ANATOMY

بسم الله الرحمن الرحيم

FINAL | Lecture 2

Posterior Abdominal Wall (Pt.1)

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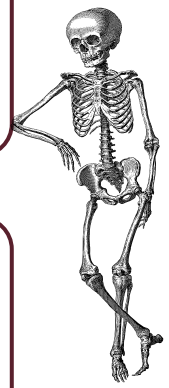


﴿ وَإِن تَتَوَلَّوْا يَسْتَبْدِلْ قَوْمًا غَيْرَكُمْ ثُمَّ لَا يَكُونُوا أَمْثَالَكُم ﴾

اللهم استعملنا ولا تستبدلنا

Dopamine ladies and gentlemen, hope this file finds you well,
in this file we focused on what is really important and valuable for both exam purposes and our level of knowledge, executing any junky info mentioned here and there.

Also, we replaced the majority of illustrations in the original files by more clear and illustrative figures that blend with the words, as the original ones are junky, worthless and causes migraine according to any mentally healthy person, and according to us being OK with these illustrations is a marked sign of psychological issues.

Wish you all the best, please be generous with your prayers and wishes for us.
A.A.A.

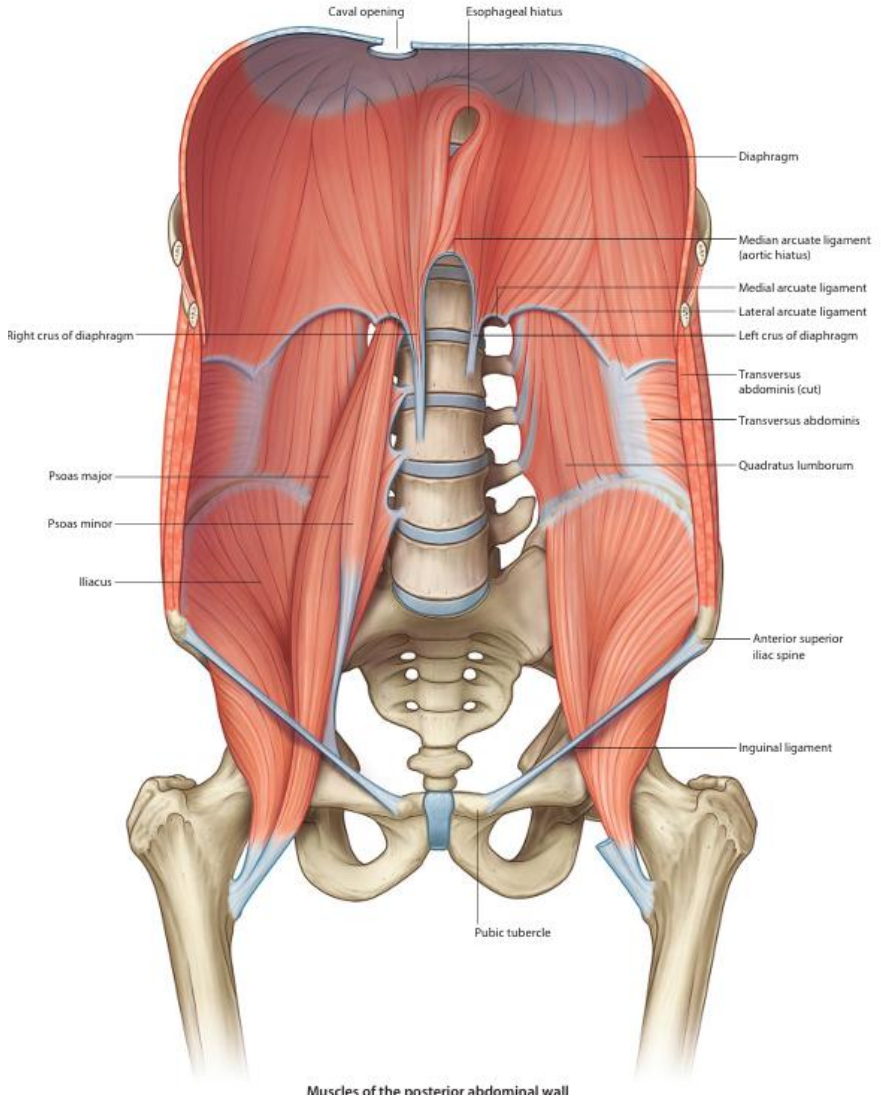
Posterior abdominal wall

1 – Structures

Posterior abdominal wall

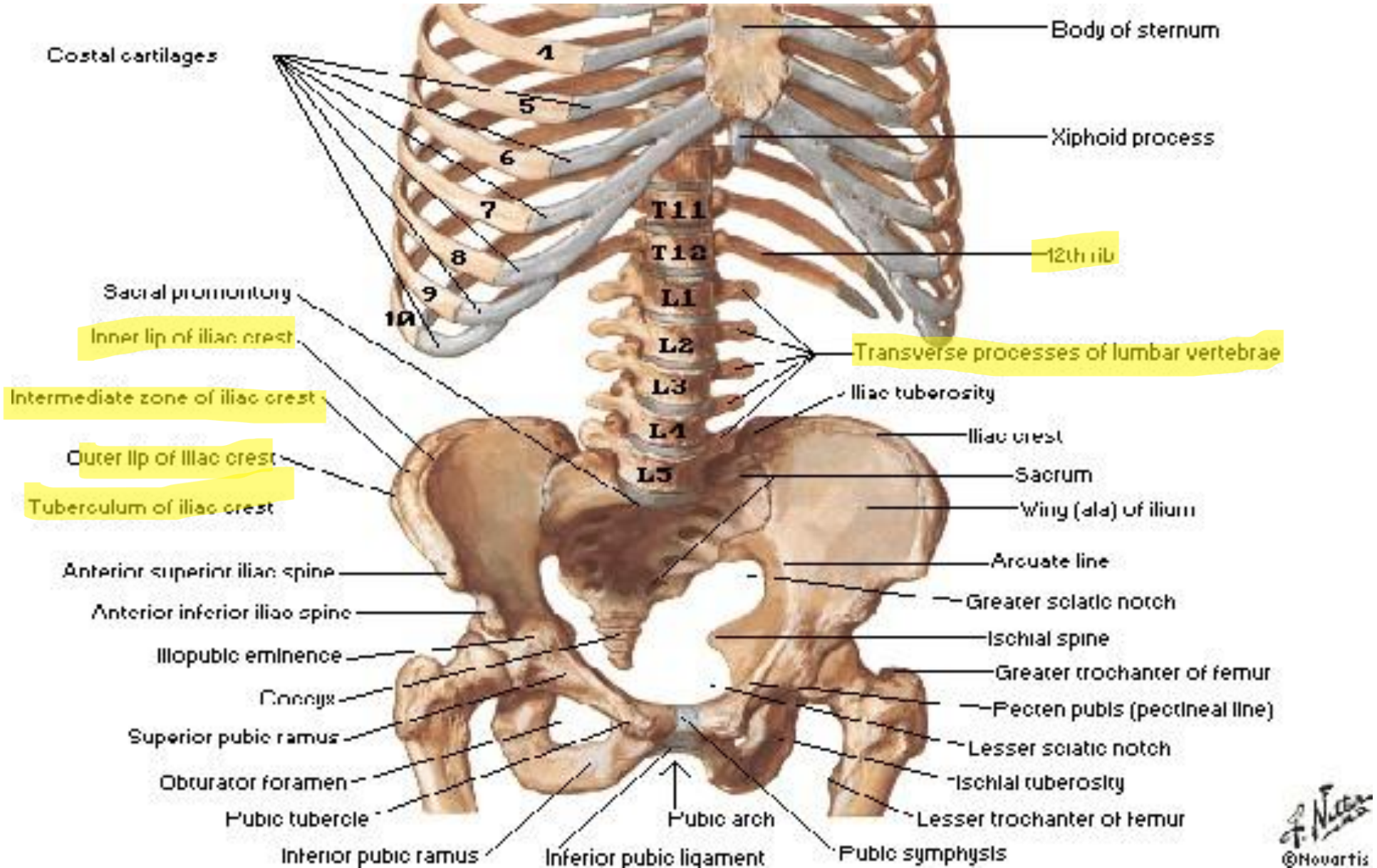
Structures of post. Abdominal wall:

- ✓ 5 lumbar vertebrae & their intervertebral discs
- ✓ 12th rib (last rib)
- ✓ Upper part of the bony pelvis (especially iliac crest)
- ✓ <u>Muscles:</u>
  1. Psoas major
  2. Psoas minor
  3. Quadratus lumborum
  4. Iliacus muscle, which lies in the iliac fossa
  5. Aponeurosis of transversus abdominis muscle



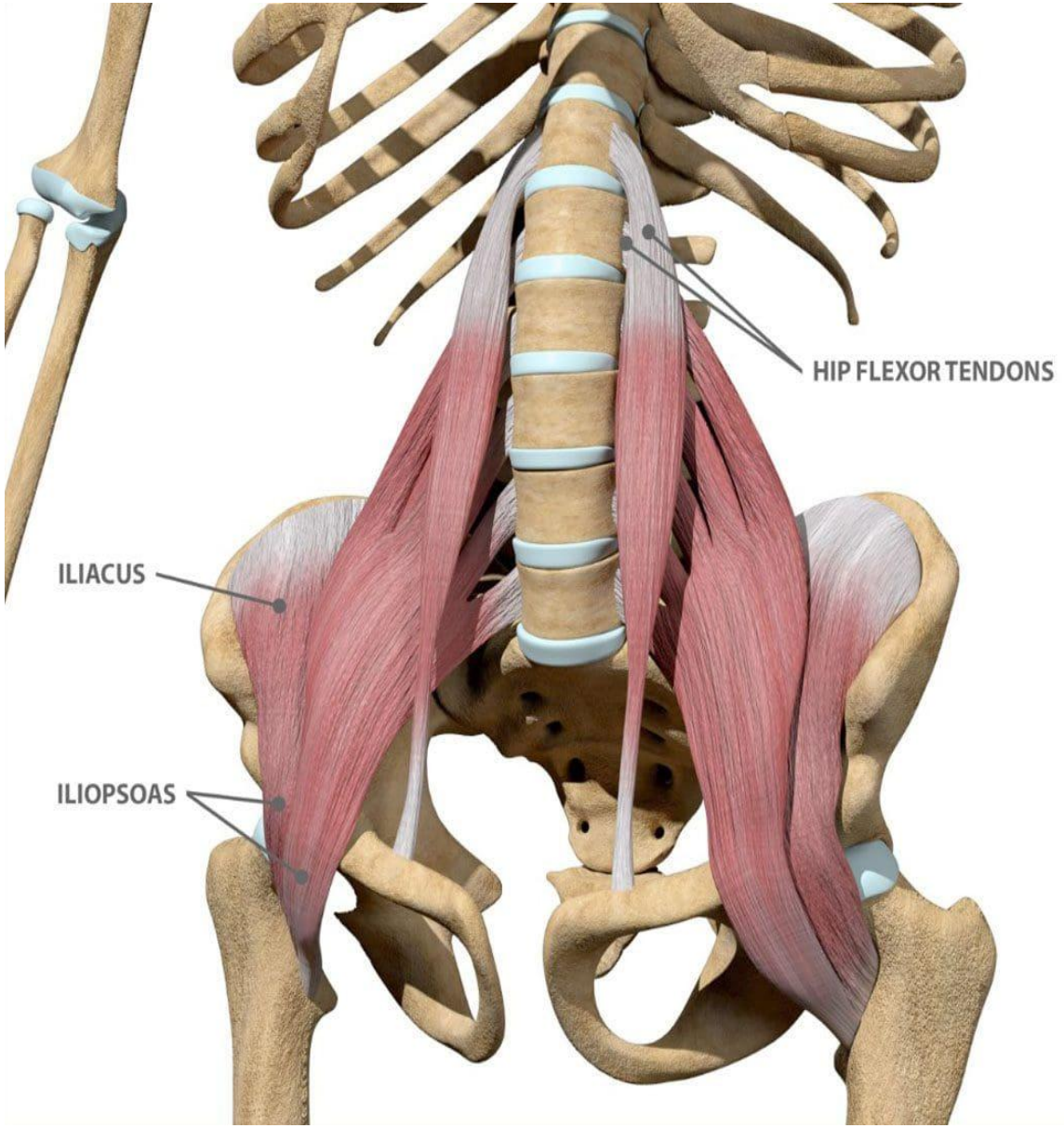
Muscles of the posterior abdominal wall

1 – Structures: Bony Framework



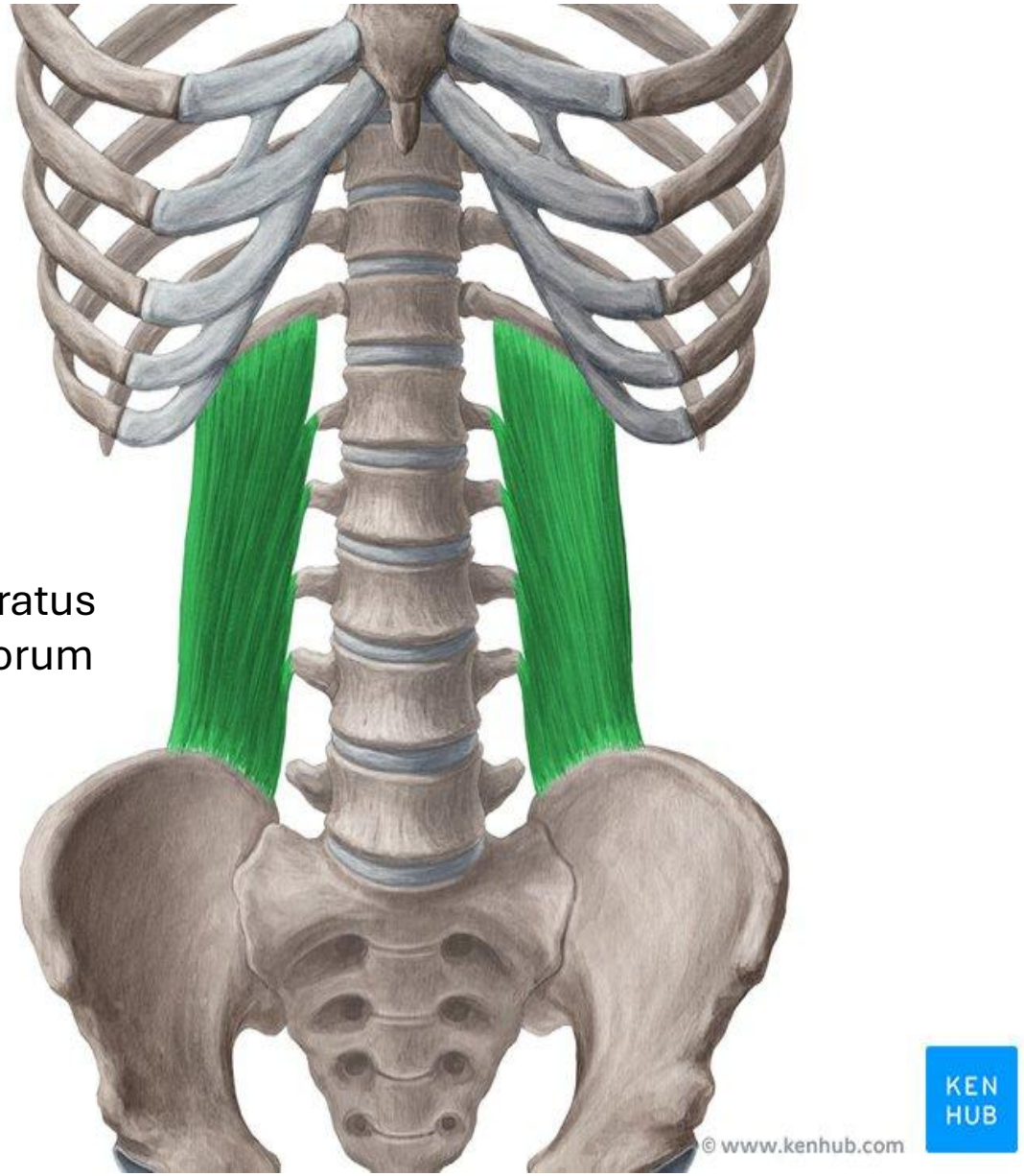
2 – Muscles

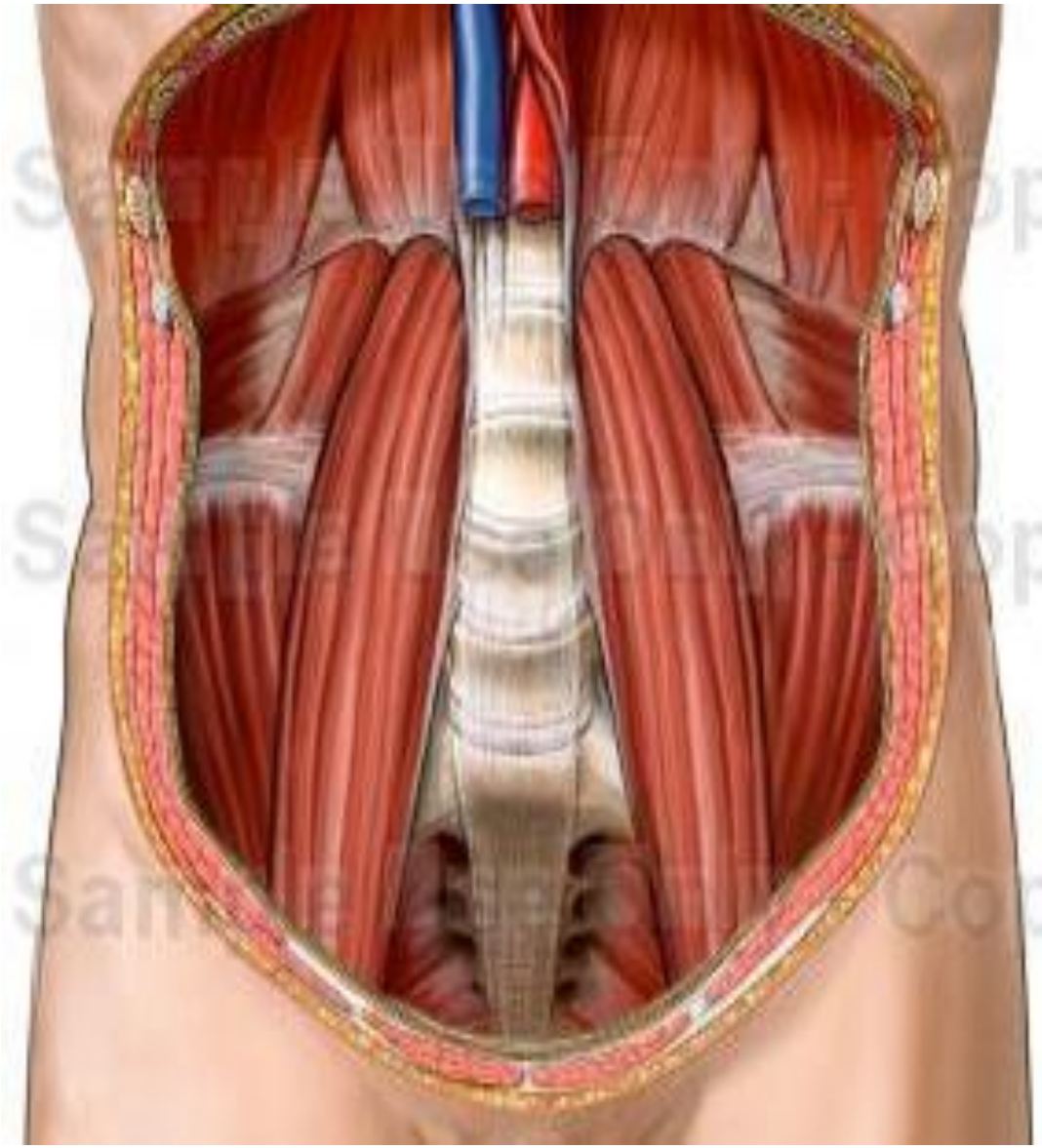
- ✓ <u>Psoas major:</u>
  - Origin: Body & transverse process of lumbar vertebrae & their intervertebral discs
  - Insertion: Lesser trochanter of femur
  - Nerve Supply: Nerve plexus (T12, L1, L2, L3)
  - Action:
    - 2 sides: bending forward
    - 1 side: bending towards that side
  - 😟 : It's prone to diseases, where an abscess occurs and tracks downward, reaching the pelvis.
- ✓ <u>Psoas minor:</u>
  - It may be absent

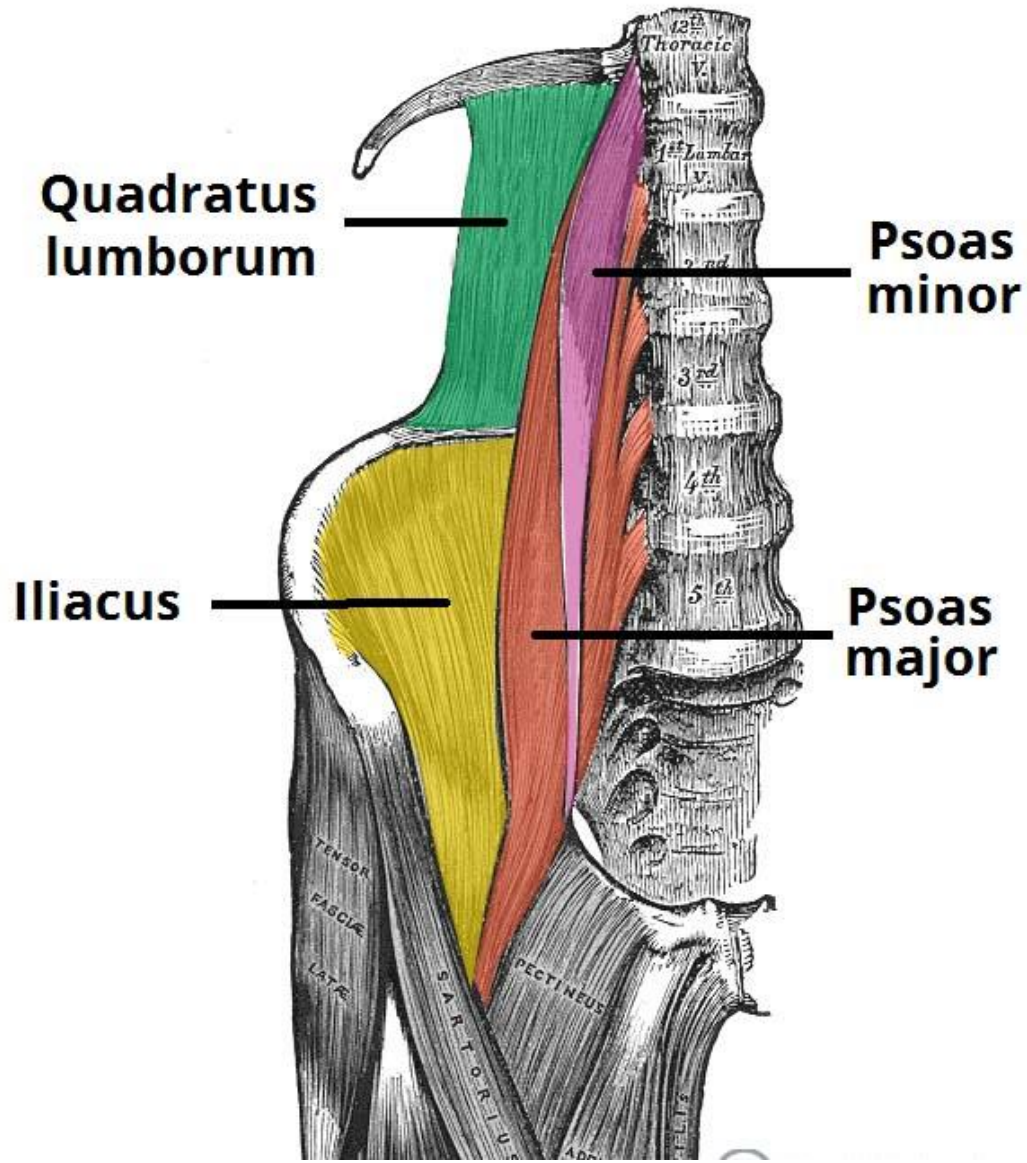


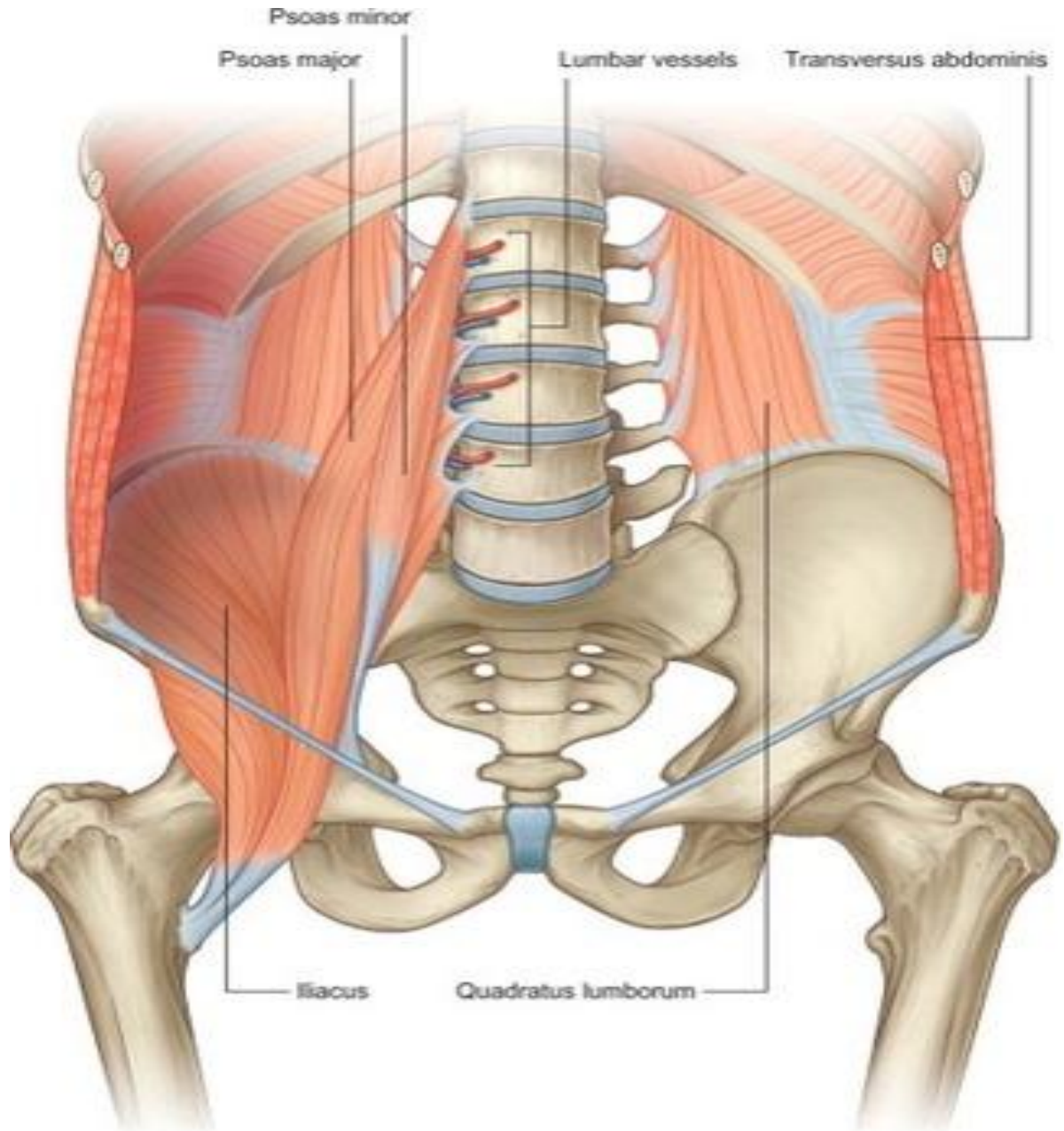
2 – Muscles

- ✓ <u>Quadratus lumborum</u>
  - Origin: Iliolumbar ligament & iliac crest
  - Insertion: 12th rib
  - Nerve Supply: Nerve plexus (T12, L1, L2, L3)
  - Action: Fix or depresses 12th rib during respiration & lateral flexion of the trunk
- ✓ <u>Iliacus muscle</u>
  - Origin: Iliac fossa
  - Insertion: Lesser trochanter of femur
  - Nerve Supply: Femoral nerve
  - Action: Lateral flexion of hip & thigh for lying position



