

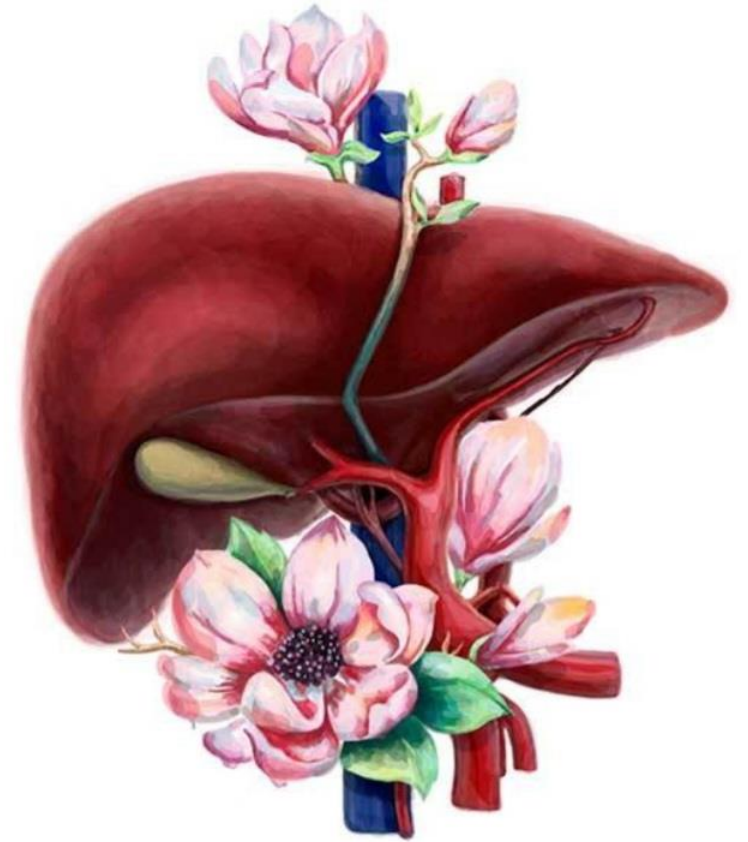
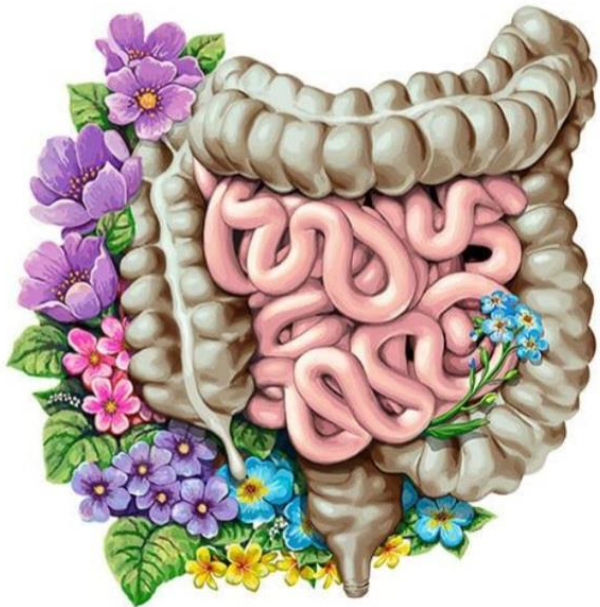
# **HUMAN ANATOMY**

## **Abdominal cavity**

**By**

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**B.D.S.-F.I.B.M.S.**

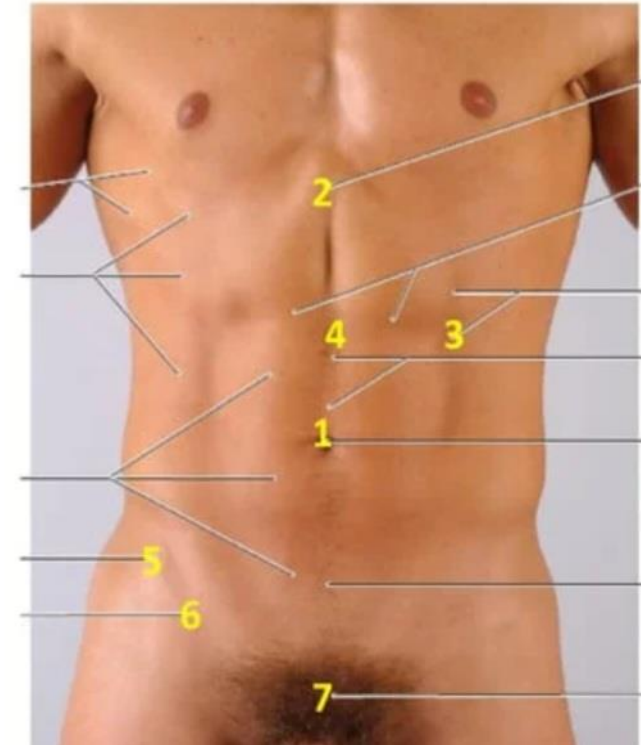


# The abdomen

- ❖ Is cylindrical chamber extending from the inferior margin of the thorax to the superior margin of the pelvis and the lower limb
- ❖ The abdomen is marginated superiorly by the inferior thoracic aperture and inferiorly by the pelvic inlet
- ❖ Abdominal wall enclose the chamber
- ❖ This chamber have only one large cavity = peritoneal cavity

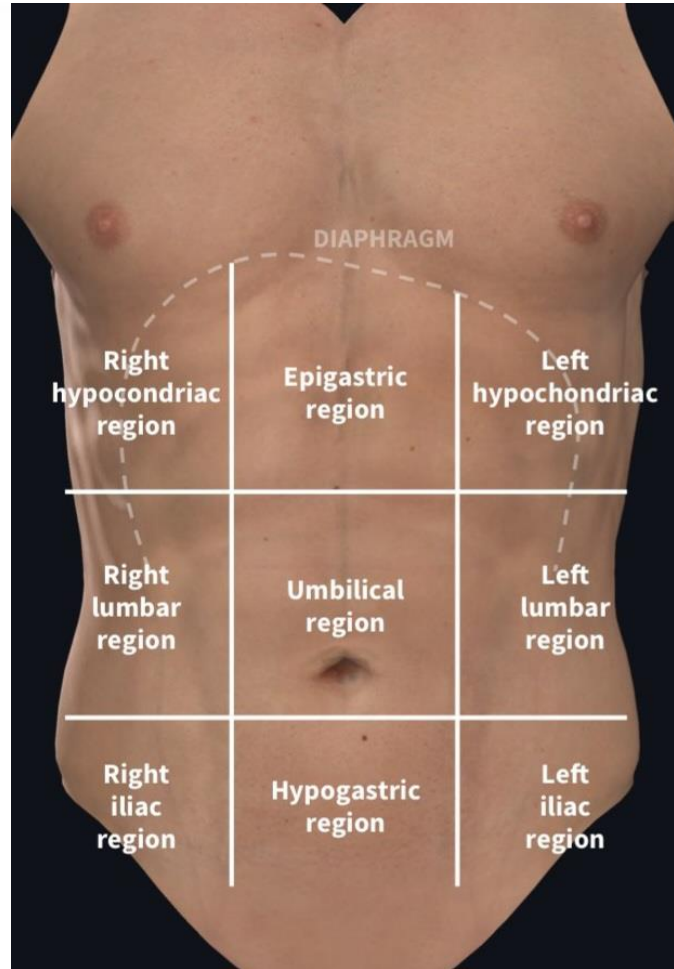
## Surface anatomy of abdomen

1. Umbilicus
2. Xiphoid process
3. Lina emilunaris
4. Lina alba
5. Anterior superior iliac spine (ASIS)
6. Inguinal ligament
7. Pubic symphysis



