

**The University Of Jordan  
Faculty Of Medicine**



# **Anatomy of the pelvis II**

**By**

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# **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)

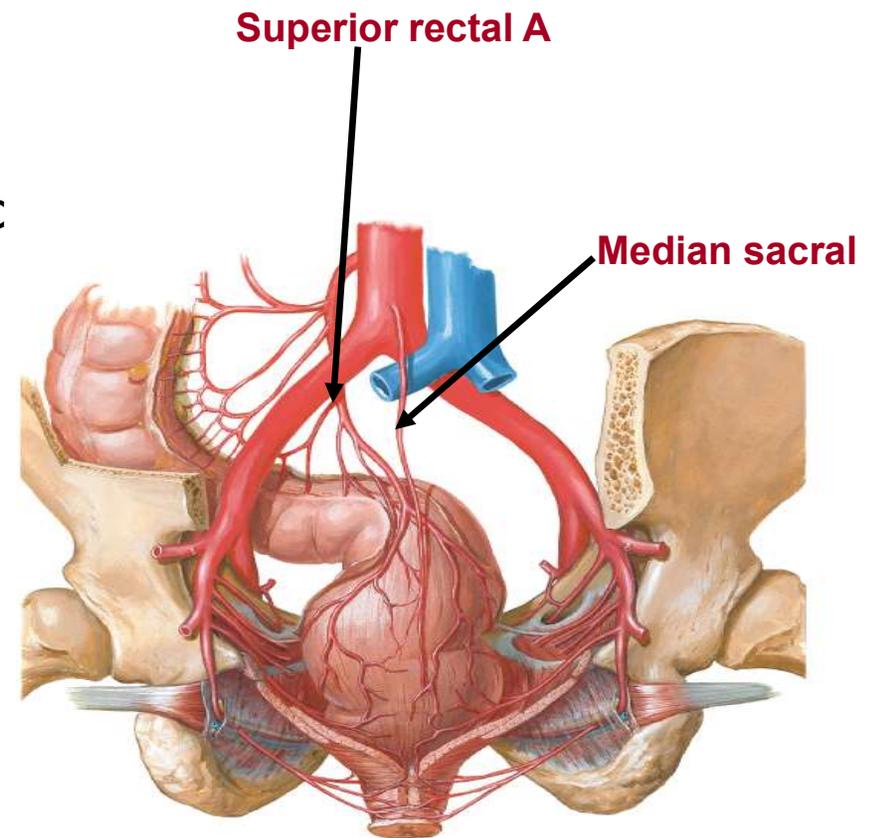
✓ Median sacral artery (from Aorta)

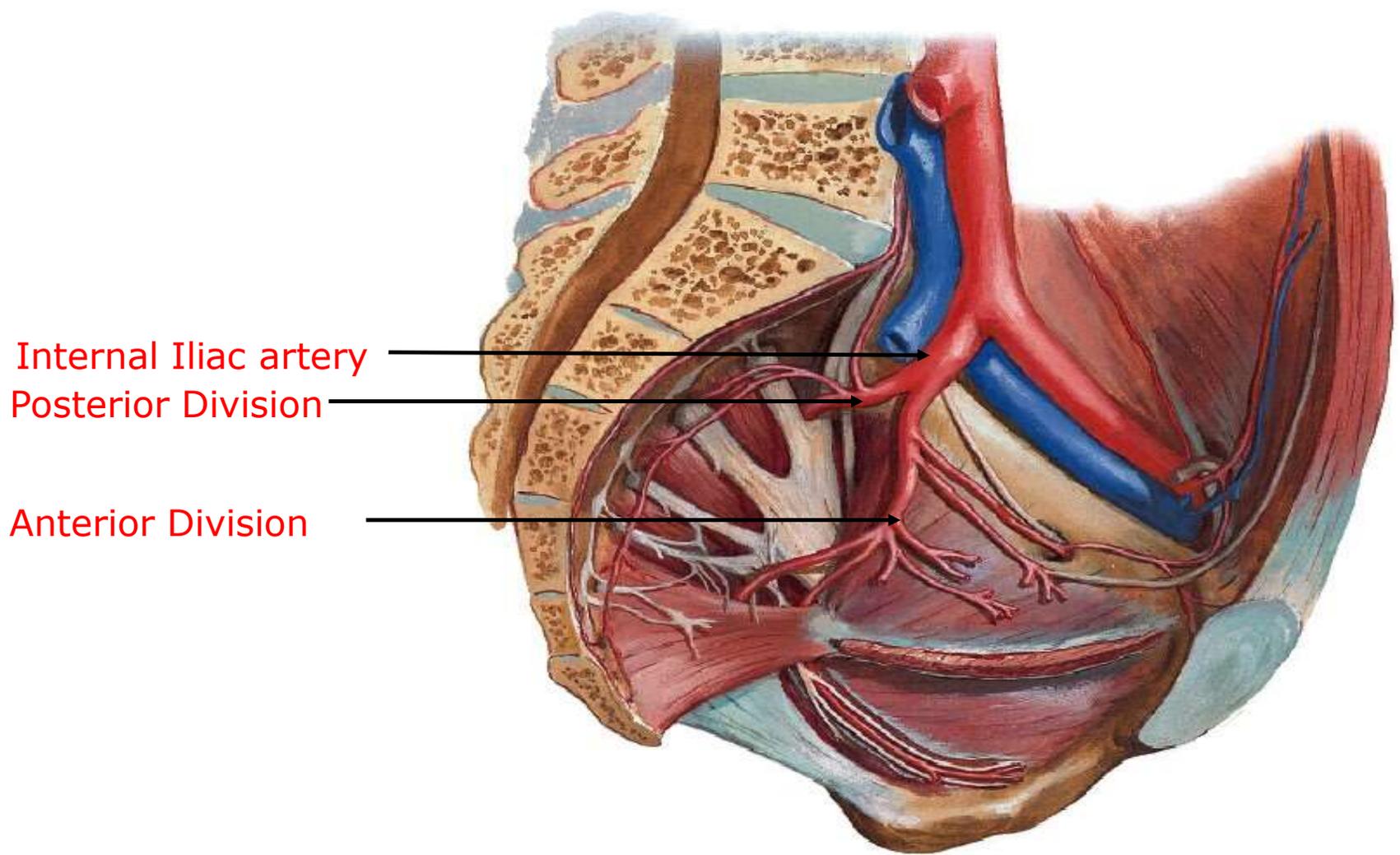
✓ The two ovarian arteries (from Aorta) .

