

MSA
Education

INTRO TO GASTRIC AND PELVIC ANATOMY

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WHY IS THIS RELEVANT TO MY LIFE



she believed

That you could just skip abdominal and pelvic anatomy

- A good understanding of abdominal anatomy can help predict where infections and malignancies can spread.
- Surface anatomy is incredibly important for clinical examination and to plan the surgical access to the abdominal cavity !
- Think of how many pathologies and specialties are involved with just the abdomen alone. This is going to be your building block to understand what's going on when you enter the wards !

CONTENTS/ WHAT YOU LEARN FIRST

THE KEY – MOVING FROM GENERAL CONCEPTS TO SPECIFICS

YOU DO NOT PUT THE ICING ON THE CAKE BEFORE YOU'VE MADE THE CAKE !

- General Concepts – Vasculature and Structure – getting your scaffolding for next week's lecture.
- Key pelvic concepts !

LECTURES COVERED IN THESE SLIDES

- **General rundown** of abdomen
- Posterior abdominal wall
- Pelvis and perineum
- Rectum and Anal Canal

I am not going to be regurgitating diagrams and facts in this lecture ! This is how you go about learning it, and what you may have missed out of the lectures. We will be ranking by importance and what is easily testable.

FORMAT WHEN LEARNING ABDOMINAL AND PELVIC STRUCTURES (IN ORDER OF IMPORTANCE)

- What level does it arise?
- (If applicable) Nervous and arterial supply or if it's vasculature, what does it supply and where does this vasculature arise from
- What are its anatomical relations (e.g. what is posterior, superior, inferior) (don't go TOO overboard)

INTRAPERITONEAL AND RETROPERITONEAL

RETROPERITONEAL – enveloped by parietal peritoneum

- **S** = Suprarenal (adrenal) Glands
- **A** = Aorta/IVC
- **D** = Duodenum (except the proximal 2cm, the duodenal cap)
- **P** = Pancreas (except the tail)
- **U** = Ureters
- **C** = Colon (ascending and descending parts)
- **K** = Kidneys
- **E** = (O)esophagus
- **R** = Rectum

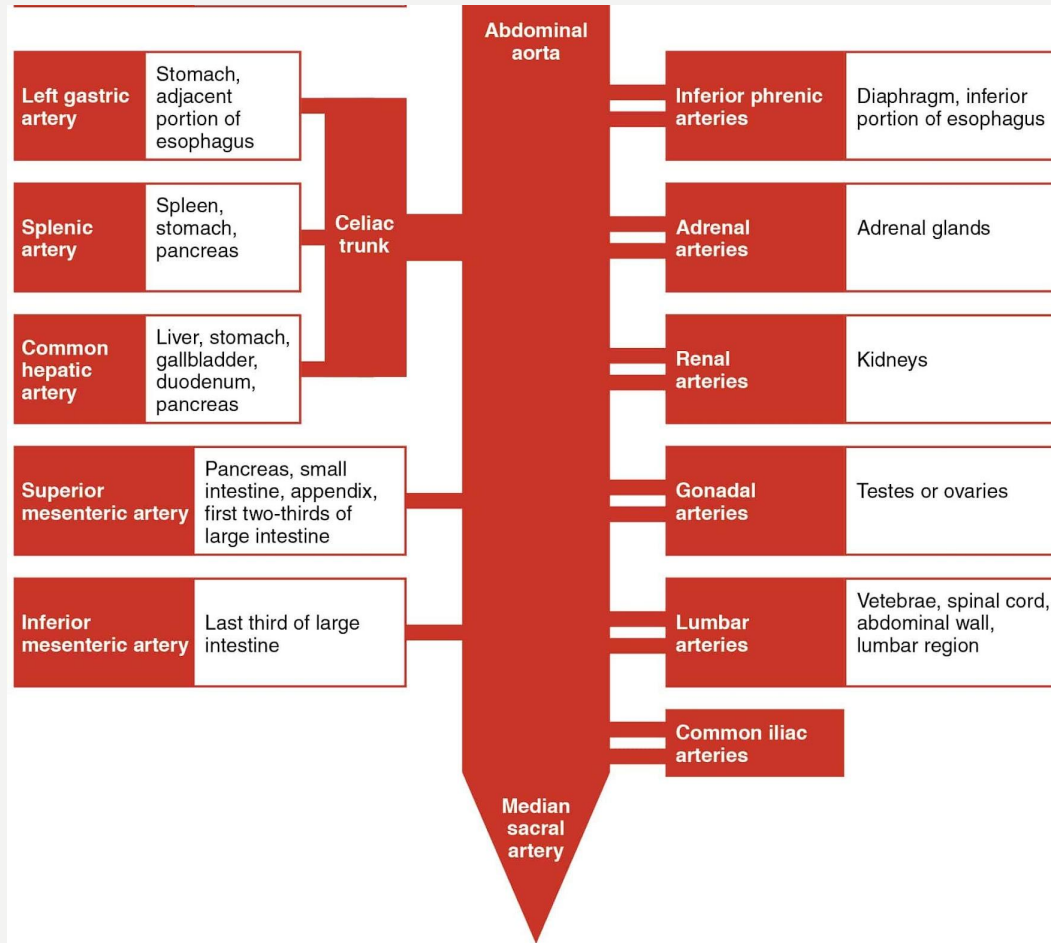
Intraperitoneal – enveloped by visceral peritoneum

- Stomach
- Liver
- Spleen
- Jejunum
- Ileum
- Transverse and sigmoid colons

THE ONLY THING I REALLY REALLY DRILLED INTO MY HEAD...



THE ABDOMINAL AORTA..



KEY CONCEPTS HERE:

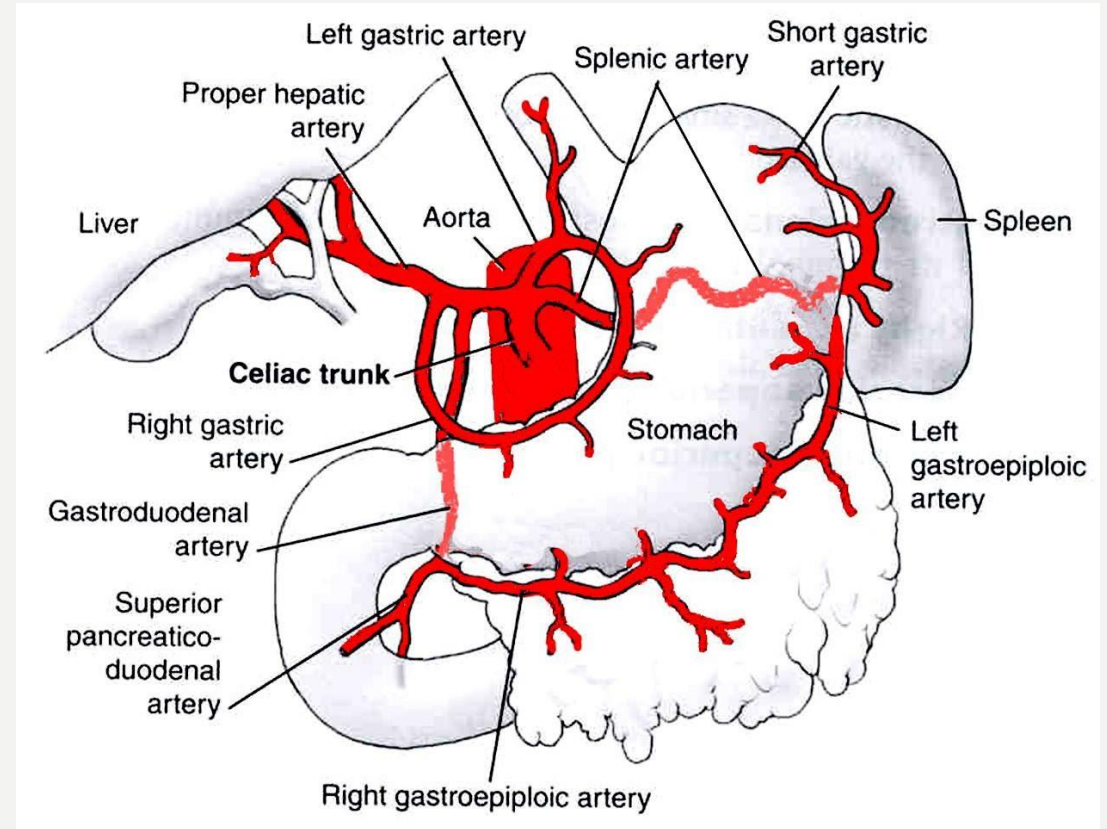
- **COELIAC TRUNK**
- **SUPERIOR MESENTERIC ARTERY**
- **INFERIOR MESENTERIC ARTERY**
- Paired parietal (left and right inferior phrenic, four paired lumbar and the median sacral)
- Paired visceral (middle suprarenal, renal, gonadal)

