Checklist GI Lab 1:
1- mandible/ palate/ salivary glands
2- tongue/pharynx
3- inguinal canal/ superficial & deep inguinal rings Tongue
Foramen cecum
Sulcus terminalis
Median sulcus
Circumvallate papilla
Glossoepiglottic folds
Palatopharyngeal & palatoglossal arches Lingual tonsils & palatine tonsils
Intrinsic and extrinsic muscles of the tongue
Hypoglossal nerve
Palate
Hard palate:
Form by 2 bones (maxillary & palatine)
Notice on the base of the skull: vomer/ choana/ stylomastoid foramen & foramen ovale
Incisive foramen
Lesser and greater palatine foramen
Soft palate: determine the muscles of soft palate
Pharynx:
Begins at the base of skull
Pharyngeal raphe
Muscles of pharynx
Interior of pharynx - 3 parts:
Nasopharynx (This lies above the soft palate and behind the nasal cavities / pharyngeal tonsil, The salpingopharyngeal fold)

Identify the structures that
pass between hyoglossus
and mylohyoid muscle?

Identify nerves and
vessels that pass through
the foramina

1. Deep part of submandibular gland
2. Submandibular duct
3. Submandibular ganglion
4.lingual nerve
5.Hypoglossal nerve

7

Oropharynx (This lies behind the oral cavity, The floor is formed by the posterior one third of the tongue and the interval between the tongue and epiglottis / median and lateral glossoepiglottic fold / vallecula) Laryngeopharynx (This lies behind the opening into the larynx/ Piriform fossa (important)
- A depression, antero-lateral to laryngopharynx
- Foreign bodies such as fish bones are lodged into

Salivary glands:
Parotid gland:
Position
Notice the fascial nerve branches
Contents of gland
Parotid duct
Relations and innervation
Submandibular gland:
Divided into superficial & deep lobe by the mylohyoid muscle Relations and innervation
Sublingual gland:
Located under the tongue
Relations and innervation
Mandible:
Ramus, body, angle of mandible
2 processes: chondylar & coronoid process Mandibular foramen, Mandibular notch Mylohyoid groove
Mental foramen
Digastric fossa

Identify and determine the nerves
and vessels that are related directly to the mandible

Inguinal canal
Aponeurosis from the external oblique muscle form:
1- Inguinal ligament (between ASIS and the pubic tubercle)
2-superficial inguinal ring (above and medial to pubic tubercle)
3-lacunar ligament (pass backward and upward to pectineal line)
4- pectineal ligament (continuation of lacunar ligament at pectineal line)

Aponeurosis of internal oblique muscle
1- Conjoint tendon (aponeurosis of internal oblique + transversus abdominis)
2- Cremasteric fascia
Inguinal canal:
4 cm long
Extend from deep inguinal ring, downward and medially to superficial inguinal ring Lies above inguinal ligament
Deep inguinal ring: oval opening in fascia transversalis
On its edge. Give attachment to internal spermatic fascia
Position: ½ inch above inguinal ligament (between ASIS and pubic symphysis) Superficial inguinal ring
Triangular defect in external muscle aponeurosis
On its edge, give attachment for external spermatic fascia
Boundaries:
Anterior wall: external oblique aponeurosis
Posterior wall: fascia transversalis
Floor: inguinal ligament and on its medial side the lacunar ligament
Roof: arching lower fibers from internal oblique and transversus abdominis muscles Contents:

1- Spermatic cord and its content in males
2- Round ligament in females
3- Genital branch of genitofemoral nerve
4- Ilioinguinal nerve (enter the canal through posterior wall)

Checklist GI Lab 2
1- Esophagus, stomach
2- Duodenum, pancreas
3- Small intestine

