MED 443
King Saud University

Anatomy 443

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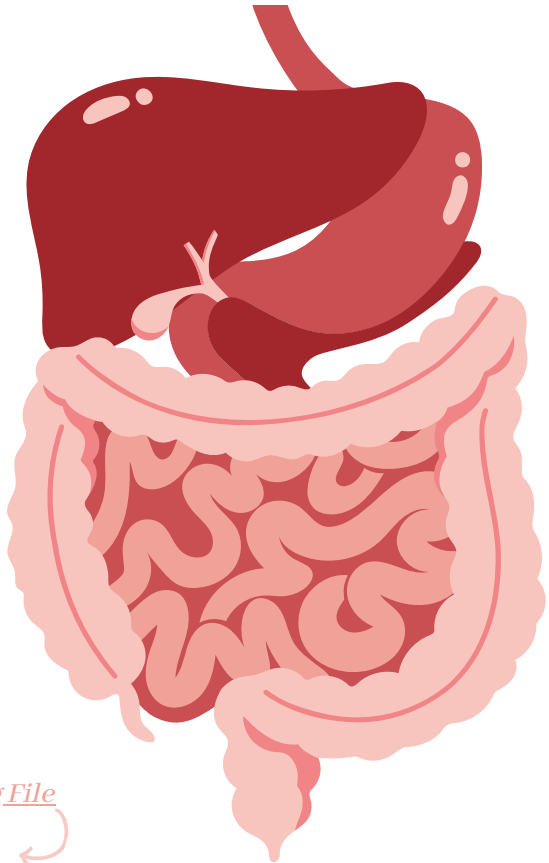
Reviewed by
Lama AlMutairi

Anatomy of the small intestine

GNT Block



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The Editing File

Objectives

- List the different **parts** of small intestine.
- Describe the anatomy of **duodenum**, **jejunum & ileum** regarding: the shape, length, site of beginning & termination, peritoneal covering, arterial supply & lymphatic drainage.
- Differentiate between each part of duodenum regarding the length, level & relations.
- Differentiate between the **jejunum & ileum** regarding the characteristic anatomical features of each of them.

This lecture was presented by :

Prof. Ahmed Fathalla Dr. Tahani Al Matrafi

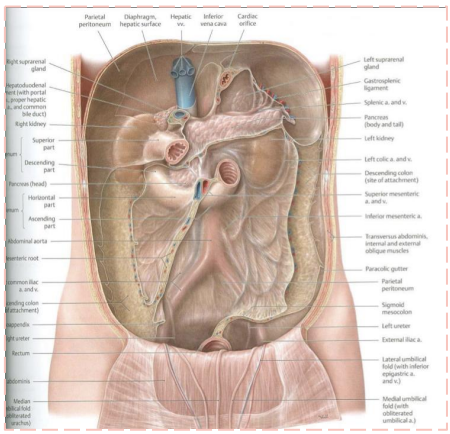
You can find Atlas by Clicking HERE!

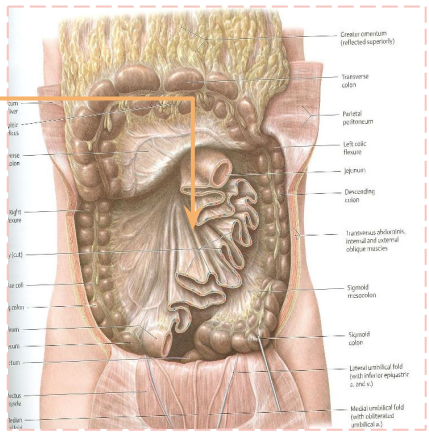
Introduction of Small Intestine

Small intestine

Fixed part (no mesentery): Duodenum

Free (movable) part (with mesentery): Jejunum and ileum





What is a mesentery?

