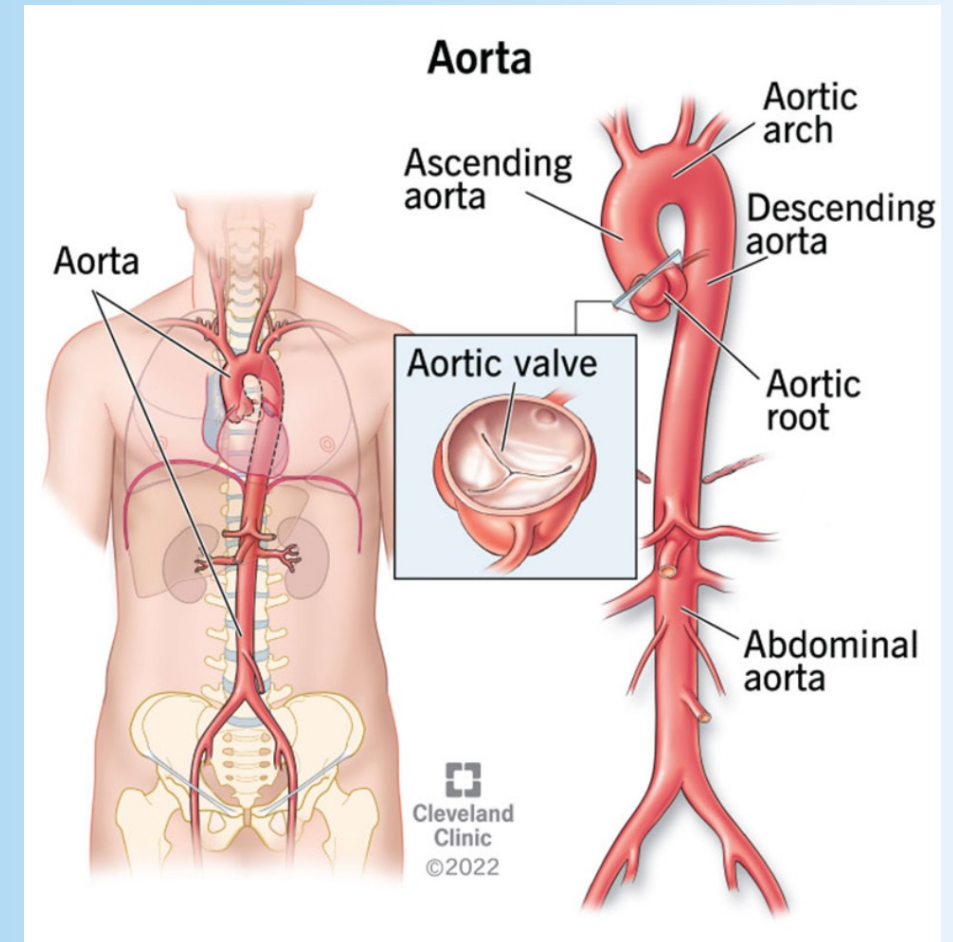


Blood Supply of the Abdomen and Pelvis

By Peter Wikiera

Quick Intro

- !!!! Abdominal aorta bifurcates (biFOURcates) at the level of L4 !!!!

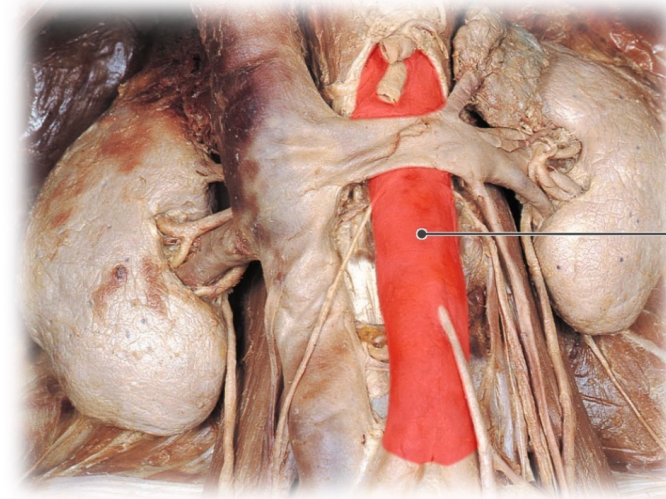
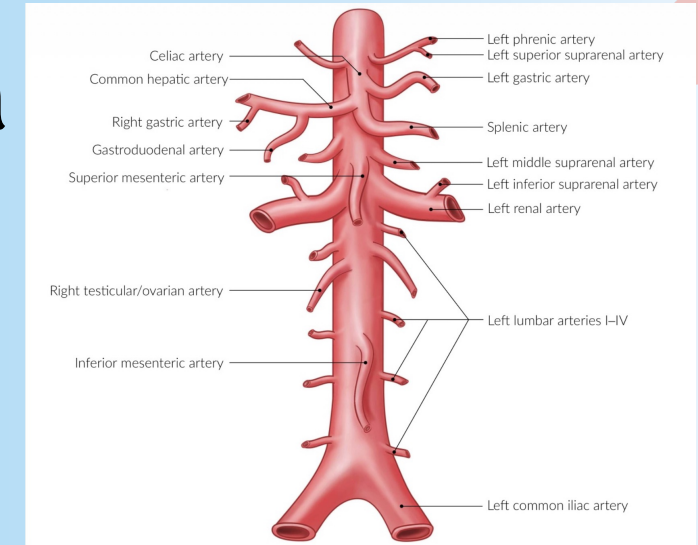


Abdominal Aorta

- Exits through the aortic hiatus from the diaphragm
- Continuation of the thoracic aorta
- Supplies everything in the abdomen

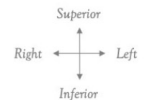
Splits off a LOT of branches

- Inferior phrenic
- Celiac trunk
- Left + Right middle suprarenal
- Superior mesenteric
- R + L Renal
- R + L Gonadal
- R+L Lumbar
- Inferior Mesenteric
- Median Sacral
- Paired and unpaired arteries



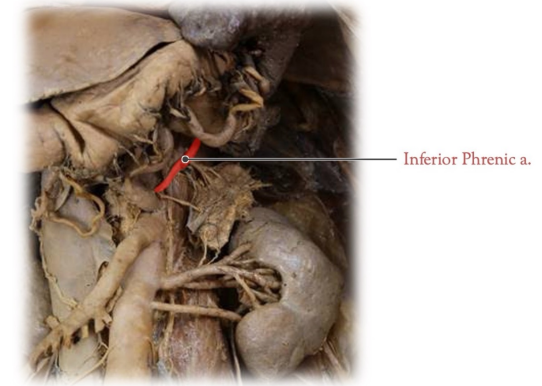
Anterior View of Posterior Abdominal Wall

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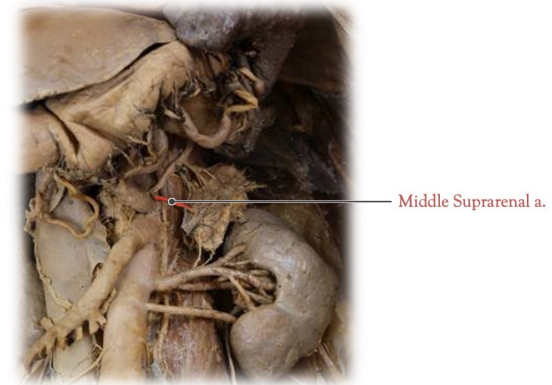


Paired Arteries

- Inferior phrenic arteries
 - Branches into:
 - Superior suprarenal artery
 - Supplies adrenal glands
 - Terminal branches
 - Supplies inferior aspect of diaphragm
- Middle Suprarenal Arteries
 - Just terminal branches
 - Supplies adrenal glands
 - Right one runs posterior to IVC



Superior



Anterior View of Posterior Abdominal Wall

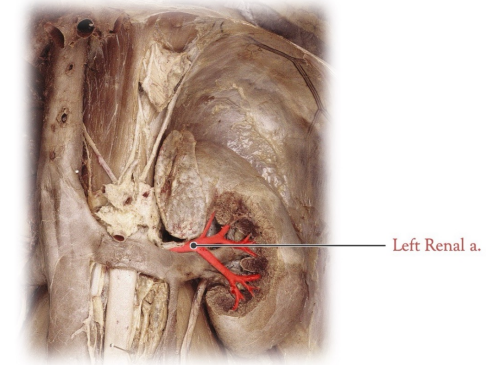
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Superior
Right ← Left
Inferior

Paired Arteries - Continued

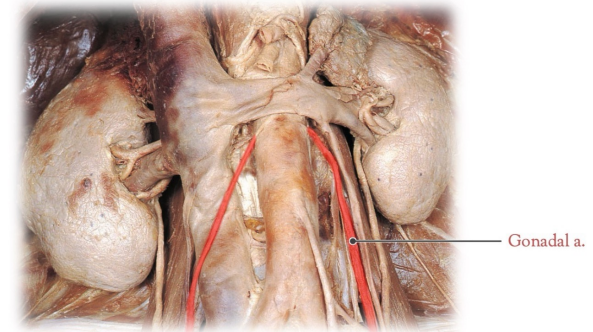
- Renal Arteries
 - Terminal branches
 - Supply kidney, renal capsule, ureters
 - Inferior suprarenal artery (branch)
 - Supplies adrenal glands
- Gonadal Arteries
 - Gonads, obviously
 - Supplies ovaries, lat 1/3 of the fallopian tubes, testes, and epididymis
 - **RUNS ANTERIOR TO THE URETERS!!!!**



Anterior View of Posterior Abdominal Wall
(Celiac Trunk and Superior Mesenteric a. Cut, and Kidney Partially Dissected)

@MarkAAbbott1

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Anterior View of Posterior Abdominal Wall

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Paired Arteries - Continued 2

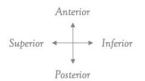
- Lumbar arteries
 - Spinal branches
 - Supply spinal canal
 - Terminal branches
 - Supply posterior abdominal wall and muscles of the back



Lateral View of Posterior Abdominal Wall
(Veins Removed)