Esophagus:
>The esophagus is a tubular structure about 10 in. (25 cm) long that joins the pharynx to the stomach.
>Enter the abdomen through esophageal opening (level of T10) in the right crus of diaphragm. >has thoracic part and abdominal part
>Relations of thoracic part:
Anteriorly: trachea, left recurrent laryngeal n., left bronchus, pericardium
Posteriorly: thoracic vertebra, thoracic duct, azygous vein, Rt posterior intercostal arteries, descending thoracic aorta
Right side: The right mediastinal pleura and the terminal part of the azygos vein
Left side: The left subclavian artery, the aortic arch, the thoracic duct, and the left mediastinal pleura and lung.
>Relations of abdominal part:
1-Anteriorly: left lobe of the liver & left vagus nerve
2-Posteriorly: left crus of the diaphragm & right vagus nerve
>blood supply of esophagus:

>Innervation:

The esophagus is supplied by parasympathetic and sympathetic efferent and afferent fibers via the vagi and sympathetic trunks.

Notice the gastroesophageal sphincter
Notice the esophageal constrictions

Stomach
>The stomach is a dilated part of the alimentary canal.
>Between the esophagus and the small intestine.
>It occupies the left upper quadrant mainly in the epigastric region.
>Shape of the stomach:
It is roughly J-shaped especially in thin person BUT Steer horn in obese person, and it has: 1-Two openings, the cardiac and pyloric orifices
2-Two curvatures, the greater and lesser curvatures
3-Two surfaces, an anterior and a posterior surface
>folds of mucosa-RUGAE-
>incisura angularis
>parts of the stomach:
1-fundus 2-body 3-pyloric antrum 4- pylorus

Rvgae

it

>epiploic foramen (foramen of winslow):
is a small vertical passage between the greater sac and the lesser sac, allowing communication between these two spaces.
Boundaries
anterior: the free edge of the lesser omentum (hepatoduodenal ligament) which contains the common bile duct, hepatic artery proper, and portal vein between its two layers
posterior: peritoneum covering the inferior vena cava

>relations of stomach

>Blood supply: branches of celiac trunk (left gastric artery, right gastric artery, short gastric artery, left and right gastroepiploic arteries)
>veins: drain into portal circulation
>lymphatic drainage: gastroepiploic nodes + short gastric nodes>> celiac nodes
>Nerve supply: anterior and posterior vagal trunk

Duodenum
>The duodenum is C shaped tube, is about 25cm (10 inches) and is retroperitoneal except the first and last inches.
>Curves around the head of pancreas
>It is important because it receives the opening of the bile and pancreatic ducts.

>The common bile duct and the pancreatic duct have the same opening in the
duodenum. When they meet, they form a bulge in the duodenal wall called ampulla
of vater.
> Around it is a sphincter called sphincter of Oddi (a smooth muscle).
>We call the opening from inside the major duodenal papilla, sometimes there is another opening 1 inch above the major papilla for accessory pancreatic ducts called minor duodenal papilla.
> The duodenum is situated in the epigastric and umbilical regions.

Parts of duodenum and relations:
First part of duodenum (2inches)
>The first part begins from the pyloduodenal junction. At the level of the transpyloric line.
>Runs upward and backward at the level of the 1 st lumbar vertebra 1 inch to the right.
Relations of the first part:
- Anteriorly: The liver (quadratus lobe), The gall bladder
- Superiorly: The epiploic foramen
- Posteriorly: The lesser sac, the bile duct, the portal vein, Inferior vena cava gastroduodenal Artery (if there is a peptic ulcer on the posterior wall of the 1st inch perforation and infiltration may occur along with bleeding from this artery)
- Inferiorly: The head of the pancreas

Second part of duodenum (3inches)
Importance of the 2nd part: it receives the common bile and pancreatic ducts.
Relations of the second part:
- Anteriorly: The gallbladder (fundus), the right lobe of the liver, the transverse colon, the coils of small
intestine

- Posteriorly: Hilum of the right kidney, the right ureter
- Laterally: Right colic flexure, ascending colon, right lobe of the liver
- Medially: Head of the pancreas, Bile and pancreatic ducts

