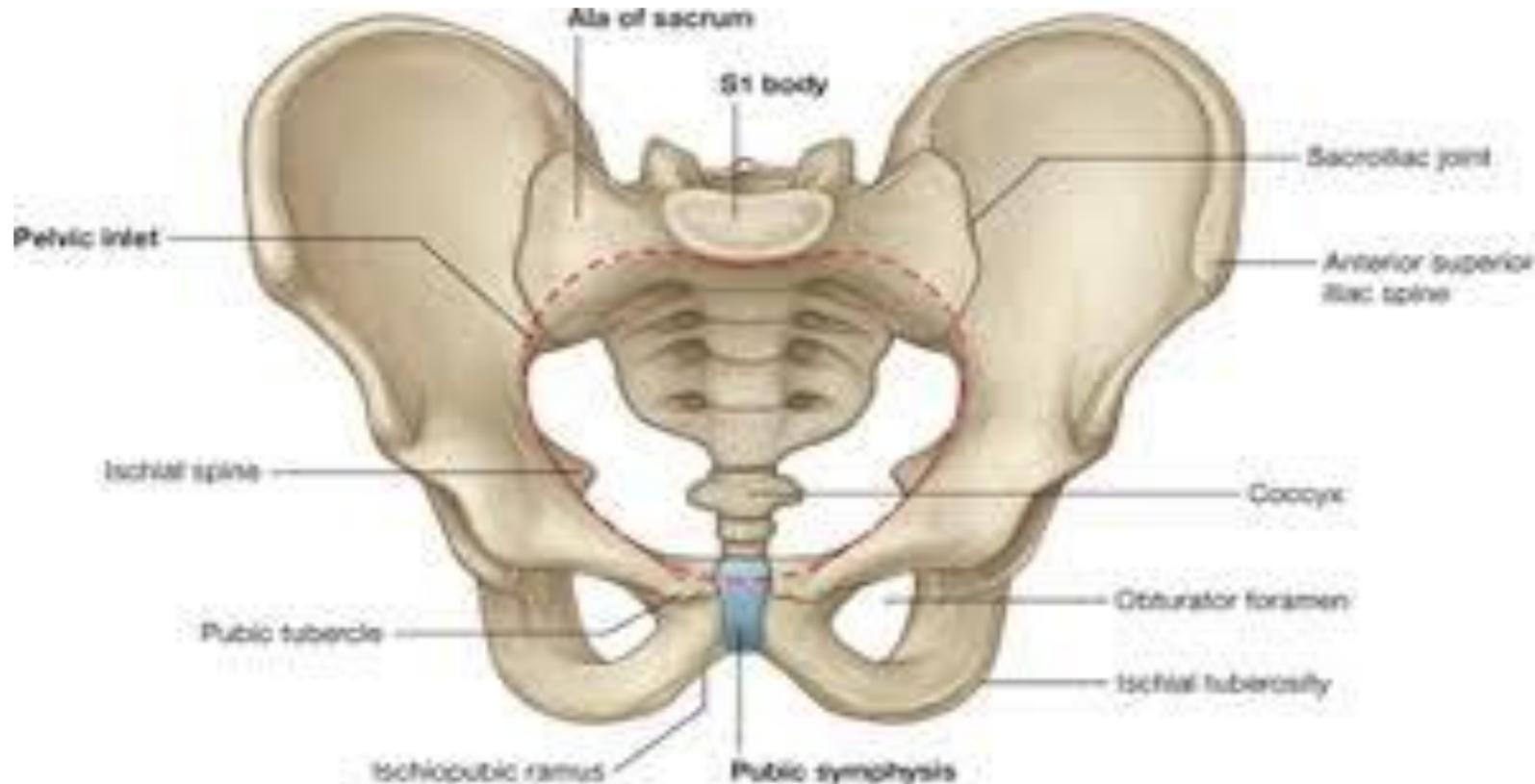
### Ligament:

Superiorly : Superior pubic ligament

Inferiorly : The arcuate pubic ligament.

## 2) Sacrococcygeal Joint:

Type: it is a secondary cartilaginous joint between sacral apex and coccygeal base.



### **3) Sacroiliac Joint :**

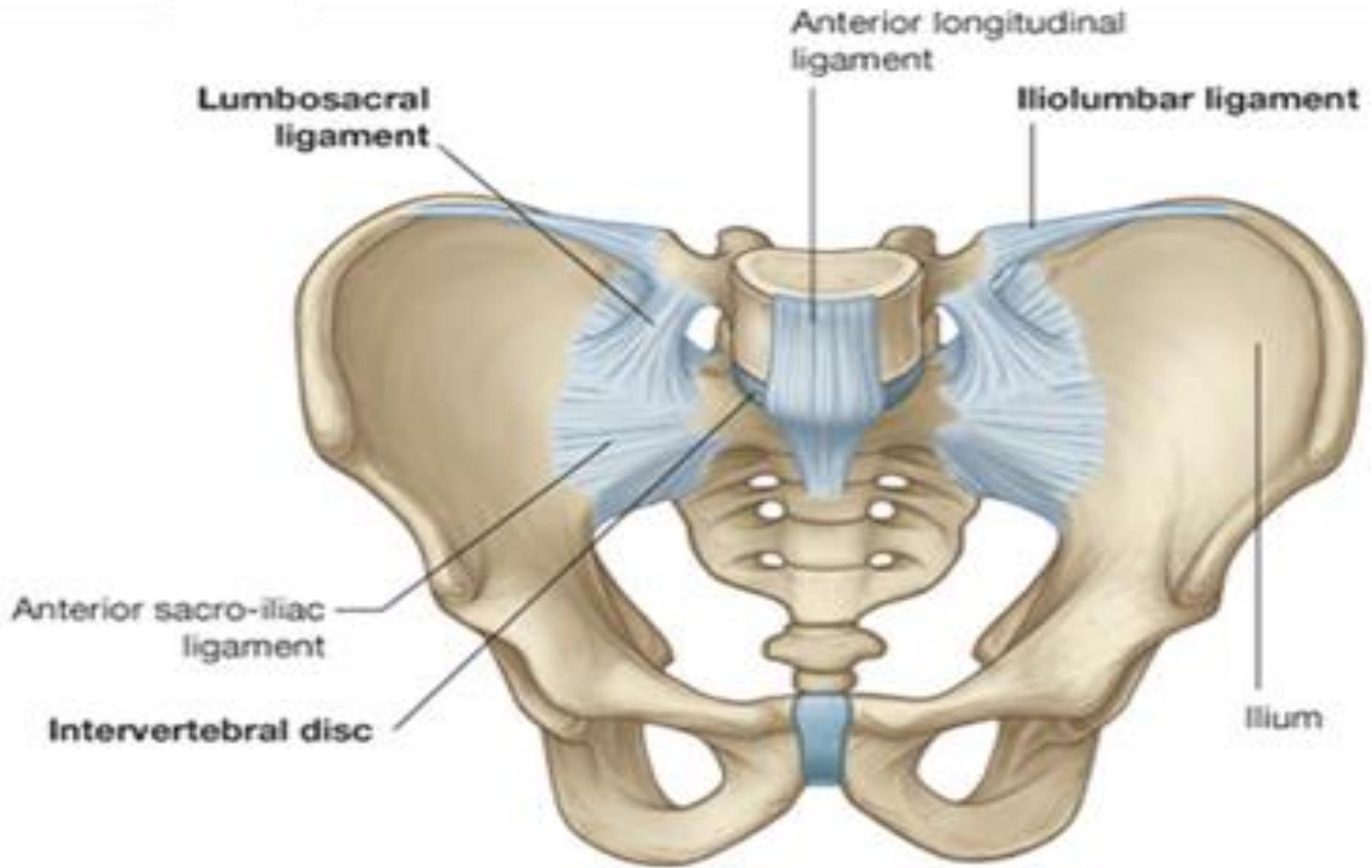
Type: plane synovial joint between sacral and iliac auricular surfaces.

#### **Ligaments :**

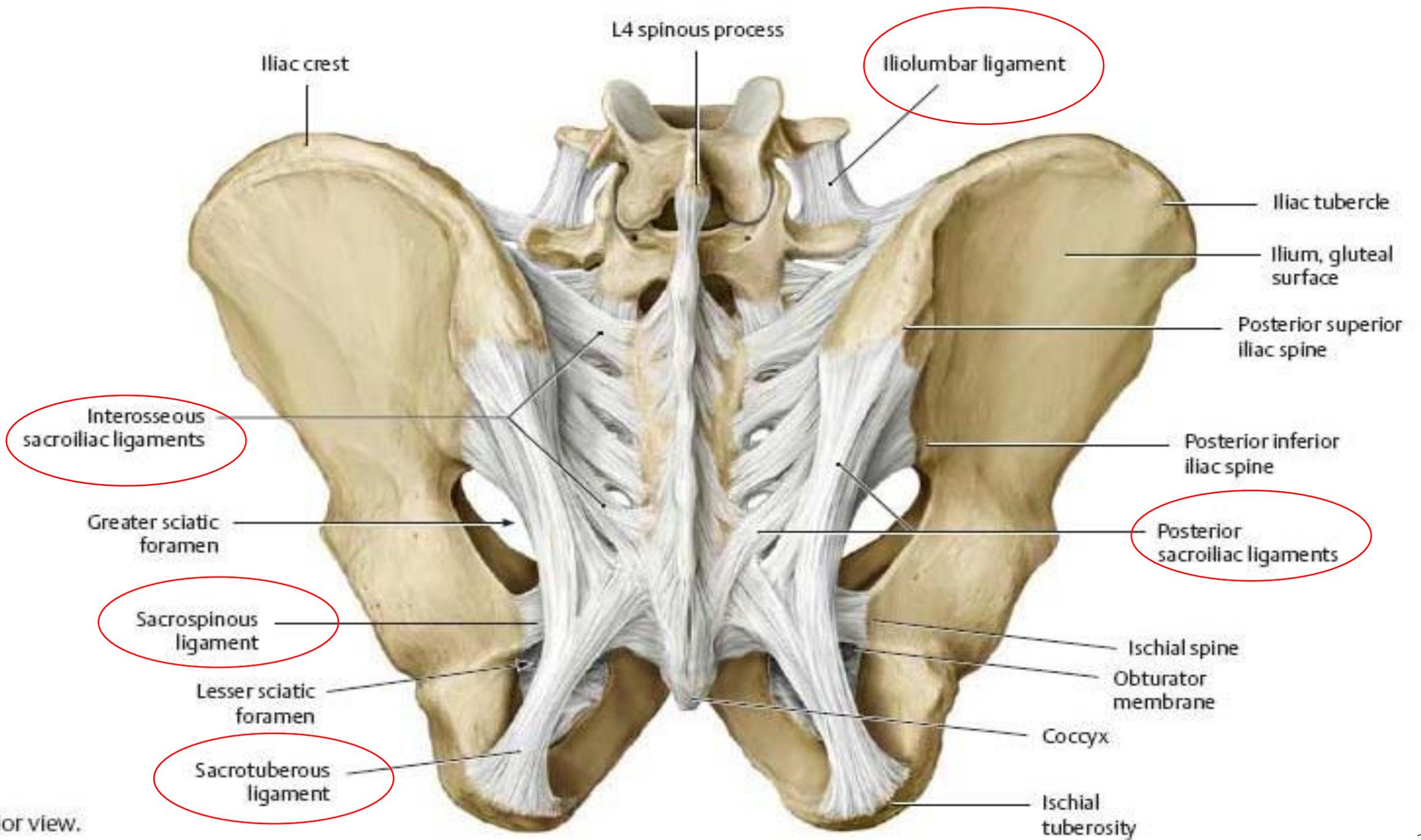
- The ventral sacroiliac ligament : it lies anteroinferior to the joint
- The interosseous sacroiliac ligaments : (the strongest ligament), lies posterior to the joint.
- The dorsal sacroiliac ligament: lies dorsal to the interosseous ligament.

#### **Movements and Functions:**

- ✓ It transmits the body weight from lumbar spine to the hip bones.
- ✓ It allows slight rotation around a horizontal axis when the trunk is flexed on the hip joints.







B Posterior view.

## Vertebropelvic ligaments:

- 1) **Iliolumbar ligament** : extends from the tip of the [L5 transverse process](#) to iliac crest.
- 2) **Lumbosacral ligament** : extends from the inferior aspect of [L5 transverse process](#) to the lateral part of the ala of sacrum.
- 3) **Sacrospinous ligament ;**  
It extends between lower part of the sacrum and coccyx and ischial tuberosity.
- 4) **Sacrospinous ligament:** Extends from ischial spine to the lateral margins of sacrum and coccyx.

### Functions of the Vertebropelvic Ligaments:

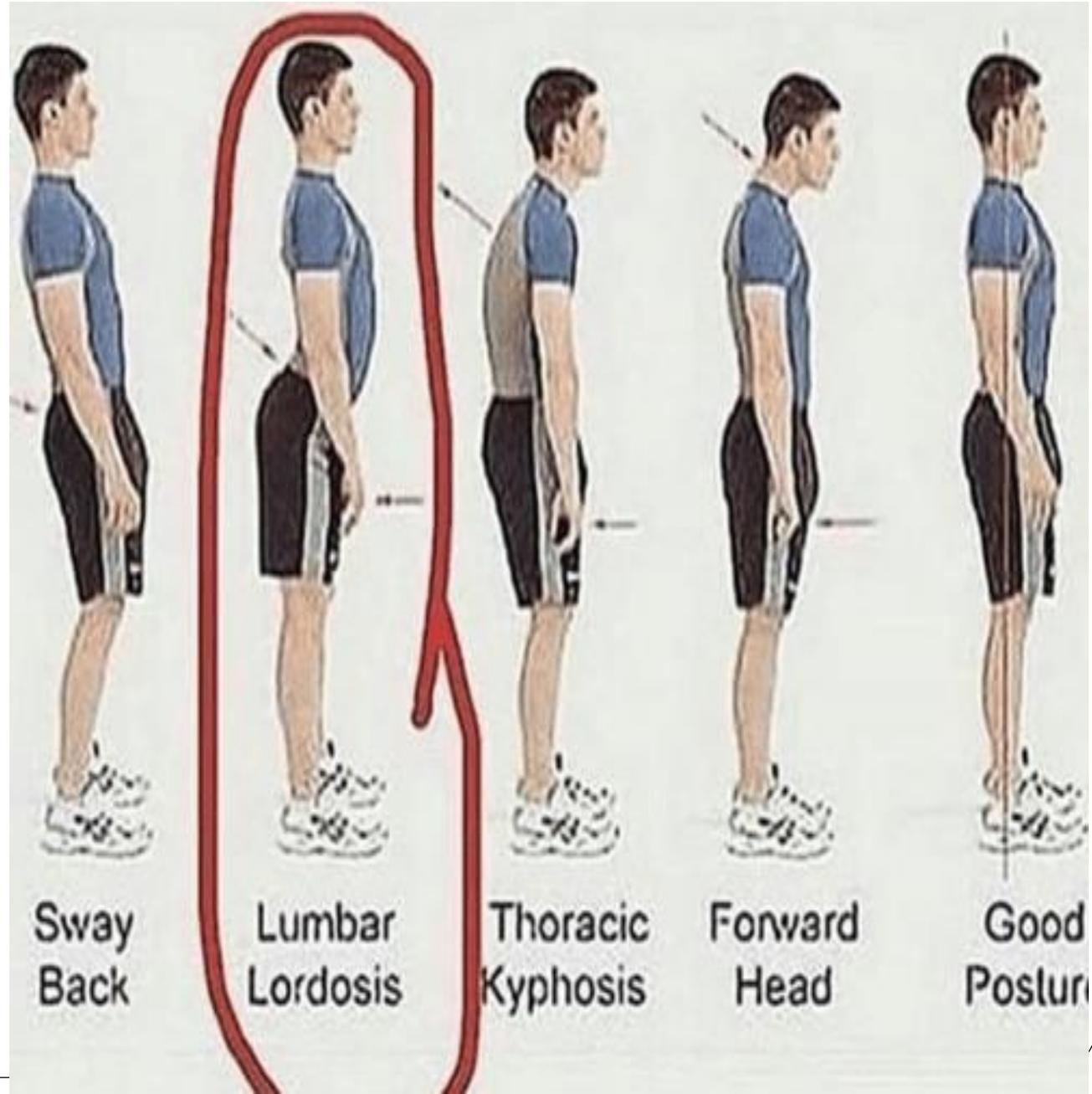
- ❖ The **iliolumbar and lumbosacral ligaments** prevent the anteroinferior displacement of L5 vertebra under effect of body weight.
- ❖ The **sacrospinous and sacrotuberous ligaments** convert the greater and lesser sciatic notches into foramina.  
They also prevent the upward tilting of the lower part of sacrum under effect of body weight

## **Relaxation of Pelvic Ligaments and Increased Joint Mobility in Late Pregnancy**

- Increased levels of sex hormones and the presence of the hormone relaxin cause the pelvic ligaments to relax during the last half of pregnancy.
- This allowing increased movement at the pelvic joints.
- Relaxation of the sacro-iliac joints and pubic symphysis permits as much as a 10–15% increase in diameters (mostly transverse, including the interspinous distance )
- The coccyx is also able to move posteriorly.
- This is facilitating passage of the fetus through the pelvic canal.

### **("swayback") posture**

- ❖ Relaxation of sacro-iliac ligaments permitting greater rotation of the pelvis and contributing to this posture



# **3- Muscles Of the Pelvis**

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# Muscles Of Pelvis

```
graph TD; A[Muscles Of Pelvis] --> B[Two Muscles in the pelvic wall]; A --> C[Two Muscles in the pelvic floor]; B --> B1[1-Piriformis]; B --> B2[2-Obturator internus]; C --> C1[1-Levator ani]; C --> C2[2-Coccygeus];
```