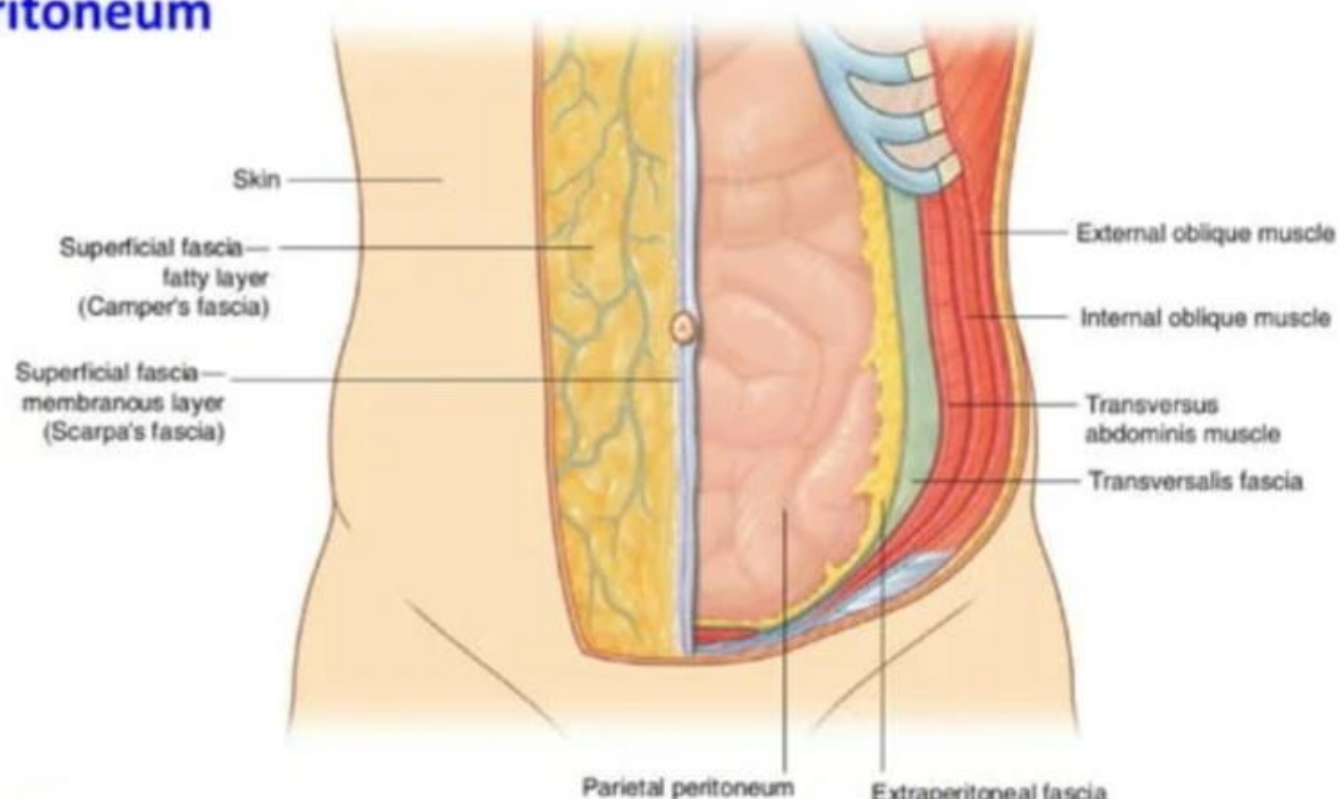
# Quadrants of the abdomen

- Abdomen is divided either as four quadrants pattern or six quadrants pattern



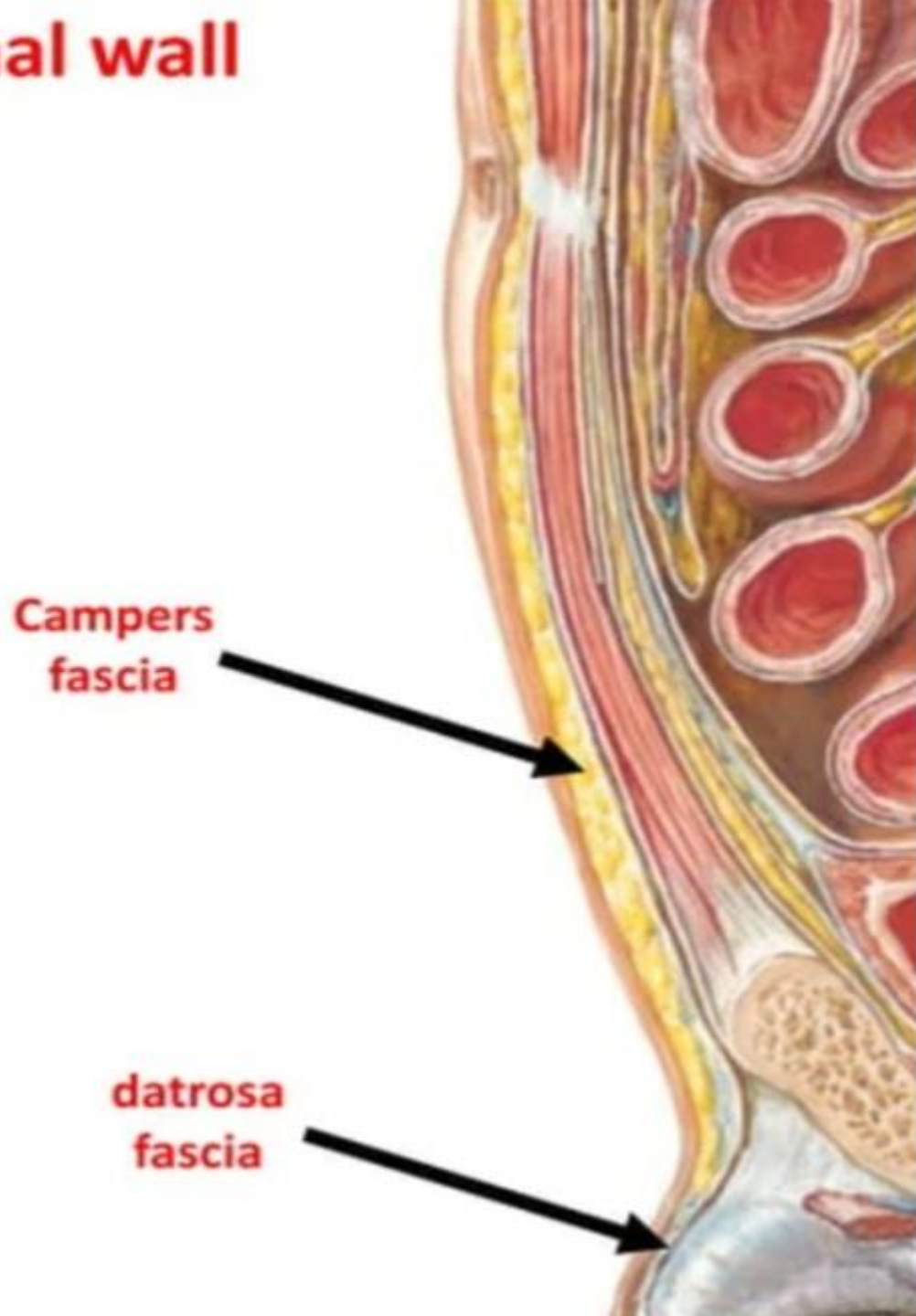
# Abdominal wall

1. Skin
2. Superficial fascia ( subcutaneous )
3. Muscles & associated deep fascia
4. Extraperitoneal fascia
5. Parietal peritoneum



## Superficial fascia of abdominal wall

- On single layer above the umbilicus and becomes 2 layers below it.
- The two layers of superficial fascia below umbilicus are :
  - 1) **camper's fascia** :
    - which is the superficial and contain fat
    - It continue with superficial fascia of thigh over the inguinal ligament and with fascia of perineum
    - Have variety in thickness
    - In men, this fascia continue over the penis, fuse with the deeper layer & loss its fat and from a specialized fascia contains a smooth muscles called **dartos fascia**
    - In women, this fascia is a component of the labia majora



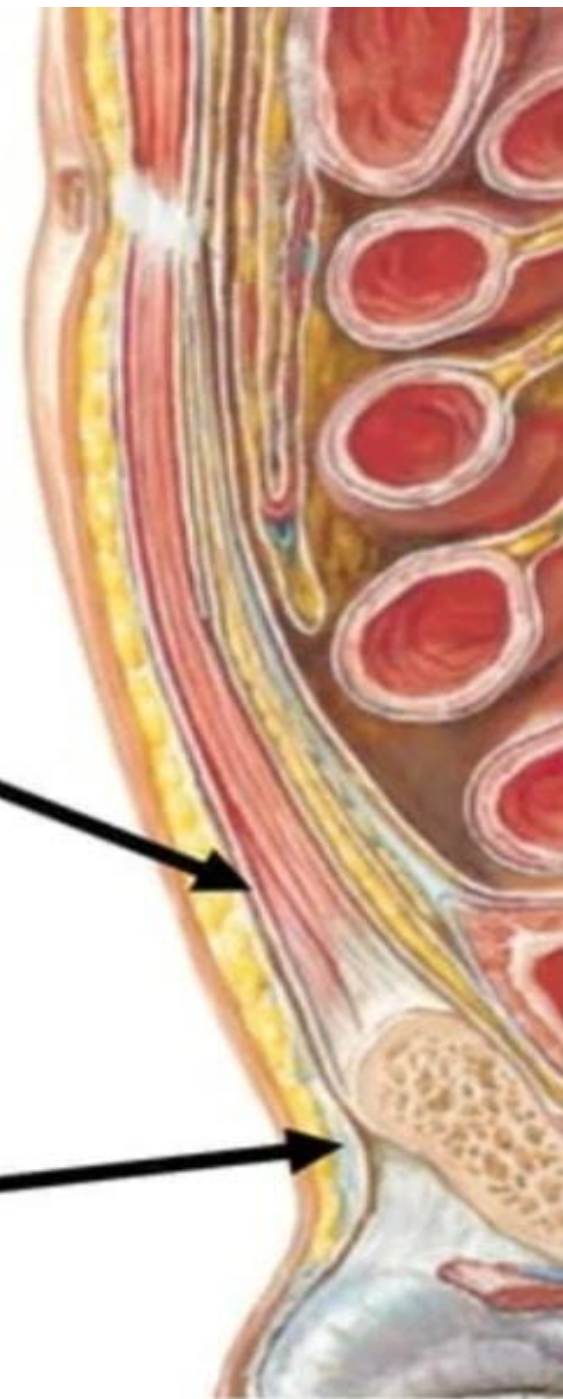
## Superficial fascia of abdominal wall

### • 2) Scarp's fascia :

- deep layer which is membranous contains NO fat.
- Continuous with thigh below inguinal ligament and fuse with fascia lata ( deep thigh fascia )
- Has a bony attachments to pubic symphysis and ischiopubic rami in addition to firm attachment to linea alba
- When it continuous on the anterior part of perineum into ischiopubic ramus and the posterior margin of perineal membrane, here its called **Colles` fascia** ( superficial perineal fascia )
- fuse with the superficial fascia ( Camper`s fascia ) on scrotum and penis in men.
- Dorsally in men penis, it will form **Fundiform ligament of penis.**
- In women, it is continuous with labia majora and perineum

Scarp's  
fascia

Fundiform  
ligament  
of penis



# Abdominal wall

- Consist of bones and muscle ( major component ) ...

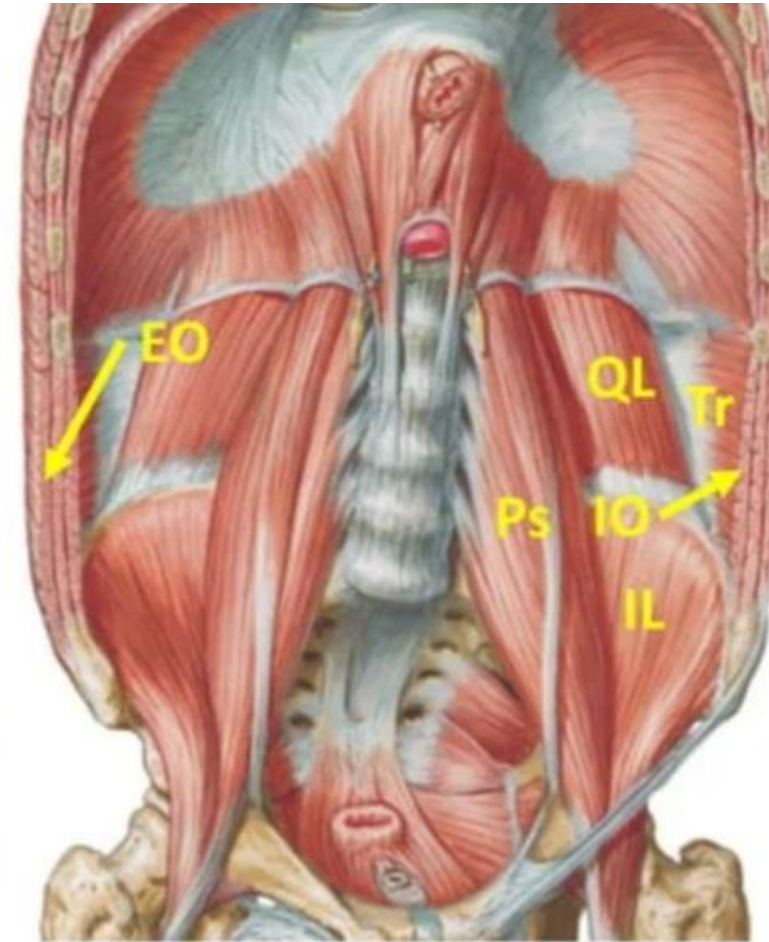
- Composed of :-

## A) Skeletal elements

1. Lumbar vertebrae & IV disks
2. Superior portion of pelvic bones.
3. Bony parts of the inferior thoracic wall including costal margin, ribs XI & XII and the xiphoid process.

