

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.

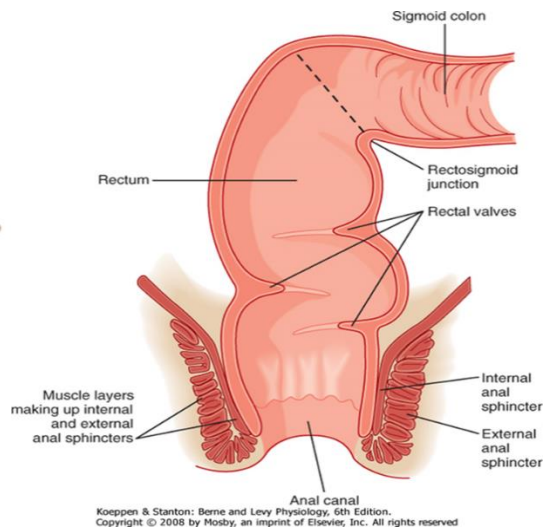
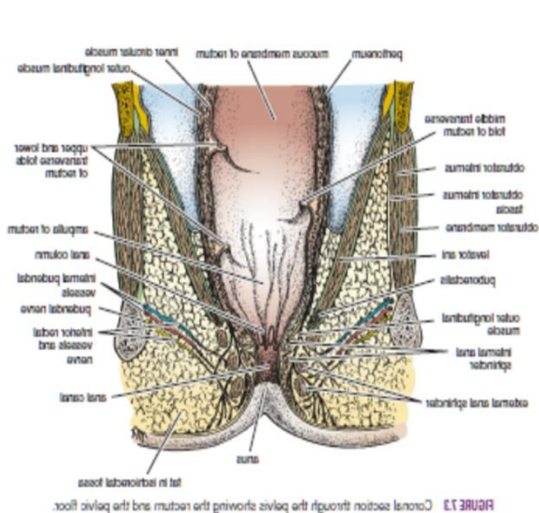
Rectum

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

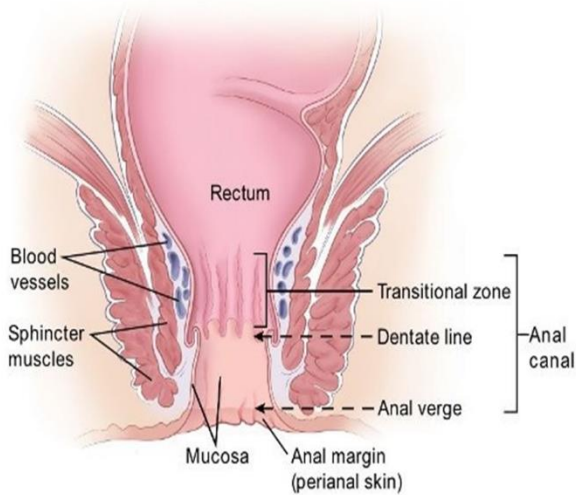
Arteries: superior, middle, inferior rectal artery

