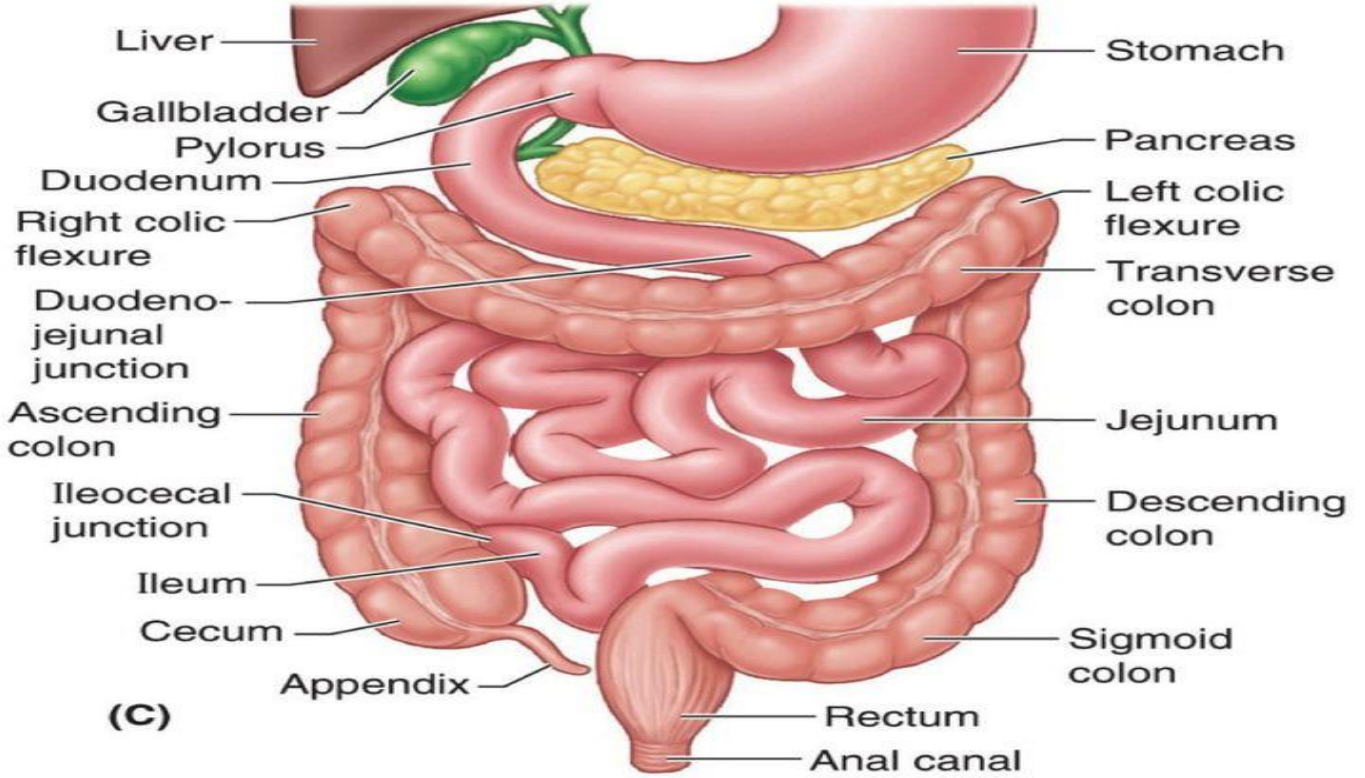
THE SMALL INTESTINE

By Karishma Basir

introduction

- the small intestine is the longest part of alimentary canal.
- It extends from the pylorus of the stomach to the ileocecal junction.
- The greater part of digestion and absorption takes place in the small intestine.



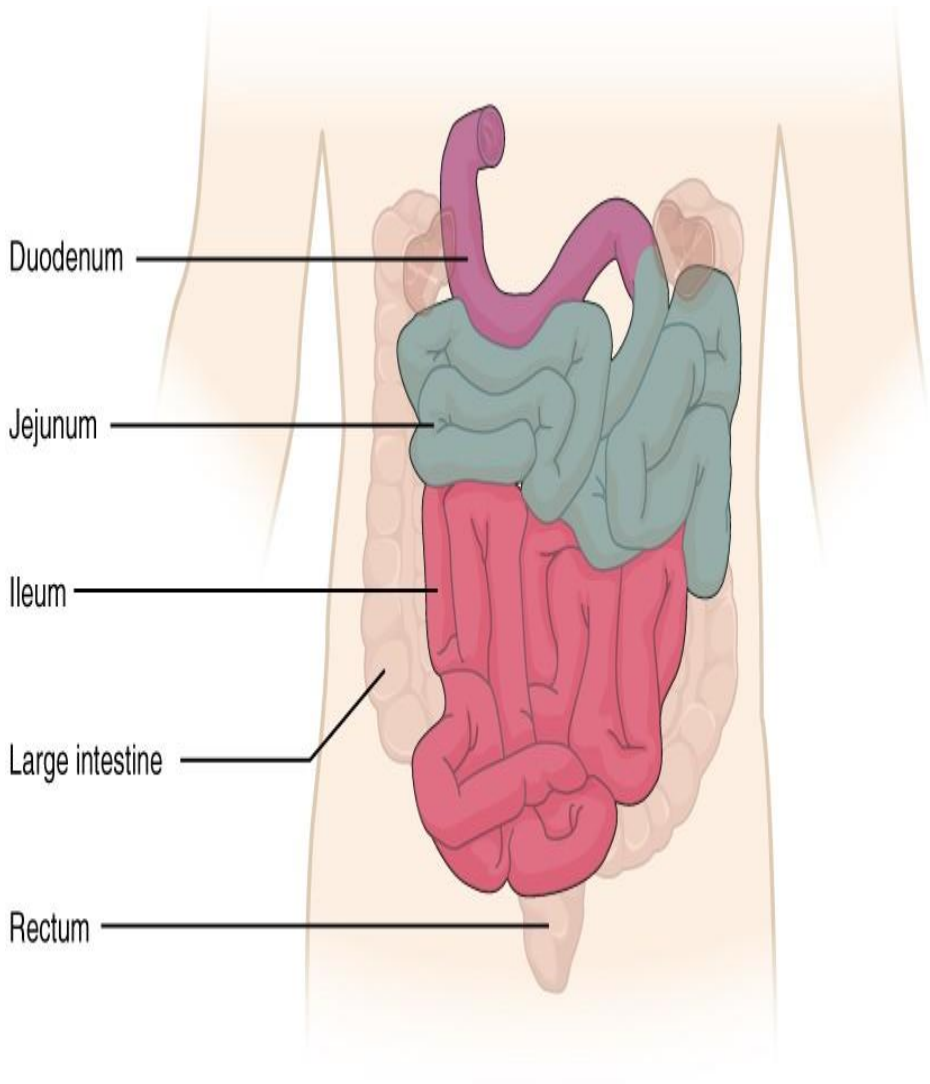
PARTS OF SMALL INTESTINE

- The small intestine is divided into 3 parts;

1.Duodenum

2.Jejunum

3.ileum



DUODENUM

- C shaped tube.
- 10 inches[25cm] long.
- It joins the stomach to the jejunum.
- It curves around the head of the pancreas.
- The proximal part of duodenum [2.5cm] resembles the stomach in that it is covered on the anterior and posterior surfaces with peritoneum; so this part is intraperitoneal.
- The remainder of the duodenum is retroperitoneal being partially covered by peritoneum.