THE COELIAC TRUNK – arises at T12

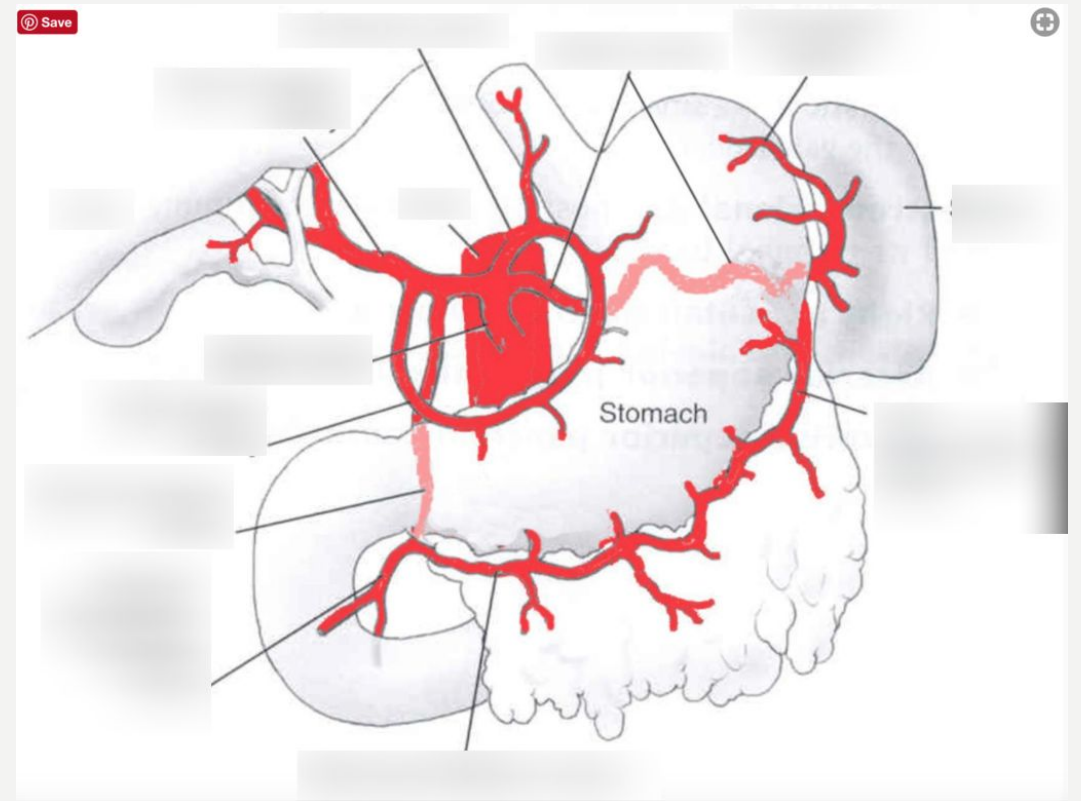
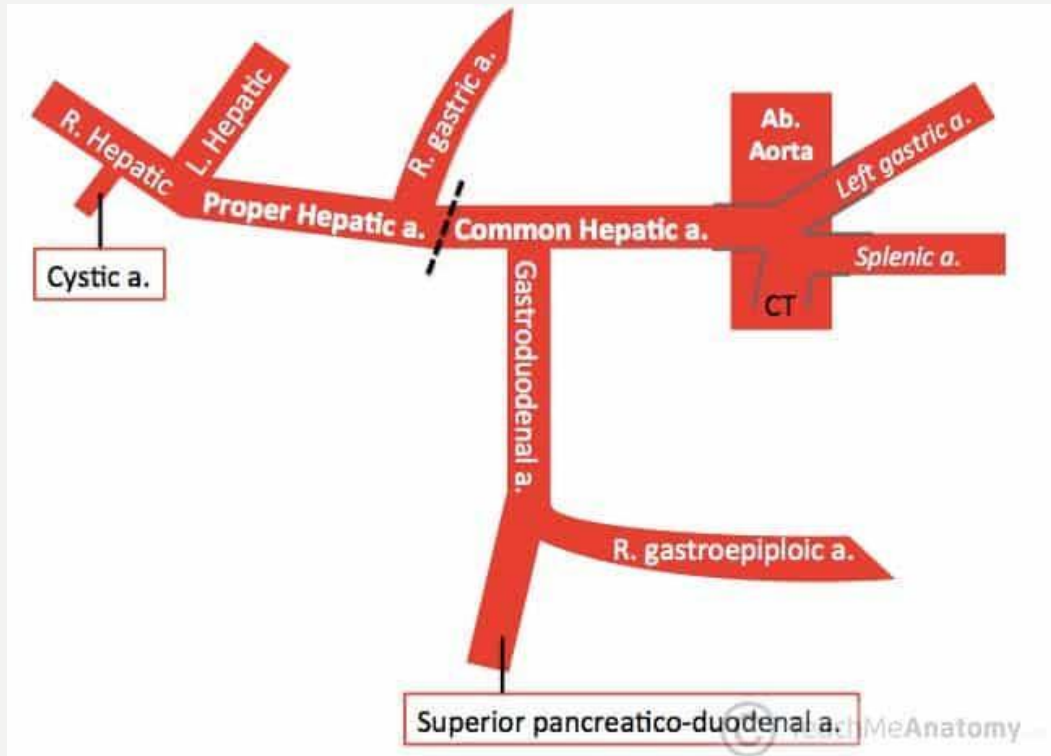
THE COELIAC TRUNK SPLITS INTO THREE BRANCHES... REMEMBER THESE !

DUODENUM, STOMACH, SPLEEN, PANCREAS !