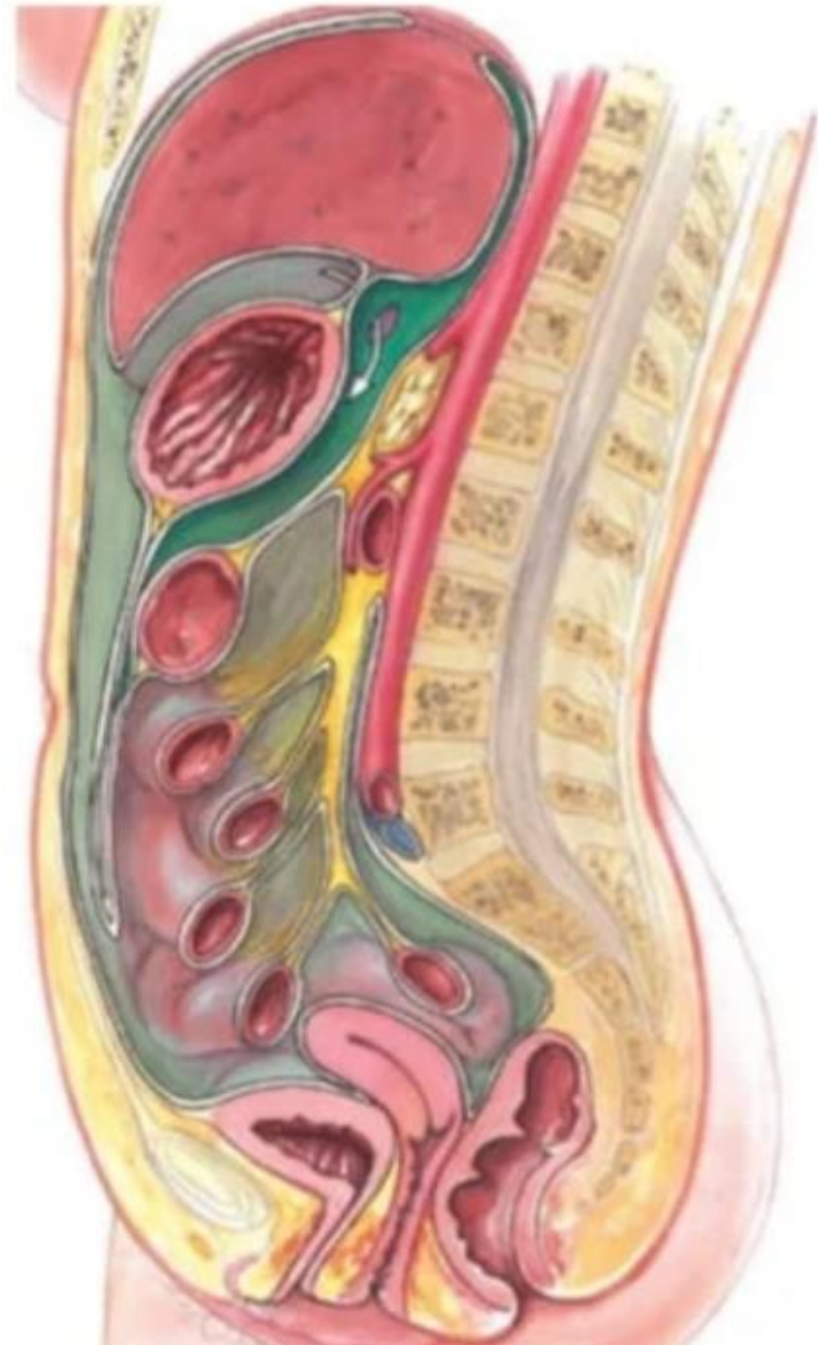
## B) Muscular component

1. Lateral part of the vertebral column is formed by quadratus lumborum, iliacus & psoas major.
2. Lateral part of the abdominal wall composed of three layers ( similar to thoracic wall ) from transversus abdominis, internal & external oblique.
3. Anteriorly, rectus abdominis fill the space between inferior thoracic wall & pelvis.



# Abdominal cavity

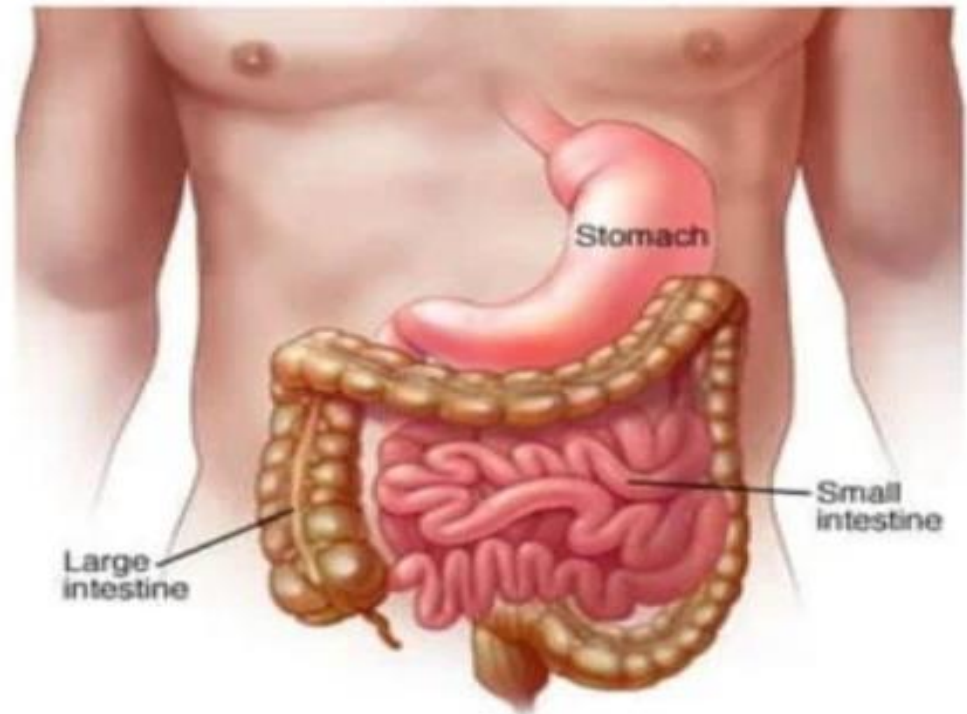
- You can think that the abdominal cavity contain a tube ( represents the GIT tract ) that suspended to abdominal wall by the thin sheath-like tissue called the “ **mesenteries** ”.
- a ventral ( anterior) mesentery for proximal regions of the gut tube.
- a dorsal (posterior) mesentery along the entire length of the system.
- Abdominal cavity is lined by **peritoneum** which covers the abdominal wall then reflected to cover the suspended organs and become a part of the mesenteries.





# Stomach

- **The stomach** is the dilated portion of the alimentary canal
- It is situated in the upper part of the abdomen, extending from beneath the left costal margin region into the epigastric and umbilical regions.
- Much of the stomach lies under cover of the lower ribs.
- The stomach relatively fixed at both ends but is very mobile in between.



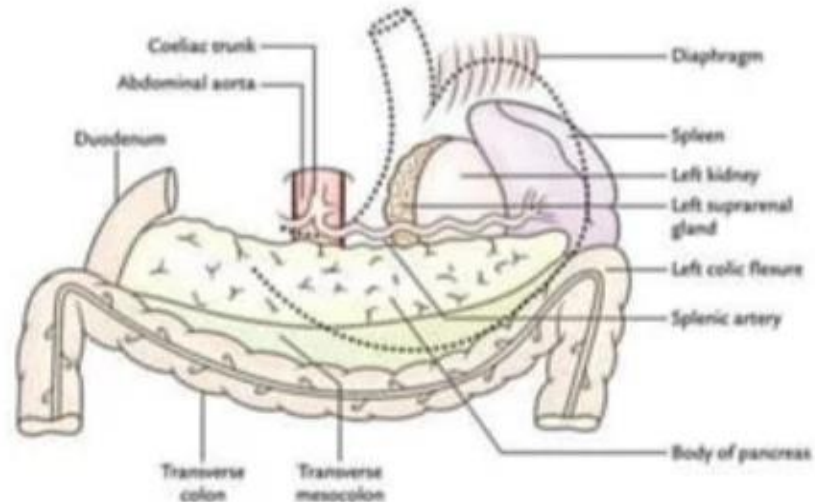
# Relations of the stomach

- **Anterior relations**

- Anterior abdominal wall
- Left costal margin
- Left pleura and lung
- Diaphragm, and the
- Left lobe of the liver.

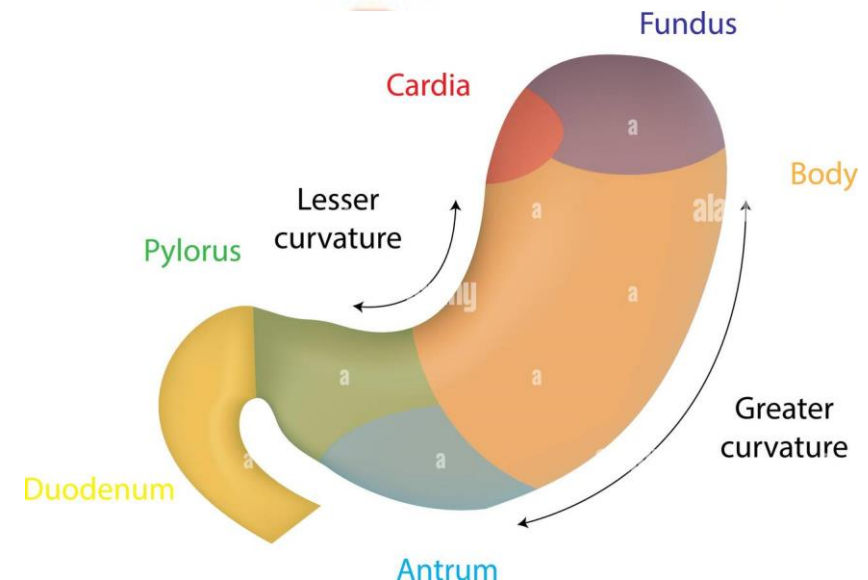
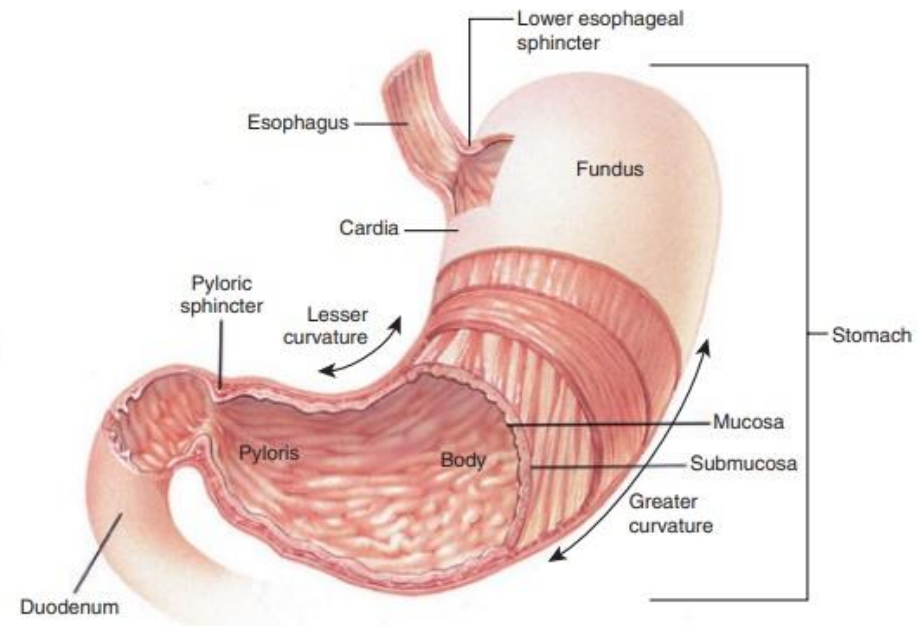
- **Posterior relations**

- Lesser sac
- Diaphragm
- Spleen
- Left suprarenal gland
- Upper part of the left kidney
- Splenic artery
- Pancreas
- Transverse colon
- Transverse mesocolon



# Anatomical description of the stomach

- Shape: Roughly J-shaped
- **The stomach has:**
- two openings, the cardiac and pyloric orifices;
- two curvatures, the greater and lesser curvatures;
- two surfaces, anterior and posterior surfaces.
- **Also the stomach is divided into:**
- Fundus
- Body
- Pyloric antrum
- Pylorus; pyloric sphincter and canal