**Internal Iliac Artery :**

**Beginning :** Opposite the lumbosacral disc

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





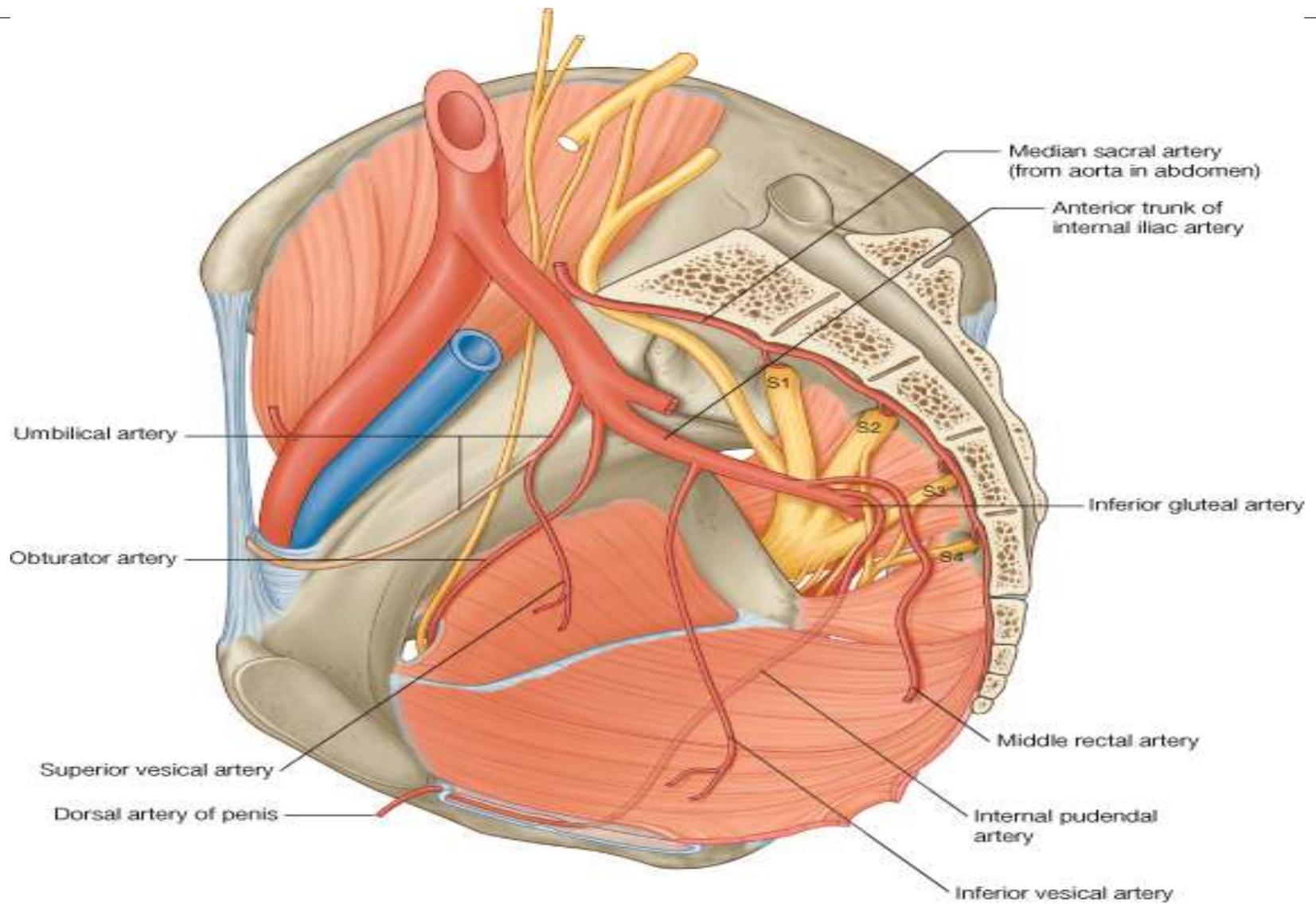
Internal Iliac artery

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>		



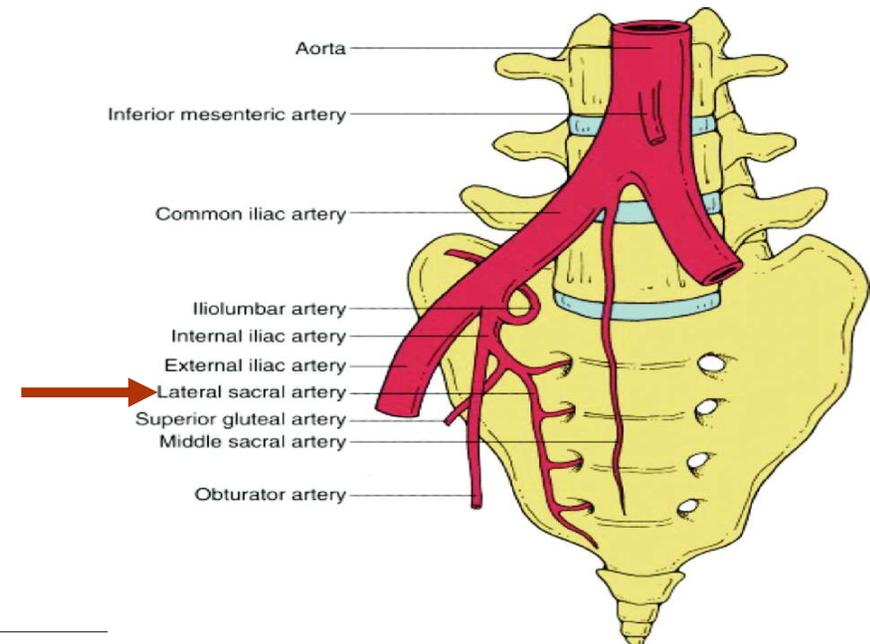
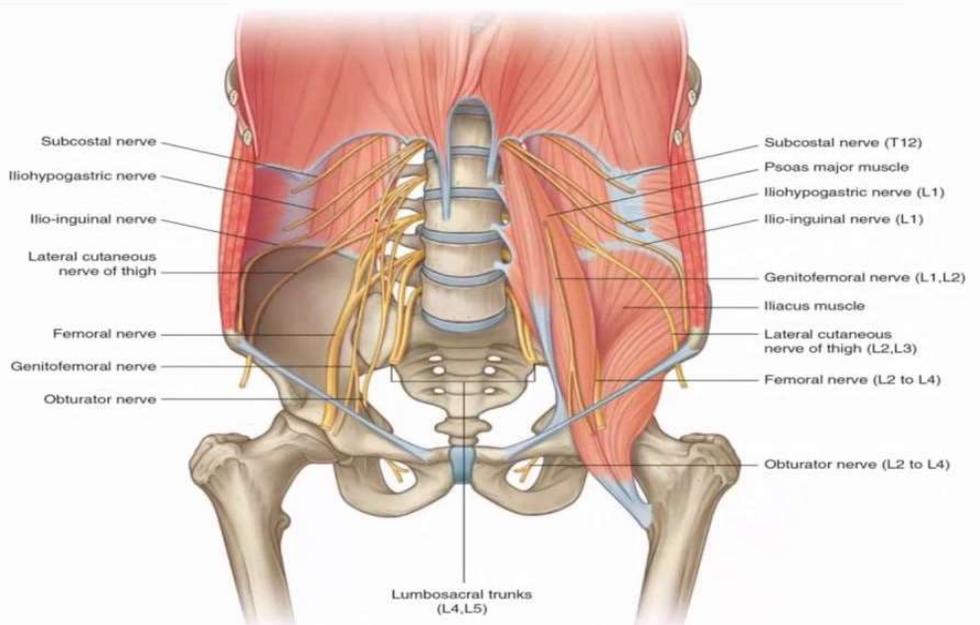
## Posterior division Branches

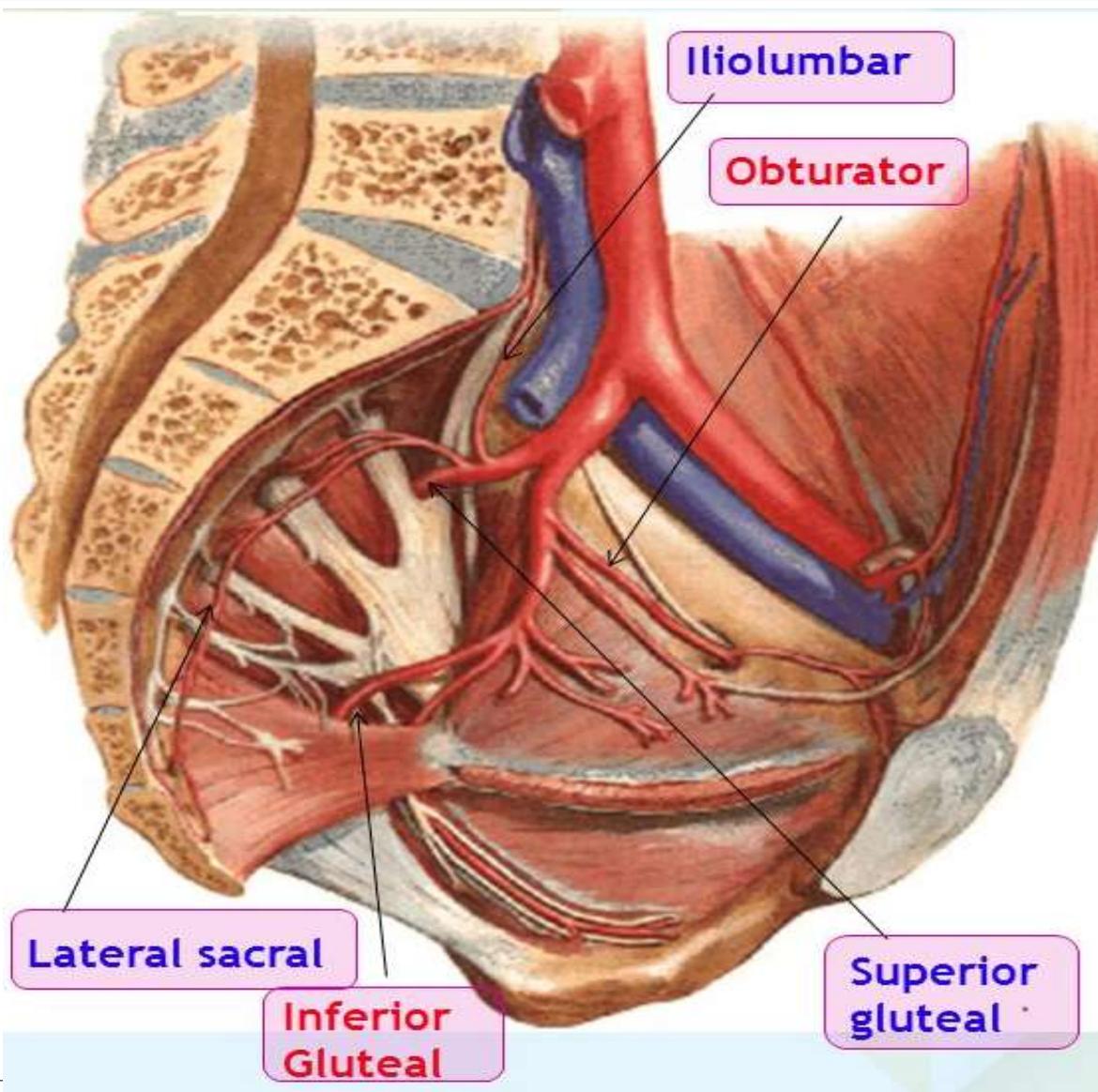
### 1) Iliolumbar A. (muscular)

- ❖ 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.