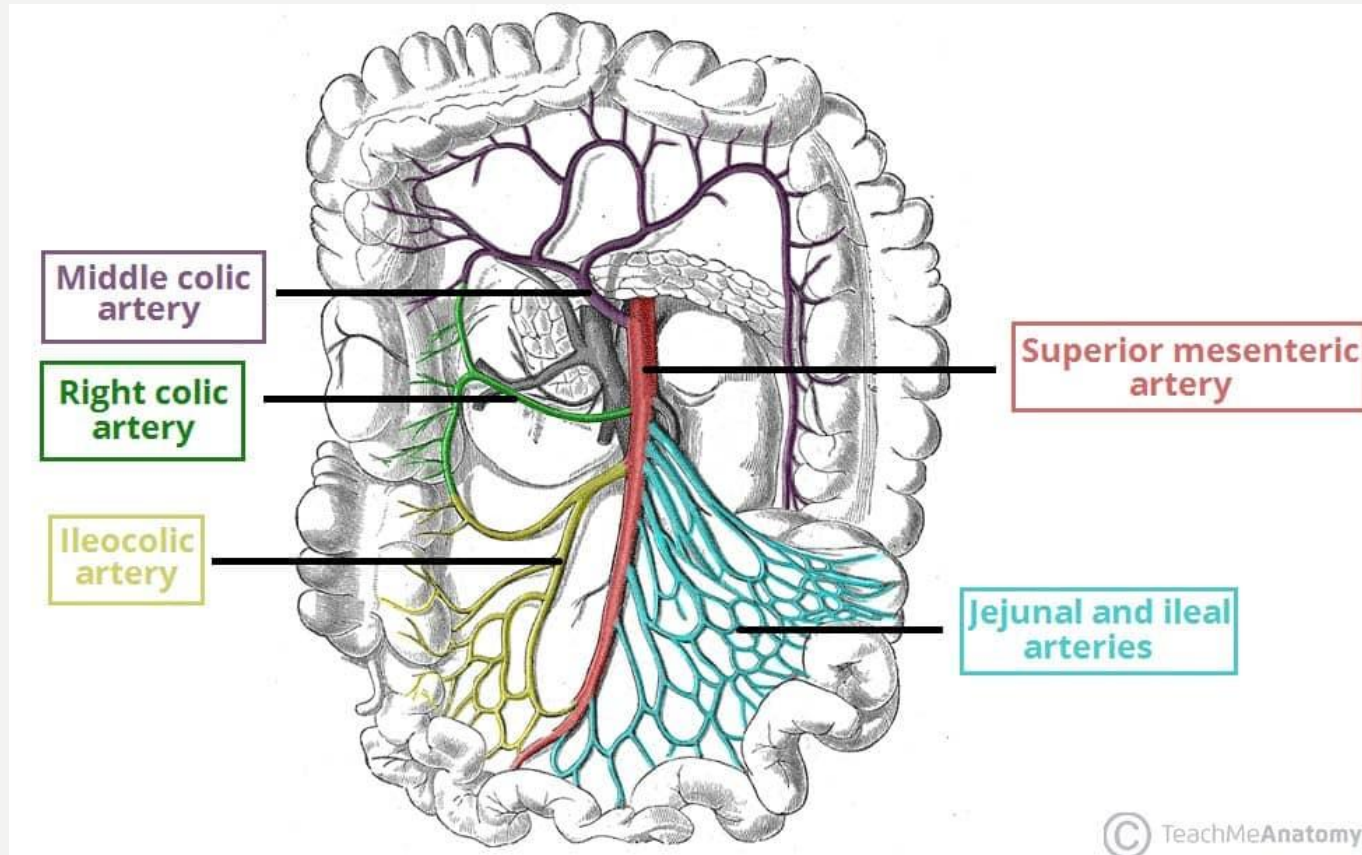
LEFT GASTRIC
SPLenic
COMMON HEPATIC



KEY DIAGRAMS

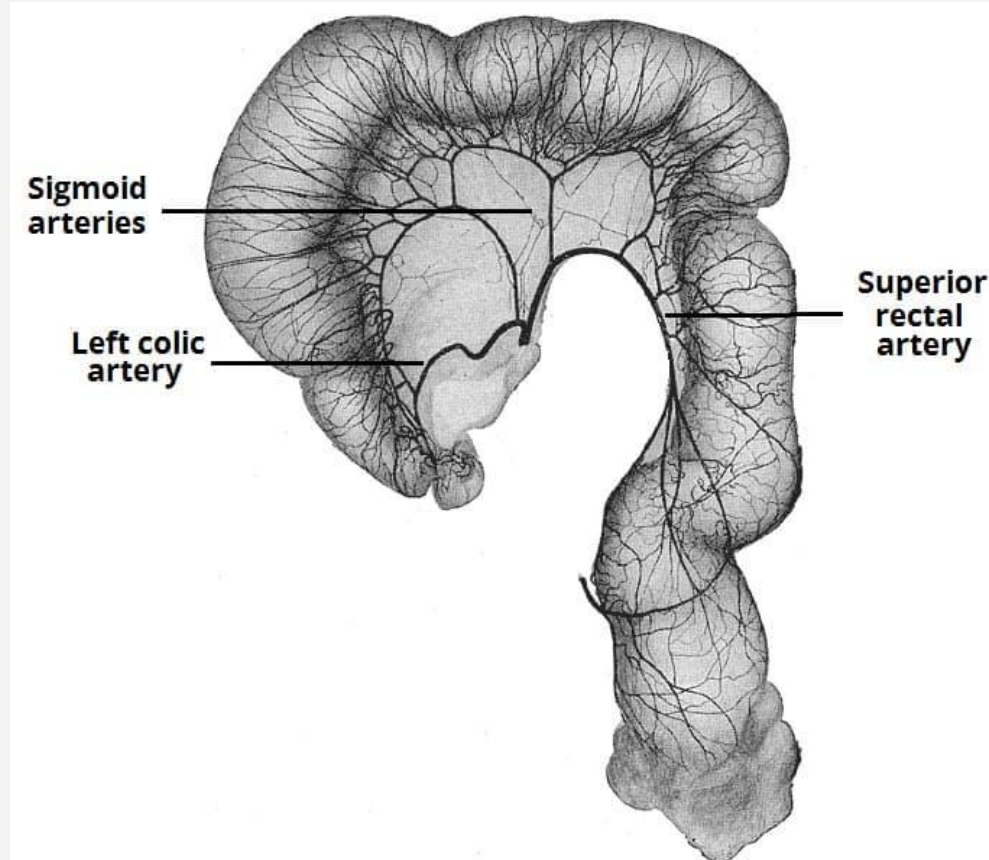


SUPERIOR MESENTERIC ARTERY – L1



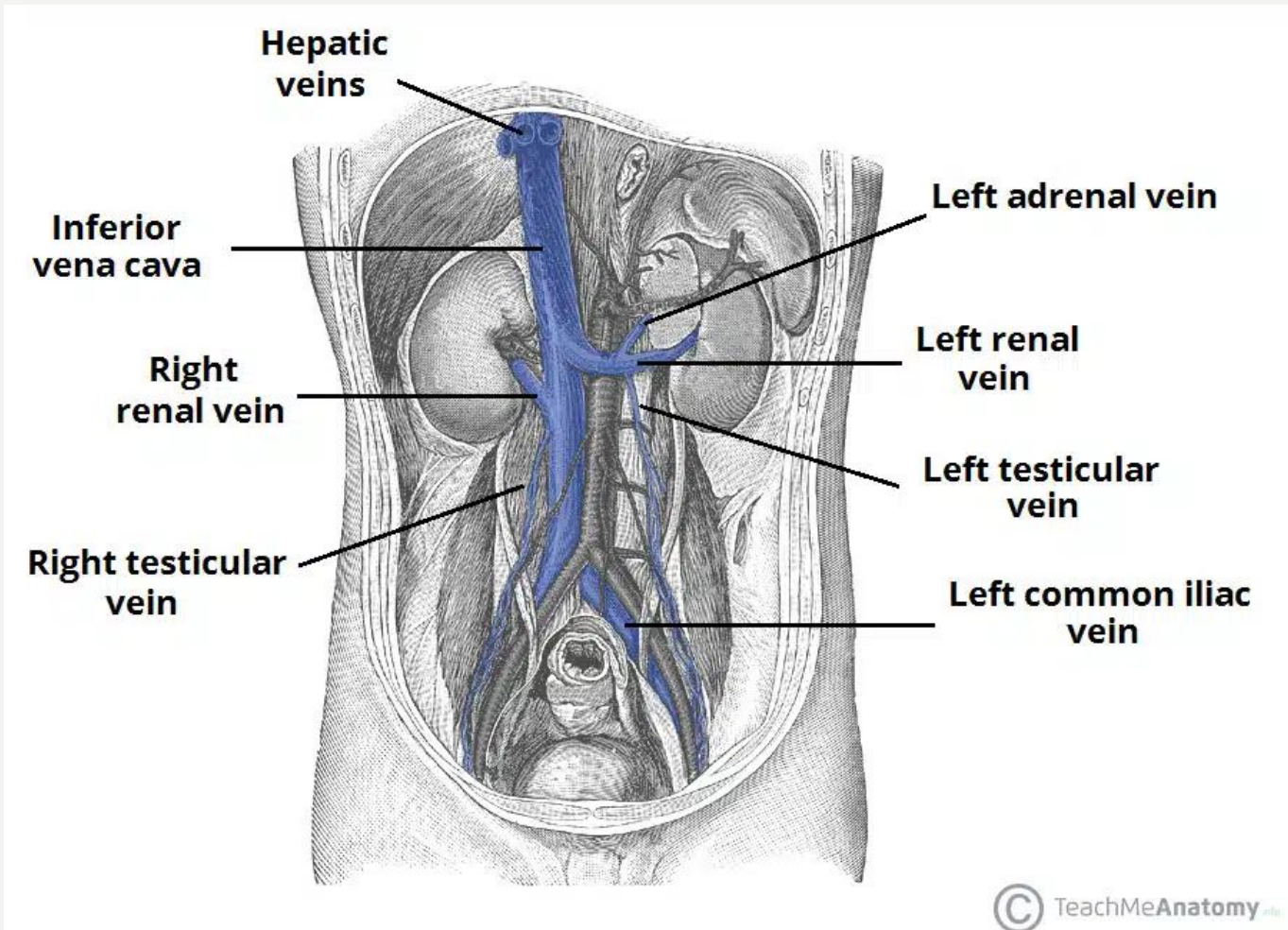
Supplies: the small intestines (part of duodenum) , cecum, ascending and part of the transverse colon