Third Part of the Duodenum(4inches)
Runs horizontally to the left, in front of the vertebral column. On the subcostal plane.
Relations of the third part:
- Anteriorly: The root of the mesentery of the small intestine, the superior mesenteric vessels
contained within the mesentery coils of the jejunum
- Posteriorly: The right ureter, the right psoas muscle, the inferior vena cava, the aorta
- Superiorly: The head of pancreas
- Inferiorly: Coils of jejunum

forth Part of the Duodenum (1inch)
>Runs upward to the left
>Ends in the duodenojejunal junction at the level of the 2nd lumbar vertebrae 1 inch to the left.
>The junction (flexure) is held in position by the ligament of Treitz, which is attached
to the right crus of the diaphragm (duodenal recess).
Relations of the fourth part:
- Anteriorly: The beginning of the root of the mesentery, Coils of the jejunum
- Posteriorly: Left psoas major muscle, The sympathetic chain on the left margin of the aorta
- Superiorly: Uncinate process of the pancreas

>Blood supply: upper half>>> superior pancreaticoduodenal artery
Lower half>>>inferior pancreaticoduodenal artery
>venous drainage: upper half>>> portal vein
Lower half>>> superior mesenteric vein
>Lymphatic drainage: via pancreaticoduodenal nodes>>> gastroduodenal node>> celiac nodes Pancreaticoduodenal nodes>>>superior mesenteric nodes

Pancreas
>The pancreas is both an exocrine and endocrine gland
>The pancreas is an elongated structure that lies in the epigastrium and the left upper quadrant. >The pancreas is divided into a head, neck, body, and tail
>apart of the head extends to the left behind the superior mesenteric vessels and is called the uncinate process.
>Relations
Anteriorly: From right to left: the transverse colon and the attachment of the transverse mesocolon, the lesser sac, and the stomach.
Posteriorly: From right to left: the bile duct, the portal and splenic veins, the inferior vena cava, the aorta, the origin of the superior mesenteric artery, the left psoas muscle, the left suprarenal gland, the left kidney, and the hilum of the spleen.
>Blood supply: The splenic and the superior and inferior pancreaticoduodenal arteries.

Small intestine
>divided into three parts: the duodenum, the jejunum, and the ileum.
>The jejunum and ileum measure about 20 ft (6 m) long
>The jejunum begins at the duodenojejunal flexure
>the ileum ends at the ileocecal junction.
• The coils of jejunum and ileum are freely mobile and are attached to the posterior abdominal wall by a fan shaped fold of peritoneum known as the mesentery of the small intestine

Legment of

Tere 2-

>Identify the root and content of the small intestine mesentery

>Blood supply: branches of superior mesenteric artery, ileocolic artery (the lowest part of ilium)

>veins: superior mesenteric vein

>Lymphatic drainage: superior mesenteric nodes

we have :

1-Superior mesenteric artery which forms arcades and vasa recta when reaching jejunum and ilium.
2-Superior mesenteric vein and its tributaries. 3-Nerves: sympathetic and

e

parasympathetic. 4-Fat which is more in mesentery of ilium.

Checklist GI Lab 3:

1- Liver & gallbladder
2- Spleen
3- Appendix, cecum
LIVER:
Present in the right hypochondriac region and epigastric region (leŌ lobe) and extend to leŌ hypochondrium.
Surrounding by the diaphragm anteriorly, above and posteriorly.
It has 5 surfaces: Anterior, posterior, superior, right & visceral.
Lobes of the liver
• Rt. Lobe
• Lt .lobe
• Quadrate lobe
• Caudate lobe
The following structures forming an “H shape”, divide the liver into the previously menƟoned 4 Lobes:
1. Right sagiƩal fossa - groove for inferior vena cava superiorly and gall bladder inferiorly
2. LeŌ sagiƩal fissure - contains the ligamentum venosum superiorly and round ligament of liver (lig. Teres) inferiorly
3. Transverse fissure (porta hepaƟs)
Peritoneum of the liver
▪ The liver is covered by peritoneum (intraperitoneal organ) except at bare area → so can
be considered “Interperitoneal”
Ligament s of the liver:
Falciform ligament:
Separate the right lobe from the leŌ lobe
AƩached to the anterior abdominal wall and to the diaphragm.
Divide the superior space above the diaphragm into right and leŌ subphrenic (the abscess reaches the right subphrenic space which is open into the right guƩer).
Free border of the ligament contains Ligamentum teres (obliterated umbilical vein)