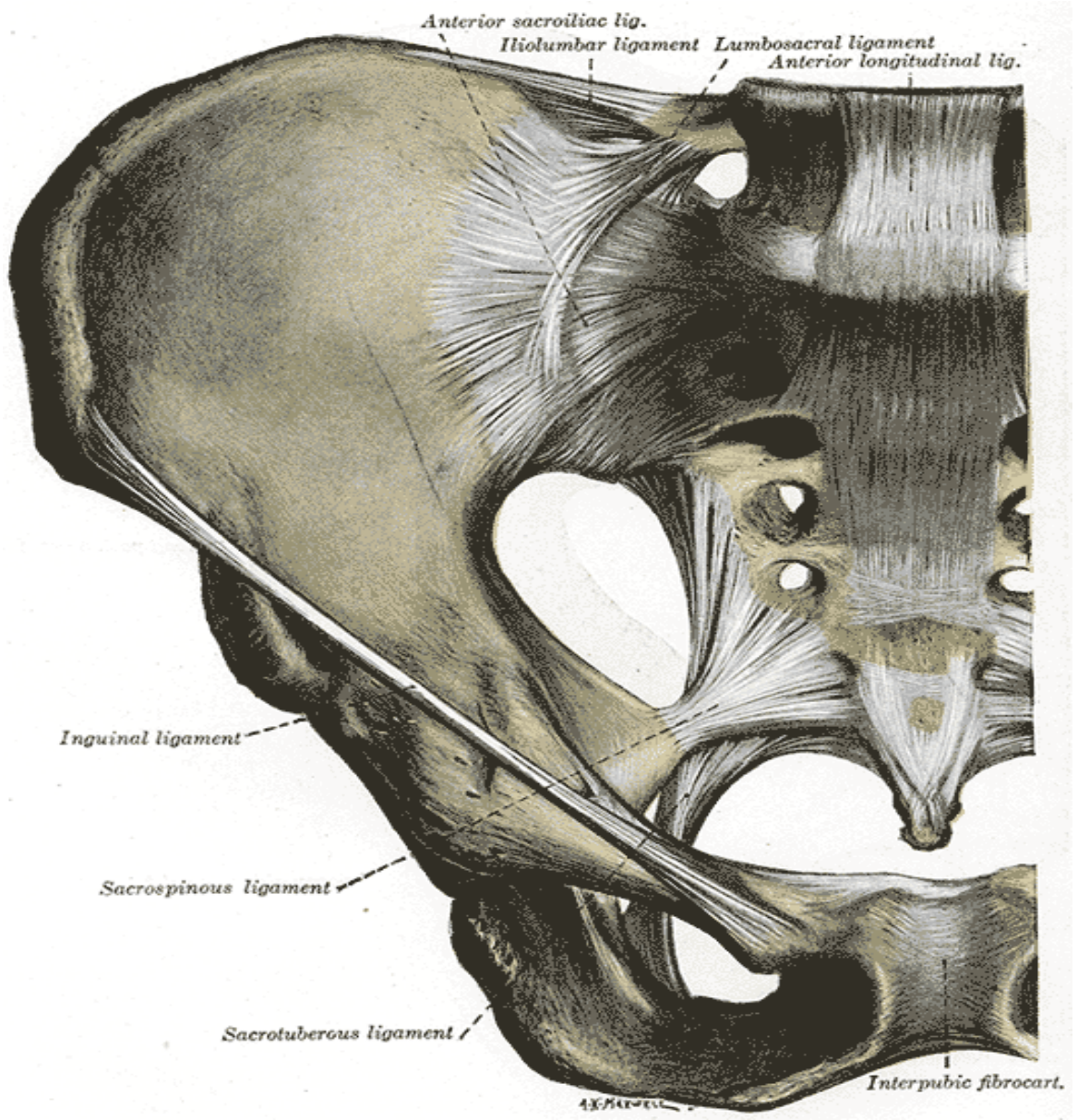



Quadratus lumborum
Psoas minor
Iliacus
Psoas major
12th Thoracic
1st Lumbar
2nd
3rd
4th
5th
TENSOR FASCIÆ LATÆ
SARTORIUS
PECTINEUS


Psoas minor
Psoas major
Lumbar vessels
Transversus abdominis
Iliacus
Quadratus lumborum

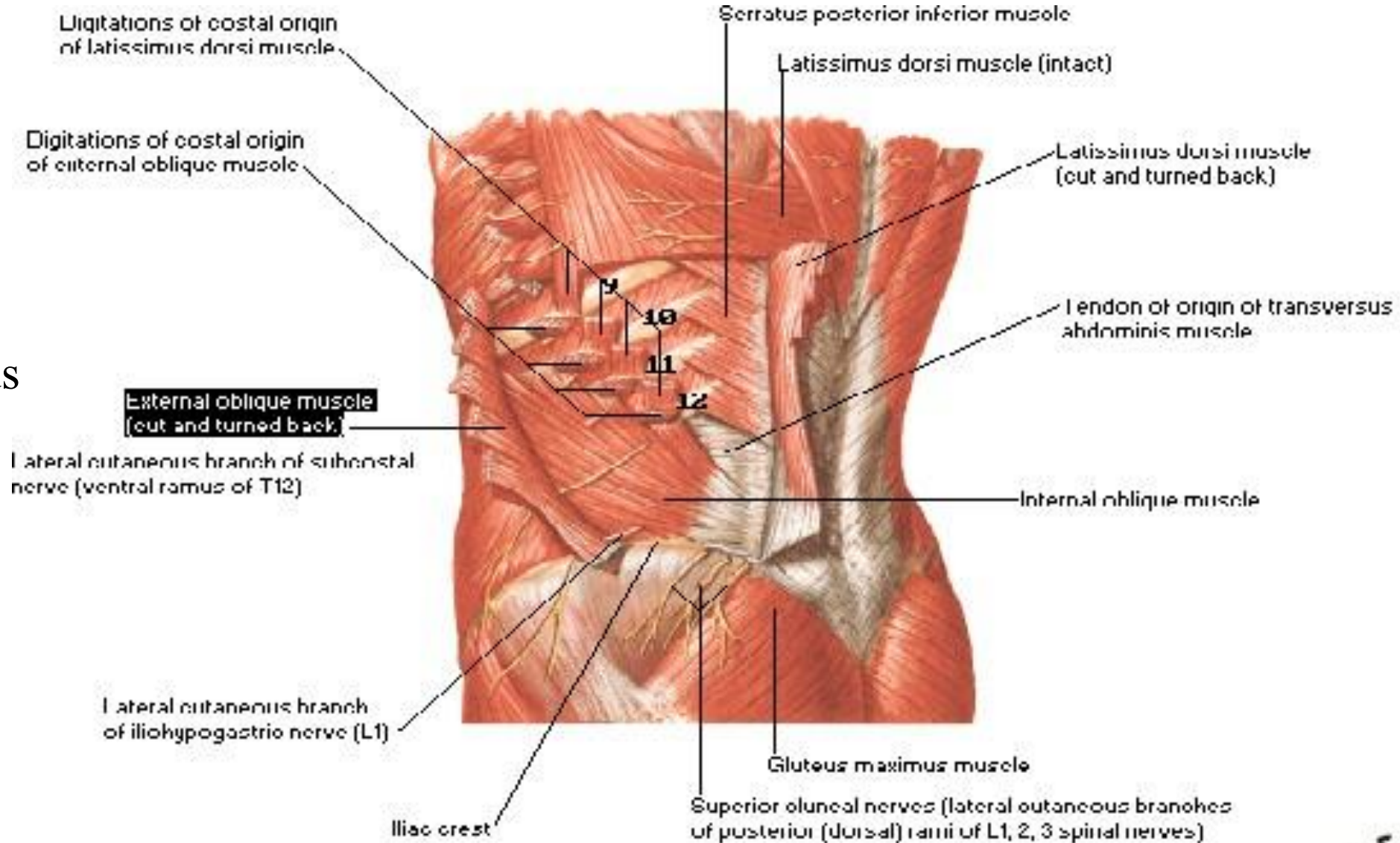
3 – Iliolumbar ligament

- ✓ The **Iliolumbar ligament :**
  - A strong ligament
  - Passing from the tip of the transverse process of the 5th lumbar vertebra → the iliac crest.
  - Giving origin for the <u>Quadrates Lumborum</u> muscle.



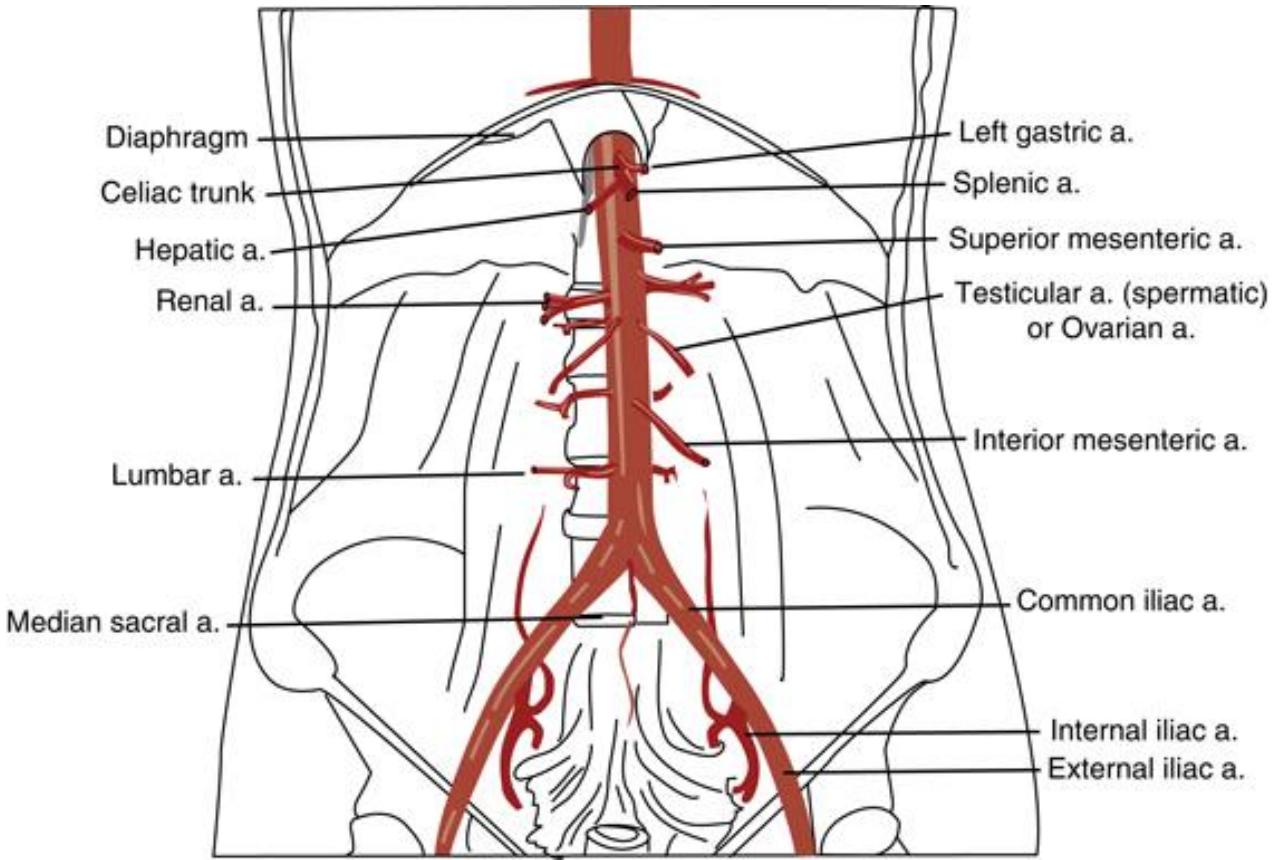
4 – Posterolateral Abdominal

Encompasses oblique muscles and transversus abdominus



5 – Abdominal Aorta: Course

- ✓ Posterior abdominal arteries all emerge from the abdominal aorta, which ends as the common iliac artery.
- ✓ **Course:**
  - Enters the diaphragm at the midline through the aortic opening, at the level of T12.
  - Descends behind the peritoneum on the anterior surface of the bodies of the lumbar vertebrae. It is **retroperitoneal**.
  - Ends at the level of the 4th lumbar vertebra, at the left side. It is just opposite to I.V.C., which starts at the level of 5th lumbar vertebra, to the right.



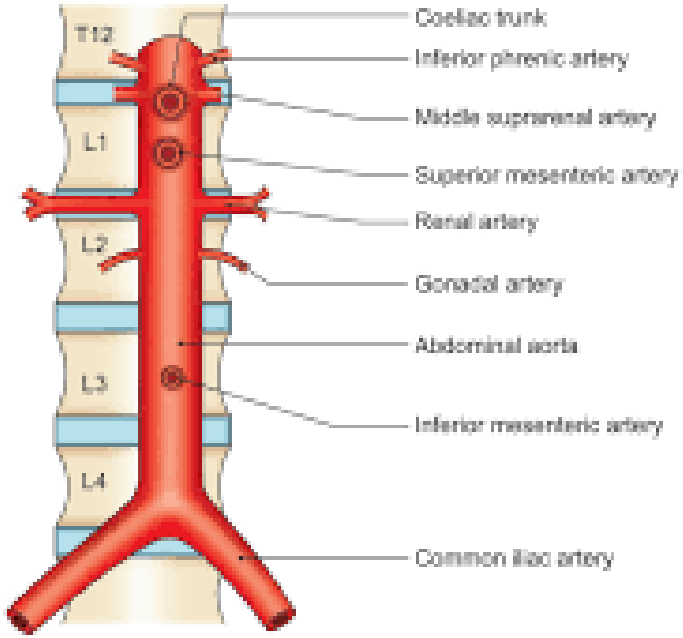
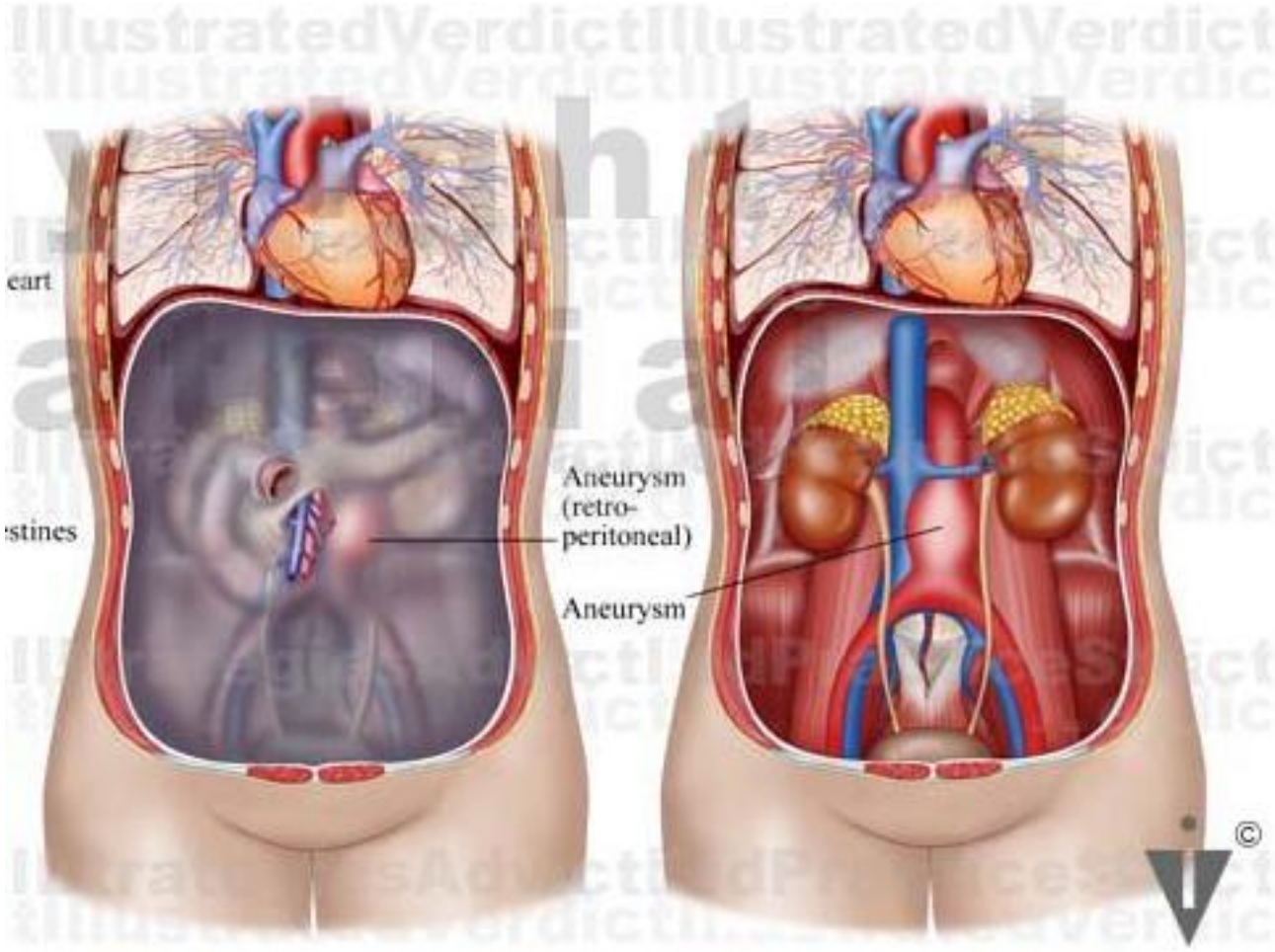
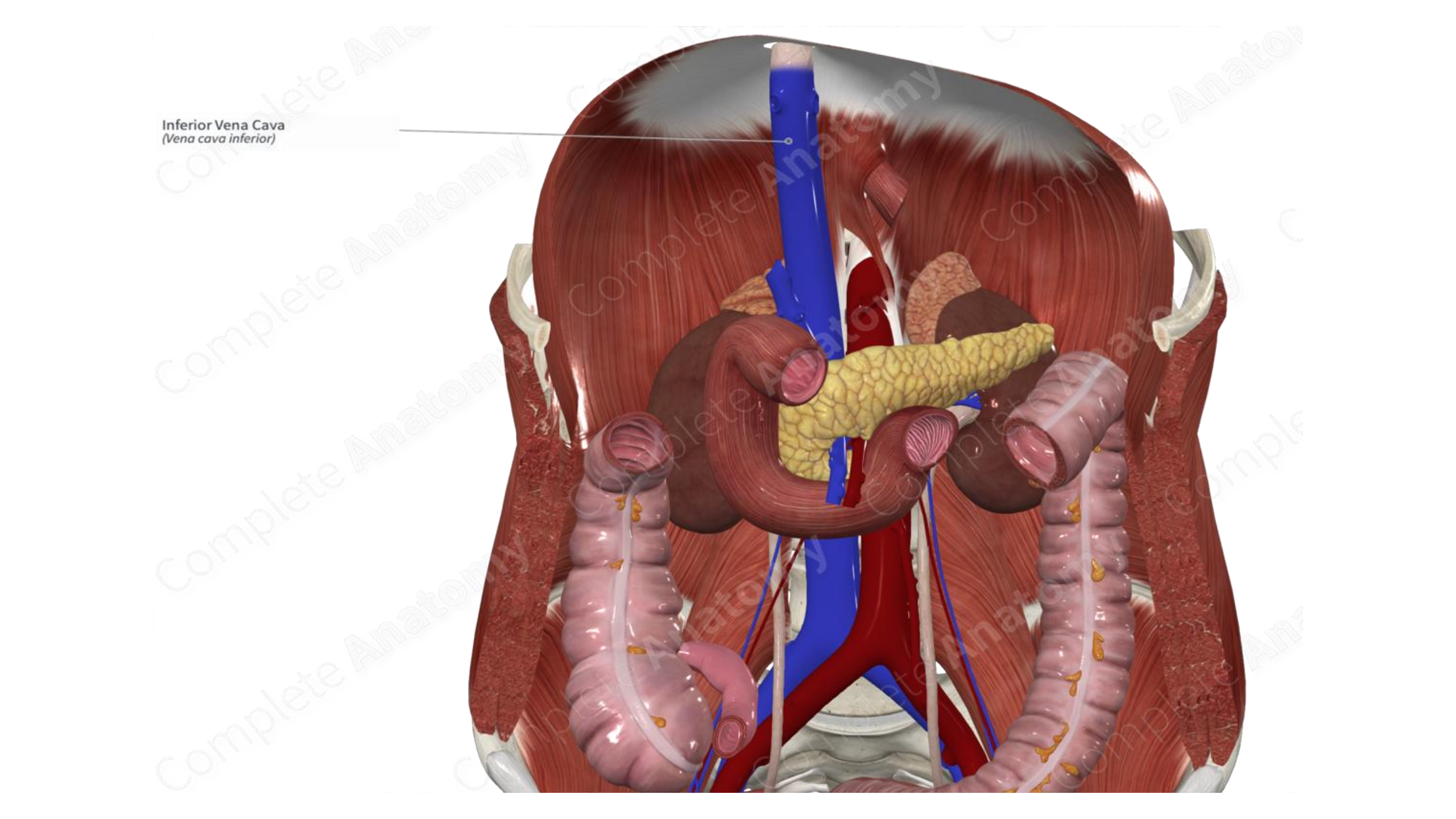