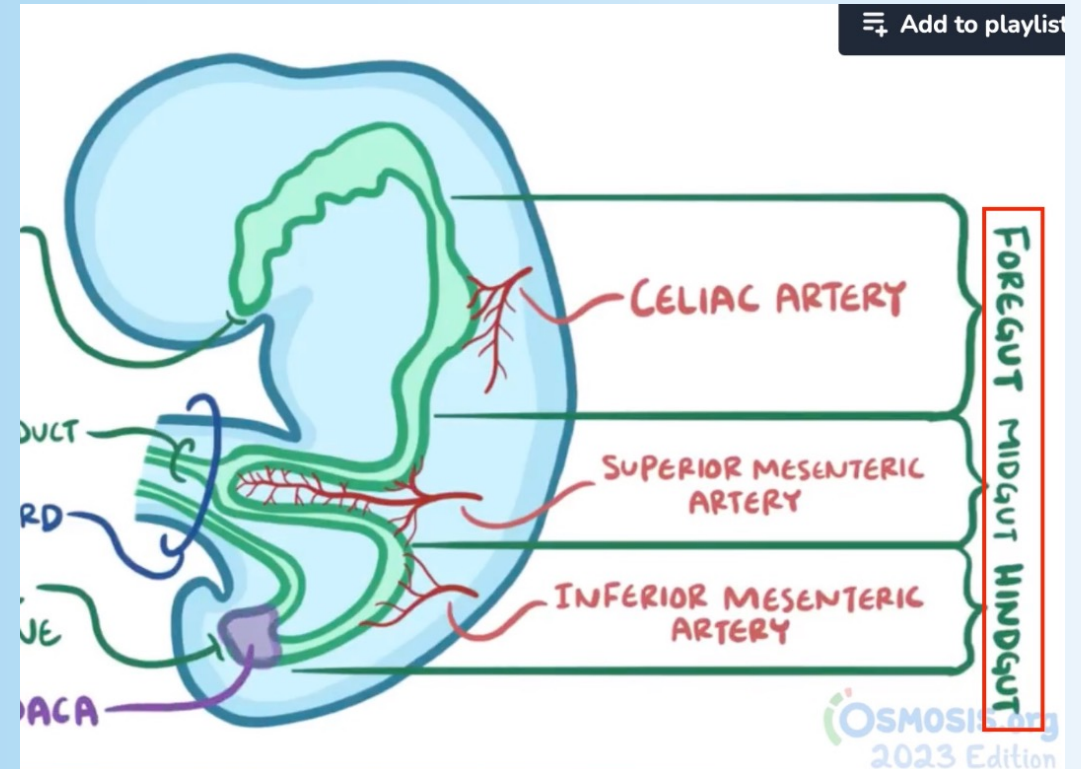
 @MarkAAbbott1

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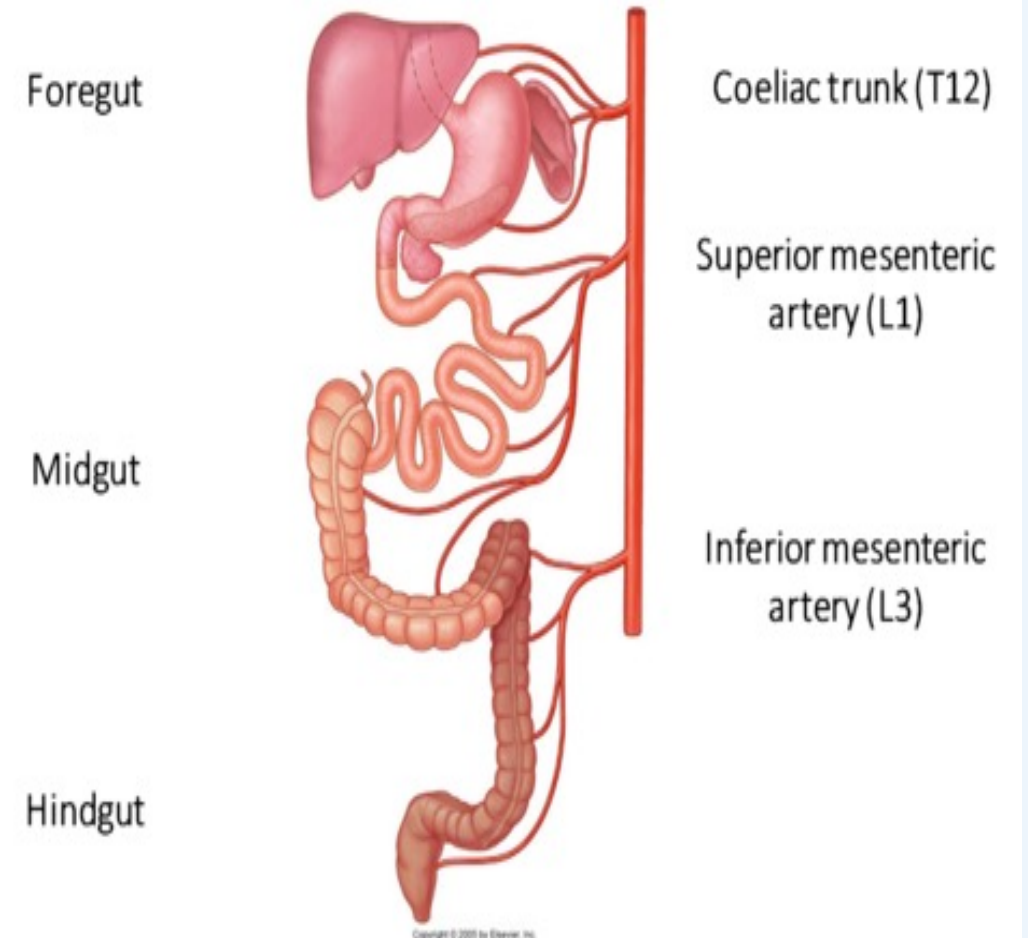
Basic Embryology

- During the fetal period, we develop our digestive tract in different parts
- These parts then rotate over themselves, 180 degree (which form the loops of intestines)
- Split into three parts - foregut, midgut, hindgut



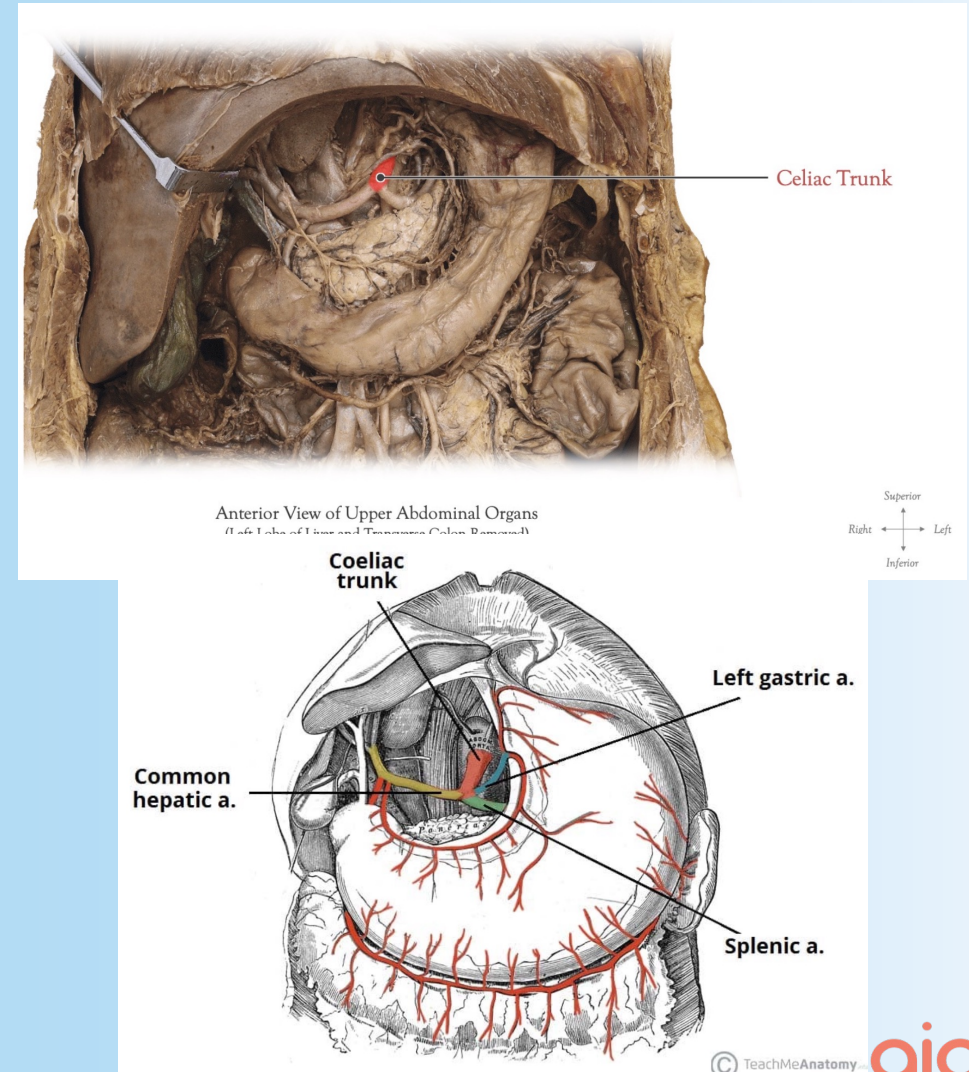
Foregut, Midgut, Hindgut

		Foregut	Midgut	Hindgut
Derivatives		• <u>Esophagus</u> • <u>Stomach</u> • <u>Proximal duodenum</u> (proximal to the <u>Ampulla of Vater</u>) • <u>Liver</u> • <u>Gall bladder</u> and <u>bile ducts</u> • <u>Pancreas</u> • <u>Trachea</u>, respiratory tract, and <u>lungs</u> 📺	• <u>Distal duodenum</u> (distal to the <u>Ampulla of Vater</u>) • <u>Jejunum</u> • <u>Ileum</u> • <u>Cecum</u> • <u>Ascending colon</u> • <u>Proximal 2/3 of the transverse colon</u>	• <u>Distal 1/3 of the transverse colon</u> • <u>Descending colon</u> • <u>Rectum</u> • <u>Anal canal proximal to the pectinate line</u> • <u>Urogenital sinus</u>
Vertebral level		• T12–L1	• L1	• L3
Artery		• <u>Celiac trunk</u> 📺	• <u>Superior mesenteric artery</u>	• <u>Inferior mesenteric artery</u>
Vein		• <u>Portal vein</u>	• <u>Superior mesenteric vein</u>	• <u>Inferior mesenteric vein</u>
Innervation 📺	<u>Parasympathetic</u>	• <u>Vagus nerve</u>	• <u>Vagus nerve</u>	• <u>Pelvic splanchnic nerves</u>
	<u>Sympathetic</u>	• T5–T9 thoracic <u>splanchnic nerves</u>	• T10–T12 thoracic <u>splanchnic nerves</u>	• L1–L2 lumbar <u>splanchnic nerves</u>

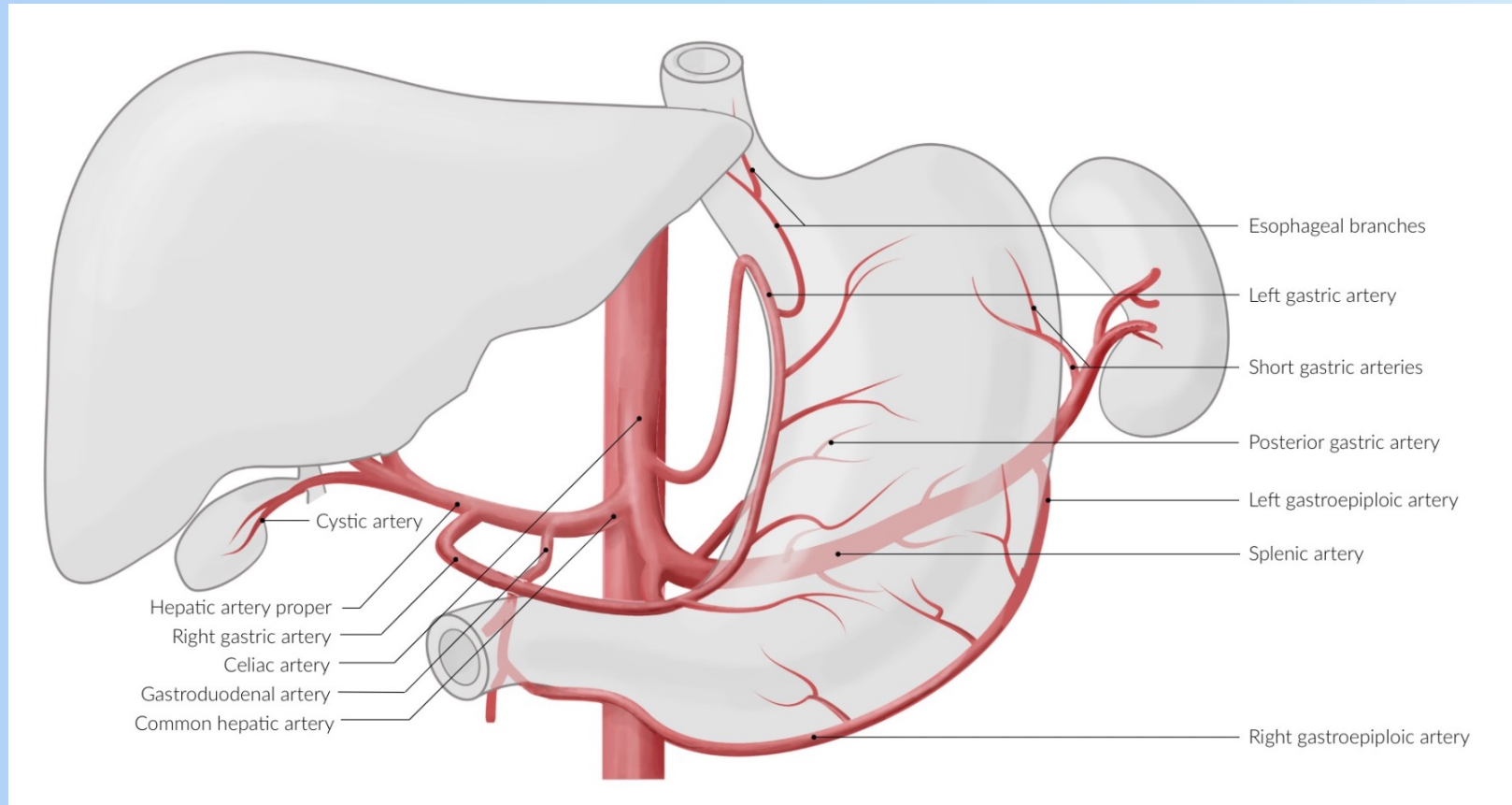


Celiac Artery (Trunk) - Foregut

- Supplies esophagus, stomach, PROXIMAL (to ampulla of Vater) duodenum, liver, gall bladder, liver, pancreas, trachea, respiratory tract, and lungs
- Splits into three main branches - common hepatic, left gastric, and splenic arteries