## Two Muscles in the pelvic wall

1-Piriformis

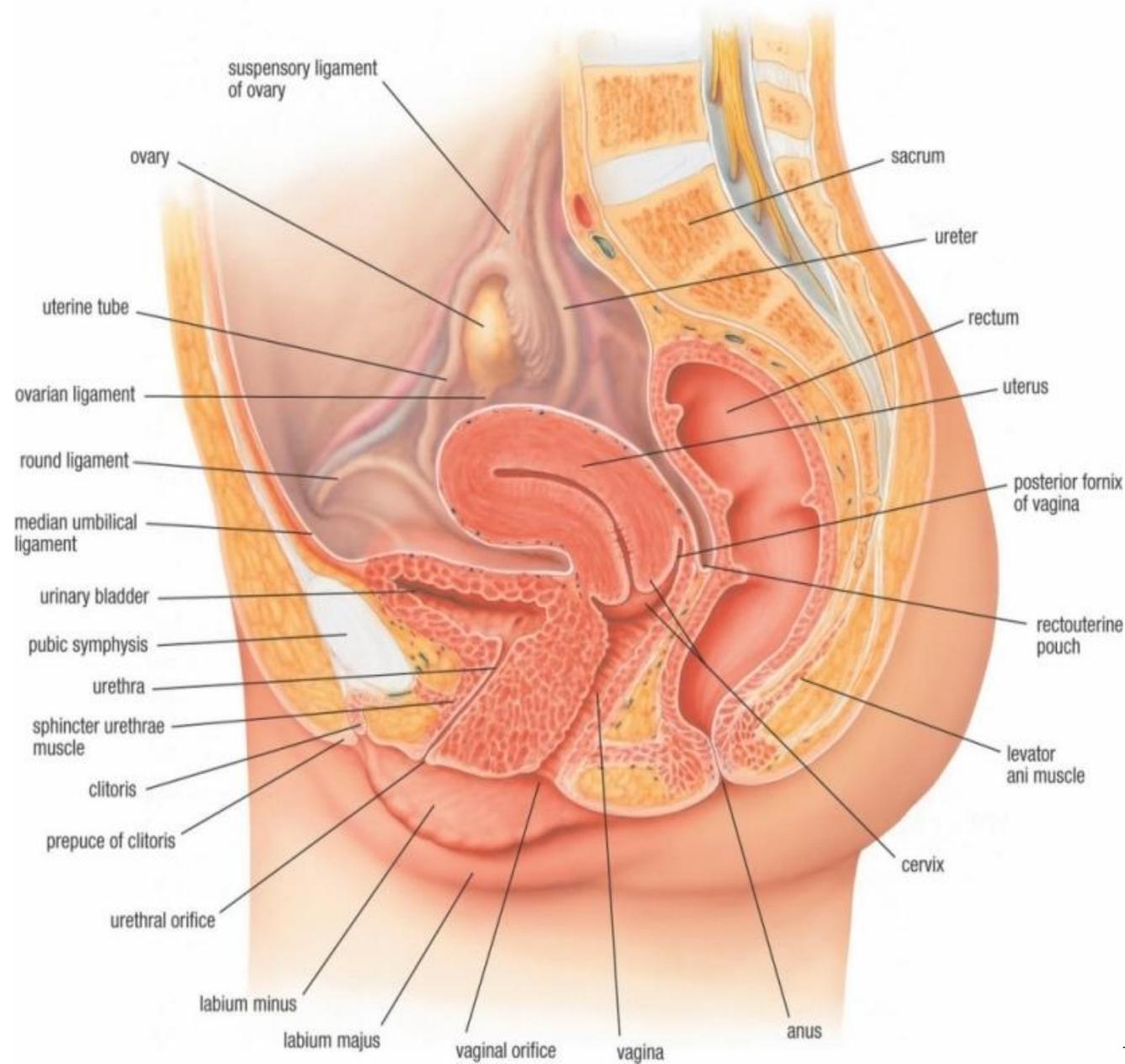
2-Obturator internus

## Two Muscles in the pelvic floor

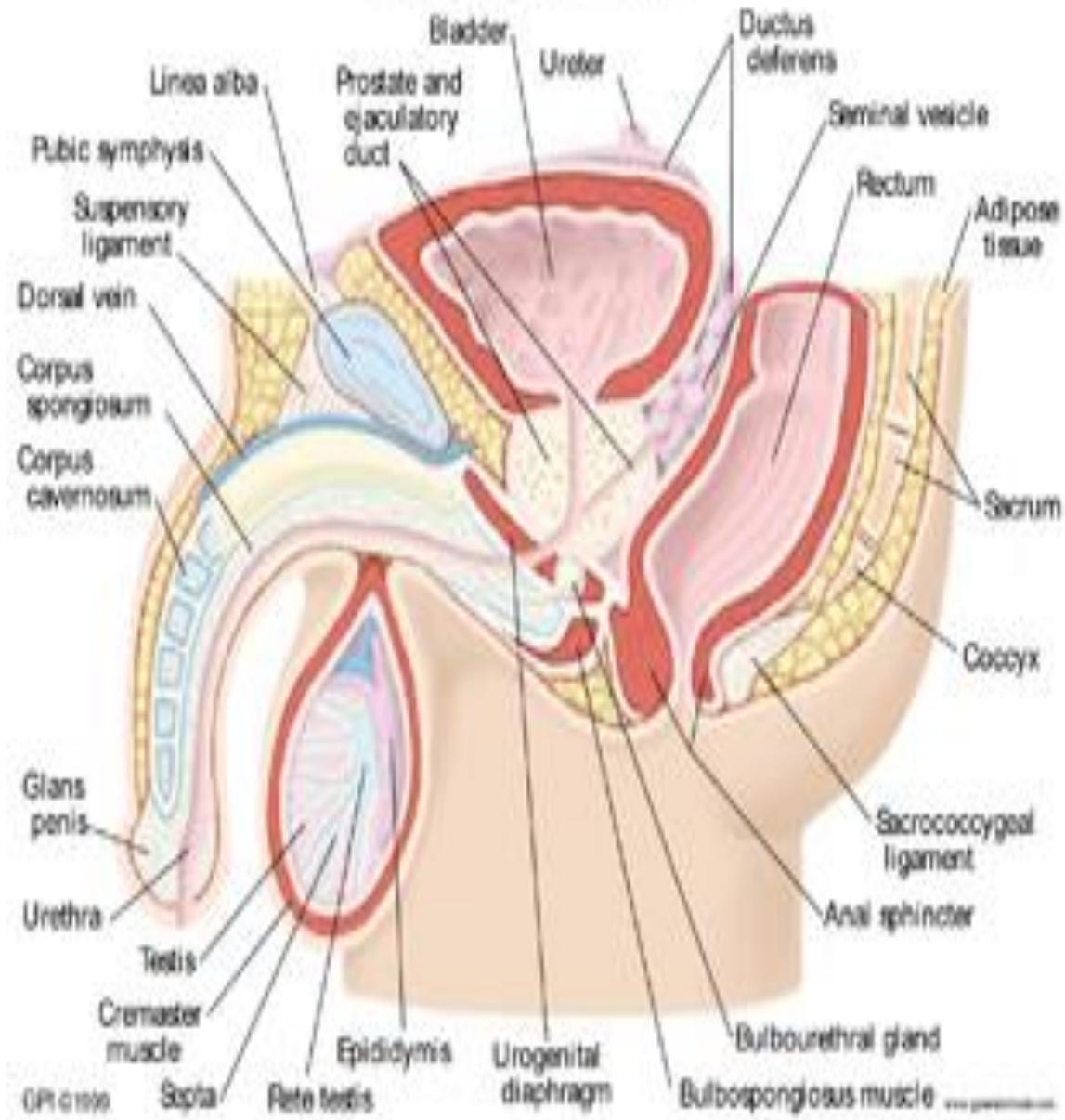
1-Levator ani

2-Coccygeus

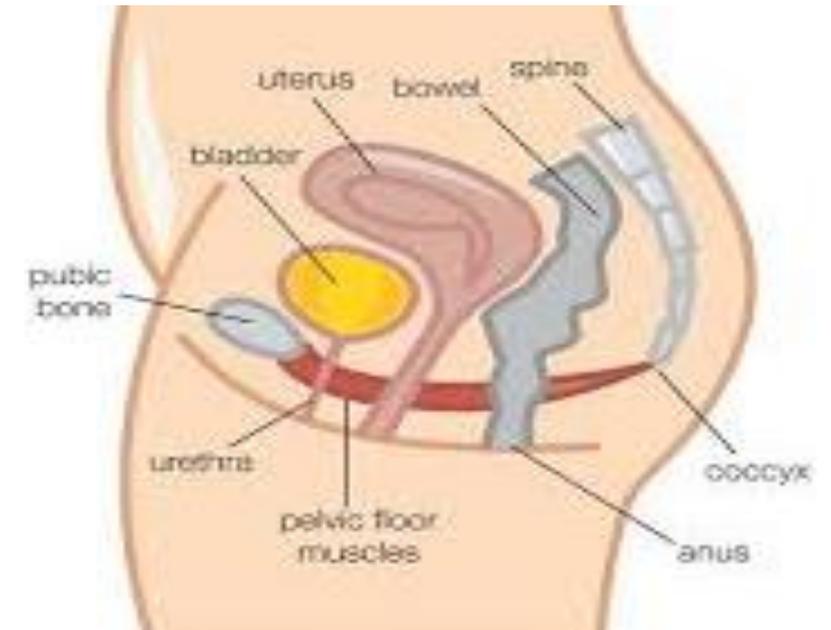
# FEMALE UROGENITAL SYSTEM (MIDSAGITTAL VIEW)



# MALE PELVIS



- Levator ani and coccygeus (of both sides) form the pelvic diaphragm which forms the pelvic floor
- The part of the pelvis **above** levator ani is the **pelvic cavity**.
- The part of the pelvis **below** levator ani is the **perineum**.
- The part of **obturator internus** **above** origin of levator ani is in the side wall of the pelvic cavity.
- The part of **obturator internus** **below** origin of levator is in the side wall of ischiorectal fossa of the perineum.
- Anterior borders of the 2 Levator ani muscles are separated by a gap which is filled by puboprostatic ligaments (in male) or pubovesical ligaments (in female).



## Pelvic Fascia

**Piriformis fascia:** is a part of parietal pelvic fascia

Anteriorly related to it internal iliac vessels

Posteriorly related to it sacral nerves

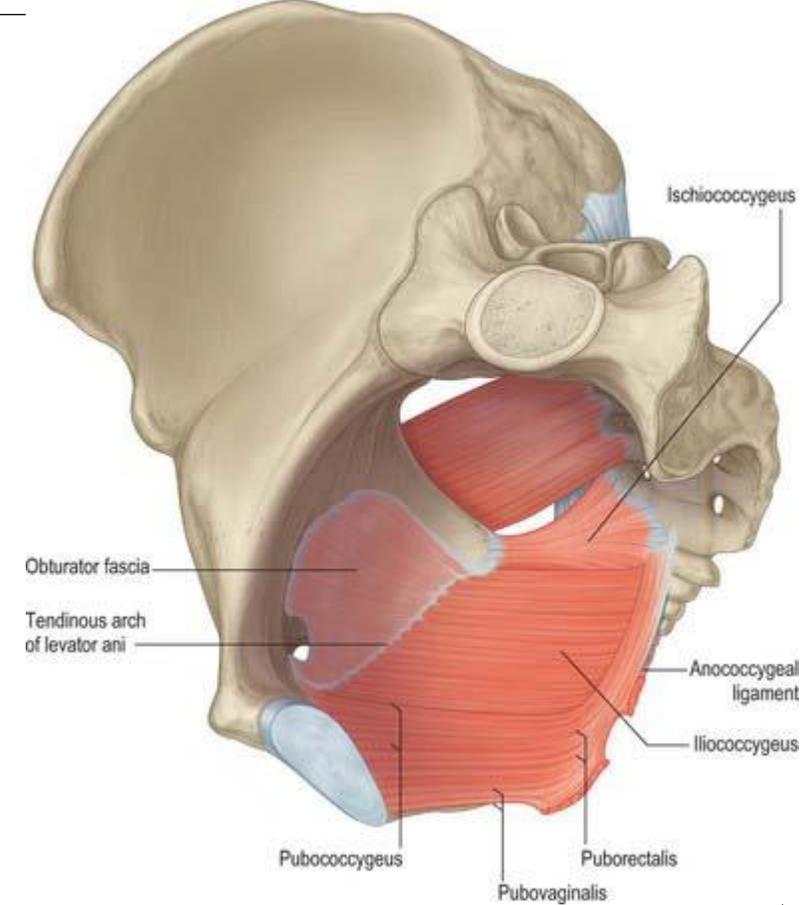
## Obturator fascia

❑ It covers the pelvic surface of obturator internus.

❑ It fuses with the periosteum at the margins of the muscle except at **obturator groove** where it passes below obturator nerves and vessels.

❑ Between the lower border of pubic body and ischial spine, the fascia thickens to form tendinous arch **(white line)** which gives origin for levator ani muscle.

❑ Below level of levator ani, the fascia lies in the lateral wall of ischiorectal and form the **pudendal canal** around the internal pudendal A. and pudendal N.



# Levator ani

## Origin :

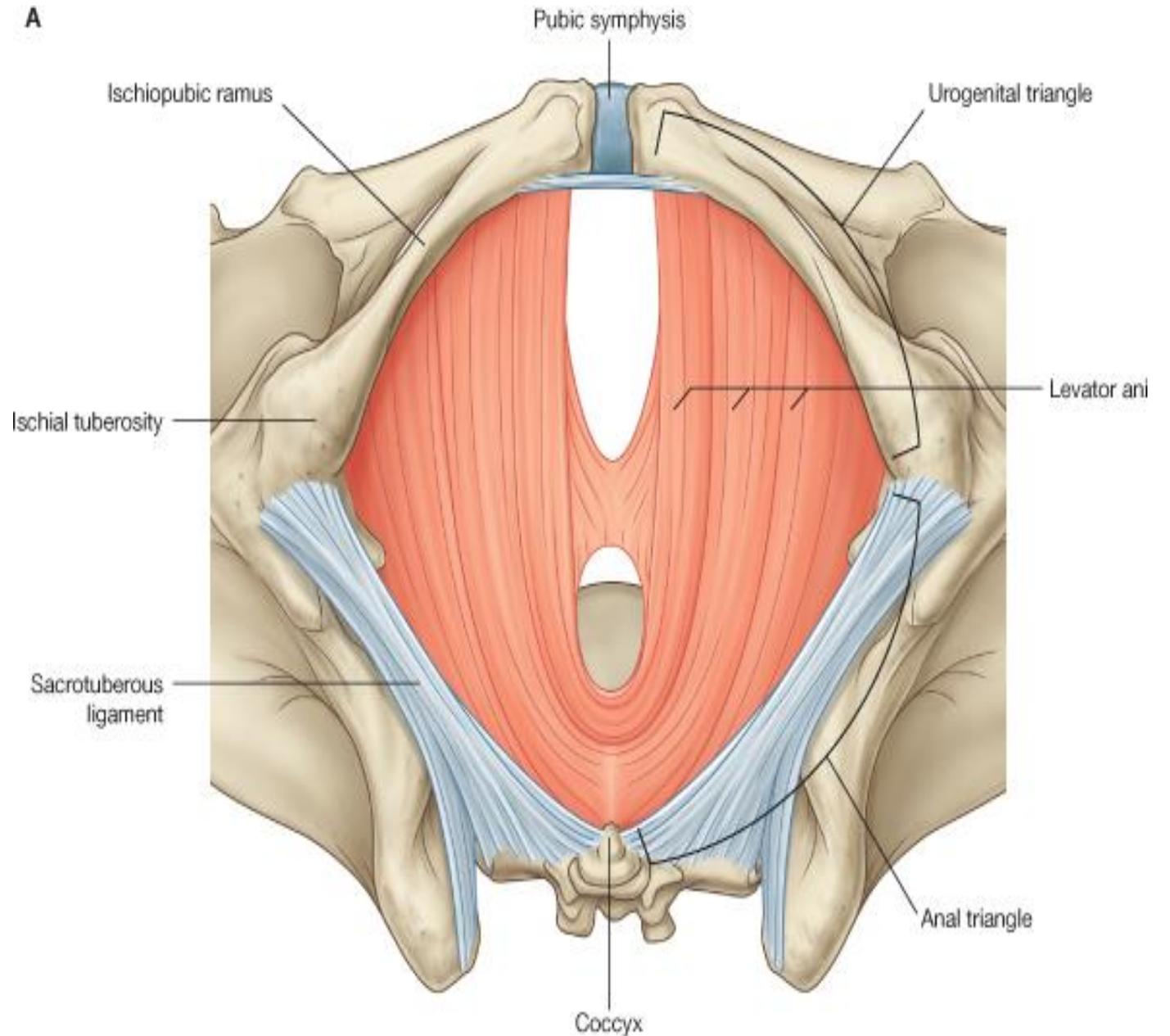
- Lower part of back Body of pubis
- White line of Obturator fascia
- Pelvis surface of Ischial spine

## Nerve Supply :

- On its pelvic surface : fourth sacral N. (sacral plexus)
- On its perineal surface : perineal branch (of pudendal N.)

## Action :

- 1-Supports and maintains the pelvic viscera in position.
- 2-It resist the rise in intra pelvic pressure during the straining
- 3-Sphincter action on the anorectal junction, and vagina.



# Levator Ani Muscle

```
graph TD; A[Levator Ani Muscle] --> B[Pubococcygeus]; A --> C[Iliococcygeus]; B --> D[Anterior fibres]; B --> E[Intermediate fibres]; B --> F[Poserior fibres]; D --- D1[form Levator prostate in males and Sphincter vaginae in females]; E --- E1[Puborectalis]; F --- F1[pubococcygeus proper];
```

## Pubococcygeus

Arises from body of pubis and anterior 1/2 of the white line

## Iliococcygeus

Arises posterior 1/2 of the white line and ischial spine

### Anterior fibres

form Levator prostate in males and Sphincter vaginae in females

### Intermediate fibres

Puborectalis

### Poserior fibres

pubococcygeus proper

## 1- Levator prostatae or sphincter vaginae ;

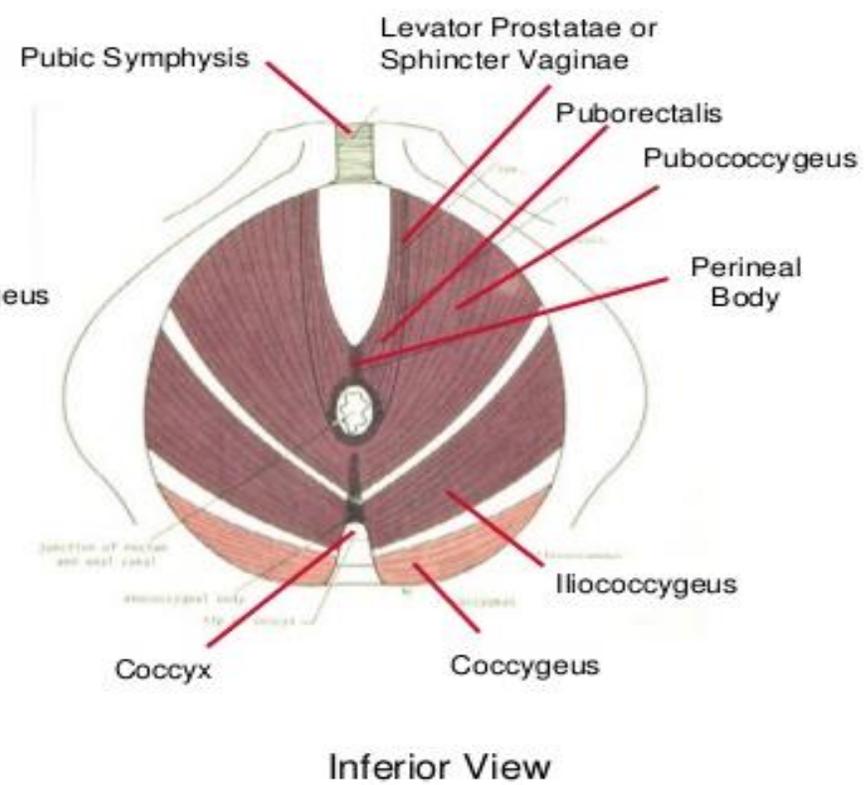
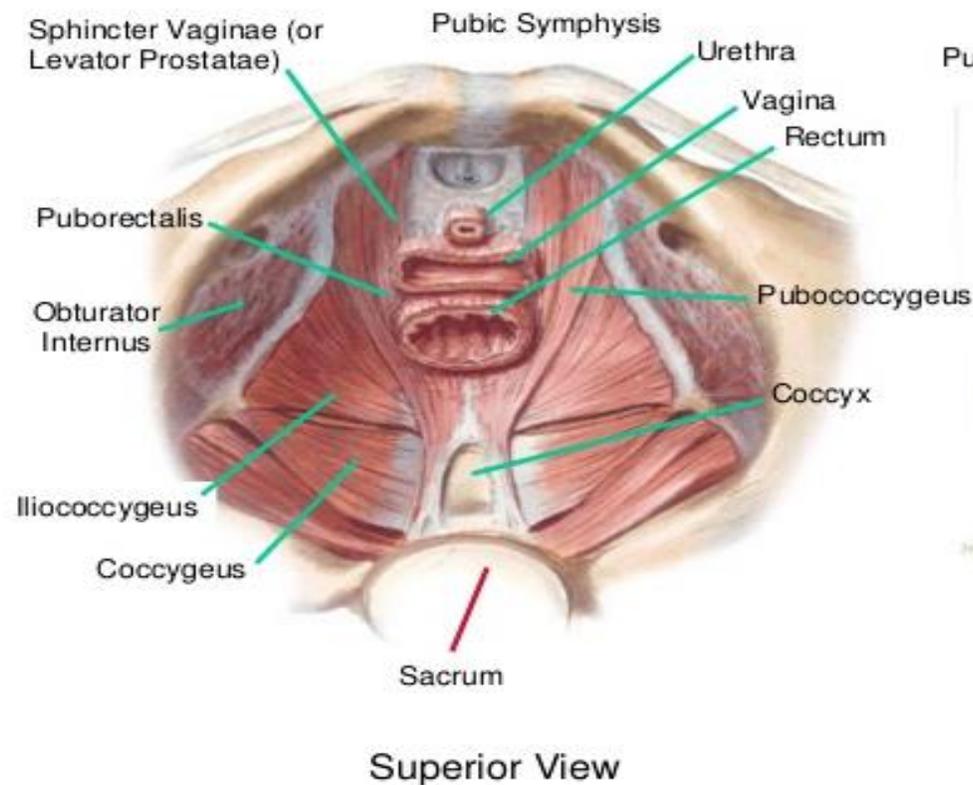
It pass horizontally and backwards around the sides of prostate in male or sides of vagina in female to insert into the **perineal body**

It supports the prostate , constrict the vagina and stabilize the perineal body.

**Perineal Body** : is a mass of fibrous tissue, in front of the anal canal.

❖ **In the male** : it lies between anal canal and bulb of the penis.

