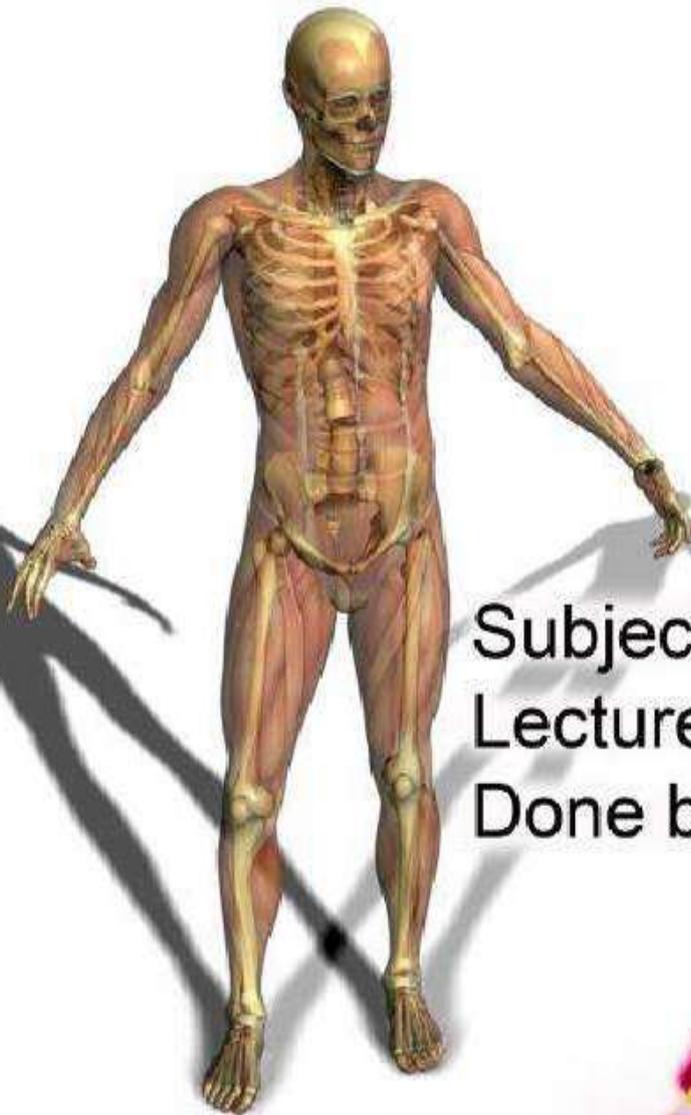




ANATOMY



Subject : *Introduction to Anatomy*

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lecture # : *35*

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Duodenum, small intestine, large intestine, and appendix

In the last week we started talking about the GI system, and we divided it into GI tube and accessory glands. Then we talked about abdominal esophagus and stomach.

*Quick revision of the stomach:

-the stomach is the upper dilated part of the GI tube, located in the epigastric region and left hypochondriac region and umbilical region.

-It has a cardiac opening and a pyloric opening. Has anterior surface and posterior surface. It has a greater curvature and lesser curvature. And at lesser curvature there is an angular notch which is marking the pylorus from the body of the stomach.

-Since the stomach is related to the foregut it is supplied by branches from the celiac artery. Its venous drainage is by portal vein.

**The end of the pylorus and the beginning of the duodenum is called the *pyloroduodenal junction*.

**The end of the duodenum and the beginning of the small intestine (jejunum) is called the *dudenojejunal junction*.

Duodenum:

-The duodenum is a capital G shaped tube extending from the pyloroduodenal junction to deudenojejunal junction.

-It is 10 inches long tube.

-It is surrounding the head of pancreas; so any problem in one of them affects the other.

-Duodenum is the site where the food is mixed with the three juices for carbohydrates, proteins, and fats. And that is because common bile duct and pancreatic duct ends in it. (pancreas, pancreatic duct and common bile duct are medial to the duodenum)

-Duodenum passes by L1,L2,L3,L4 vertebrae [see image in slide 27].

- Duodenum is retroperitoneal **except** its 1st and last inches.



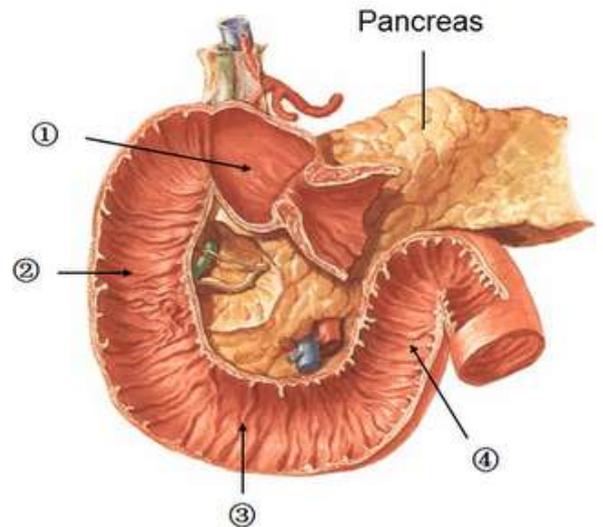
-The duodenum is divided into **4 parts** :

1st part:

- Crossing L1 vertebra.
- 2 inches long.
- 1st inch is intraperitoneal and distal inch is retroperitoneal.
- Its direction is upward backward pointing towards gall bladder.