INFERIOR MESENTERIC ARTERY – L3



- Supplies arterial blood to HINDGUT – I.e. the distal third of transverse colon, splenic flexure, descending colon, sigmoid colon and rectum
- RETROPERITONEAL
- GIVES RISE TO THREE BRANCHES –
 - Left colic
 - Sigmoid
 - Superior Rectal

VENOUS DRAINAGE OF ABDOMEN



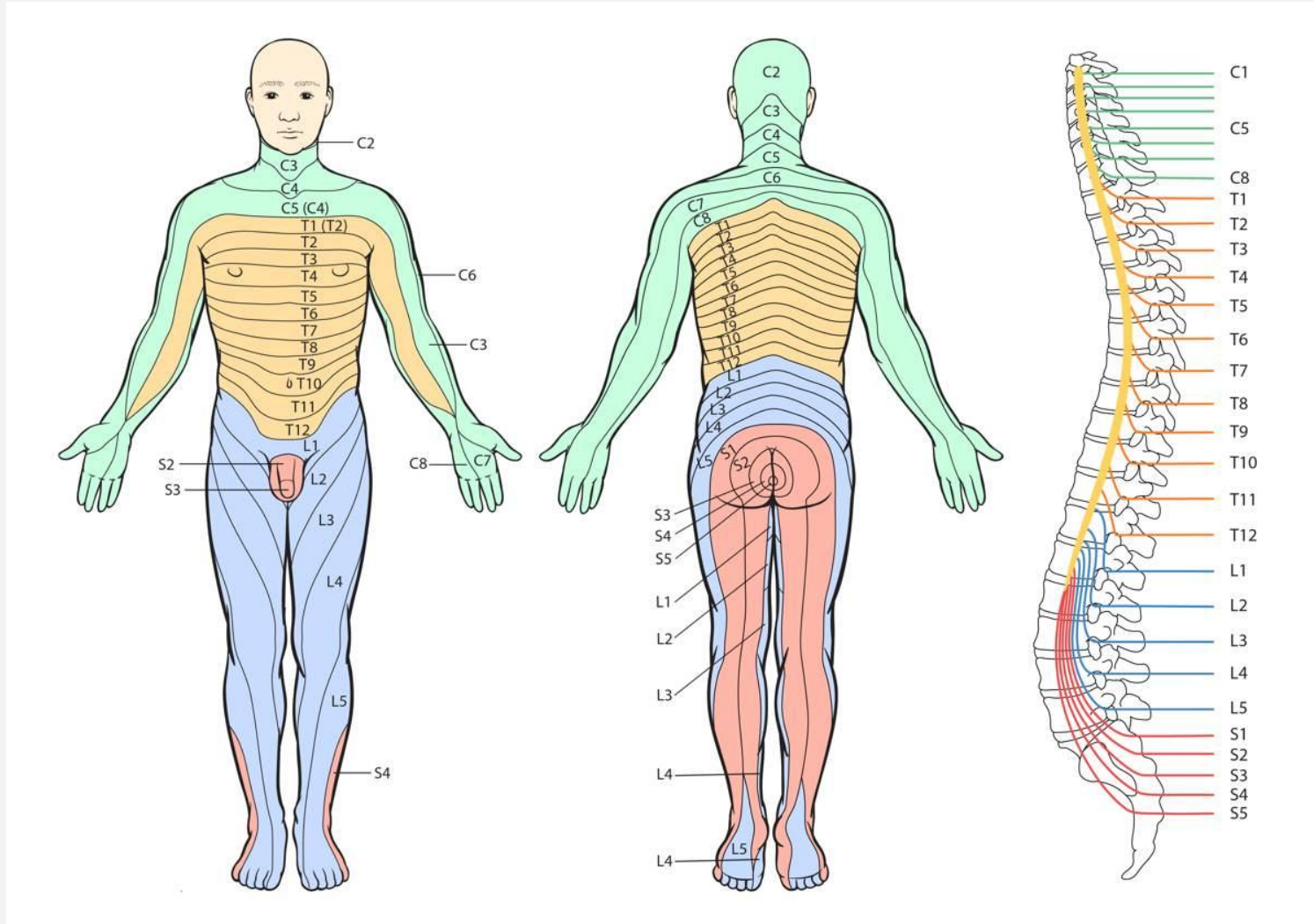
IVC - learn these tributaries!

There are no tributaries from the spleen, pancreas or gallbladder going directly into IVC as these drain into the portal venous system, and then enter the hepatic vein after being processed by liver.

Tributaries of IVC

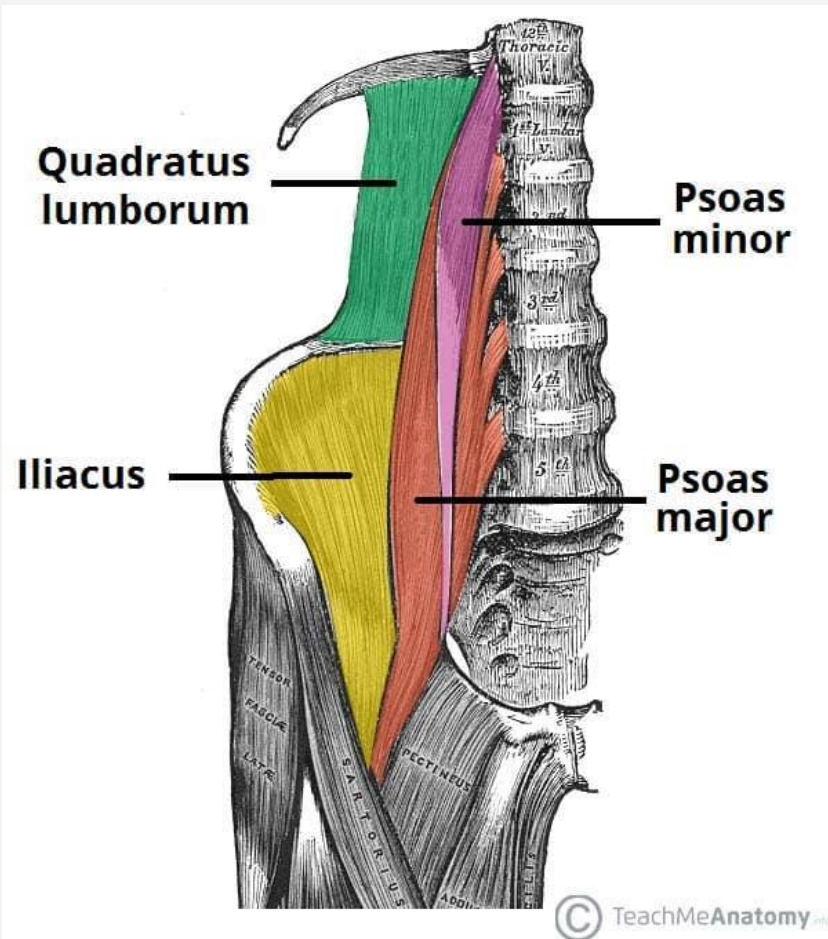
- **Common iliac veins** – formed by the external and internal iliac veins. They drain the lower limbs and gluteal region.
- **Lumbar veins** – drain the posterior abdominal wall.
- **Renal veins** – drain the **kidneys, left adrenal gland** and **left testis/ovary**.
- **Right testicular or ovarian vein** – drains the **right testes in males and the right ovary** in females (the left testicular or ovarian vein drains into the left renal vein).
- **Right suprarenal vein** – drains the **right adrenal gland** (the left adrenal vein drains into the left renal vein).
- **Inferior phrenic veins** – drain the diaphragm.
- **Hepatic veins** – drain the liver and drains the portal hepatic system

DERMATOMES



- Very useful to know as they are extremely easy to test !