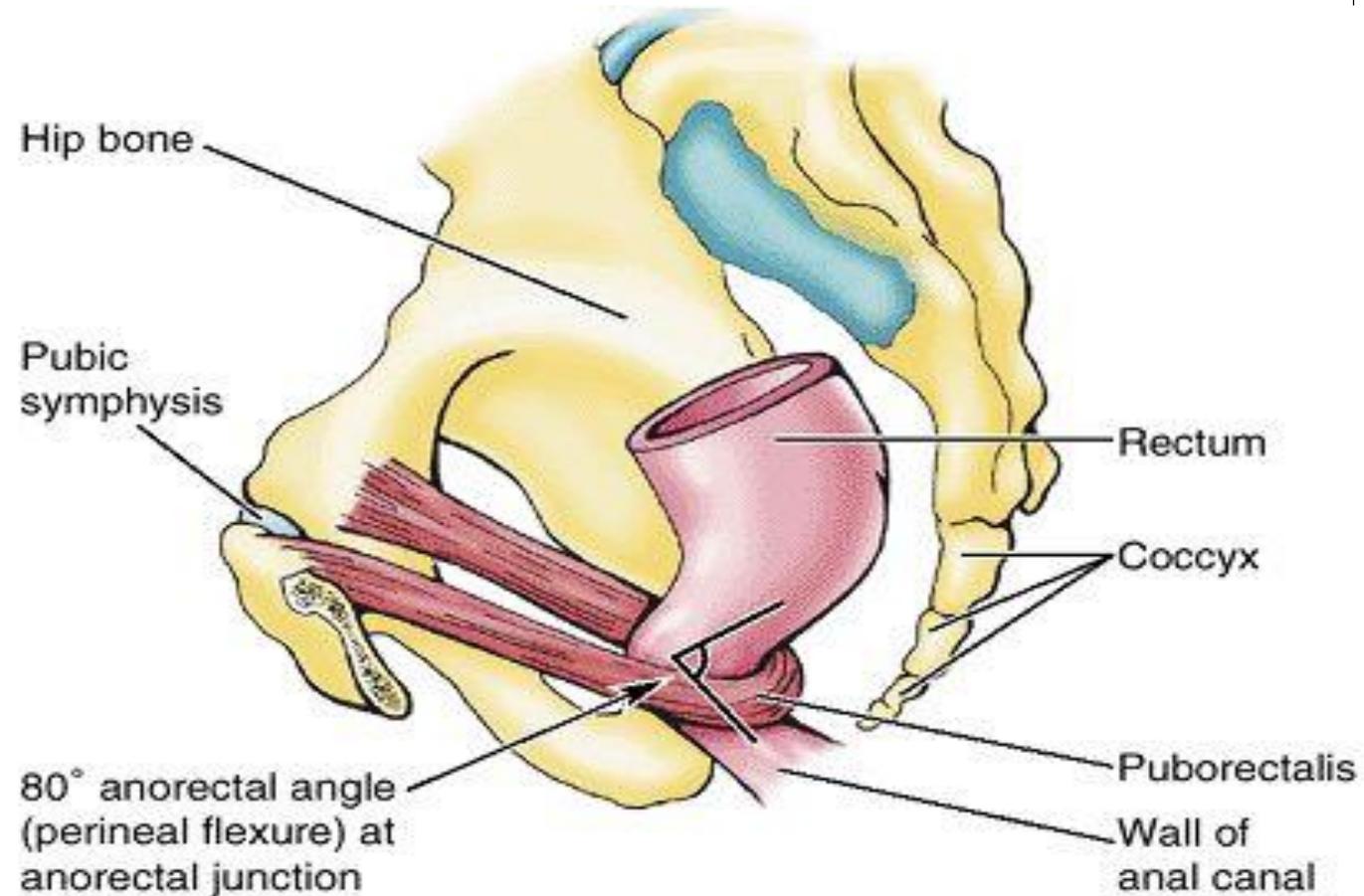
❖ **In the female** : it lies between anal canal and lower part of vagina.



## 2. The puborectalis

It passes inferomedially to become continuous with the opposite ones behind the anorectal junction, so form a U-shaped sling.

It is inserted into Anococcygeal body

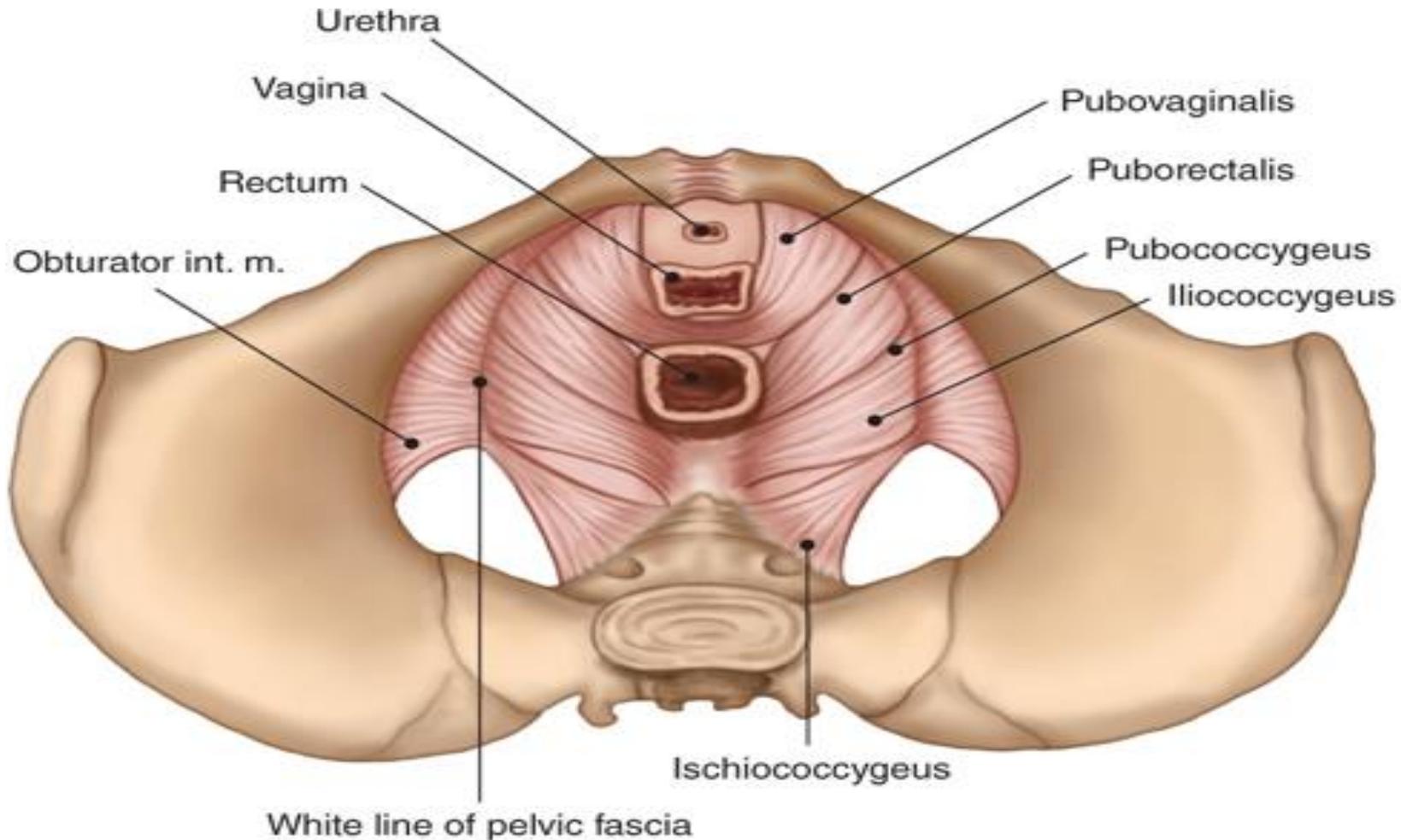


**Medial view from left**

### 3-Pubococcygeus proper

It pass medially to be attached to side of coccyx and anococcygeal Body

**Anococcygeal body** :A small fibrous mass between the tip of the coccyx and the anal canal.



Source: G. D. Posner, Jessica DY, A. Black, G. D. Jones: Human Labor & Birth, 6th Edition

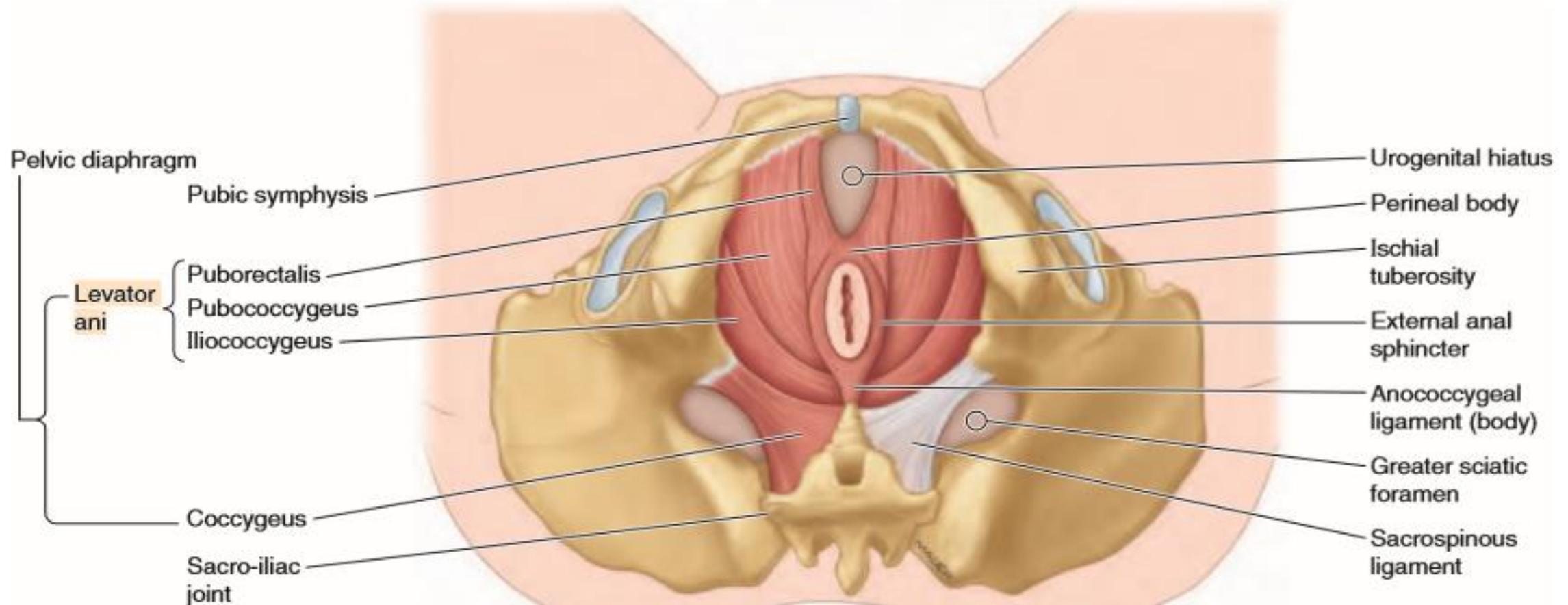
[www.obgyn.mhmedical.com](http://www.obgyn.mhmedical.com)

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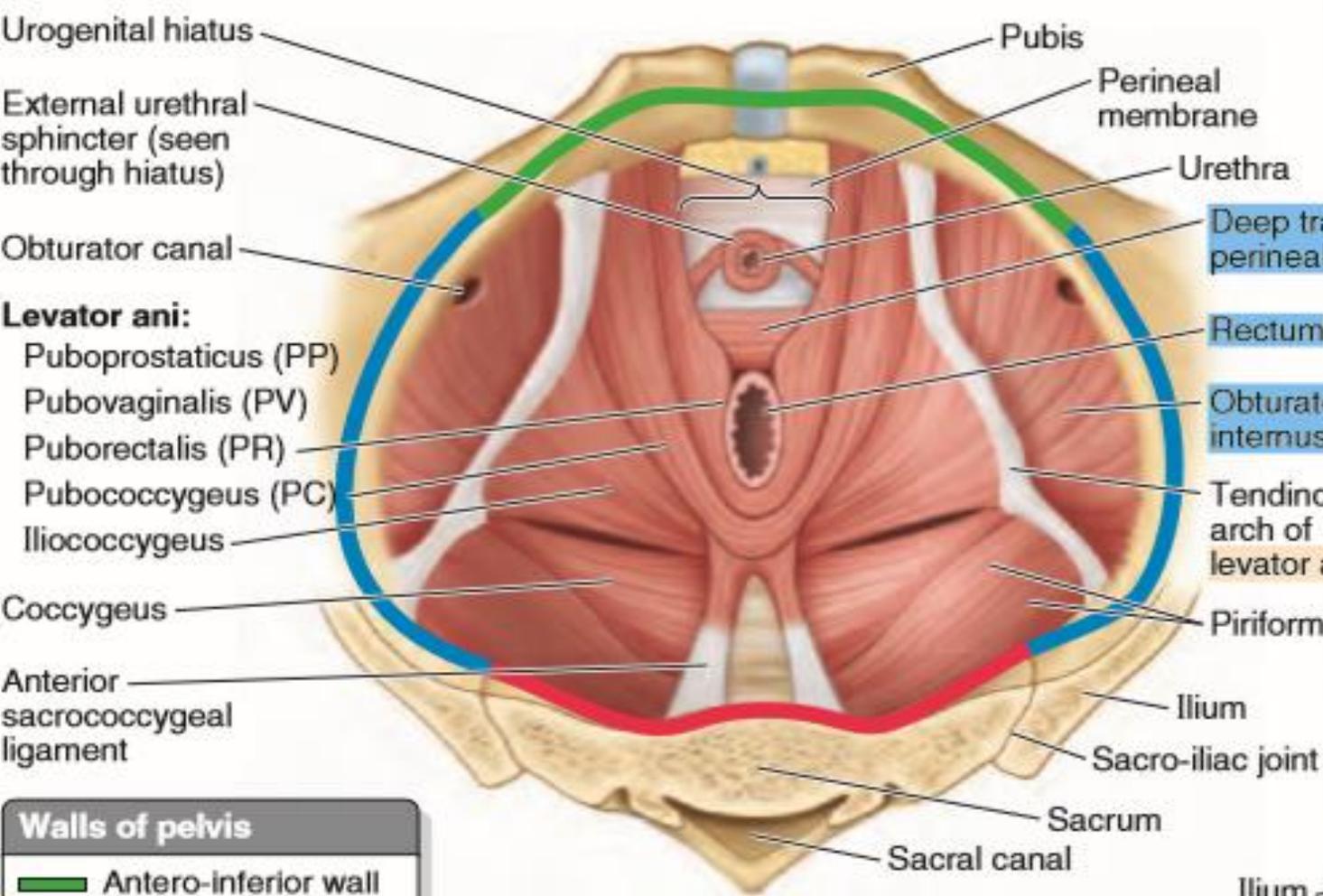
## Iliococcygeus :

It arises from posterior 1/2 of the white line and ischial spine.

Its fibres pass medially inferior to the pubococcygeus proper and has the same insertion into side of coccyx and the anococcygeal raphe.

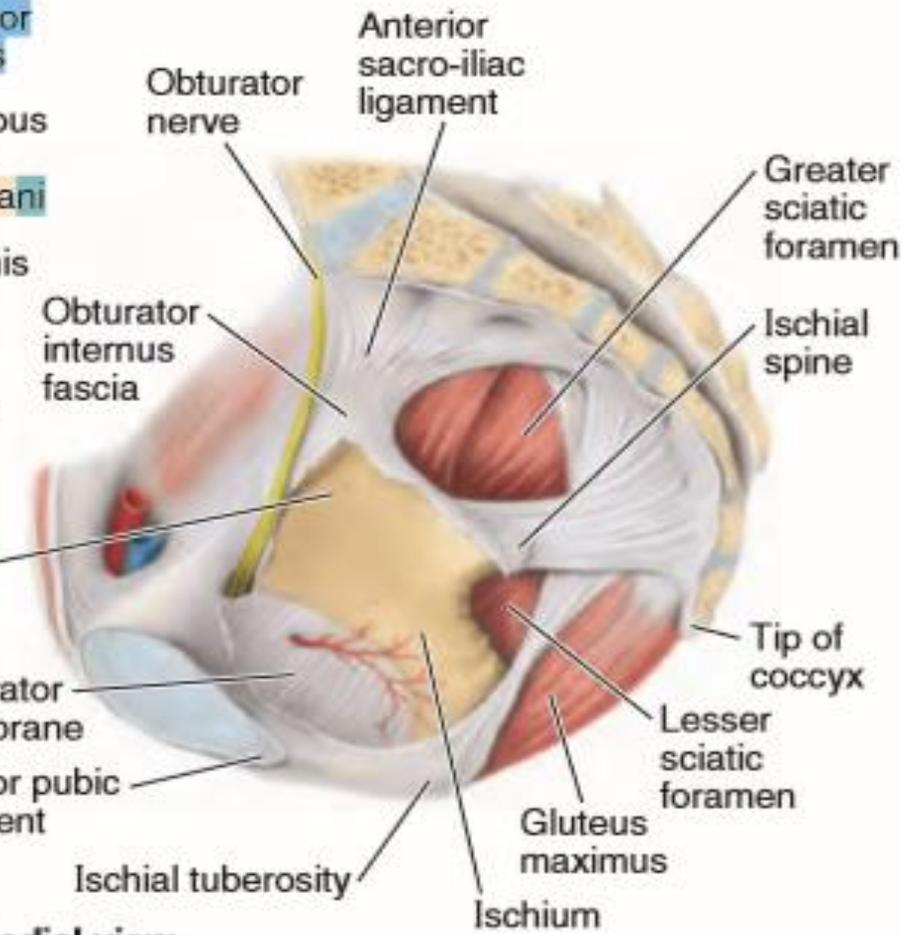


(A) Inferior view of perineum, lithotomy position

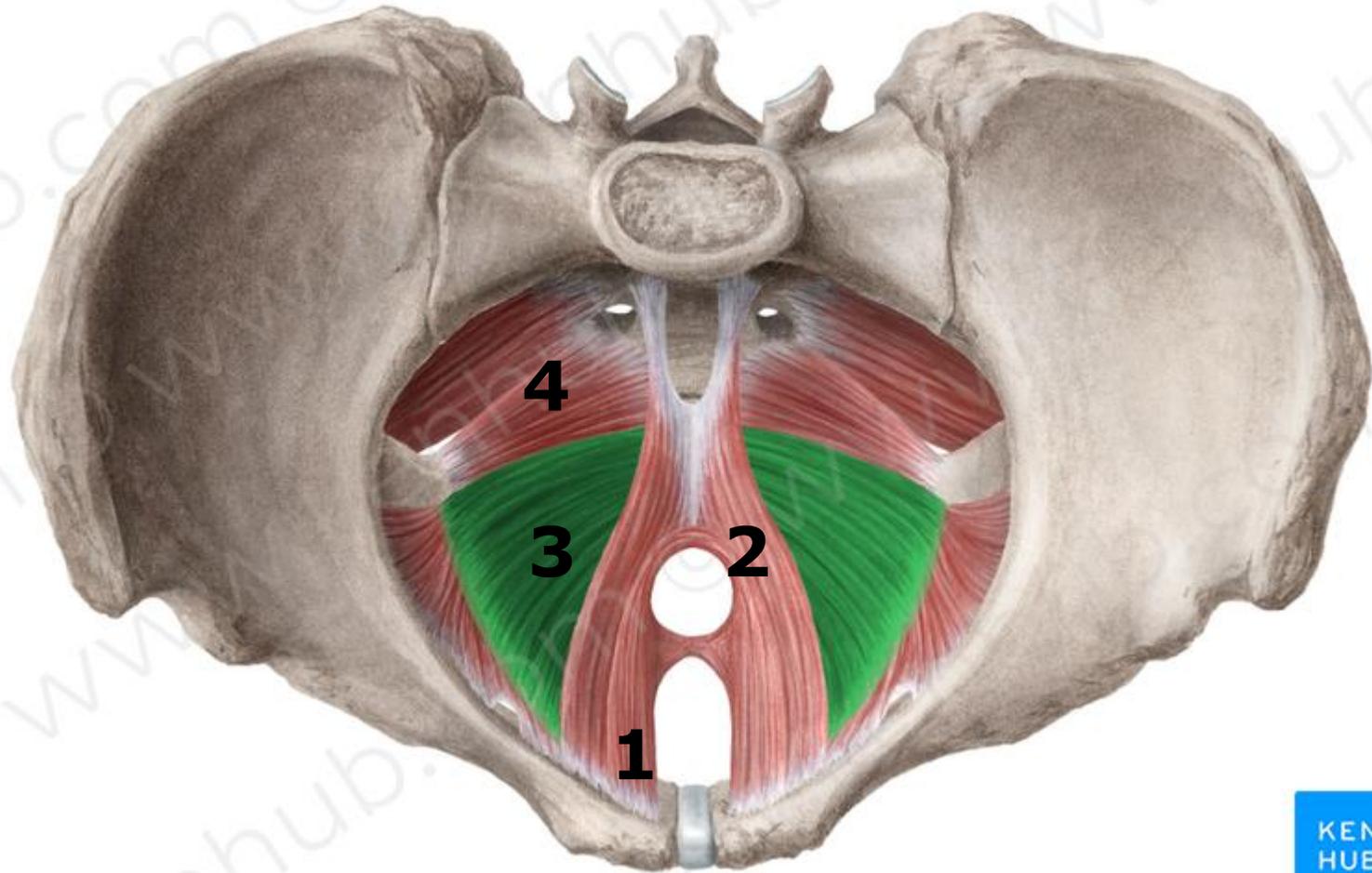


Walls of pelvis	
<span style="color: green;">█</span>	Antero-inferior wall
<span style="color: blue;">█</span>	Lateral wall
<span style="color: red;">█</span>	Posterosuperior wall
★	Pelvic diaphragm