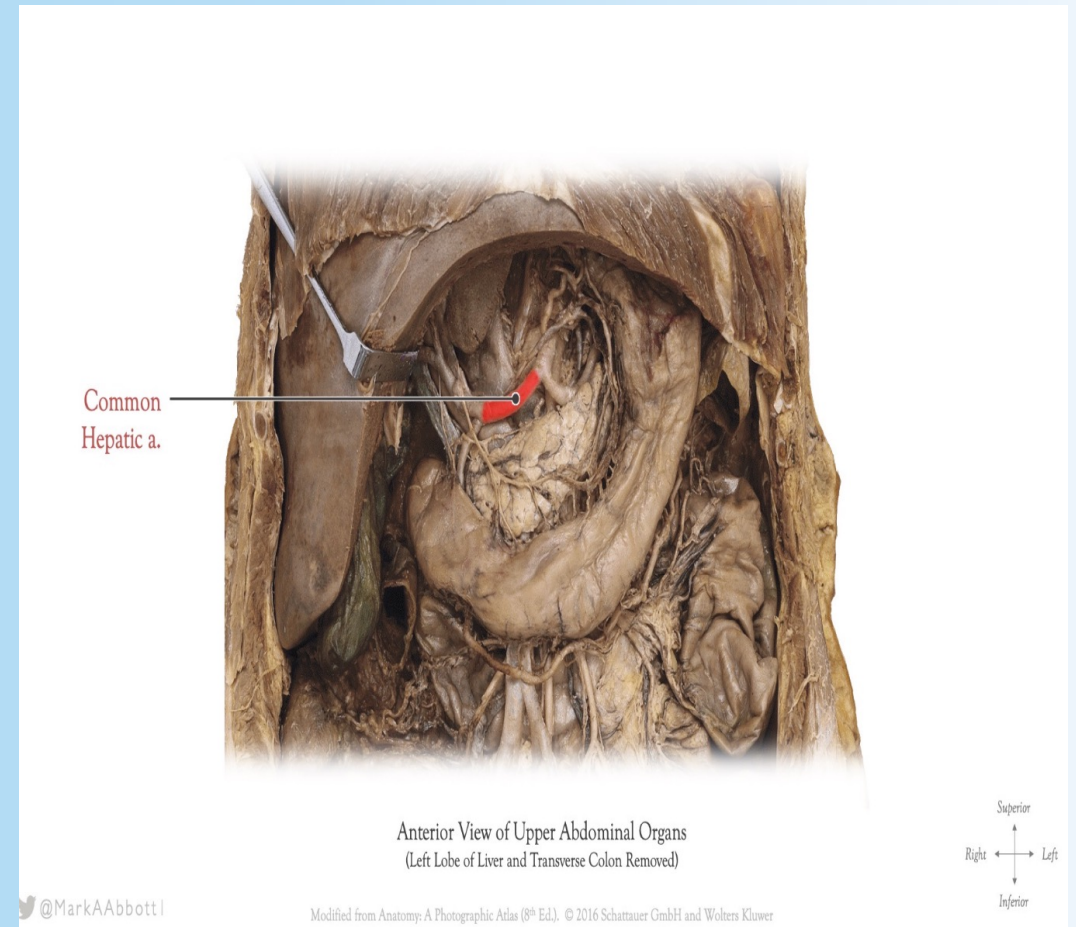


Celiac Artery (Trunk) - Foregut



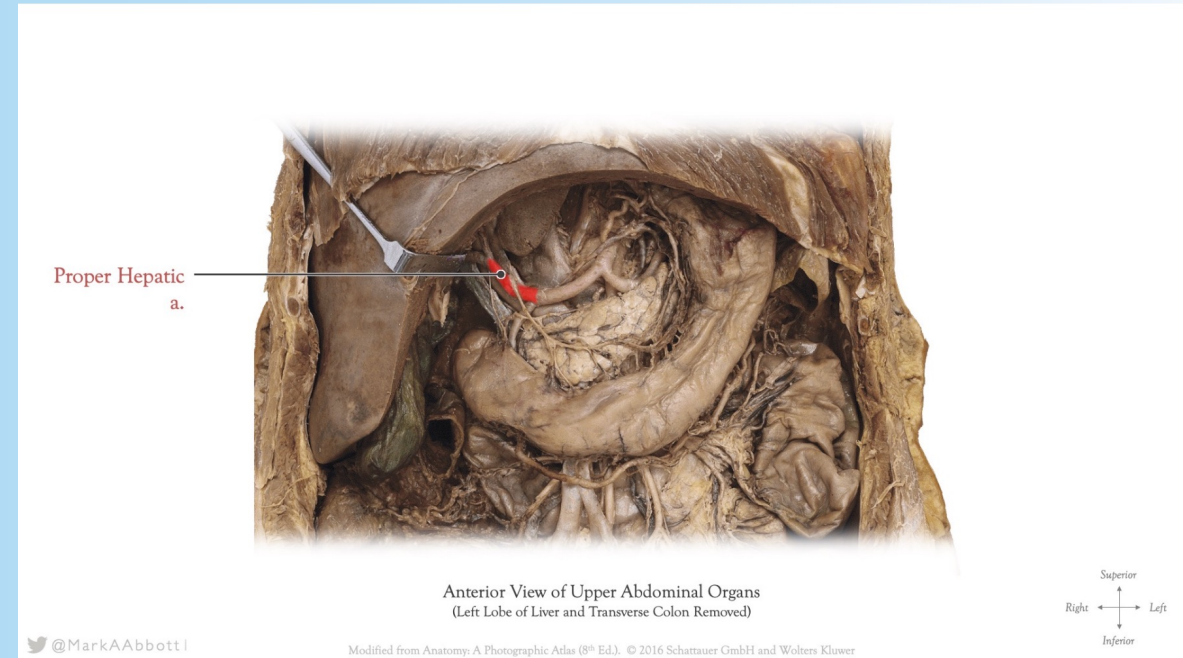
Common Hepatic

- First branch off the celiac trunk (goes to patient right)
- Supplies stomach, liver, gall bladder, caudate lobe, duodenum, pancreas
- Splits into the proper hepatic artery which is a continuation of it) and the gastroduodenal artery



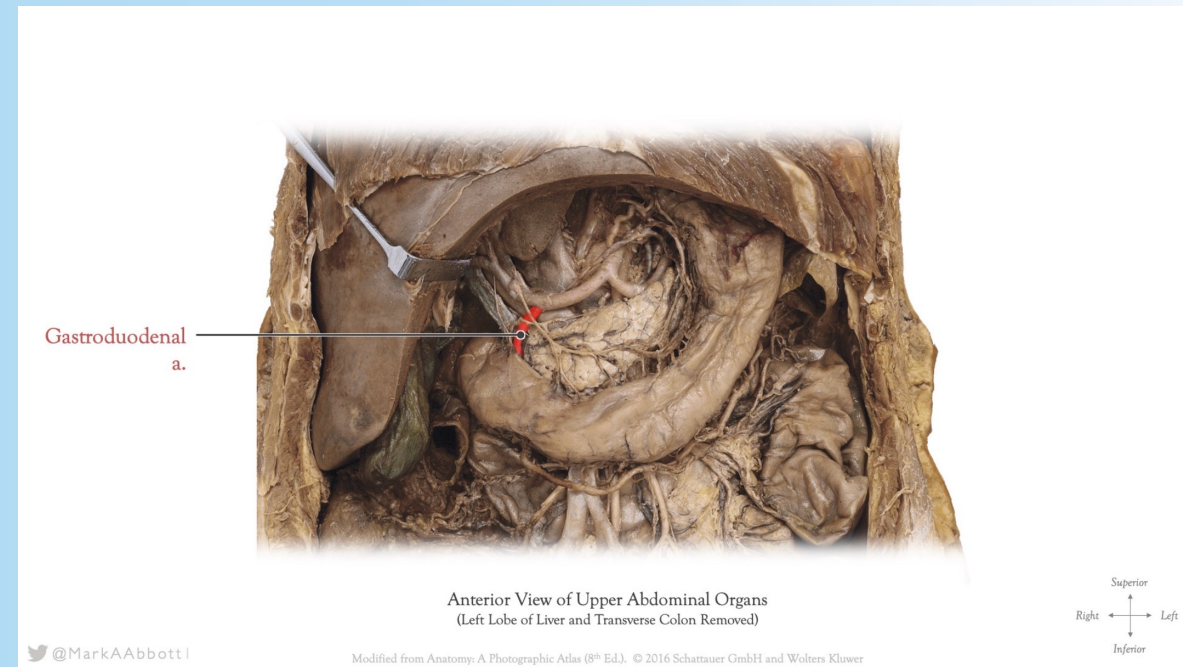
Proper Hepatic

- Continuation of the common hepatic after it gives off the gastroduodenal artery
- Splits into:
 - Right gastric artery
 - Supplies the stomach (lesser curvature)
 - Right hepatic artery
 - Supplies:
 - Liver (right portion)
 - Gall bladder (via cystic artery)
 - Caudate lobe
 - Left hepatic artery
 - Supplies:
 - Liver (left portion)
 - Caudate lobe



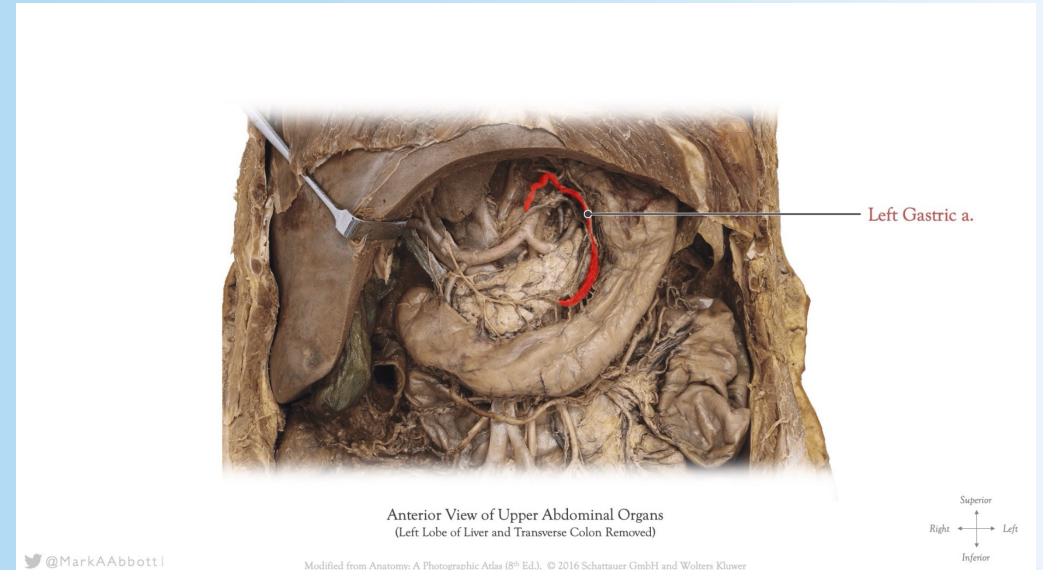
Gastroduodenal Artery

- Branch off the common hepatic
- Runs posterior to the first part of the duodenum and divides into two branches:
 - Right gastroepiploic artery
 - Runs along the greater curvature of the stomach and anastomoses with the left gastroepiploic artery
 - Anterior and posterior superior pancreaticoduodenal artery
 - Anastomose with anterior and posterior branch of the inferior pancreaticoduodenal artery around the head of the pancreas
- BOTH supply stomach, duodenum, and pancreas