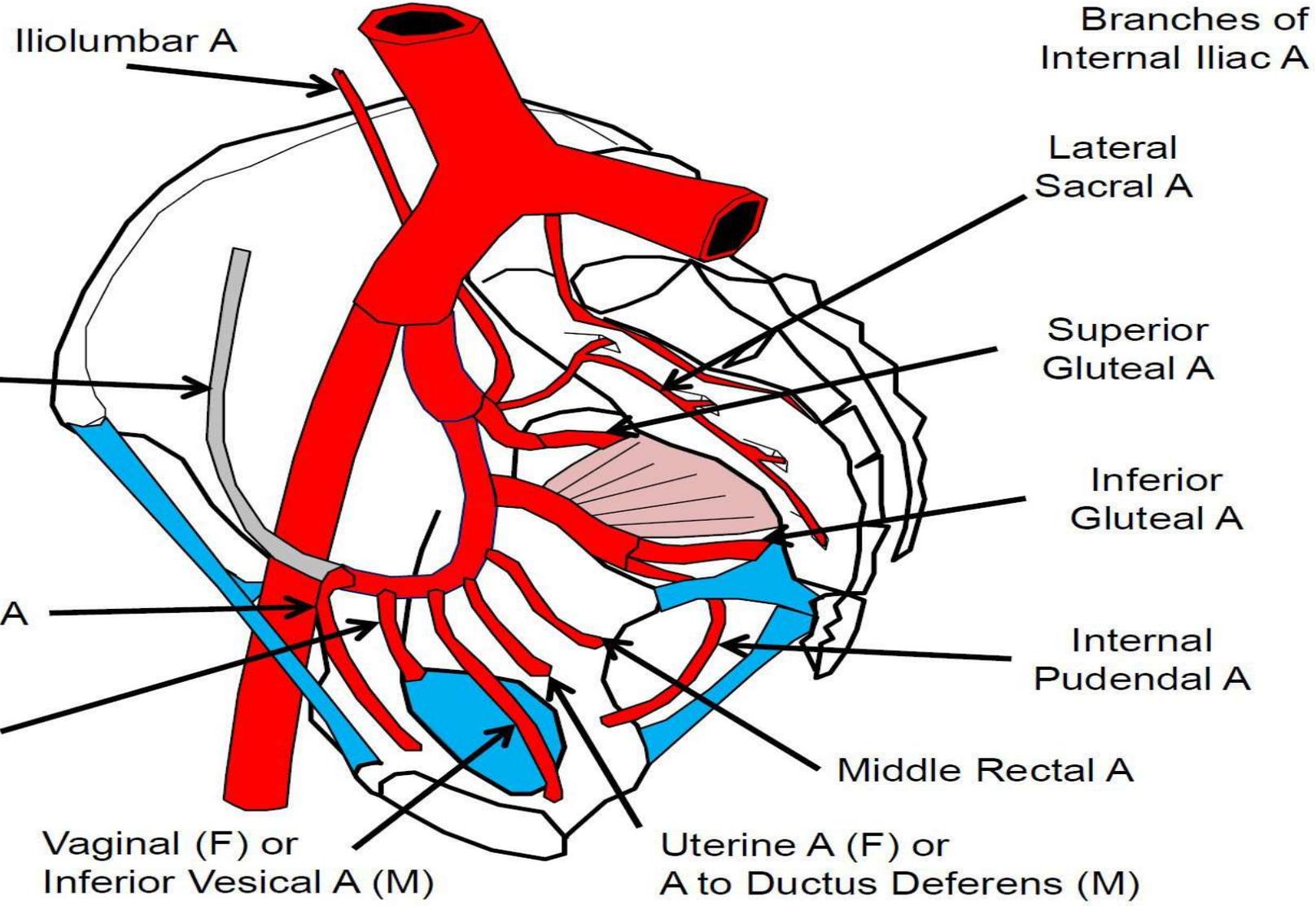
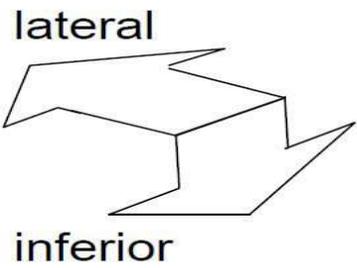
- **In female**: The vaginal A. supplies the base of the bladder and gives vaginal branches which anastomose with vaginal branches from uterine A.

### **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.

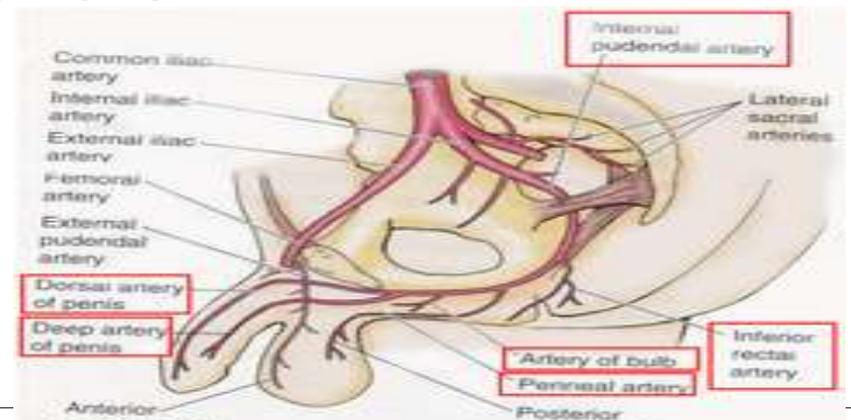


## 5) Obturator Artery:

- ❑ 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 and enters the gluteal region below the piriformis muscle .
- ❑ It then enters the perineum by passing through the lesser sciatic foramen and passes forward in the pudendal canal with the pudendal nerve.



## Other arteries in the pelvis

### Superior Rectal Artery

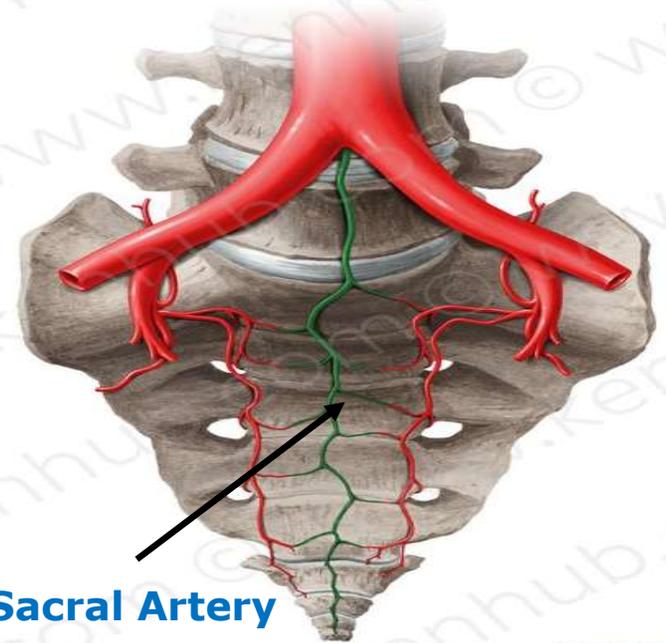
- ❖ The superior rectal artery is a direct continuation of the inferior mesenteric artery as it crosses the left common iliac artery.
- ❖ It supplies the mucous membrane of the rectum and the upper half of the anal canal.

### Ovarian Artery

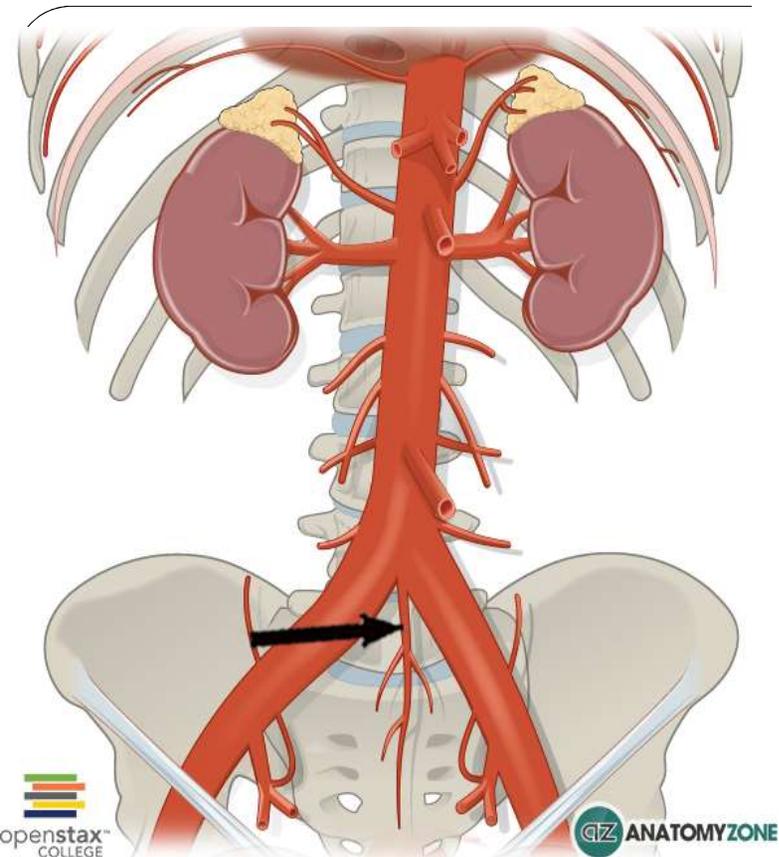
The ovarian artery arises from the abdominal part of the aorta at the level L2.

### Median Sacral Artery

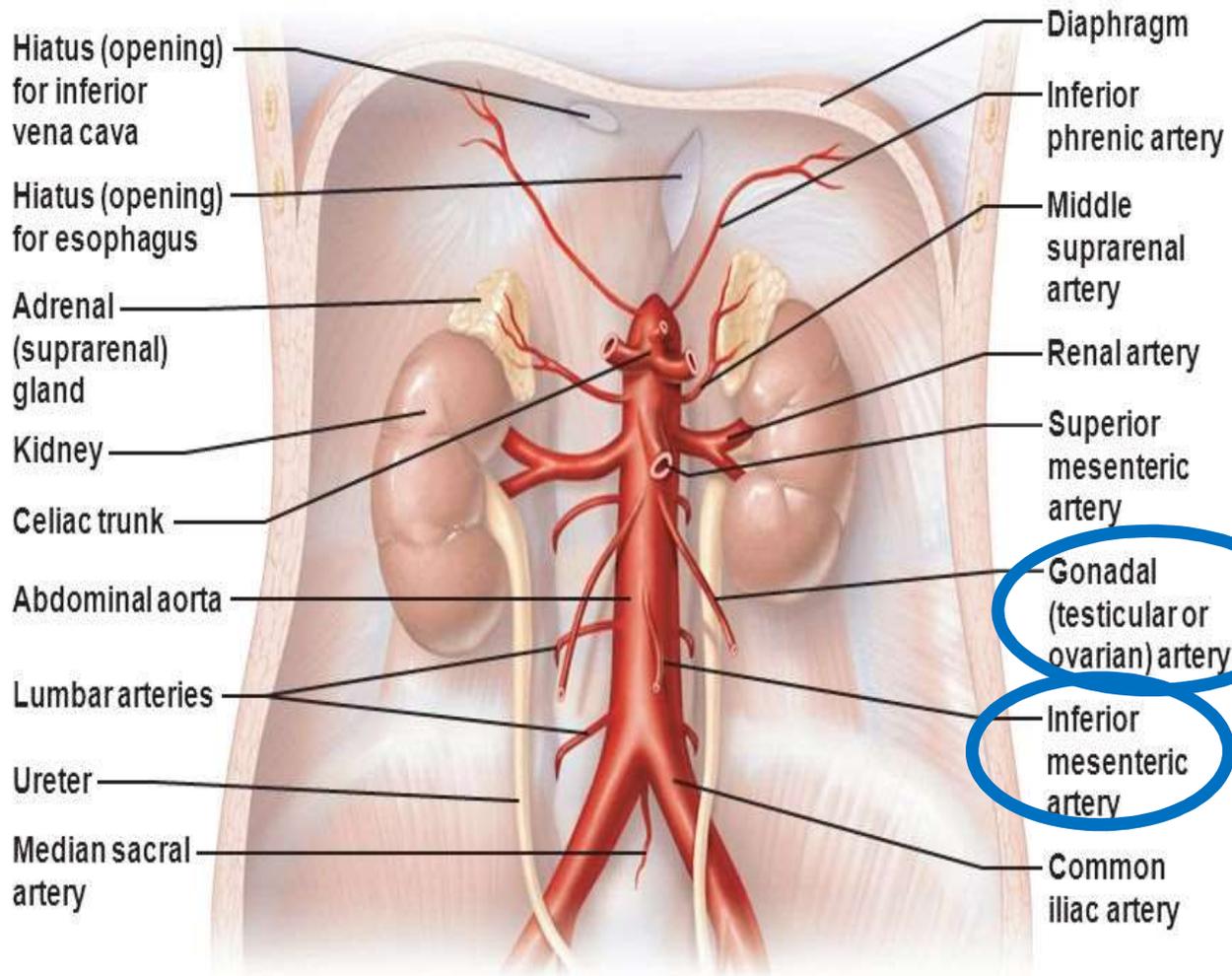
- ❑ The median sacral arises at the bifurcation of the aorta .
- ❑ It descends over the anterior surface of the sacrum and coccyx.