Coronary ligament:
the area between upper and lower layer of the coronary ligament is the bare area of liver which contract with the diaphragm to the bare area.
Give arise to the right and leŌ triangular ligaments at the sides of the liver.
Ligamentum venosum:
Between the caudate and leŌ lobes.
AƩached to lesser omentum.
IMPRESSIONS OF THE LIVER (important)

RelaƟon of the liver (important)
Anteriorly: Diaphragm, Rt & Lt pleura and lung, Costal carƟlage, Xiphoid process, Ant. abdominal wall Posterior: Diaphragm, Rt. Kidney, Supra renal gland, T.colon(hepaƟc flexure), Duodenum, Gall bladder, I.V.C, Esophagus, Fundus of stomach
Visceral surface: I.V.C, the esophagus, the stomach, the duodenum, the right colic flexure, the right kidney, Rt. Suprarenal gland, the gallbladder., Porta hepaƟc (bile duct,H.a.H.V), Fissure for lig. Venoosum & lesser omentum, Tubular omentum, Lig.teres
Superior surface: Diaphragm, cut edge of the falciform ligament, the leŌ and right triangular ligaments, The cut edges of the superior and inferior parts of the coronary ligament, I.V.C and the 3 hepaƟc veins (right, leŌ & middle) → passing through a groove
Right & leŌ liver lobes and the bare area of the liver can be seen from the superior view.
RelaƟons of Superior surface of liver:

• Diaphragm
• Pleura & lung
• Pericardium & heart

Porta hepaƟs:
It is the hilum of the liver
-t is found on the posteroinferior surface
- lies between the caudate and quadrate lobes
- Lesser omentum aƩaches to its margin Contents

- Gallbladder (ant.)
- HepaƟc. Art + nerve+ lymphaƟc node (middle).
- Portal vein (post.)

Blood supply of the liver:

The gallbladder
▪ It is a green muscular pear-shaped hollow organ
▪ Anatomical posiƟon of the gallbladder: In the Epigastric - Right hypochondrium region At the Ɵp of the 9th right costal carƟlage (the fundus).

IVC

On inferior surface of liver: Between quadrate and right lobes.
▪ Parts
• Fundus.
RelaƟons: anteriorly - anterior abdominal wall
postero inferiorly - transverse colon
• Body.
RelaƟons: superiorly - liver
postero inferiorly transverse colon, end of 1 st part of duodenum to beginning of 2nd part of duodenum
• Neck
- Forms the cysƟc duct which is 4cm long
- Body and neck are directed towards porta hepaƟs
• Hartmann’s Pouch: opposite to the neck of the gallbladder. It’s usually filled with
bile secreƟons but stasis of bile can occur resulƟng in gallstones (usually a single stone)
1. Lies between body and neck of gallbladder
2. A normal variaƟon
3. May obscure cysƟc duct
4. If very large, may see cysƟc duct arising from pouch
▪ It’s someƟmes completely covered by peritoneum and has short mesentery
(intraperitoneal). Other Ɵmes, it's just fixed from the anterior and sides to the liver and has a bare area (Interperitoneal)
▪ Major funcƟon: bile concentraƟon by increasing water absorpƟon so that the concentraƟon of bile increases 20 Ɵmes.

Blood supply of the gallbladder:
- CysƟc artery branch of right HepaƟc artery (from proper hepaƟc artery from common hepaƟc artery)
- CysƟc vein which ends in portal vein
- Small branches (arteries and veins run between liver and gall bladder)
Common bile duct
▪ Common bile duct is 7-10cm long (3 inches)
▪ Descends in the free edge of lesser omentum