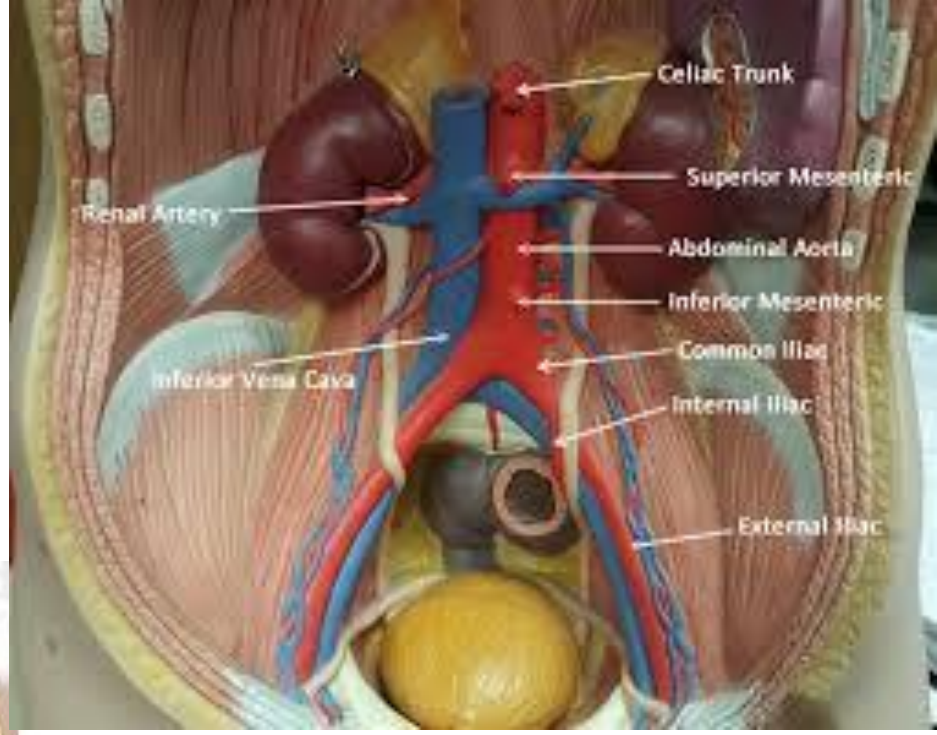
Fig. 21.1: Ventral and lateral branches of the abdominal aorta with their levels of origin

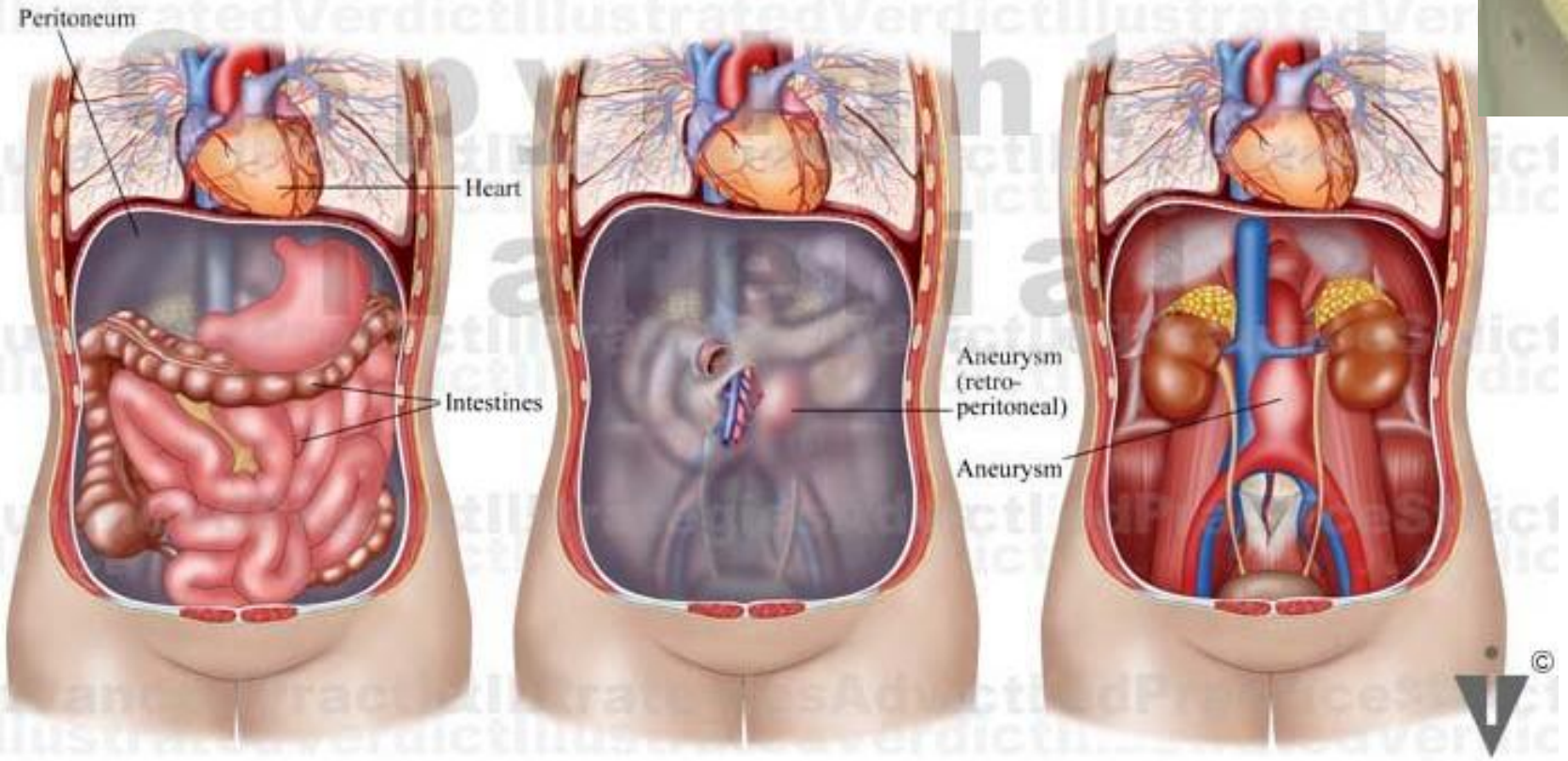
5 – Abdominal Aorta: Relations

- ✓ **Anterior:**
  - Pancreas
  - 3rd part of duodenum (horizontal part)
  - Coils of small intestine
  - Crossed by the left renal vein; to reach the I.V.C. on the right side
- ✓ **Right:**
  - I.V.C
  - Cisterna chyle
  - The start of thoracic duct and azygos vein
- ✓ **Left:**
  - Left sympathetic chain

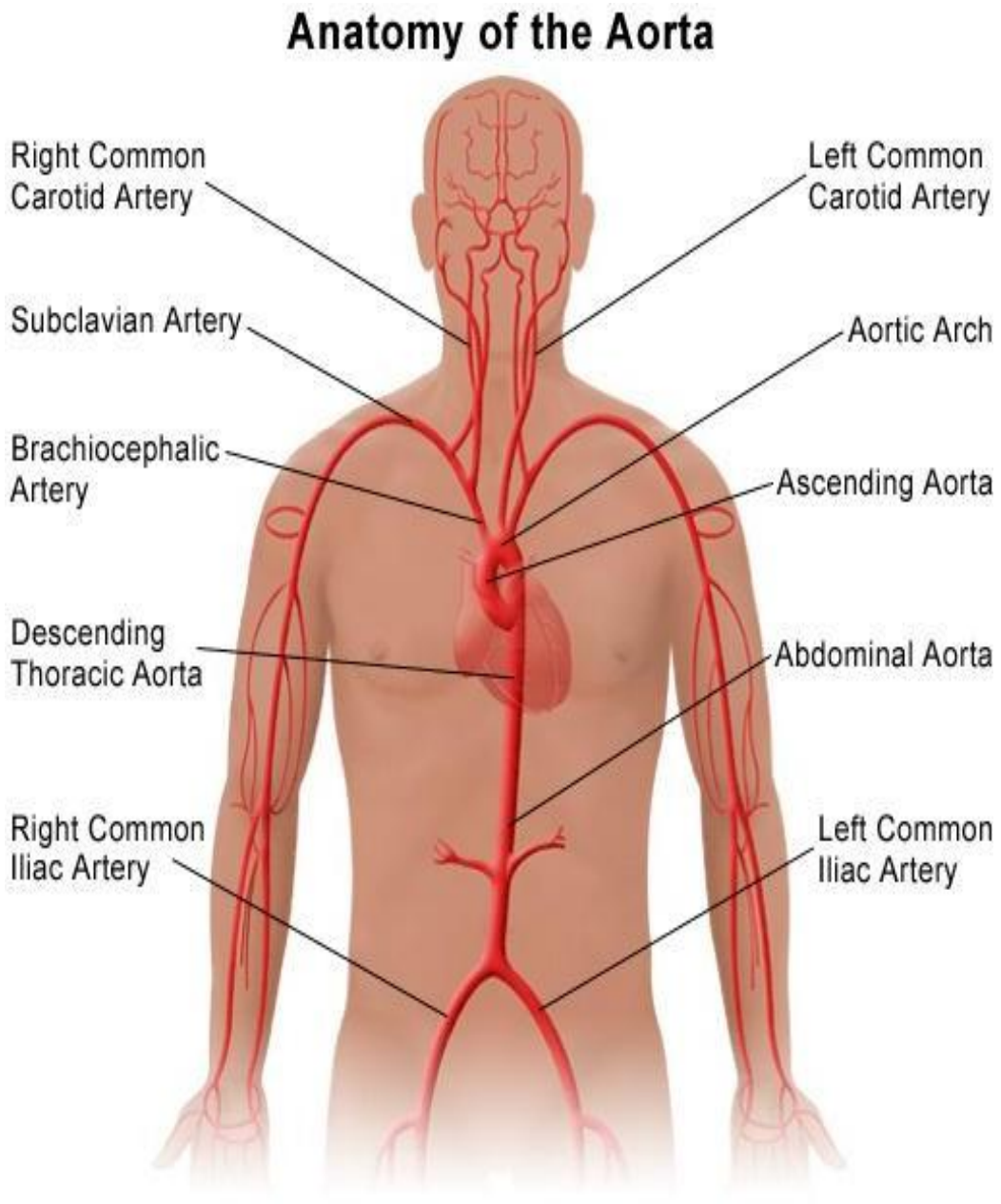



Inferior Vena Cava
(Vena cava inferior)


Celiac Trunk
Superior Mesenteric
Renal Artery
Abdominal Aorta
Inferior Mesenteric
Common Iliac
Inferior Vena Cava
Internal Iliac
External Iliac

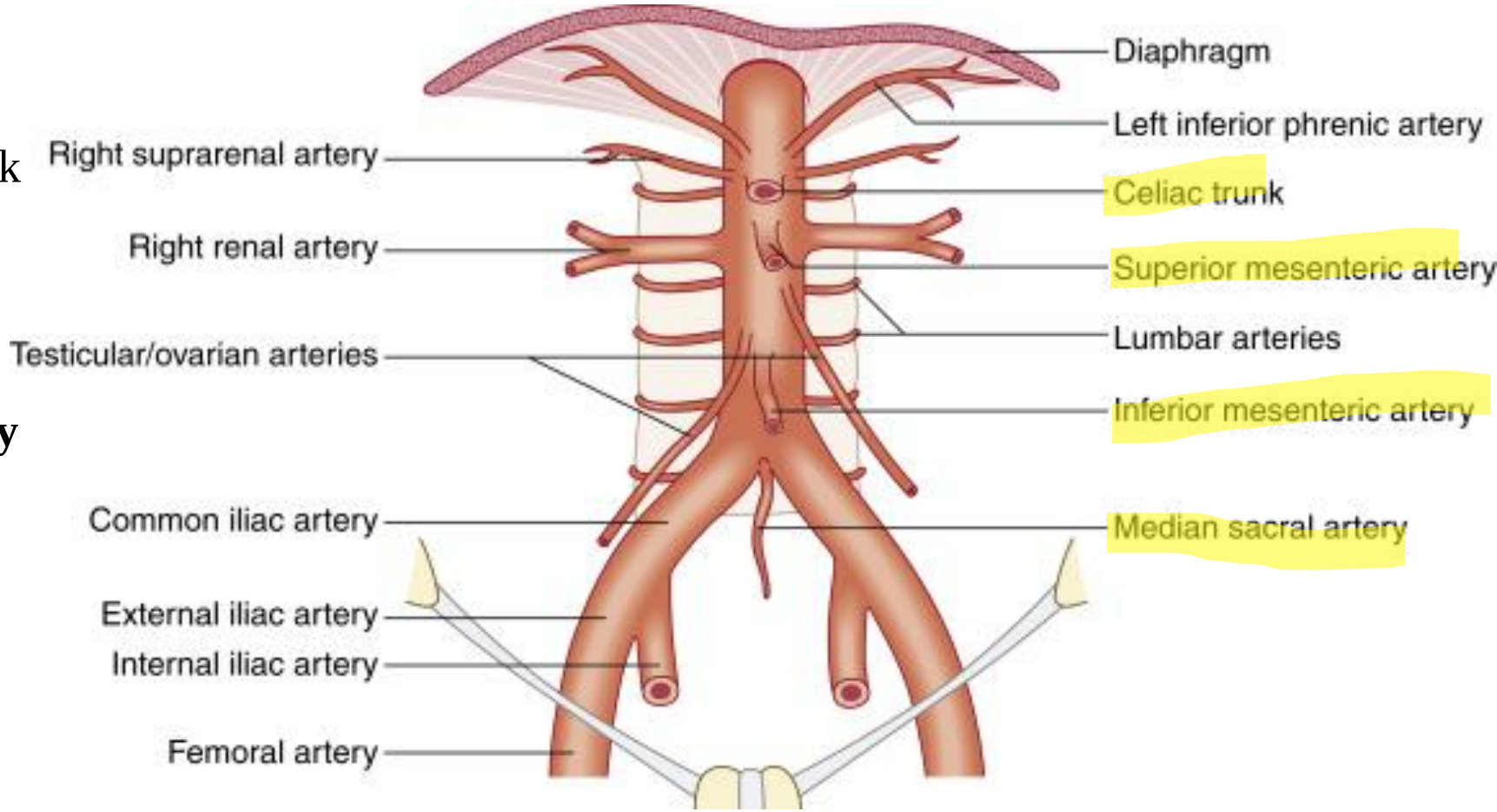

Peritoneum
Heart
Intestines
Aneurysm (retro-peritoneal)
Aneurysm
©

This pic is provided by Dr. Muhtaseb. Good luck trying to gain knowledge using it.



5 – Aorta (branches)

- ✓ **Branches of the abdominal aorta:**
- **Single branches**: 3 front & 1 back
- **Front:**
  - **Celiac trunk** – supplies the <u>foregut</u>.
  - **Superior mesenteric artery** – supplies the <u>midgut</u>.
  - **Inferior mesenteric artery** – supplies the <u>hindgut</u>.
- **Back:**
  - **Median sacral artery**



5 – Aorta (branches)

Pairs branches:

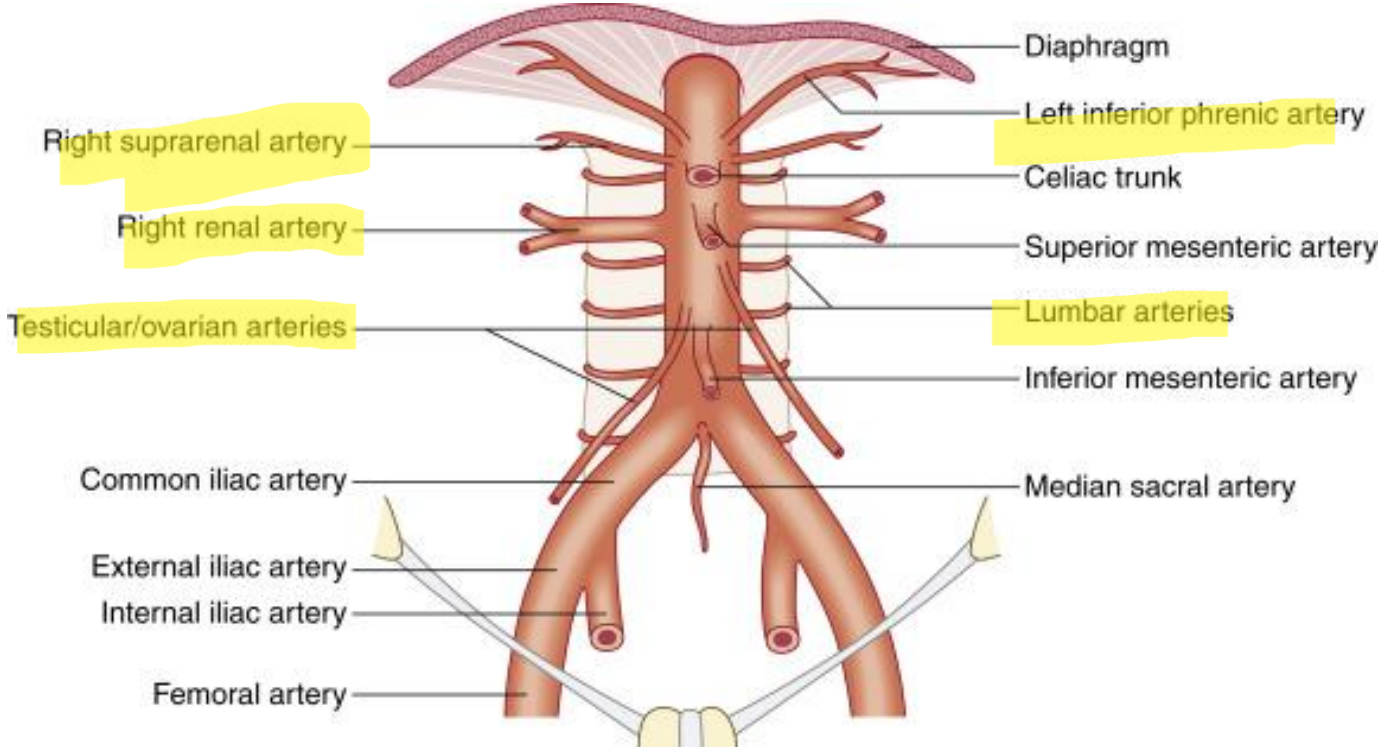
- ✓ 1 front → **gonadal (testicular or ovarian) artery at level L2** {left and right}.

- ✓ 4 back → **lumbar arteries** {in front of the lumbar vertebrae}.

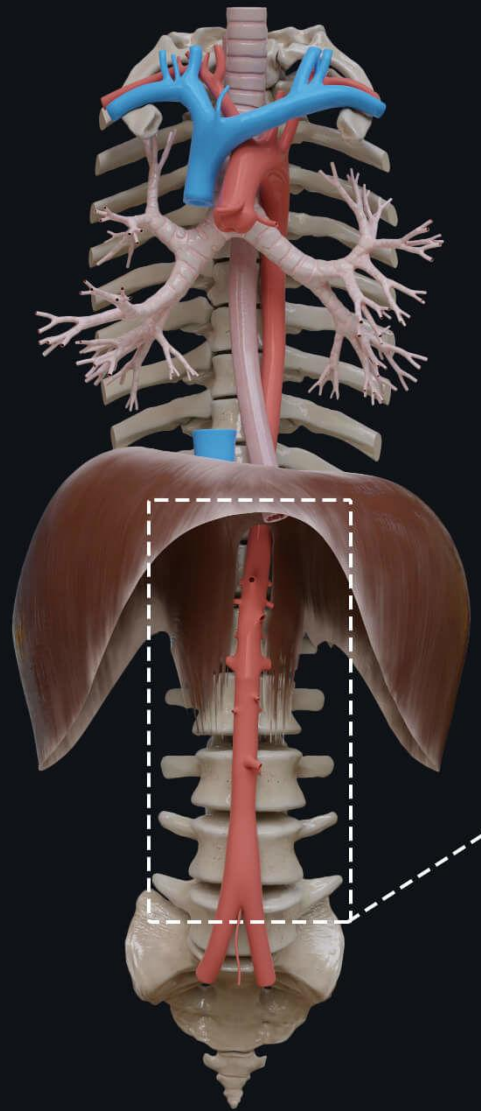
- ✓ 3 side of aorta →
  - **Inferior phrenic artery** arises just below the diaphragm and supplies the diaphragm.

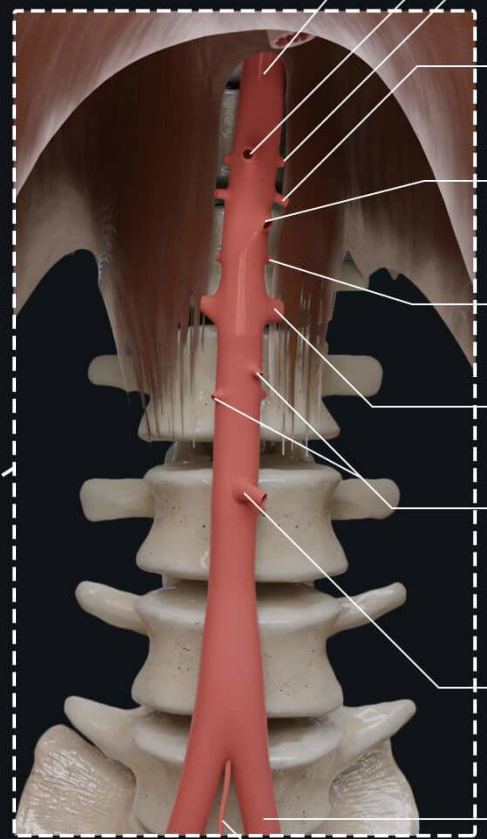
  - **Middle suprarenal artery**: one of three arteries supplying the adrenal gland (superior, middle, and inferior); the middle suprarenal comes directly from the aorta.

  - **Renal arteries at the level of L2**: the right renal artery is longer than the left because the aorta lies closer to the left kidney, making the left renal artery shorter.