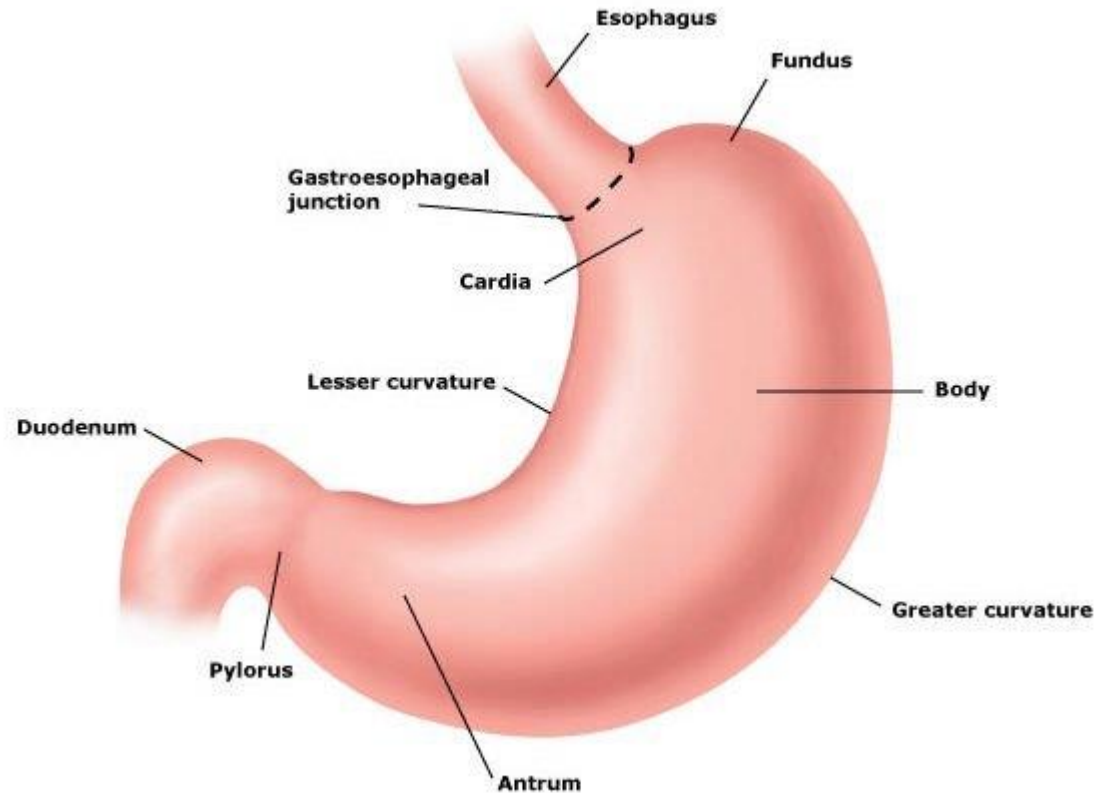


# Curvatures of the stomach


- **Lesser curvature:** Forms the right border of the stomach and extends from the cardiac orifice to the pylorus.
- It is suspended from the liver by the lesser omentum.
- **Greater curvature:** Much longer than the lesser curvature and extends from the left of the cardiac orifice, over the dome of the fundus, and along the left border of the stomach to the pylorus.
- **The gastrosplenic omentum (ligament)** extends from the upper part of the greater curvature to the spleen,
- **The greater omentum** extends from the lower part of the greater curvature to the transverse colon .
- Peritoneum completely surrounds the stomach

# Openings of the stomach

- **The cardiac orifice:** Where the esophagus enters the stomach.
- **The pyloric orifice:** Formed by the pyloric canal, which is about 1 in. (2.5 cm) long. The circular muscle coat of the stomach is much thicker here and forms the anatomic and physiologic pyloric sphincter.



# Liver

- ▶ Liver is the largest gland in human body after skin
  - ▶ It weighs 1500 grams
  - ▶ It comprises of 2.5% of the total body weight
  - ▶ In a mature fetus it may even serve as an Hematopoietic organ
  - ▶ Except fat it absorbs all the nutrients from GIT by portal system
  - ▶ Liver stores glycogen and secretes bile for emulsification of fats
- 

# Anatomical Features



## ▶ Surfaces

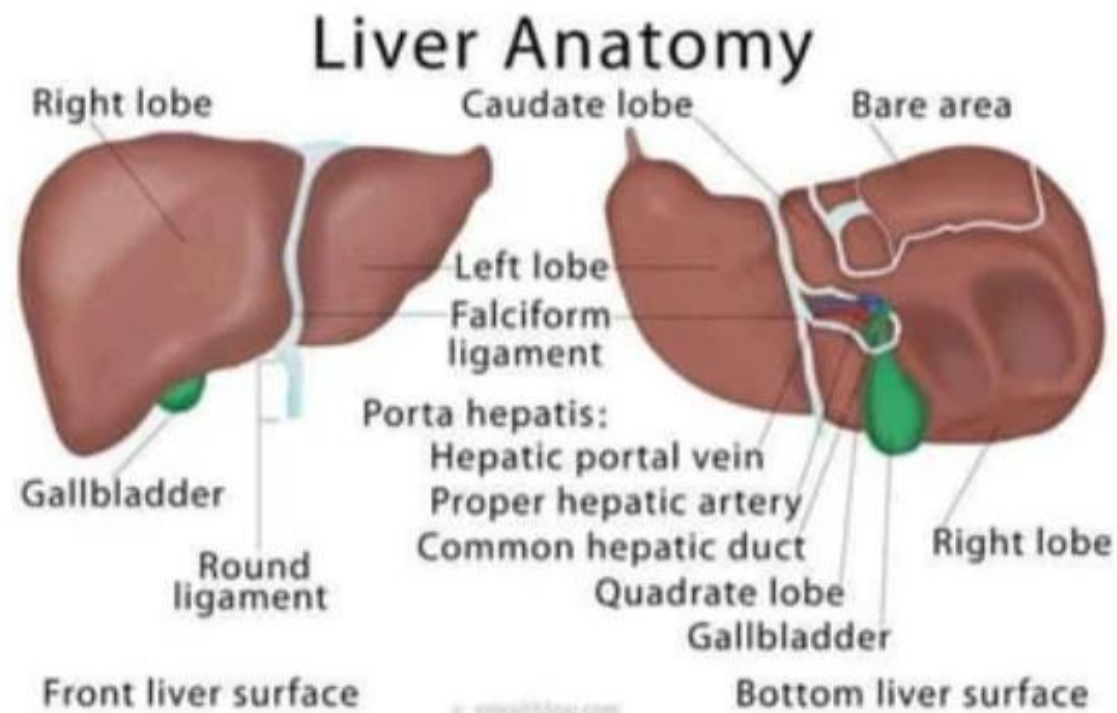
- Diaphragmatic/antero superior
- Visceral/postero inferior

## ▶ Lobes :

- Major lobes
  - Right
  - Left
- Accessory lobes
  - Caudate
  - Quadrate

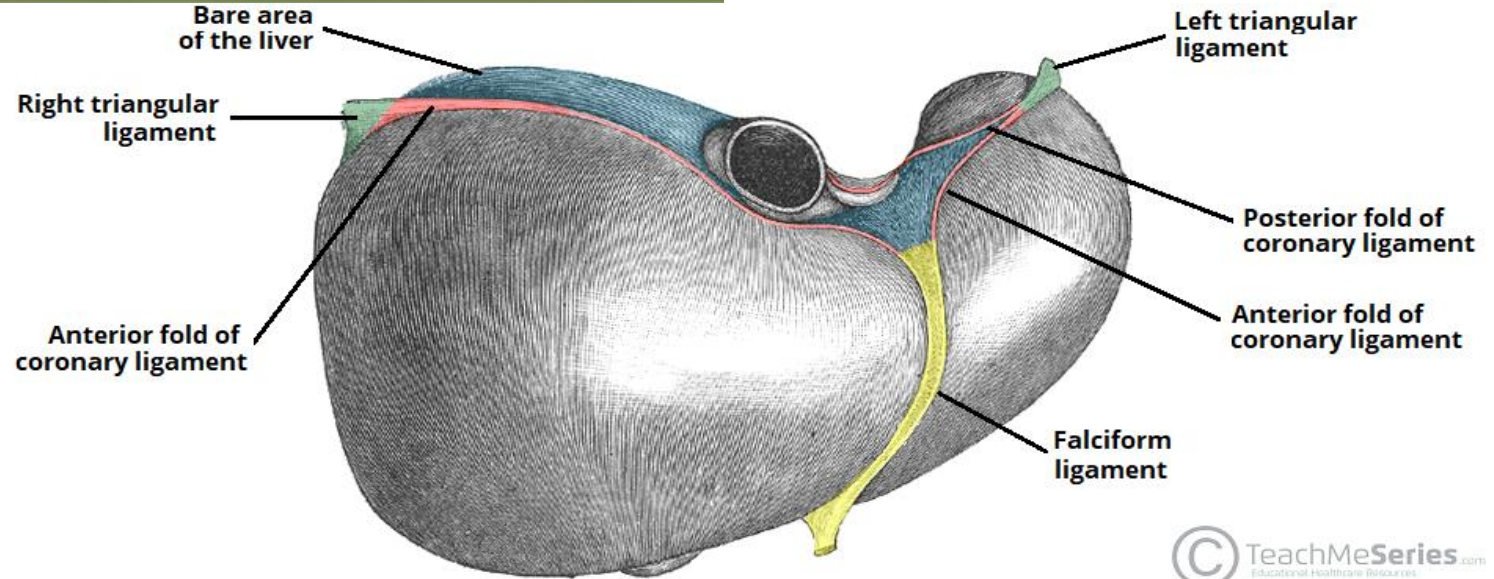
## ▶ Border

- Inferior Border



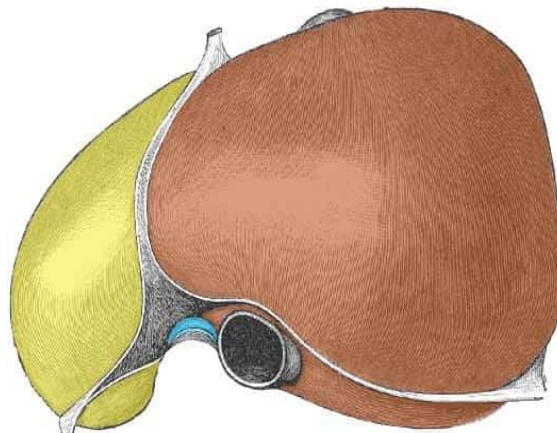
# Surfaces of Liver

- The liver has two surfaces:
  - A convex **diaphragmatic** surface
  - A relatively flat or even concave **visceral** surface (posteroinferior)