(A) Superior view



(B) Medial view



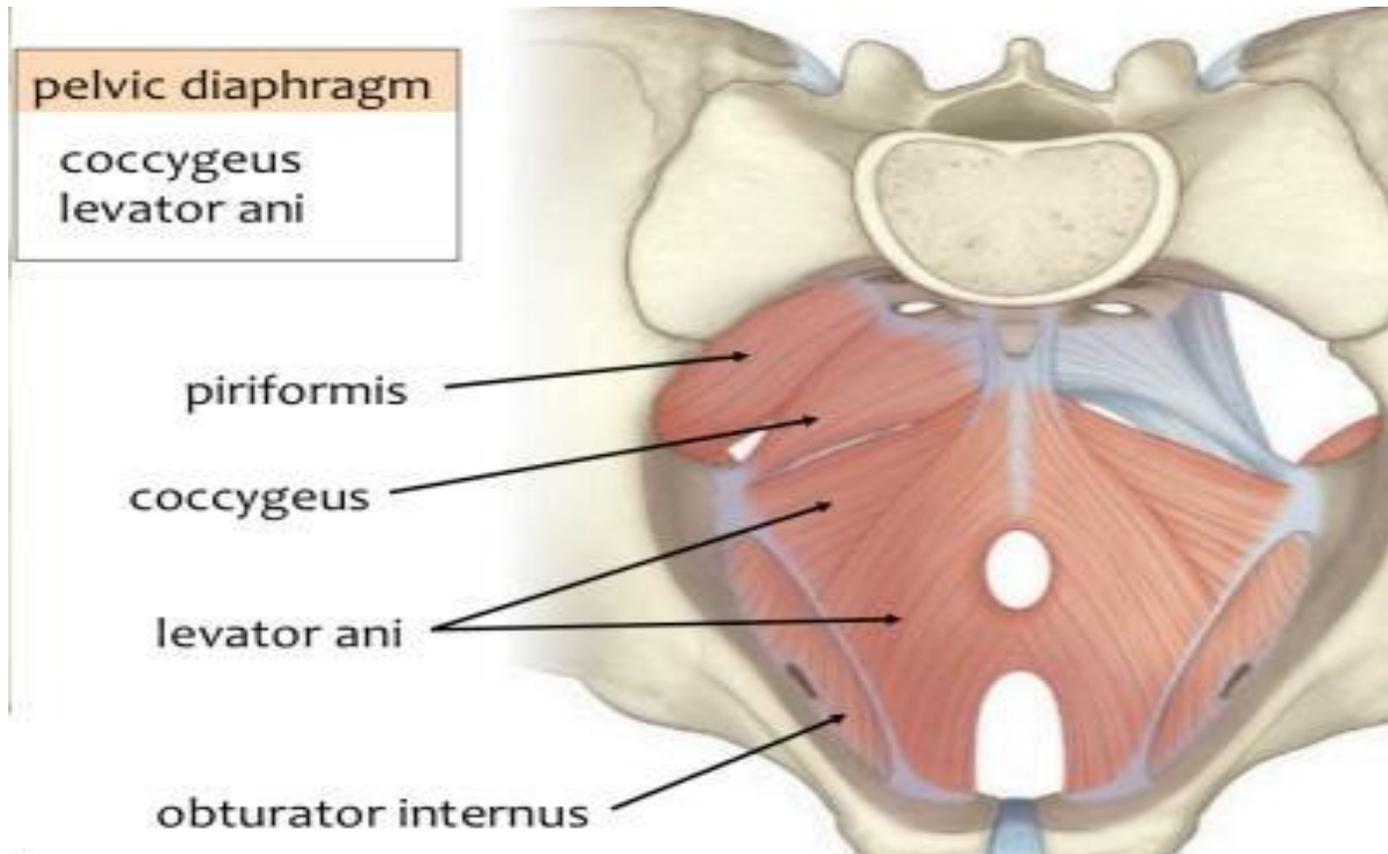
## Coccygeus Muscle

**Origin :** Ischial spine

**Insertion :** lower end of the sacrum and into the coccyx

**Nerve supply:** A branch of the 4th and 5th sacral nerves

**Action:** The two muscles assist the levatore ani in supporting the pelvic viscera.



# Functional Significance of the Pelvic Floor in the Female

It helps in head rotation during second stage of labour

## Injury to the pelvic floor

- Can happen during a difficult childbirth
- This leads to loss of support for the pelvic viscera leading to
  - Uterine and vaginal prolapse,
  - Herniation of the bladder (cystocele),
  - Alteration in the position of the bladder neck and urethra, leading to **stress incontinence** (patient dribbles urine whenever the intra-abdominal pressure is raised, as in coughing).
  - Prolapse of the rectum may also occur.



# **4- Arteries Of The Pelvis**

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This item includes;

- ❖ Internal iliac artery

- ❖ Other arteries:

- ✓ Superior rectal artery (continuation of the inferior mesenteric A)

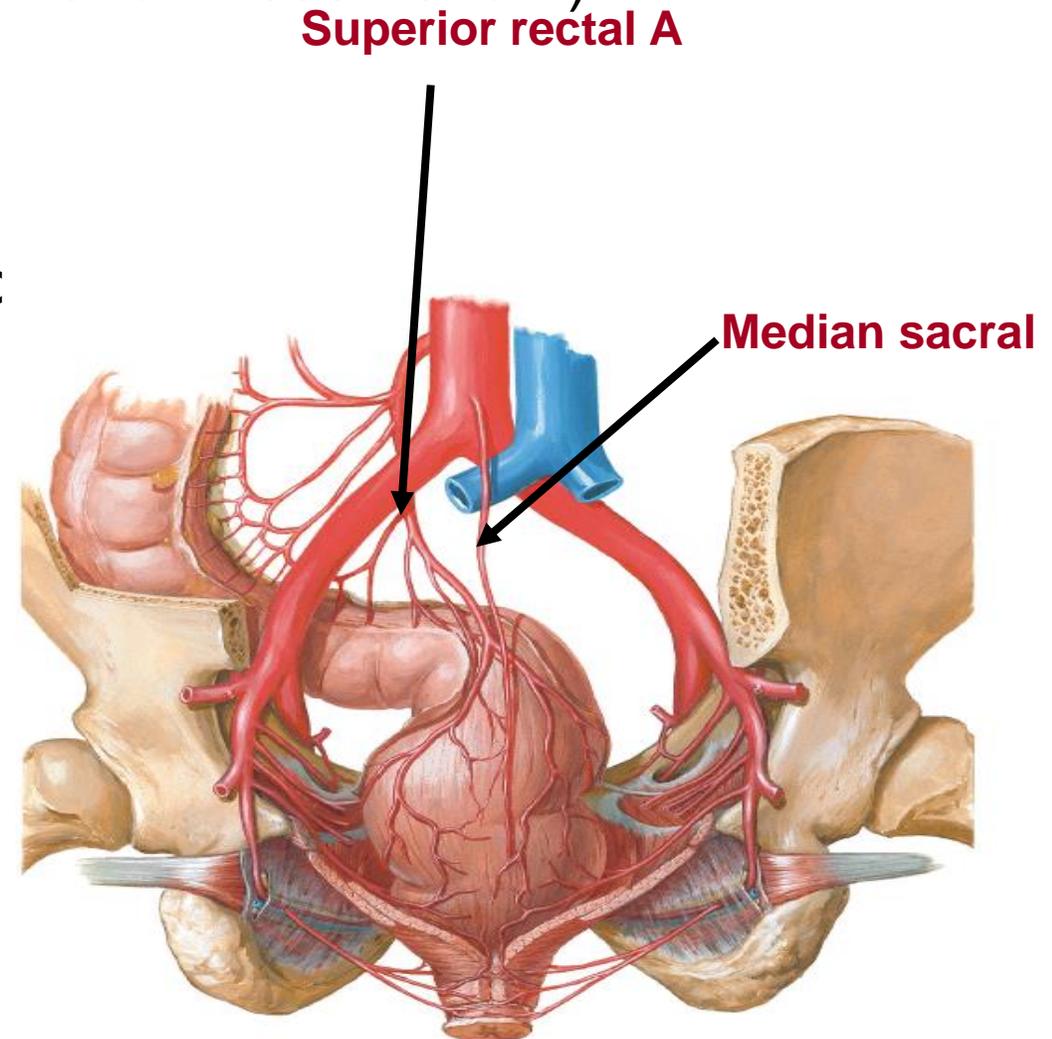
- ✓ Median sacral artery (from Aorta)

- ✓ The two ovarian arteries (from Aorta) .

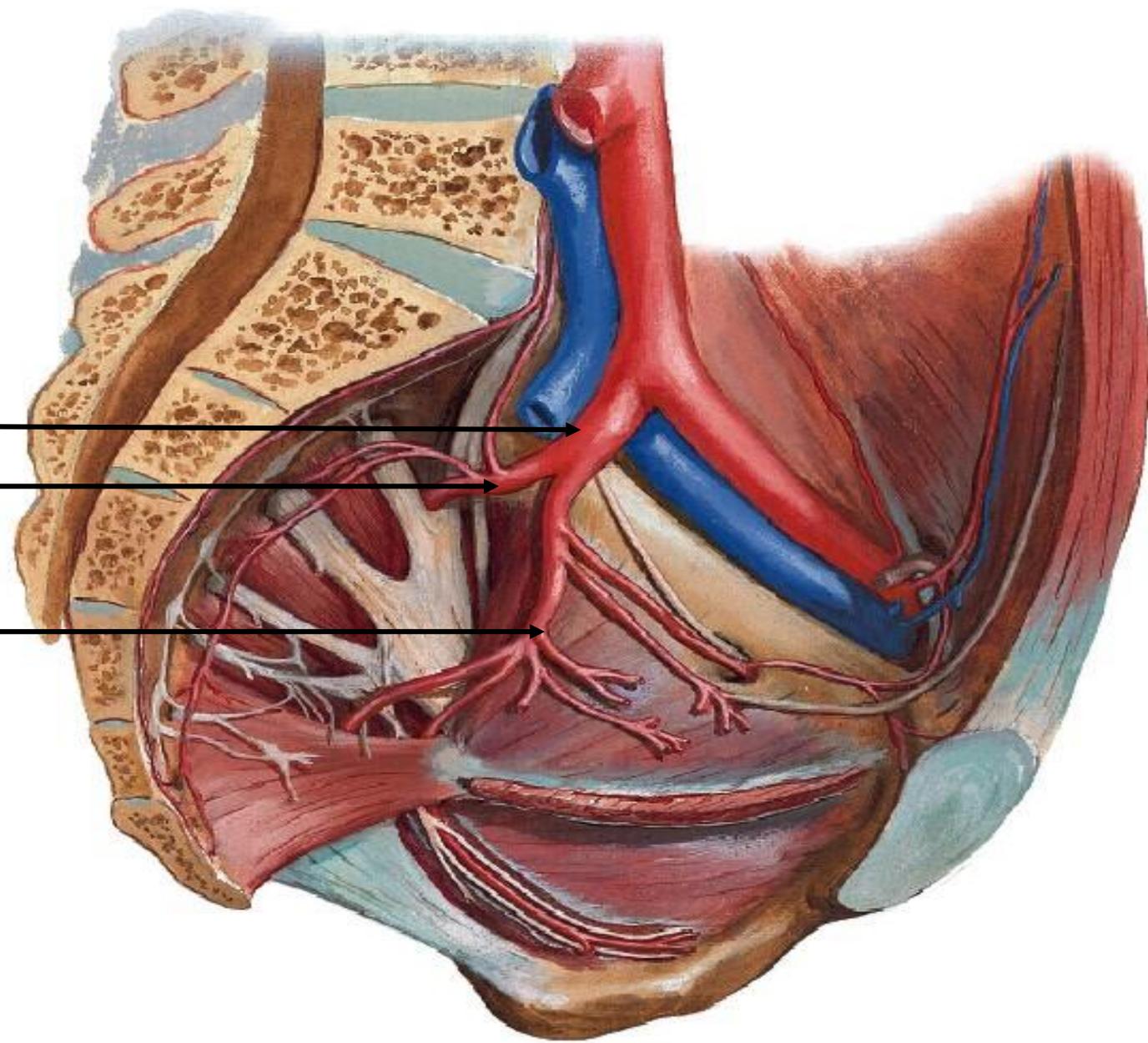
### **Internal Iliac Artery :**

**Beginning :** Opposite the lumbosacral disc

**Termination :** Upper margin of greater sciatic foramen by dividing into anterior and posterior divisions.

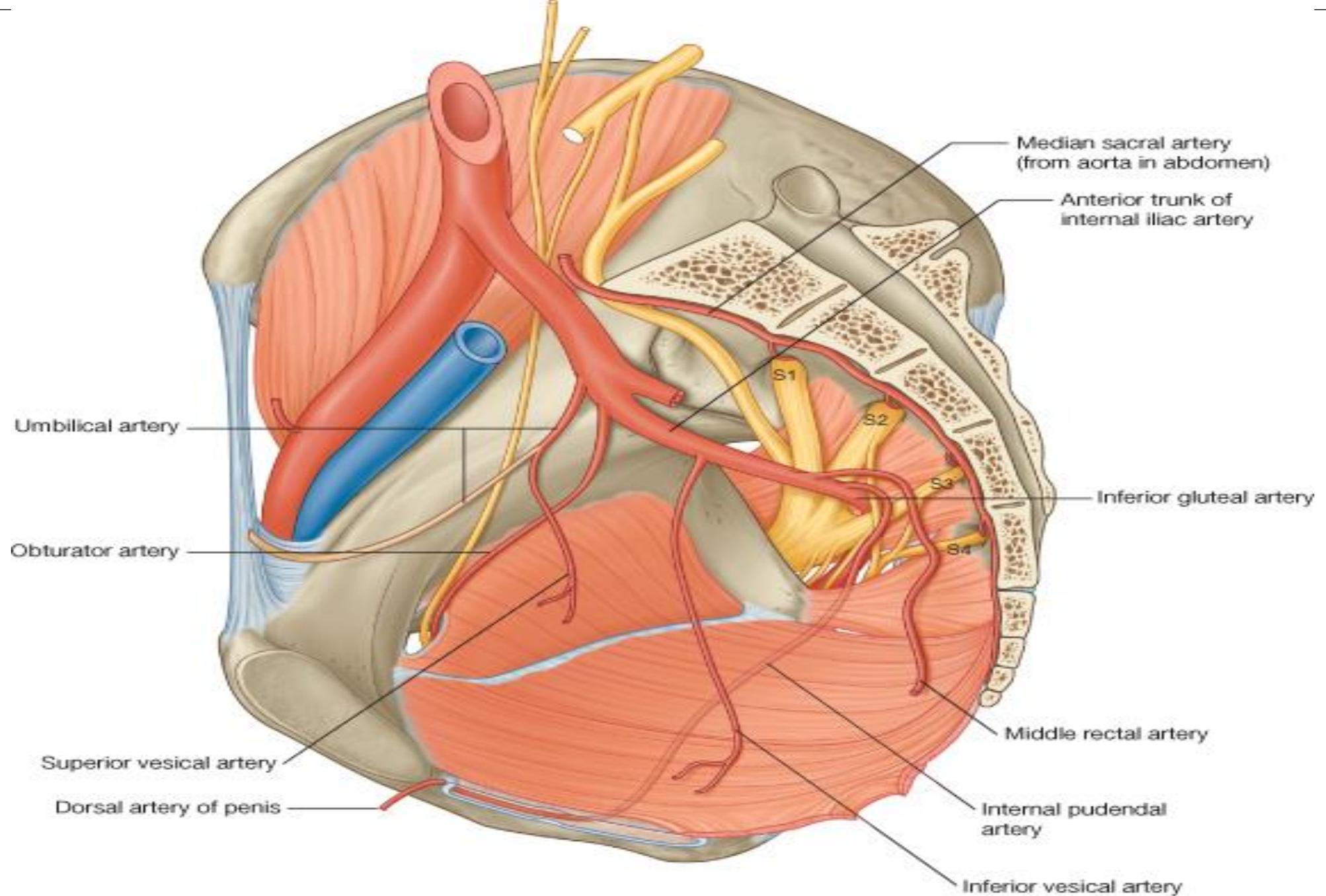


Internal Iliac artery  
Posterior Division  
Anterior Division



## Branches of Internal Iliac Artery

Anterior Visceral branches	Anterior Parietal branches	Posterior division parietal branches
Superior vesical A.	Obturator A.	Iliolumbar A.
Inferior vesical A. <i><u>(OR vaginal in female)</u></i>	Internal pudendal A	Two lateral sacral arteries
Middle rectal A.	Inferior gluteal A.	Superior gluteal A.
Uterine A. <i><u>(has NO corresponding branch in the male)</u></i>		



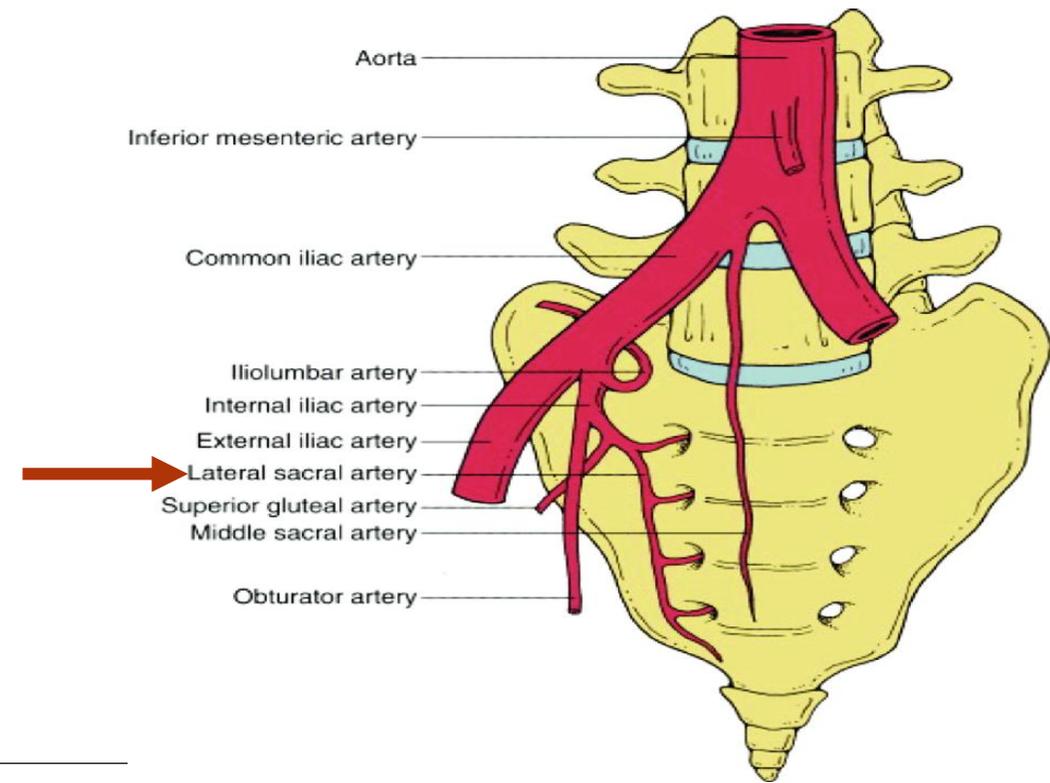
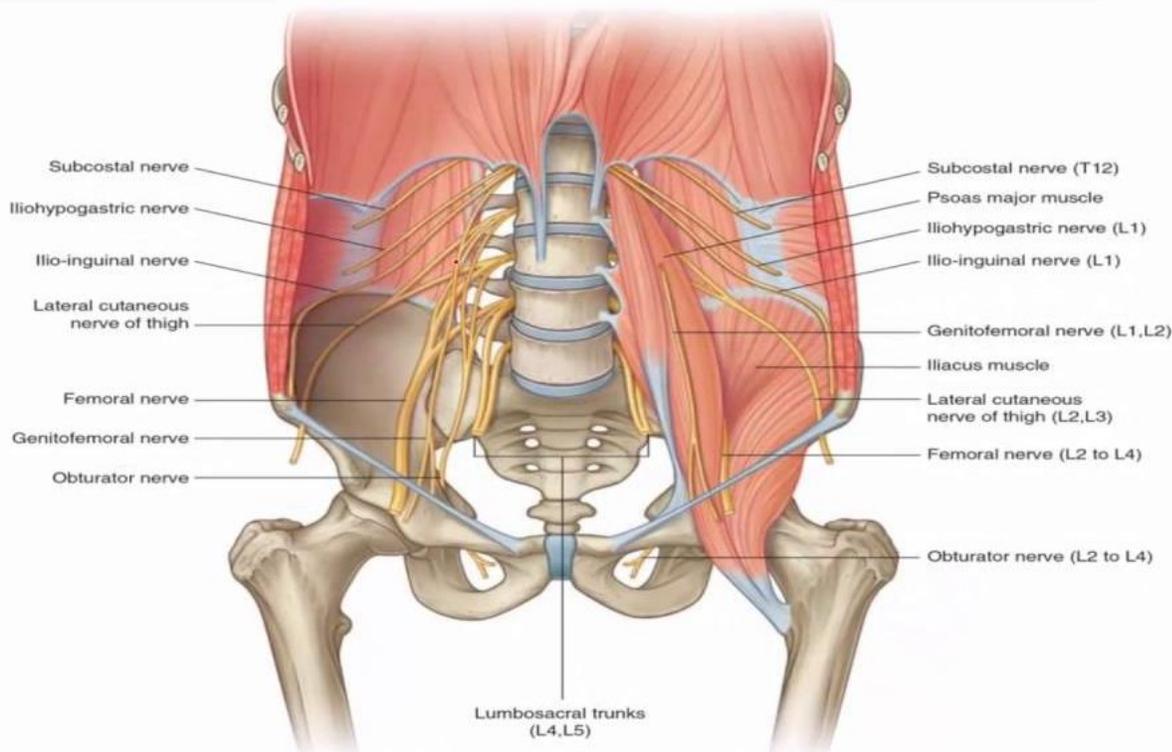
## Posterior division Branches