Abdominal aorta



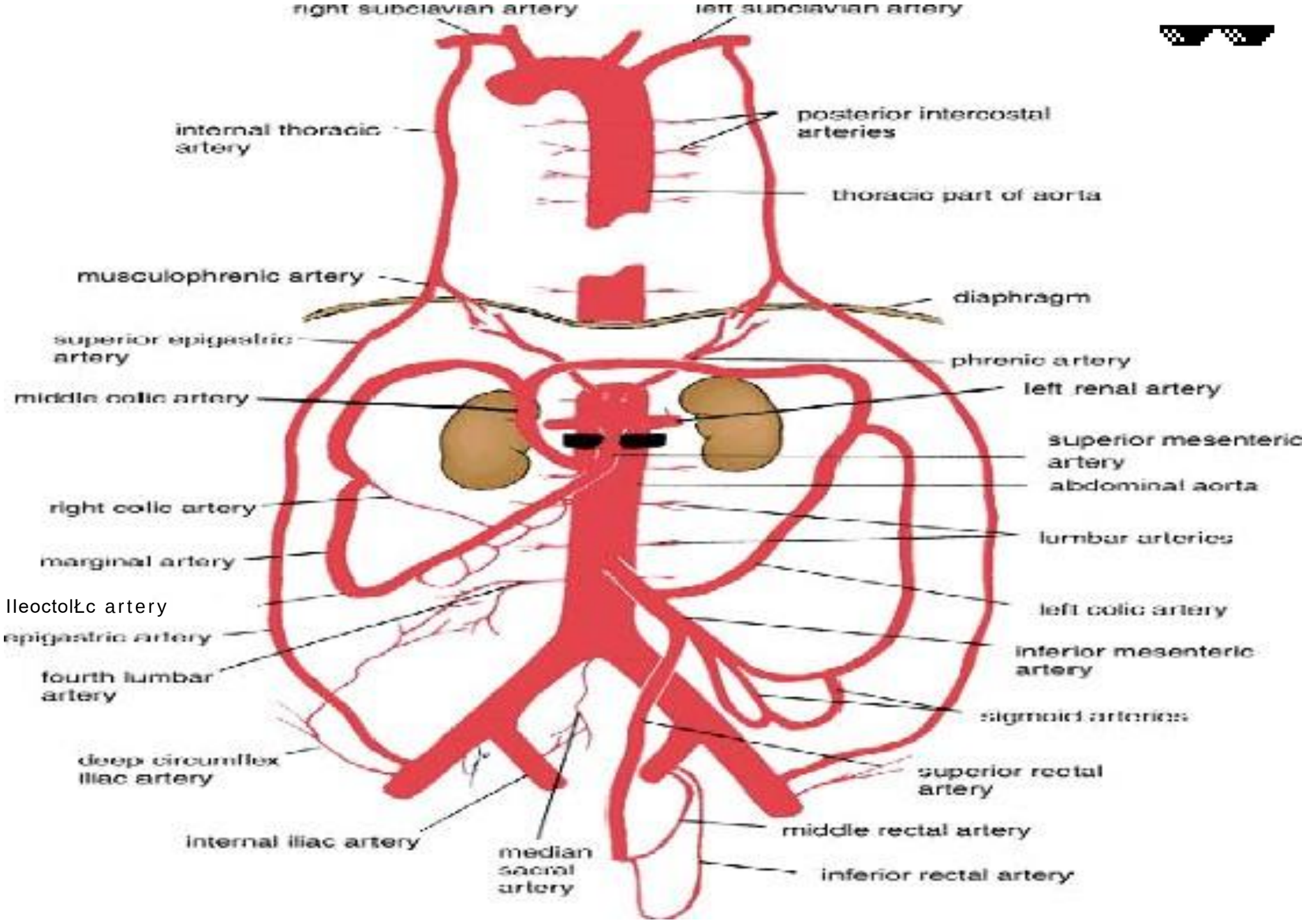


- Abdominal aorta
- Celiac trunk
- Inferior phrenic artery
- Middle suprarenal artery
- Superior mesenteric artery
- Lumbar artery
- Renal artery
- Gonadal (ovarian or testicular) arteries
- Inferior mesenteric artery
- Common iliac artery
- Median sacral artery

Anatomy.app

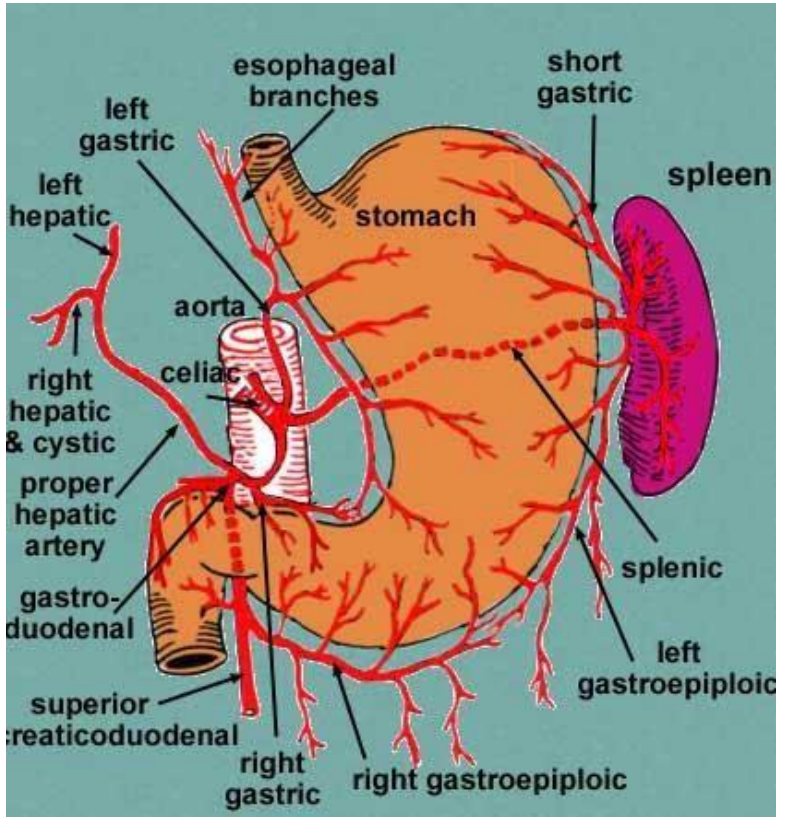
Anterior view

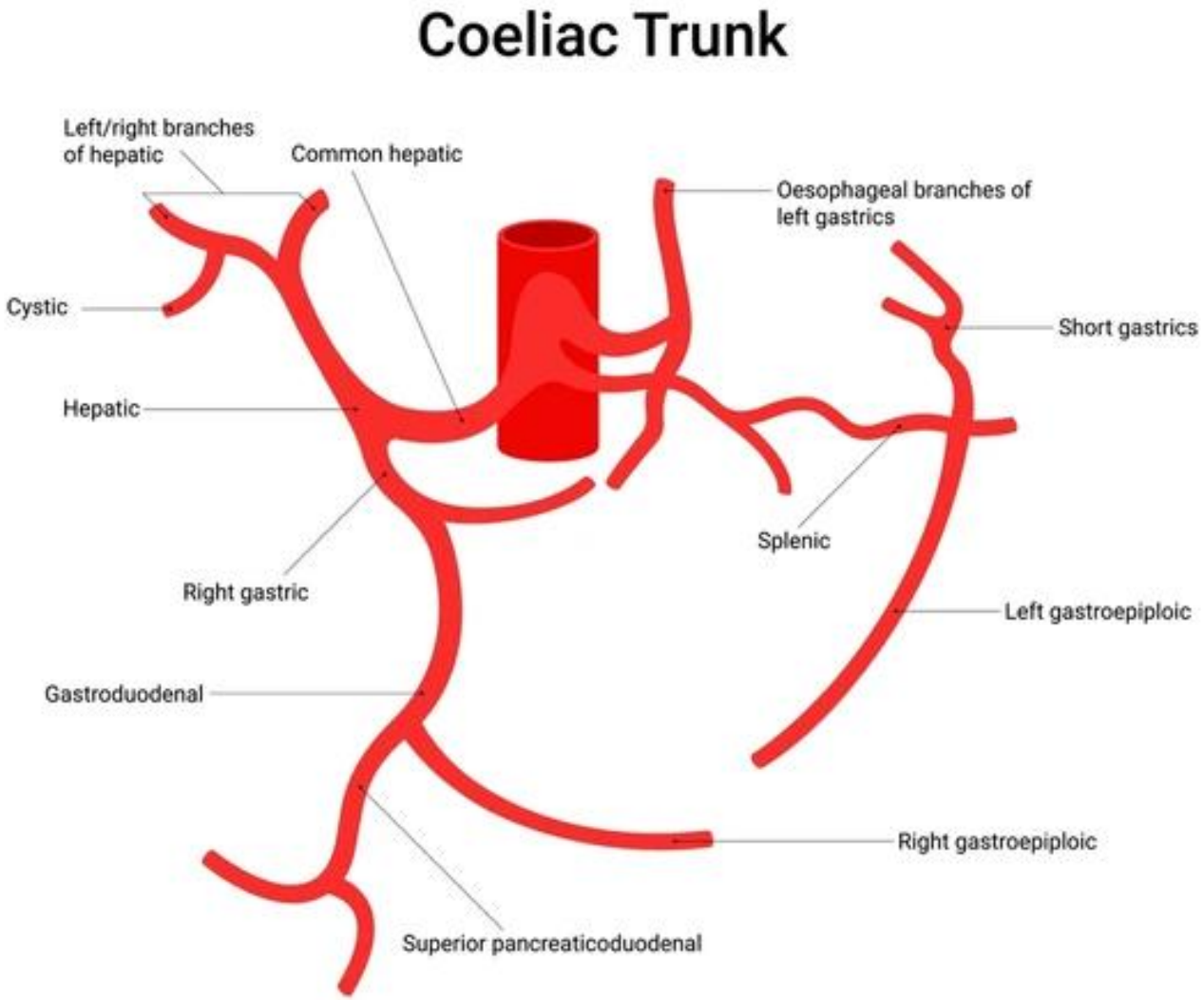
This is the pic provided by Dr. Muhtaseb, I bet you cannot gain knowledge using it.

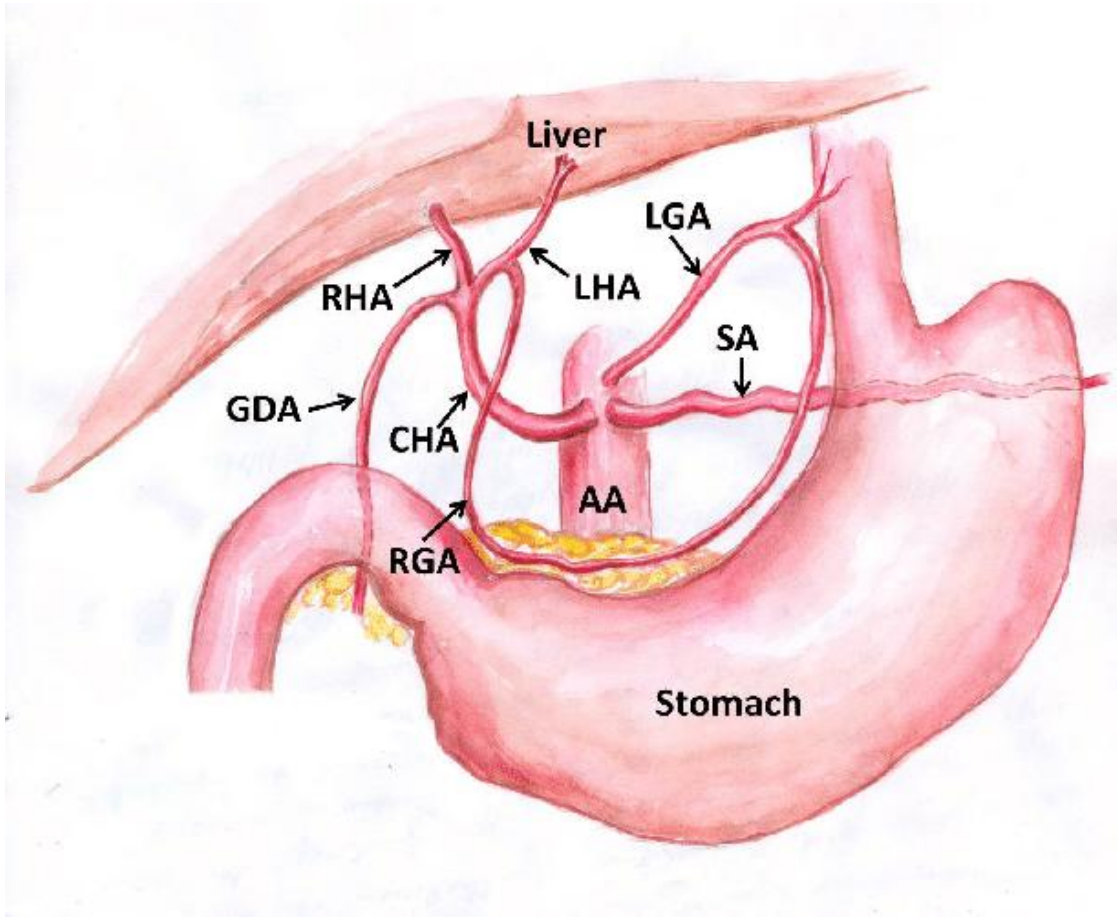


5 – Aorta (single front branches: celiac trunk)

- ✓ **The celiac trunk** is very short (~1 cm) and arises at **the upper border of L1** (or sometimes noted as the lower border of T12 in some sources).
- ✓ It gives three main branches:
  1. **Left gastric artery** – supplies the lower third of the esophagus and the lesser curvature of the stomach. It anastomoses with the right gastric artery. Both run in the **lesser omentum**.
  2. **Splenic artery** – a tortuous artery that runs along the upper border of the pancreas to the spleen. It gives:
     - Pancreatic branches (anterior and posterior)
     - Short gastric arteries to the fundus (via the gastrosplenic ligament)
     - Left gastroepiploic artery to the greater curvature of the stomach (in the greater omentum).
  3. **Common hepatic artery** – gives:
     - Right gastric artery (lesser curvature)
     - Gastroduodenal artery, which gives:
       - Right gastroepiploic artery
       - Superior pancreaticoduodenal artery
     - Continues as proper hepatic artery, which divides into right and left hepatic arteries. The right hepatic artery gives the cystic artery to the gallbladder.



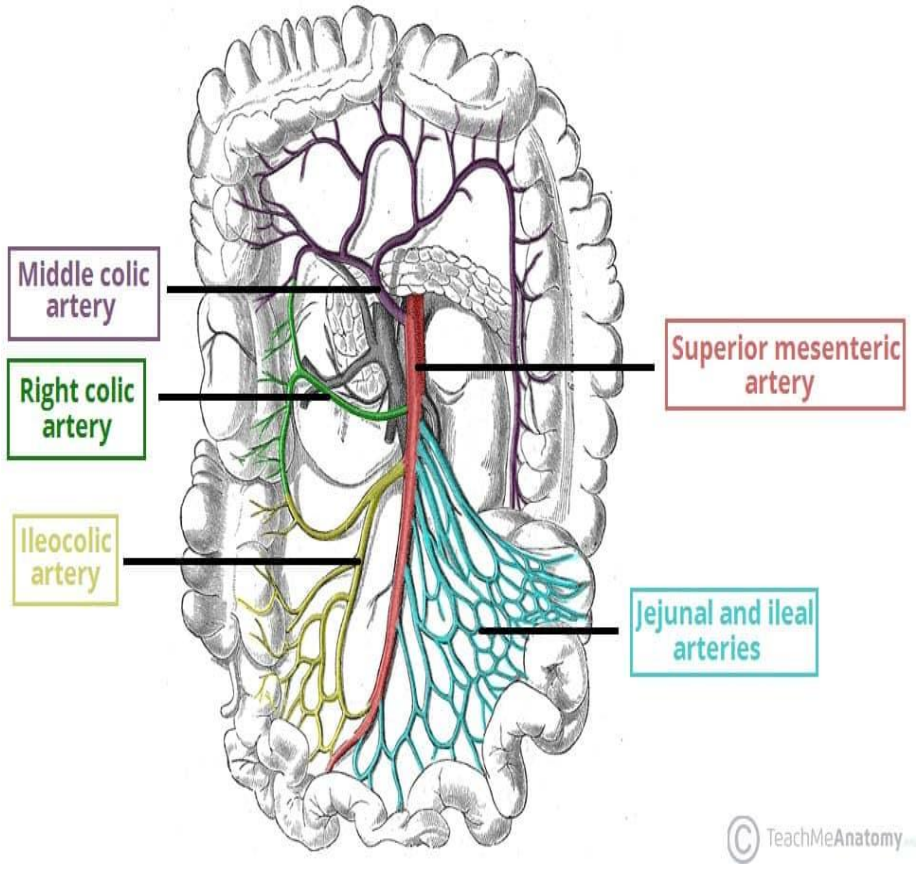




AA: Abdominal Aorta
SA: splenic A.
LGA: left gastric A.
CHA: common hepatic A.
RHA: Right hepatic A.
LHA: left hepatic A.
GDA: gastroduodenal
RGA: Right gastric

5 – Aorta (single front branches: sup. Mesenteric)

- ✓ **Superior Mesenteric Artery**
  - Origin: upper border of L2 or lower border of L1.
  - Supplies the **midgut**.
- ✓ Branches:
  1. **Inferior pancreaticoduodenal artery** – supplies the lower half of the duodenum and pancreas.
  2. **jejunal and ileal branches:** to the ileum and ascending colon
     - On the left side: run in the mesentery and form arterial arcades (anastomoses).
  3. **Ileocolic artery** –**Cecal branches**: anterior and posterior cecal arteries. **The posterior cecal artery** gives rise to the **appendicular artery**.
  4. **Right colic artery** – to the ascending colon.
  5. **Middle colic artery** – to the transverse colon (also gives branches to ascending colon).
- ✓ **The superior mesenteric vein** lies **to the right {lateral}** of the artery.



5 – Aorta (single front branches: Inferior mesenteric A.)

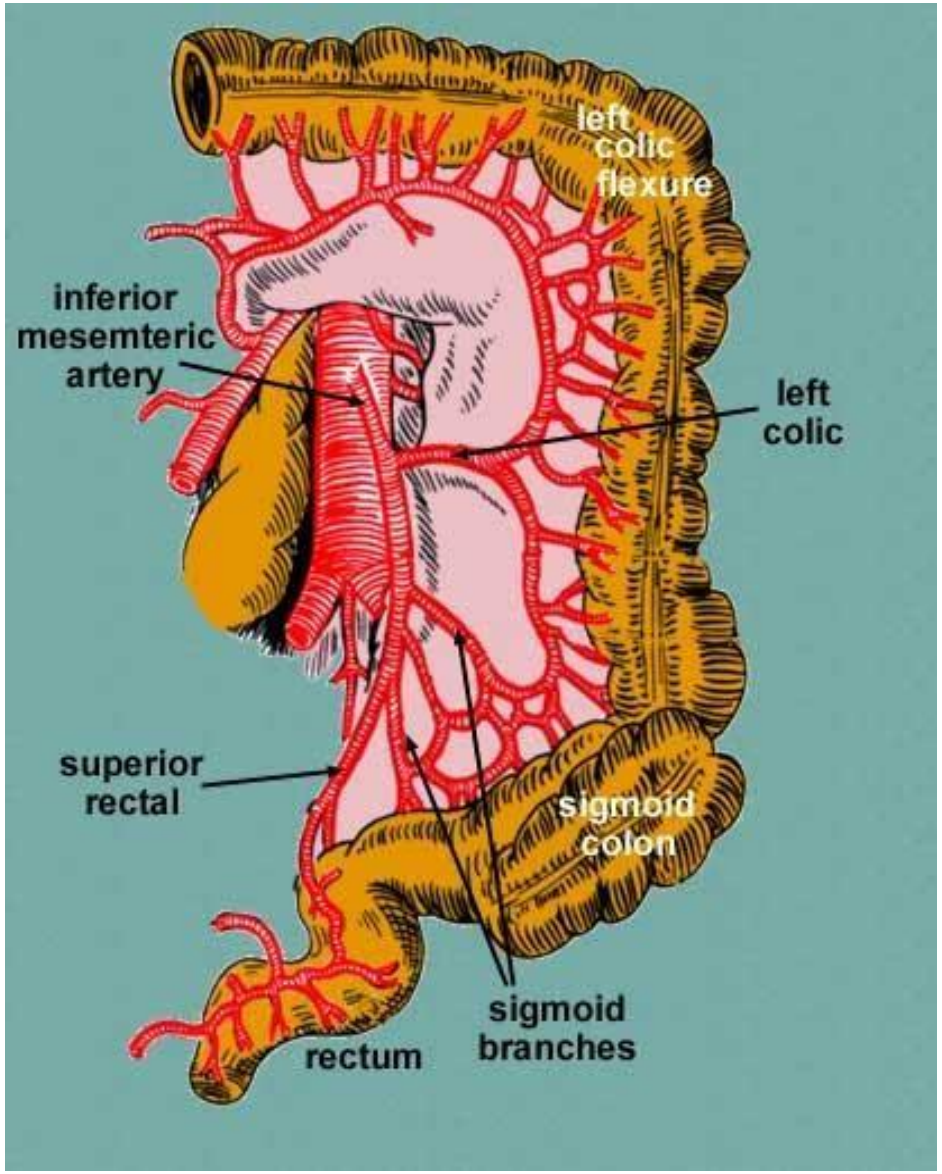
Inferior Mesenteric Artery (IMA)

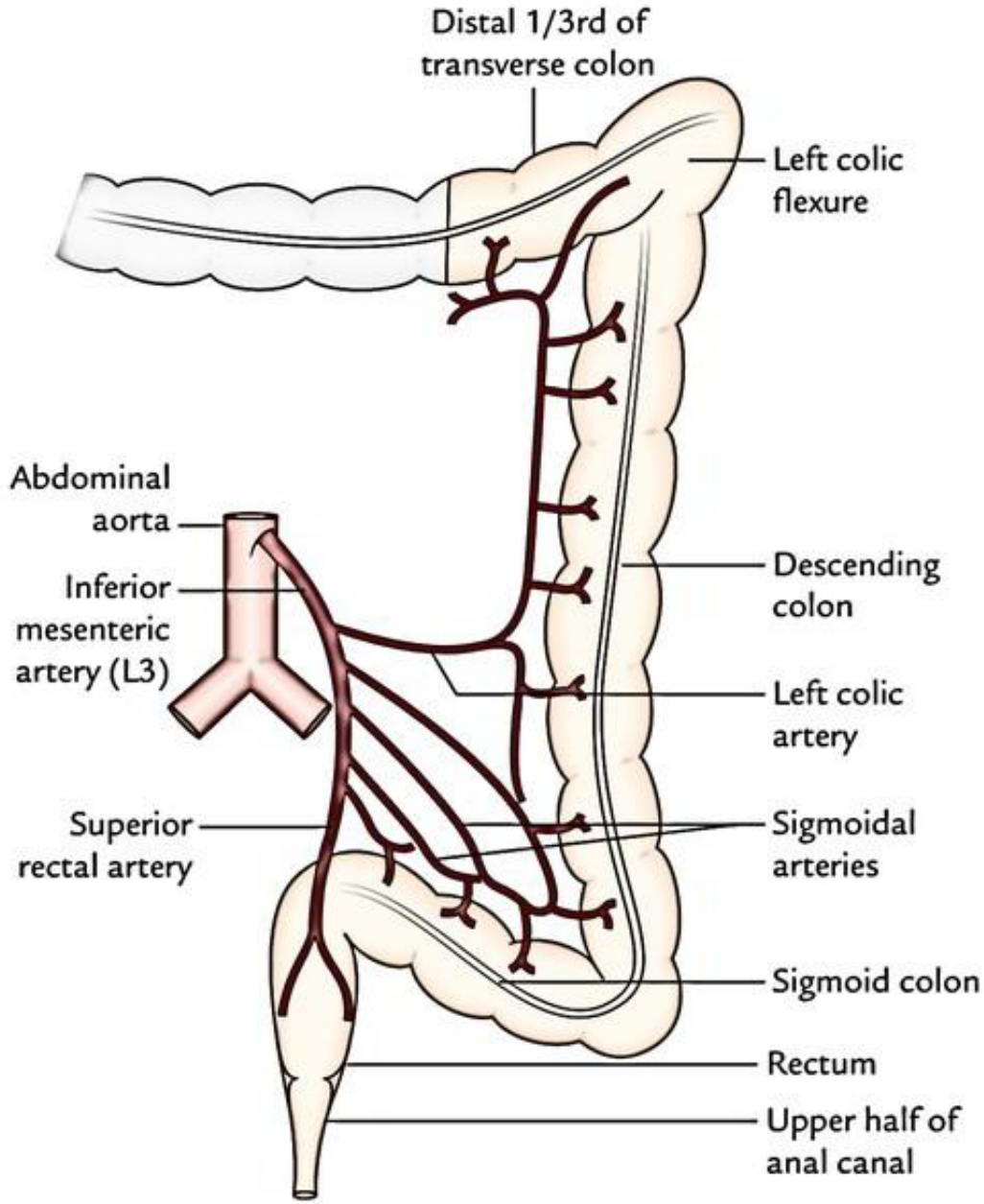
- ✓ **The inferior mesenteric artery** originates **at the level of L3.**
- ✓ It supplies the **hindgut**, including:

1. Left colic artery – supplies the lateral third of the transverse colon and the descending colon.

2. Sigmoidal arteries – supply the sigmoid colon.

3. It continues as the **superior rectal artery**, which supplies the **rectum** and the **upper half of the anal canal.**

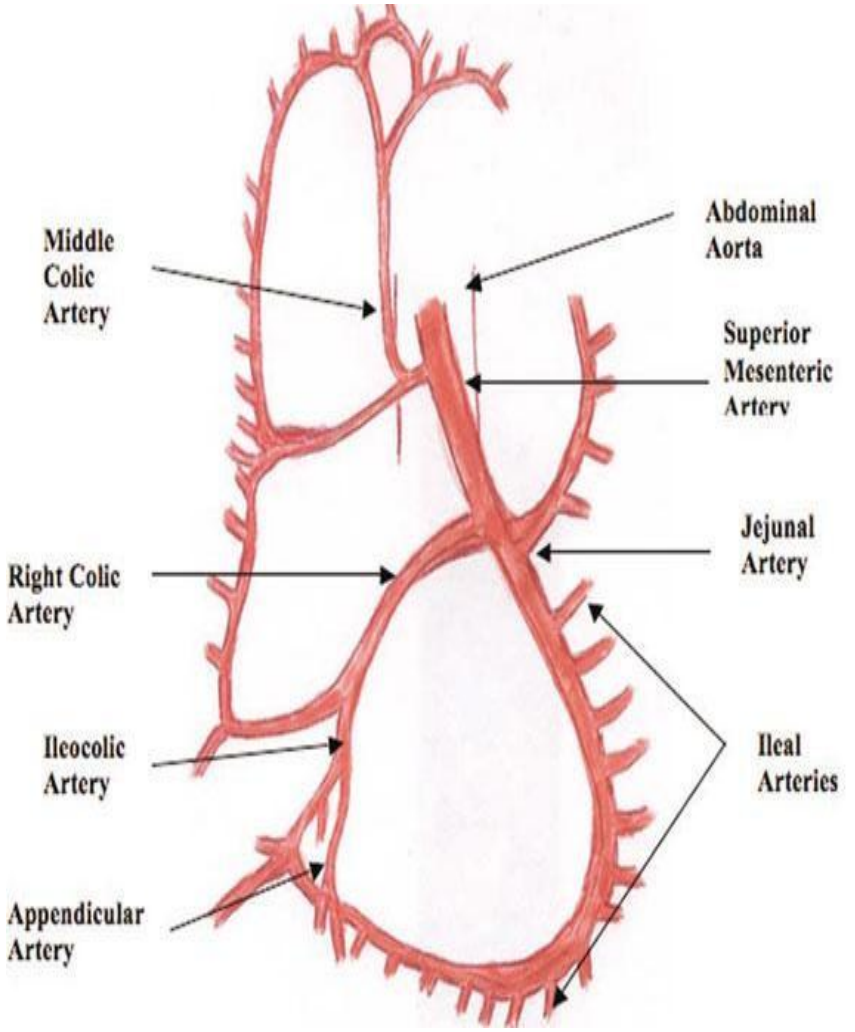



Distal 1/3rd of transverse colon
Left colic flexure
Abdominal aorta
Inferior mesenteric artery (L3)
Descending colon
Left colic artery
Superior rectal artery
Sigmoidal arteries
Sigmoid colon
Rectum
Upper half of anal canal

6 – Marginal Artery

Marginal Artery:

- ✓ Along the **concave border** of the large intestine (transverse colon, ascending, descending, and sigmoid), the branches from different arteries form a continuous line of anastomoses.
- ✓ This continuous arterial loop is called the marginal artery.
- ✓ It provides **collateral circulation**, meaning if a main artery is blocked, the marginal artery can help maintain blood flow.