▪ Blood supply: small arteries
a. Arise from cysƟc artery
b. Posterior branch of superior pancreaƟcoduodenal artery
▪ It can be divided into 3 parts: Supra-duodenal, retro-duodenal, retro-pancreaƟc.
SPLEEN
The spleen is completely covered with peritoneum (intraperitoneal organ)
• Two ligaments
1- the gastrosplenic omentum (ligament): (carrying the short gastric and leŌ gastroepiploic vessels) 2- splenicorenal ligament (carrying the splenic vessels and the tail of the pancreas)
It has two surfaces: 2 Surfaces (DiaphragmaƟc surface / Visceral surface)
1. DiaphragmaƟc surface: Has Post- lat.relaƟon, Convex, Smooth, Diaphragm separates it from - Pleura & lung – Ribs 9,10 ,11
The upper border is lobulated whereas the lower border is rounded.
2. Visceral surface: Has Ant- med. RelaƟons,
It is divided by a ridge into: anterior or gastric, A posterior or renal porƟon.

Spleen has two boarders: superior & inferior boarder
Two ends: medial & lateral end
Hilum of spleen
- Splenic . >>ant
- Splenic . v >>post
- Tail of pancreas
IMPRESSOINS OF THE SPLEEN:

- Renal (leŌ kidney), below the hilum

infra-
duodenal

A

-Gastric, above the hilum
-Colic (leŌ colic flexure)
- Pancreas, make impression on the hilum
*Related to the 9thn10th and 11th ribs and the tenth ribs is parallel to the spleen so when someone has an accident and hurt his ribs we will be afraid from splenic rupture and in case we find it we must do splenectomy (we can remove it since it’s a lymphoid Ɵssue).

Blood supply
• The large splenic artery is the largest branch of the celiac artery.
• It has a tortuous course
• It runs along the upper border of the pancreas
• The splenic artery then divides into about six branches, which enter the spleen at the hilum
Veins
- The splenic vein leaves the hilum and runs behind the tail and the body of the pancreas.
- Behind the neck of the pancreas, the splenic vein joins the superior mesenteric vein to form the portal
vein.

Appendix:
LocaƟon and DescripƟon: it is a narrow (with a very narrow lumen), muscular tube, containing
a large amount of lymphoid Ɵssue (it is considered as lymphaƟc Ɵssue)
Although it is a part of GI tract (mid gut), it has no role in digesƟon. It is involved in immunity.
Its length from 3 to 5 inches, another books state from 2 to 22cm; it may be very short or very long due to the variaƟon. (In infecƟon the size is increased due to edema and inflammaƟon)
It has base, apex and mesoappendix(mesentery):
-The base is aƩached to the posteromedial surface of the cecum about 1 in. (2.5 cm) below the ileocecal opening (juncƟon/valve)
-The remainder of the appendix is free.
It has a complete peritoneal covering (intraperitoneal organ), which is aƩached to the mesentery of the small intesƟne by a short mesentery of its own, the mesoappendix.
The mesoappendix contains the appendicular vessels, nerves, lymph nodes.

PosiƟon:
The appendix is part of the large intesƟne, lies in the right iliac fossa, and in relaƟon to the anterior abdominal wall, it may be found in different posiƟons, including:
1. Retrocecal: in retrocecal recess, behind cecum in 74% of people. (most common site).
2. Pelvic: in pelvis related to Rt. Ovary and uterine tube in 21% of people.
3. Subcecal: below cecum in 3.5% of people.
4. Preileal: infront of ileum in 1% of people.
5. PosƟleal: behind the ileum in 0.5% of people.
To determine the locaƟon of appendix in retrocecal fossa: by tracking the tenia coli to the base unƟl it converges around the appendix.
Surface anatomy of appendix – (McBurney's point):
McBurney's point: the point between the upper 2 thirds and the lower third of the line joining the right anterior superior iliac spine to the umbilicus, where the base of the appendix is situated.
Blood Supply of appendix:
Arteries:
-The appendicular artery (A branch from posterior cecal artery (ilio-cecal artery) from SMA, which descends behind the ileum).

- Note: Appendicular artery runs in a free margin of the mesoappendix
Veins:
-The appendicular vein drains to posterior cecal vein.
Why is common to have a gangrene in the appendix?!
Because there is only one blood supply which is appendicular artery.

