



## Anatomy

● Sheet

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number

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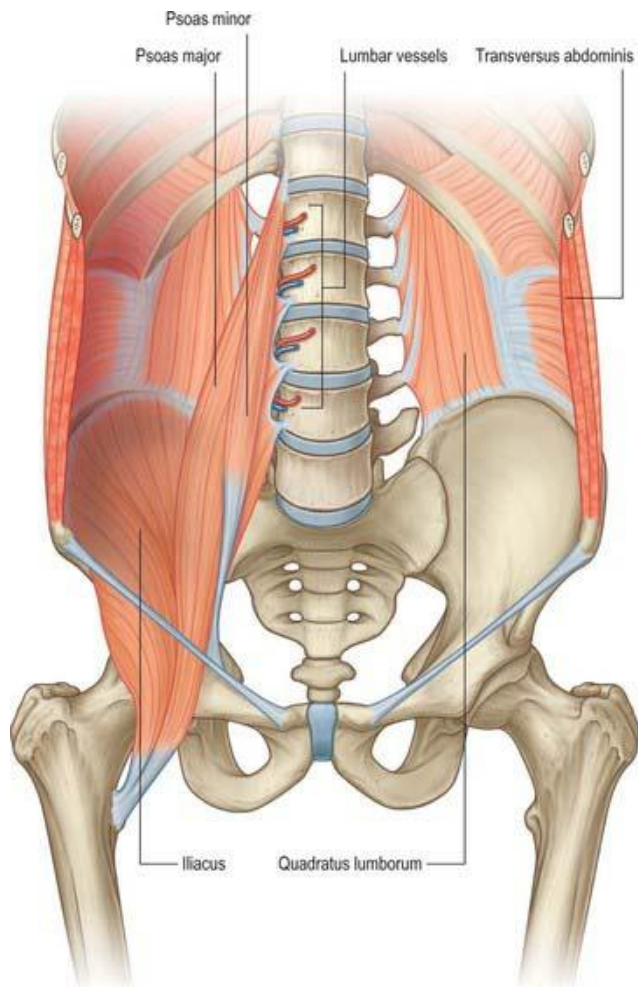
Mohammad Al- Muhtaseb

In this lab, we are going to discuss the **posterior abdominal wall**, and here are the main points of the lecture:

- Muscles of posterior abdominal wall
- Abdominal Aorta and its branches
- Inferior Vena Cava and its tributaries
- Related nerves and sympathetic chain

### **Muscles of posterior abdominal wall (On both sides, left and right):**

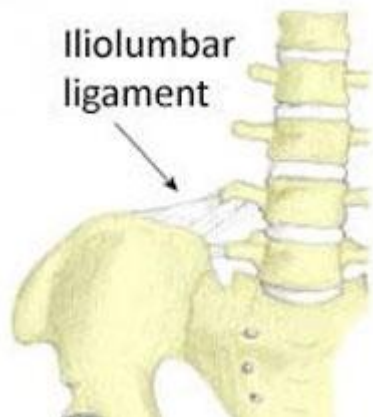
Muscle	Origin	Insertion	Nerve supply	Action
Iliacus	Iliac fossa	The two muscles insert together on lesser trochanter of femur	Femoral nerve	Flexes the thigh at hip joint
Psoas major	Bodies and transverse processes of lumbar vertebra L1-L4		Anterior rami of T12,L1, L2,L3	Flexes the thigh at hip joint
Psoas minor <i>*sometimes absent*</i>	Bodies of T12 and L1 vertebra	Pectineal line and iliopubic eminence	Anterior rami of L1	Flexion of lumbar vertebral column
Quadratus Lumborum	Iliolumbar ligament and iliac crest	T12 and transverse processes of L1-L4	Anterior rami of T12,L1, L2,L3,L4	Depresses and stabilizes 12 <sup>th</sup> rib during respiration and bends the trunk laterally
Transversus Abdominis (Direction is from backward to lateral)	Thoracolumbar fascia, anterior two thirds of iliac crest, lateral third of inguinal ligament, inner surface of lower six costal cartilage	Xiphoid process, Linea alba, symphysis pubis	Anterior rami of T6-T12,L1	Compresses abdominal content



Notes:

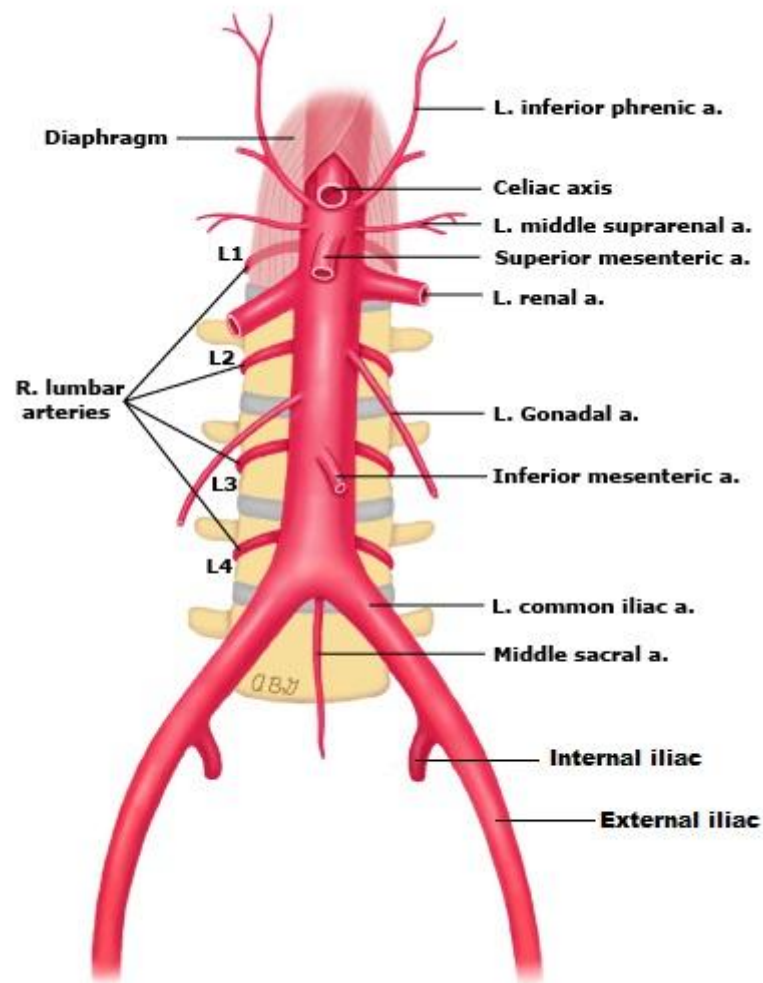
- Quadratus Lumborum is behind the **kidney**

- At the middle of the posterior abdominal wall are the five **lumbar vertebrae** and their intervertebral discs



**Iliolumbar ligament** is a structure in the posterior abdominal wall that attaches iliac crest with lumbar vertebrae so it stabilizes iliosacral joint

## Abdominal Aorta:



- Starts from an orifice in the diaphragm (Aortic orifice) at the level of T12 and at the midline
- On the left side of lumbar vertebra (left to inferior vena cava)

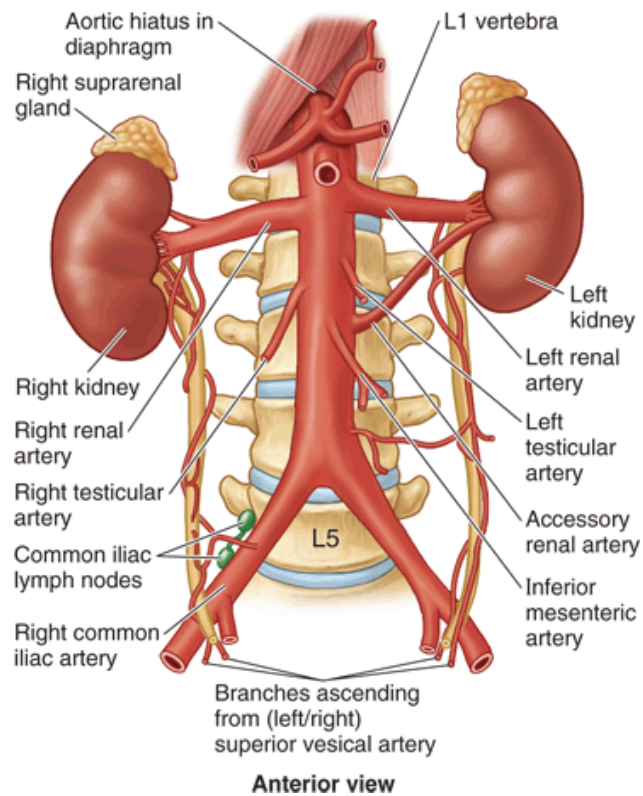
### Branches of abdominal aorta→

- **Single anterior branches:**
  - Celiac trunk: between T12 and L1
  - Superior mesenteric: between L1 and L2
  - Inferior mesenteric: at the level of L3
- **Paired arteries** (one on the right and one on the left):