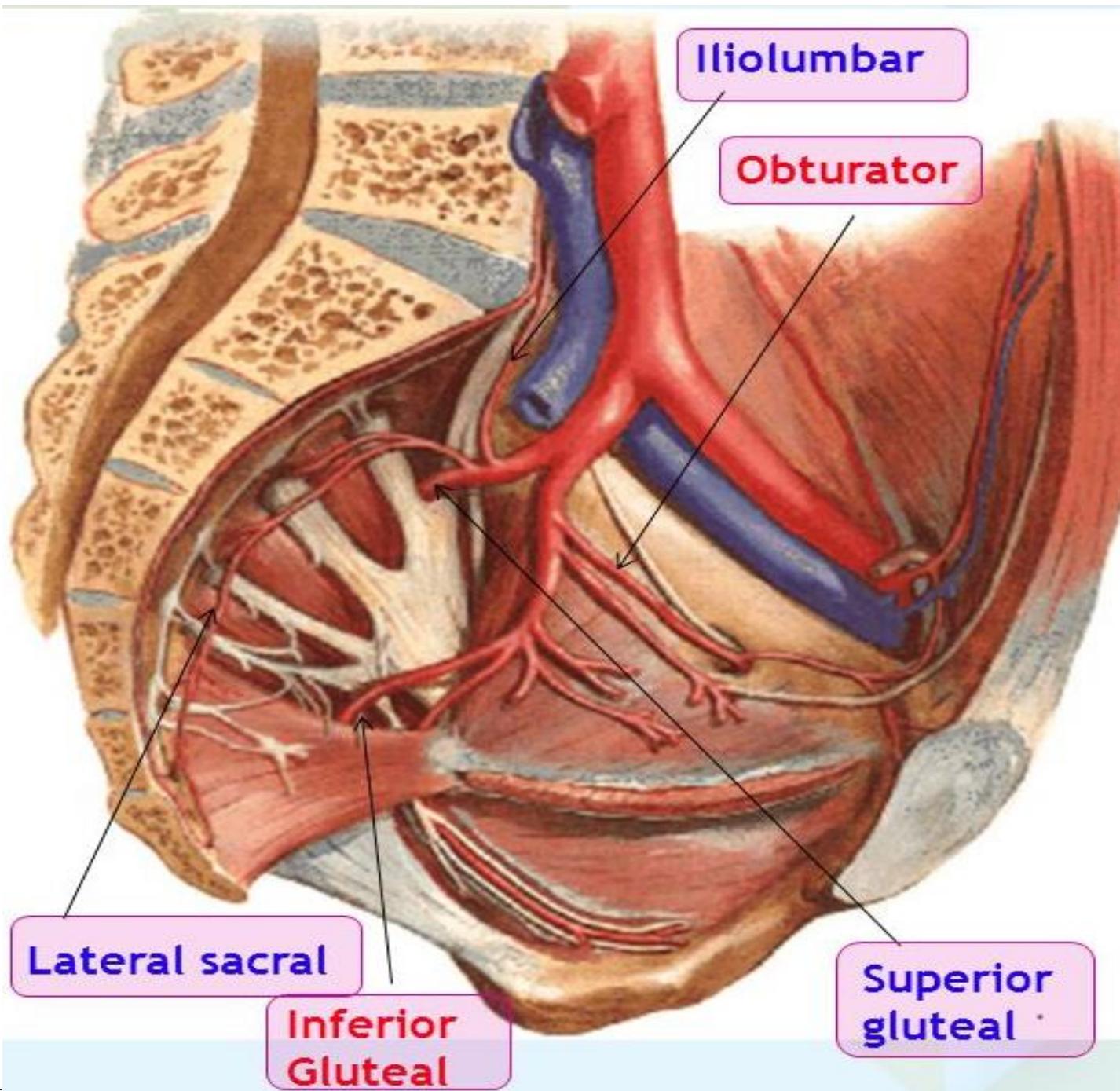
### 1) Iliolumbar A. (muscular)

- ❖ It divides into iliac and lumbar branches to supply iliacus, psoas major and quadratus lumborum muscles

### 2) Two Lateral Sacral Arteries (superior, inferior):

- These are the arteries of sacral canal.
- They enter the ventral sacral foramina to supply contents of sacral canal and then come through the dorsal sacral foramina to supply the overlying muscles.





## Anterior division Branches

### 1) Superior Vesical A. (Obliterated Umbilical A.):

- It was the umbilical artery in the fetus
- Its **proximal part is patent** (= superior vesical A.)
- It gives branches to the bladder, ureter and vas deference.
- Its **distal part is fibrosed** form medial umbilical ligament which form the medial the medial umbilical fold of peritoneum.

### 2) Inferior Vesical A. (Vaginal A. in the female):

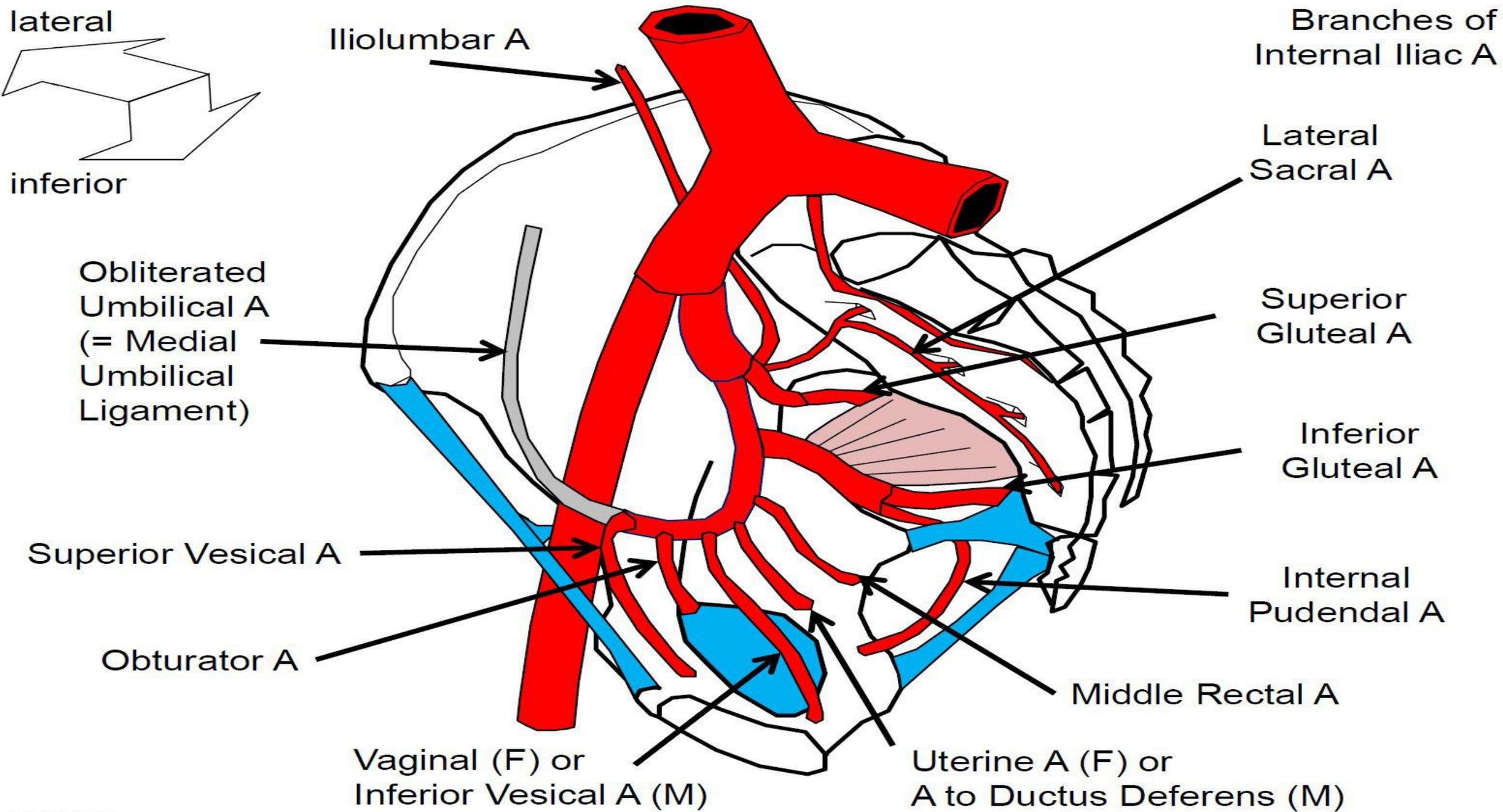
- It supplies base of the urinary bladder, seminal vesicle, prostate and **gives artery of the vas** which runs in the spermatic cord and anastomoses with the testicular artery.
- **In female**: The vaginal A. supplies the base of the bladder and gives vaginal branches which anastomose with vaginal branches from uterine A.

### **3) Middle Rectal Artery:**

- ❖ It supplies the musculosa of rectum, seminal vesicles and prostate in the male and vagina in the female.
- ❖ It anastomoses with other rectal arteries.

### **4) Uterine Artery:**

- ❖ It runs medially on the upper surface of the pelvic diaphragm.
- ❖ It ends by anastomosing with the ovarian A.
- ❖ It supplies pelvic part of ureter, vagina (azygos arteries), cervix and of uterus, medial part of the uterine tube.

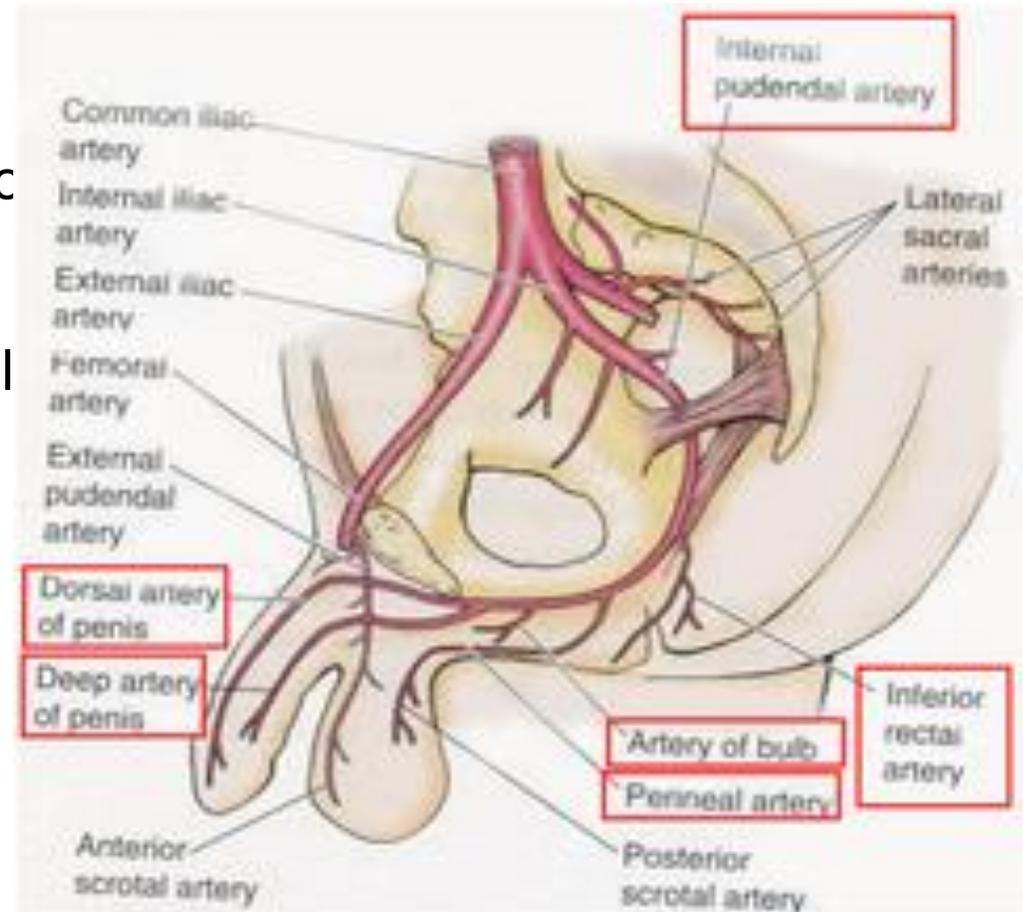


## 5) Obturator Artery:

- ❑ In the pelvis, it gives a pubic branch which anastomoses with the pubic branch of inferior epigastric artery on the posterior surface of the body of the pubis
- ❑ It enters the thigh through obturator foramen

## 6) Internal pudendal artery

- ❑ It leaves the pelvis through the greater sciatic foramen region below the piriformis muscle .
- ❑ It then enters the perineum by passing through forward in the pudendal canal with the pudendal



## Other arteries in the pelvis

### Superior Rectal Artery

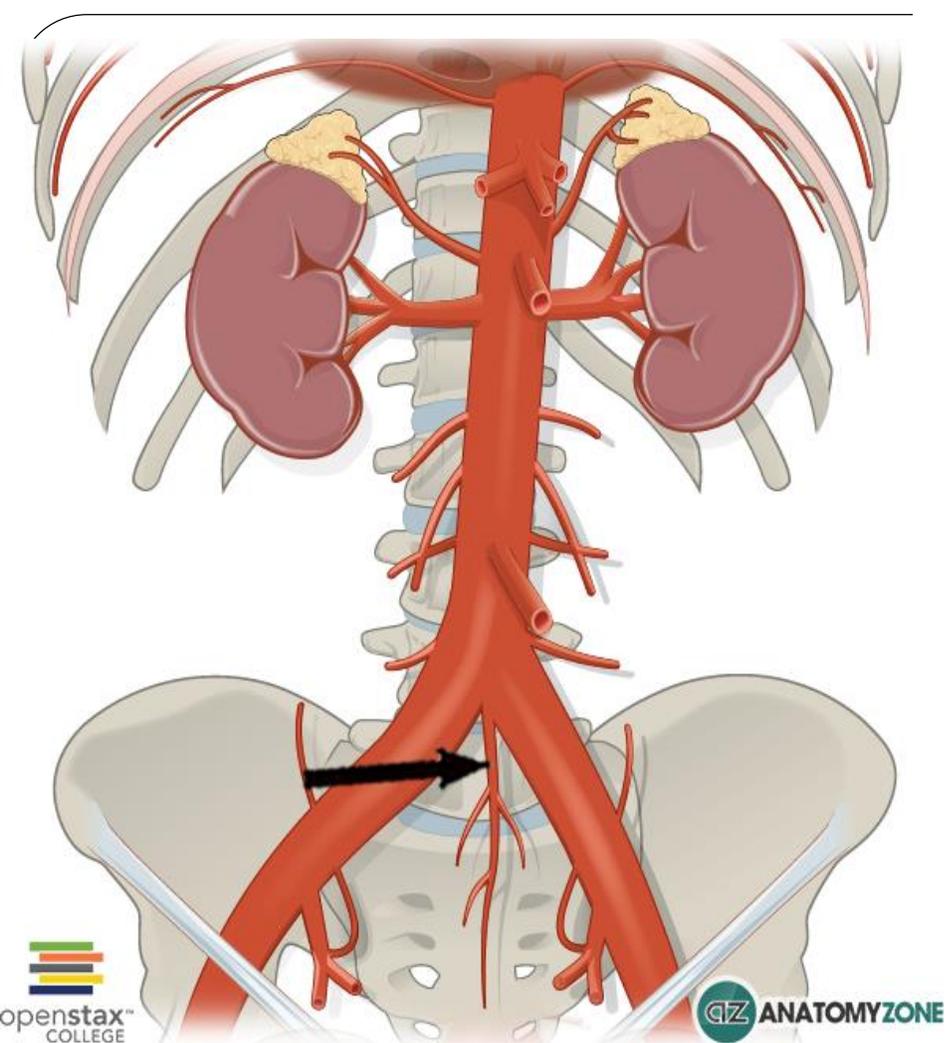
- ❖ The superior rectal artery is a direct continuation of the inferior mesenteric artery as it crosses the left common iliac artery.
- ❖ It supplies the mucous membrane of the rectum and the upper half of the anal canal.

### Ovarian Artery

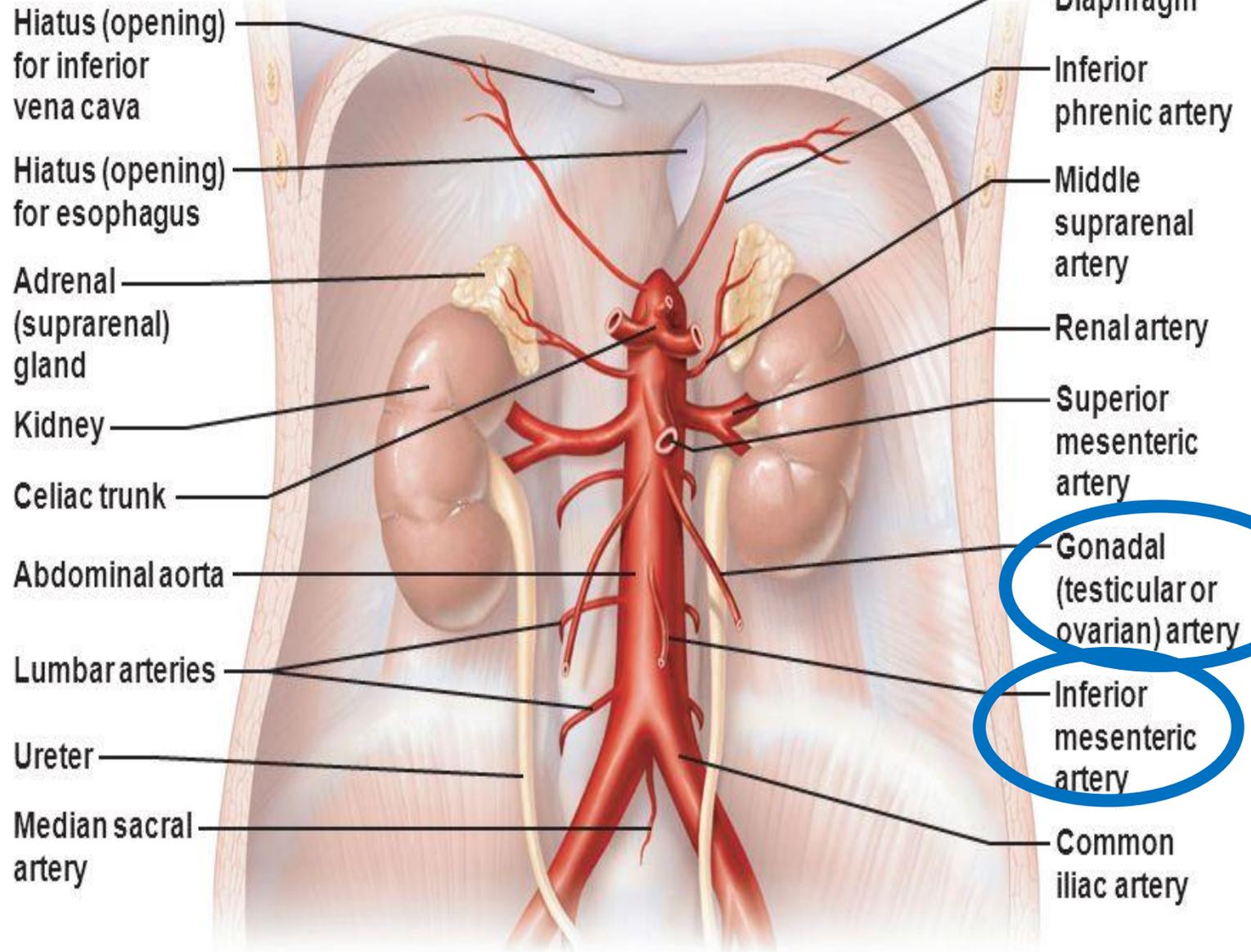
- The ovarian artery arises from the abdominal part of the aorta at the level L2.