Cecum
-The cecum is a blind-ended pouch within the right iliac fossa, it is about 2.5 in. (6 cm) long
- is completely covered with peritoneum
- At the juncƟon of the cecum and the ascending colon, it is joined on the leŌ side by the terminal part of the ileum.
-The appendix is aƩached to its posteromedial surface.
Arteries: Anterior and posterior cecal arteries from the ileocolic artery (from SMA)
Veins: drain to SMV
There are two things that open into the cecum:
1-The first thing is ileum; through the ileocecal juncƟon which is a physiological sphincter, prevents cecal contents from returning back into the ileum.
2- The second thing is the appendix which usually presents in the retrocecal recess
AND DON’T FORGET THE OPENING OF ASCENDING COLON
RelaƟons
■■ Anteriorly: Coils of small intesƟne, someƟmes part of the greater omentum, and the anterior abdominal wall in the right iliac region.
■■ Posteriorly: The psoas and the iliacus muscles, the femoral nerve, and the lateral cutaneous nerve of the thigh, the appendix is commonly found behind the cecum.
■■ Medially: The appendix arises from the cecum on its medial side.
ILEOCECAL VALVE
A rudimentary structure, the ileocecal valve consists of two horizontal folds of mucous membrane that project around the orifice of the ileum.

Checklist Lab 4

1- Large bowel
2- Sigmoid, anal, rectum
3-posterior abdominal wall

Ascending Colon
-The ascending colon is about 5 in. (13 cm) long and lies in the right lower quadrant
- it is retroperitoneal
- Relations
■■ Anteriorly: Coils of small intestine, the greater omentum, and the anterior abdominal wall.
■■ Posteriorly: The iliacus, the iliac crest, the quadratus lumborum, the origin of the transversus abdominis muscle, and the lower pole of the right kidney. The iliohypogastric and the ilioinguinal nerves cross behind it.
Blood Supply
Arteries: The ileocolic and right colic branches of the superior mesenteric artery.
Veins: The veins correspond to the arteries and drain into the superior mesenteric vein.

Transverse Colon
-The transverse colon is about 15 in. (38 cm) long and extends across the abdomen, occupying the umbilical region.
- It begins at the right colic flexure below the right lobe of the liver and hangs downward, suspended by
the transverse mesocolon from the pancreas. It then ascends to the left colic flexure below the spleen. The left colic flexure is higher than the right colic flexure and is suspended from the diaphragm by the phrenico colic ligament
Relations
■■ Anteriorly: The greater omentum and the anterior abdominal wall (umbilical and hypogastric regions)
■■ Posteriorly: The second part of the duodenum, the head of the pancreas, and the coils of the jejunum and the ileum.
Blood Supply
Arteries The proximal two thirds are supplied by the middle colic artery, a branch of the superior mesenteric artery.
The distal third is supplied by the left colic artery, a branch of the inferior mesenteric artery.
Veins The veins correspond to the arteries and drain into the superior and inferior mesenteric veins. Descending Colon
-The descending colon is about 10 in. (25 cm) long and lies in the left upper and lower quadrants
- It extends downward from the left colic flexure, to the pelvic brim, where it becomes continuous with
the sigmoid colon.
- retroperitoneal
Relations
■■ Anteriorly: Coils of small intestine, the greater omentum, and the anterior abdominal wall
■■ Posteriorly: The lateral border of the left kidney, the origin of the transversus abdominis muscle, the quadratus lumborum, the iliac crest, the iliacus, and the left psoas. The iliohypogastric and the ilioinguinal nerves, the lateral cutaneous nerve of the thigh, and the femoral nerve also lie posteriorly. Blood Supply
Arteries The left colic and the sigmoid branches of the inferior mesenteric artery supply this area. Veins The veins correspond to the arteries and drain into the inferior mesenteric vein.