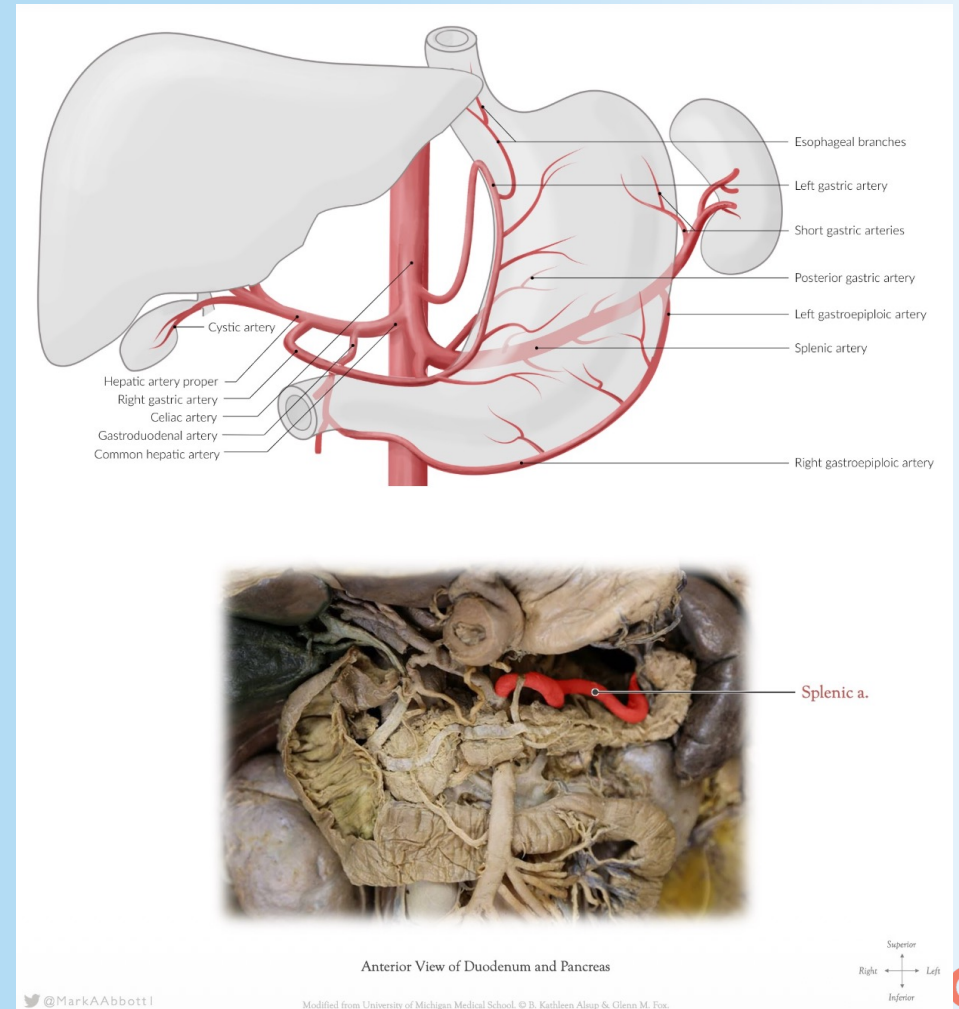
Left Gastric Artery - Celiac Trunk

- Back to the celiac trunk branches
- Runs along the lesser curvature of the stomach to anastomose with the right gastric artery
- Direct branches and esophageal branches
 - Direct - supply stomach (lesser curvature)
 - Esophageal - esophagus

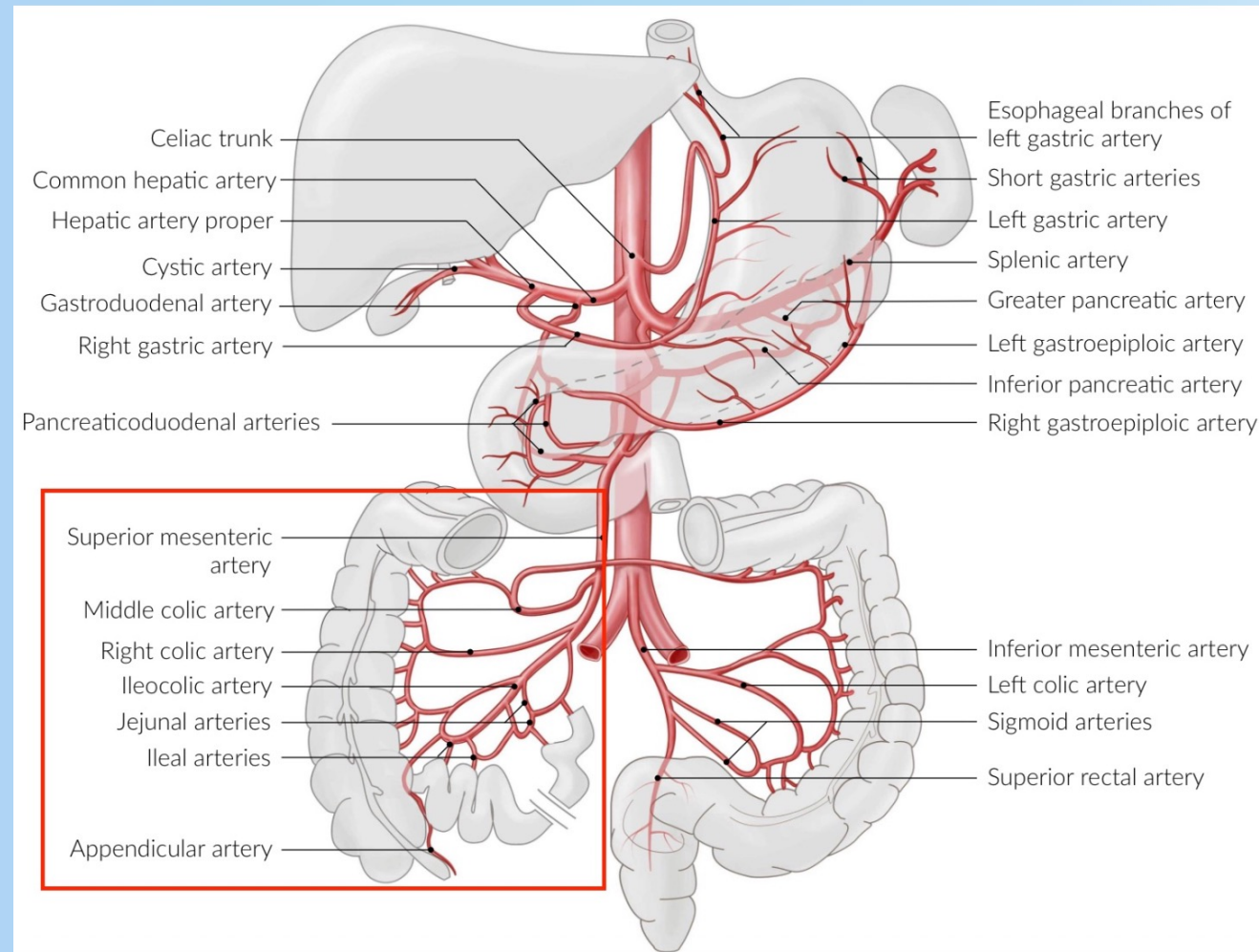


Splenic Artery - Celiac Trunk

- Branch off celiac trunk
- Runs along the superior margin of the pancreas and enters the splenorenal ligament to supply the spleen
- SIX branches, THREE organs supplied
 - Pancreas
 - Pancreatic branches (run dorsally)
 - Dorsal pancreatic artery (first branch)
 - Greater pancreatic artery
 - Posterior gastric wall and fundus region
 - Posterior gastric artery
 - Stomach (fundus and greater curvature)
 - Short gastric arteries
 - Left gastroepiploic artery