**Median Sacral Artery**



**Median Sacral Artery**



**(c) Major branches of the abdominal aorta.**

## 5-Venous drainage of the pelvis

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This is include

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

## Internal Iliac Vein:

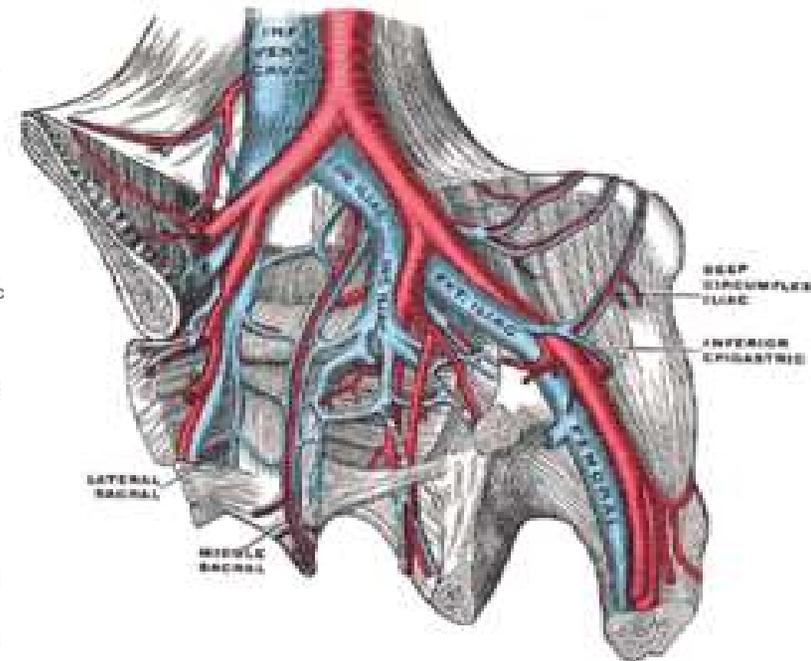
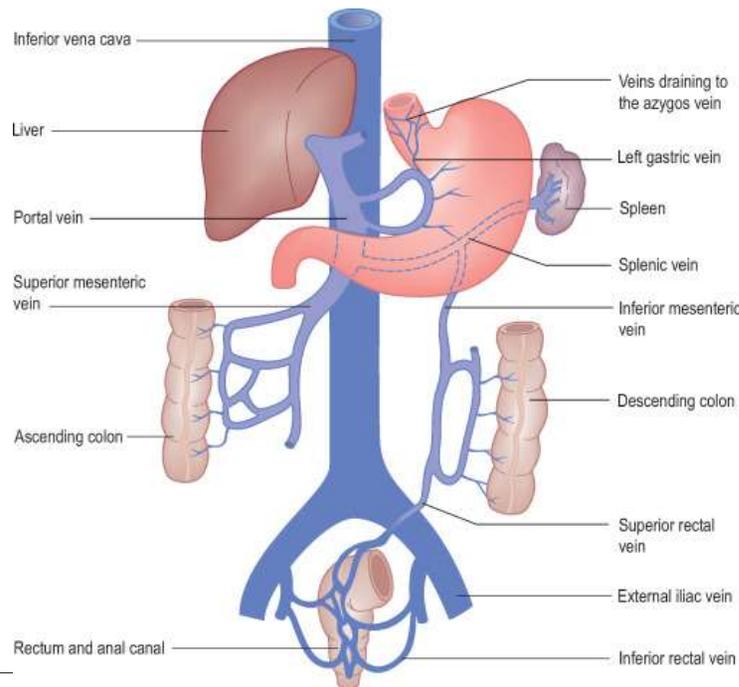
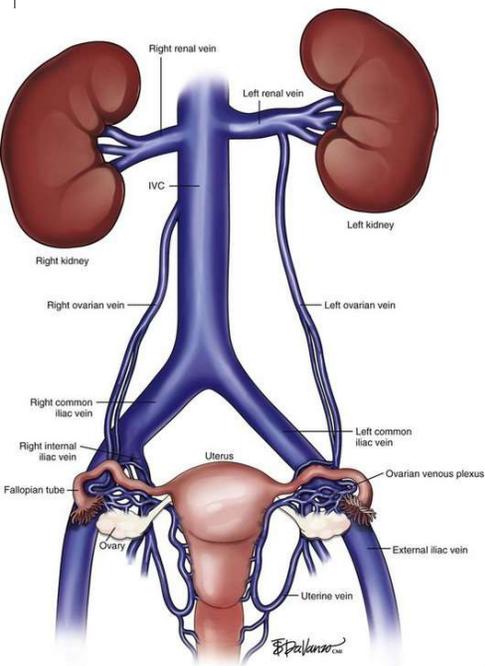
- It begins opposite the upper part of greater sciatic foramen
- It ends at pelvic brim by joining the external iliac vein to form the common iliac vein
- It receives veins similar to the branches of internal iliac artery except the iliolumbar vein which ends in the common iliac vein.



- 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**

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# Nerves of Pelvis

## Somatic

Sacral  
plexus

Coccygeal  
plexus

## Autonomic

Sympathetic  
Sacral  
sympathetic  
trunks

Parasympathetic  
Pelvic splanchnic  
nerve arising from  
S2, S3, S4

## **Sacral plexus**

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

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

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

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

It join inferior hypogastric plexus.

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

it is the somatic nerve of the perineum.

**4- 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.

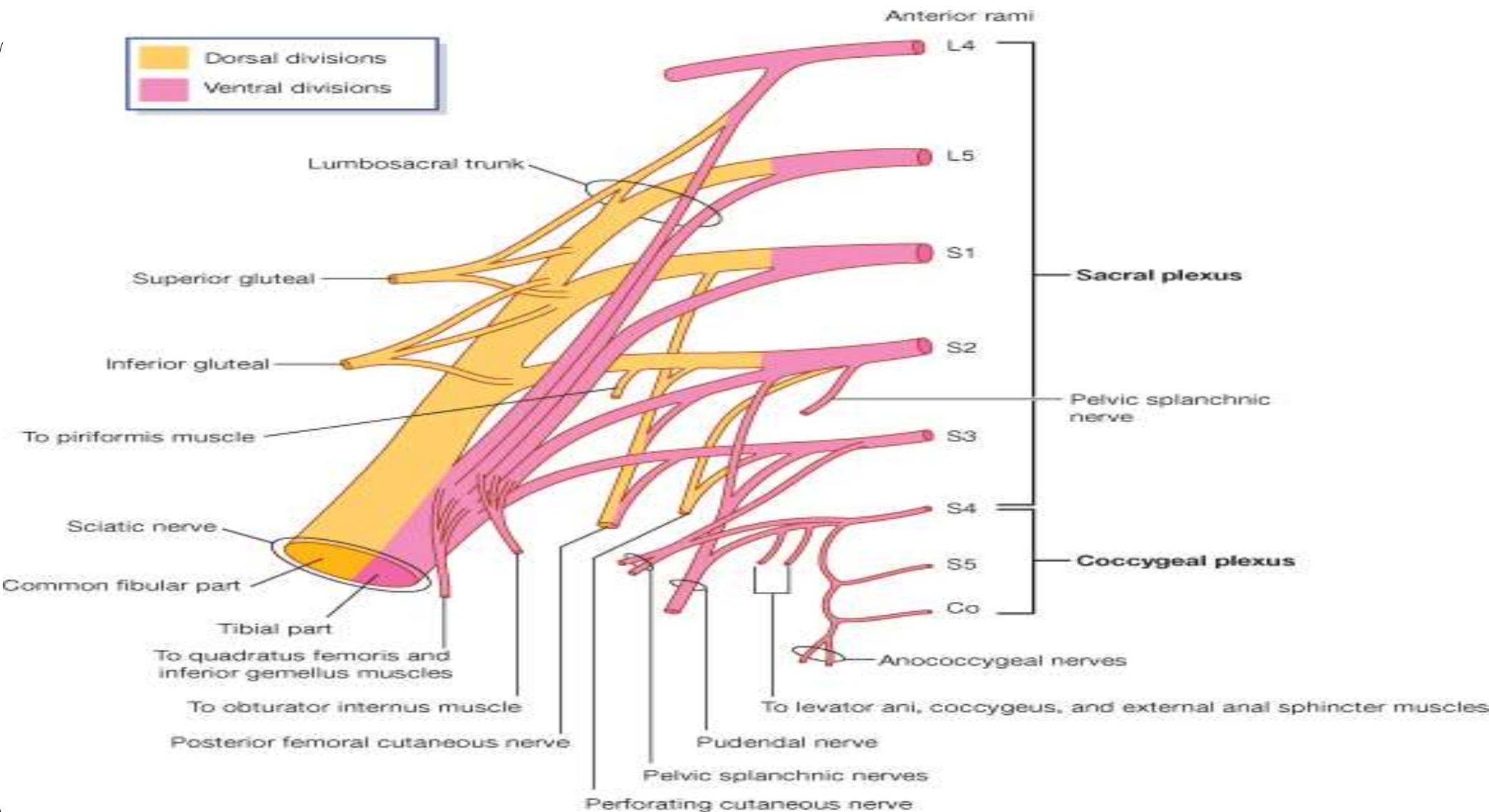
## **The Coccygeal Plexus**

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.