### Median Sacral Artery

- ❑ The median sacral arises at the bifurcation of the aorta .
- ❑ It descends over the anterior surface of the sacrum and coccyx.



## Median Sacral Artery



(c) Major branches of the abdominal aorta.

## 5-Venous drainage of the pelvis

---

This is include

- ❖ Internal iliac vein
- ❖ Superior rectal
- ❖ Median sacral
- ❖ Ovarian veins

## Internal Iliac Vein:

- It begins opposite the upper part of greater sciatic foramen
- It ends at pelvic brim by joining the external iliac vein to form the common iliac vein
- It receives veins similar to the branches of internal iliac artery except the iliolumbar vein which ends in the common iliac vein.

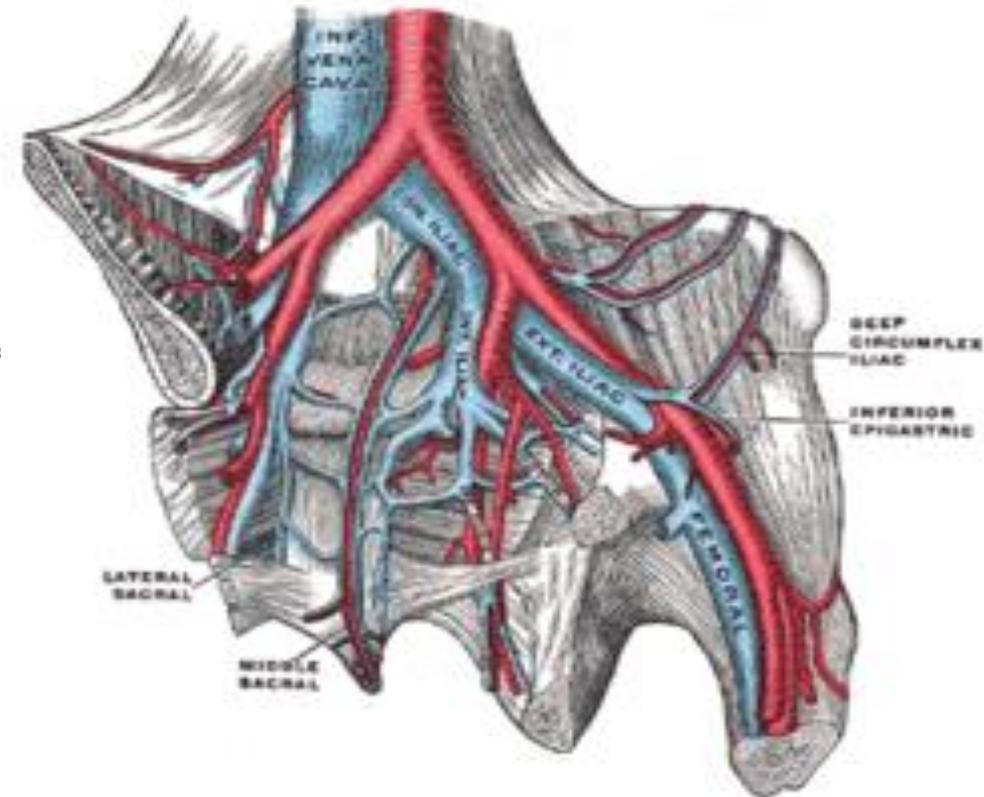
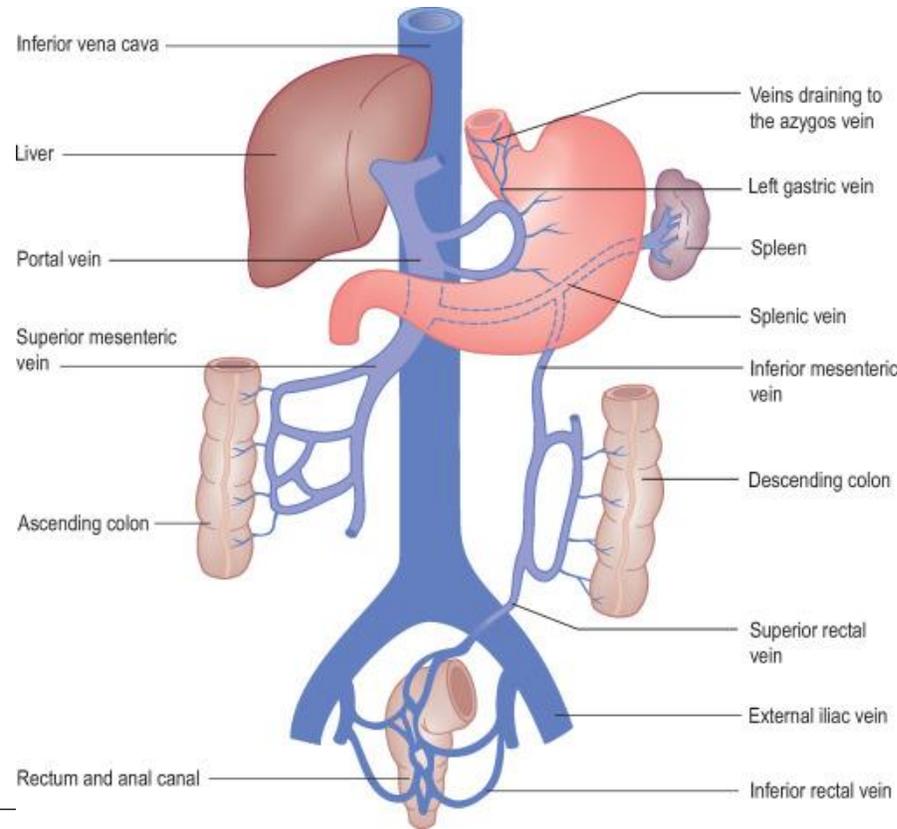
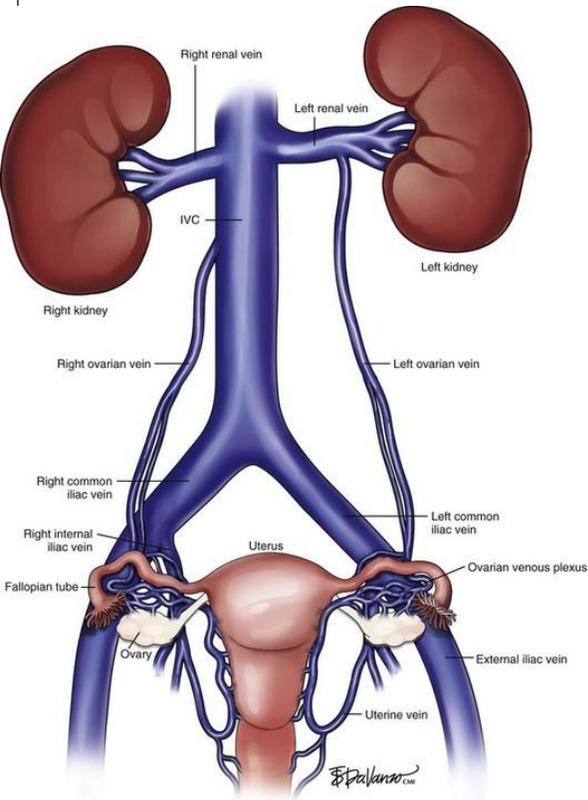


**N.B**

- The internal iliac veins drain blood from the pelvic viscera by means of visceral veins and drain blood from the internal vertebral venous plexuses by means of the valveless lateral sacral veins.
- Increase in the pelvic pressure (e.g. coughing & straining) may cause reflux of blood backwards up to the internal vertebral venous plexuses.
- In this way, primary tumors in pelvic viscera give rise to secondaries in the lumbar vertebrae

## Other Veins in The Pelvis:

1. superior rectal vein : arises from the internal rectal venous plexus of rectum and ascends to become inferior mesenteric vein which joins splenic vein.
2. median sacral vein : begins in front of sacrum and ascends to join **left common iliac v.**
3. Ovarian veins: The right joins I.V.C. and the left joins left renal vein



# **6- Nerves in The Pelvis**

---

# Nerves of Pelvis

## Somatic

Sacral  
plexus

Coccygeal  
plexus

## Autonomic

Sympathetic  
Sacral  
sympathetic  
trunks

Parasympathetic  
Pelvic splanchnic  
nerve arising from  
S2, S3, S4

Sacral plexus is formed by union of lumbosacral trunk (part of L<sub>4</sub> and whole L<sub>5</sub>) and S<sub>1</sub>, S<sub>2</sub>, S<sub>3</sub> and part of S<sub>4</sub> ventral rami

The plexus lies between piriformis and parietal pelvic fascia.

### **Vessels Related To The Sacral Plexus:**

- Internal pudendal vessels descends in front of the plexus.
- The superior gluteal A. passes backwards between the lumbosacral trunk and S<sub>1</sub> ventral ramus.
- The inferior gluteal A. passes backwards between S<sub>1</sub>, S<sub>2</sub> ventral rami

### **The Coccygeal Plexus**

It is formed by union of the inferior part of S<sub>4</sub> and whole S<sub>5</sub> and coccygeal ventral rami.

#### **It gives**

Anococcygeal nerves :

supplies skin from coccyx to the anus.

## **Branches Of The Sacral Plexus (pelvic branches)**

**1-To levator ani and coccygeus .**

**2-Perineal branch of fourth sacral nerve:**

It supplies external anal sphincter and perianal skin.

**3-Pelvic splanchnic nerves (S2, S3, S4):**

It join inferior hypogastric plexus.

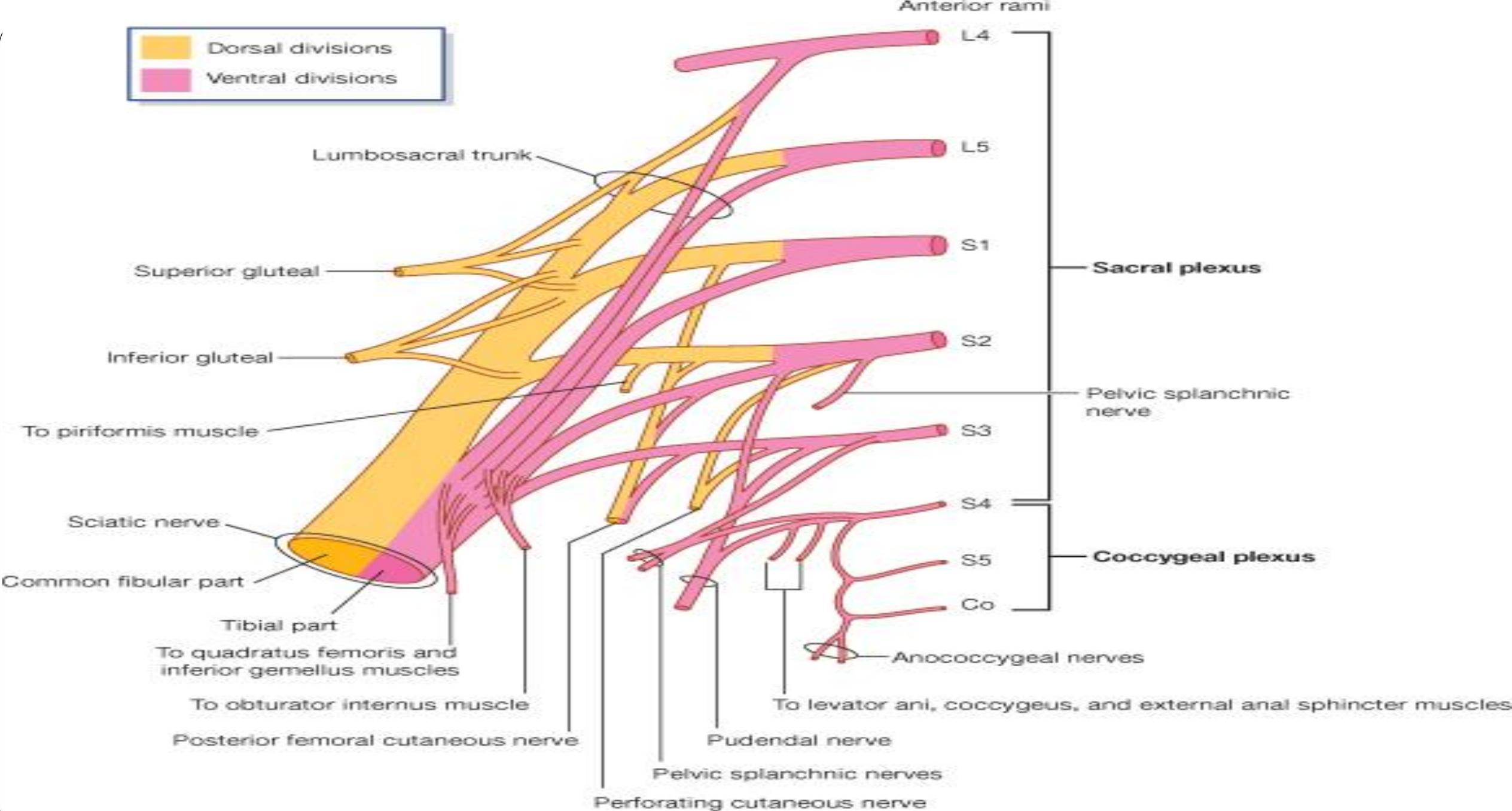
**4-Pudendal N, (S2, S3, S4):**

it is the somatic nerve of the perineum.

**5- Perforating cutaneous nerve:**

Supplies skin of lower medial part of the buttock

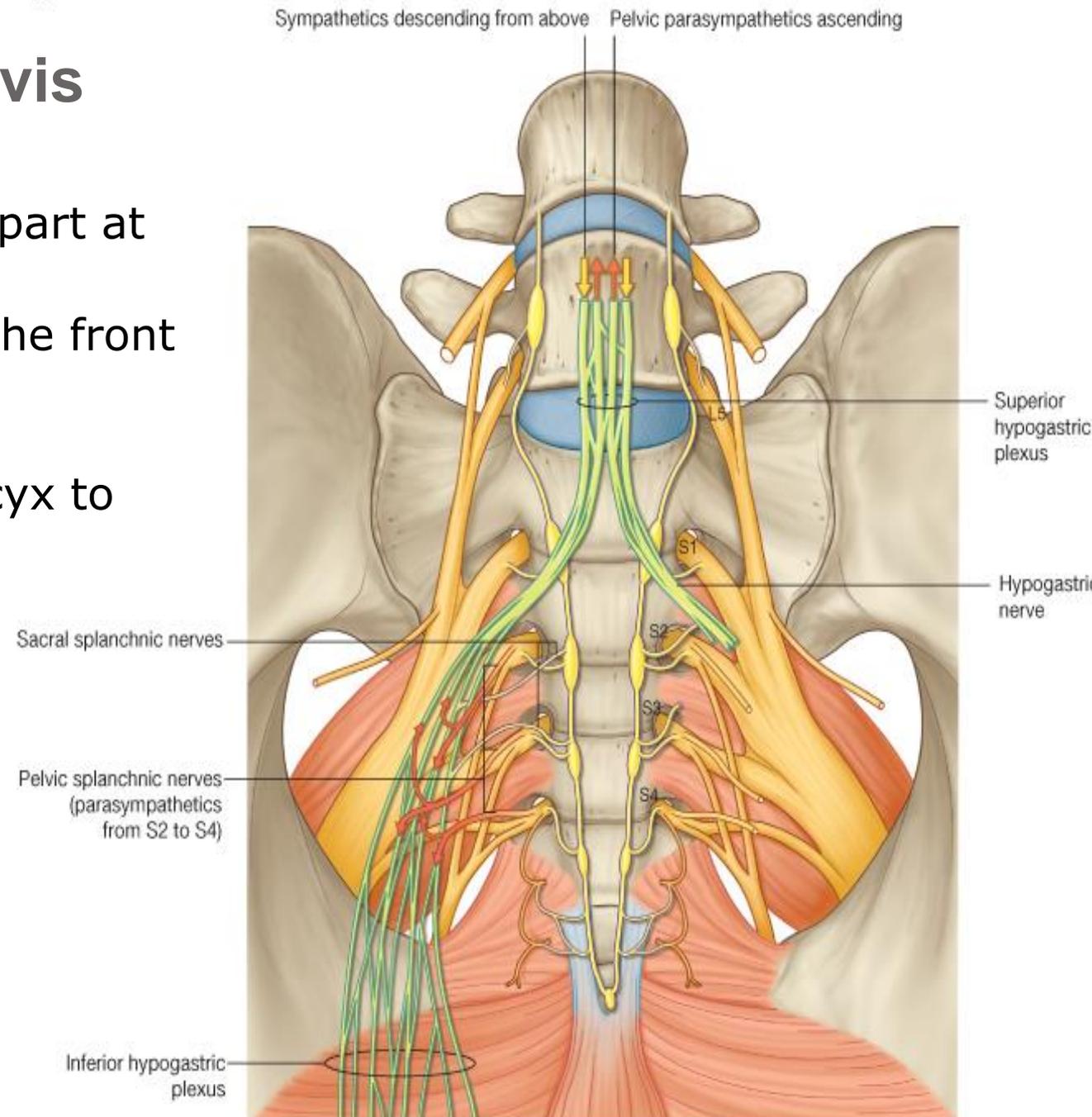
 Pressure from the Fetal Head During the later stages of pregnancy, leads to compression of sacral plexus , the mother often complains of discomfort or aching pain extending down one of the lower limbs.