MUSCLES OF THE POSTERIOR ABDOMINAL WALL



- Iliacus
 - From iliac fossa surface and ASIS
 - Into the lesser trochanter of femur
 - Flexion and lateral rotation of thigh
 - Femoral nerve (sacral plexus)
- Quadratus lumborum
 - For extension and lateral flexion of vertebral column
 - T12 – L4 anterior rami
 - From iliac crest and iliolumbar ligament onto transverse processes of L1 – L4
- Psoas major
 - Transverse processes of T12 – L5, attaching to lesser trochanter of femur
 - Flexion of thigh and lateral flexion of vertebral column

MUSCOSKELETAL TIPS !

- It is quite logical – think about all the muscles that insert into the same place e.g. lesser trochanter of femur. They may have similar functions.
- Imagine these muscles like rubber bands – when they contract it's like pulling a rubber band, and thus the places where they are attached will move closer together.
- PLEASE MAKE FLASHCARDS OF THE MUSCLES RESPONSIBLE FOR EACH ACTION !

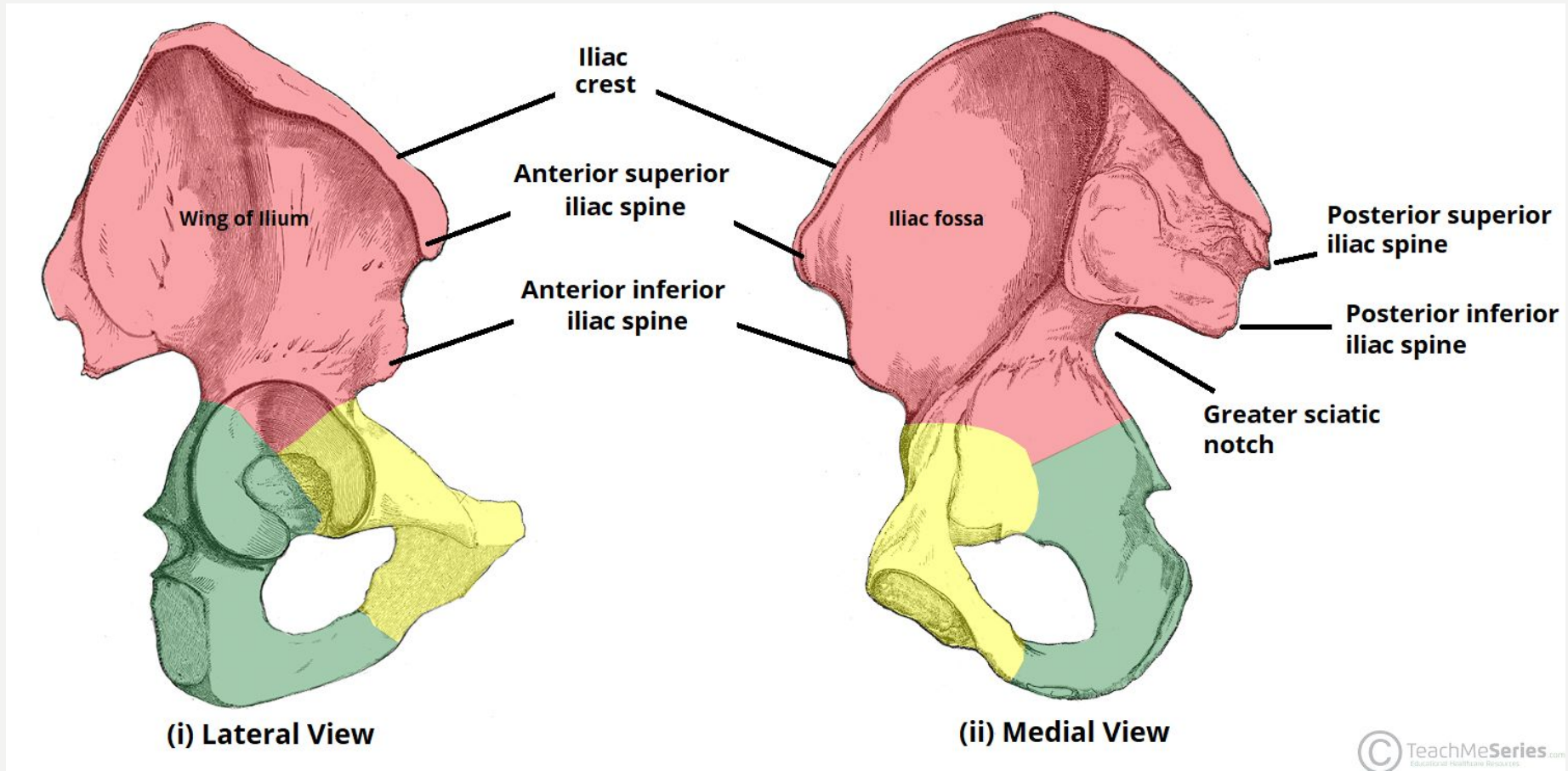
PELVIC ANATOMY IN DEPTH NOW!

ENJOY

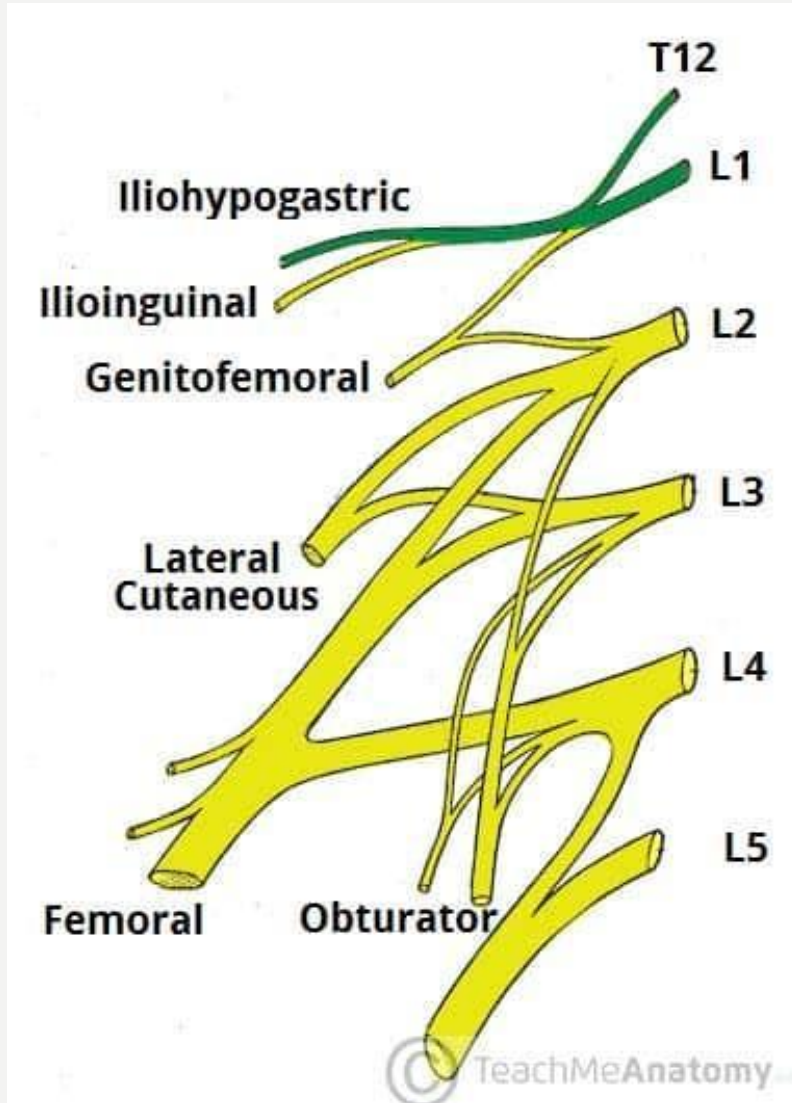
WHAT AM I ACTUALLY LEARNING?