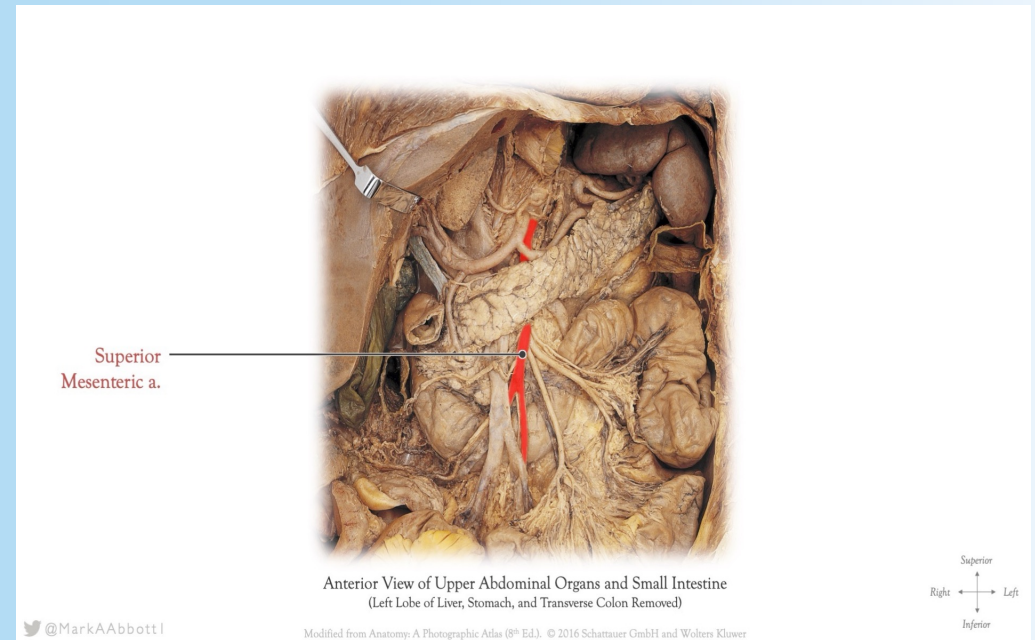


Superior Mesenteric Artery - Midgut

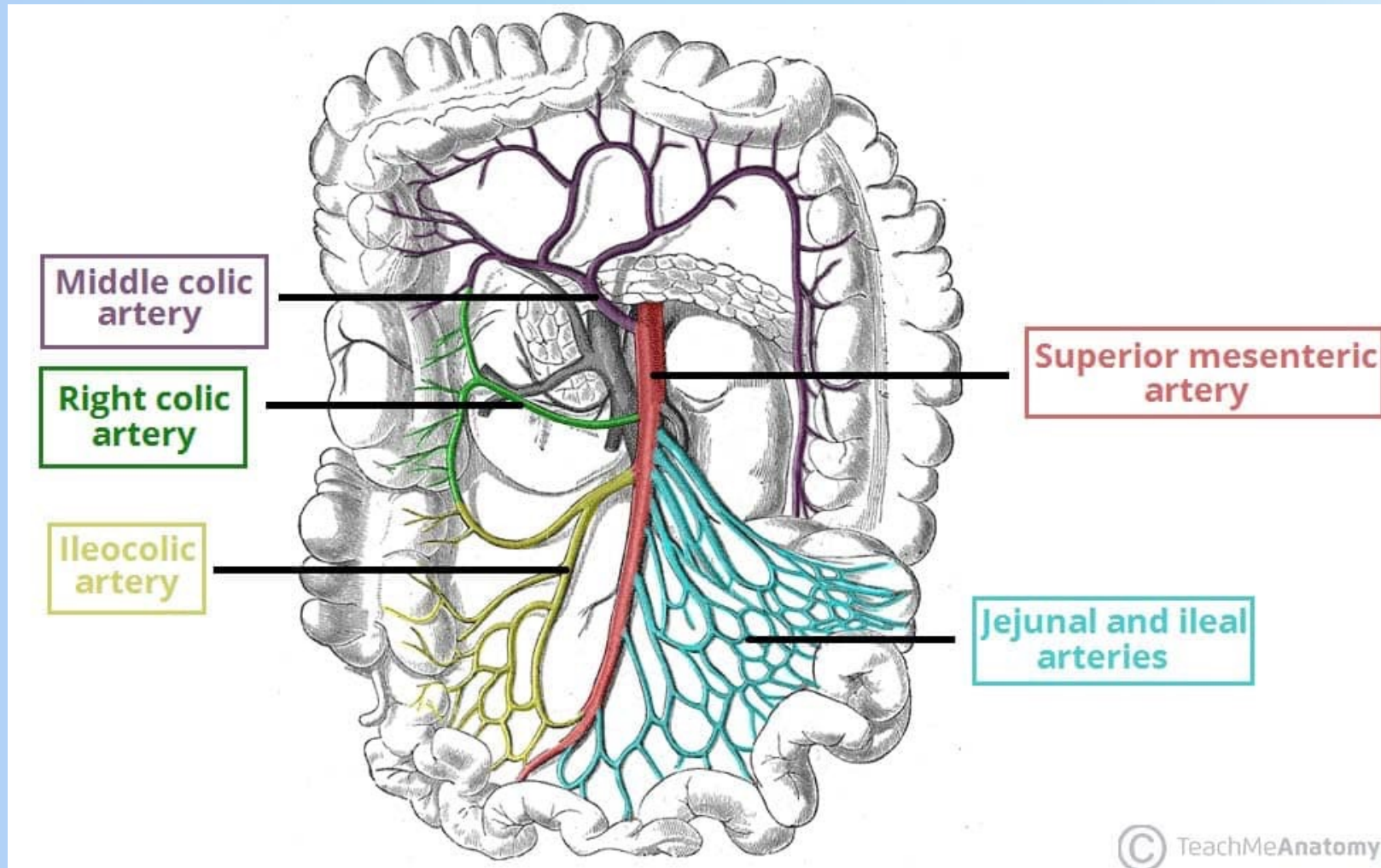


Superior Mesenteric Artery - Midgut

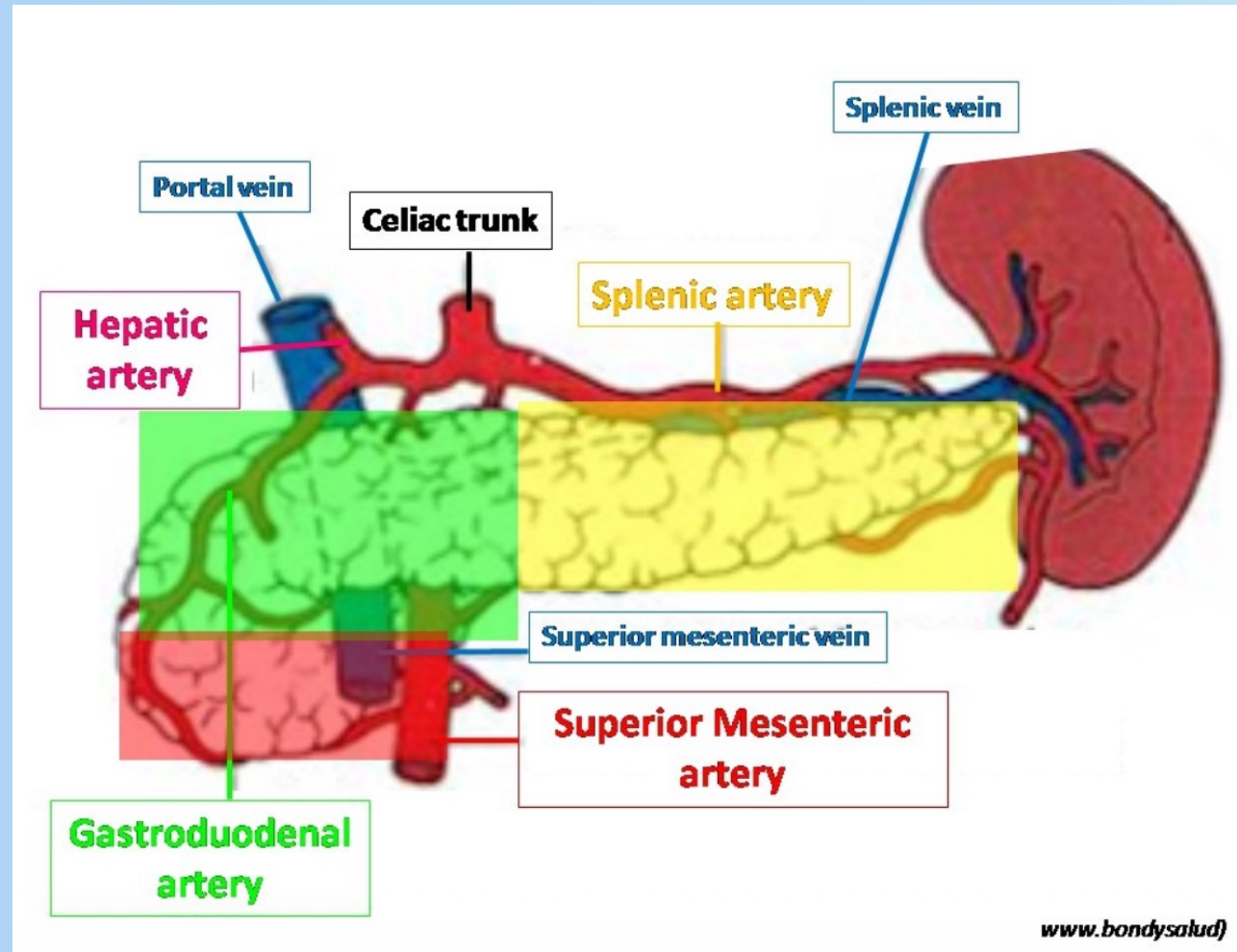
- Reminder: supplies the midgut
- Six branches
 1. Inferior pancreaticoduodenal artery
 - Supplies head of pancreas
 2. Jejunal artery
 - Supplies jejunum
 3. Ileal artery
 - Supplies ileum
 4. Ileocolic artery
 - Supplies cecum and terminal ileum
 - Gives off appendicular artery
 5. Right colic artery
 - Supplies ascending colon
 6. Middle colic artery
 - Supplies transverse colon



Superior Mesenteric Artery - Midgut

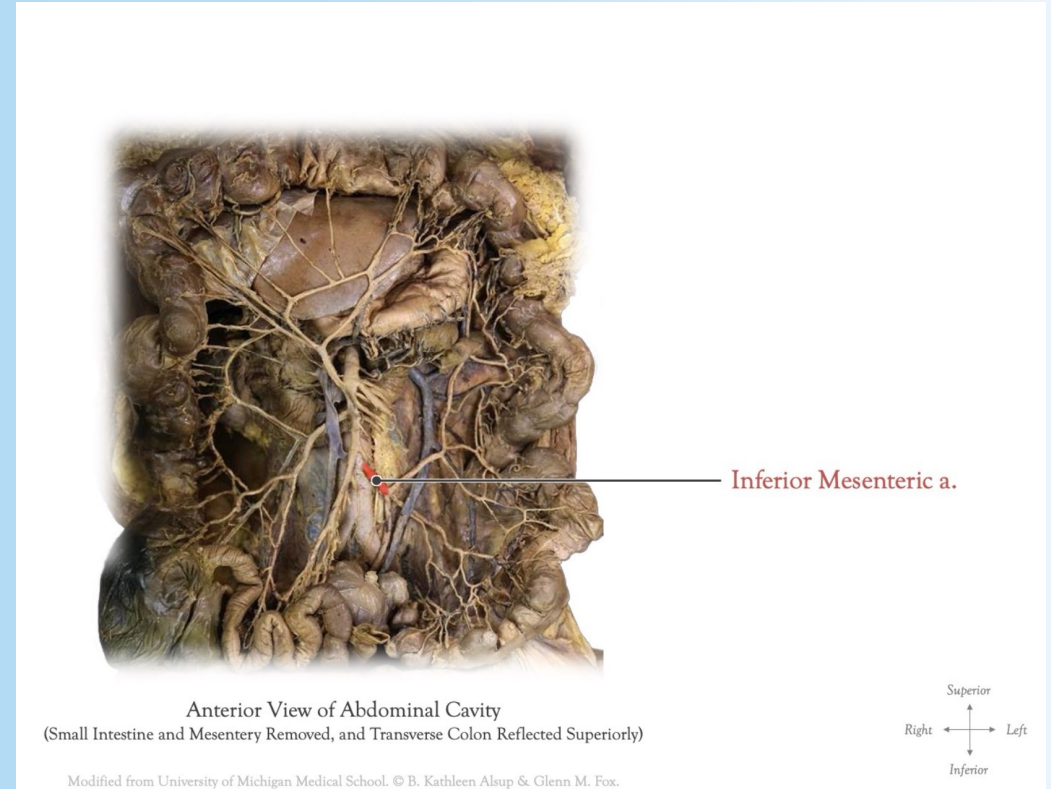


Pancreas Blood Supply

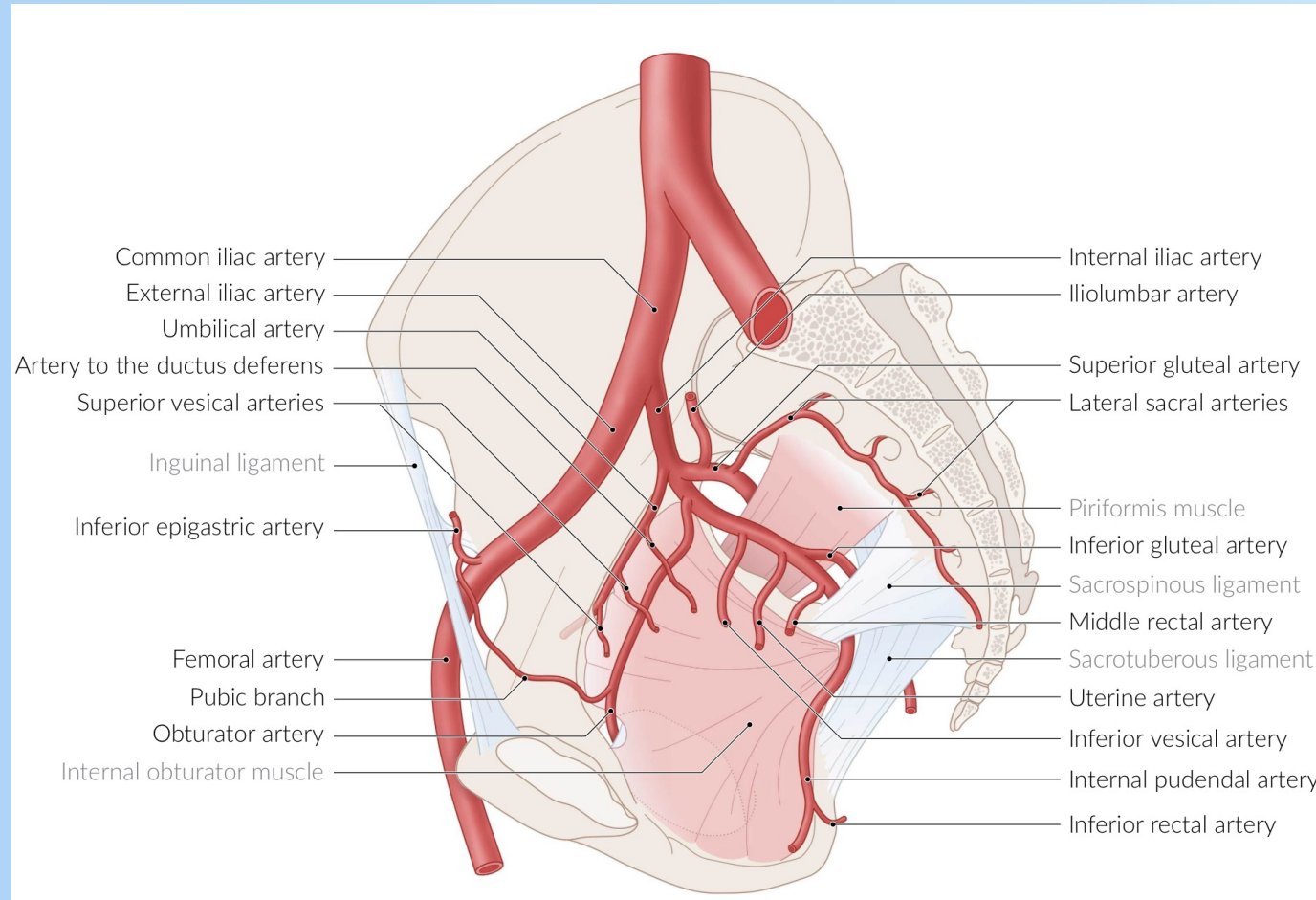


Inferior Mesenteric Artery - Hindgut

- Three main branches
 - Left colic artery
 - Supplies distal 1/3 of transverse colon, descending colon
 - Sigmoid arteries
 - Supplies sigmoid colon (obviously)
 - Superior rectal artery
 - Supplies upper 2/3 of rectum
 - Inferior 1/3 is supplied by inferior rectal artery which is a branch off internal pudendal artery (which comes off the internal iliac)