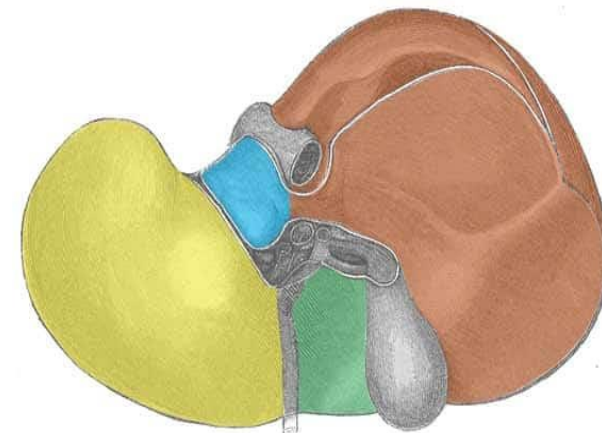


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Superior Surface



Inferior Surface



- Left
- Right
- Caudate
- Quadrate



# Ligaments of Liver

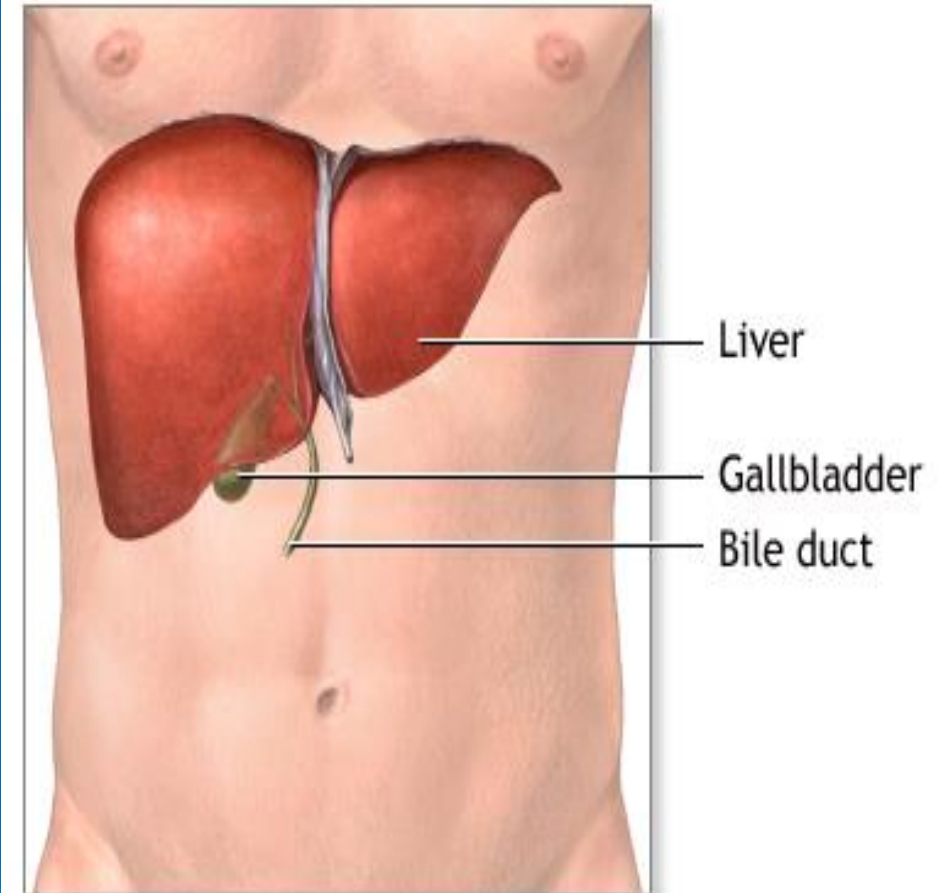
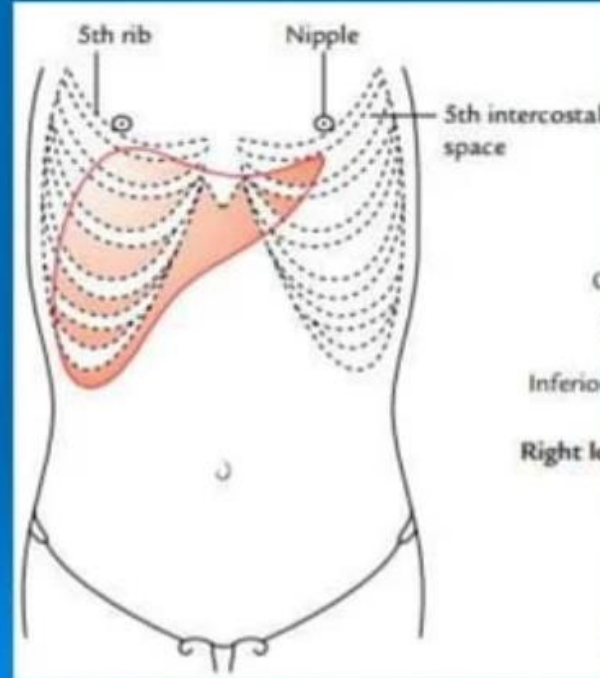
- ▶ Falciform ligament
- ▶ Anterior coronary ligament
- ▶ Posterior coronary ligament
- ▶ Round ligament
- ▶ Ligamentum venosum
- ▶ Lesser omentum has 2 parts:
  - Hepatogastric ligament
  - Hepatoduodenal ligament

## Main functions are

- It secretes bile and stores glycogen.
- It synthesizes the serum proteins and lipids.
- It detoxifies blood from endogenous and exogenous substances (e.g., toxins, drugs, alcohol, etc.) that enter the circulation.
- It produces hemopoietic cells of all types during fetal life.

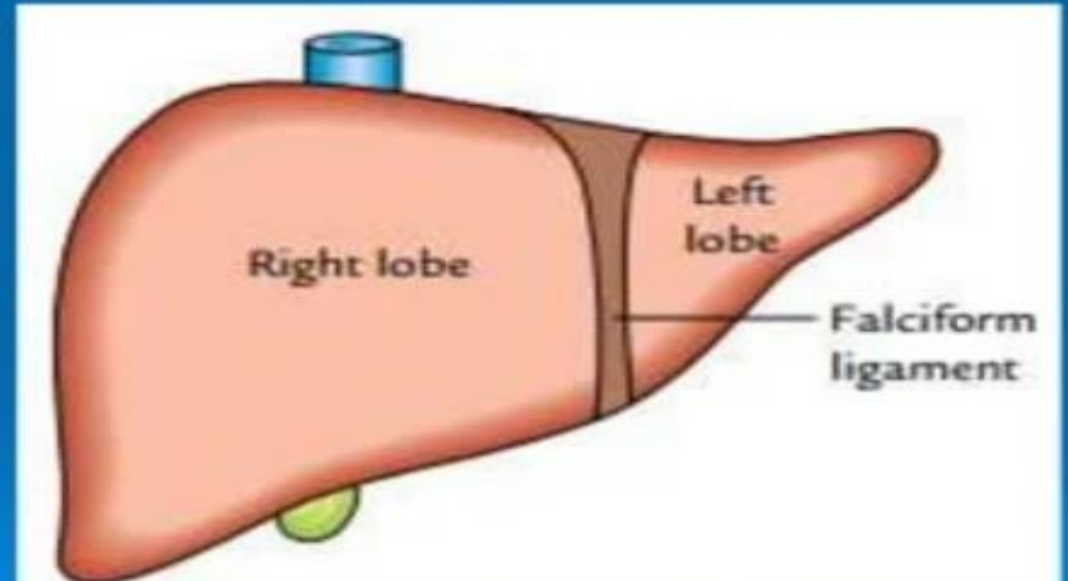
## LOCATION

- The liver almost fully occupies:
  - The right hypochondrium.
  - Upper part of the epigastrium.
  - And part of the left hypochondrium up to the left lateral (midclavicular) line.
- It extends upward under the rib cage as far as the 5th rib anteriorly on the right side (below the right nipple) and left 5th intercostal space
- The sharp inferior border crosses the midline at the level of trans pyloric plane (at the level of L1 vertebra).



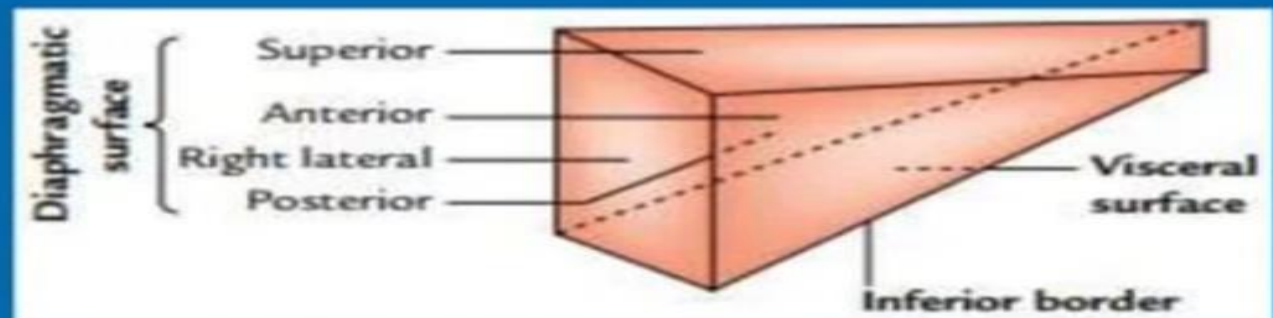
# LOBES OF THE LIVER

- Anatomical Lobes:
- On the diaphragmatic surface: the liver is divided into two lobes, right and left, by the attachment of the falciform ligament.
- The right lobe which forms the base of the wedge-shaped liver is approximately six times larger than the left lobe.



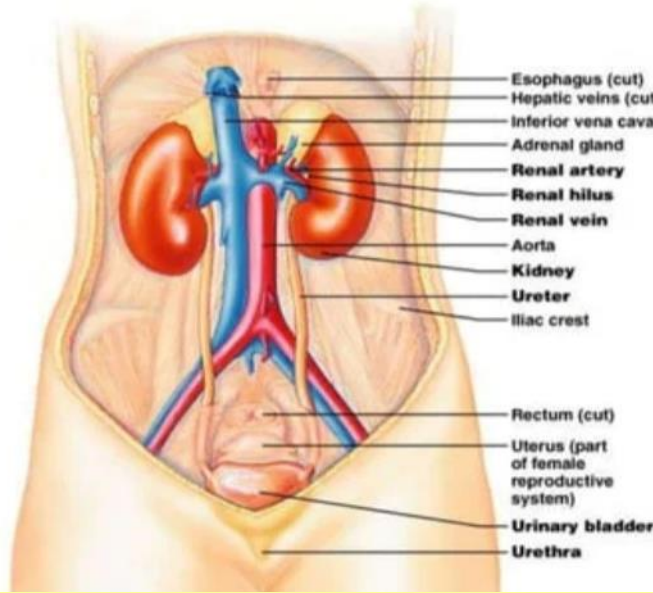
## EXTERNAL FEATURES

- The wedge-shaped liver presents:
- Two well-defined surfaces: diaphragmatic and visceral.
- One well-defined border: inferior border.



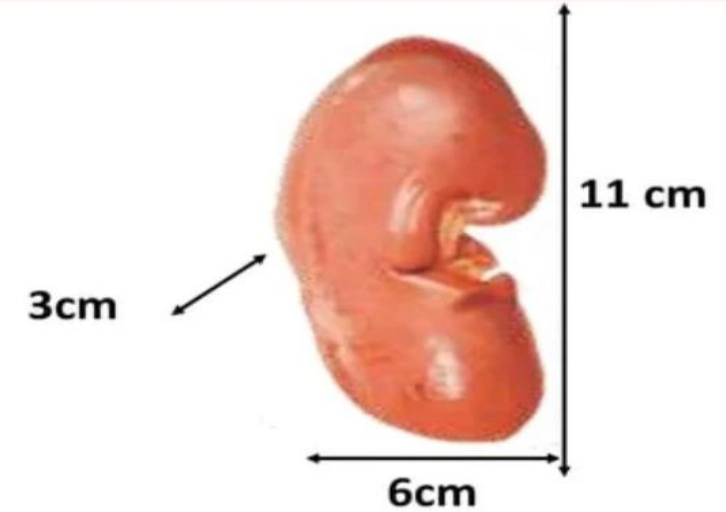
# Organs of the Renal System

- 2 Kidneys
- 2 Ureters
- Urinary bladder
- Urethra
- Not many structures, but very important!