# Autonomic plexuses of pelvis <sup>A</sup>

## 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**

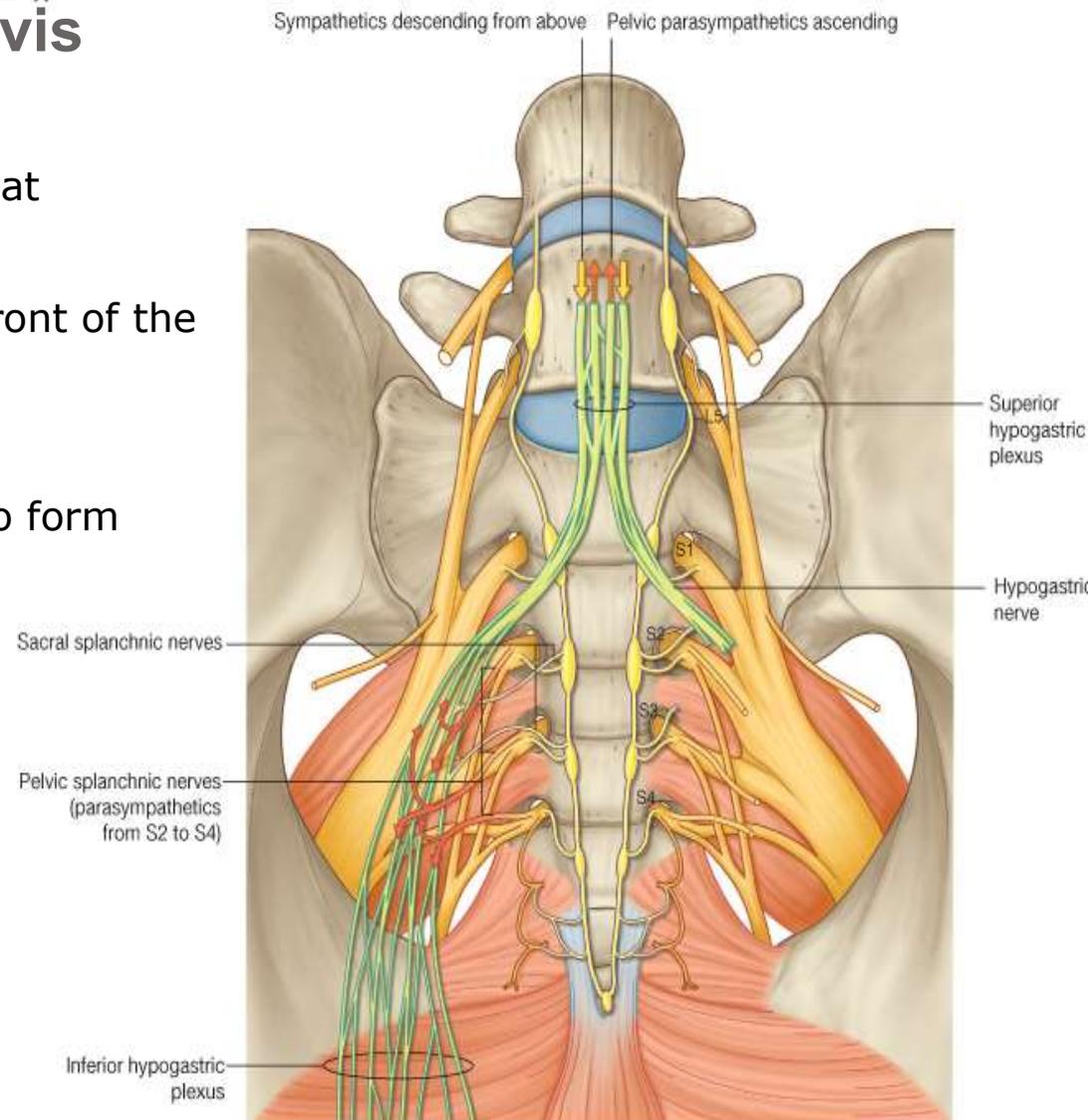
#### • **Branches**

#### ✓ **Grey rami communicantes :**

Join the sacral, coccygeal nerves for distribution to the blood vessels, sweat glands and erector pilae muscles.