Parts of the duodenum;

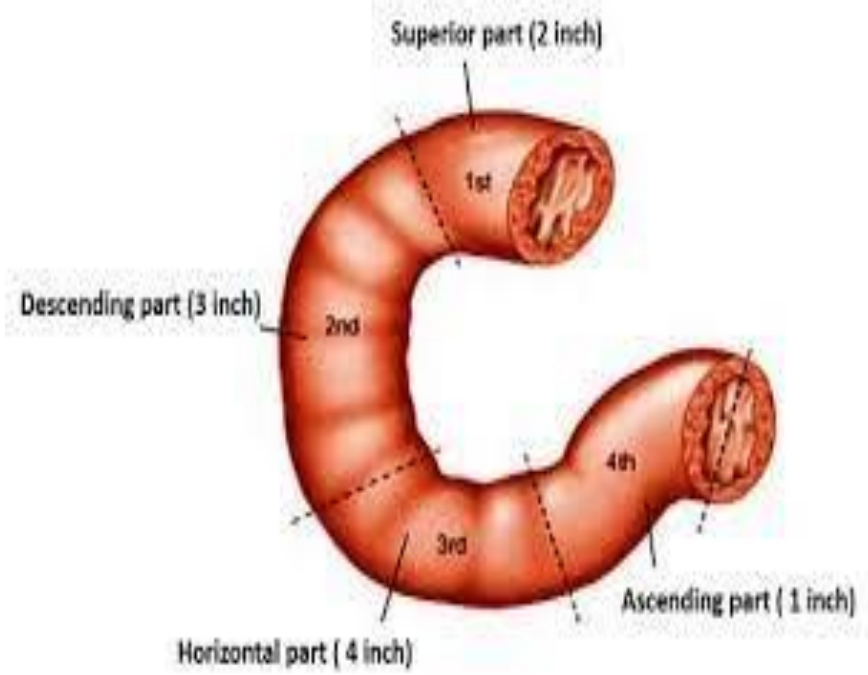
- There are four parts of the duodenum;

1.First part [superior part]

2.Second part [descending part]

3.Third part [horizontal part]

4.Fourth part [ascending part]



FIRST PART OF DUODENUM

- The first part of duodenum extend from pylorus upto the superior duodenal flexure. When it begins from pylorus it runs upward and backward on the transpyloric plane at the level of first lumber vertebrae.
- RELATIONS;

1.anteriorly; quadrate lobe of liver and gall bladder

2.posteriorly; gastrodudenal artery[branch of common hepatic artery]