Parts of the pelvic mesocolon
-Sigmoid colon
-Rectum

-Upper part of the anal canal
Sigmoid colon
Length: 10-15 inches
has Special features: it is inverted V mesentery shape.
Relations
■■ Anteriorly: In the male, the urinary bladder; in the female, the posterior surface of the uterus and the upper part of the vagina
■■ Posteriorly: The rectum and the sacrum. The sigmoid colon is also related to the lower coils of the terminal part of the ileum.
Blood Supply
Arteries: Sigmoid branches of the inferior mesenteric artery.
Veins: The veins drain into the inferior mesenteric vein, which joins portal system.
Sigmoid continue as rectum.

Rectum

The rectum is about 5 in. (13 cm) long and begins in front of the third sacral vertebra as a continuation of the sigmoid colon.
The lower part of the rectum is dilated to form the rectal ampulla

Attachment of the root of
mesocolon
• At middle piece of sacrum
• Bifurcation of Lt. common iliac
artery
• Middle of Lt.Ext.iliac artery

-The peritoneum covers the anterior and lateral surfaces of the first third of the rectum and only the anterior surface of the middle third, leaving the lower third devoid of peritoneum.

Relations

■■ Posteriorly: The rectum is in contact with the sacrum and coccyx; the piriformis, coccygeus, and levator ani muscles; the sacral plexus; and the sympathetic trunks.

■■ Anteriorly: In the male, the upper two thirds of the rectum, which is covered by peritoneum, is related to the sigmoid colon and coils of ileum that occupy the rectovesical pouch. The lower third of the rectum, which is devoid of peritoneum, is related to the posterior surface of the bladder, to the termination of the vas deferens and the seminal vesicles on each side, and to the prostate.

In the female, the upper two thirds of the rectum, which is covered by peritoneum, is related to the sigmoid colon and coils of ileum that occupy the rectouterine pouch (pouch of Douglas).

The lower third of the rectum, which is devoid of peritoneum, is related to the posterior surface of the vagina.

Blood supply

Arteries: superior, middle, inferior rectal artery

Veins: superior rectal vein is a tributary of the portal circulation and drains into the inferior mesenteric vein.

The middle and inferior rectal veins drain into the internal iliac and internal pudendal veins, respectively.

Anal Canal

Location and Description: The anal canal is about 1.5 in. (4 cm) long and passes downward and backward from the rectal ampulla to the anus.

Posterior abdominal wall
Structures of Post. Abdominal wall:
• 5 lumbar vertebra & their intervertebral disc.
• 12th ribs (floating ribs).
• Upper part of bony pelvis (iliac crest).
• Muscles:
- psoas major inserted on lesser trochanter.
- psoas minor in front of psoas major (usually absent).
- Quadratus lumborum.
- Iliacus which lies in the iliac fossa, inserted into lesser trochanter.
- Aponeurosis of transversus abdominis muscles

For the muscles, mention
origin /insertion/ nerve
supply/action

Arteries on the Posterior Abdominal Wall
1-Abdominal aorta
Abdominal aorta then descends to form the descending thoracic aorta that enters the abdomen through the aortic opening at the midline of the diaphragm on the level of T12 as abdominal aorta.
• At the right side of abdominal aorta there are cisterna chyli & azygos vein.
• Abdominal aorta ends on the left side on the level of L4 then it divides into two common iliac arteries, which branch into internal and external iliac arteries that go to the pelvis.
Relation

Ant: Pancreas, 3rd part of duodenum, Coils of small intestine, Crossed by Lt.renal vein
right side: The inferior vena cava, The cisterna chyli, The beginning of the azygos vein.
left side: The left sympathetic trunk
❖Branches of abdominal aorta
1- Anterior
a. Single branches:
1) Celiac Trunk.
2) Superior mesenteric artery.
3) Inferior mesenteric artery.
b. Paired branches:
Testicular arteries (males) or ovarian arteries (females) at the level of L2.
NOTE: The right vein drains directly into the IVC while the left one drains into the left renal vein. 2- Posterior
a. Single branches:
Median sacral artery >>It’s considered the continuation of abdominal aorta.
b. Paired branches:
4 lumbar arteries anterior to the lumbar vertebrae.
3- Lateral
1) Inferior phrenic arteries that supply the diaphragm.
2) Middle suprarenal arteries that supply the suprarenal glands.
3) Renal arteries at the level of L2 to supply the kidneys.

