BIO 4432 – Human Anatomy

Resource #11

The concepts this resource covers are the topics typically covered during this week of the semester. If you do not see the topics your particular section of class is learning this week, please take a look at other weekly resources listed on our website for additional topics throughout the semester.

We also invite you to look at the group tutoring chart on our website to see if this course has a group tutoring session offered this semester.

If you have any questions about these study guides, group tutoring sessions, private 30 minute tutoring appointments, the Baylor Tutoring YouTube channel or any tutoring services we offer, please visit our website www.baylor.edu/tutoring or call our drop in center during open business hours. M-Th 9am-8pm on class days 254-710-4135.

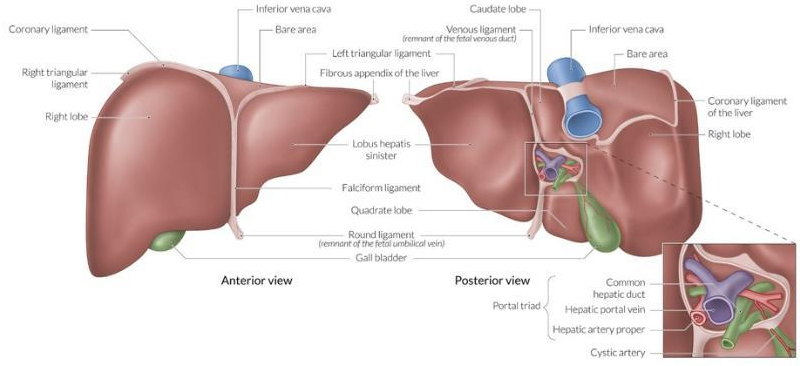
Keywords: GI structures and organization, Abdominal aorta, Portacaval system, Rectum

Topic of the Week: Gastrointestinal System

Foregut

- From the last 1/3 of the esophagus to the first half of the duodenum (also includes the liver, biliary system, and pancreas)
- Blood supply comes from the celiac trunk

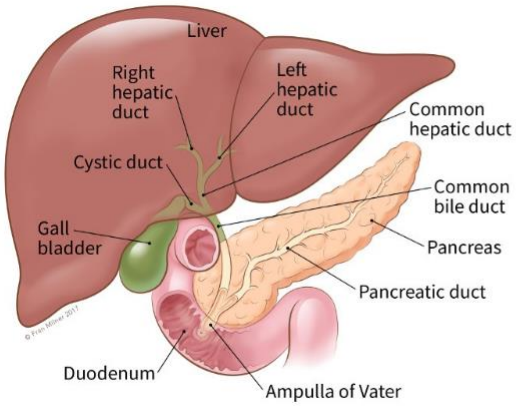
Liver



This image was taken from amboss.com.

- Falciform ligament: boundary between left and right lobes; attaches the liver to the diaphragm and anterior abdominal wall
- Round ligament: inferior portion of the falciform ligament; also called ligamentum teres
  - Used to be the fetal umbilical vein
- Ligamentum venosum: remnant of ductus venosus

Biliary system



This image was taken from cancer.org.

- The liver makes bile, and the gallbladder stores it.
- The hepatopancreatic ampulla (ampulla of Vater) empties contents of the common bile and pancreatic ducts into the second part of the duodenum.
- Hepatobiliary triangle: common hepatic duct (medial), cystic duct (lateral), and the inferior border of the liver (superior).

Midgut

- From the second half of the duodenum to the first half of the transverse colon
- Blood supply comes from the superior mesenteric artery

Small intestine

- Duodenum, jejunum, and ileum
  - The duodenum has 4 parts: first (superior) part, second (descending) part, third (transverse) part, and fourth (ascending) part.
  - The ligaments of the duodenum: the hepatoduodenal ligament and the suspensory ligament of Treitz

Large intestine

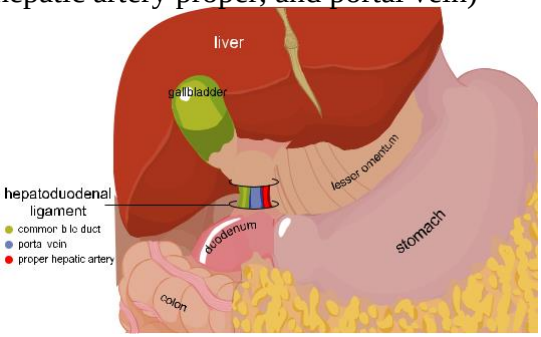
- Taeniae coli: 3 longitudinal ribbons of smooth muscle on the outside of the colon
- Haustra: small pouches caused by the contraction of the taeniae coli
- Appendices epiploica: fat filled appendages