Female Slides

Mesentery is double layer of visceral peritoneum suspends the small intestine (particularly the jejunum and ileum) from the posterior abdominal wall, resulting in:

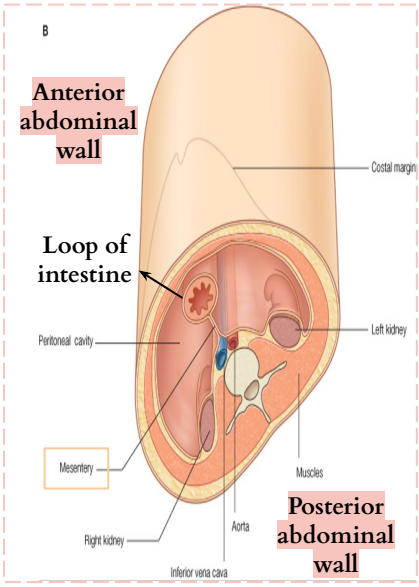
1- making jejunum and ileum **intraperitoneal** structures. (totally covered by visceral peritoneum)

2-**mobility** of jejunum and ileum.

Unlike jejunum and ileum, duodenum has NO mesentery making it:

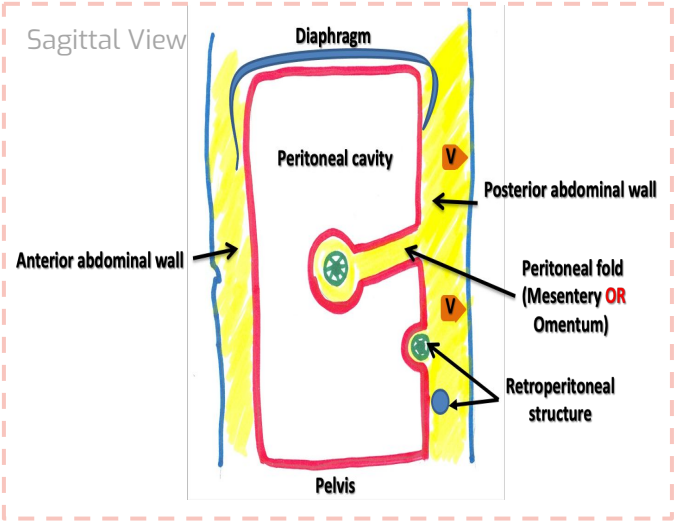
1-**retroperitoneal** structure (behind and partially covered by parietal peritoneum) except its 1st part.

2-**immobile**/ fixed organ.



Abdomen

Male Slides



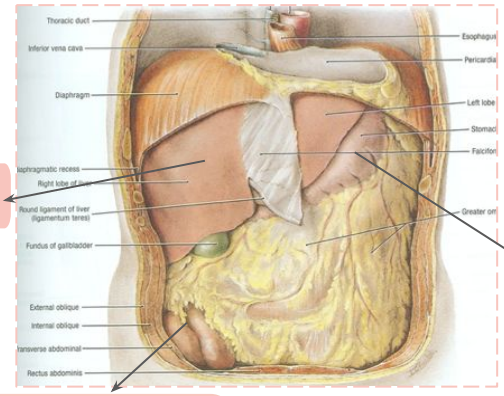
This part is **covered in detail in the omentum lecture**, however **click here** for great explanation of intra/retroperitoneal structures and peritoneal folds (reflections)

Layers of the Abdomen

1 First Layer

Transverse colon

Jejunum and ileum



Stomach

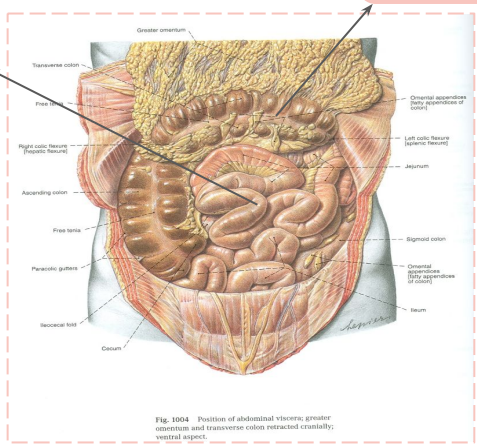


Fig. 1004 Position of abdominal viscera; greater omentum and transverse colon retracted cranially; ventral aspect.