# Autonomic plexuses of pelvis

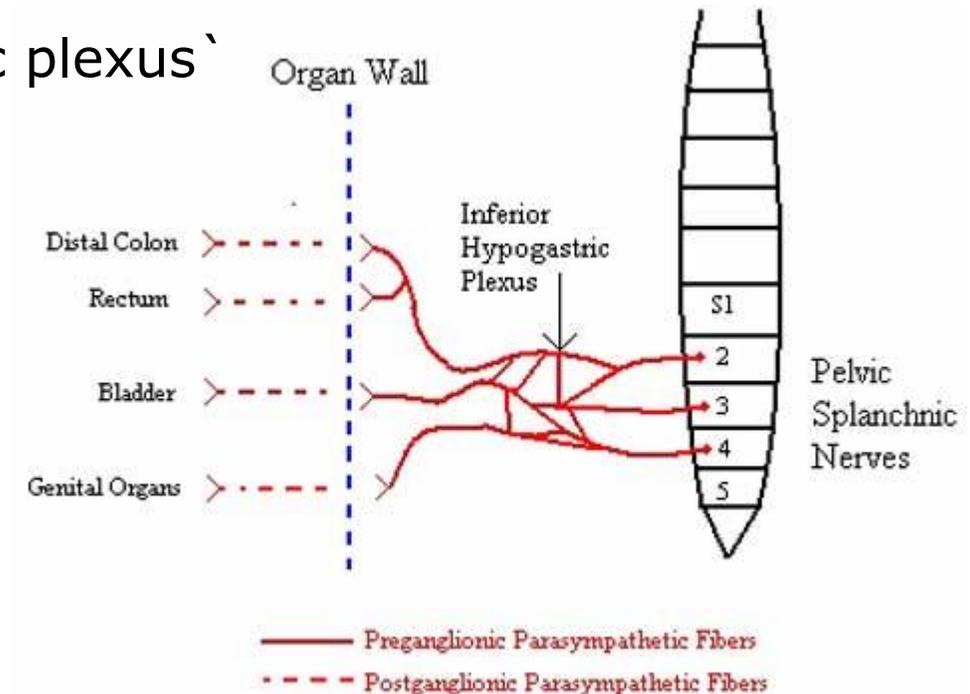
## Sacral sympathetic trunk

- ❖ Is continuous above with the abdominal part at Common iliac vessels
- ❖ It runs down behind the rectum and on the front of the sacrum
- ❖ Has 4 or 5 ganglion
- ❖ The two trunks unite in front of the coccyx to form ***ganglion impar***
- **Branches**
  - ✓ **Grey rami communicantes :**  
Join the sacral, coccygeal nerves for distribution to the blood vessels, sweat glands and erector pilae muscles.
  - ✓ **Visceral branches :**  
Join inferior hypogastric plexus



## Pelvic Splanchnic Nerves

- It forms the parasympathetic part of the autonomic nervous system in the pelvis.
- The preganglionic fibers arise from the 2nd, 3rd and 4th sacral nerves
- It synapses in ganglia in the **inferior hypogastric plexus** or in **the walls of the viscera.**
- Some of the parasympathetic fibers supplies large intestine from the left colic flexure to the upper half of the anal canal via inferior mesenteric plexus`



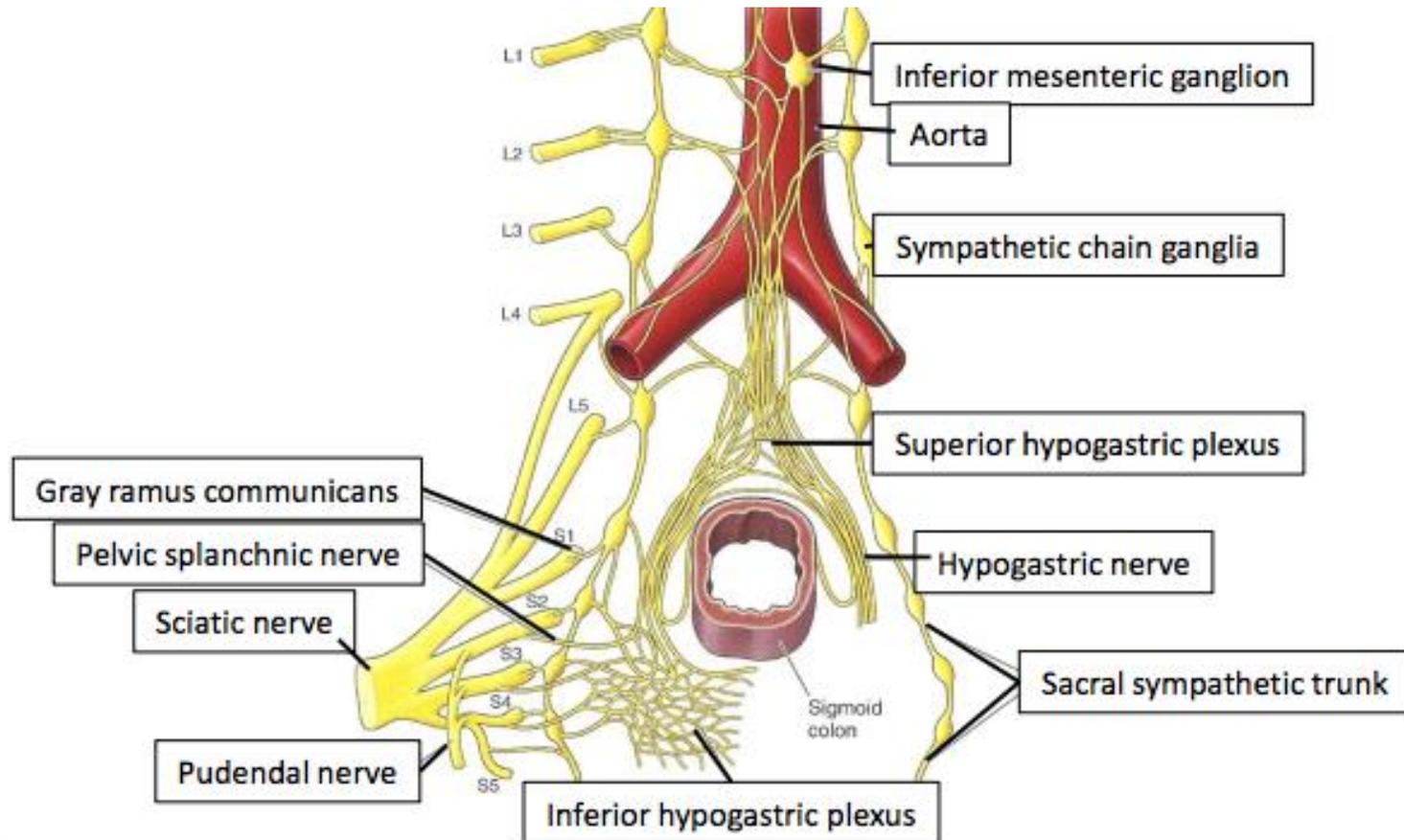
## Superior Hypogastric Plexus

**Location :** It is situated in front of the promontory of the sacrum .

It is formed as a continuation of the aortic plexus and from branches of the 3rd and 4th lumbar sympathetic ganglia.

It contains sympathetic and sacral parasympathetic nerve fibers and visceral afferent nerve fibers.

It divides inferiorly to form the **right** and **left hypogastric nerves**



## Inferior hypogastric plexus

**Location :** Lie medial to internal iliac vessels and lateral to rectum

### Contributions:

#### 1- Parasympathetic contribution

Pelvic splanchnic nerves (S2, S3, S4 ).

#### 2- Sympathetic contribution

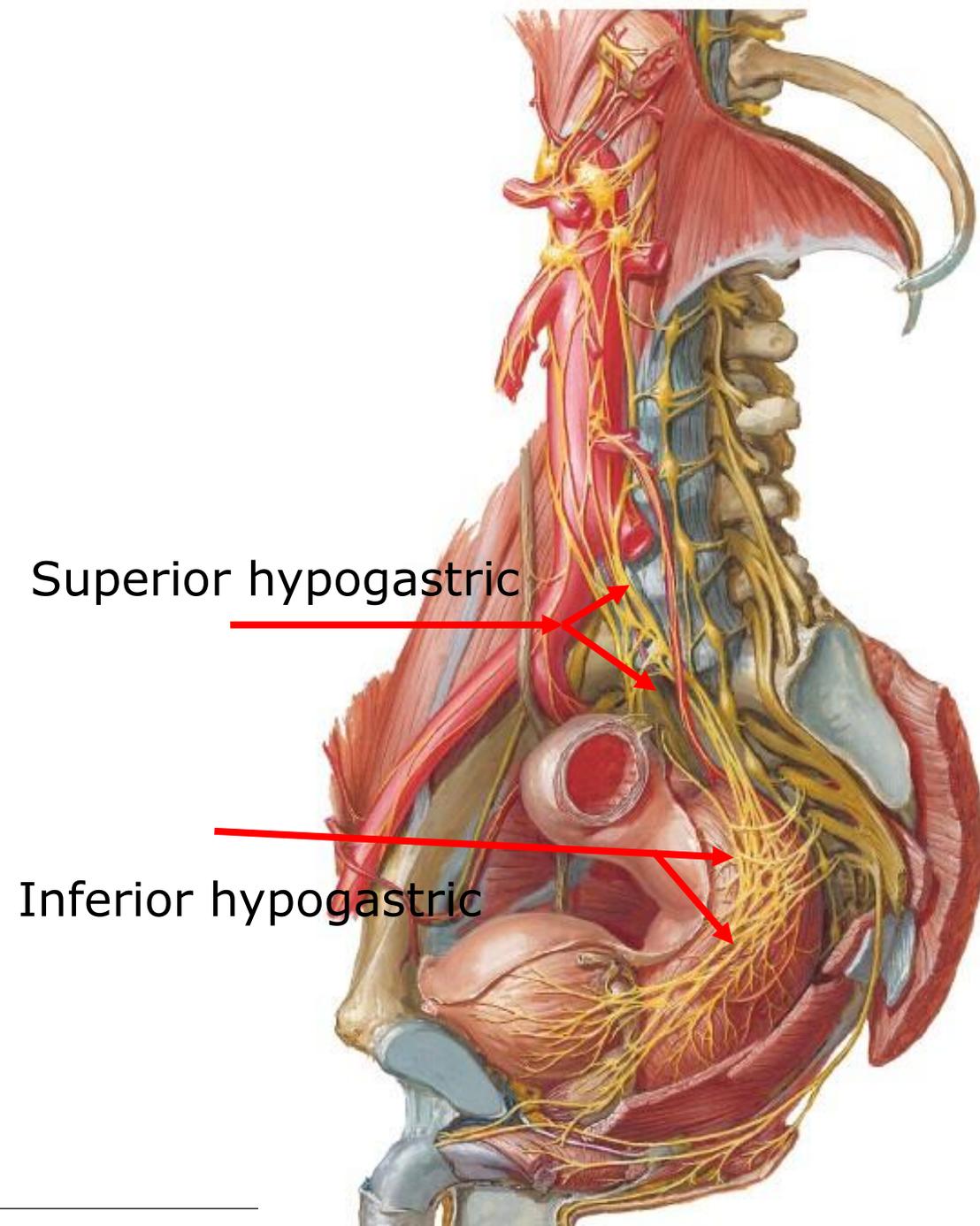
Is derived mainly from

- superior hypogastric plexus
- sacral sympathetic chain

### Distribution :

The branches of the plexus reach the viscera along the branches of internal iliac artery as follows:-

**A. Branches (parasympathetic) ascend to join inferior mesenteric plexus to supply hindgut.**



## **B. Autonomic branches to pelvic viscera and perineal organs:**

1. Rectum, anal canal and internal anal sphincter.

2. Urinary bladder and internal urethral sphincter.

3. Male genitalia:

Prostate, seminal vesicles, and ejaculatory ducts (for ejaculation).

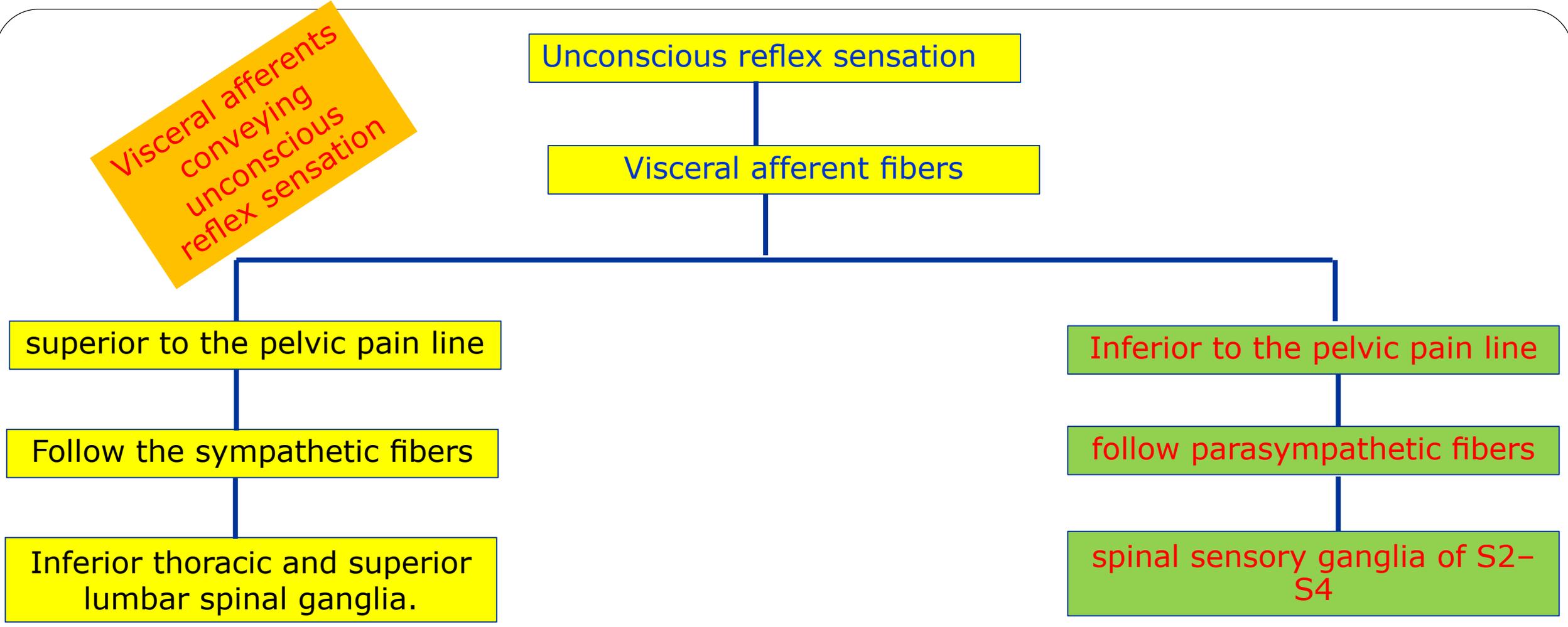
Corpora cavernosa, corpus spongiosum (for erection).

***N.B- Ejaculation depends upon the sympathetic while erection depends upon the parasympathetic innervation.***

4- Female genitalia

Uterus, medial part of uterine tube.

Vagina, erectile tissue of vestibular bulbs and clitoris

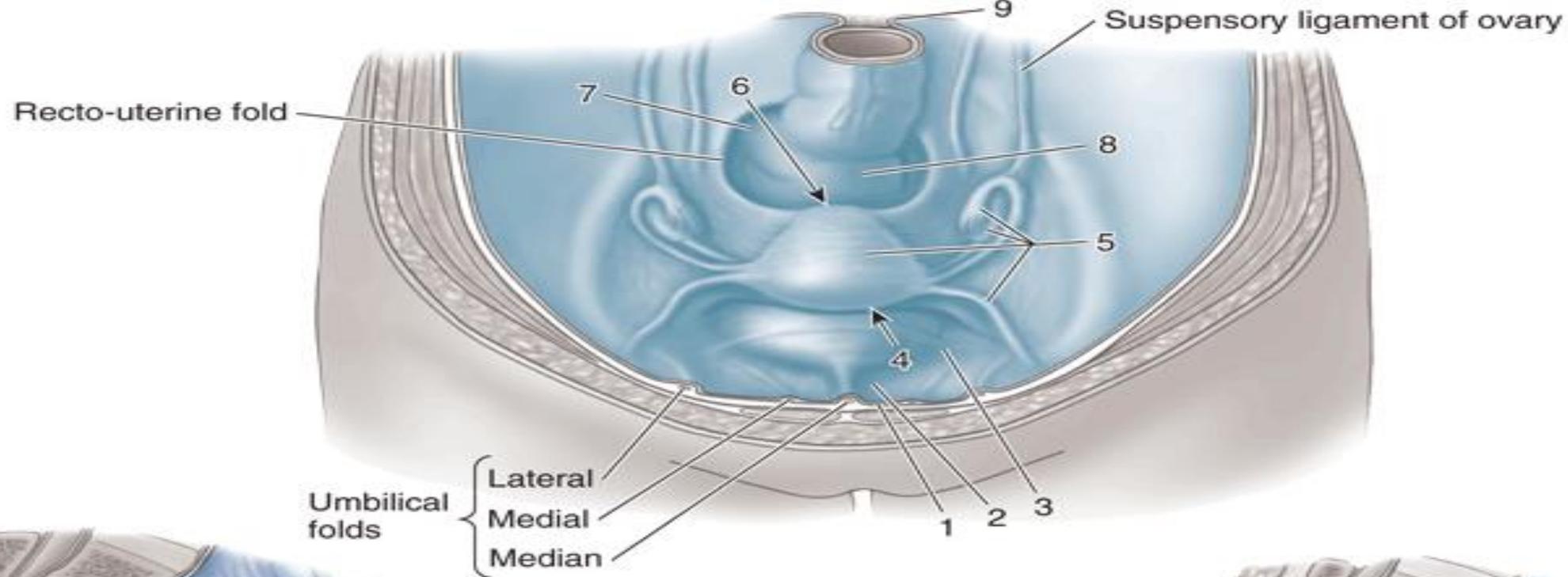


**Superior to the pelvic pain line :**

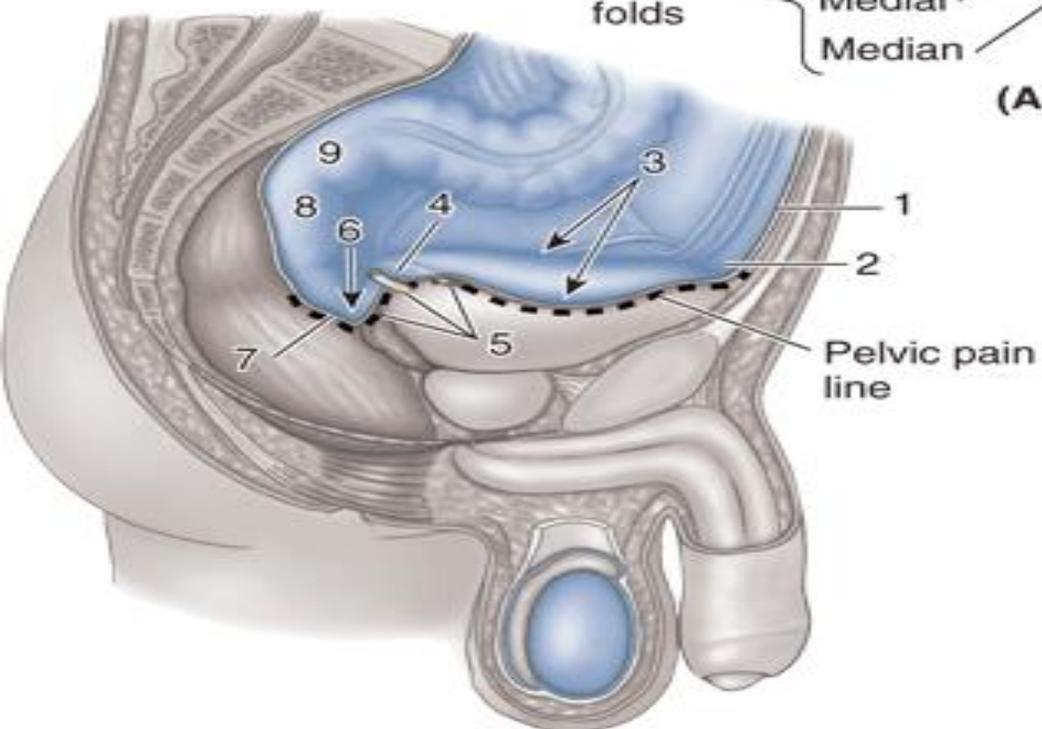
structures in contact with the peritoneum, except for the distal sigmoid colon and rectum

**Inferior to the pelvic pain line**

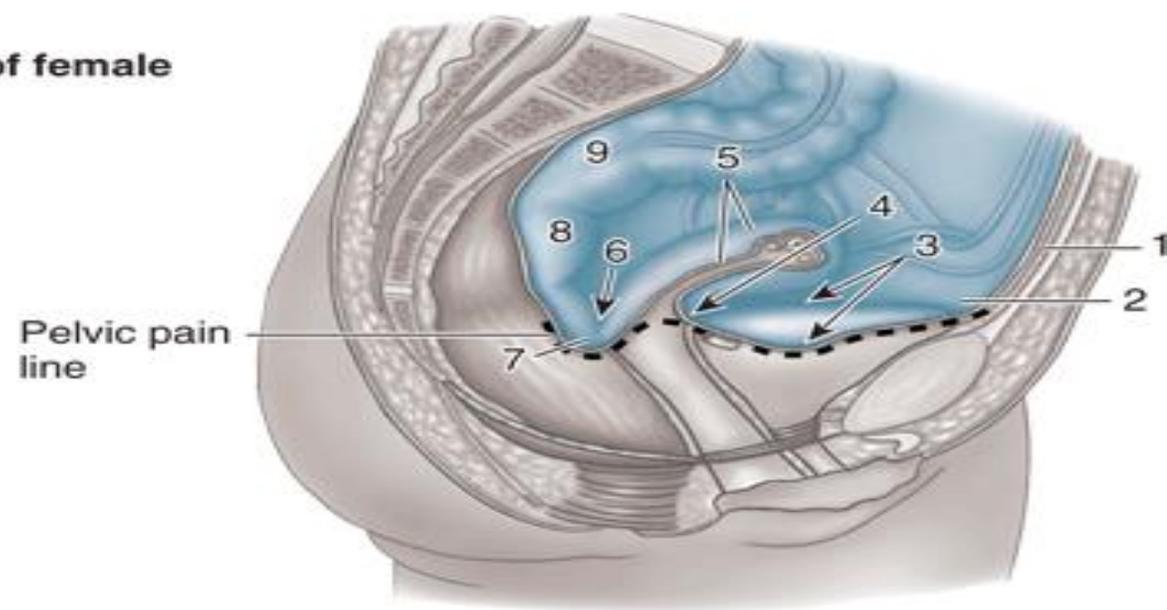
structures that do not contact the peritoneum plus the distal sigmoid colon and rectum