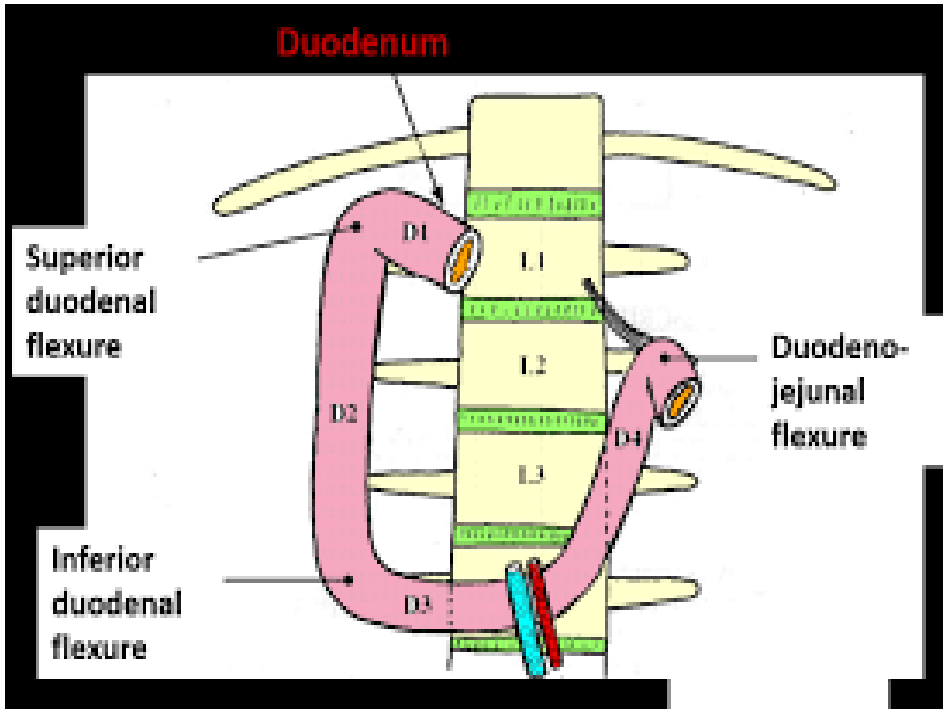
the bile duct

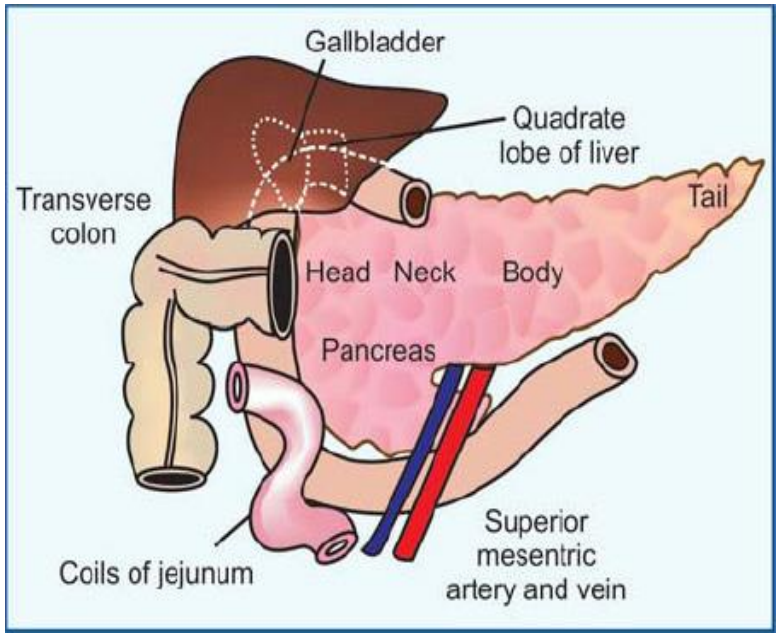
portal vein

inferior vena cava

Superiorly;epiploic foraman

Inferiorly;head of pancreas





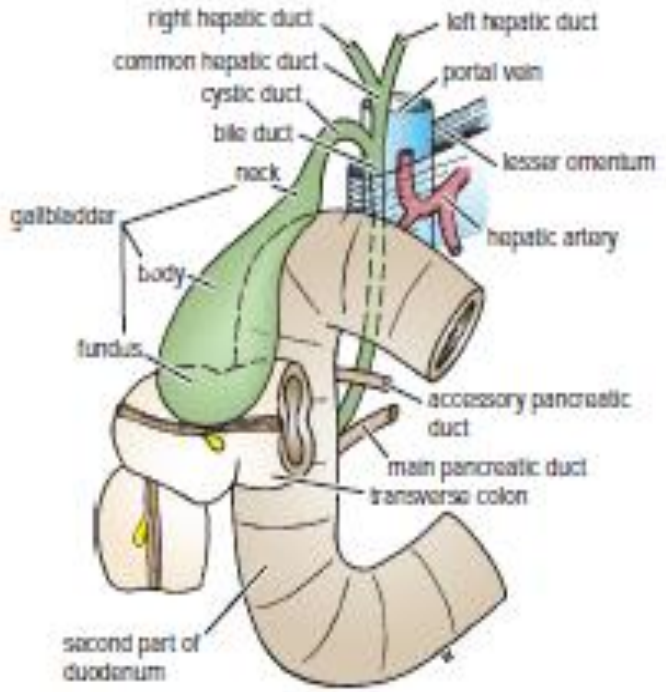
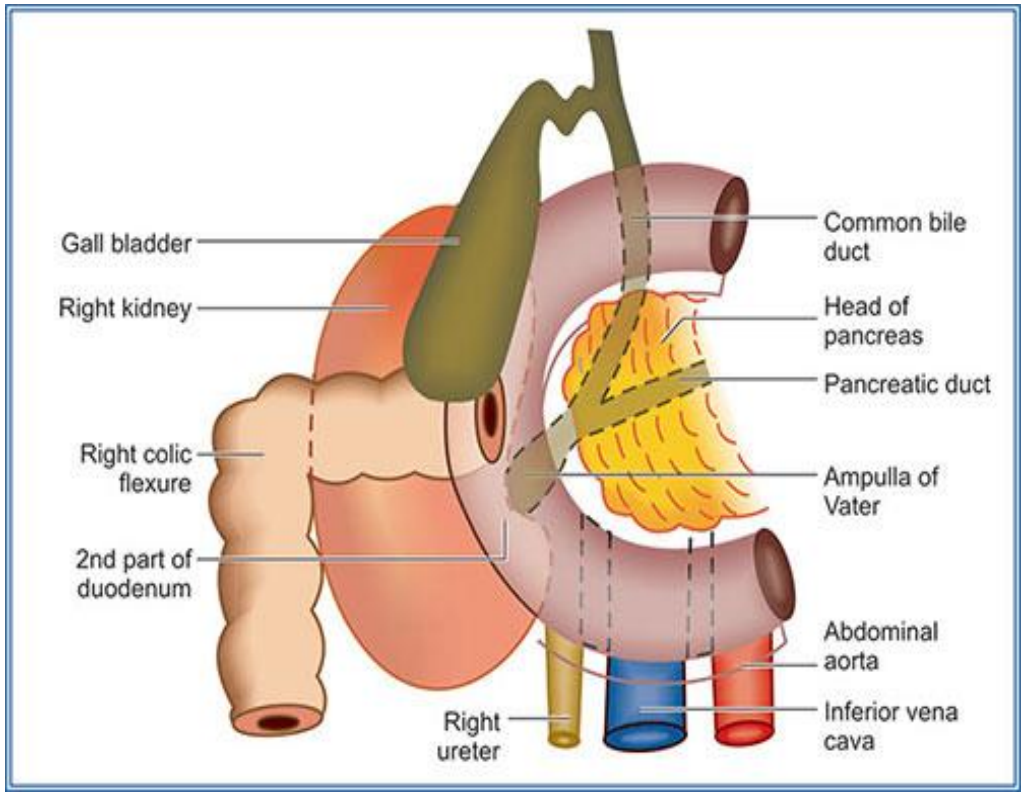


FIGURE 5.29 The bile ducts and the gallbladder. Note the relation of the gallbladder to the transverse colon and the duodenum.



SECOND PART OF DUODENUM

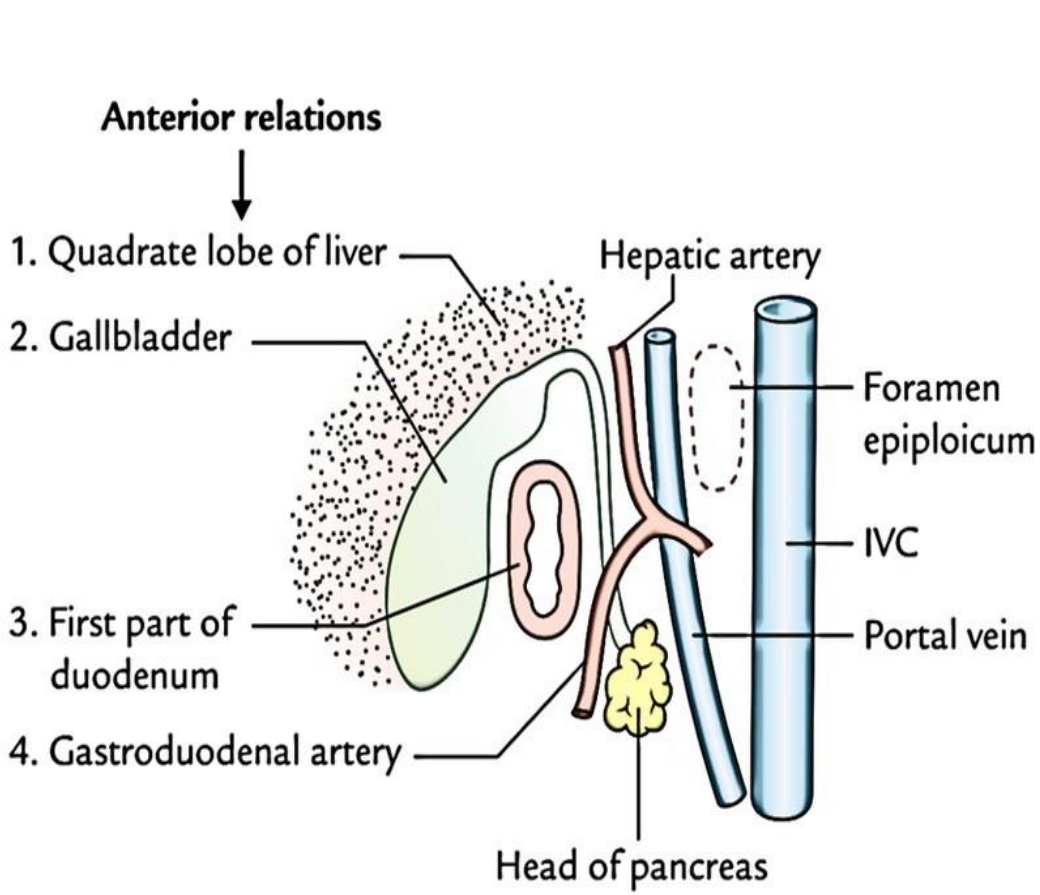
- This part extend from superior duodenal flexure to inferior duodenal flexure.
- Relations