Hindgut

- From the second half of the transverse colon to the anus
- Blood supply comes from the inferior mesenteric artery

Important ligaments of the GI system:

- Hepatoduodenal ligament: the **portal triad** lies within this ligament (common bile duct, hepatic artery proper, and portal vein)



This image was taken from Wikipedia

- Gastrosplenic ligament contains the short gastric and right gastroepiploic vessels
    - Part of the greater omentum; connects the greater curvature of the stomach to the spleen

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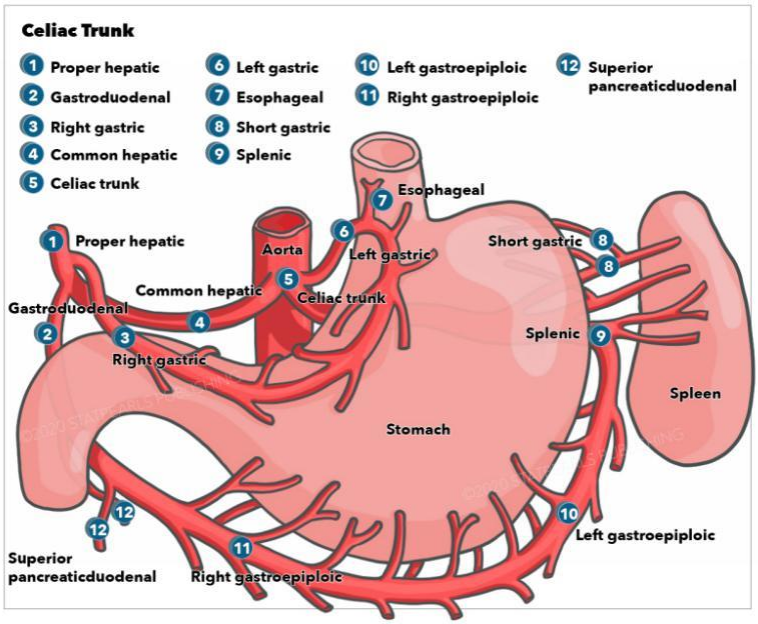
Highlight #1: Abdominal Aorta

Celiac trunk: the first unpaired branch of the abdominal aorta

- 3 branches: common hepatic, splenic, and left gastric



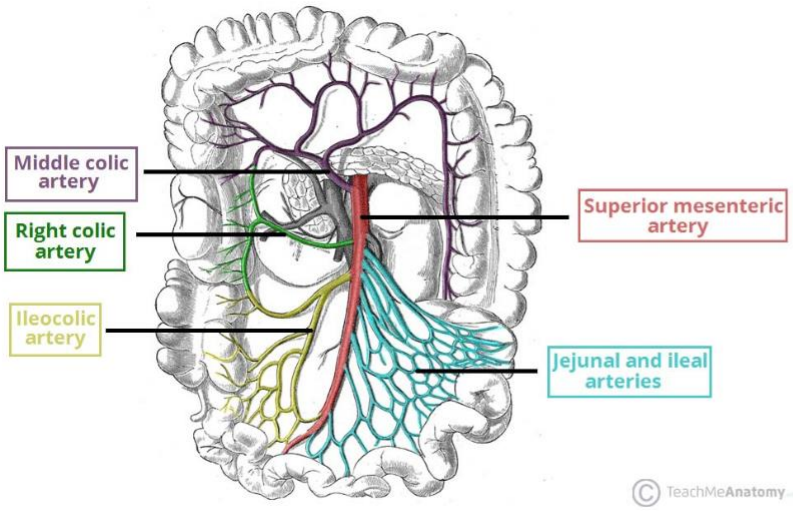
This image was taken form NCBI.

Common hepatic artery branches: gastroduodenal, right gastric, and proper hepatic

- Gastroduodenal branches into right gastroepiploic and superior pancreaticoduodenal arteries

Splenic artery branches: short gastric, left gastroepiploic, and pancreatic (not pictured)

Superior mesenteric artery *This image was taken from teachmeanatomy.com.*



Ileocolic – appendix, cecum, colon Right colic – ascending colon Middle colic – transverse colon Jejunal and ileal arteries – jejunum and ileum

Inferior pancreaticoduodenal (not pictured) – pancreas and duodenum

Inferior mesenteric artery

Inferior mesenteric artery

- Left colic artery, superior rectal artery, and sigmoidal

arteries Rectum blood supply:

- Superior portion: superior rectal a. (branch of inferior mesenteric)
- Middle portion: middle rectal a. (branch of internal iliac)
- Inferior portion: inferior rectal a. (branch of internal pudendal which is a branch of internal iliac)