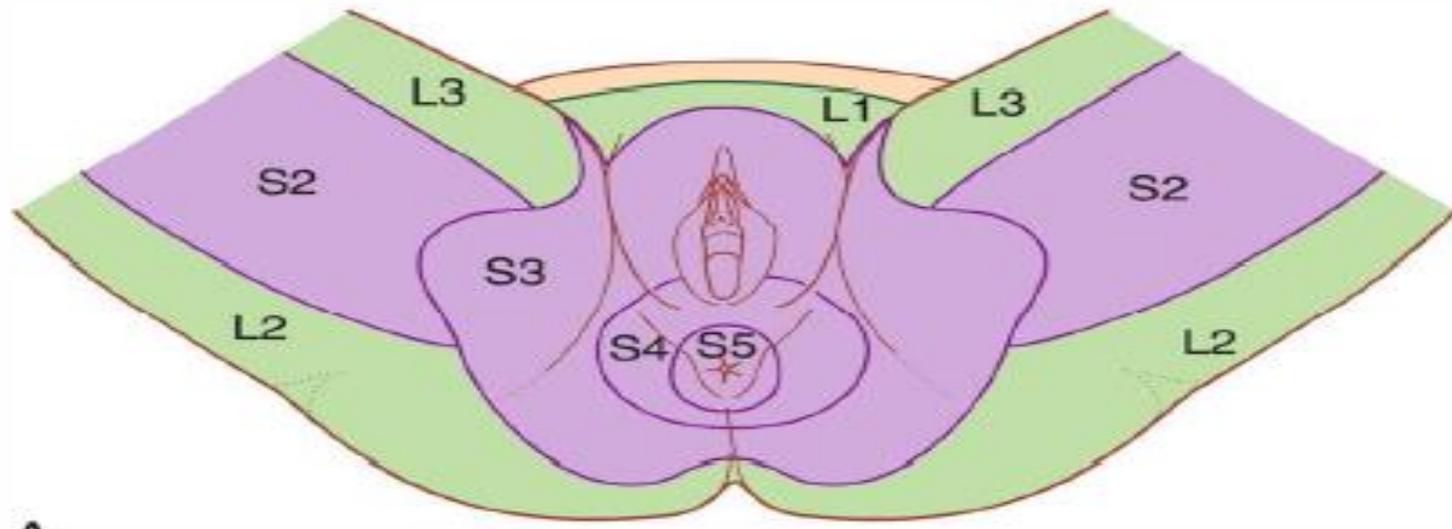
(A) Anterior view of female



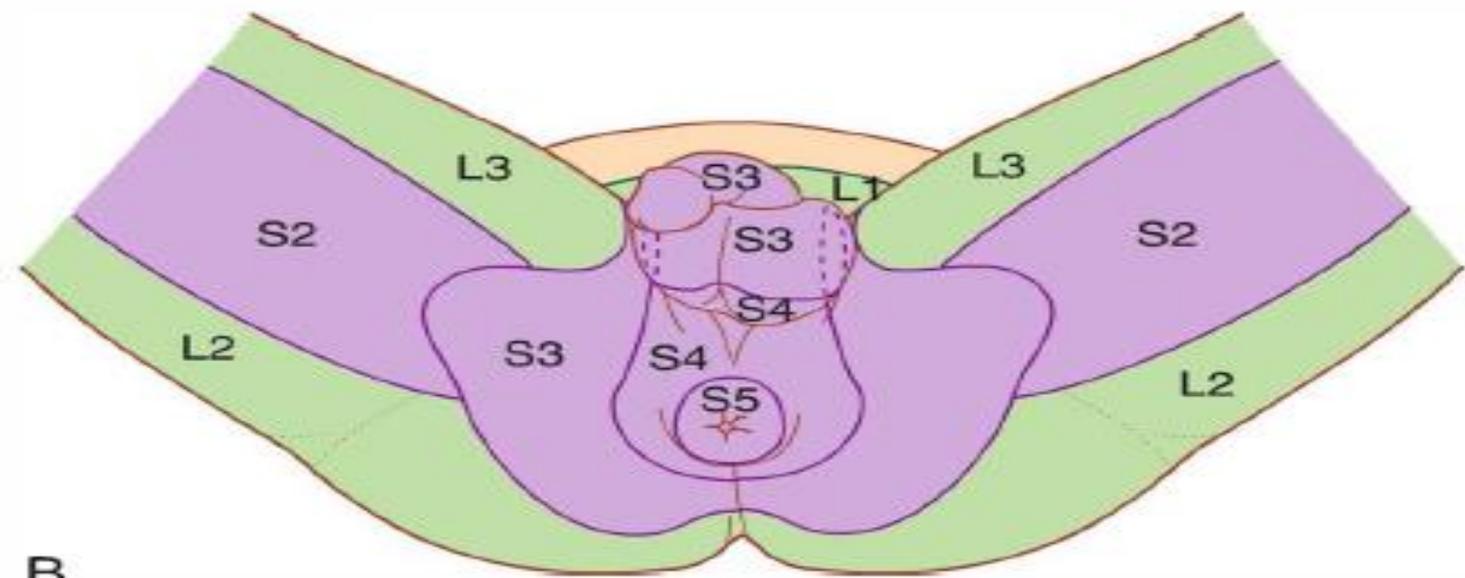
(B) Right lateral view of male



(C) Right lateral view of female



A



B

**Fig. 5.14** Dermatomes of the perineum. **A.** In women. **B.** In men.

## 7-Lymph Drainage of the Pelvis

---

- ❑ The lymph drainage of pelvic viscera and deep perineum returns to 3 groups of lymph nodes : 2 main groups : internal and external iliac lymph nodes and one subsidiary : sacral lymph nodes.
- ❑ The final lymph nodes for these 3 groups is the common iliac lymph nodes.
- ❑ Some of pelvic viscera drain directly to the lateral aortic lymph nodes as ovaries, uterine tubes and fundus of the uterus

**lateral aortic lymph node**

**Common Iliac lymph node**  
Close to common iliac vessels

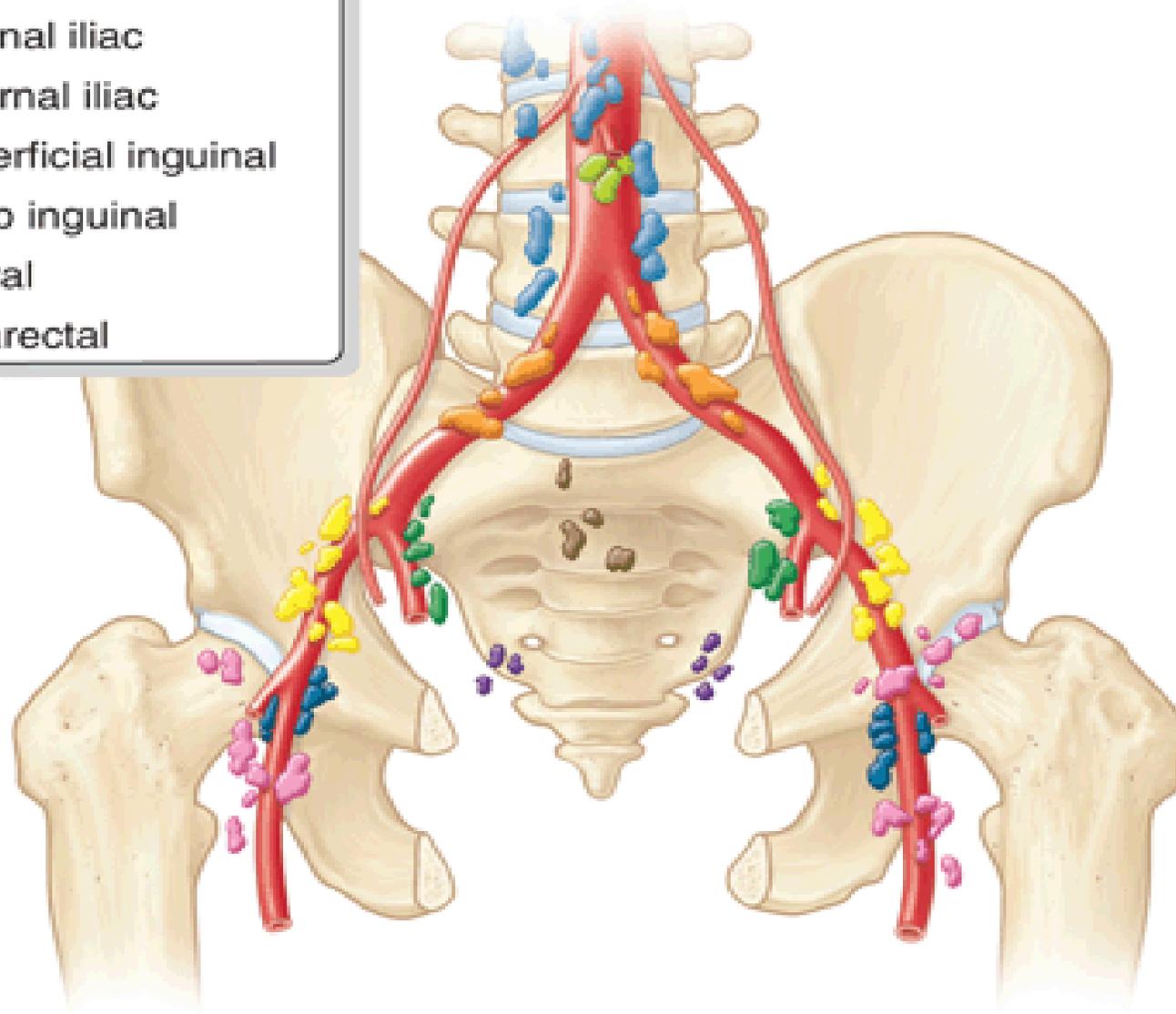
**Internal Iliac Lymph node**  
Close to internal iliac vessels

**External Iliac Lymph node**  
Close to external iliac vessels

**Sacral Lymph node**  
Close to lateral sacral  
vessels in front of sacrum

**Lymph nodes:**

- Lumbar (caval/aortic)
- Inferior mesenteric
- Common iliac
- Internal iliac
- External iliac
- Superficial inguinal
- Deep inguinal
- Sacral
- Pararectal



# **8- Peritoneum of The Pelvis**

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1- The peritoneum forms the sigmoid mesocolon, and cover front and, sides of the upper 1/3 of rectum, front only of the middle 1/3 of the rectum.

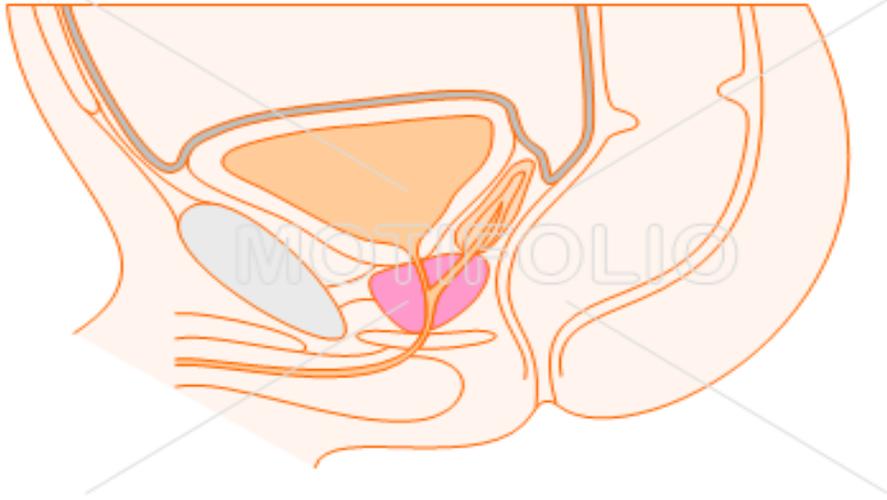
**2- In the male,** the peritoneum cover upper part of the fundus and upper surface of urinary bladder and then is reflected on to the anterior abdominal wall.

The pouch, so formed, is called **rectovesical pouch.**

**3-In the female,** the peritoneum is reflected on to the upper part of posterior vaginal wall, forming **recto-vaginal pouch (pouch of Douglas)**

4- It covers upper surface of uterus, inferior surface of uterus down to level of internal os, then reflected on to upper surface of the urinary bladder, forming **uterovesical pouche,** then to anterior abdominal wall.

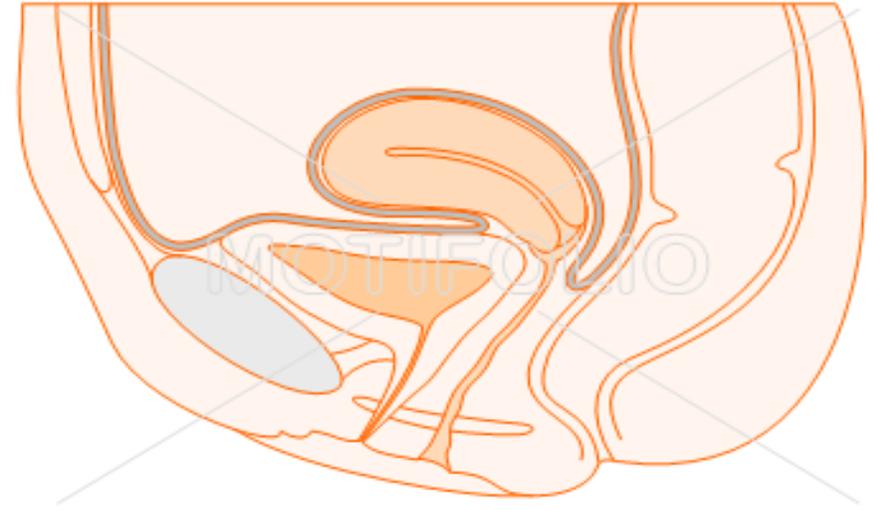
Peritoneum covering male pelvic organs



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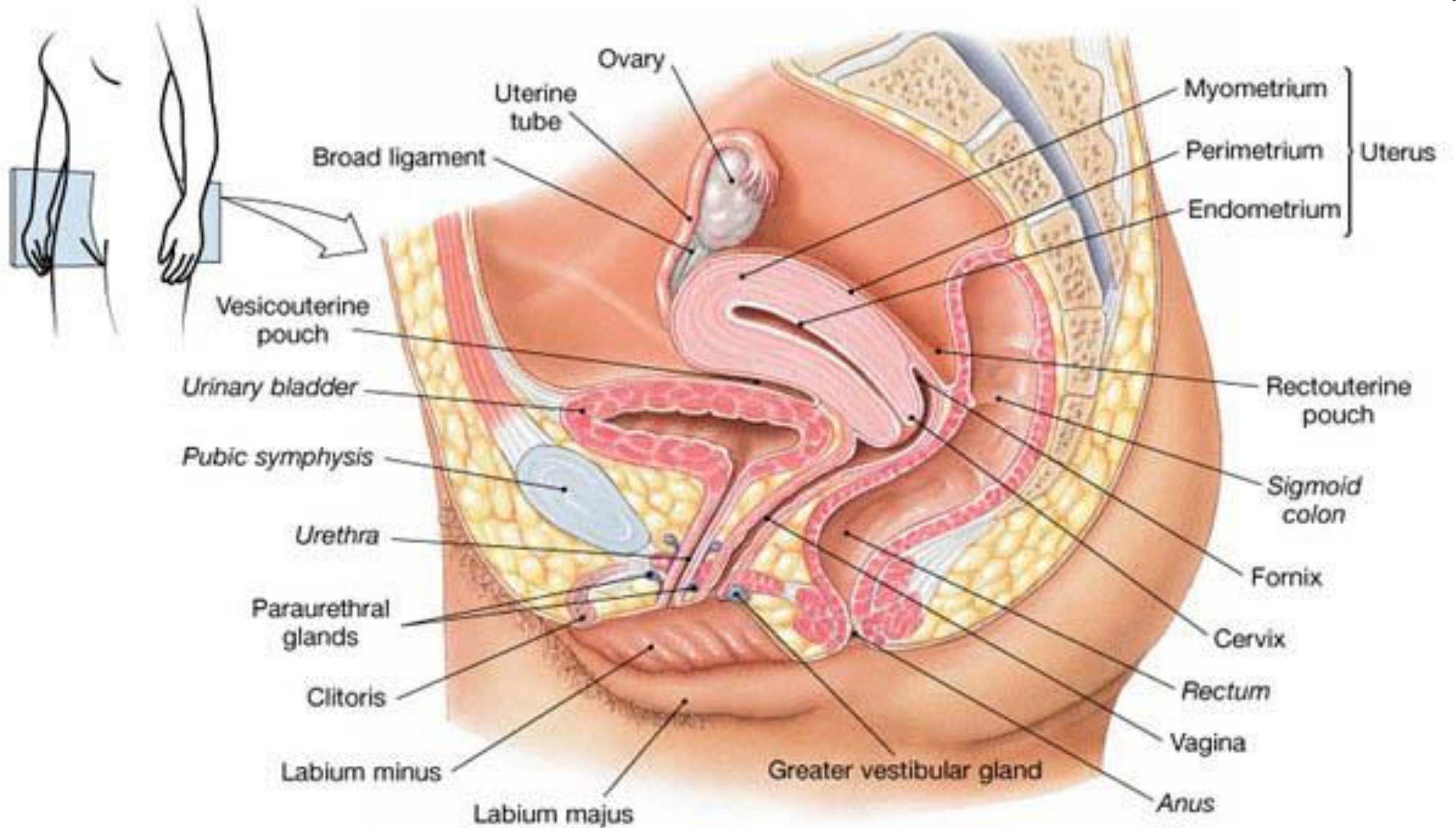
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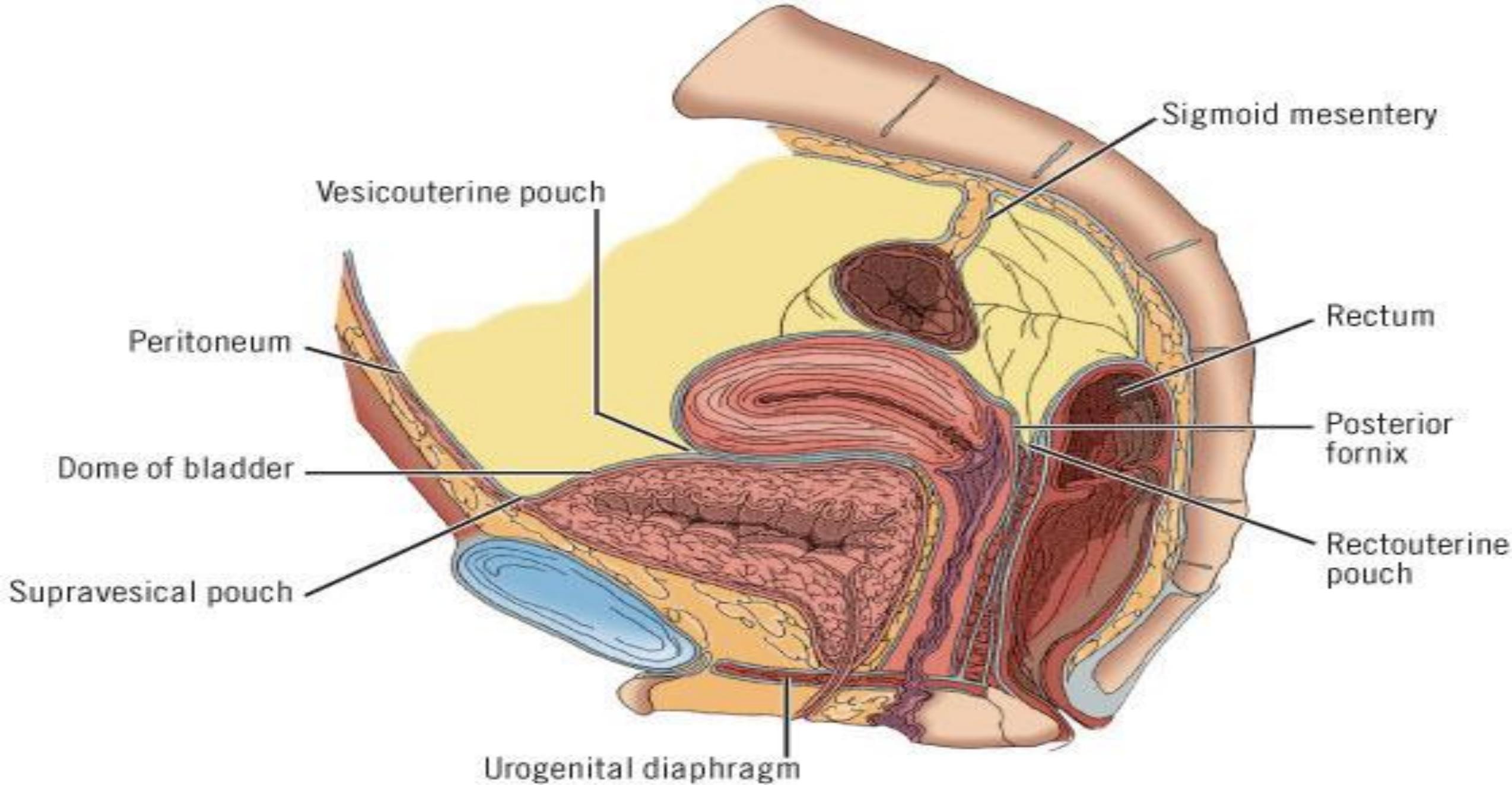
Peritoneum covering female pelvic organs



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**Thank You  
ALL**