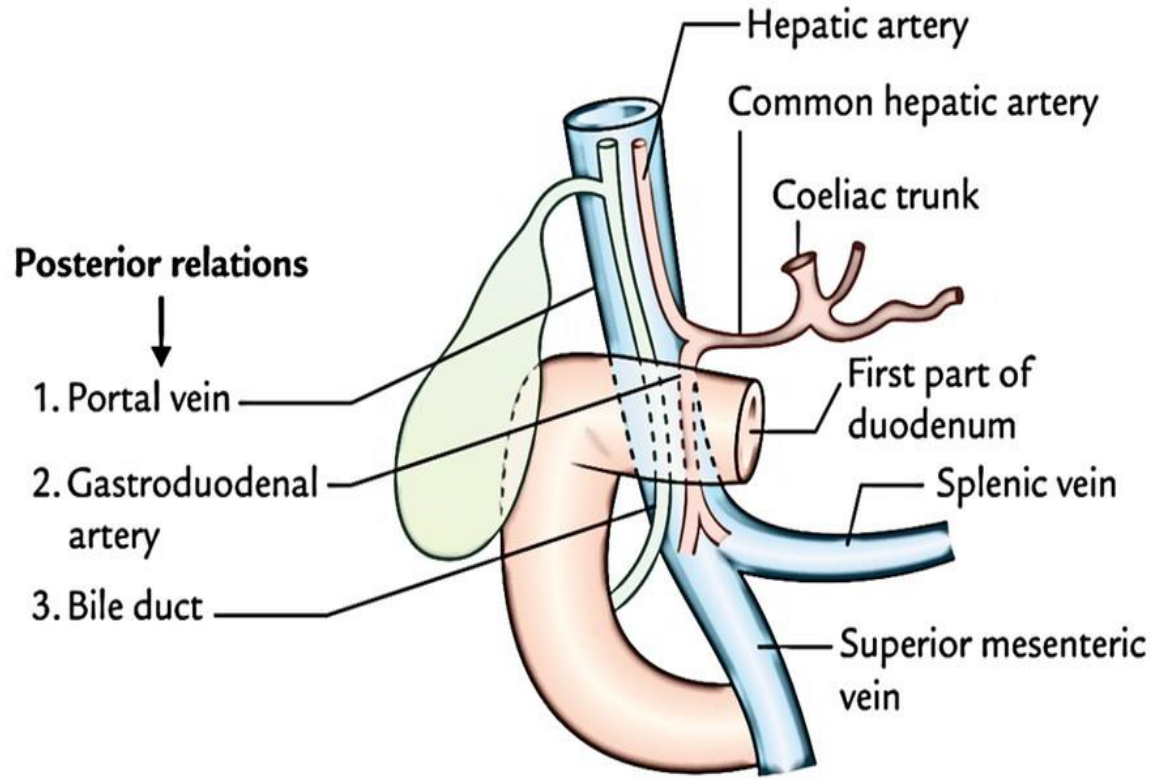
Anteriorly; fundus of the gall bladder ,right lobe of liver , transverse colon

Posteriorly;hilum of right kidney and right ureter

Laterally;ascending colon ,right lobe of liver

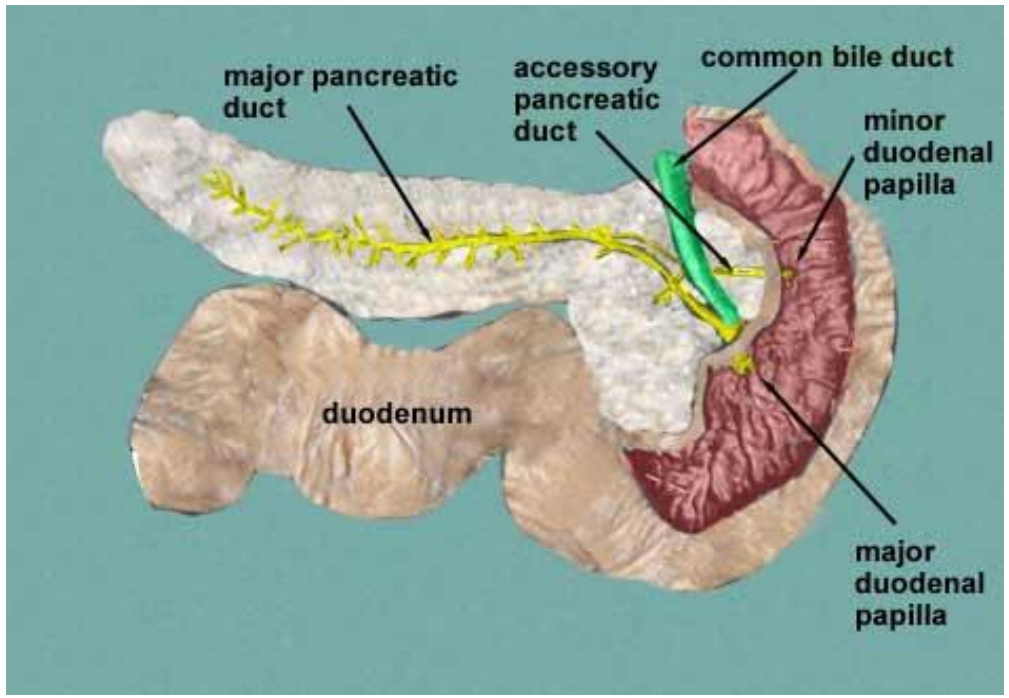
Medially; head of pancreas,bile duct and main pancreatic duct


Anterior relations
1. Quadrate lobe of liver
2. Gallbladder
3. First part of duodenum
4. Gastroduodenal artery
Hepatic artery
Foramen epiploicum
IVC
Portal vein
Head of pancreas


Posterior relations
1. Portal vein
2. Gastroduodenal artery
3. Bile duct
Hepatic artery
Common hepatic artery
Coeliac trunk
First part of duodenum
Splenic vein
Superior mesenteric vein