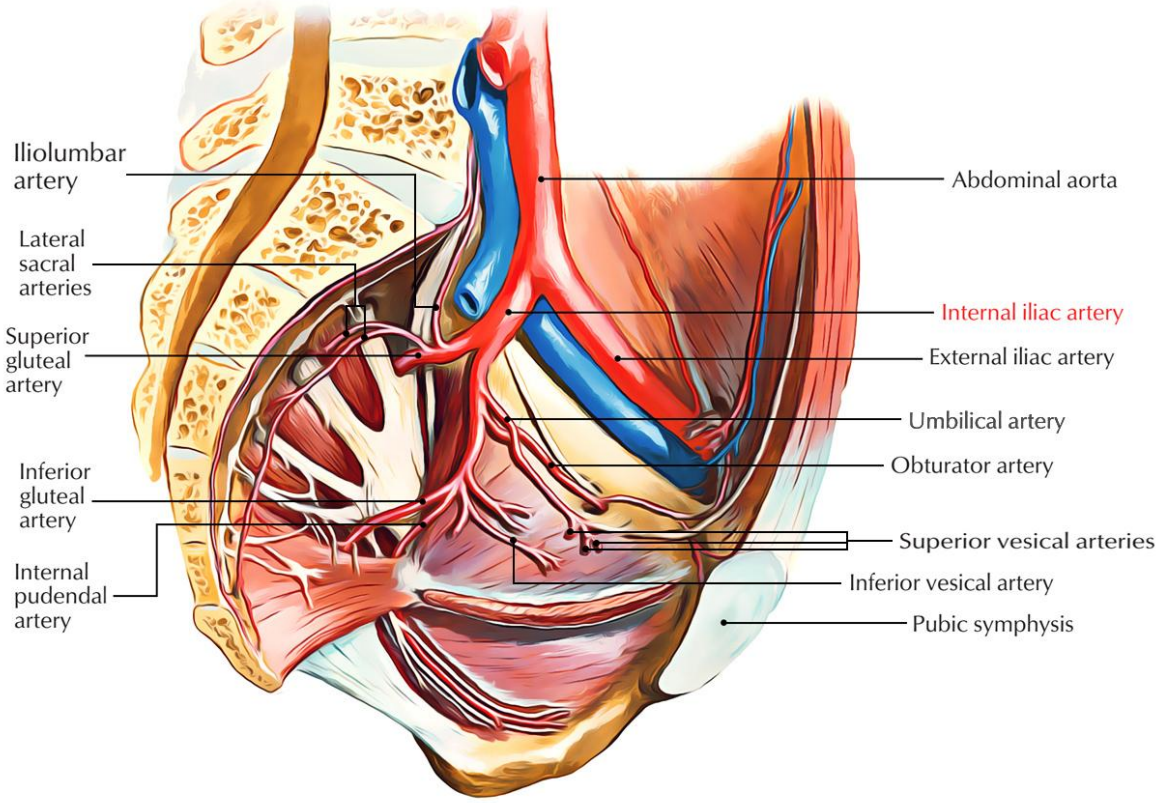
7 – Common Iliac Artery (the end of Aorta)

Common Iliac Artery

The **abdominal aorta** ends **at the level of L4** (left side), where it divides into the **right and left common iliac arteries.**

Each common iliac artery then divides near the pelvic inlet into:

- ✓ **External iliac artery** – continues to the lower limb.
- ✓ **Internal iliac artery** – supplies the pelvic organs.



Before the **external iliac artery** becomes the femoral artery, it gives off:

- ✓ The **inferior epigastric artery**, which enters the **rectus sheath** and passes deep to the **rectus abdominis muscle.**

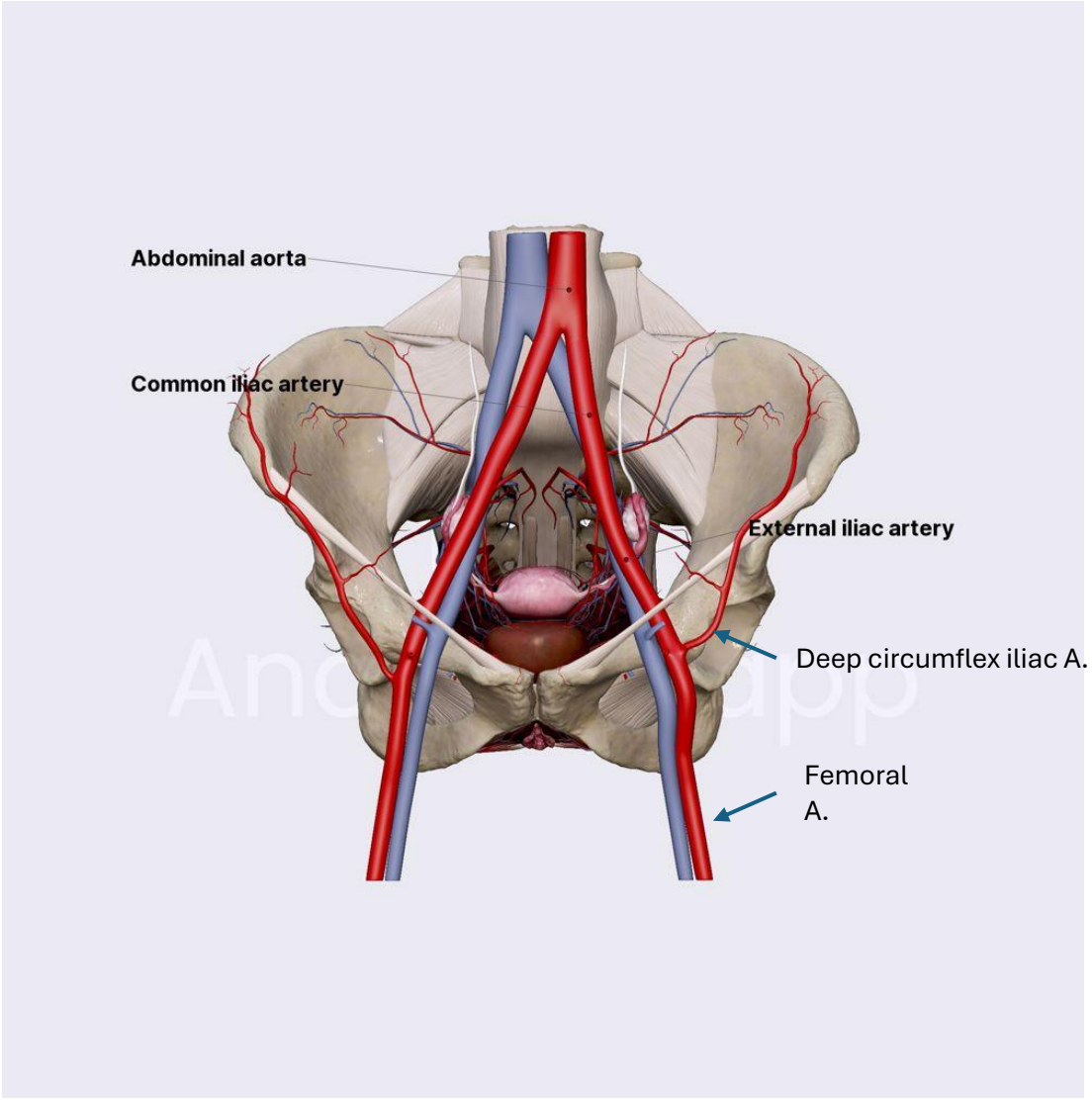
☹️**:** This artery is clinically important for identifying **inguinal hernias:**

- ➢ **Direct hernia**: medial to the inferior epigastric artery.
- ➢ **Indirect hernia**: lateral to it.

8 - course of Ex. iliac artery

External Iliac Artery

- ✓ Located on the **medial border** of the **psoas major muscle** in the abdomen.
- ✓ It reaches the **pelvic brim** and gives off the **deep circumflex iliac artery,** which runs toward the **anterior superior iliac spine (ASIS).**
- ✓ This artery supplies the **muscles of the lower abdominal wall.**



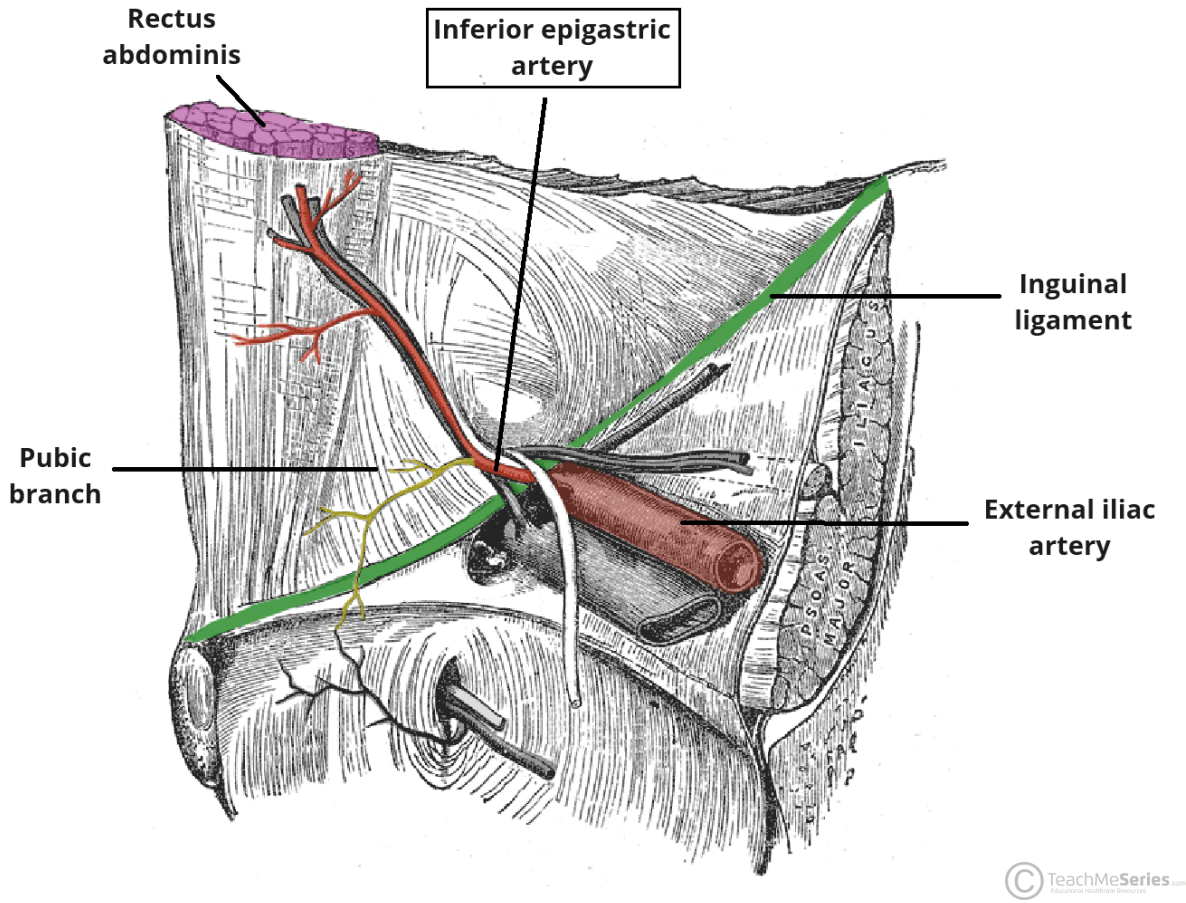
8- Branches of Ex. iliac artery

1- **The inferior epigastric:**

- ✓ artery arises just above the inguinal ligament.
- ✓ It passes upward and medially along the medial margin of the deep inguinal ring and enters the rectus sheath behind the rectus abdominis muscle.

2- The deep circumflex iliac - artery arises close to the inferior epigastric artery.

- ✓ It ascends laterally to the anterior superior iliac spine and the iliac crest, supplying the muscles of the anterior abdominal wall.



9 – Course and branches of int. iliac artery

- ✓ **Internal Iliac Artery**
  - The internal iliac artery supplies the **pelvic organs.**

- ✓ **External iliac Artery** goes to the lower limb and they are above each other.

- ✓ The internal iliac artery divides into:
  - **Posterior division.**
  - **Anterior division**.

- ✓ **Posterior Division Branches**:
  1. **Iliolumbar artery** – ascends to the **iliolumbar ligament.**
  2. **Lateral sacral arteries** – enter the **sacral foramina**, posterior relation to the rectum and sigmoid {the sacrum and content of it}.
  3. **Superior gluteal artery** – passes through the **greater sciatic foramen**, **above the piriformis muscle**, and supplies the **gluteus maximus** and surrounding muscles.

9 – Course and branches of int. iliac artery

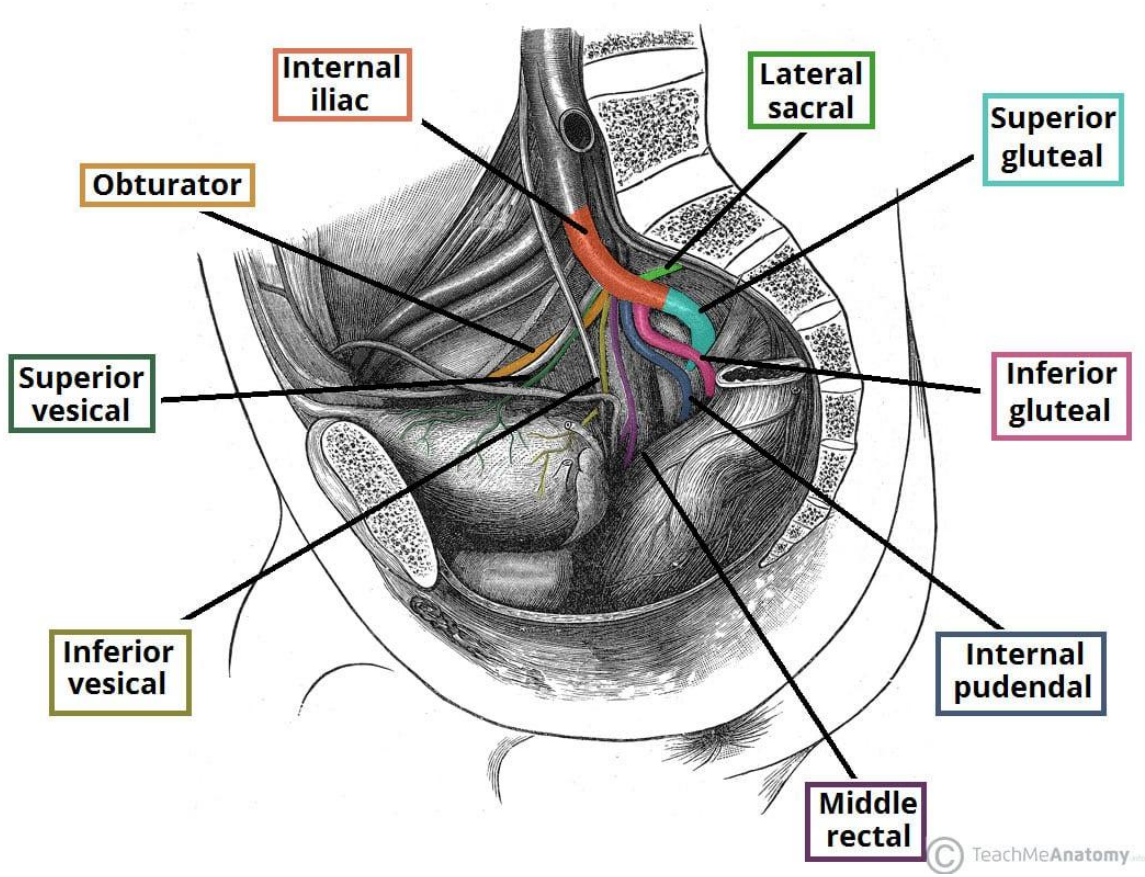
Anterior Division Branches:

1. Obturator artery – runs with the **obturator nerve**, exits through the **obturator foramen,** and supplies the **medial compartment of the thigh**.

2. Inferior gluteal artery – passes below the piriformis through the greater sciatic foramen, supplying muscles in the gluteal region.

3. Umbilical artery – part of it becomes **obliterated at the distal part** and forms the medial umbilical ligament. (Not to be confused with the median umbilical ligament, which is the urachus, from the embryonic bladder to the umbilicus). **Give the superior vesical artery,** which supplies the **upper part of the urinary bladder.**

4. Inferior vesical artery (in males) – supplies **the lower part of the bladder.**



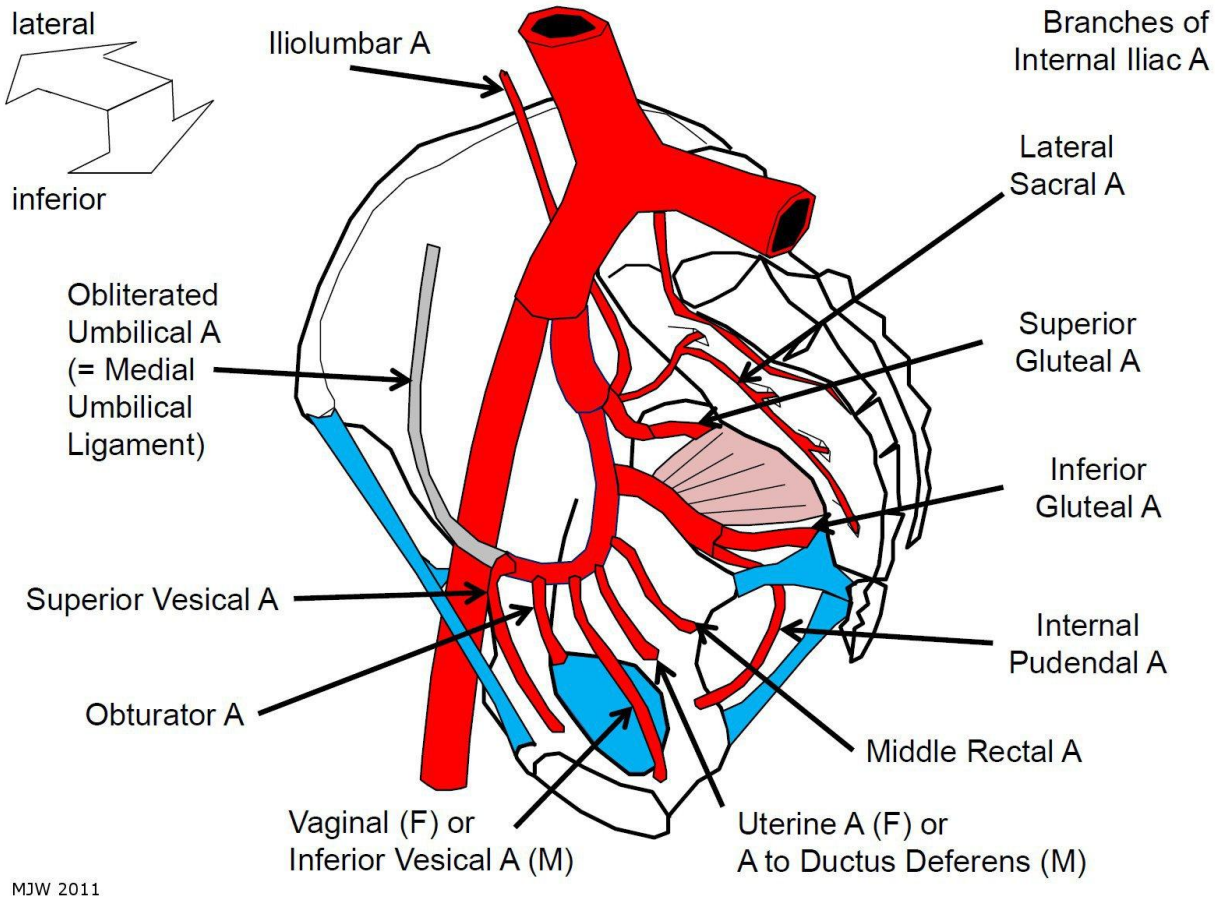
9 – Course and branches of int. iliac artery

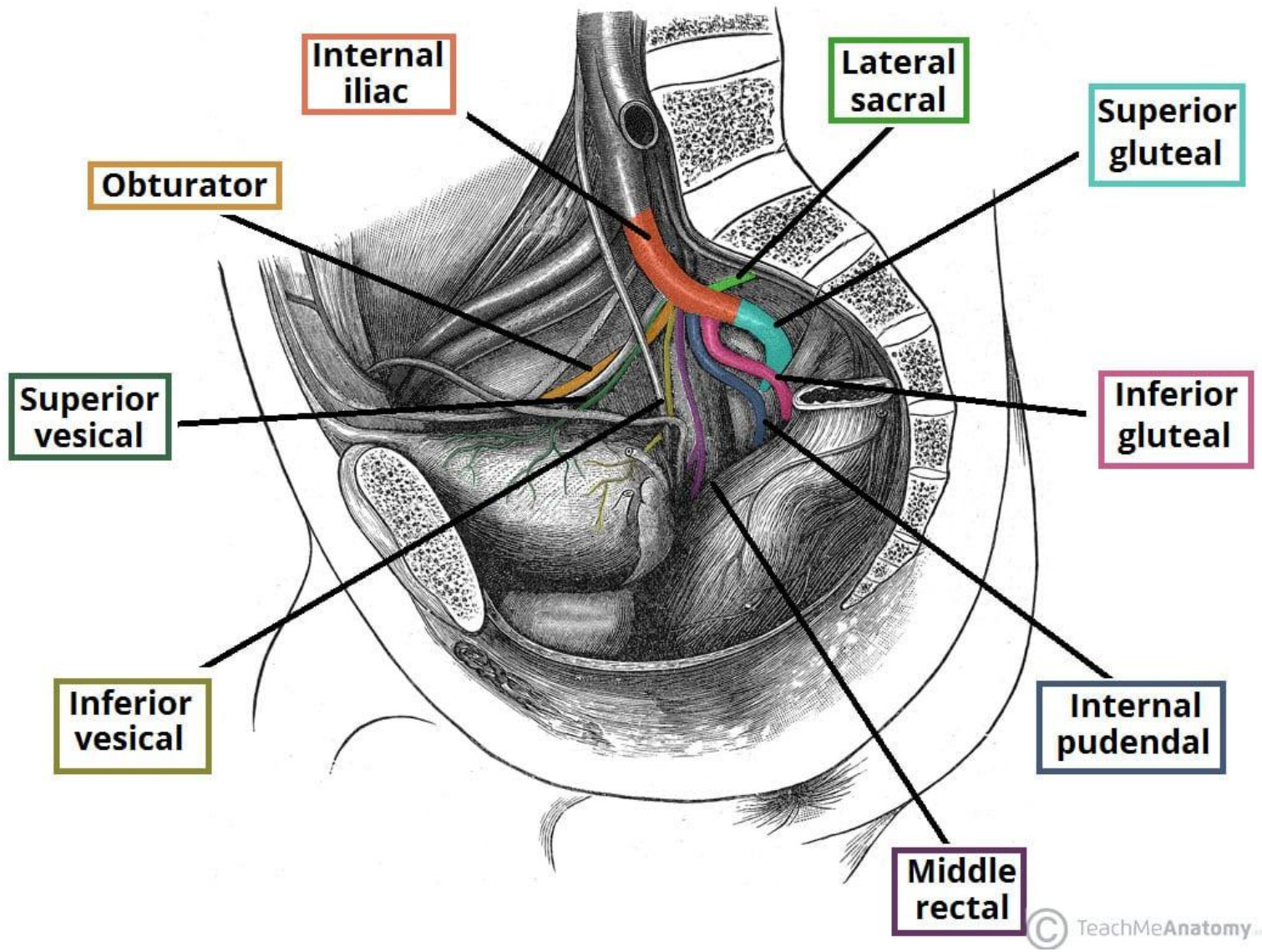
5. In females:
• **Uterine artery** – supplies the uterus; it is tortuous to accommodate uterine expansion during pregnancy.
• **Vaginal artery** – supplies the vagina.

