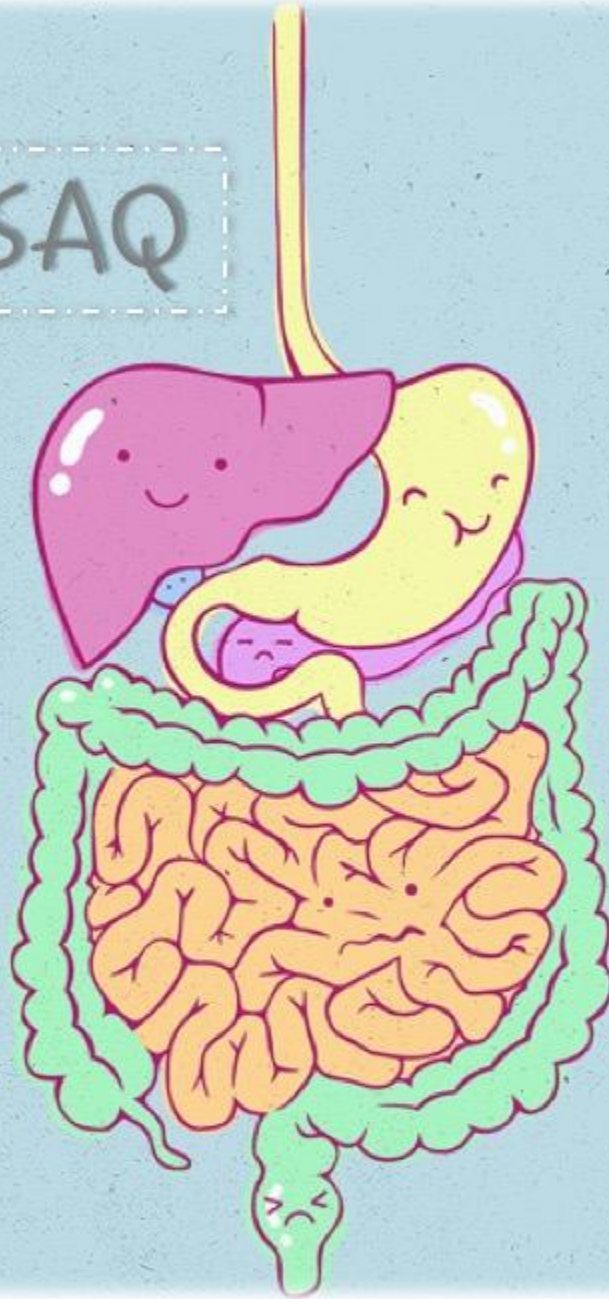




# GIT SAQ



## ANATOMY , HISTOLOGY , EMBRYOLOGY

### Table of content

The Subject	Anatomy	Histology	Embryology
Page Number	1-9	10-14	15

# Oral Cavity , Esophagus and stomach

**Mention the muscles of the soft palate.** 5 pairs of muscles

1- Tensor veli palatini. 2- Levator veli palatini. 3- Palatoglossus. 4- Palatopharyngeus. 5- Musculus uvulae.

**What are the motor & sensory nerve supply SOFT PALATE :**

- **Motor supply :** All muscles of the palate are supplied by pharyngeal plexus of nerves **EXCEPT** Tensor Veli Palatini (By MANDIBULAR NERVE).
- **Sensory supply :** *Maxillary nerve* & Glossopharyngeal nerve.

**Enumerate the intrinsic muscles of the tongue and motor supply and sensory innervation of tongue.**

1- Longitudinal                      2- Transverse                      3- Vertical fibers.

**The motor Supply of tongue :**

All muscles of the tongue are supplied by the Hypoglossal nerve **EXCEPT** Palatoglossus which is supplied by the Pharyngeal plexus

**The Sensory supply of tongue :**

- Anterior 2/3 of tongue : General by lingual nerve, taste by Chorda Tympani of the facial nerve
- posterior 1/3 of tongue : General and taste by glossopharyngeal nerve
- Root of tongue and epiglottis : General & taste sensations are carried by the (Vagus nerve).

**Enumerate the Extrinsic Muscles of the tongue.** 4 pairs

1- Palatoglossus.                      2- Styloglossus.                      3- Genioglossus                      4- Hyoglossus.

**ESOPHAGUS formed of 3 part , mention them:**

1- Cervical part    2- Thoracic part    3- Abdominal part

**There is a close relationship between the left atrium of the heart and the esophagus.**

**What is the clinical application?**

A *barium swallow* in the esophagus will help the physician to assess the size of the left atrium (Dilation) as in case of a heart failure.