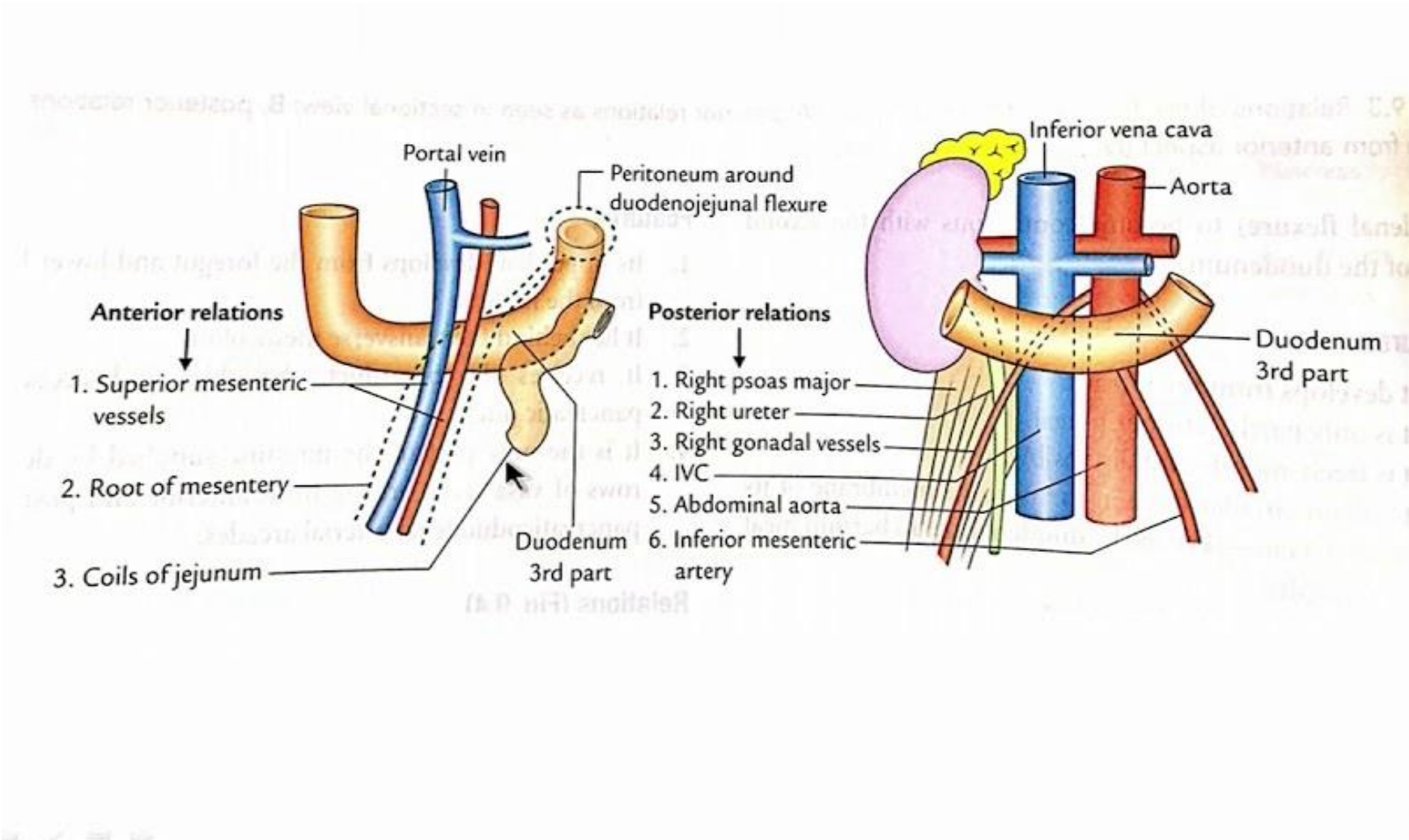
PAPILLA OF SECOND PART

- Major duodenal papilla; main pancreatic duct and bile duct combine to form ampulla that opens on the summit of major duodenal papilla.
- Minor duodenal papilla; the accessory pancratic duct if present enters the minor duodenal papilla.