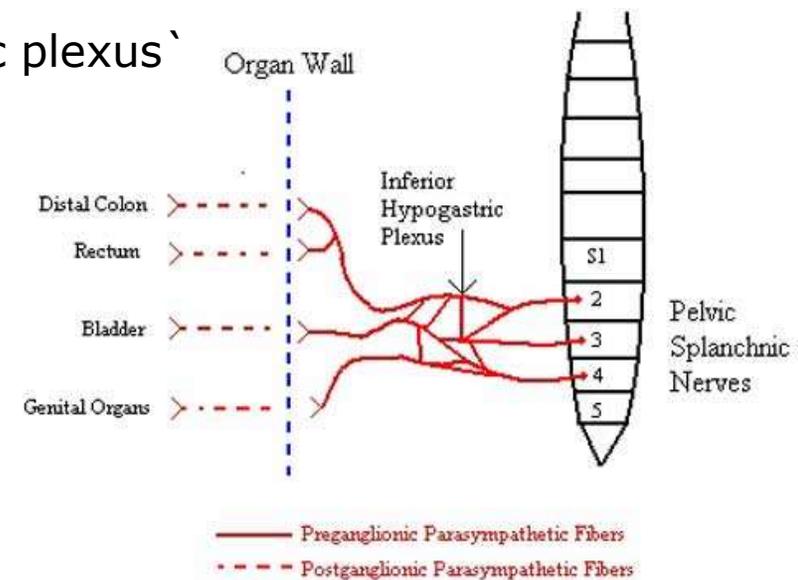
#### ✓ **Visceral branches :**

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`



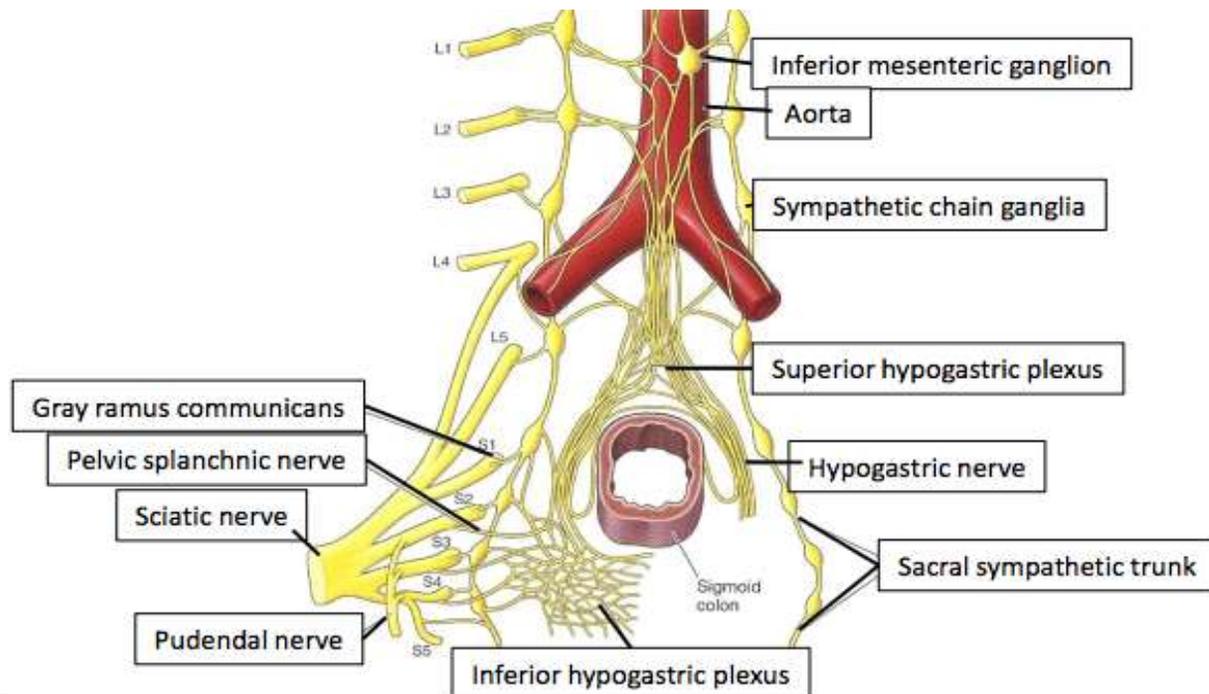
## Superior Hypogastric Plexus

**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:

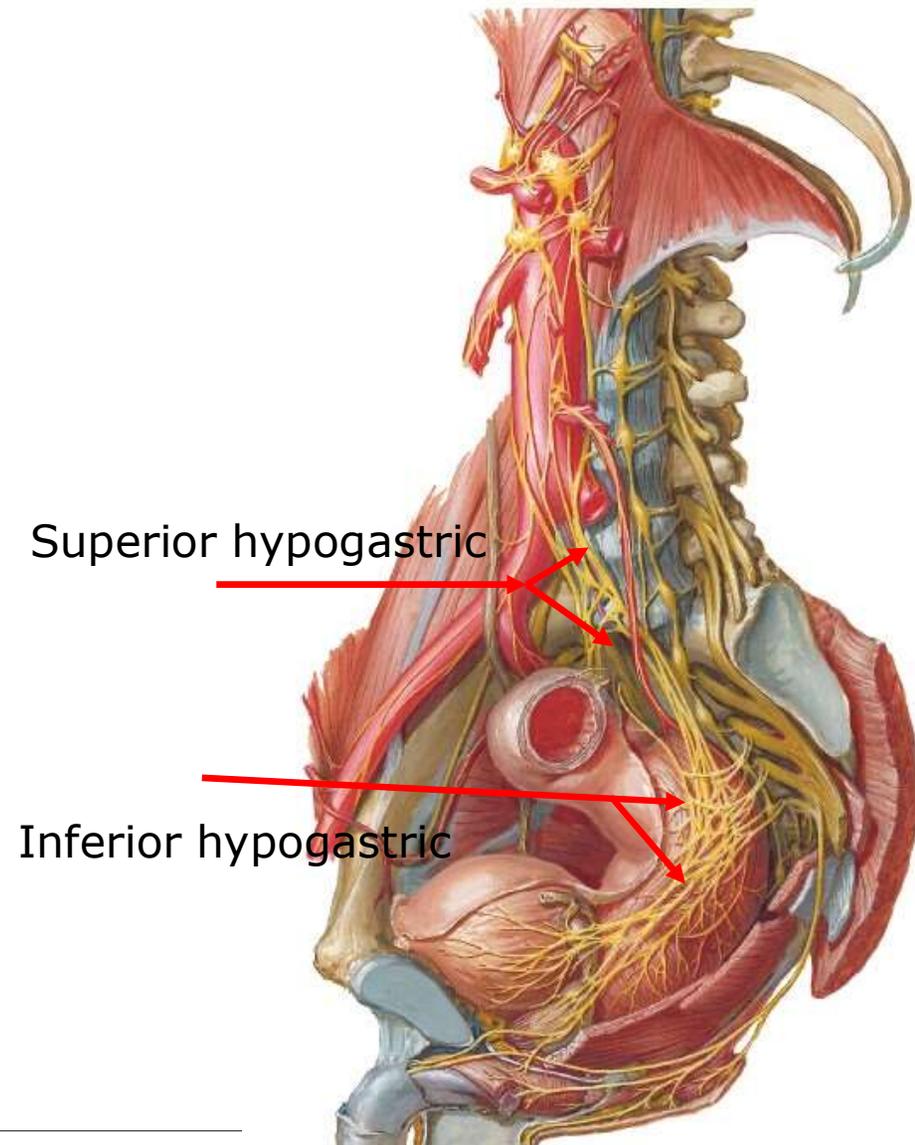
#### 1- Parasympathetic contribution

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 (parasympatbetic)

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).

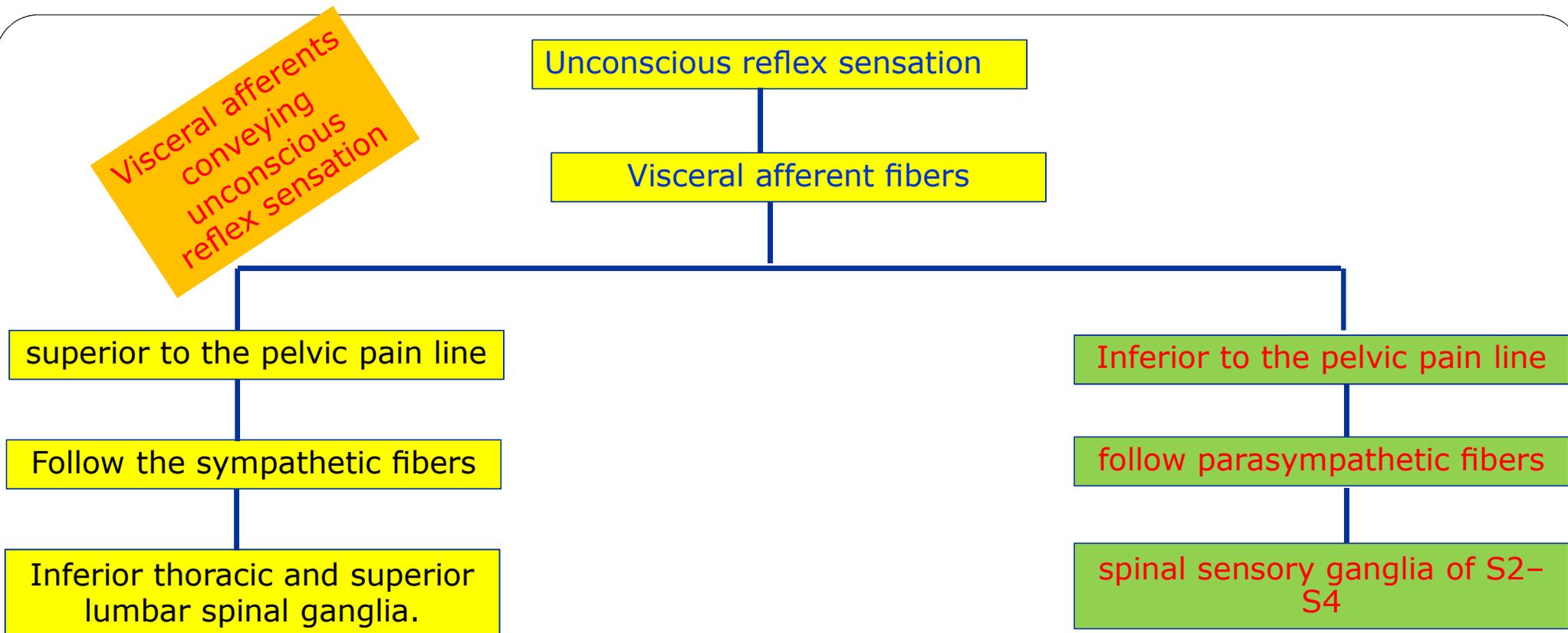
Corpora cavernosa, corpus spongiosum (for erection).

***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

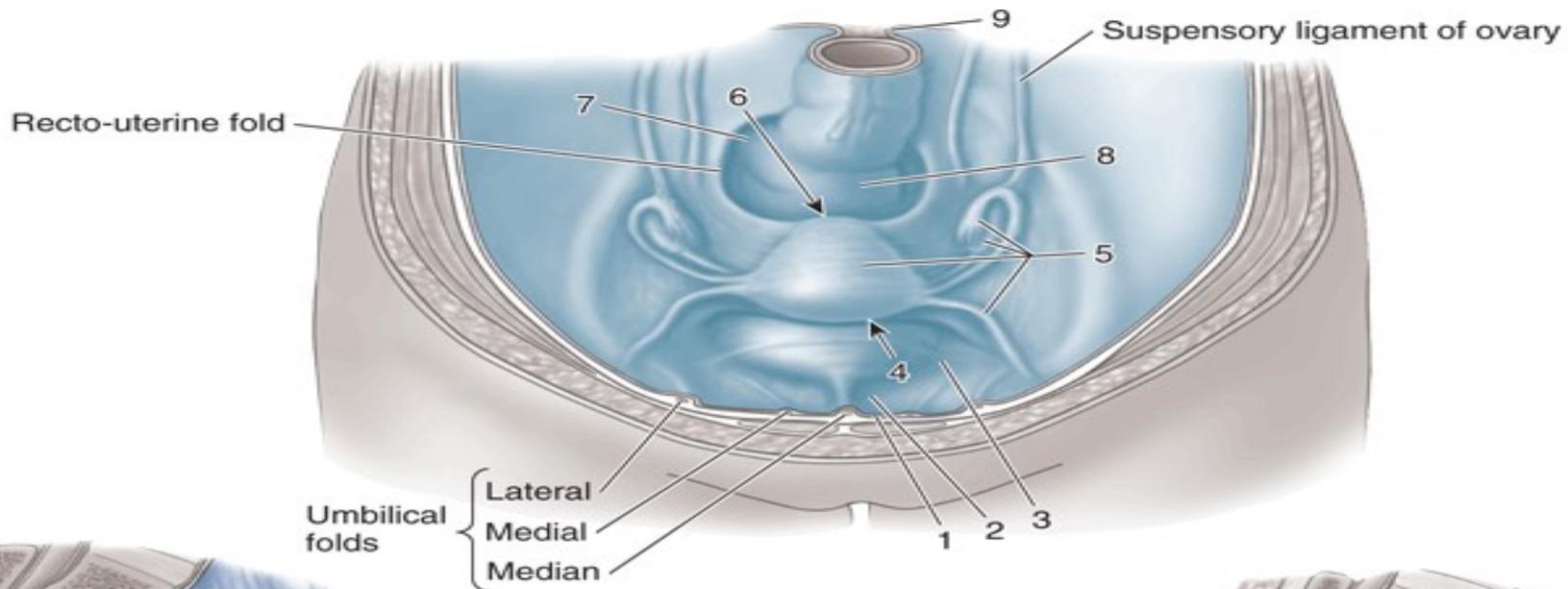


**Superior to the pelvic pain line :**

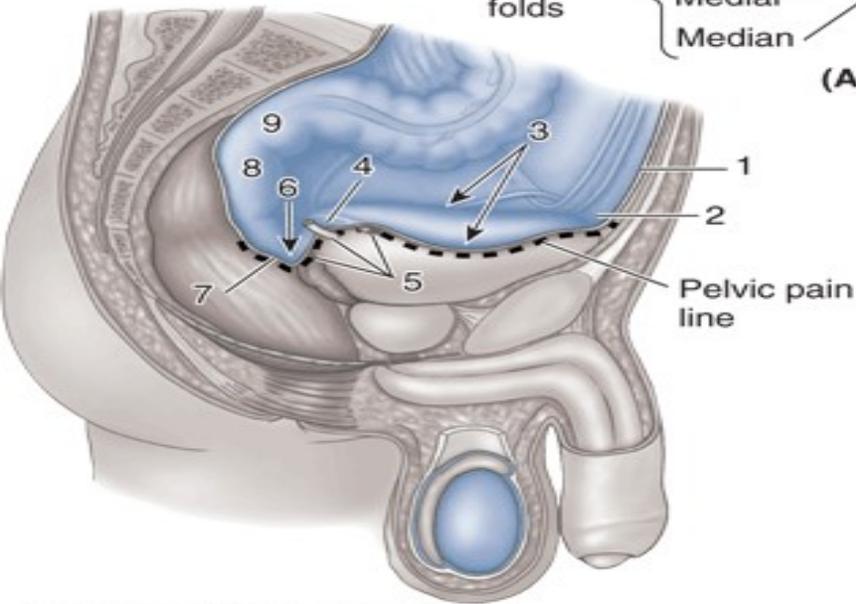
structures in contact with the peritoneum, except for the distal sigmoid colon and rectum