**Mention The 3 anatomic constrictions of esophagus.**

- 1-The first is : at the junction with the pharynx.
- 2-The second is : at the crossing with the aortic arch and the left main bronchus.
- 3-The third is : at the junction with the stomach

**Write briefly about the considerable clinical importance of ESOPHAGEAL CONSTRICTIONS.**

- 1- They may cause difficulties in passing an esophagoscope.
- 2- In case of swallowing of caustic liquids (mostly in children), this is where the burning is the worst and strictures develop.
- 3- The esophageal strictures are a common place of the development of esophageal carcinoma.

**Write the ARTERIAL SUPPLY and VENOUS DRAINAGE of**

upper esophagus. Inferior thyroid artery and vein

Lower esophagus. Left gastric artery and vein.

middle esophagus ARTERIAL : thoracic aorta                      VENOUS : azygos veins.

**Mention the LYMPH DRAINAGE of esophagus.**

- Upper third : deep cervical nodes.
- Middle third:superior and inferior mediastinal nodes.
- Lower third:celiac lymph nodes in the abdomen

**Mention the NERVE SUPPLY of esophagus :**

- sympathetic fibers from the **sympathetic trunks**.
- parasympathetic supply comes form the **vagus nerves**.

**What is the Function of CARDIAC ORIFICE ?** Prevents esophageal regurgitation (reflux)

**What is the site of the stomach fundus?** It reaches to the left fifth intercostal space a little below the apex of the heart.

**Mention the parts of stomach.**

**2 Orifices:** 1-Cardiac orifice      2- Pyloric orifice

**2 Borders:** 1-Greater curvature      2- Lesser curvature

**2 Surfaces:** 1-Anterior surface      2- Posterior surface

**3 Parts:** 1- Fundus      2- Body      3- Pylorus:

The pylorus is formed of 3 parts : 1-Pyloric antrum      2-Pyloric canal      3- Pyloric sphincter

**Mention the arterial, venous drainge, lymph drainge and nerve supply of the stomach**

**Five arteries:**

- 1- Left gastric artery.      2- Right gastric artery.      3- Short gastric arteries.
- 4- Left gastroepiploic artery      5- Right gastroepiploic artery:

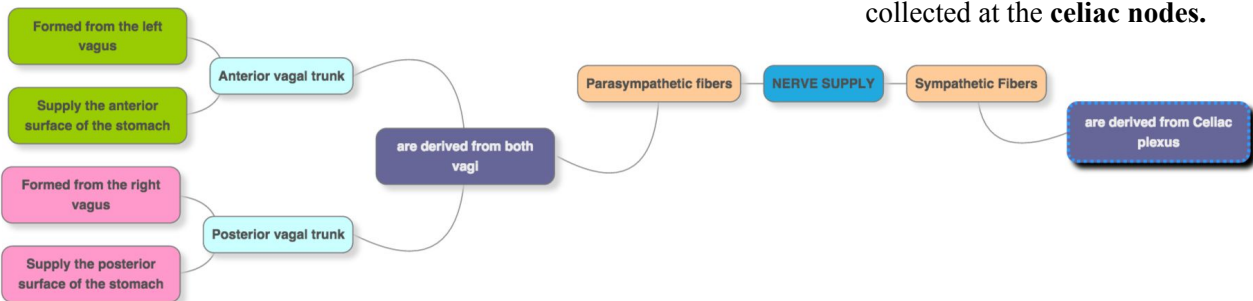
**Venous drainge :** All of them drain into the **portal circulation**.

**LYMPH DRAINAGE:**

- 1- Left and right gastric nodes.
- 2- Left and right gastroepiploic nodes
- 3- Short gastric nodes.

Ultimately all the lymph from the stomach is collected at the **celiac nodes**.

**NERVE SUPPLY :**



**Mention 4 POSTERIOR RELATIONS that form the stomach bed.**

- 1- Left crus of diaphragm.      2- Part of left kidney      3- Spleen.      4- Pancreas.

**Mention some differences between Greater and lesser Curvature ?**

<b>Greater</b>	Forms the <u>left</u> border of the stomach	Extends from the cardiac orifice to the pylorus.	Its <u>upper</u> part is attached to the spleen by <b>gastrosplenic ligament</b>	Its <u>lower</u> part is attached to the transverse colon by the <b>greater omentum</b> .
<b>lesser</b>	Forms the <u>right</u> border of the stomach.		Attached to the liver by the <b>lesser omentum, (gasrtohepatic ligament)</b> .	-

# Salivary Glands



## What is the types of salivary glands ? and what they prouduce?

Exocrine glands , secrete saliva .

## Mention the most important 3 salivary glands ans their secretion , blood and nerve supply?

1-parotid gland: prouduce a serous watery secretion

- Its arterial supply is : External carotid artery.

- Nerve supply: Parasympathetic fibers : from tympanic branch of glossopharyngeal nerve from inferior salivary nucleus.

- Venous drainage: retromandibular vein.

- Lymphatic: parotid & deep cervical lymph nodes.