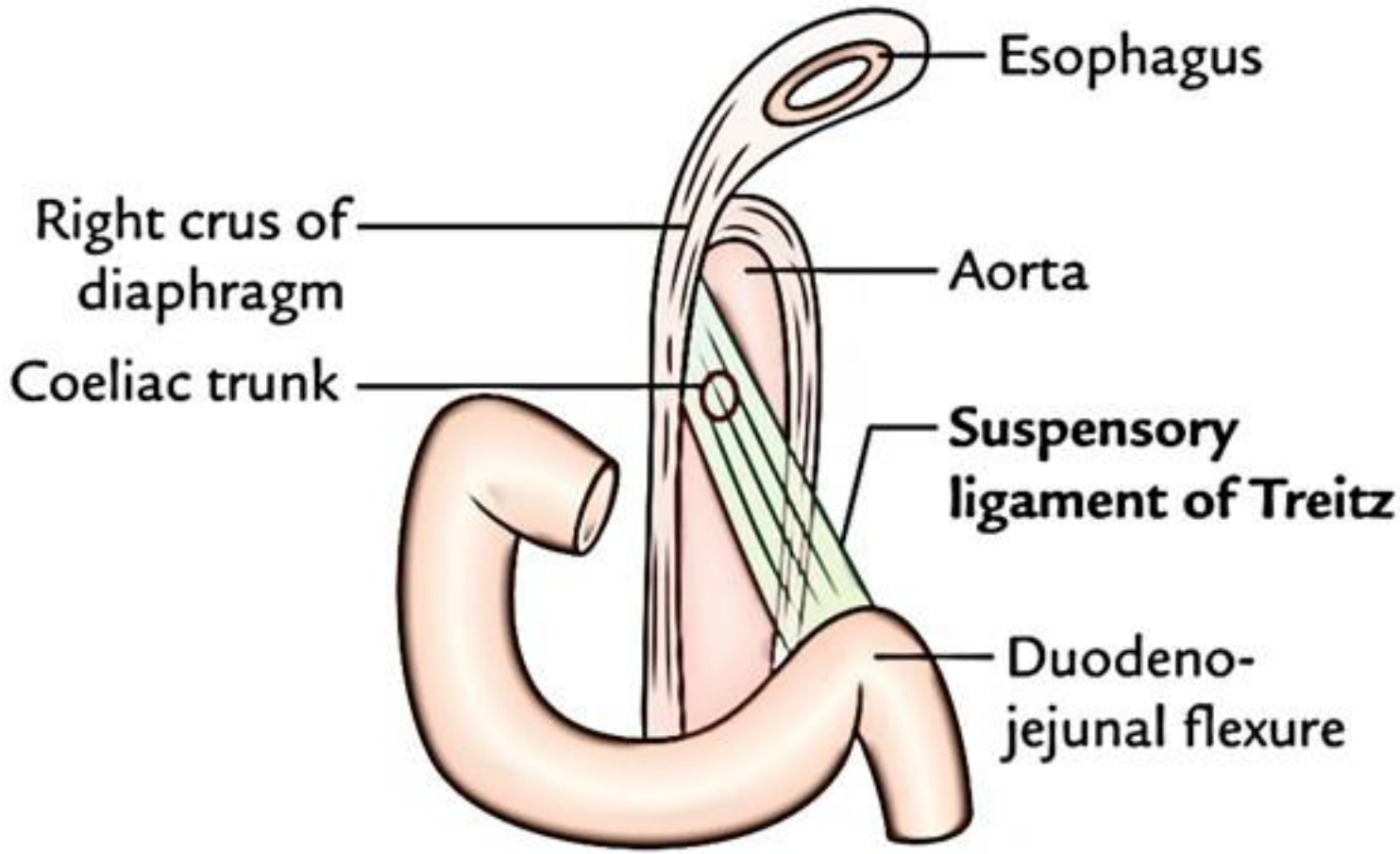
THIRD PART OF DUODENUM

- Begins at inferior duodenal flexure and passes to the left crossing the vertebral column
- Relations;
- Anteriorly; 1.superior mesenteric vessels [superior mesenteric artery a branch of abdominal aorta and superior mesenteric vein which combines with splenic vein to form portal vein] 2.root of mesentery
- posteriorly; right ureter ,right psoas muscle,inferior vena caca ,aorta
- superiorly; head of pancreas
- Inferiorly; coils of jejunum


Portal vein
Peritoneum around duodenojejunal flexure
Anterior relations
1. Superior mesenteric vessels
2. Root of mesentery
3. Coils of jejunum
Duodenum 3rd part
Inferior vena cava
Aorta
Duodenum 3rd part
Posterior relations
1. Right psoas major
2. Right ureter
3. Right gonadal vessels
4. IVC
5. Abdominal aorta
6. Inferior mesenteric artery

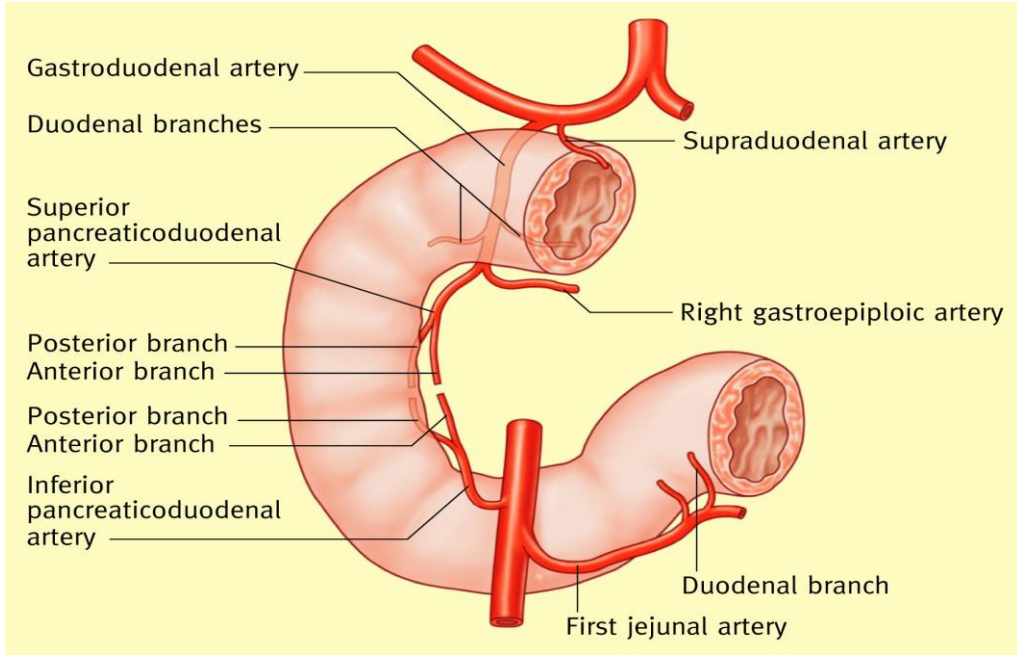
FOURTH PART OF DUODENUM

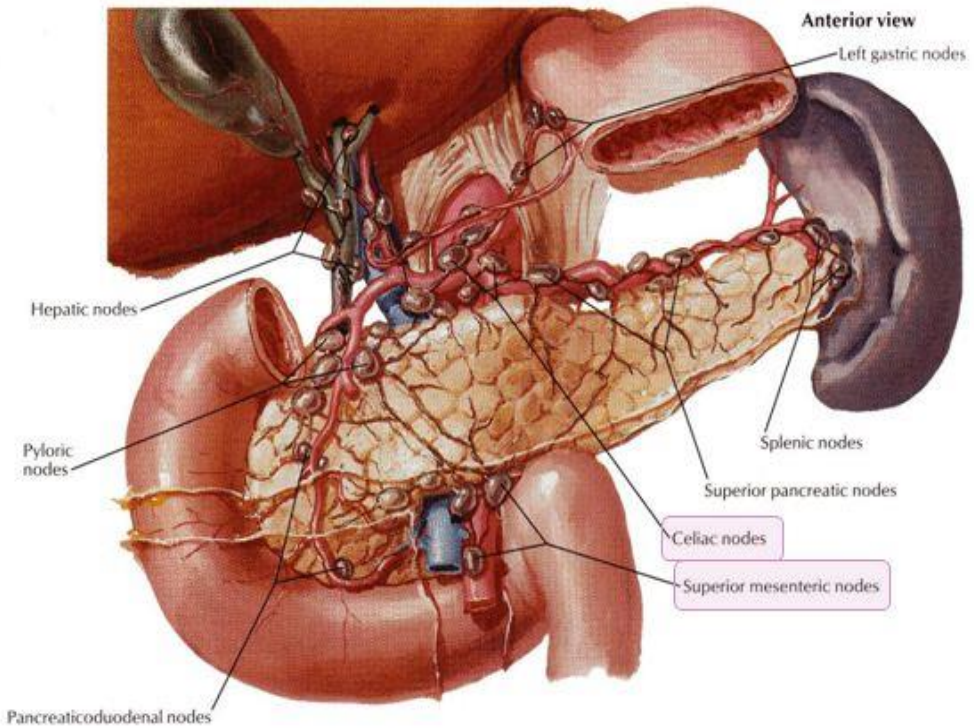
- The fourth part of duodenum runs upward and to the left of duodenojejunal flexure
- Suspensory ligament of duodenum[ligament of treitz] held this flexure in position
- this ligament is attached to the right crus of diaphragm
- Relations;
- Anteriorly; beginning of root of mesentery and coils of jejunum
- Posteriorly; left margin of aorta ,medial border of psoas major muscle


Esophagus
Right crus of diaphragm
Aorta
Coeliac trunk
Suspensory ligament of Treitz
Duodeno-jejunal flexure

BLOOD SUPPLY OF DUEDENUM

- Superior pancreaticoduodenal artery ; a branch of gastrodudenal artery supplies the upper half.
- Inferior pancreaticodudenal artery; a branch of superior mesenteric aretery supplies the lower half.
- Superior pancreaticodudenal vein ; drains into the portal vein.
- Inferior pancreaticodudenal vein ; drains into superior mesenteric vein.