## HEIGHT & WEIGHT:

Each kidney is 11 cm (4-5") long, 6 cm (2-3") broad and 3 cm (1") thick, weight 150 g in males and 135 g in females.



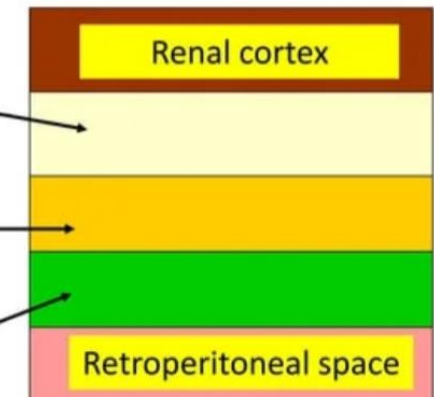
## LOCATION:

- Kidneys are a pair of excretory organs situated on the posterior abdominal wall,
- above the waist,
- extending from upper border of T12 to L3 vertebra,
- partially protected 11<sup>th</sup> & 12<sup>th</sup> pairs of ribs.

## Protection of the Kidneys

- **3 layers of connective tissue:**

- Inner layer- Renal capsule
- Middle layer- Adipose capsule
- Outer layer- Renal fascia



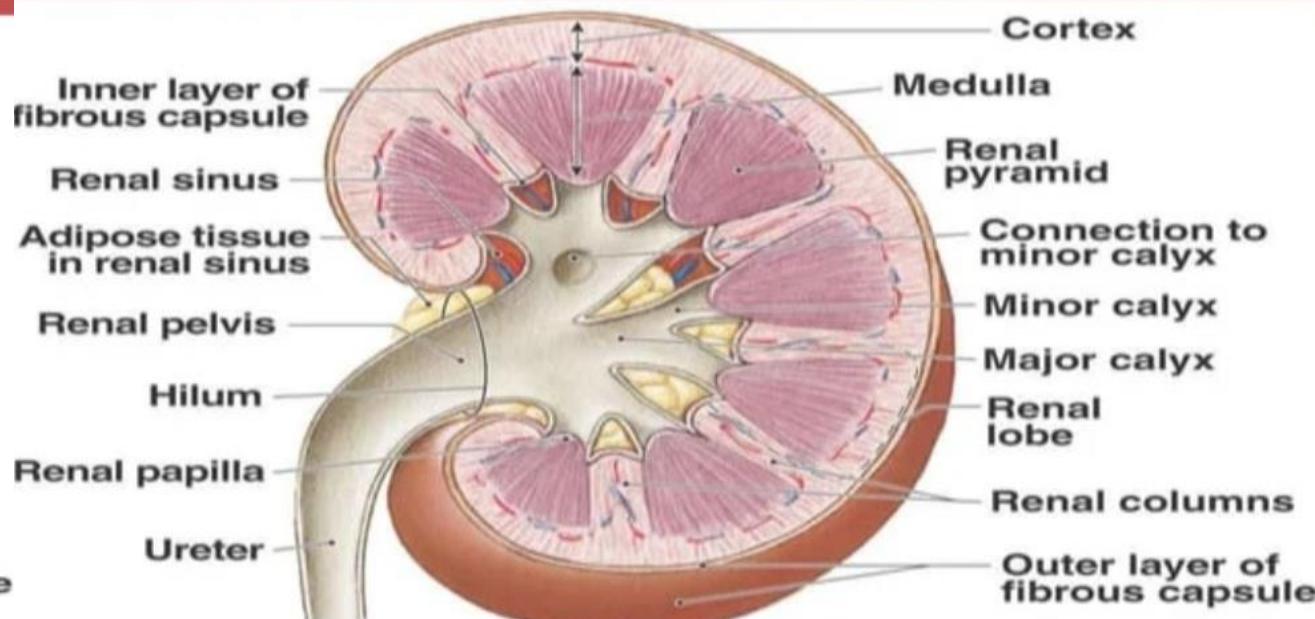
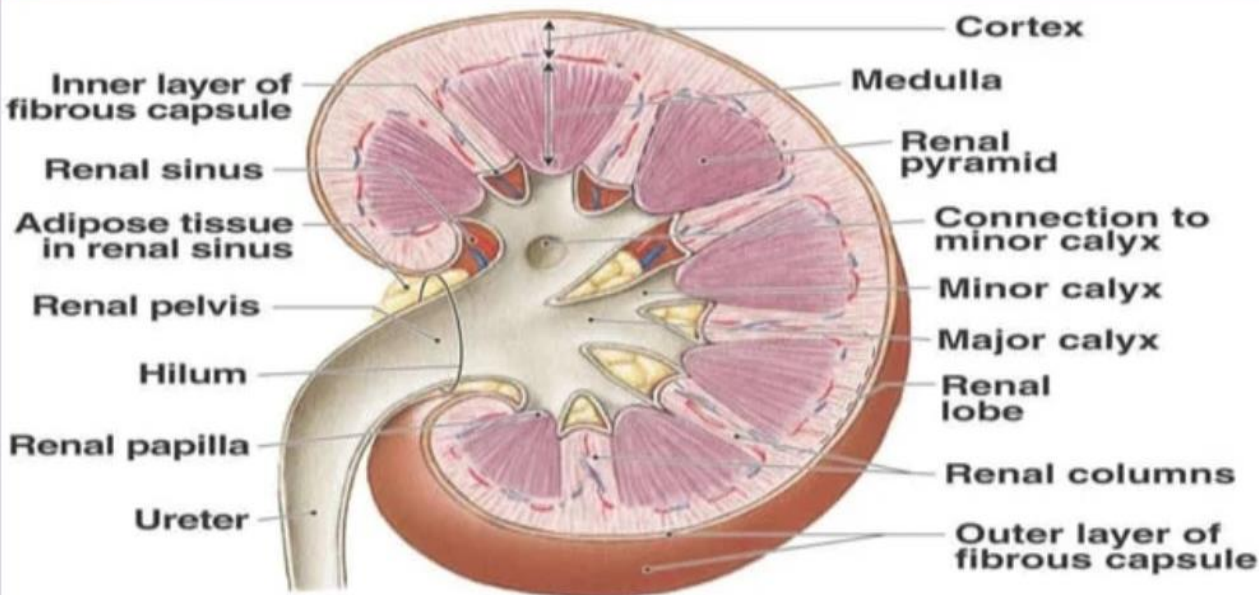
# GROSS STRUCTURE OF THE KIDNEY

Longitudinal section there are 3 areas.

- I. Fibrous capsule
- II. Cortex
- III. Medulla

**CORTEX:** A reddish brown layer of tissue immediately below the capsule and outside the pyramids.

**MEDULLA:** the inner most layer consisting of pale conical shaped striations called renal pyramids.



# INTESTINE

The Intestine is formed of two Parts:

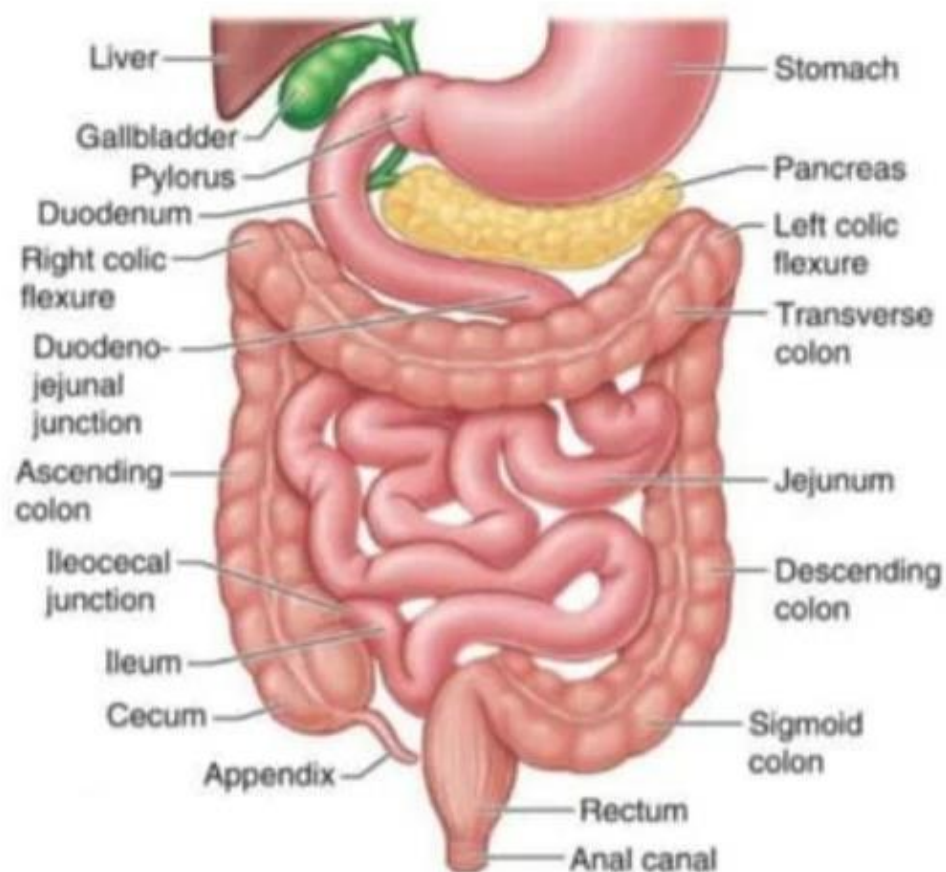
1. Small Intestine and
2. Large Intestine

- **Small intestine has:**

- A. Duodenum
- B. jejunum
- C. Ileum

- **Large Intestine has:**

- A. Caecum
- B. Colon (Ascending, Transverse, Descending and Sigmoid Colon),
- C. Rectum and
- D. Anal canal



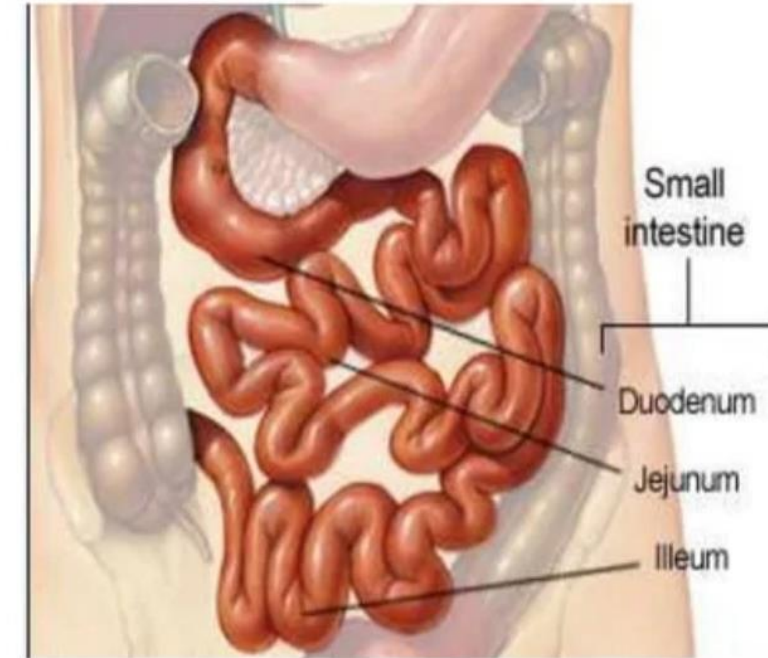
# THE SMALL INTESTINE

- The small intestine extends from the pylorus to the ileocaecal junction.
- It is about 6 meter long.
- It is approximately 2.5–3 cm in diameter.
- The surface area of the human small intestinal mucosa averages 30 square meter