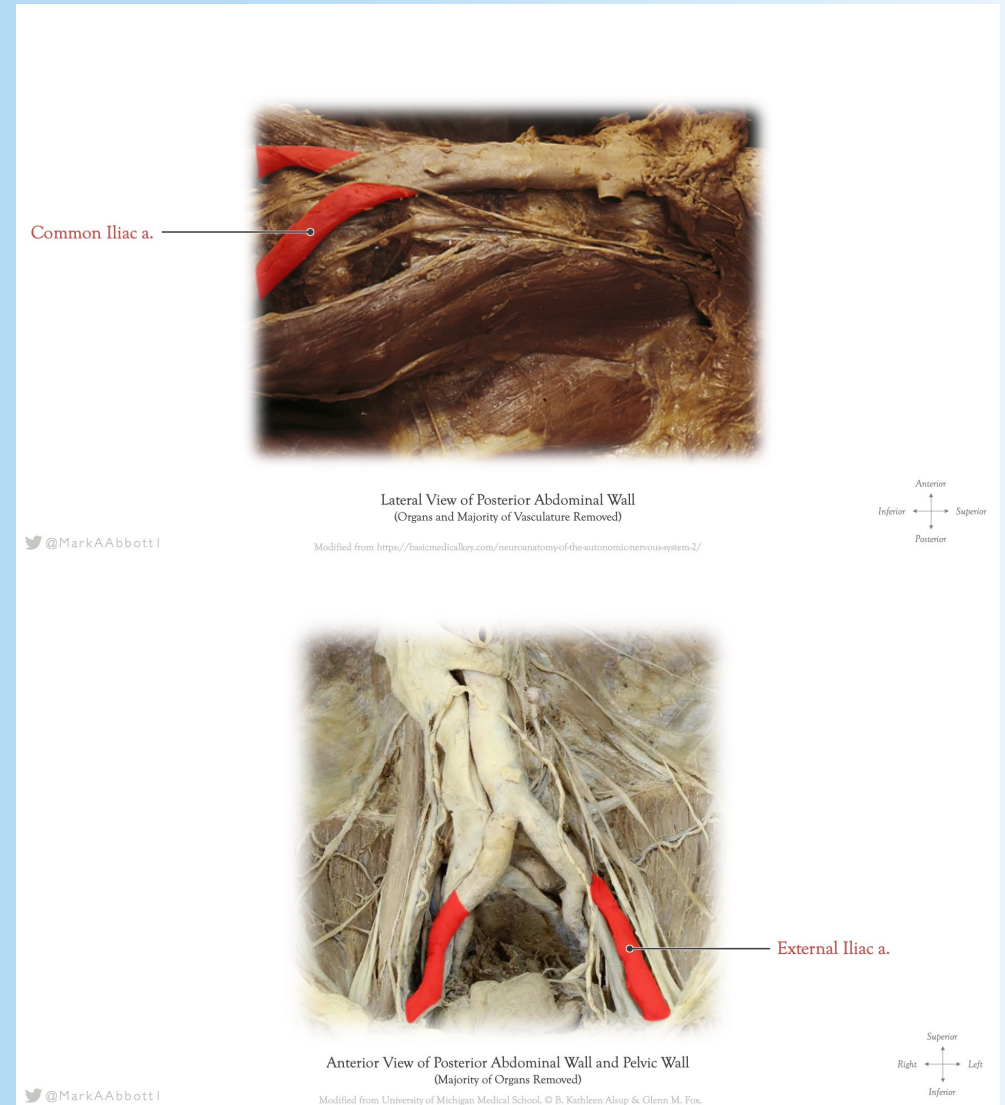


Pelvic Blood Supply



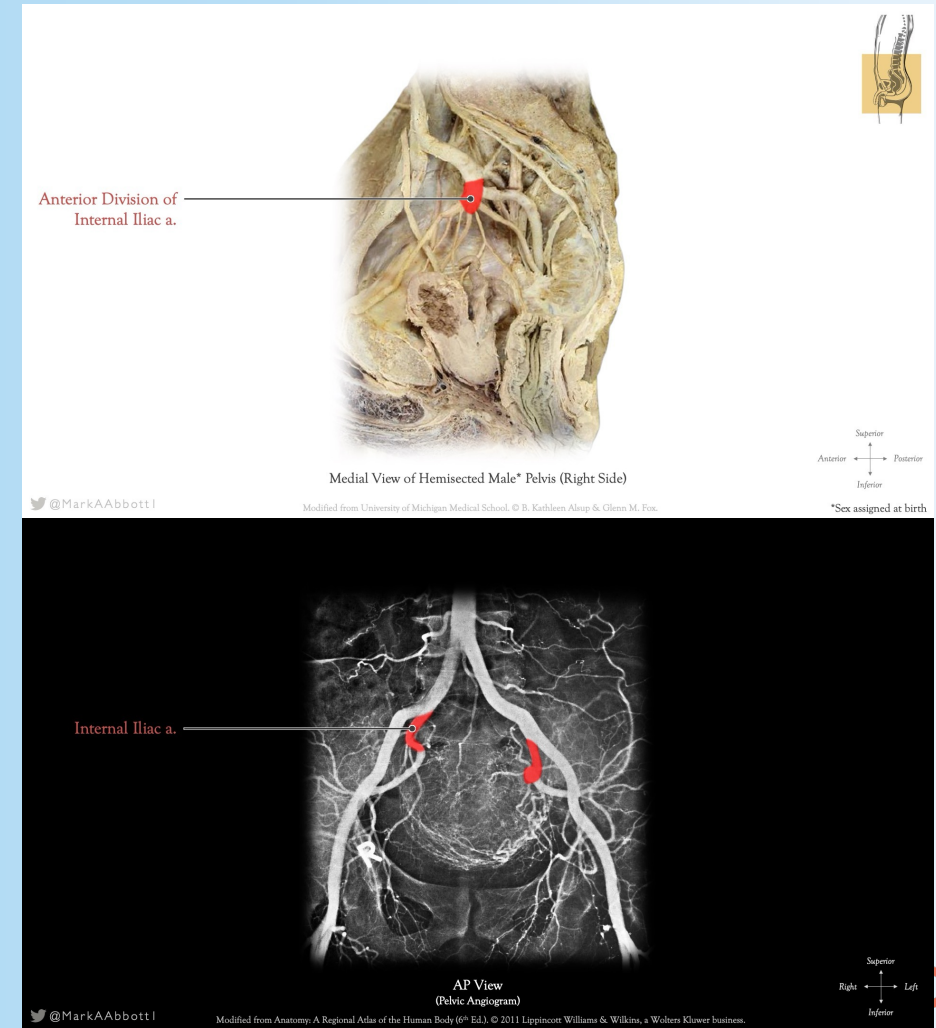
Pelvic Blood Supply

- Iliac arteries are the continuation of the abdominal aorta
 - Split at T4 into the common iliac arteries
 - External iliac continues into the leg to supply the lower limb
 - Gives off inferior epigastric artery which anastomoses with the obturator artery
 - Internal iliac is composed of two trunks - anterior and posterior



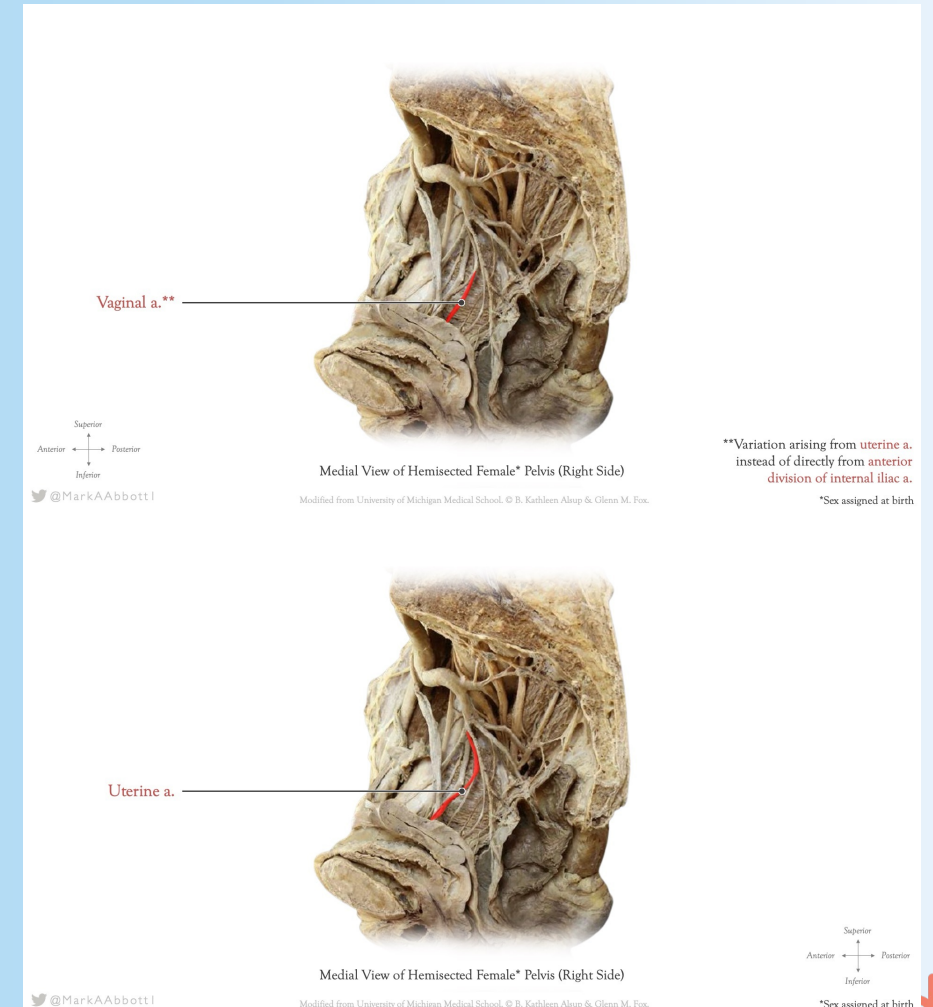
Internal Iliac Artery - Anterior Trunk

- Anterior Trunk
 - A LOT of branches
 - Umbilical artery
 - Two branches
 - Artery to the ductus deferens
 - Superior vesicular arteries
 - Supply superior portion of bladder
- Inferior Vesicular Artery
 - Supplies fundus of bladder and lower part of ureter
 - In males - also supplies prostate, seminal vesicles, and ductus deferens