2nd part:

- Descending part.
- Retroperitoneal.
- 3 inches long.
- On the right side of L1, L2, L3 .
- Near to the head of pancreas, common bile duct, and pancreatic duct (they are medial to the duodenum); so this is where the secretions of these structures are secreted. And this makes the duodenum very important.



3rd part:

- Retroperitoneal.
- Crossing L3 vertebra.
- 3 inches long.
- Superior mesenteric vessels (artery and vein) cross this part.

4th part:

- Ascending part.
- 2 inches long; Proximal inch is retroperitoneal and distal inch is intraperitoneal.
- Ascending from L3 to L2. Then it bends making an angle to give the duodenojejunal junction. Why? Because it was retroperitoneal and it will give the small intestine which is completely intraperitoneal tube.

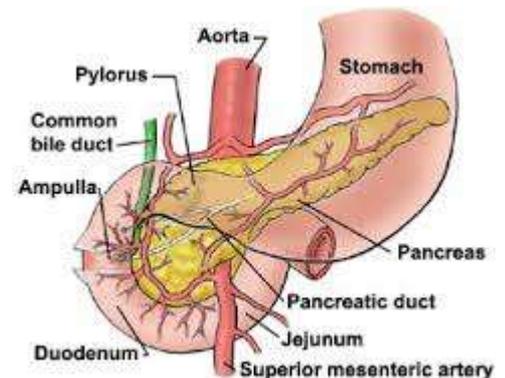
Arterial supply of the duodenum:

Duodenum is developed from foregut and midgut in the site of entrance of the common bile duct; the proximal 1/2 is from foregut, and distal 1/2 from midgut, so it is supplied by branches from celiac artery to the proximal 1/2 and by branches from superior mesenteric artery to the distal 1/2.

Venous drainage:

It is drained by 2 veins which finally go to portal vein then to the liver.

**note: duodenum is the site where the food is exposed to the three juices; gastric for carbohydrates, pancreatic for proteins, and bile for fat, and that's why we never remove the duodenum from a patient, but we remove part of the stomach.



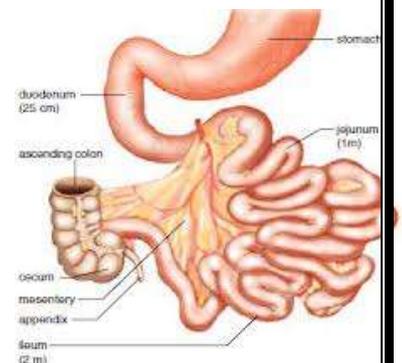
Small intestine:

-It is a complete highly mobile intraperitoneal tube.

-It is extending from duodenum to cecum; from duodenojejunal junction at left side to ileocecal junction at right side.

- Located below and around the umbilicus; so pain in this area is related to the small intestine.

-It is 6m long. ((Like the epididimis))



It is long to make absorption of the food. In the beginning it mixes the food with the juices, then in the jejunum the fluids are absorbed in fast manner and that's why we always find it empty, and then fibers go down to the ileum which is slow in digestion and absorption and contains bacteria to digest the fibers.

-Small intestine is **anchored** to posterior abdominal wall by a fan-shaped mesentery.

*Anchored means moving within a distance (doesn't mean fixed). Many organs in the body like liver, spleen and kidney while you are moving they move up and down within a distance.

*Mesentery: double layer of peritoneum that anchor the small intestine to the posterior abdominal wall, and it has a fan shape.

-Small intestine is part of the midgut; so it is supplied by superior mesenteric artery.

-Its venous drainage is to the portal vein.

-The small intestine is divided into two parts:

The proximal 2/5 → Jejunum

The distal 3/5 → Ileum

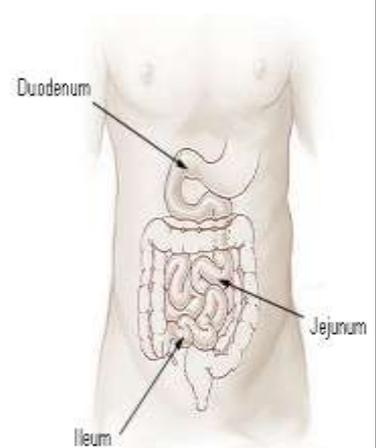
There is a mistake in the slides 38 and 39. Correction: The proximal is 2/5 and the distal is 3/5 as they are in the image in slide 37.