Gastroduodenal artery
Duodenal branches
Supraduodenal artery
Superior pancreaticoduodenal artery
Right gastroepiploic artery
Posterior branch
Anterior branch
Posterior branch
Anterior branch
Inferior pancreaticoduodenal artery
Duodenal branch
First jejunal artery



The duodenum

The duodenal lymph vessels follow the **arteries** and drain:

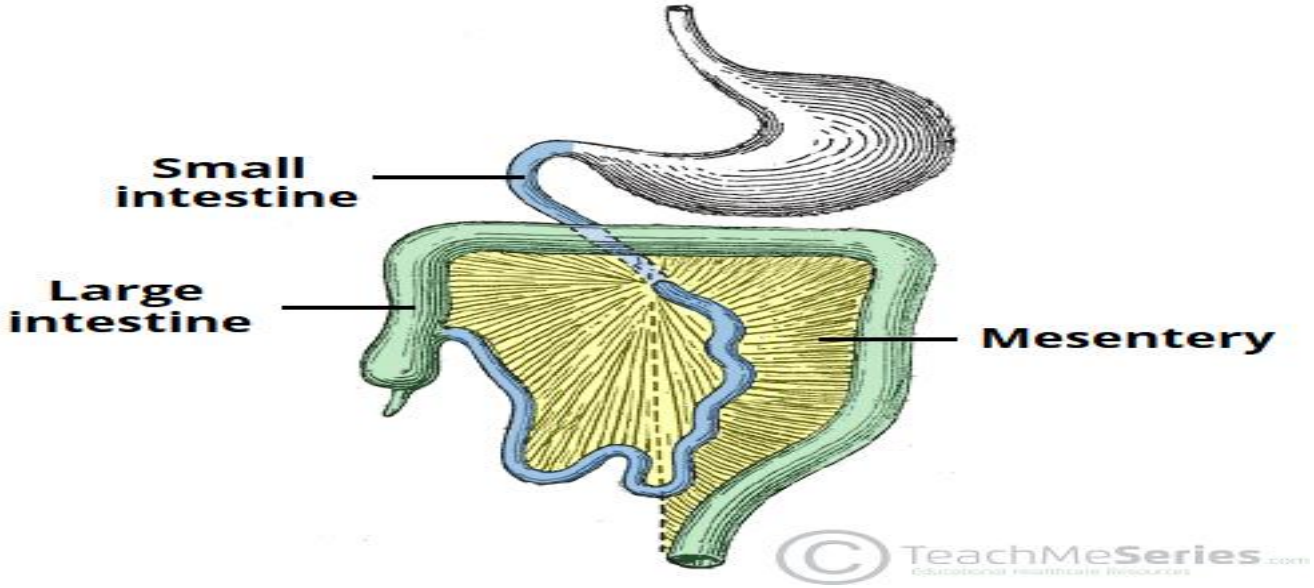
- **Upward** via pancreaticoduodenal nodes to the gastroduodenal nodes and then to the *celiac nodes*.
- **Downward** via pancreaticoduodenal nodes to the superior mesenteric *nodes around the origin of the superior mesenteric artery*.

NERVE SUPPlY OF DUODENUM

- Sympathetic and parasympathetic nerves derived from celiac and superior mesenteric plexus supply the duodenum