# SMALL INTESTINE

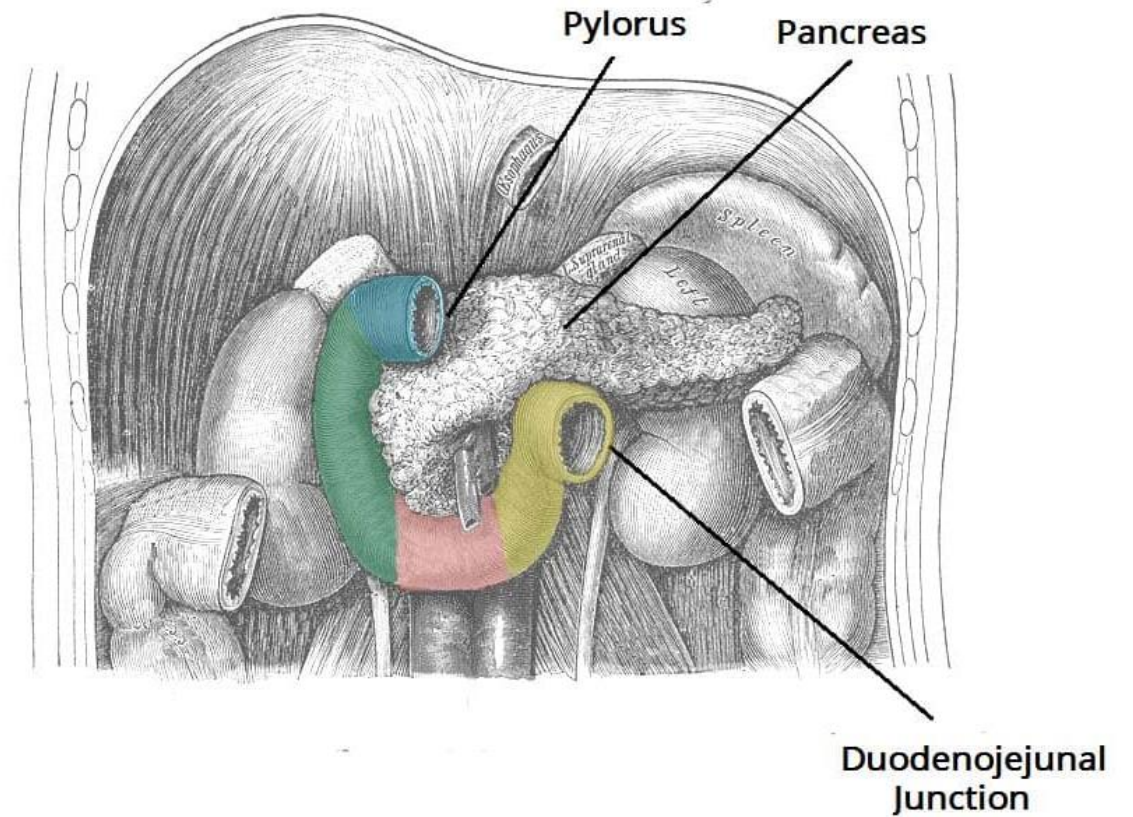
The small intestine is divided

- Duodenum
- Jejunum
- Ileum.



# THE DUODENUM

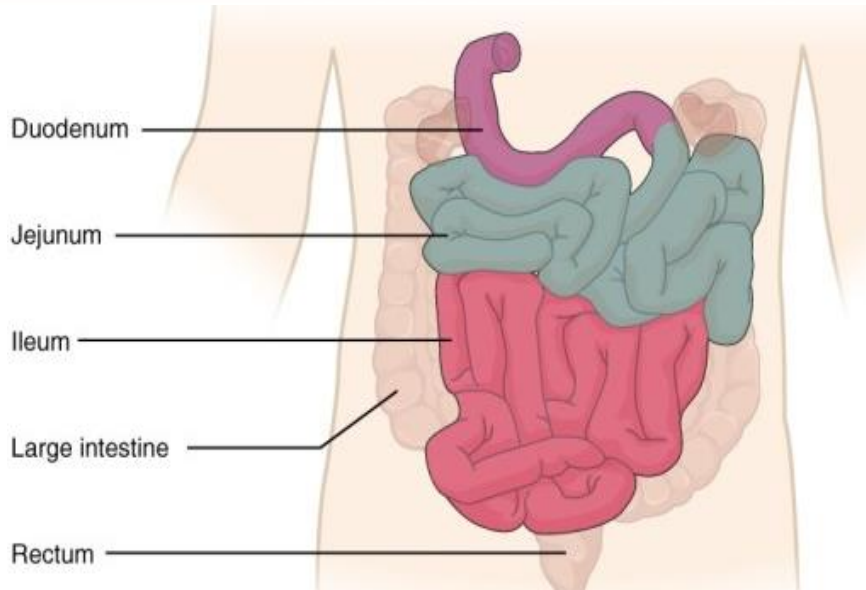
- Greek word- **dodekadaktulos** – means *twelve fingers*
- The duodenum is a short structure (about **20–25 cm** long) continuous with the stomach and shaped like a "C".
- It lies above the level of the umbilicus, opposite 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> lumbar vertebrae.
- It surrounds the head of the pancreas.
- It receives **gastric chyme** from the stomach, together with digestive juices from the pancreas (digestive enzymes) and the gall bladder (bile).
- The digestive enzymes break down proteins and bile and emulsify fats into **micelles**.
- The duodenum contains **Brunner's glands**, which produce a mucus-rich alkaline secretion containing bicarbonate.
- These secretions, in combination with bicarbonate from the pancreas, neutralizes the stomach acids contained in gastric chyme.





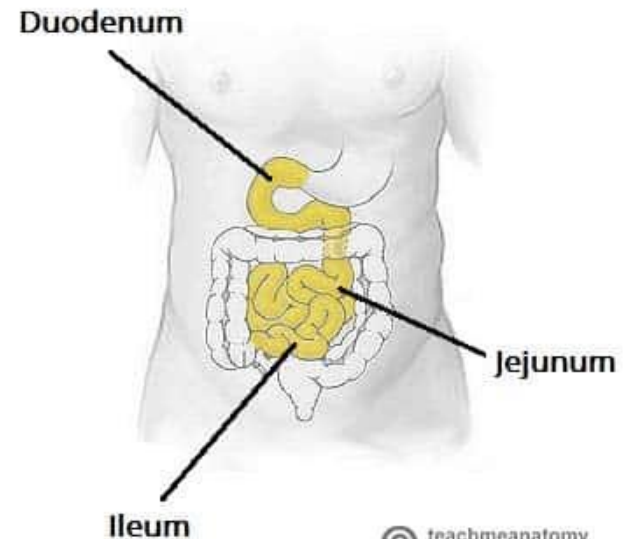
# THE JEJUNUM

- The jejunum is the midsection of the small intestine, connecting the duodenum to the ileum.
- It is about 2.5 m long, and contains the plicae circulares, and villi that increase its surface area.
- Products of digestion (sugars, amino acids, and fatty acids) are absorbed into the bloodstream here.
- The suspensory muscle of duodenum marks the division between the duodenum and the jejunum.



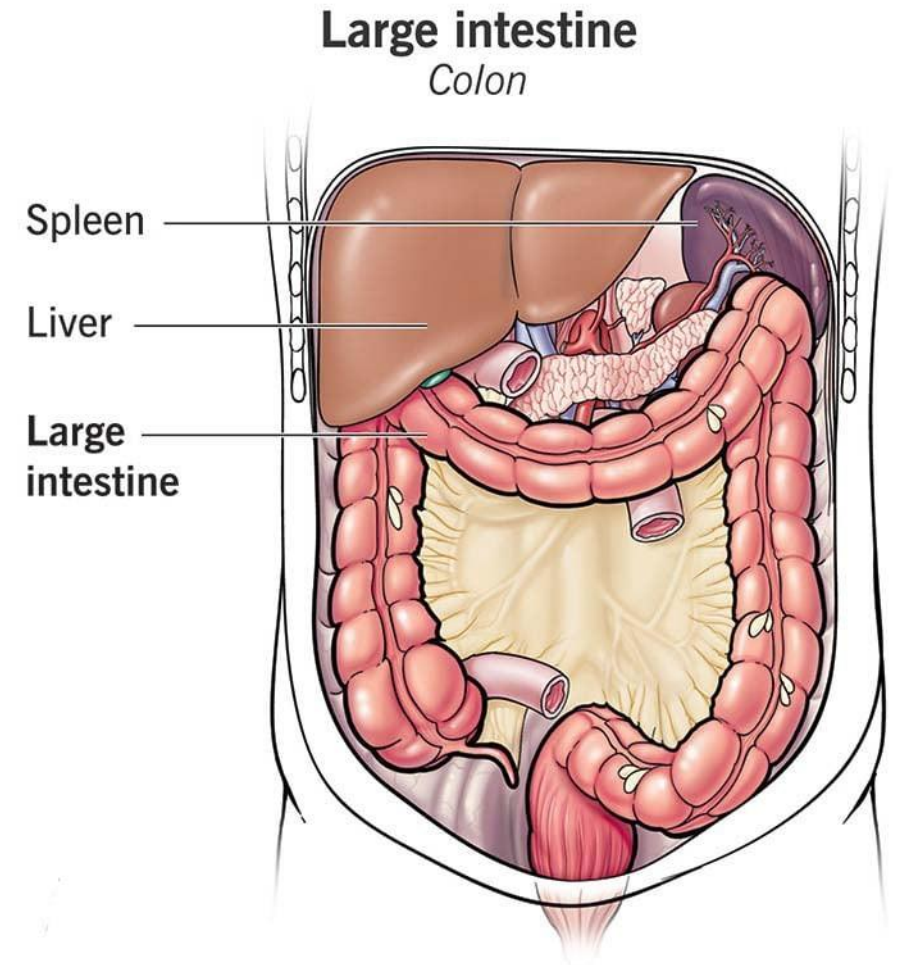
# The ileum:

- The final section of the small intestine.
- It is about 3 m long, and contains villi similar to the jejunum.
- It absorbs mainly vitamin B12 and bile acids, as well as any other remaining nutrients.
- The ileum joins to the cecum of the large intestine at the ileocecal junction.