- Osteology
- Lumbar plexus
- Muscles of the pelvis – i.e. the pelvic floor
- The perineum

PELVIS - OSTEOLOGY



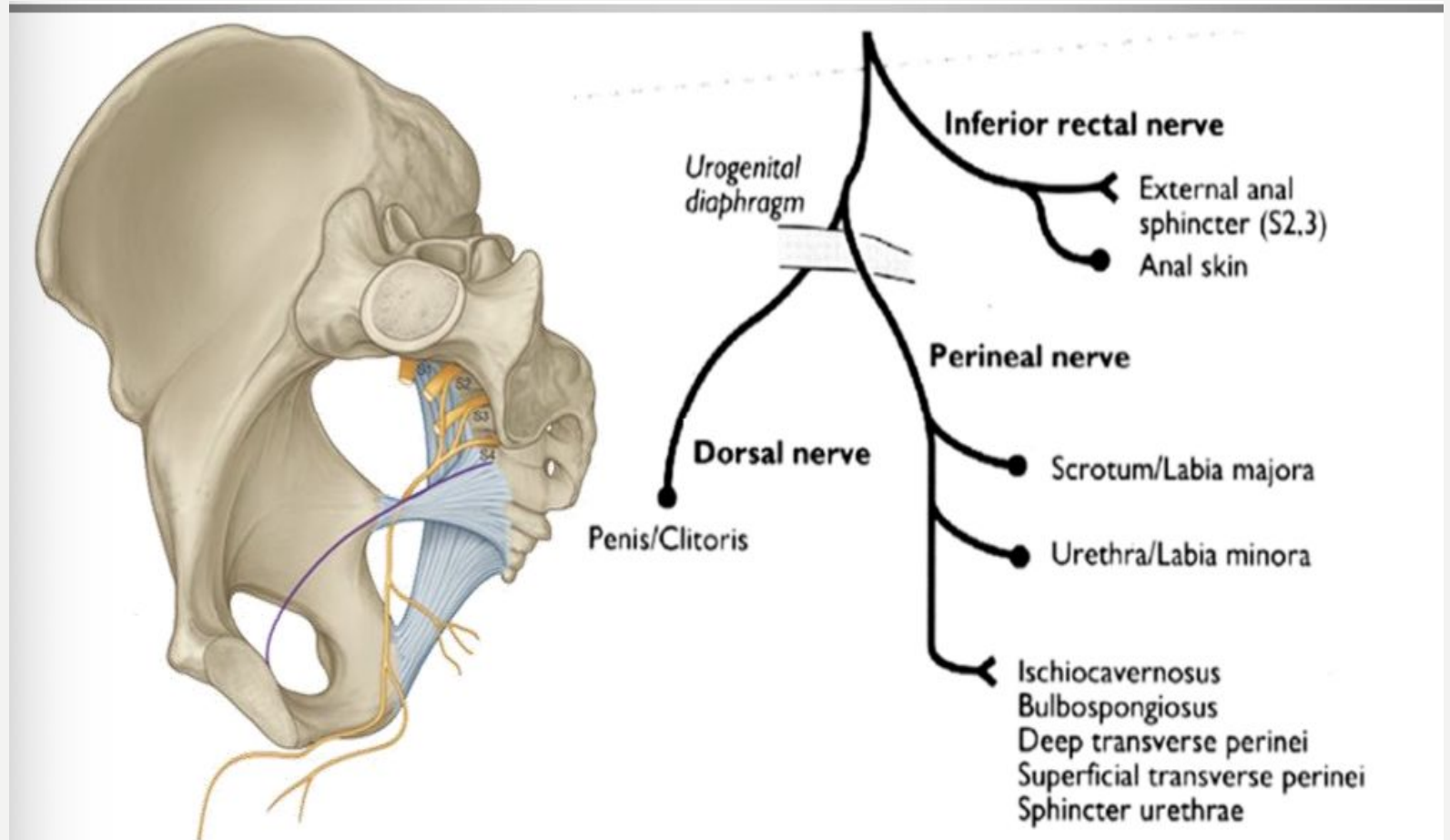
LUMBAR PLEXUS



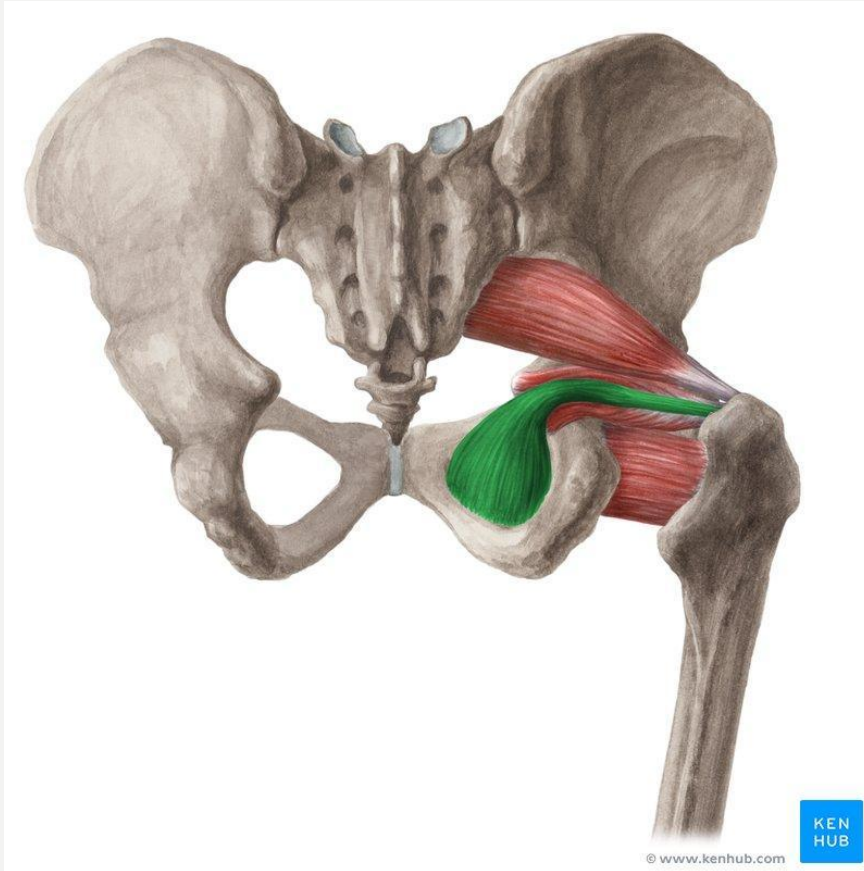
- Relevant for both lower limb and pelvic anatomy – for pelvic anatomy, we will concern ourselves with the **iliohypogastric, ilioinguinal and genitofemoral**
- **ILIOHYPOGASTRIC** – sensory to the lateral gluteal area
- **ILIOINGUINAL** – anterior skin of genitalia and upper medial thigh, L1 – see dermatomes
- **GENITOFEMORAL** – L1 and L2 – pierces psoas and then **DIVIDES INTO FEMORAL AND GENITAL BRANCH.**
- **MAIN NERVE OF PERINEUM – Pudendal NERVE**

PUDENDAL NERVE

- S2 – S4
- KEY NERVE OF THE PERINEUM !
- THREE BRANCHES – inferior rectal, perineal nerve, dorsal nerve