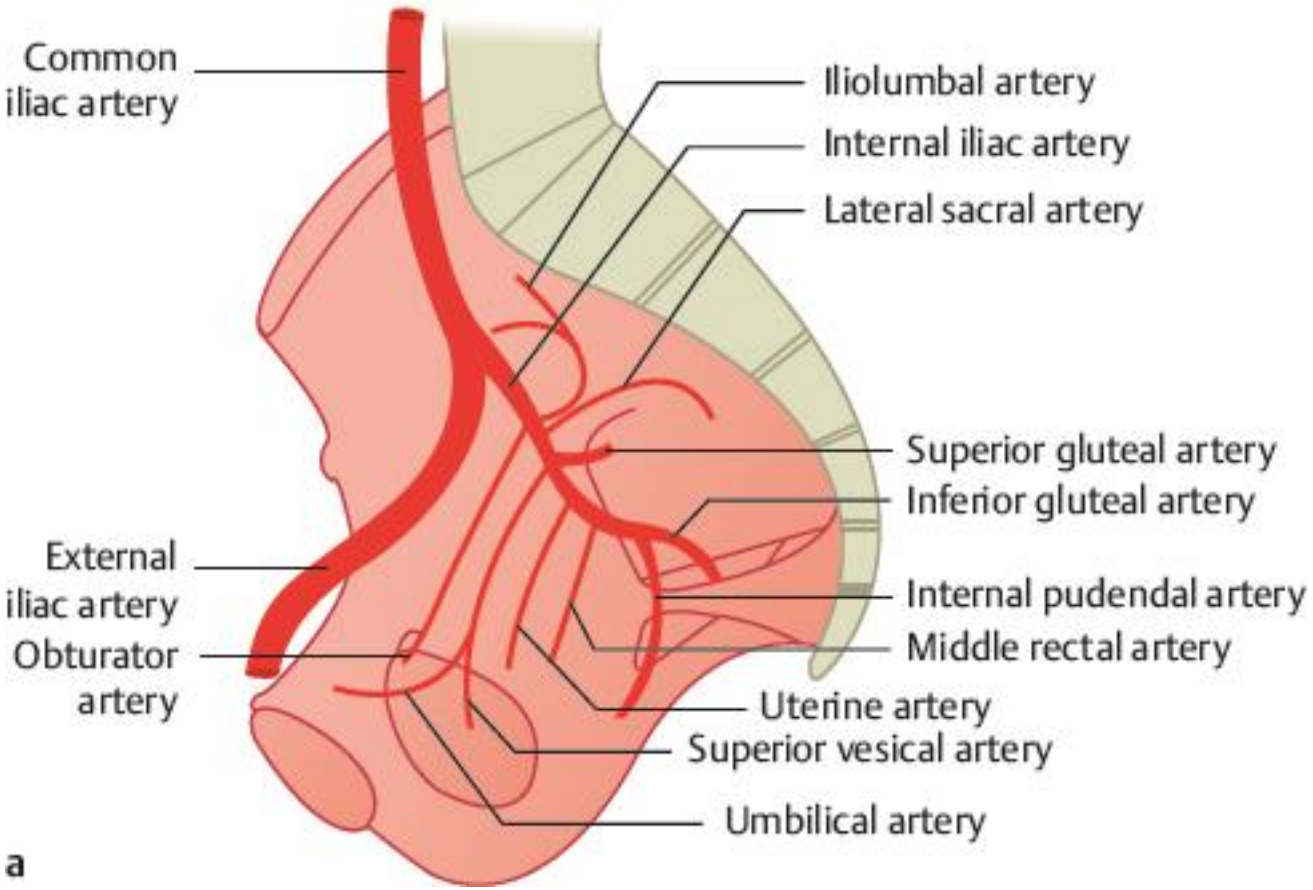
6. In males:
• Artery to the vas deferens – supplies the vas deferens.

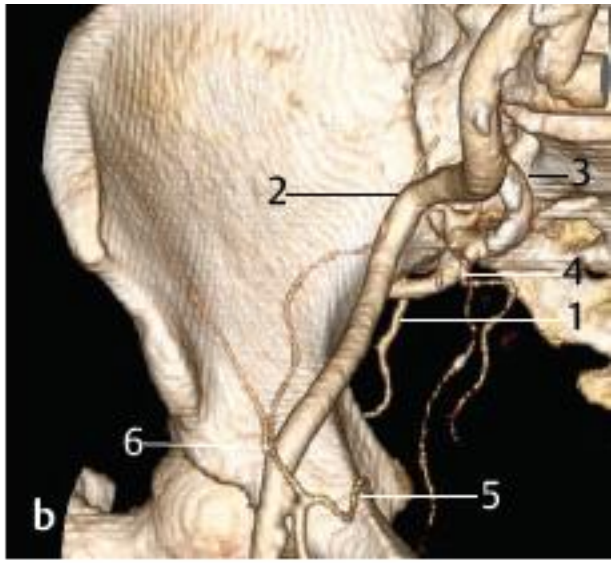
The terminal branches of the int. iliac artery:
7. Middle rectal artery – supplies the middle part of the rectum.

8. Internal pudendal artery – give inferior rectal artery.




Internal iliac
Lateral sacral
Superior gluteal
Obturator
Superior vesical
Inferior gluteal
Inferior vesical
Internal pudendal
Middle rectal
© TeachMeAnatomy

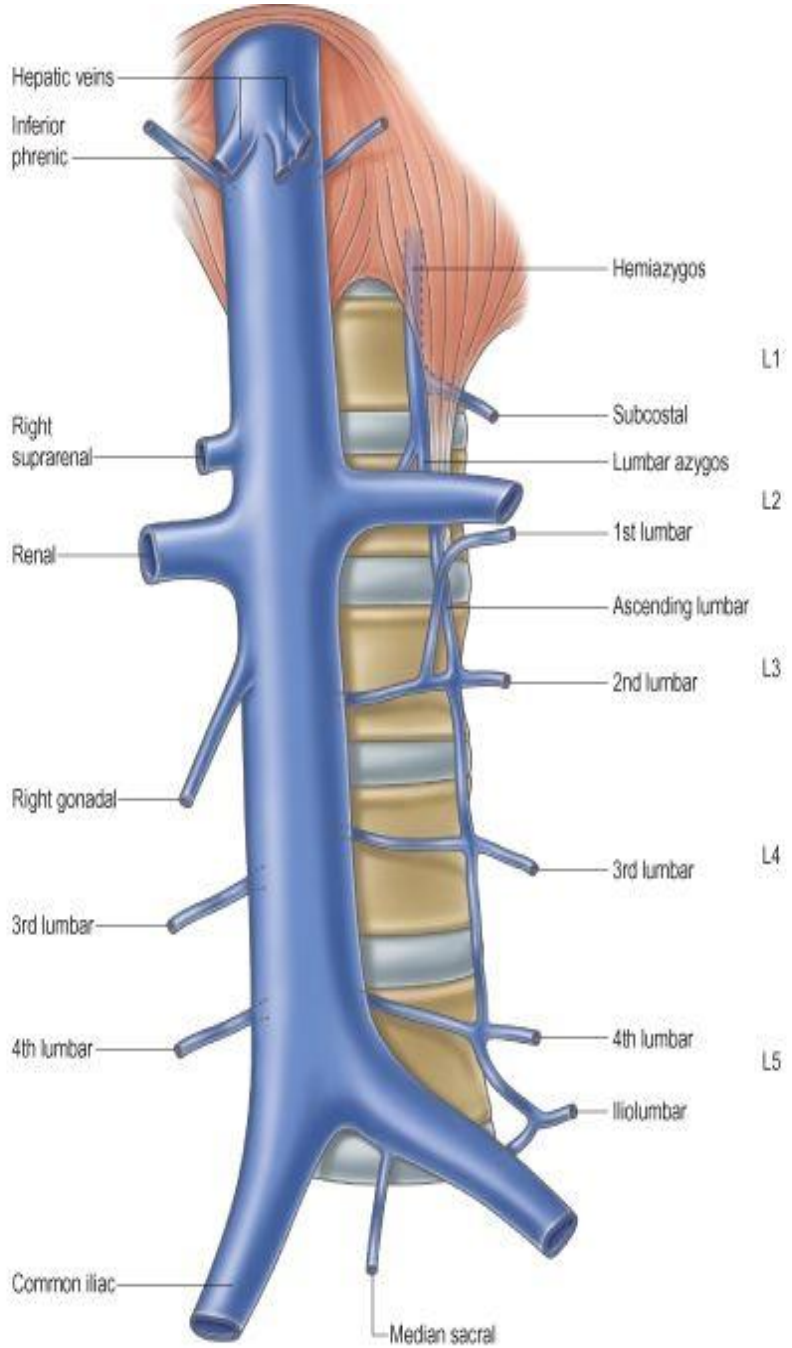

Common iliac artery
Iliolumbal artery
Internal iliac artery
Lateral sacral artery
Superior gluteal artery
Inferior gluteal artery
External iliac artery
Internal pudendal artery
Obturator artery
Middle rectal artery
Uterine artery
Superior vesical artery
Umbilical artery
a


2
3
4
1
6
5
b

10 – I.V.C: course

- ✓ I.V.C is formed by the union of left and right common iliac veins at the level of 5th lumbar vertebra (L5).
- ✓ It makes its way upward to the right piercing the diaphragm at central tendon at the level of 8th thoracic vertebra (T8).
- ✓ It ends at the right atrium, as it drains most of the blood from the body below diaphragm.
- ✓ In the veins are deeper than arteries, i.e., common iliac veins are deeper than arteries; to protect veins form pressure applied by pregnant uterus to thin-walled veins.
  Rather this pressure is applied to arteries which have thick walls, making them less vulnerable.

😟: even though veins are less prone to pressure here, pelvic varicocele is still seen in pregnant women.

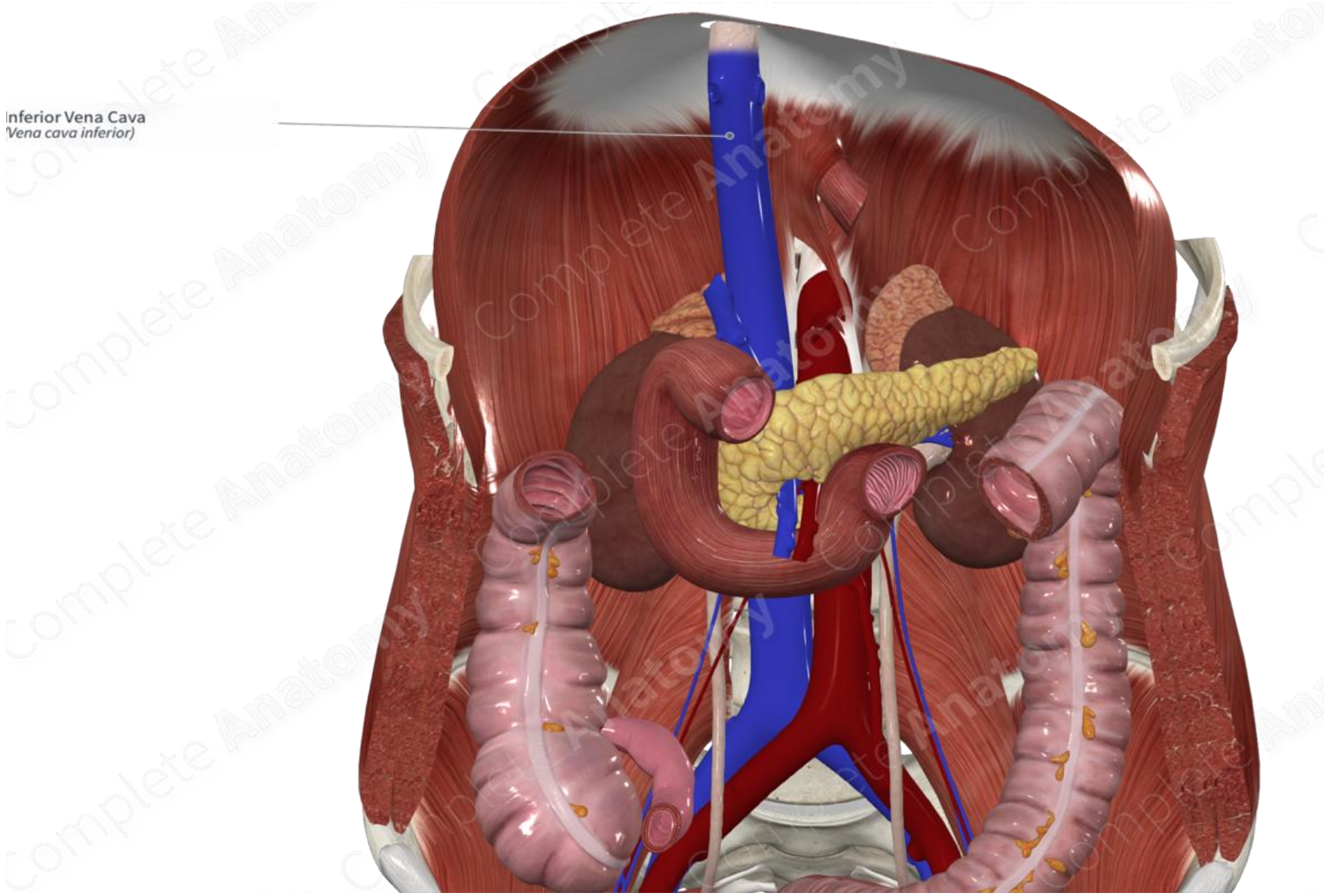


10 – I.V.C: Relations

Anterior

- Coils of small intestine
- 3rd part & 1st part of d.d
- Head of pancreas & Common bile duct
- Related to foramen of Winslow
- Portal vein
- Lies in deep groove of liver

Posterior:
sympathetic chain, laying to the right margin posterior to I.V.C.


Inferior Vena Cava
(Vena cava inferior)

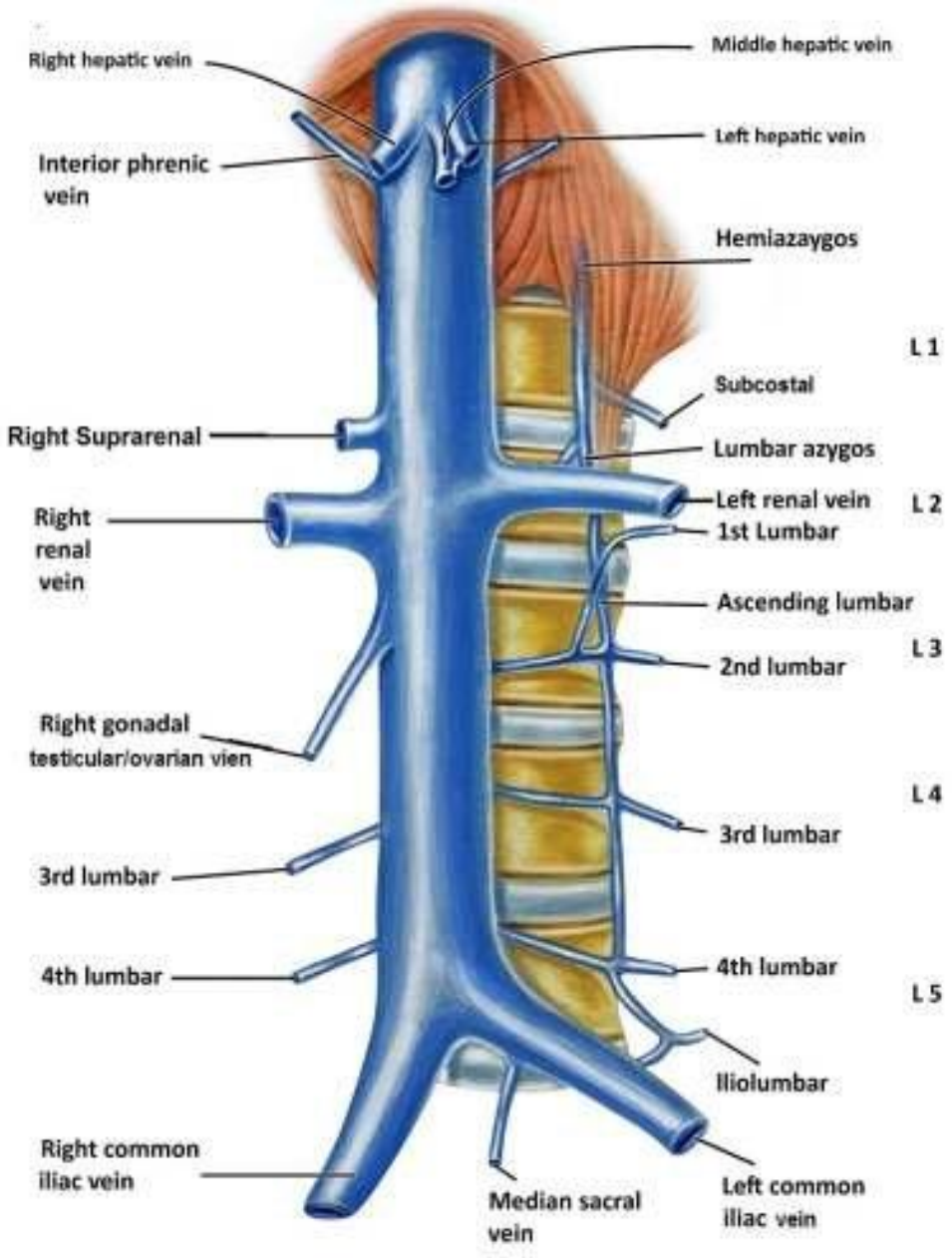
10 – I.V.C: Tributaries

- ✓ Two anterior visceral tributaries:
  - ➢ the left and right hepatic veins coming from corresponding lobes.
  - ➢ A third one <u>may be seen</u>, as in the pic, which is central/middle hepatic vein, coming from caudate and quadrate lobes of liver.

- ✓ Three lateral visceral tributaries:

1. the right suprarenal vein (the left vein drains into the left renal vein).
2. renal veins. Note that the <u>left renal vein is longer</u> than the right one.
3. right gonadal (testicular or ovarian) vein (the left vein drains into the left renal vein)

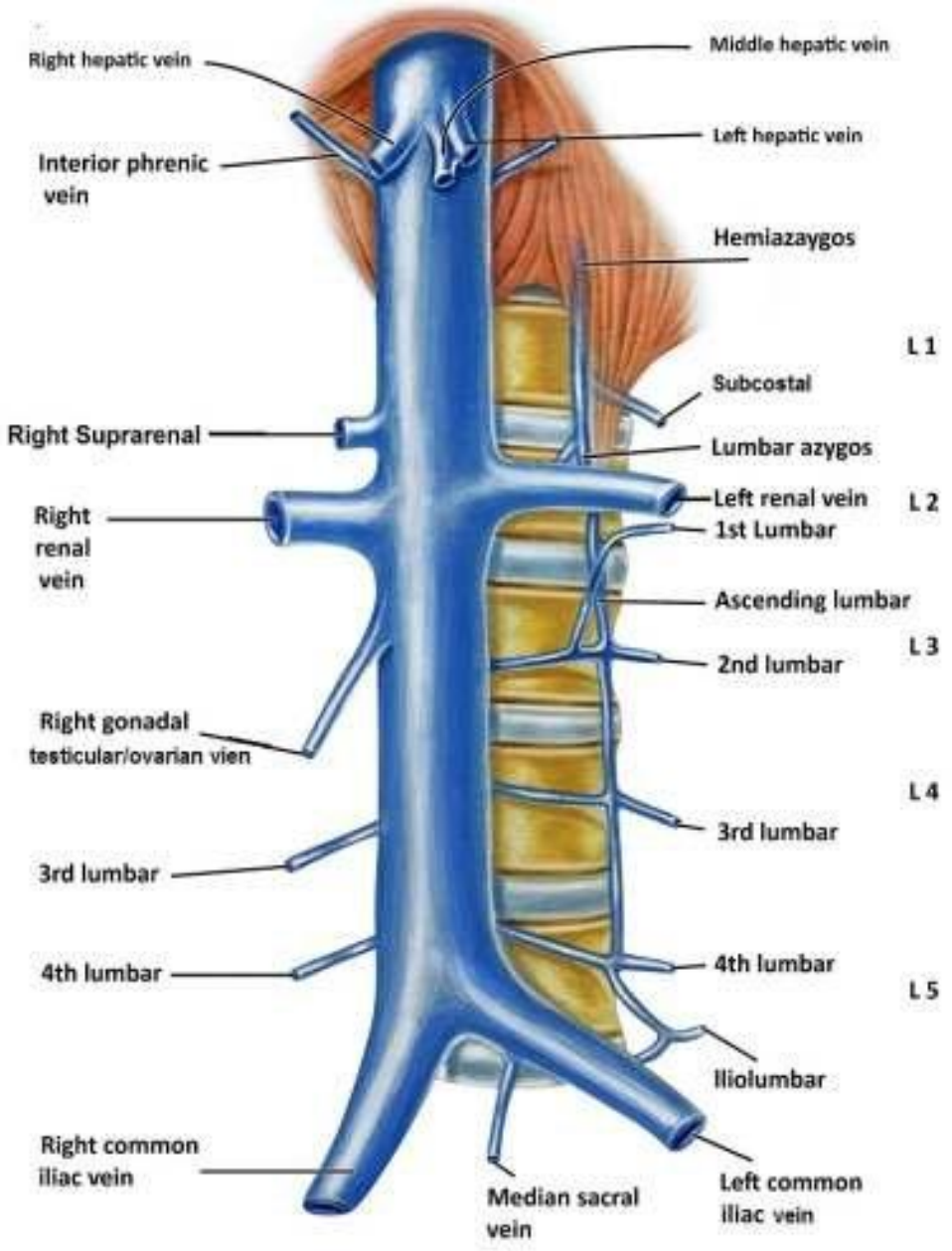
☹️: left gonadal vein is more prone to varicocele;
it longer and more perpendicular than the right one



10 – I.V.C: Tributaries

- ✓ Five lateral abdominal wall tributaries:
- ➢ The inferior phrenic vein
- ➢ four lumbar veins

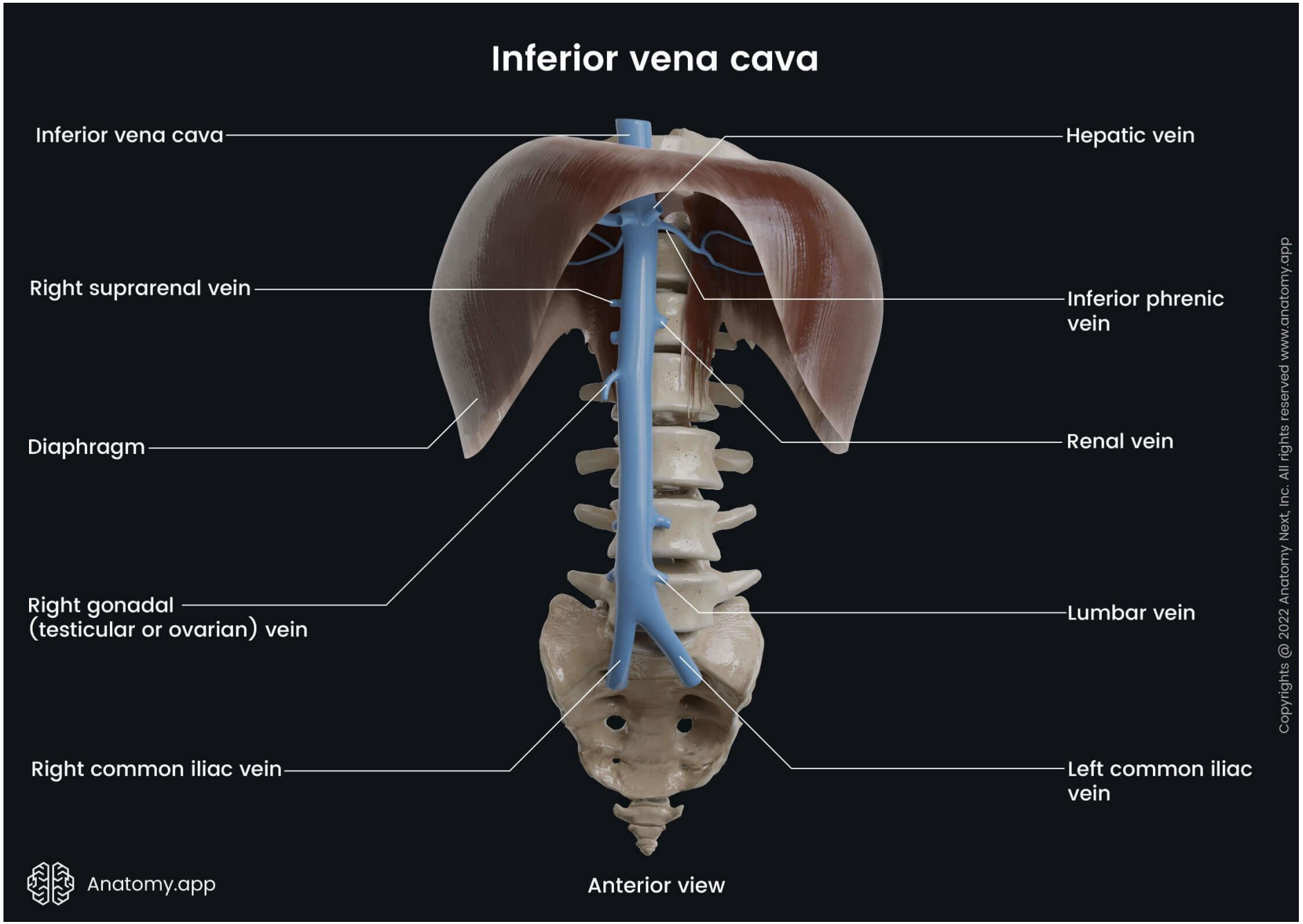
- ✓ Three veins of origin:
- ➢ two common iliac veins. They unite at the level of L5 to form I.V.C
- ➢ the median sacral vein.