Jejunum and ileum

2 Second Layer

3 Third Layer

Pancreas

Duodenum

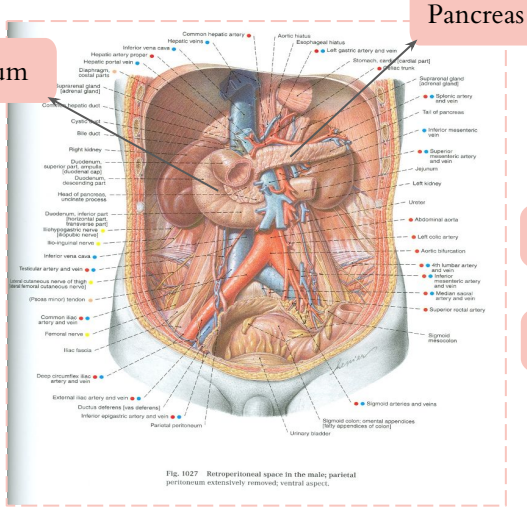


Fig. 1027 Retroperitoneal space in the male; parietal peritoneum extensively removed; ventral aspect.

Right suprarenal gland

Left suprarenal gland

Right kidney

Left kidney

Abdominal aorta

Inferior vena cava

Left psoas major

Right psoas major

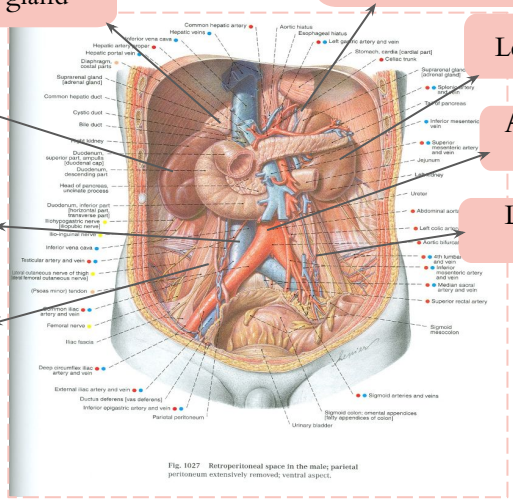
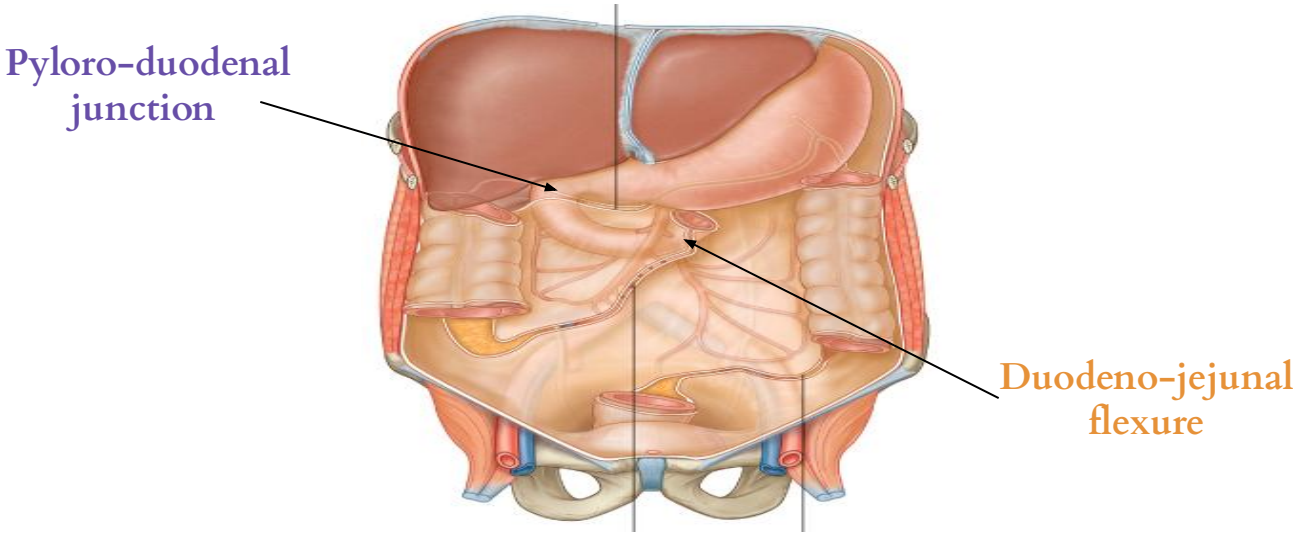