PELVIC WALL

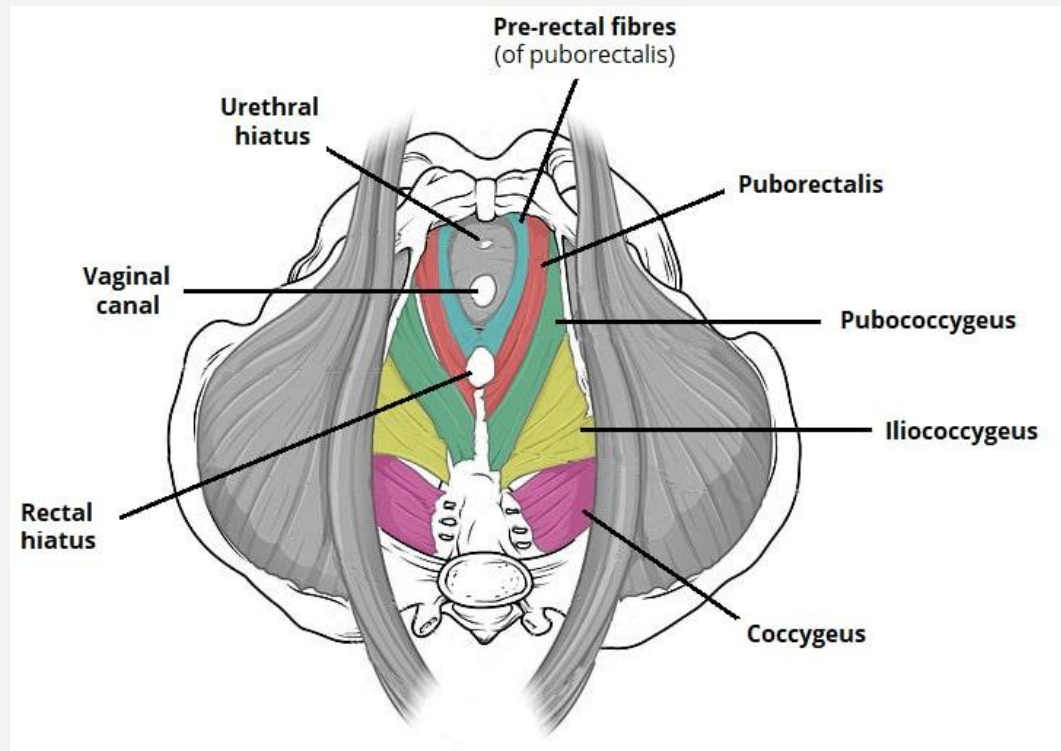


- PIRIFORMIS – laterally rotates the hip, superior gluteal nerve and ventral rami of S1 and S2
- OBTURATOR INTERNUS – lateral rotator of hip joint, but really little role in the pelvis

MUSCLES OF THE PELVIC FLOOR

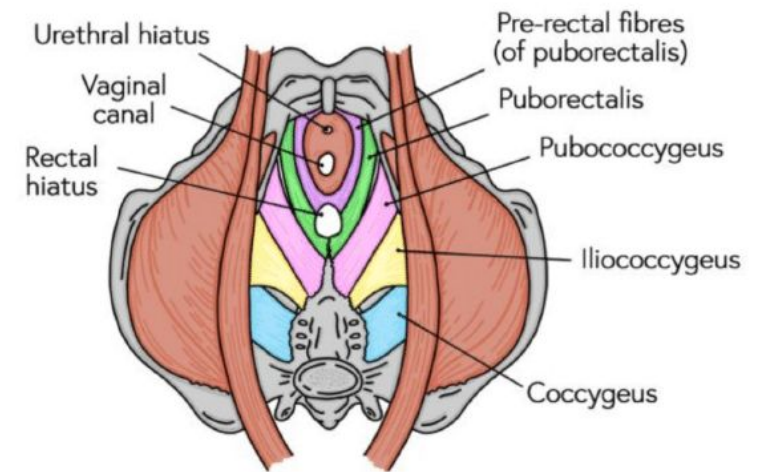
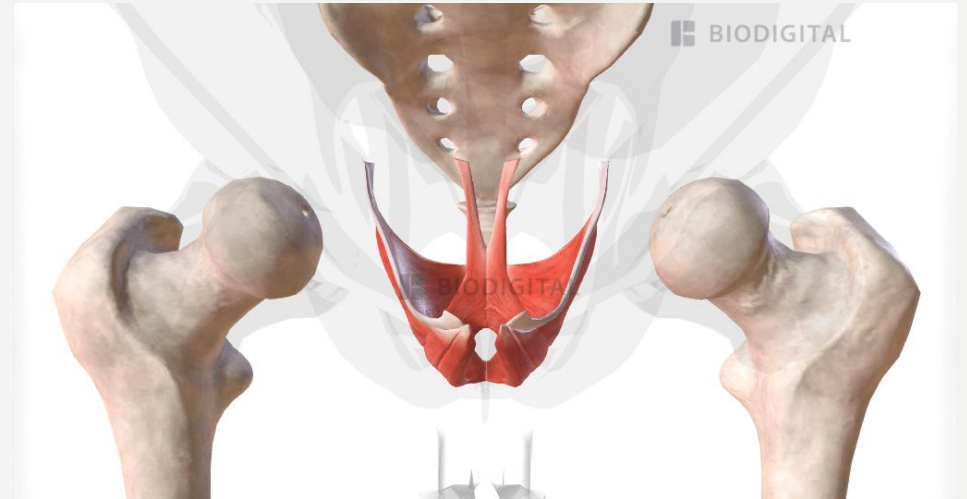
- FUN FACT – it's basically like a funnel.
- THREE MAIN COMPONENTS:
 - Levator ani muscles
 - Coccygeus muscle
 - Fascia coverings

These form the 'pelvic diaphragm'

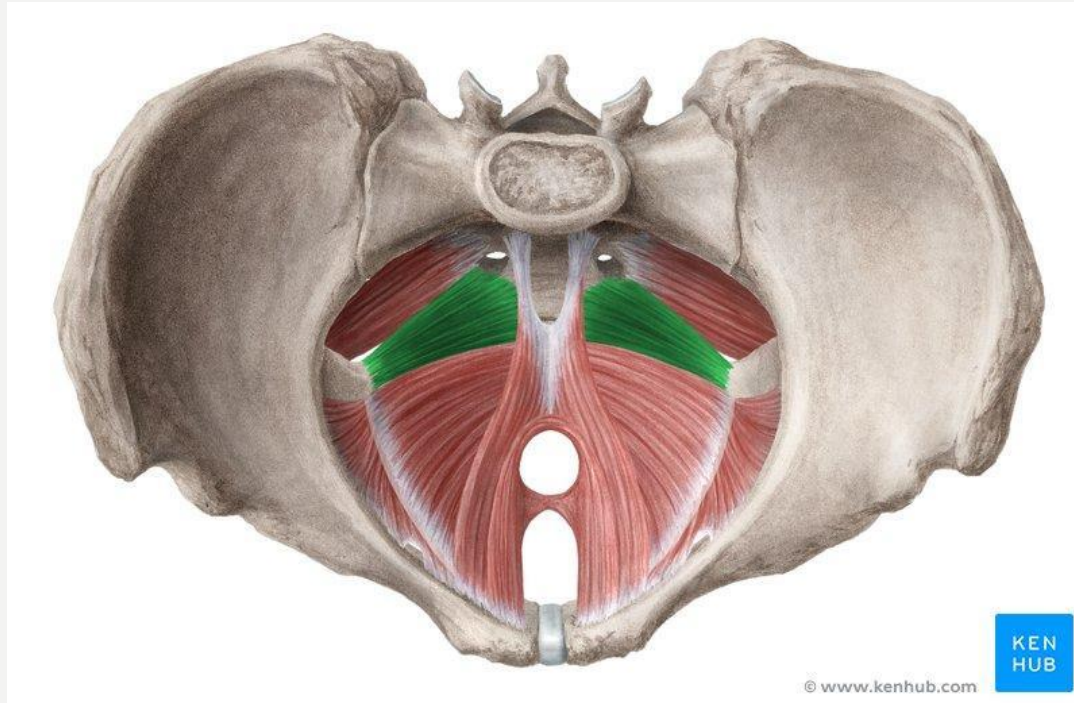


LEVATOR ANI

- GENERAL INNERVATION: **nerve to levator ani and pudendal nerve**
- Puborectalis
 - MAINTAINS FAECAL CONTINENCE
- Pubococcygeus
 - Main bulk of levator ani
 - between the puborectalis and the iliococcygeus – it's quite like a sandwich.
 - To stabilize the abdominal and pelvic organs
- Iliococcygeus
 - Posterolateral part, it's there to elevate the pelvic floor and anorectal canal.