The jejunum :

- proximal 2/5.
- Red in color; because of the high absorption it contains many blood vessels.
- Larger in diameter and thicker in wall.
- Small amount of fat in its mesentery (scanty fat → very little)

The ileum :

- Distal 3/5.
- Pale in color.
- Smaller in diameter and thinner in wall.
- Numerous (large amount) fat within its mesentery.



Large intestine :

-They are large in diameter and have elevations and depressions which are called sacculations. (and that's why they are called large intestine).

-Sacculations are common site of fermentation. They contain bacteria that make fermentation.

-Large intestine surrounds the small intestine like a frame (framing the small intestine).

-It has the following parts:

1- Cecum:

- located in the right iliac fossa, above iliacus muscle.
- It is intraperitoneal pouch.
- Supplied by superior mesenteric artery.

2- Ascending colon:

- Retroperitoneal.
- Located in the right side.
- Supplied by superior mesenteric artery.

3- Hepatic angle:

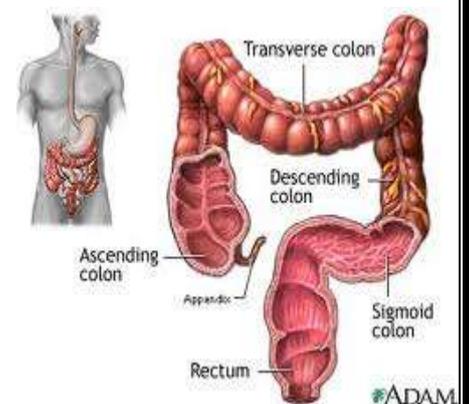
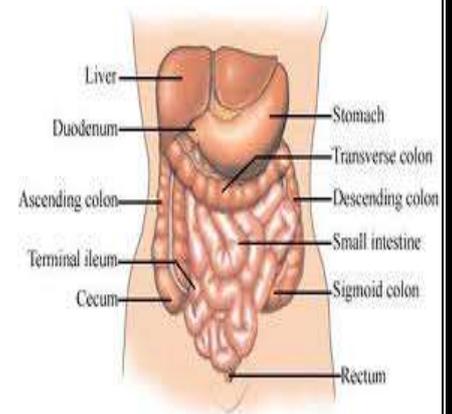
- Located below, related, and touching the inferior surface of the liver (hepat).
- Right angle.

4- Transverse colon:

- Intraperitoneal mobile.
- It may reach the umbilicus.
- Has a mesentery.
- Separates the midgut from the hindgut.
- Arterial supply:
 - Proximal 2/3 is related to the midgut → by superior mesenteric artery.
 - Distal 1/3 related to hindgut → by inferior mesenteric artery.

5- Splenic angle:

- The highest point of the large intestine, so it is the common side of the collection of gases.
- It touches the spleen.
- Left angle.



6- Descending colon:

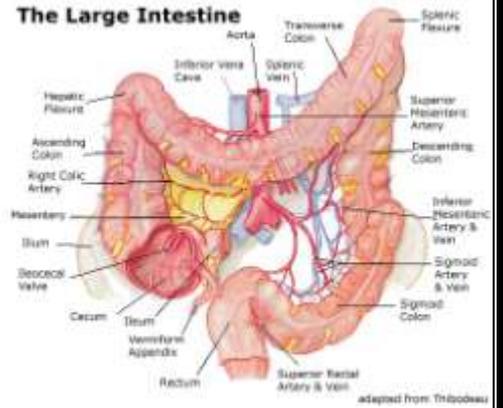
- Retroperitoneal.
- Supplied by inferior mesenteric artery.

7- Sigmoid:

- Intraperitoneal.
- S - shaped.

8- Rectum.

9- Appendix.



****note:** All large intestine are intraperitoneal **except** its pillars: ascending colon and descending colon which are retroperitoneal.

Appendix:

-Intraperitoneal blind tube (blind means with one opening).

-It is extending down from the cecum.

-Located in the right iliac fossa.

-It has a small lumen because it has a large amount of lymphoid tissue (lymphatic cells).

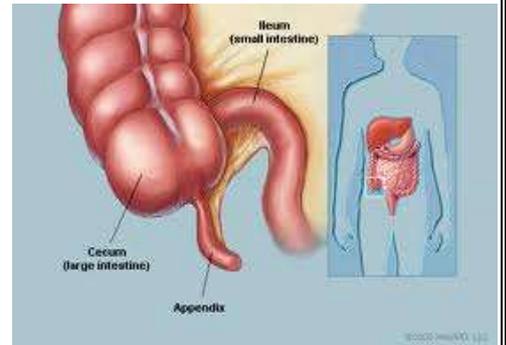
-It is long in children and short in adults and old ages. Why?

Because it contains lymphatic cells that play a rule in immunity.

-Being long in children makes appendicitis more common in children.

-It is mobile, has a fixed base and a mobile tip (variable in position).

-Arterial supply: superior mesenteric artery. And venous drainage through portal vein.



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Good luck 😊