NOTE: The right renal artery is longer than the left because the aorta is more to the left side. ***Right & left Common iliac arteries are the terminal branches of abdominal aorta. 2-Celiac artery at the level of L1
>>originates between T12 & L1
• It has 3 terminal branches:
1- The left gastric.
2- splenic artery
3- hepatic artery
please track the path of each artery on the picture

3-Superior mesenteric artery at the level of L2
>>It originates behind the body of pancreas at the level between L1 and L2.
4-Inferior mesenteric artery at the level of L3
>>It originates behind the horizontal part of duodenum.
5-Marginal artery
>>It’s the anastomosis between of the colic arteries around the concave margin of the large intestine. 6-Common iliac arteries
7-External and internal iliac arteries
Veins of the posterior abdominal Wall
1-Inferior vena cava
>>It’s the opposite of the abdominal aorta.
>>It ascends on the right side of the aorta, pierces the central tendon of the diaphragm at the level of T8.

>>Ascends then separated from the aorta by the right crus of the diaphragm.
>>Drains into the right atrium of the heart.
>>It is formed by the union of the common iliac veins behind the right common iliac artery at the level of L5.

>>The blood that moves in the IVC is called systemic venous blood. Systemic means that it’s going to the heart.
>>The right sympathetic trunk lies behind its right margin and the right ureter lies close to its right border. The entrance into the lesser sac separates the inferior vena cava from the portal vein.
Anterior Relation: Coils of small intestine, third and first part of duodenum, Head of pancreas & C.B.D ,related to foramen of Winslow, Portal vein, Lies in deep groove of liver
Tributaries of I.V.C
• Two anterior visceral tributaries: the hepatic veins.
• Three lateral visceral tributaries:
1. The right suprarenal vein (the left vein drains into the left renal vein).
2. Renal veins.
3. Right testicular or ovarian vein (the left vein drains into the left renal vein).
• Five lateral abdominal wall tributaries: the inferior phrenic vein and four lumbar veins.
• Three veins of origin: two common iliac veins and the median sacral vein.
>>The rest of the veins, superior and inferior mesenteric, gastric, and duodenal, drain in the portal vein to the liver.
>>WHY?
To transfer the simple absorptive materials of digestion to the liver so it can do its function of metabolism of absorptive materials.
Nerves of posterior abdominal wall:
1- subcostal nerve; it is below the last rib (12th).
2- ilioinguinal and iliohypogastric nerves which originate from L1.
3- Lateral cutaneous nerve of the thigh: goes to anterior superior iliac spine.
4-Femoral nerve: clearly large nerve at the lateral border of psoas major muscle.
Ilioinguinal, iliohypogastric, lateral cutaneous, and femoral nerves (arranged from superior to inferior) are all lateral to psoas major.
5-Genitofemoral nerve: arises within the substance of psoas major muscle at its anterior surface. 6-Obturator nerve: At the medial side of psoas major and goes to obturator foramen.
7-Lumbosacral trunk: also,at the medial side of psoas major and goes to obturator foramen.

Lymphatics on the Posterior Abdominal Wall
>>The lymph nodes are closely related to the aorta and form a pre-aortic and a right and left lateral aortic (para-aortic or lumbar) chains which drains into the cisterna chyli.
Thoracic duct
>> Begins in the abdomen, arising from an elongated lymph sac, the cisterna chyli (final destination of all the lymphatics of the abdomen and lower limb), which lies just below the diaphragm at the opening of the aorta.
>>Found at the right side of the aorta.
>>The thoracic duct ascends upwards at the left side and ends at the junction of left subclavian and left internal jugular veins (beginning of the left brachiocephalic vein).
The cisterna chyli
>>Receives lymph from:
1. The right and left lumbar trunks under the diaphragm on the side of the aorta.
2. The intestinal trunk.
3. Some small lymph vessels that descend from the lower part of the thorax.
4. Right & Left vessels from lower thorax.