Fig. 1027 Retroperitoneal space in the male; parietal peritoneum extensively removed; ventral aspect.

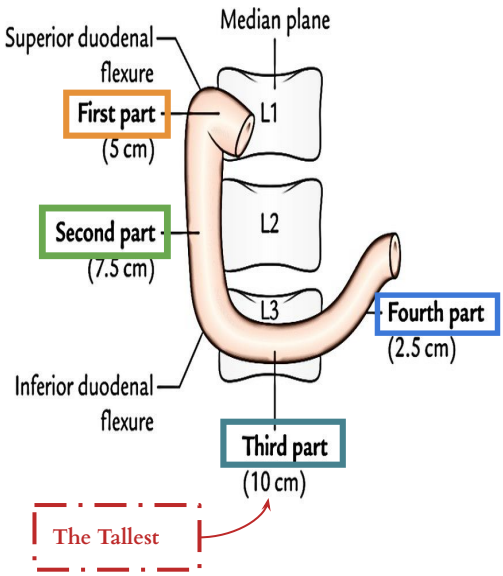
Duodenum

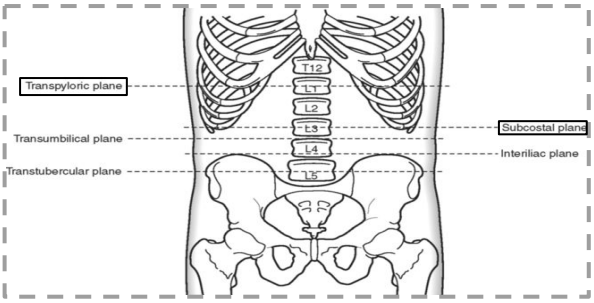
PART OF SMALL INTESTINE:	The fixed part (NO MESENTERY)	
SHAPE:	C-shaped loop	
LENGTH:	10 inches	
BEGINNING:	At Pyloro-duodenal junction	
TERMINATION:	At Duodeno-jejunal flexure	
PERITONEAL COVERING:	Retroperitoneal (except the first inch of its first part)	
DIVISIONS:	4 parts	
EMBRYOLOGICAL ORIGIN (2):	Foregut	Midgut
ARTERIAL SUPPLY:	Coeliac (celiac) trunk Gastroduodenal branch	superior mesenteric
VENOUS DRAINAGE:	-	superior mesenteric
	ultimately drains into the portal veins.	
LYMPHATIC DRAINAGE:	Coeliac (celiac)	superior mesenteric



Parts of Duodenum

1st part	Horizontal (Superior)	Length: 2 inches Level: L1 (transpyloric plane)
2nd part	Descending (Vertical)	Length: 3 inches Level: descend from L1 to L3
3rd part	Horizontal (Inferior)	Length: **4 inches** Level: L3 (subcostal plane)
4th part	Ascending	Length: 1 inches Level: ascend from L3 to L2