*Marginal artery of the colon anastomoses the superior and inferior mesenteric arteries

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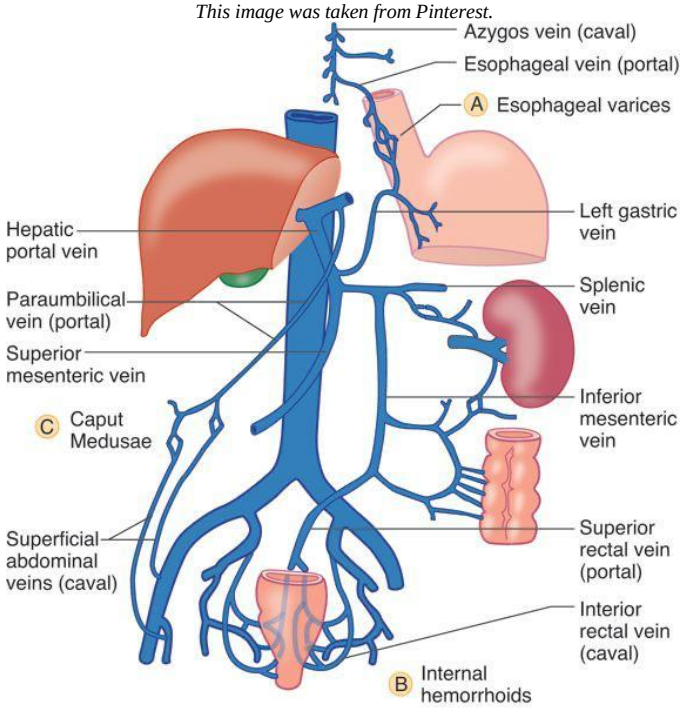
Highlight #2: Portacaval Anastomoses

This image was taken from Pinterest.



Region	Portal drainage	Caval drainage	Clinical Sign
Esophagus	Left gastric vein	Azygos vein	Esophageal varices
Rectal	Superior rectal vein	Middle and inferior rectal veins	Hemorrhoids
Umbilical	Paraumbilical vein	Superficial epigastric vein	Caput medusa

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Highlight #3: Rectum

Blood supply:

- Superior portion: superior rectal a. (branch of inferior mesenteric)
- Middle portion: middle rectal a. (branch of internal iliac)
- Inferior portion: inferior rectal a. (branch of internal pudendal which is a branch of internal iliac)

Pectinate line

- Above the pectinate line = visceral
- Below the pectinate line = somatic
- Blood supply:
  - Above = superior rectal artery
  - Below = middle and inferior rectal artery
- Hemorrhoids: internal are above the pectinate line and painless, but external are below the pectinate line and painful.

Week 14 Knowledge Checkpoint:

1. Which ligament contains the portal triad?
   a. Suspensory ligament of Treitz
   b. Hepatoduodenal ligament
   c. Gastrosplenic ligament
   d. Falciform ligament

2. What branch of the common hepatic artery supplies the lesser curvature of the stomach?
   a. Left gastric
   b. Short gastric
   c. Right gastric
   d. Left gastroepiploic

3. A patient was admitted with symptoms of an upper bowel obstruction. Upon CT examination, it was found that the third (transverse) portion of the duodenum was compressed by a large vessel causing the obstruction. The vessel involved is most likely to be the:
   a. Inferior mesenteric artery
   b. Inferior mesenteric vein
   c. Portal vein
   d. Superior mesenteric artery

4. A patient was diagnosed with pancreatitis due to a reflux of bile into the pancreatic duct caused by a gallstone. The stone is likely to be lodged at the:
   a. Common bile duct
   b. Common hepatic duct
   c. Hepatopancreatic ampulla
   d. Cystic duct

5. A patient presents with internal hemorrhoids. Do they feel pain? Why or why not?

THINGS YOU MAY STRUGGLE WITH!

1. ***The celiac trunk:*** The branches of the celiac trunk can get confusing. There are a lot of branches supplying different organs, but it can help to draw it out (you should be doing

this in class). Y'all know I love a good flow chart, so go ahead and make one of those too if it helps!

2. ***Volume of material:*** The GI lectures are packed with information. Make sure to get this down before going over the innervations of everything. Split it up into foregut, midgut, and hindgut so you can consolidate the material instead of trying to do it all at once.

CONGRATS: You made it to the end of the resource! Thanks for checking out these weekly resources! Don't forget to check out our website for group tutoring times, video tutorials and lots of other resources: www.baylor.edu/tutoring!

Answers

1. b
2. c
3. d
4. c
5. No – internal hemorrhoids are above the pectinate line, so they are painless