Happy week 14! I hope everyone had a great Easter break 😊. Your third (and last!!!) lecture exam is next Thursday, so make sure you’re doing what you need to do to adequately prepare. Y’all are so close to the finish line!!! **Disclaimer! The GI lecture is a big one, so I will only be including the major topics. Use this resource to follow along with your notes and help you organize your thoughts, NOT as your only study tool! This resource will cover structures of the GI and blood supplies and next week’s will include innervation.

Remember: The tutoring center offers free individual and group tutoring for this course. Our group tutoring session will be Thursdays from 6:45-7:45 PM in the basement of Sid Rich, room 74. You can reserve your spot at [https://baylor.edu/tutoring](https://baylor.edu/tutoring). Hope to see you there!

**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**

- 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
- 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)
- **Gastroplenic 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

![Celiac Trunk Diagram](Image)

*This image was taken from 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.

![Superior Mesenteric Artery Diagram](Image)

*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**

- 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**

<table>
<thead>
<tr>
<th>Region</th>
<th>Portal drainage</th>
<th>Caval drainage</th>
<th>Clinical Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Esophagus</td>
<td>Left gastric vein</td>
<td>Azygos vein</td>
<td>Esophageal varices</td>
</tr>
<tr>
<td>Rectal</td>
<td>Superior rectal vein</td>
<td>Middle and inferior rectal veins</td>
<td>Hemorrhoids</td>
</tr>
<tr>
<td>Umbilical</td>
<td>Paraumbilical vein</td>
<td>Superficial epigastric vein</td>
<td>Caput medusa</td>
</tr>
</tbody>
</table>

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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**.

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**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?

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