Mnemonic

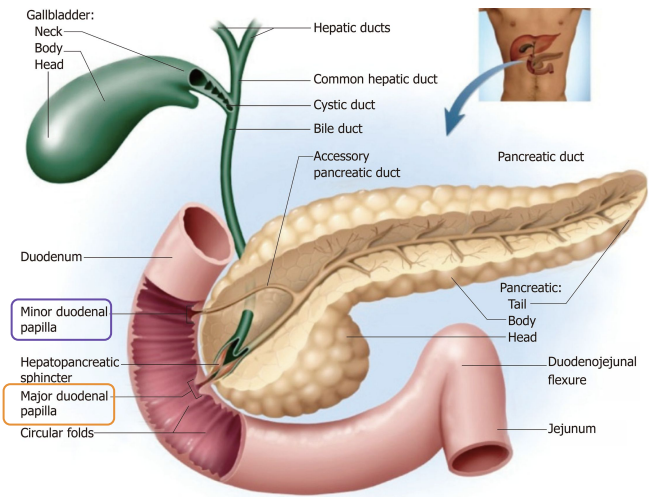
Length from 1st to 3rd parts are:
No. of part +1
Ex. 2nd part: 2+1=3 in

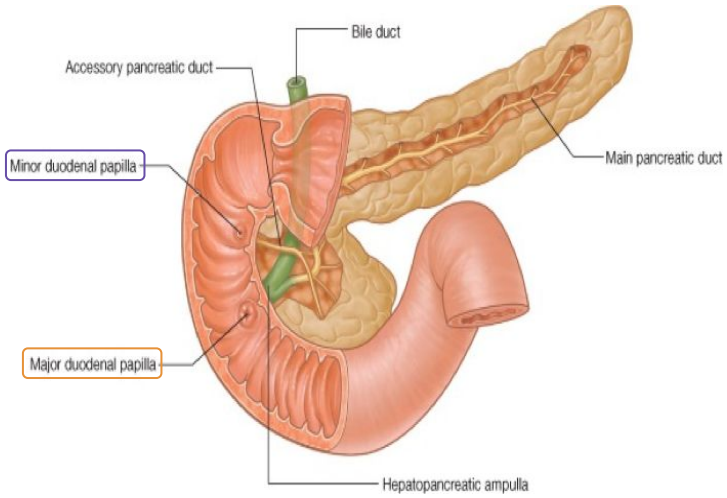
Length of 4th part:
Total duodenal length(10)-Length from 1st to 3rd (9)= 1in

Openings in 2nd Part of Duodenum

Common opening of bile duct & main pancreatic duct: on summit of major duodenal papilla.

Opening of accessory pancreatic duct (one inch higher): on summit of minor duodenal papilla.