COCCYGEUS

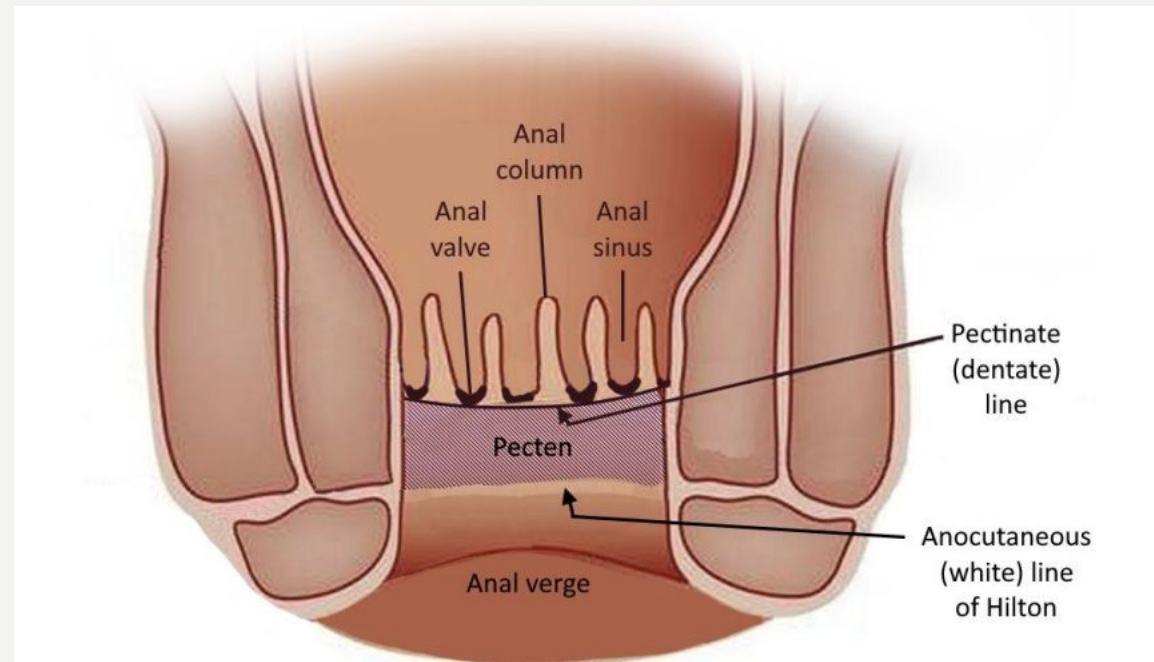


- Located posterior to the levator ani
- **IMPORTANT ANATOMICAL RELATION:** is **in contact with the piriformis**, forming a canal in the greater sciatic foramen which the **internal pudendal artery, inferior gluteal artery and pudendal nerve travel through**.
- Structures that **DIRECTLY** pierce the coccygeus include the nerves to levator ani and the perineal branch of L4.

- **ACTION:** supports the pelvic viscera, flexes the coccyx

RECTUM AND ANAL CANAL

- KEY TO THIS TOPIC – what is above and what is below the pectinate line
- ABOVE – autonomic nerve supply and supplied by superior rectal artery – IMA branch..
- BELOW – arterial supply from inferior rectal arteries, and somatic nerve supply, so very sensitive.



SBA #1

A 74-year-old man presents with abdominal pain consistent with mesenteric ischaemia and he is taken to theatre for an emergency laparotomy.

The segment of bowel found to be ischaemic is from the splenic flexure of the colon through to the rectum.

At what vertebral level does the blocked artery branch from the aorta?

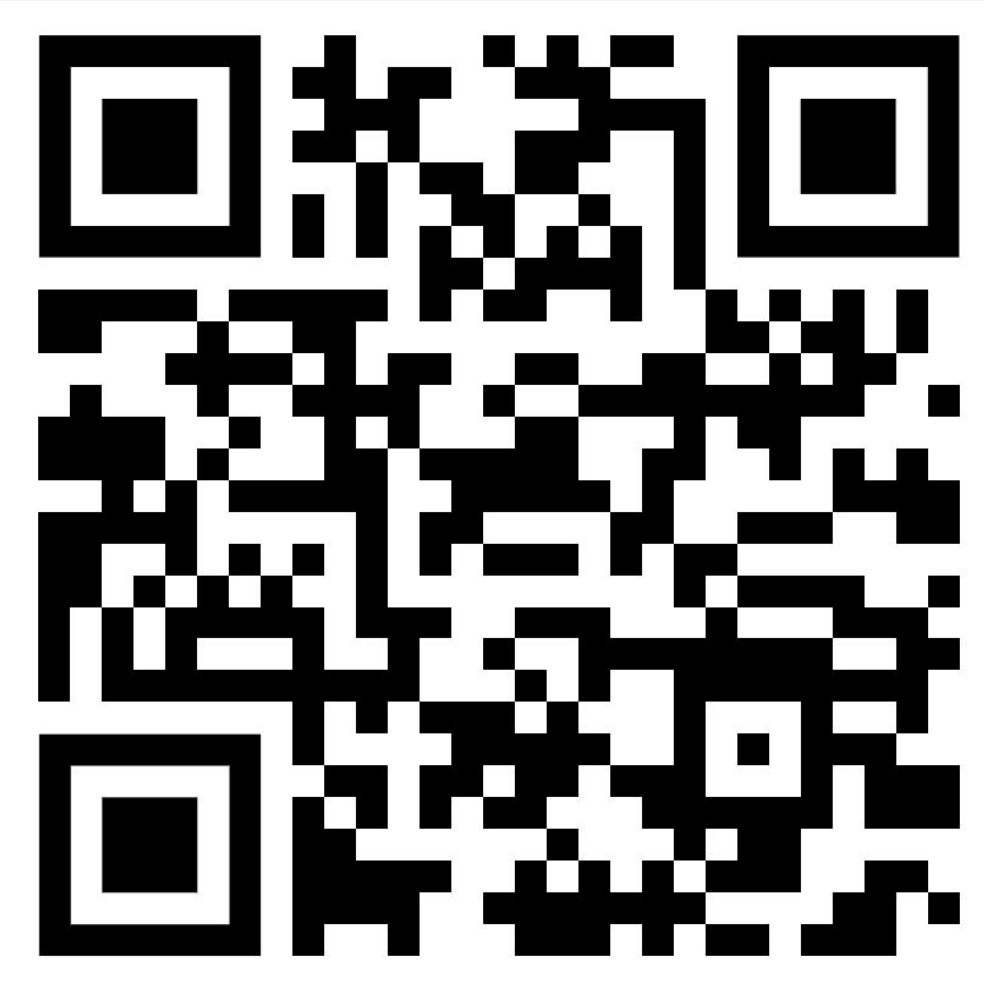
- a) L1
- b) L2
- c) L3
- d) T11
- e) T12

SBA #2

How many unpaired branches leave the abdominal aorta to supply the abdominal viscera?

- a) 1
- b) 2
- c) 3
- d) 4

FEEDBACK FORM !



Thank you for attending the session -

Please fill in the feedback form:

[https://docs.google.com/forms/d/e/1FAIpQLSeM7hVTncysN8FcDj45VA4m-QZjByOfWXg17n5iRlj7GgKLSA/viewform?usp=sf link](https://docs.google.com/forms/d/e/1FAIpQLSeM7hVTncysN8FcDj45VA4m-QZjByOfWXg17n5iRlj7GgKLSA/viewform?usp=sf_link)

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HAVE FUN LEARNING ALL THAT!