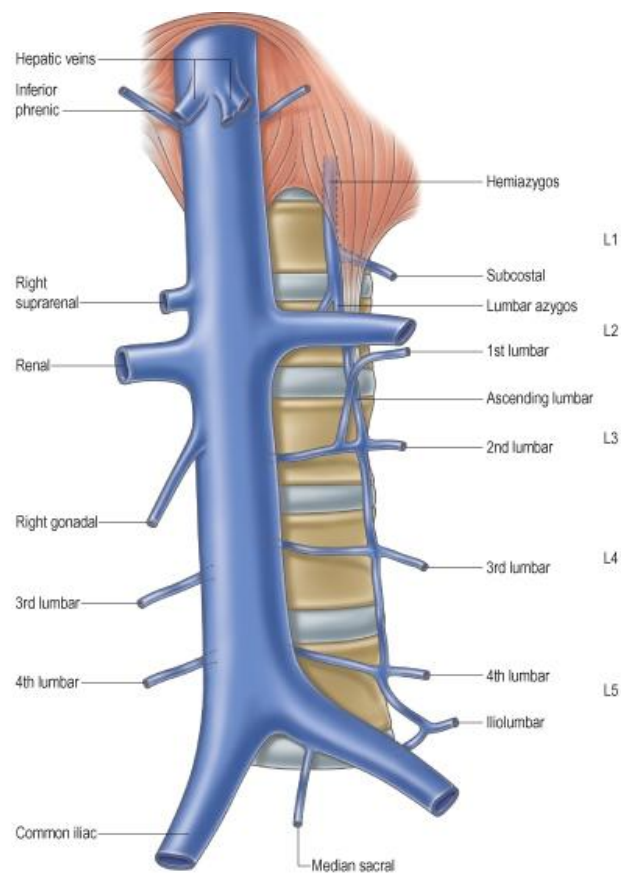
- Renal arteries: At the level of L2. Since the abdominal aorta is on the left side (closer to the left kidney) and the inferior vena cava is on the right side, crossing occurs and one branch is longer than the other. In other words, the left renal vein passes in front the abdominal aorta, and it is longer than the right renal vein which is not related to the renal artery. On the other hand, the right renal artery is longer and it passes behind inferior vena cava.  
Renal artery is deep to the renal vein.
- Gonadal arteries: testicular in males and ovarian in females, also at the level of L2→ at the same level of renal vessels.

The right testicular vein heads towards the vena cava, while the left testicular heads to the renal branches.

- Lumbar arteries: 4 paired at each side posteriorly reach close to the lumbar vertebrae.
  - Phrenic: at the level of L1, to diaphragm.
  - Suprarenal: also at the level of L2, to suprarenal glands
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- Before ending it gives a single branch; median sacral artery from its posterior surface
  - The abdominal aorta ends at the level of L4 (left to the midline) by giving the two terminal branches; left and right common iliac arteries:
    - Each artery of the common iliac bifurcates into internal and external iliac arteries
    - The ureters cross the bifurcations of common iliac arteries on both sides.
    - Branches of internal iliac artery are: obturator artery (accompanies obturator nerve), pudendal artery (accompanies pudendal nerve in pudendal canal), and superior & inferior gluteal arteries.



## Inferior Vena Cava:



- Starts at the level of L5 to the right from midline by union of right and left common iliac veins (lower than the end of abdominal aorta)

*Common iliac arteries are superficial to common iliac veins. This is opposite to the general rule in body vessels where veins are superficial to arteries. (especially in the pelvis)*

- Ascends at the right of abdominal aorta, passes behind the liver and ends at the level of T8 and enters directly the right atrium.
- **Paired tributaries:**
  - Renal veins: remember, renal artery is deep to the vein. Left renal vein crosses abdominal aorta anteriorly and it's longer than the right.
  - Gonadal veins: In males, right testicular vein drains directly into Inferior Vena Cava while left testicular vein drains into left renal vein.
  - Lumbar veins
- **Unpaired tributaries:**
  - Hepatic veins: Left, middle, and right. They drain blood from the liver to Inferior Vena Cava

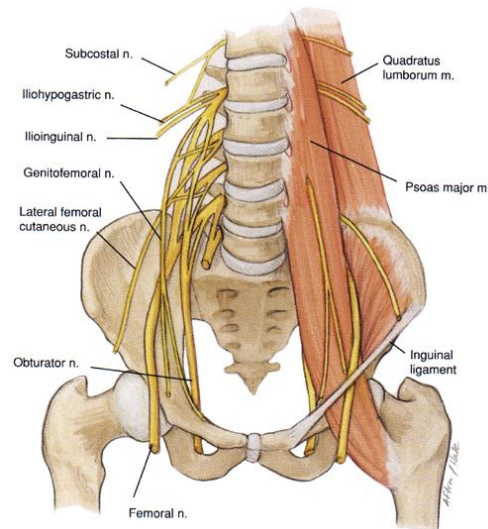
Note: Portal vein goes to the liver and has nothing to do with Inferior Vena Cava.

### **Nerves of posterior abdominal wall:**

- Three nerves originate and pass behind the kidneys:
  - The first is nerve is the subcostal; it is below the last rib (12<sup>th</sup>).
  - Then ilioinguinal and iliohypogastric nerves which originate from **L1**.
- Lateral cutaneous nerve of the thigh: goes to anterior superior iliac spine.
- Femoral nerve: clearly large nerve at the lateral border of psoas major muscle.

*Ilioinguinal, iliohypogastric, lateral cutaneous, and femoral nerves (arranged from superior to inferior) are all **lateral** to psoas major.*

- Genitofemoral nerve: arises within the substance of psoas major muscle at its **anterior** surface.
- Obturator nerve: At the **medial** side of psoas major and goes to obturator foramen.
- Lumbosacral trunk: Also at the **medial** side.



- **Sympathetic chain:** it is behind inferior vena cava at the right side; has ganglia 4 or 5 lumbar sympathetic ganglia on each side and they give off sympathetic fibers. Their preganglionic nerves come from lumbar spinal nerves L1-L2, and they synapse at the ganglia.

(Inferior mesenteric ganglia give off the superior rectal nerves and sigmoidal nerves.)