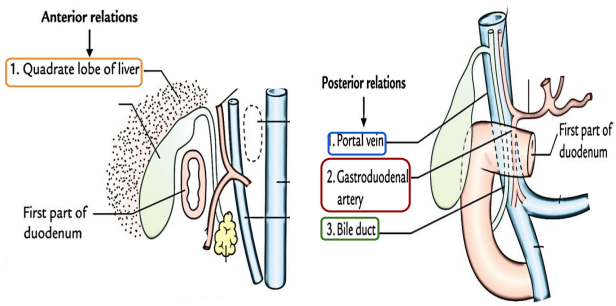




Structures Related to Duodenum

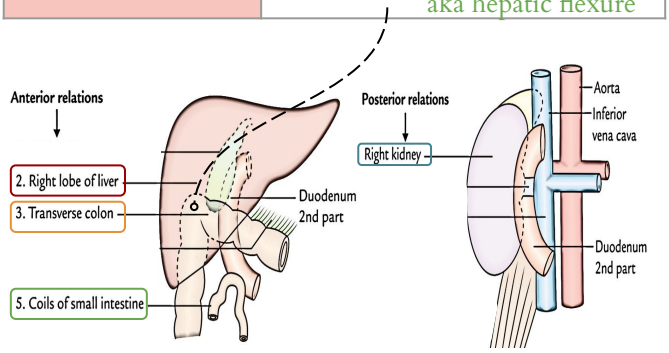
1 Relations of 1st part

ANTERIOR	Liver
POSTERIOR	1)Bile duct 2) Gastroduodenal artery 3)Portal vein



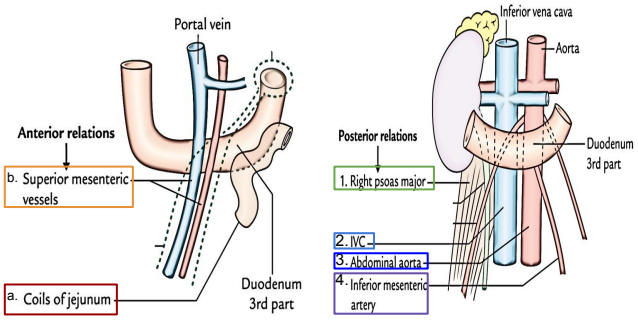
2 Relations of 2nd part

ANTERIOR	1)Liver 2)Transverse Colon 3)Small intestine
POSTERIOR	Right kidney
MEDIAL	Pancreas
LATERAL	Right Colic Flexure aka hepatic flexure



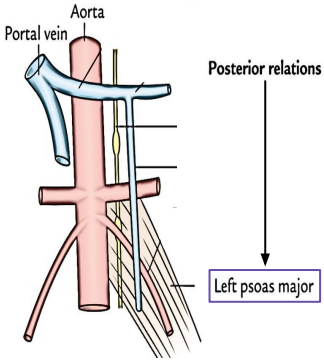
3 Relations of 3rd part

ANTERIOR	a) Small intestine b) Superior mesenteric vessels
POSTERIOR	1) Right psoas major 2) Inferior vena cava 3) Abdominal aorta 4) Inferior mesenteric vessels



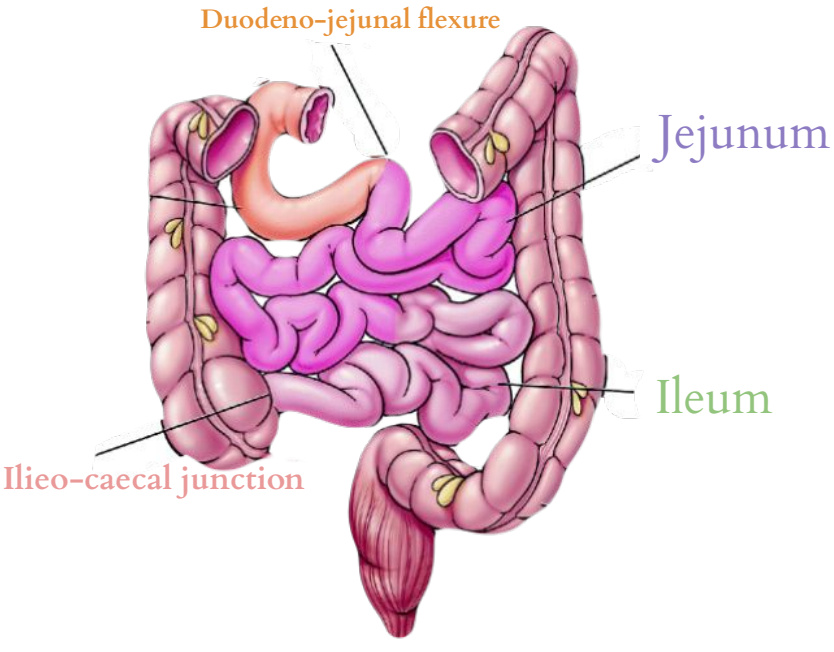
4 Relations of 4th part

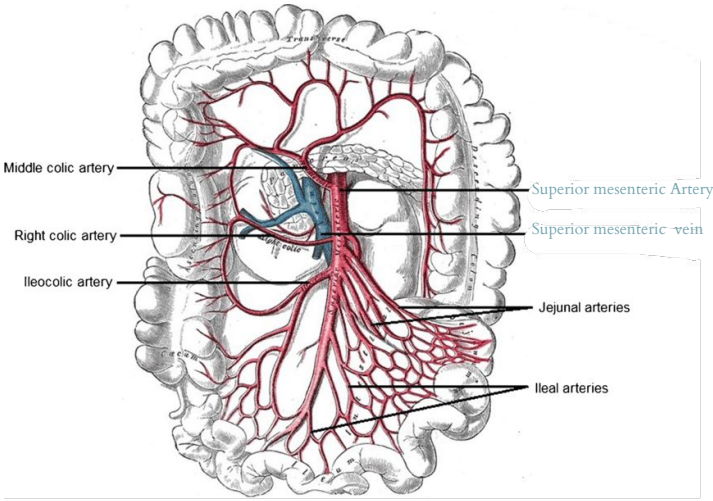
ANTERIOR	Small intestine
POSTERIOR	Left psoas major