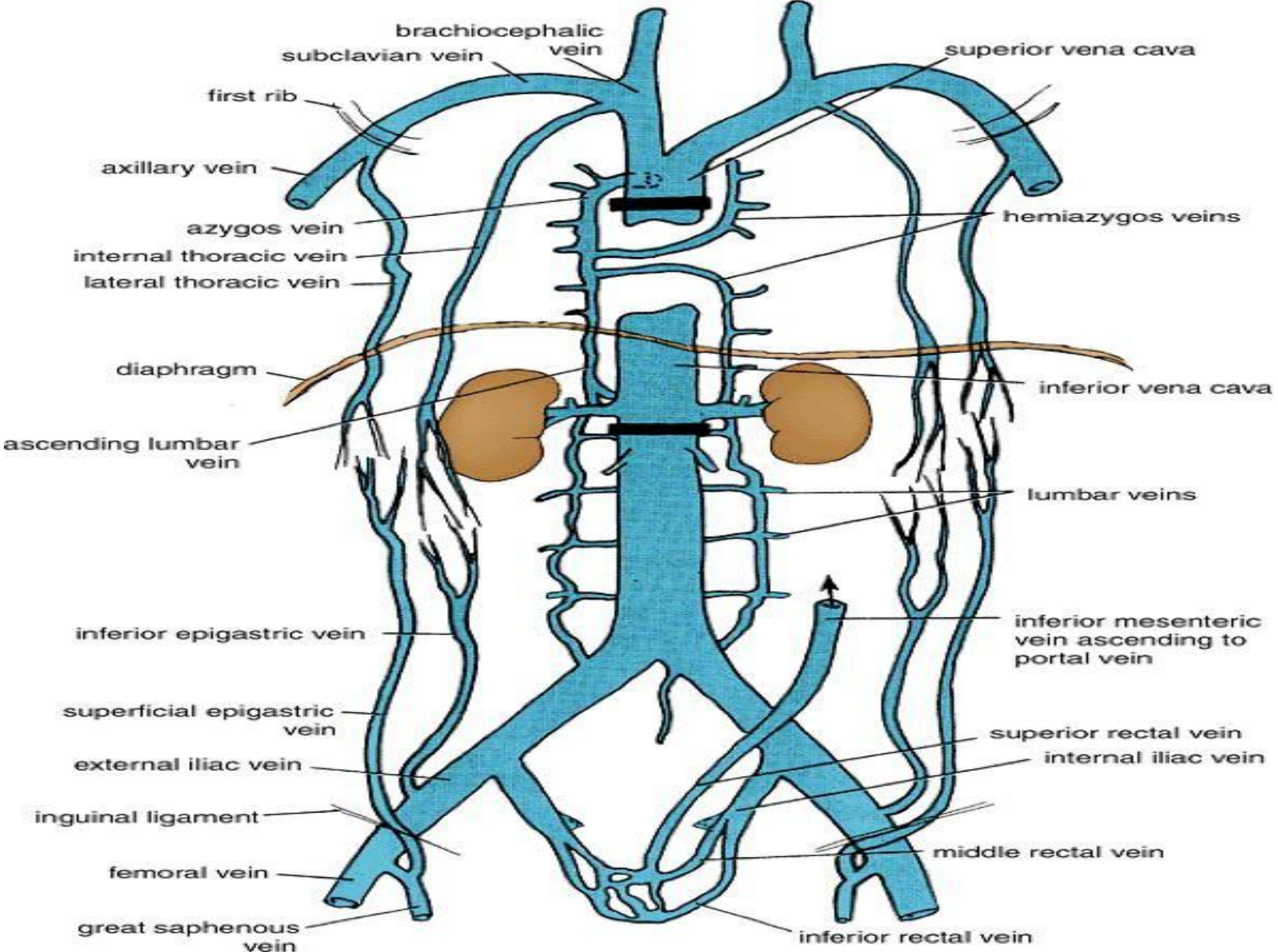
Note that:

- central/middle hepatic vein
- the median sacral vein

are not shown in this pic.

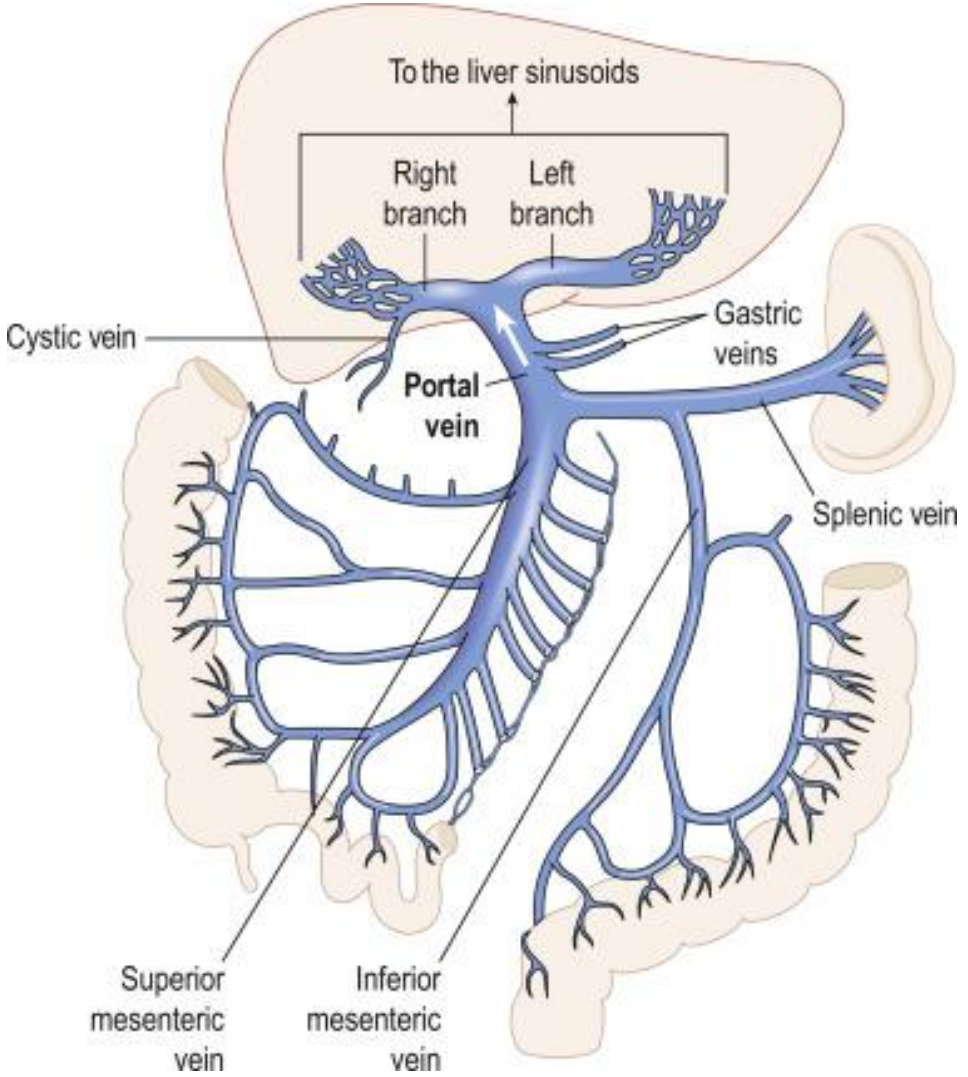


This pic is by
Dr. muhtaseb
Good luck trying
to understand it.



11 – Portal vein: course

- ✓ Portal vein is 2 inches long (5 cm)
- ✓ start: behind the neck of pancreas by the union of splenic and superior mesenteric veins.
- ✓ ends: in porta hepatis as right and left branches.
- ✓ The portal vein enters the liver and breaks up into sinusoids, from which blood passes into hepatic veins that join I.V.C
- ✓ The portal vein drains blood from the abdominal part of G.I.T. from the lower third of esophagus to halfway down the anal canal.
- ✓ It also drains blood from the spleen, pancreas and gallbladder



11 – Portal vein: main tributaries

Inferior Mesenteric Vein

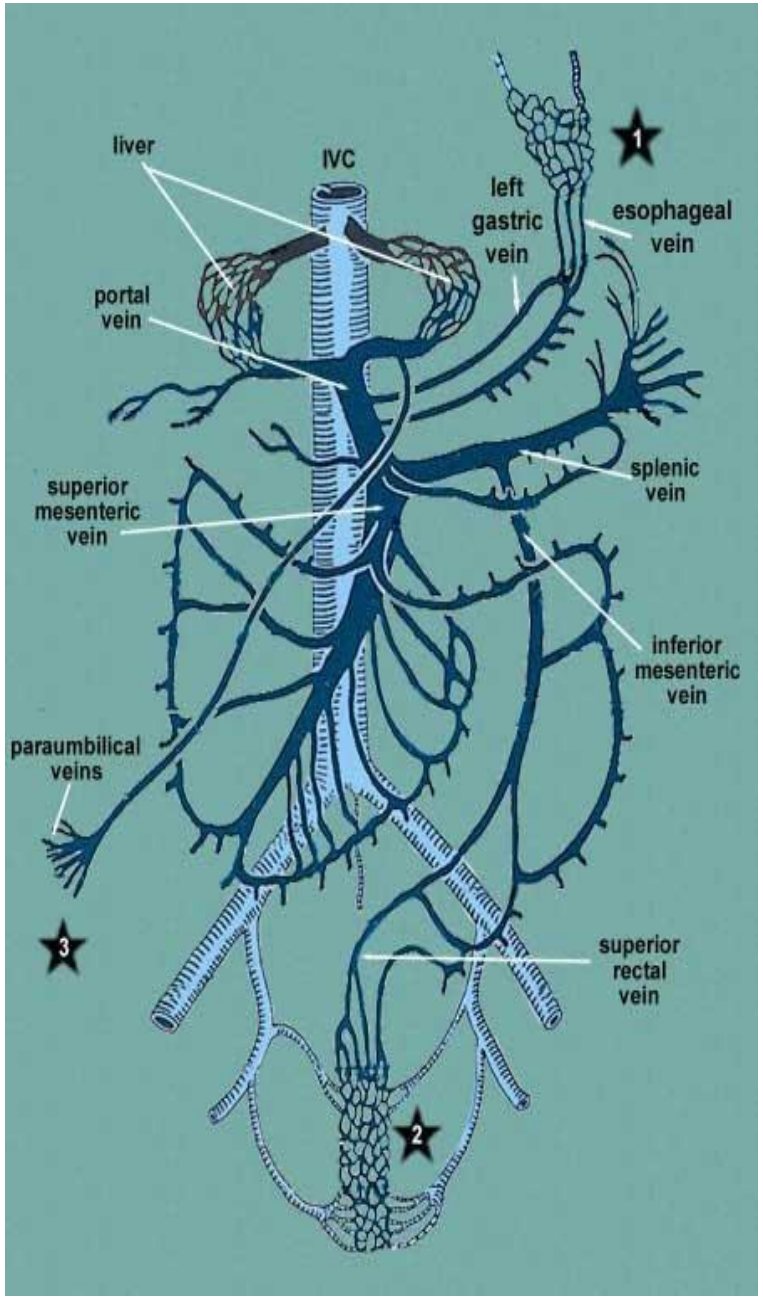
The inferior mesenteric vein is a tributary of the portal circulation. It begins halfway down the anal canal as the superior rectal vein.

- ✓ It passes up the posterior abdominal wall on the left side of the inferior mesenteric artery and the duodenojejunal flexure and joins the splenic vein behind the pancreas.
- ✓ It receives tributaries that correspond to the branches of the artery.

The splenic vein

It is a tributary of the portal circulation. It begins at the hilum of the spleen by the union of several veins and is then joined by the short gastric and the left gastroepiploic veins.

- ✓ It passes to the right within the splenico-renal ligament and runs behind the pancreas.
- ✓ It joins the superior mesenteric vein behind the neck of the pancreas to form the portal vein.
- ✓ It is joined by veins from the pancreas and the inferior mesenteric vein.

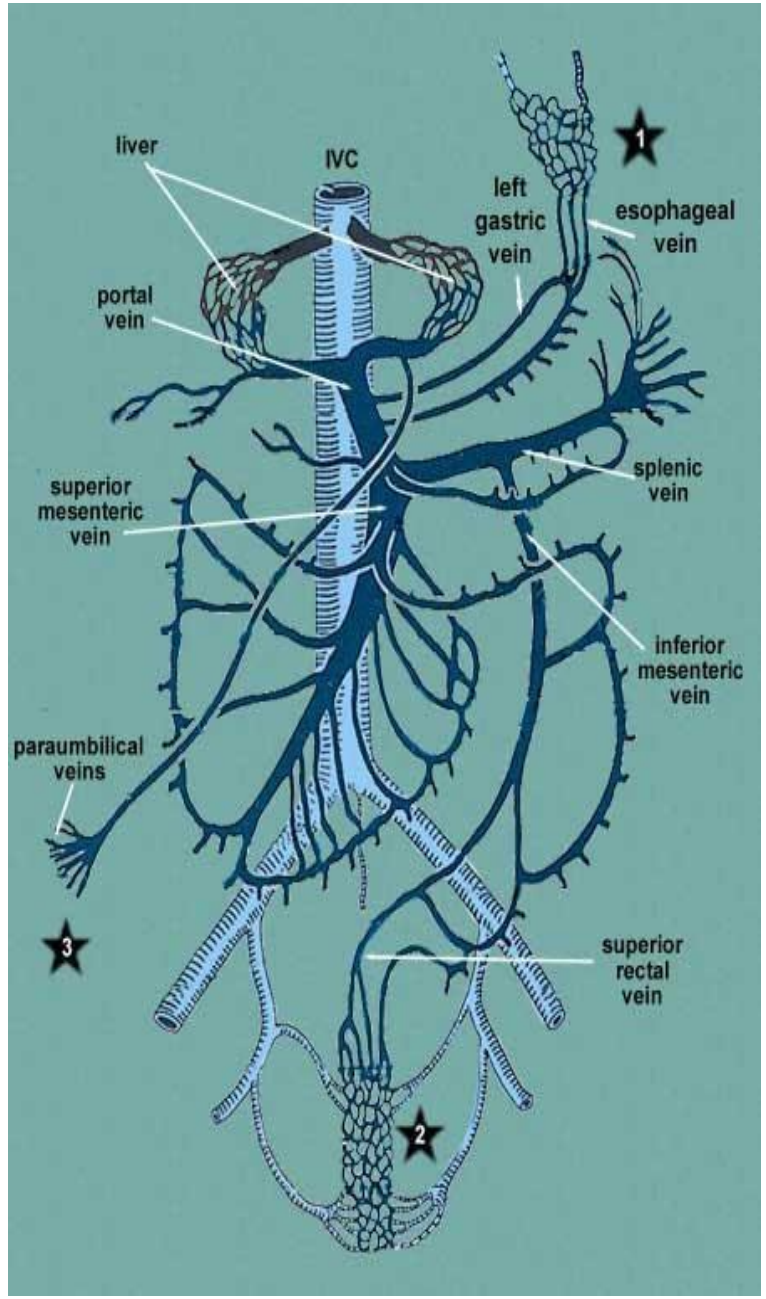


11 – Portal vein: main tributaries

Superior Mesenteric Vein

The superior mesenteric vein is a tributary of the portal circulation.

- ✓ It begins at the ileocecal junction and runs upward on the posterior abdominal wall within the root of the mesentery of the small intestine and on the right side of the superior mesenteric artery.
- ✓ It passes in front of the third part of the duodenum and behind the neck of the pancreas, where it joins the splenic vein to form the portal vein.
- ✓ It receives tributaries that correspond to the branches of the superior mesenteric artery and also receives the inferior pancreaticoduodenal vein and the right gastroepiploic vein .

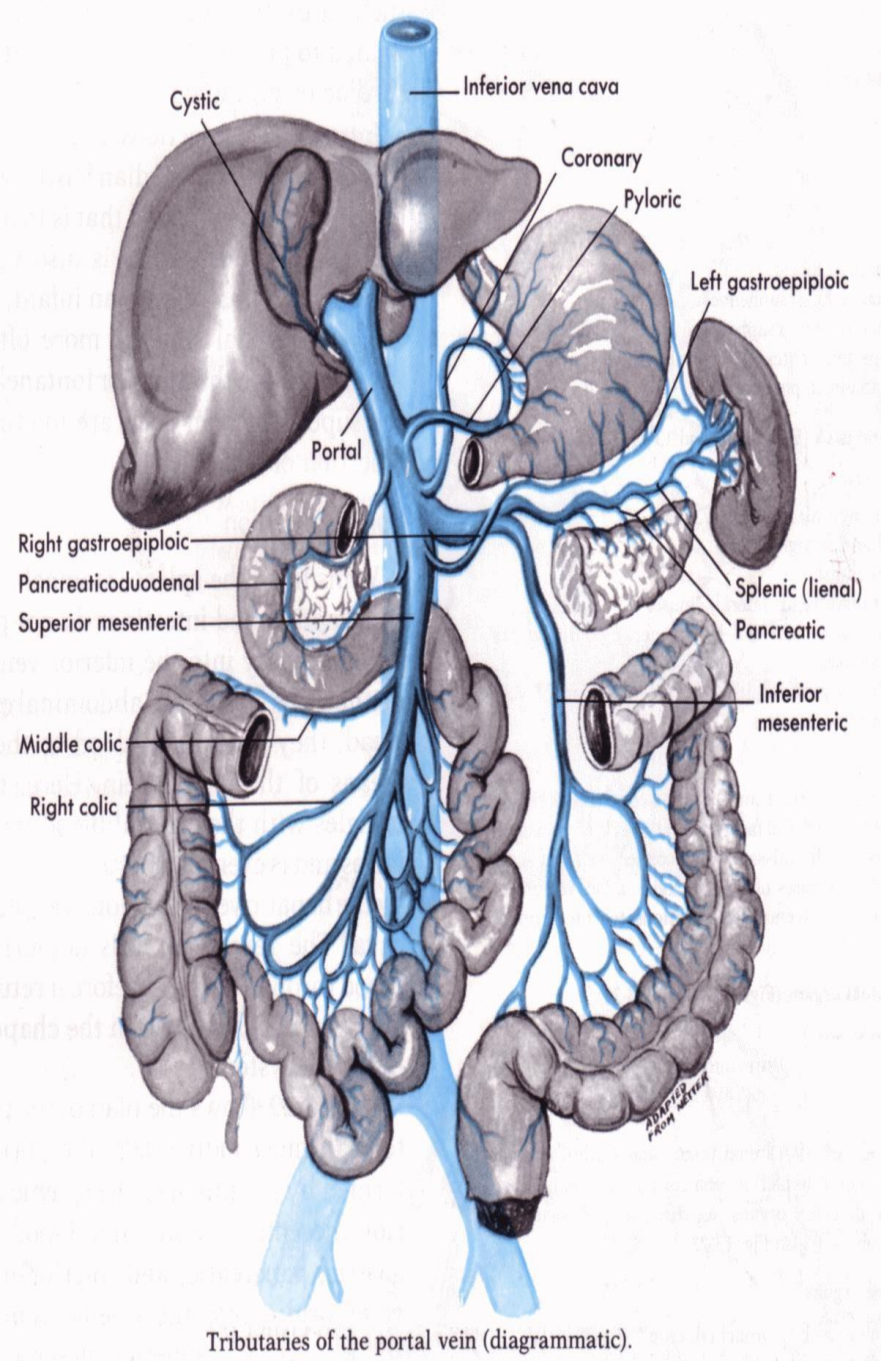


11 – Portal vein: tributaries

- ✓ Splenic vein:
- ➢ Receives:
  short gastric, left gastroepiploic, Inferior mesenteric, and pancreatic
- ➢ Unite with sup. Mesenteric behind the neck of pancreas to form portal vein.

- ✓ Superior mesenteric vein:
- ➢ Receives from:
  jejunal, ileal, ileocolic, right colic, middle colic, inferior pancreaticoduodenal, and right gastroepiploic veins.

- ➢ ascends in the root of mesentery of the small intestine.



Tributaries of the portal vein (diagrammatic).

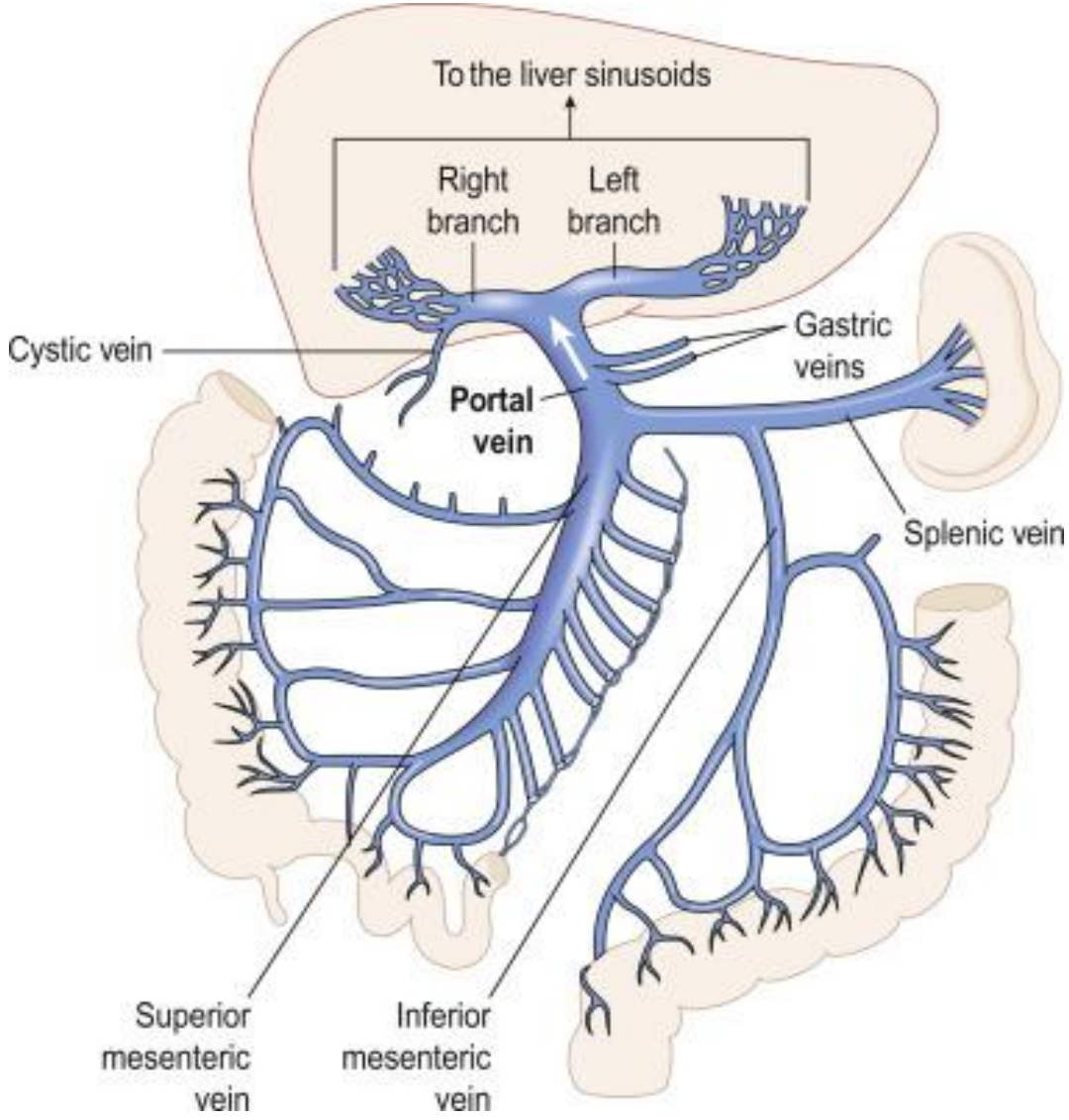
11 – Portal vein: tributaries

- ✓ Inferior mesenteric vein:
- ➢ Receives from:
  superior rectal, sigmoid and left colic veins
- ➢ Drains to splenic vein

- ✓ Left gastric:
- ➢ Drains left portion of the lesser curvature and distal part of esophagus.
- ➢ Opens directly to portal vein.

- ✓ Right gastric vein:
- ➢ Drains right portion of the lesser curvature
- ➢ Drains directly to portal vein

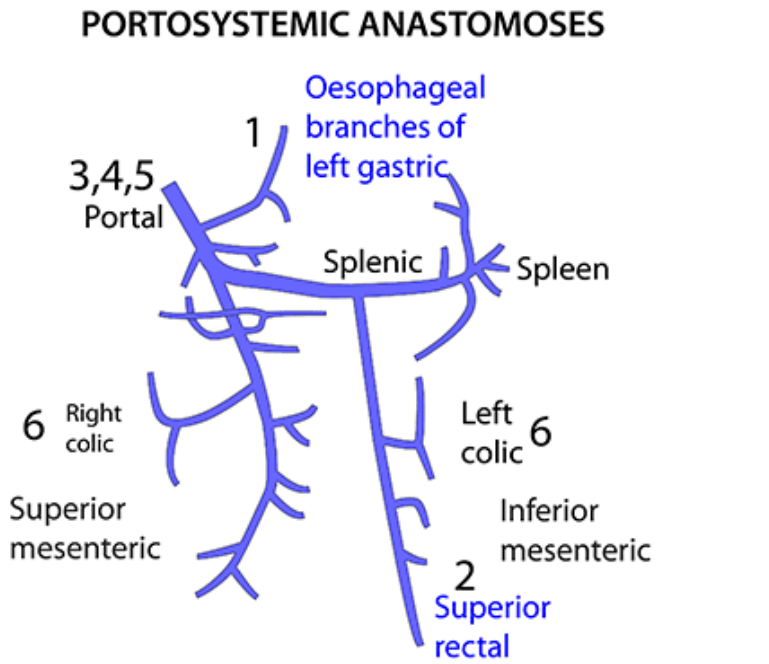
- ✓ Cystic vein
- ➢ Either drain gall bladder directly to liver, or to portal vein



12 – Portal systemic anastomosis

- ✓ A portal-caval anastomosis (portal systemic anastomosis)
- ✓ Is a specific type of anastomosis that occur between veins of portal circulation and systemic circulation.
- ✓ The lower end of esophagus is one of the important sites for anastomosis.