**Inferior to the pelvic pain line**

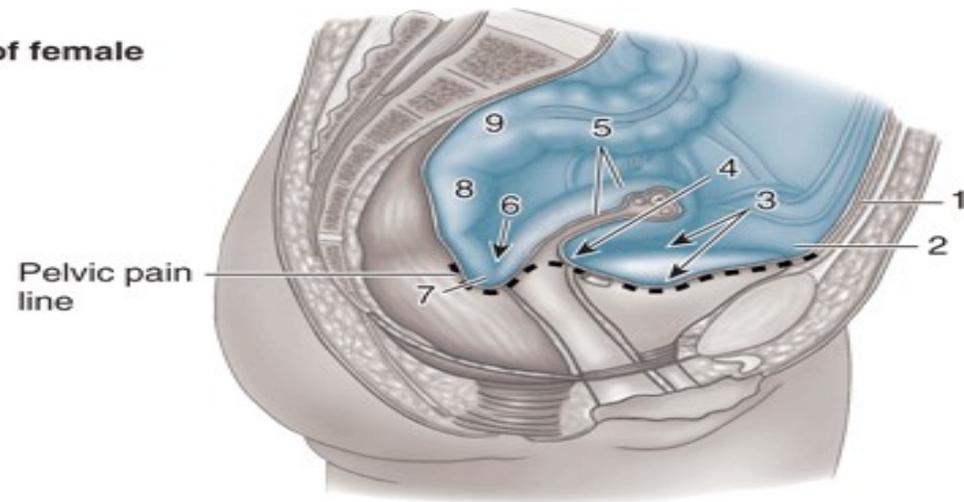
structures that do not contact the peritoneum plus the distal sigmoid colon and rectum



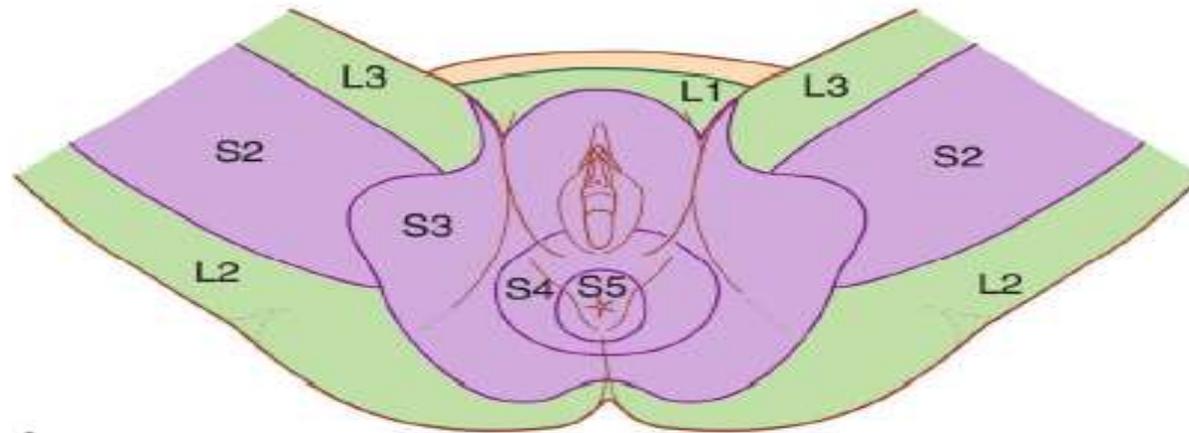
(A) Anterior view of female



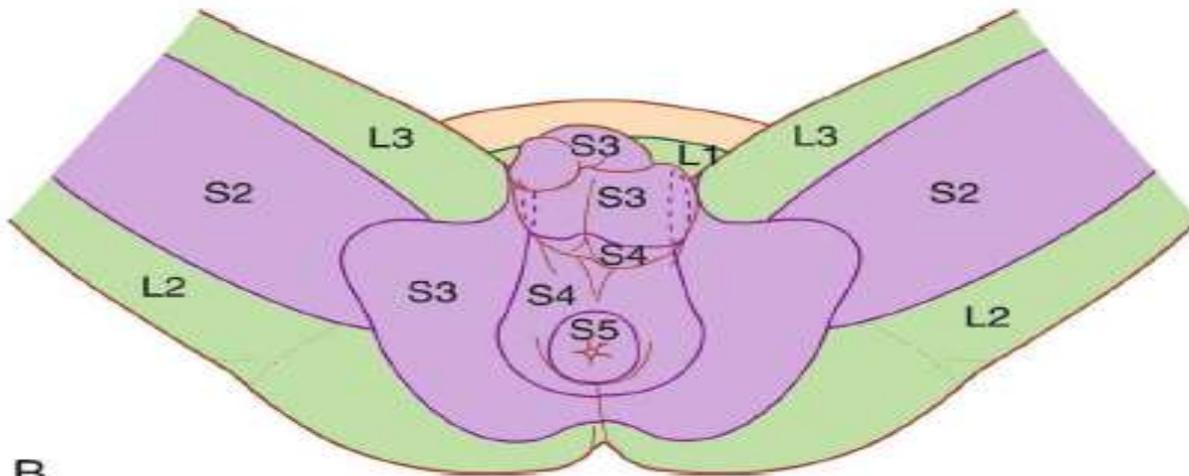
(B) Right lateral view of male



(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

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- ❑ 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

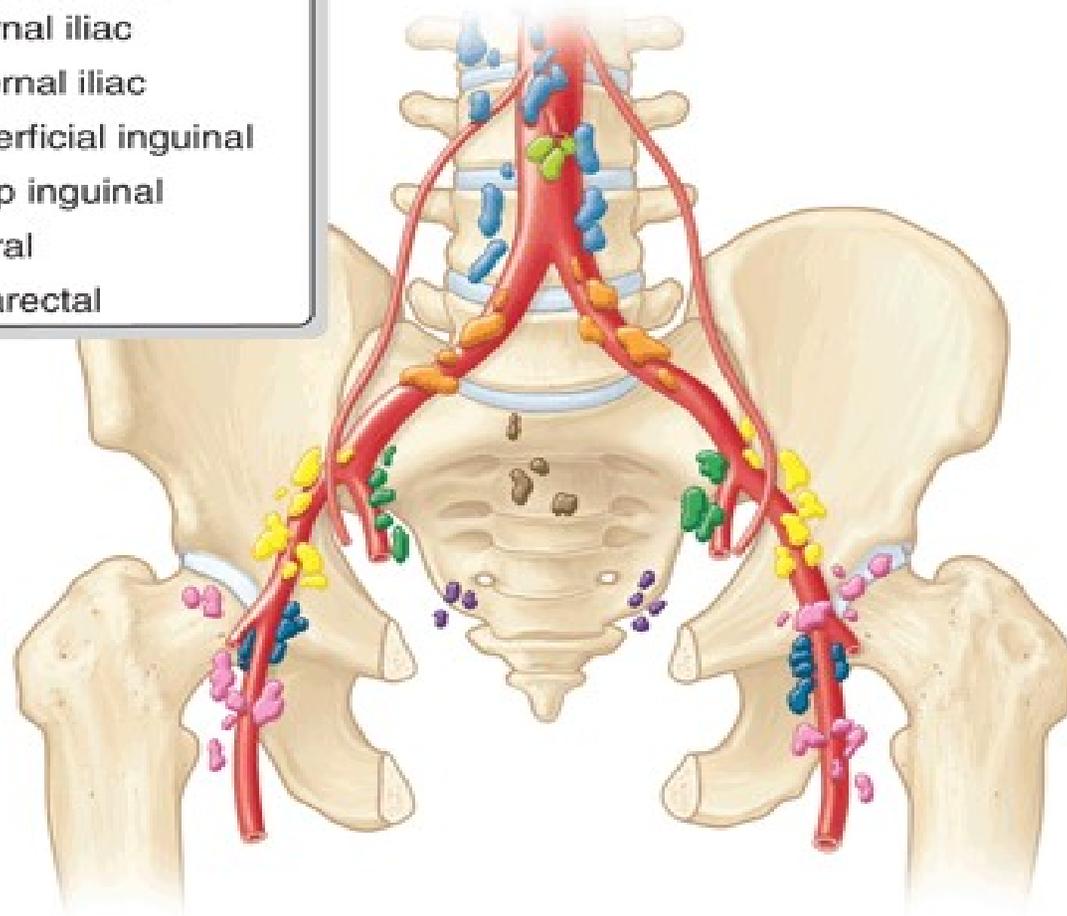
**Internal Iliac Lymph node**  
Close to internal iliac vessels

**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.

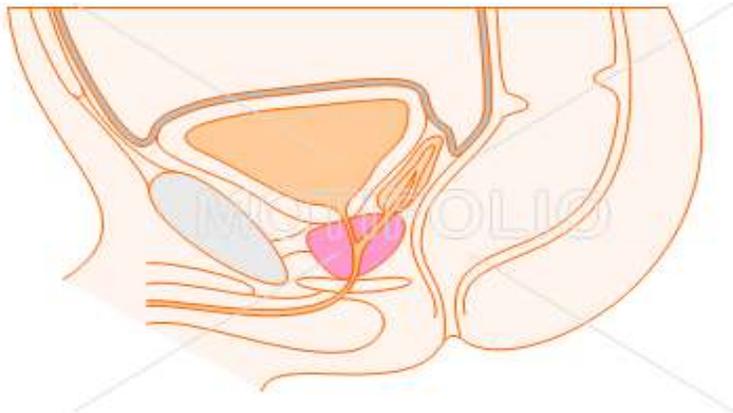
**2- In the male,** the peritoneum cover upper part of the fundus and upper surface of urinary bladder and then is reflected on to the anterior abdominal wall.