# The large intestine

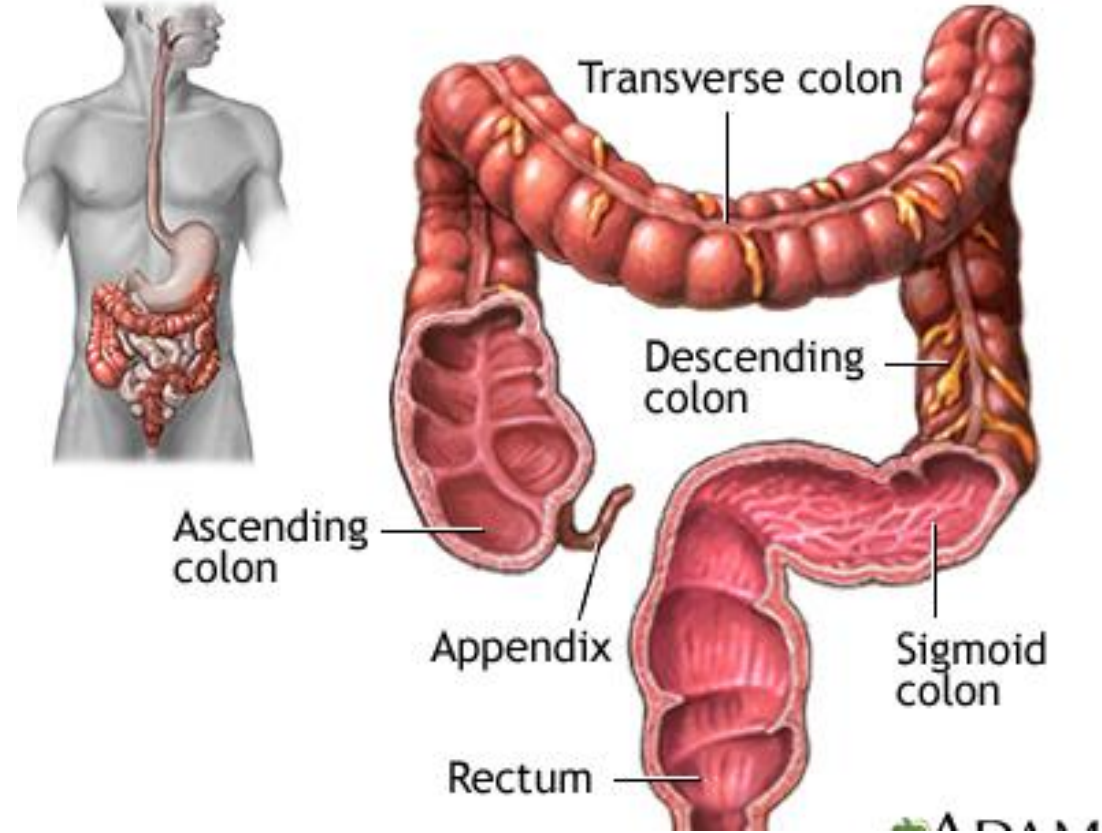
- The large intestine can easily be distinguished from the small intestine by:
  - 1. Taeniae coli, three thickened bands of longitudinal muscle.
  - 2. The sacculations of its walls between the taeniae, called haustra.
  - 3. Appendices epiploicae (omental appendages), the small pouches of omentum filled with fat.
  - 4. Much greater caliber.



# The colon

- The colon (large intestine) is a distal part of the gastrointestinal tract, extending from the **caecum** to the anal canal.
- Anatomically, the colon can be divided into four parts :—
  - Ascending:
    - » **Caecum**,
    - » **Vermiform appendix**,
  - Transverse ,
  - Descending and
  - Sigmoid .
- The colon averages **150cm** in length.

The parts of the large intestine form a frame for the small intestine



# The Cecum

The sac-like caecum (L. *caecus*, blind) is the 1<sup>st</sup> part of the large intestine and is obviously continuous with the [ascending colon](#).

The caecum is a broad blind pouch and is 5 to 7 cm in length.

- It is located in the right lower quadrant, where it lies in the iliac fossa, inferior to the [ascending colon](#).

The ileum opens into its superior part at the ileocaecal junction.

- ∇ • About 2.5 cm inferior to this, the [vermiform appendix](#) opens into its medial aspect.
- Unlike the ascending colon above it, the cecum is intraperitoneal.
- There is a cul-de-sac of the peritoneal cavity, called the ***retrocolic recess***. This recess is often deep enough to admit a digit.
  - In 64% of people, the [appendix](#) lies in it.

# ASCENDING COLON

- It is located in the right paracolic gutter and covered by the **peritoneum** on the front and sides, which binds it to the **posterior abdominal wall**.
- Its posterior surface is located on 3 muscles:
  - **Iliacus** ,
  - **Quadratus lumborum**,
  - Transversus abdominis.
- During its course from the caecum to the undersurface of the **liver**, it crosses 3 nerves.
  - From below upward these are:
    - Lateral cutaneous nerve of thigh,
    - **Ilioinguinal nerve**, and
    - **Iliohypogastric nerve**.
- Anteriorly it is related to the coils of the small bowel and right edge of the greater omentum.

# TRANSVERSE COLON

- It is the longest (20 inch/50 cm in length) and most mobile part of the **large intestine**.
- It stretches from the right colic flexure (in right lumbar region) to the left colic flexure (in the left hypochondriac region).
- Strictly speaking transverse colon isn't transverse but creates a dependent loop in front of loops of **small intestine** between the left and right colic flexures.
- The lowest point of loop generally goes up to the level of umbilicus but might occasionally extend into the pelvis. Therefore, the transverse colon is generally 'U' shaped

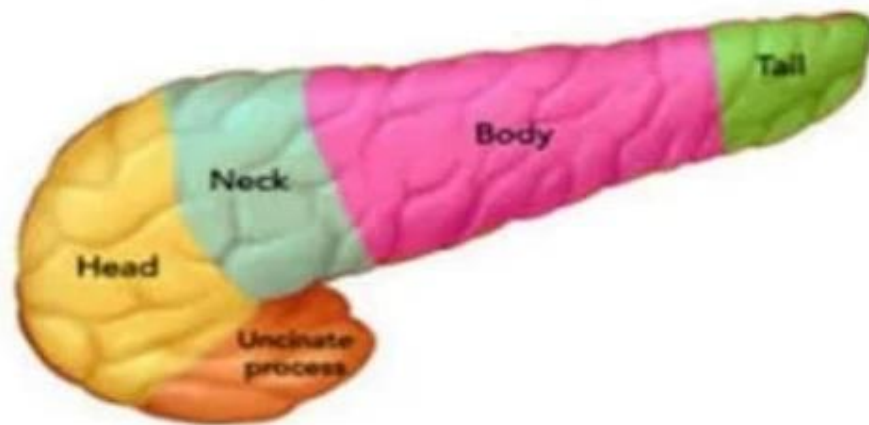
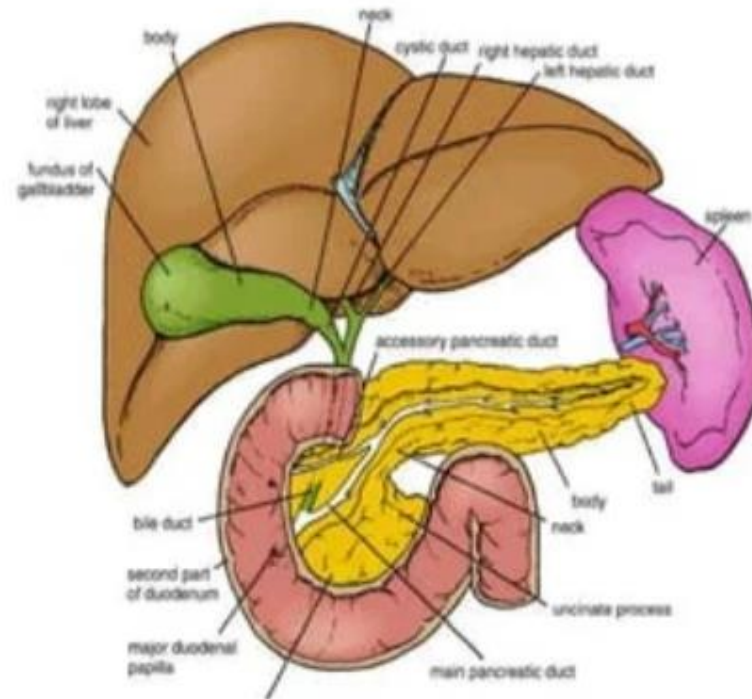
# DESCENDING COLON

- The descending colon is longer (25 cm), narrower, and more deeply found than the ascending colon.
- It goes from the left colic flexure to the very front of the left external iliac artery in the level of pelvic brim where it becomes continuous with the pelvic colon (sigmoid colon).
- It's covered by the peritoneum on the front and sides which fixes it in the left paracolic gutter and iliac fossa.

# Pancreas

- **LOCATION AND DESCRIPTION**

- Pancreas is an exocrine and endocrine gland.
- it is situated on the posterior abdominal wall behind the peritoneum and lies in the epigastrium and the left upper quadrant.
- Pancreas is divided into four parts:
  - Head
  - Neck
  - Body
  - Tail



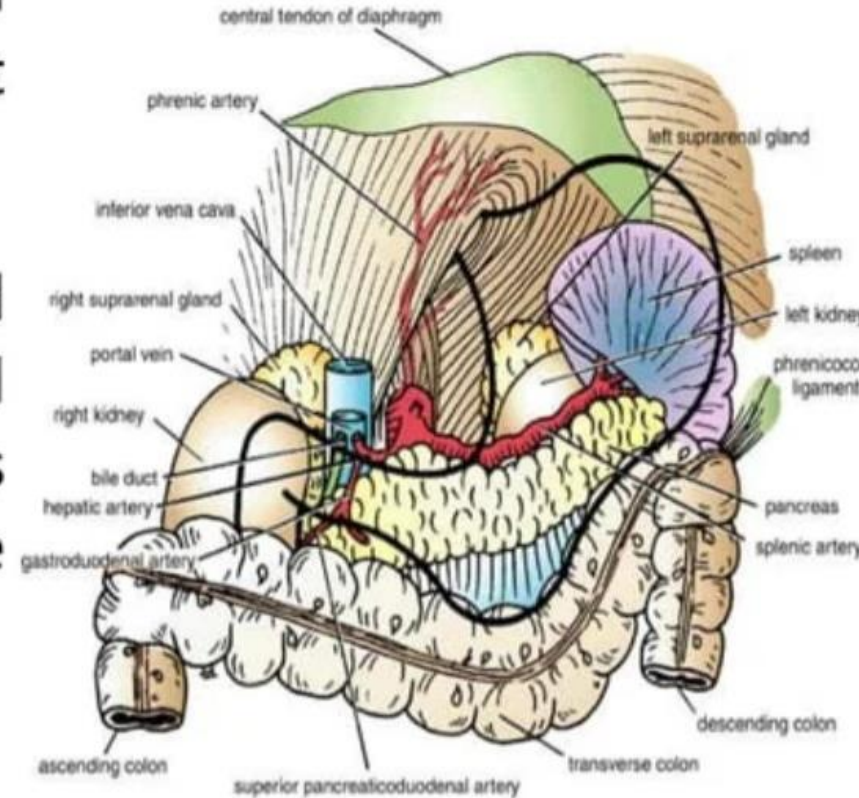


# PARTS

- 1. Head:** lies in concavity of the duodenum. A part of the head extends to the left behind the superior mesenteric vessels and is called the uncinata process.
- 2. Neck:** A constricted portion which connects the head to the body. lies in front of the beginning of the portal vein and the origin of the superior mesenteric artery from the aorta.

- 3. Body:** runs upward and to the left across the mid line.
- 4. Tail:** passes forward in the splenicorenal ligament and comes in contact with the hilum of the spleen

suprarenal glands



# Relations of the pancreas

- **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:** 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.



THANK  
YOU