😟 **: In cases of portal hypertension (ex: liver cirrhosis) esophageal varices are seen**
More severe complication is rupture of these veins → hematemesis.



1 Lower oesophagus
Portal: Oesophageal branches of left gastric veins
Systemic: Azygos veins

2 Upper anal canal
Portal: Superior rectal vein
Systemic: Middle/inferior rectal veins

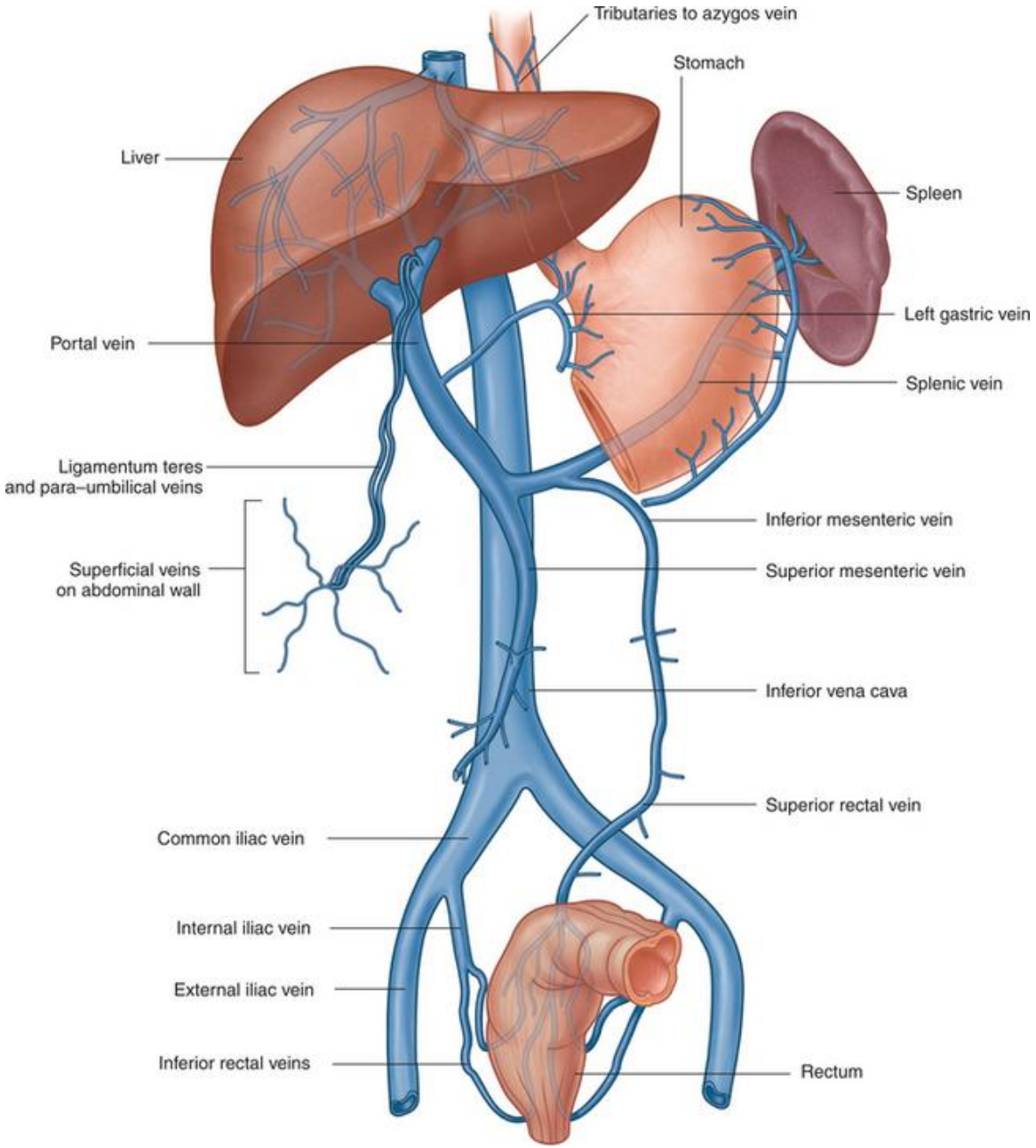
3 Umbilical
Portal: Veins of ligamentum teres
Systemic: Superior/inferior epigastric veins

4 Bare area of liver
Portal: Hepatic/portal veins
Systemic: Inferior phrenic veins

5 Patent ductus venosus (rare)
Postal: Left branch of portal vein
Systemic: Inferior vena cava

6 Retroperitoneal
Portal: Colonic veins
Systemic: Body wall veins

12 – Portal systemic anastomosis



12 – Portal systemic anastomosis

Causes of portal hypertension

- Liver diseases → Cirrhosis, fibrosis (bilharzial)
- Valvular diseases of the heart
- Congenital patent

12 – Portal systemic anastomosis

Region	Name of clinical condition	Portal circulation	Systemic circulation
Esophageal	Esophageal varices	Esophageal branch of left gastric vein	Esophageal branches of Azygos vein
Rectal	Hemorrhoids	Superior rectal vein	Middle rectal veins and inferior rectal veins
Paraumbilical	Caput medusae	Paraumbilical veins	Superficial epigastric vein
Retroperitoneal	(no clinical name)	Right colic vein, middle colic vein, left colic vein	Renal vein, suprarenal vein, paravertebral vein, and gonadal vein
Intrahepatic	Patent ductus venosus	Left branch of portal vein	Inferior vena cava

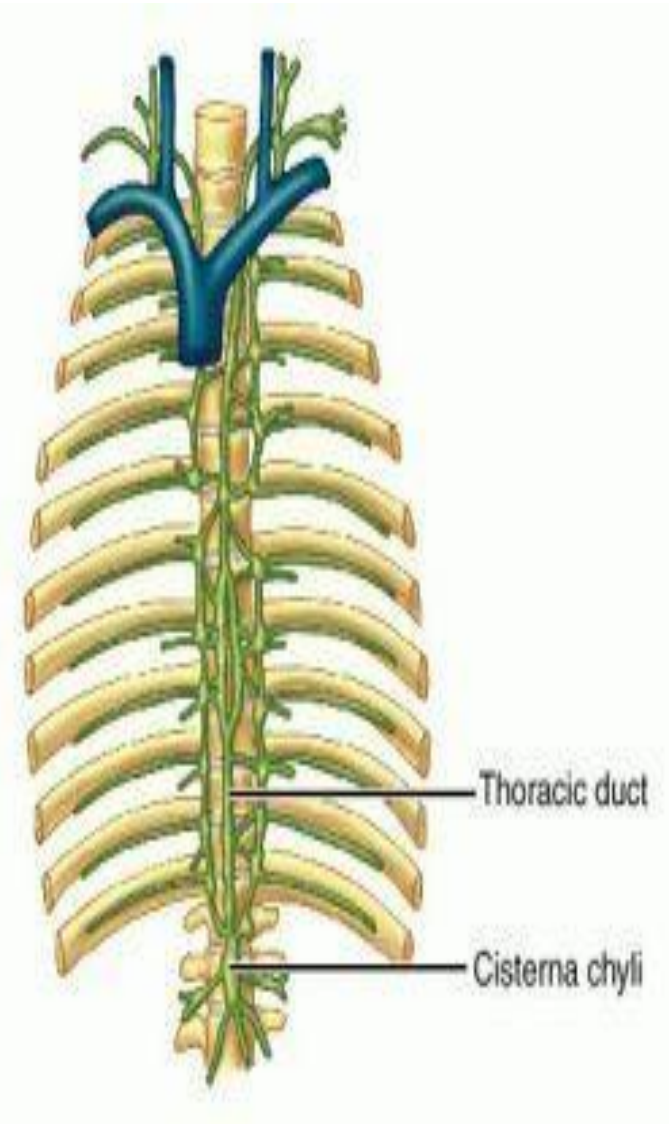
13 – cisterna chyli

The cisterna chyli

- ✓ The right and left lumbar trunks under the diaphragm on the side of the aorta

- ✓ Receives lymph from
  - ➢ The intestinal trunk
  - ➢ Some small lymph vessels that descend from the lower part of the thorax.

- ✓ Rt & Lt vessels from lower thorax



14 – Lymphatics on the Posterior Abdominal Wall

Lymph Nodes

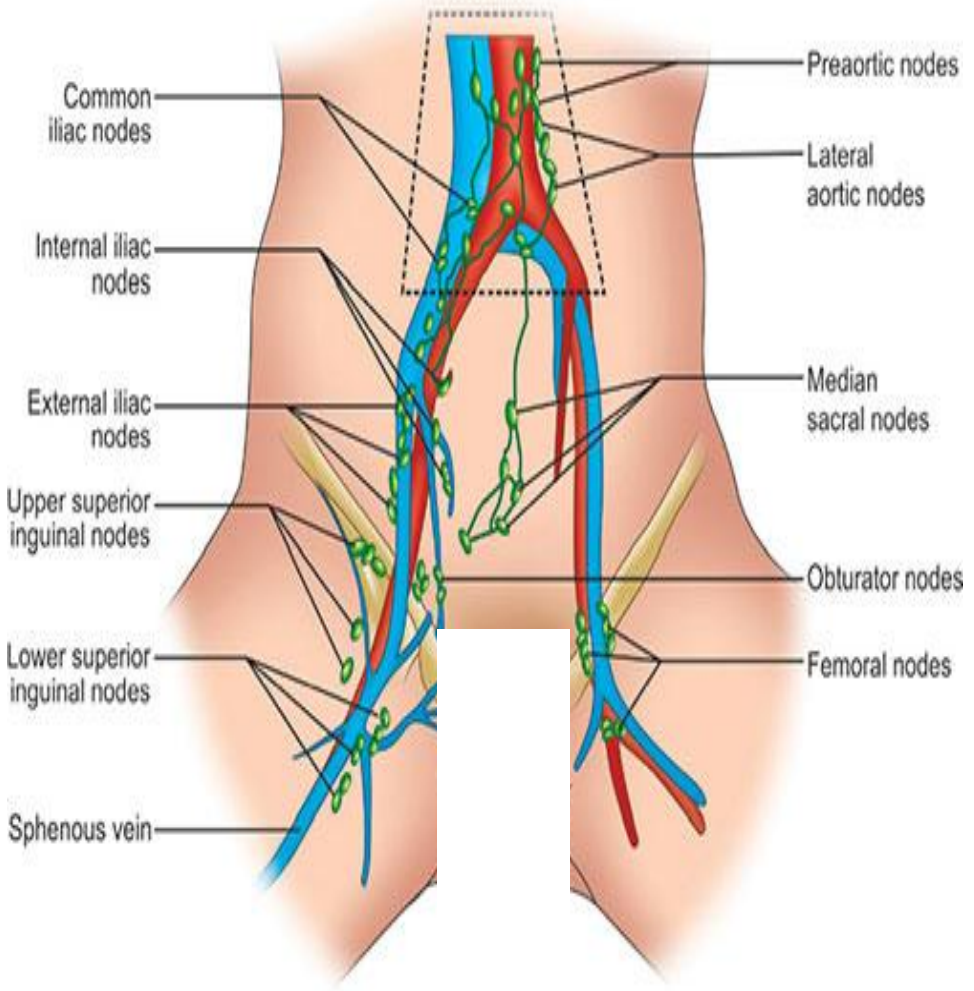
- ✓ The lymph nodes are closely related to the aorta and form a preaortic and a right and left lateral aortic (Para-aortic or lumbar) chain .

<u>The preaortic lymph nodes :</u>

- ✓ lie around the origins of the celiac, superior mesenteric, and inferior mesenteric arteries and are referred to as the celiac, superior mesenteric, and inferior mesenteric lymph nodes, respectively.

- ✓ They drain the lymph from the gastrointestinal tract, extending from the lower one third of the esophagus to halfway down the anal canal, and from the spleen, pancreas, gallbladder, and greater part of the liver.

- ✓ The efferent lymph vessels form the large intestinal trunk.



14 – Lymphatics on the Posterior Abdominal Wall

- **<u>The lateral aortic (para-aortic or lumbar) lymph nodes</u>**

✓ drain lymph from the kidneys and suprarenals; from the testes in the male and from the ovaries, uterine tubes, and fundus of the uterus in the female; from the deep lymph vessels of the abdominal walls; and from the common iliac nodes.

✓ The efferent lymph vessels form the right and left lumbar trunk

✓ The thoracic duct commences in the abdomen as an elongated lymph sac, the cisterna chyli.

✓ This lies just below the diaphragm in front of the first two lumbar vertebrae and on the right side of the aorta .

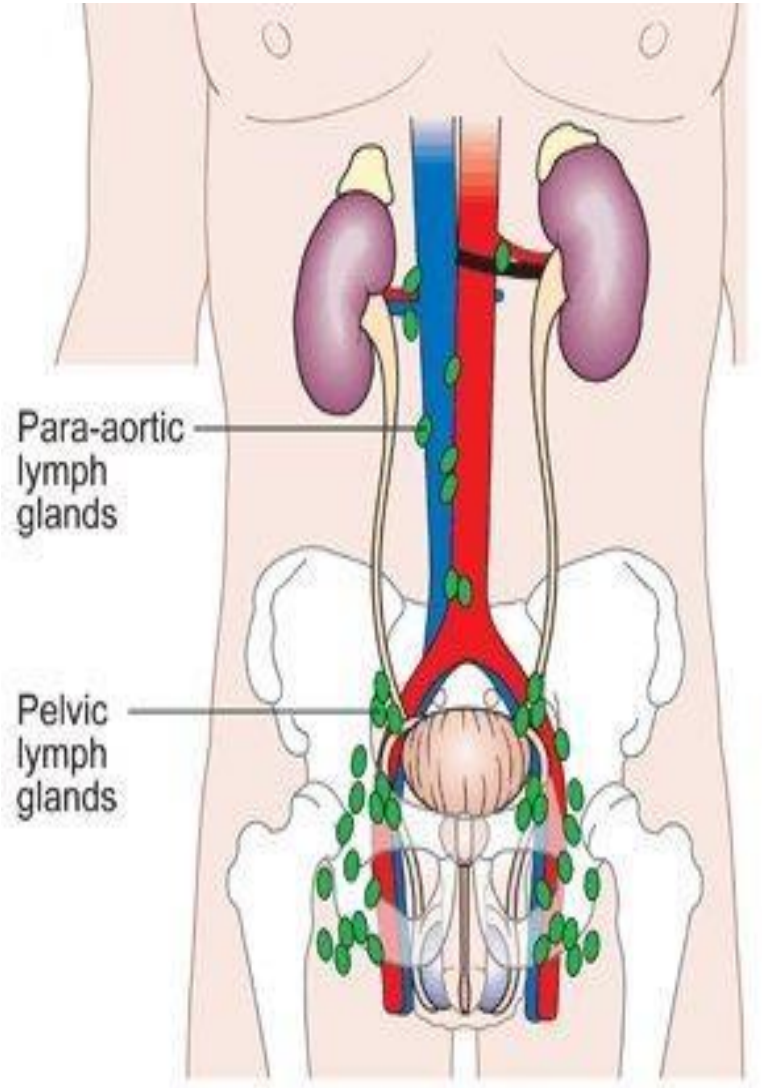
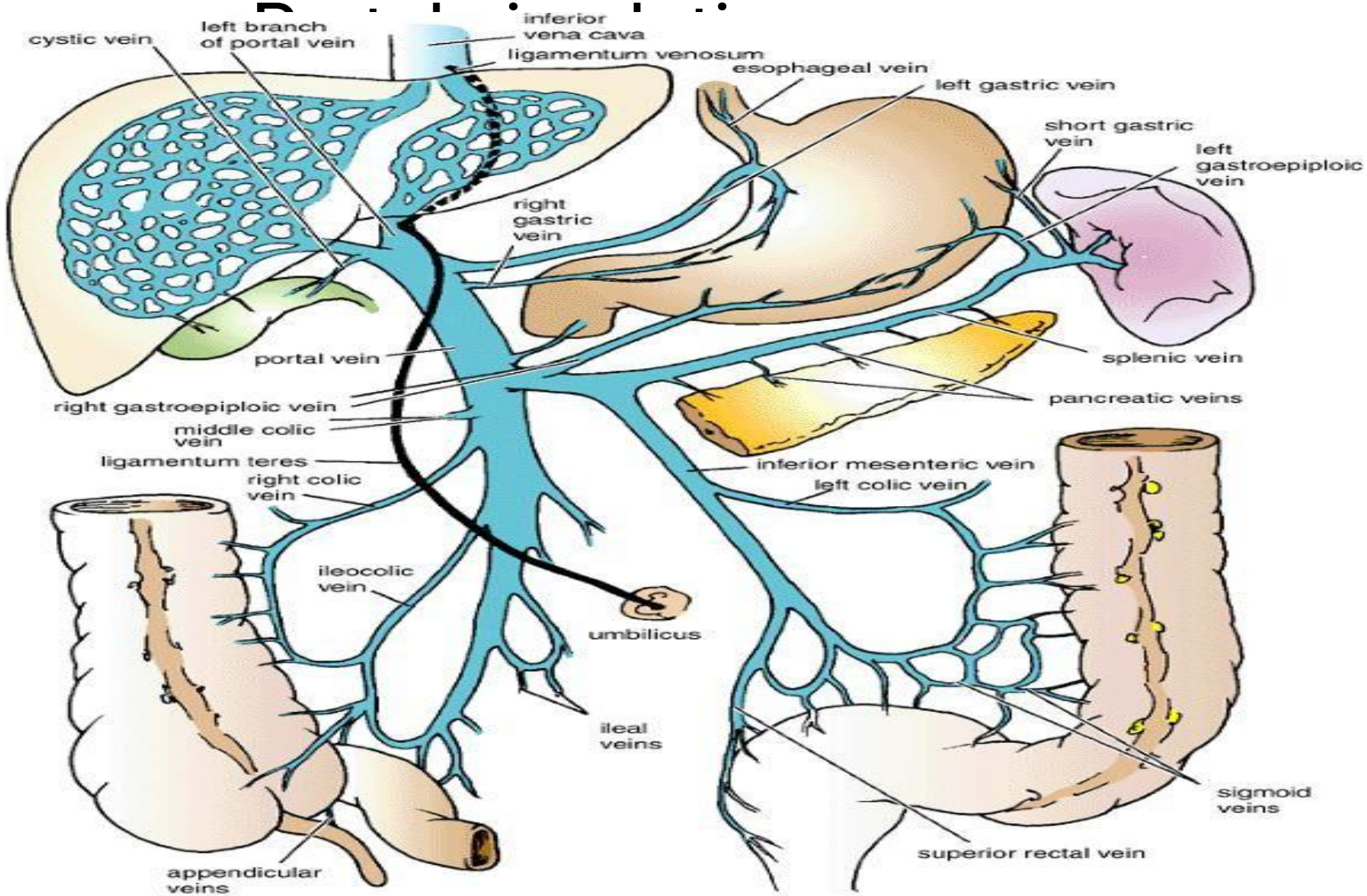
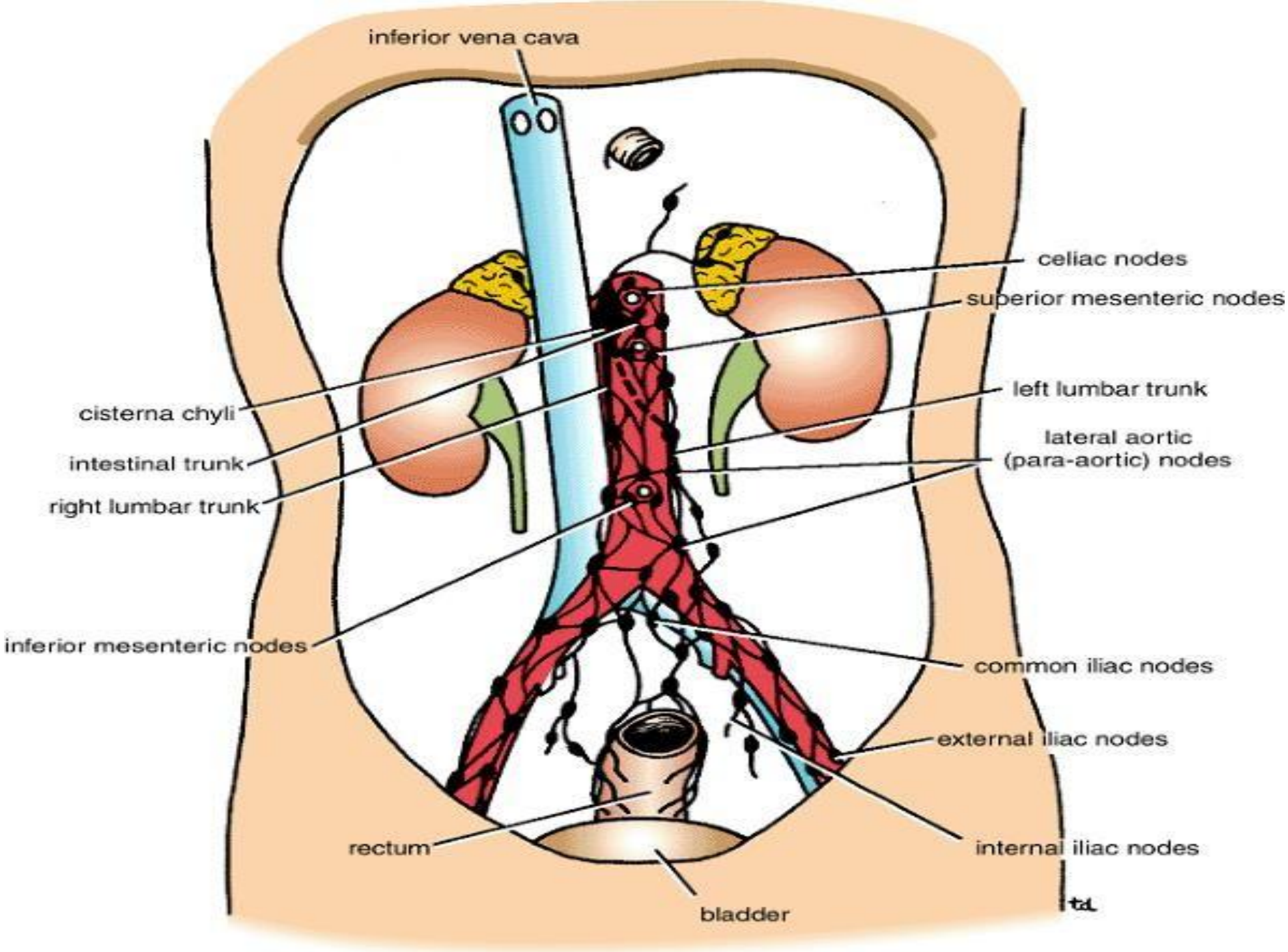


Diagram showing the pelvic and para-aortic lymph nodes


cystic vein
left branch of portal vein
inferior vena cava
ligamentum venosum
esophageal vein
left gastric vein
short gastric vein
left gastroepiploic vein
right gastric vein
portal vein
splenic vein
pancreatic veins
right gastroepiploic vein
middle colic vein
ligamentum teres
inferior mesenteric vein
left colic vein
right colic vein
ileocolic vein
umbilicus
ileal veins
sigmoid veins
superior rectal vein
appendicular veins


inferior vena cava
celiac nodes
superior mesenteric nodes
left lumbar trunk
lateral aortic
(para-aortic) nodes
cisterna chyli
intestinal trunk
right lumbar trunk
inferior mesenteric nodes
common iliac nodes
external iliac nodes
internal iliac nodes
rectum
bladder

For any feedback, scan the code or click on it.

Corrections from previous versions:

Versions	Slide # and Place of Error	Before Correction	After Correction
V0 → V1	12	I.V.C. which starts at the level of 4th lumbar vertebra	I.V.C. which starts at the level of 5th lumbar vertebra
	23	Ilecolic→ jejunal and ileal	Jejunal and ileal are direct branches of SMA
	30	External iliac divides into…	Internal iliac divides into…
	45	portal starts behind head of pancreas	Behind neck of pancreas
V1 → V2			

رسالة من الفريق العلمي:

اللهُ أَقْرَبُ جِيرَانِ الفَقِيرِ لَهُ
يُعْطِي إِذَا الجَارُ أَكْدَى جَارَهُ وَكَدَى

اللهُ جَارُ الوَرَى مِنْ شَرِّ أَنْفُسِهِمْ
فَامْدُدْ إِلَيْهِ يَدَاً يَمْدُدْ إِلَيْكَ يَدَا