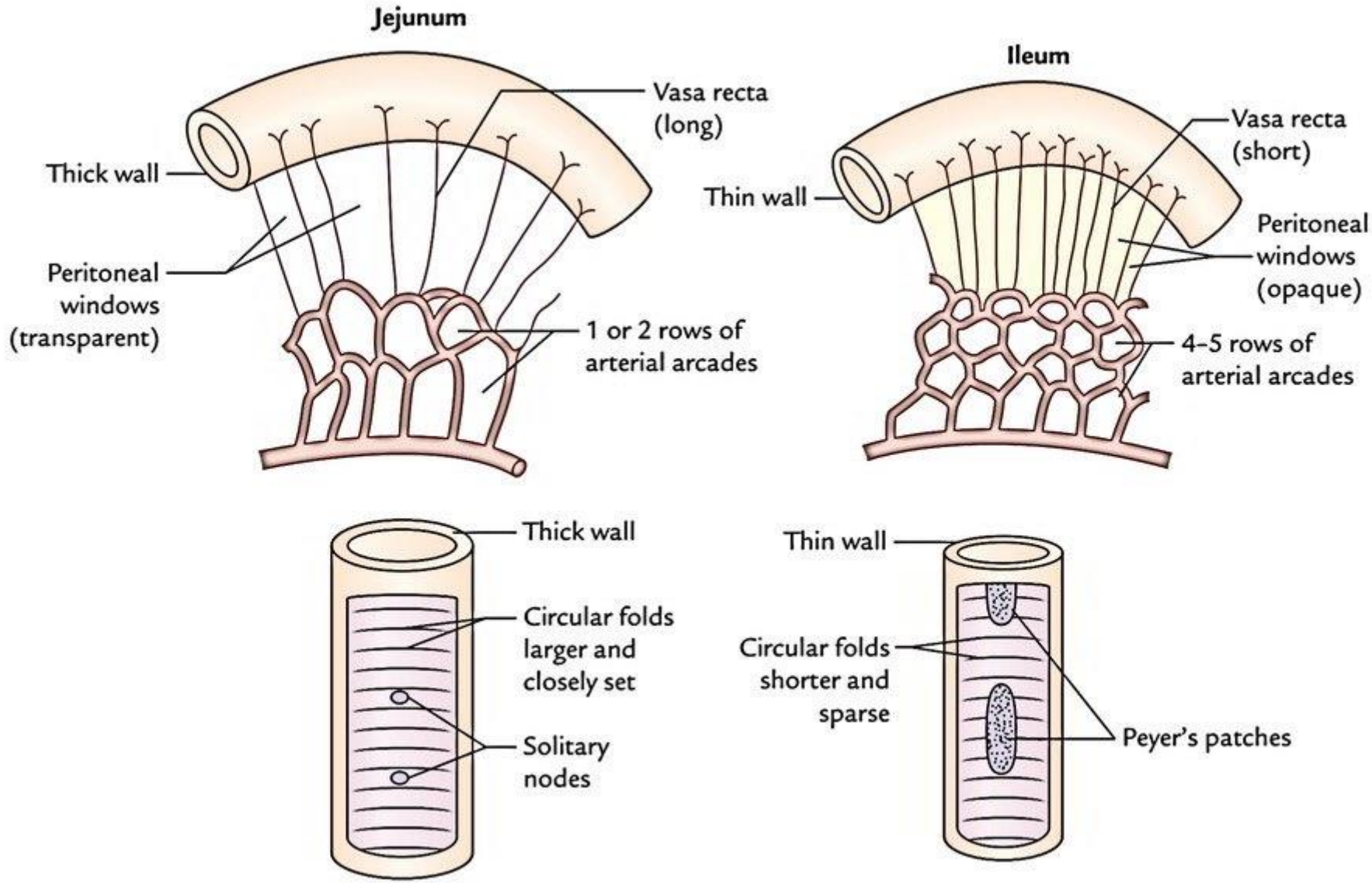
JEJUNUM AND ILEUM

- The jejunum and ileum together measure about 20 ft [6m]..
- The jejunum begins at duodenojejunal flexure.
- The ileum ends at the ileocecal junction.
- The jejunum and ileum are freely mobile and attached with posterior abdominal wall by mesentery of small intestine.
- The root of mesentery transmit the enterance and exit of branches of superior mesenteric vessels ,nerves and lymp vessels.



DIFFERENCES BETWEEN JEJUNUM & ILEUM

S.No		Jejunum	Ileum
1.	**Location**	Upper part of the peritoneal cavity	Lower part of the peritoneal cavity
2.	**General appearance**	Wider , thicker walled and reddish	Narrower, thin walled and paler
3.	**Attachment of mesentery**	To the posterior abdominal wall above and to the left of the aorta	Below and to the right of the aorta.
4.	**Arterial arcades**	Only one or two arcades / vasa recta is long	Three or four or even more arcades/vasa recta is short
5.	**Translucent windows**	Translucent windows are clearly seen (less fat)	Translucent windows are not clearly seen (more fat)
6.	**Interior**	a. Plicae circularis – larger & more numerous b. Villi-longer and more numerous. c. Payer's patches -absent	A.Plicae circularis – smaller & less numerous B. Shorter and less numerous C. Payer's patches -present


Jejunum
Vasa recta (long)
Thick wall
Peritoneal windows (transparent)
1 or 2 rows of arterial arcades
Ileum
Vasa recta (short)
Thin wall
Peritoneal windows (opaque)
4–5 rows of arterial arcades
Thick wall
Circular folds larger and closely set
Solitary nodes
Thin wall
Circular folds shorter and sparse
Peyer's patches

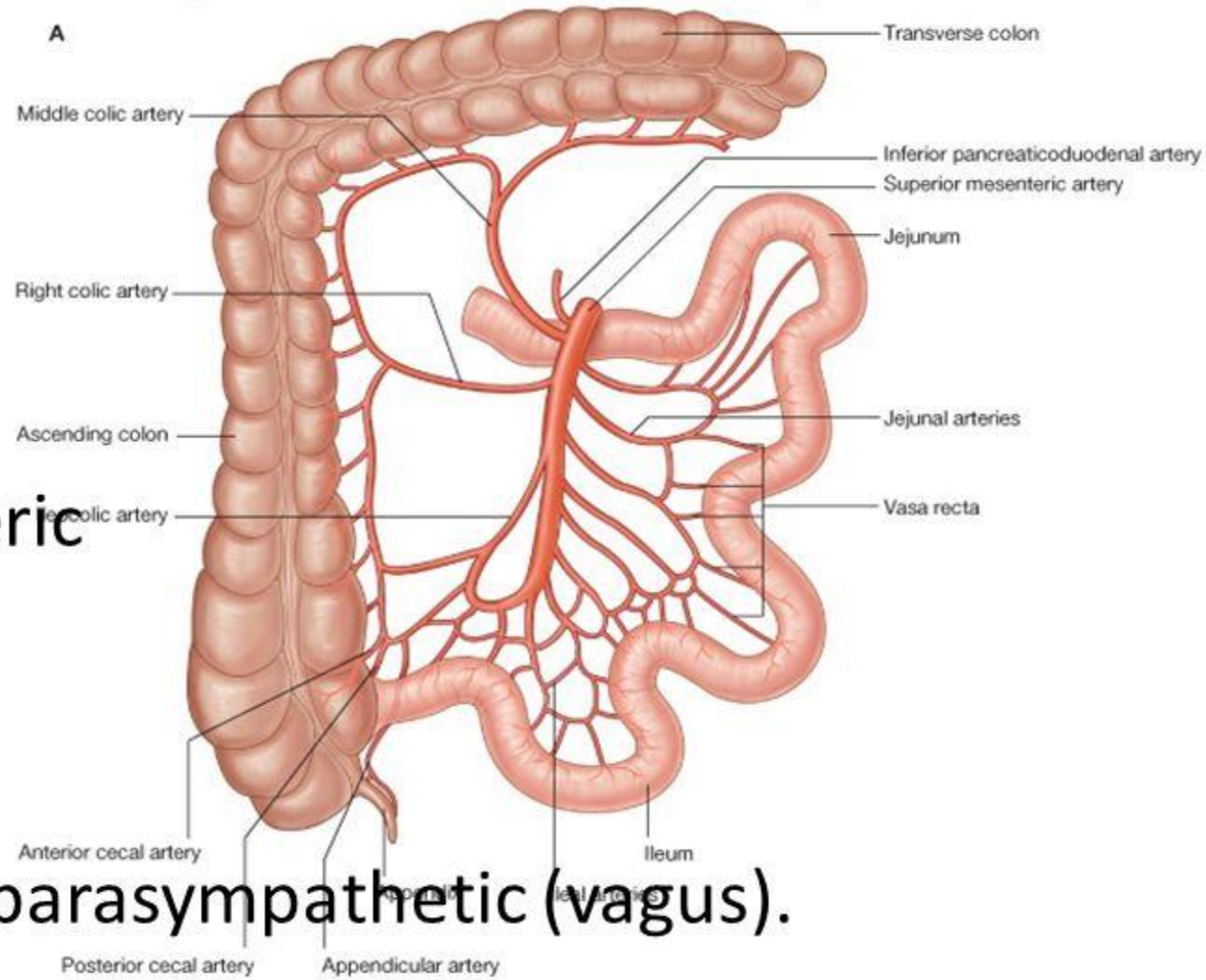
Blood Supply

Arteries: Superior mesenteric artery. Lowest part of ileum is also supplied by the ileocolic artery.

Veins: Superior mesenteric vein.

Lymph Drainage: Superior mesenteric nodes.

Nerve Supply: sympathetic and parasympathetic (vagus).




Thank You