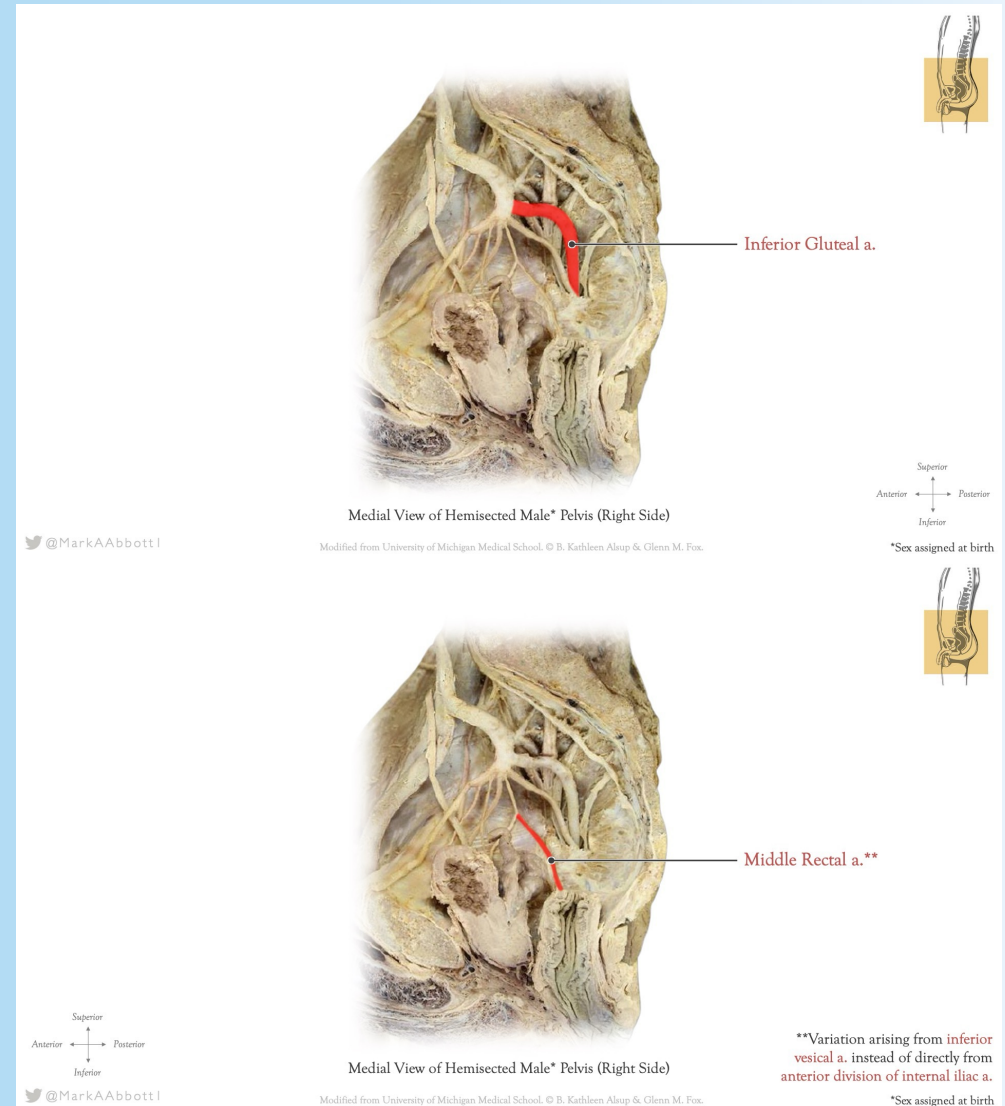
Internal Iliac Artery - Anterior Trunk Cont.

- Vaginal artery
 - Supplies anterior and posterior portion of vagina
- Uterine artery (in females)
 - Superior branch - supplies body and fundus of the uterus
 - Vaginal branch - supplies the cervix and the vagina
 - Anastomoses with the ovarian artery



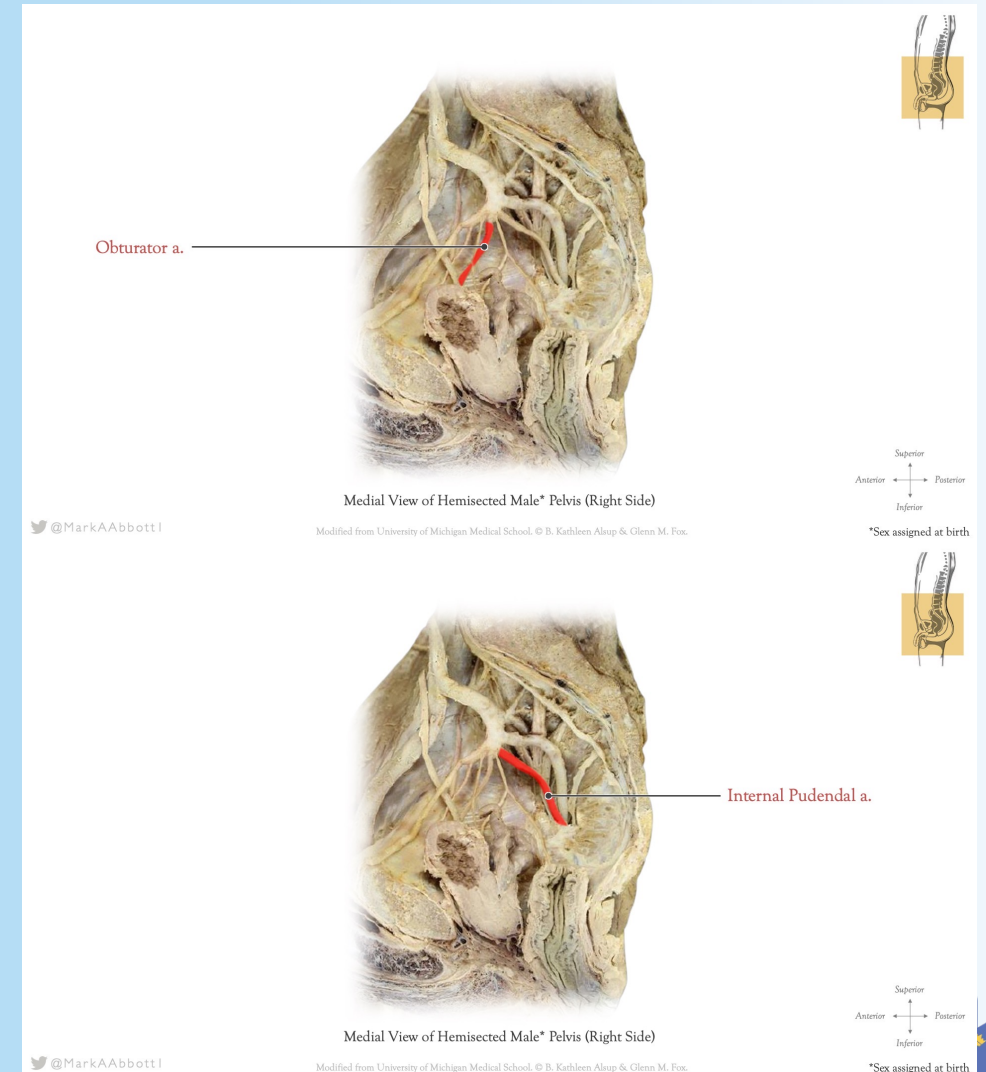
Internal Iliac Artery - Anterior Trunk Cont.

- Inferior gluteal artery
 - Supplies gluteal region and the thigh
- Middle rectal artery
 - Supplies the lower rectum, upper anal canal, and the ureter
 - In males - supplies prostate and the seminal vesicles
 - In females - supplies the vagina



Internal Iliac Artery - Anterior Trunk Cont.

- Obturator artery
 - Supplies medial compartment of the thigh and the **head of the femur** (via the foveolar artery)
- Internal pudendal artery
 - Supplies the perineum, genitalia, anal canal, and erectile tissues



Pneumonic - Anterior Branch

Often My Sexy Underwear Is Inside Pants.

Obturator Artery

Middle rectal artery

Superior vesicular arteries (Umbilical artery in fetus)

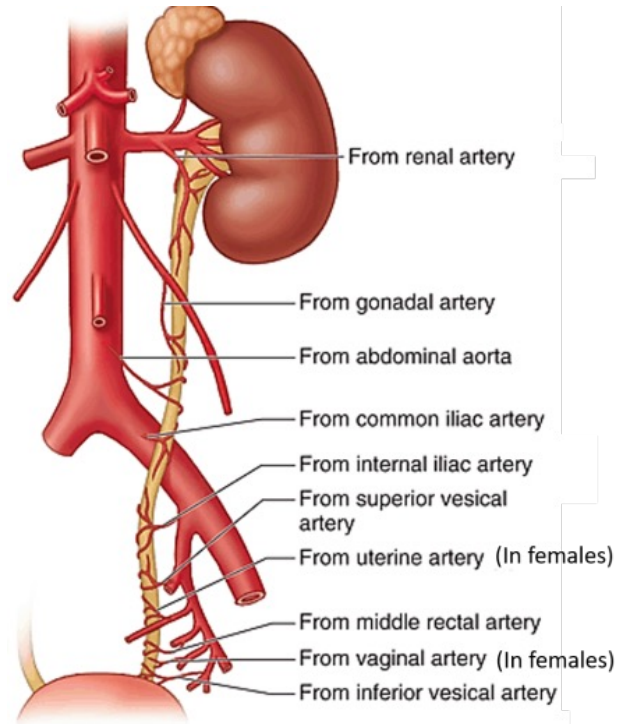
Uterine Artery (Only female)

Inferior vesicular artery (AKA Vaginal artery in female)

Inferior Gluteal Arteries

Internal Pudendal Artery (Pants = genitalia)

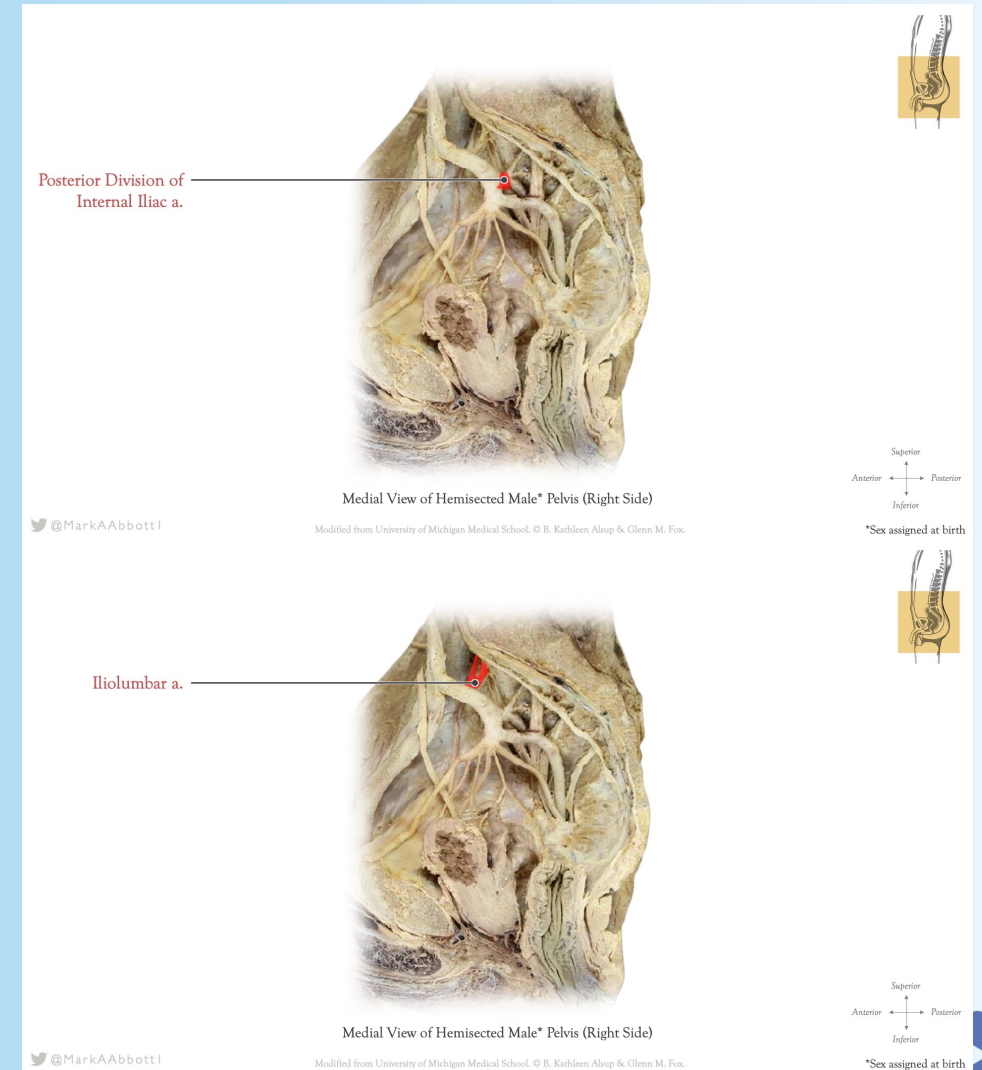
Ureter Blood Supply



Vasculature of the ureters			
	Abdominal part		Pelvic part
	Proximal ureters	Middle ureters	Distal ureters
Arteries	Renal arteries	Gonadal arteries (i.e., testicular artery/ovarian artery) and branches of the aorta, the common iliac arteries, and the internal iliac arteries	Branches of the common iliac and internal iliac arteries (e.g., superior and inferior vesical arteries) and the ovarian arteries in females
Veins	Renal veins	Renal veins, gonadal (i.e., testicular or ovarian) veins	Branches of the common iliac and internal iliac vein (e.g., superior and inferior vesical vein) and the ovarian vein in females