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

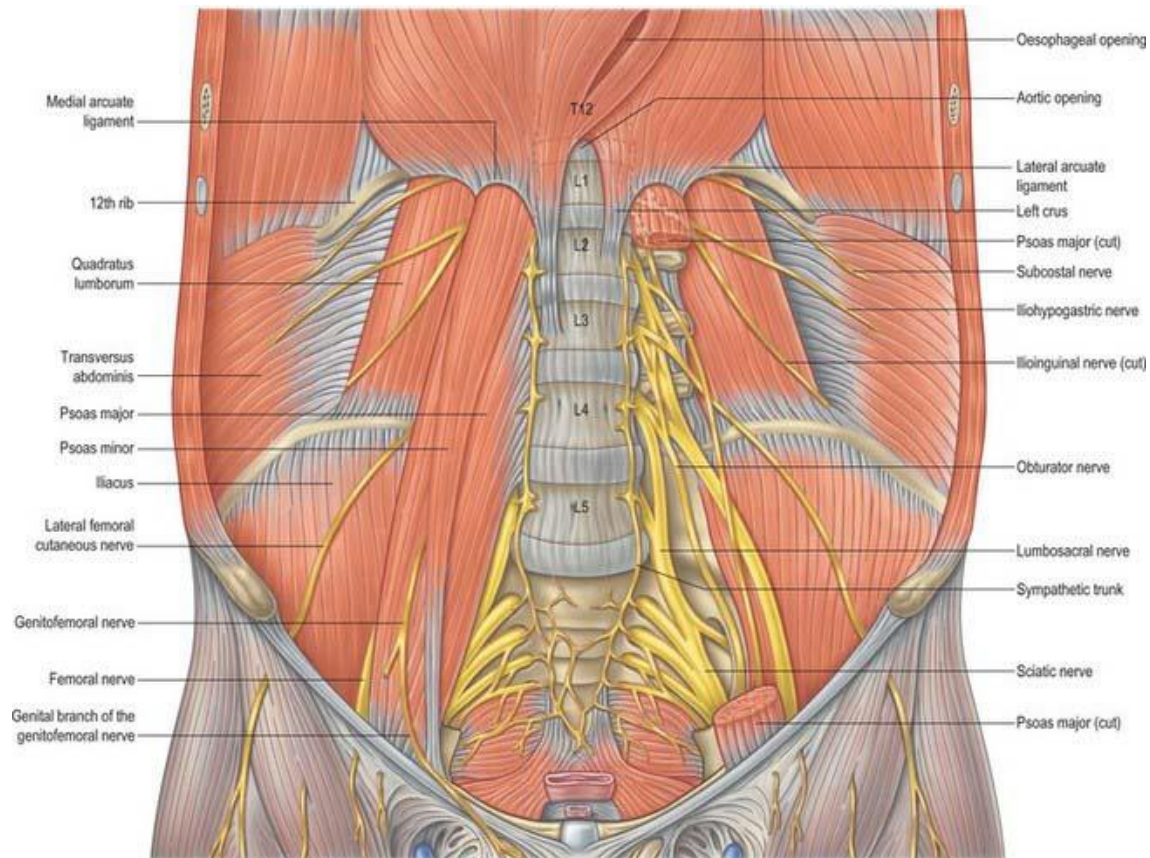
The middle and inferior rectal veins drain into the internal iliac and internal pudendal veins, respectively.

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.



	Upper half	Lower half
Mucosa	Columnar epithelium	Stratified non-keratinized squamous epithelium and when it reaches the oral orifice, it becomes keratinized
Innervation	Autonomic (Stretch)	Somatic (pain, touch, temperature)
Lymphatic drainage	Internal iliac and inferior mesenteric (From Slides)	Superficial inguinal lymph nodes
Relation with hemorrhoid	Internal hemorrhoid	External hemorrhoid
Blood supply	Superior rectal artery and vein	Middle and inferior rectal artery and vein
Origin	Endoderm	Ectoderm (skin)



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.**

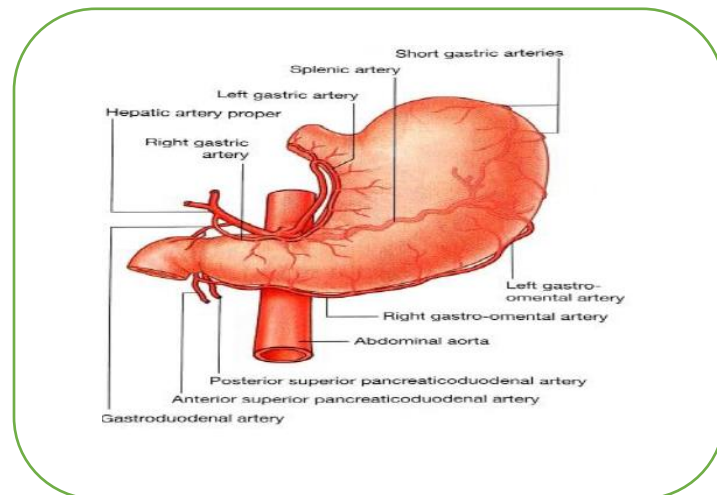
2-Celiac artery at the level of L1

>>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.