Jejunum & Ileum

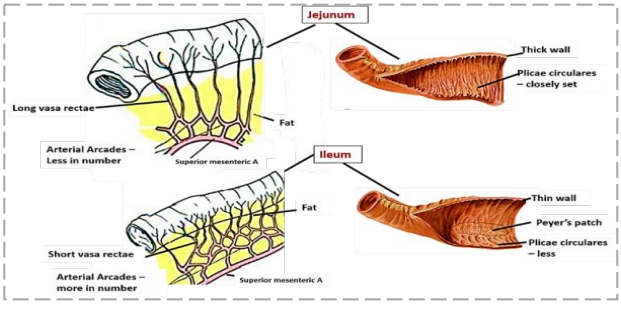
Shape	Coiled tube
Length	6 meters (20 feet)
Beginning	Duodeno-jejunal flexure
Termination	Ilieo-caecal junction
Peritoneal fold	mesentery of small intestine
Embryological origin	Midgut
Blood supply	Superior mesenteric A & V
Lymphatic drainage	Superior mesenteric lymph nodes

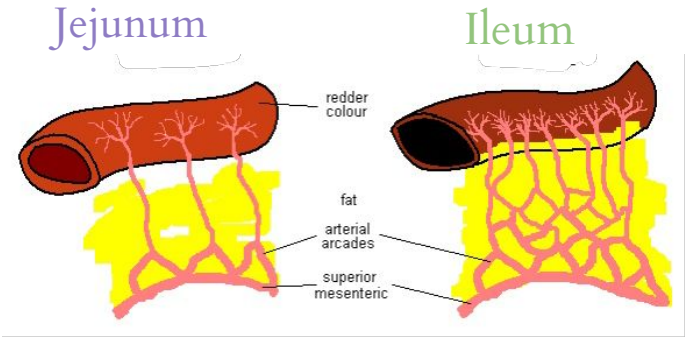




Differences between Jejunum and Ileum

	Jejunum	Ileum
Length	Shorter (proximal 2/5) of SI	Longer (distal 3/5) of SI
Diameter	Wider	Narrower
Wall	Thicker (more plicae circulares)	Thinner (less plicae circulares)
Appearance	Dark red (more vascular)	Light red (less vascular)
Vessels	High & Less arcades (long terminal branches)	Low & More arcades (short terminal branches
Mesenteric fat	Small amount & away from intestinal border	Large amount & close to intestinal border
Lymphoid tissue	Few aggregations	Numerous aggregations (Peyer's patches)





MCQs

Q1. Which one of the following is anterior to the third part of duodenum? Male Slides			
A. Superior mesenteric vessels	**B.** Right kidney	**C.** Right psoas major muscle	**D.** Abdominal aorta
Q2. Which one of the following structures could be injured in case of perforated duodenal ulcer? Male Slides			
A. Right kidney	**B.** Right colic flexure	**C.** Gastroduodenal artery	**D.** Inferior mesenteric vessels
Q3. Blood supply to the duodenum comes from?			
A. Coeliac artery	**B.** Superior mesenteric artery	**C.** Inferior mesenteric artery	**D.** A&B
Q4. Which part of duodenum is descending?			
A. 1st part	**B.** 2nd part	**C.** 3rd part	**D.** 4th part
Q5. The wall of the Jejunum is …….. in comparison with the wall of the ileum			
A. Thinner	**B.** Thicker	**C.** Equal	**D.** None
Q6. The medial relation of the second part is:			
A. Liver	**B.** Small intestine	**C.** Pancreas	**D.** None

A1. A A2. C A3. D A4. B A5. B A6. C

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