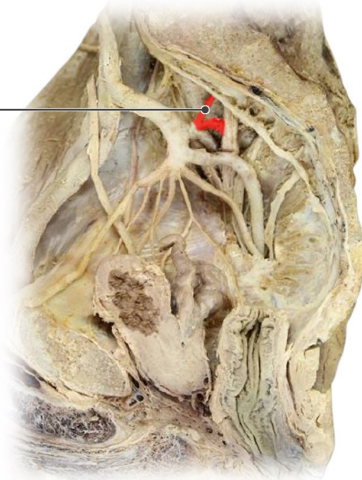
Internal Iliac Artery - Posterior Trunk

- Thankfully less branches than anterior
- Iliolumbar artery
 - Two branches
 - Iliac branch - supplies the ileum and the iliacus muscle
 - Lumbar branch - supplies the quadratus lumborum and psoas major
- Lateral sacral arteries
 - Supply the skin posterior to sacrum
- Superior gluteal artery
 - Supplies the muscles and skin of the gluteal region



Internal Iliac Artery - Posterior Trunk

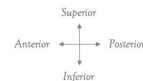
Lateral Sacral a.



Medial View of Hemisected Male* Pelvis (Right Side)

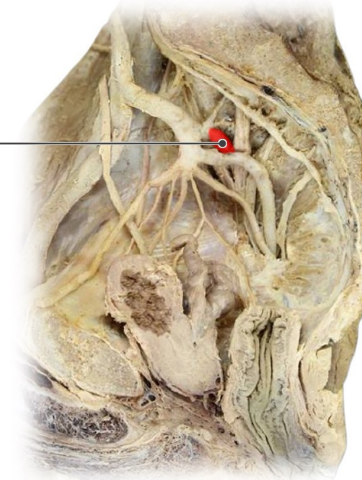
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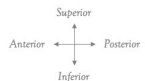
*Sex assigned at birth @MarkAAbbott1

Superior Gluteal a.



Medial View of Hemisected Male* Pelvis (Right Side)

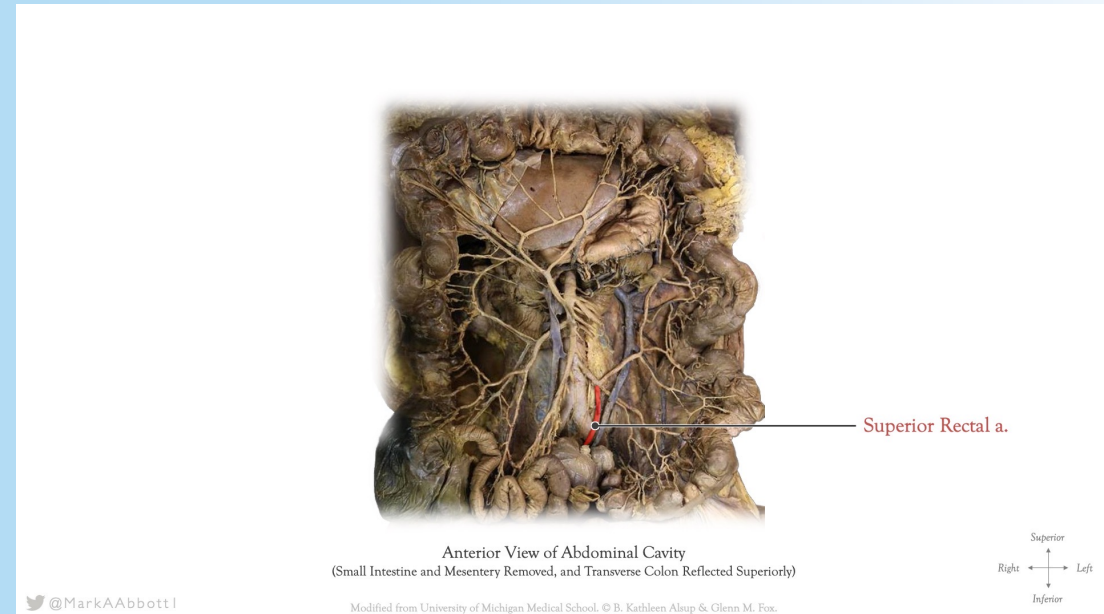
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*Sex assigned at birth

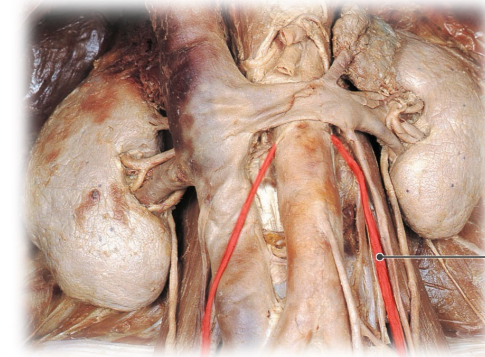
Other Pelvic Arteries

- Unfortunately, these arteries don't follow rules
- Median sacral artery
 - Arises from posterior wall of the abdominal aorta, proximal to the bifurcation at L4
 - Supplies the coccyx, lumbar vertebrae, and sacrum
- Superior rectal artery
 - Continuation of the inferior mesenteric artery
 - Supplies anal canal above the pectinate line (upper 2/3 of rectum)



Other Pelvic Arteries

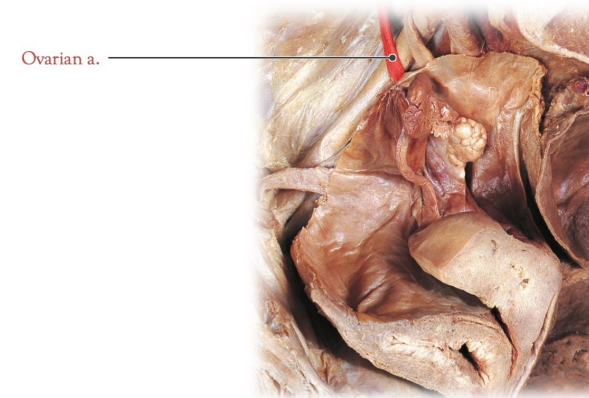
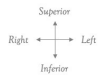
- Ovarian artery - again
 - Arises from abdominal aorta inferior to the renal arteries
 - Crosses over the proximal end of the external iliac artery
 - Supplies the ovary and the lateral 1/3 of the fallopian tube through the **suspensory ligament of the ovary**
 - Forms an anastomosis with the ovarian branch of the uterine arteries



Anterior View of Posterior Abdominal Wall

@MarkAAbbott1

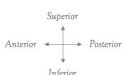
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Medial View of Hemisected Female* Pelvis (Right Side)

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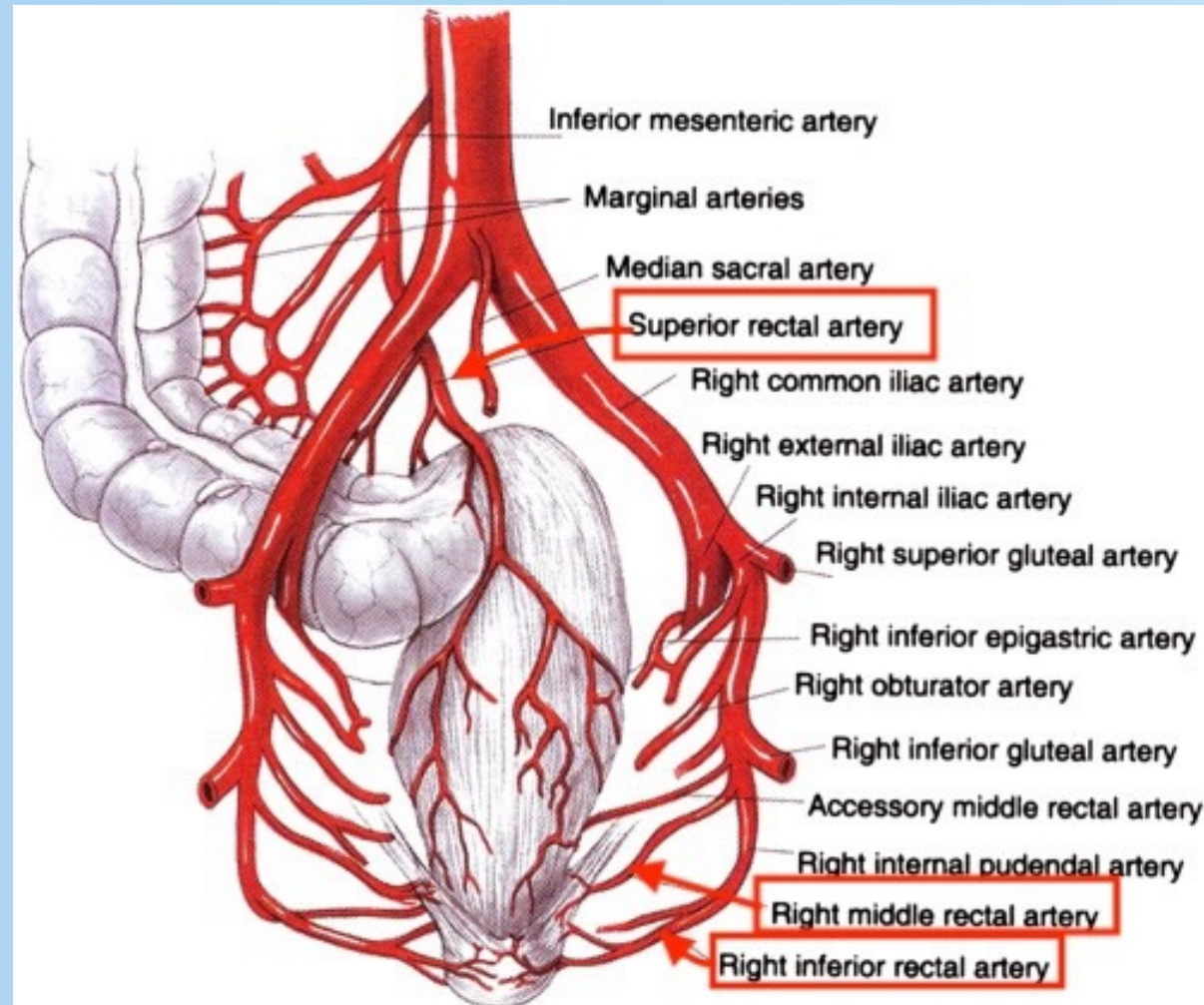
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*Sex assigned at birth



Superior, Middle, Inferior Rectal Artery



Sources

- Special thanks to:
 - Complete Cadaver (supplied all cadaver pictures)
 - AMBOSS (pictures and information)
 - Osmosis
 - BRS
 - TeachMeAnatomy
 - Dr. Izabela Zamojska

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