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 **utero-vesical poche**, then to anterior abdominal wall.

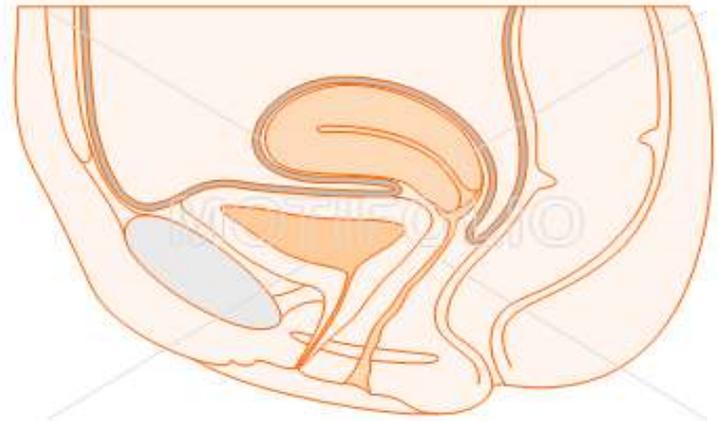
Peritoneum covering male pelvic organs



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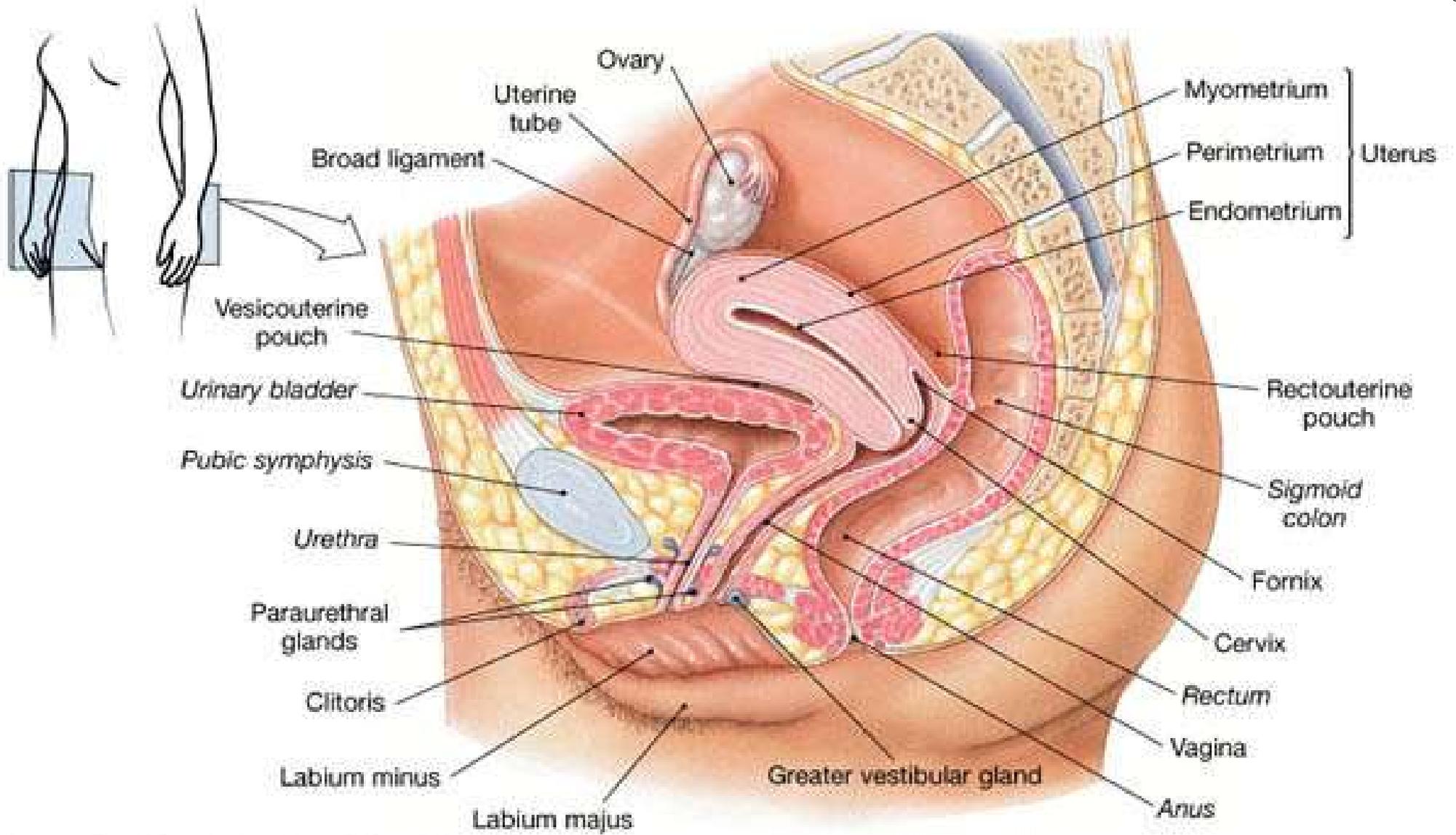
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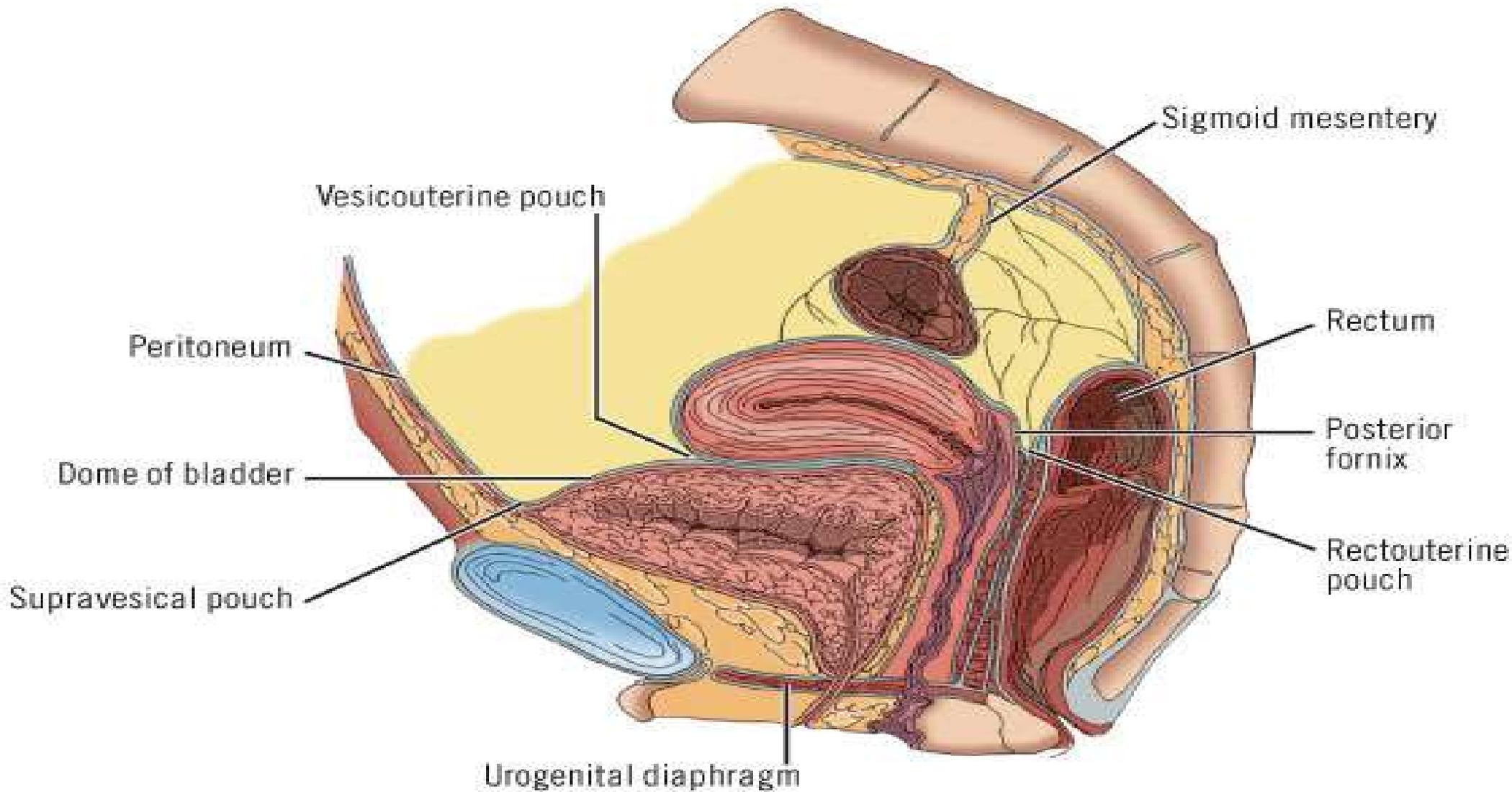
Peritoneum covering female pelvic organs



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