2-Submandibular gland : prouduces a mixed serous & mucous secretion

3-sublingual gland :secretes saliva that is mostly mucous.

BOTH thier arterial and venous supply by Facial artery

Nerve supply : by Facial nerve(chorda tympani and lingual) from superior salivary nucleus

## Where is the opeining of parotid duct ?

opposite of the upper 2nd molar tooth

## Mention Two clinical application of Submandibular duct ?

The submandibular duct can be palpated through the floor of the mouth alongside the tongue.

Saliva can usually be seen emerging from the orifice of the duct.

## What are the structures lie within parotid gland?From superficial to deep

1- Facial nerve

2- Retromandibular vein

3- External carotid artery

## What is the most common duct of gland associated with calculus formaion?

Submandibular duct

## Mention the venous and lymphatic drainge of the 3 salivary glands?

Parotid gland drains into retromandibular vein and parotid & deep cervical lymph nodes.

submandibular&sublingual drain into Facial vein and submandibular lymph nodes

## Mention the five branches of Facial nerve ?

1- Temporal

2- Zygomatic

3- Buccal

4- Mandibular



5- Cervical.

# Pleuriptent stem cell

What are the Types of Stem Cells and mention some features of each of them ?

Embryonic Stem Cells (ESC)	Adult Stem Cells (ASC)
IVF embryos	Bone Marrow
Aborted embryos	Placental Cord
Cloned embryos	Mesenchymal Stem cells
Pluripotent	Multipotent
large number can be harvested	Limited numbers and more difficult to isolate
May cause immune rejection	No immune rejection
Ethical concerns	No Ethical concerns

What are the sources of stem cells, and what are the advantages and disadvantages for each one?

Sources	1. In Vitro Fertilization	2. Nuclear Transfer	3. Adult stem cells
<b>Advantages</b> 	<ul style="list-style-type: none"> <li>• Produce all cell types</li> <li>• Abundant in IVF clinics</li> <li>• Egg can be tricked of being fertilized by an electric shock.</li> </ul>	<ul style="list-style-type: none"> <li>• Produce all cell types</li> <li>• Abundant in IVF clinics</li> <li>• Genetic matching to specific patients.</li> </ul>	<ul style="list-style-type: none"> <li>• Genetic matching to specific patients.</li> <li>• Shows promise in therapies.</li> </ul>
<b>Disadvantages</b> 	<ul style="list-style-type: none"> <li>• Limited number of cell lines.</li> <li>• Could produce teratomas</li> </ul>	<ul style="list-style-type: none"> <li>• Not available for Humans</li> <li>• Could produce teratomas.</li> </ul>	<ul style="list-style-type: none"> <li>• Limited cell types.</li> <li>• Difficult to isolate.</li> <li>• Not found in all tissues.</li> </ul>

What are the three Potential of Stem Cells ?

- **Totipotent (Total):** Total potential to differentiate into any adult cell type “entire organism” (from early embryos)
- **Pluripotent (Plural) :** Potential to form all differentiated cell types (ESC) except placenta
- **Multipotent (Multiple) :** limited potential to form only multiple adult cell types (ASC)

What is the Goal of Stem Cell Therapies ?

To promote cell replacement in organs that are damaged and do not have the ability for self repair.



**List the 4 parts of pancreas and mention one fact related to each.**

**A-Head** → includes uncinata process    **B- Neck** → Superior mesenteric vessels emerges from its inferior border  
**C- Body** → splenic vein embedded in its posterior surface    **D- Tail** → ends at the splenic hilum

**What is the structure that is most likely to be injured during splenectomy?** Splenicorenal ligament.

**Mention the pancreatic ducts and where each empties.**

**A- Main duct (of Wirsung)** → Major duodenal papilla    **B- Accessory duct (of Santorini)** → Minor duodenal papilla

**Mention the blood supply to the pancreas parts, respectively.**

**A-Head & neck:** Superior & inferior pancreaticoduodenal arteries and veins    **B-Body & Tail:** Splenic artery and vein

**What is the final lymphatic drainage & nervous innervation of the pancreas?**

celiac and superior mesenteric lymph node, /Sympathetic: thoracic splanchnic nerves / Parasympathetic :Vagus nerve

**Mention the blood and nerve supply and lymphatic drainage of gallbladder?**

**-Blood supply:** - Cystic artery (from right hepatic - Cystic vein (into portal vein)

- Several small arteries and veins between liver and Gallbladder.

**-Nerve supply:** Vagus nerve and sympathetic    **-Hormonal supply:** CCK from duodenum in response to presence of fatty acids will causes contraction of Gallbladder.

**Lymphatic drainage :** drains into cystic lymph node which drain into hepatic lymph node which drain into celiac lymph node.

**List is the components and functions of Biliary system**

1- **Liver** : Secrete Bile.    2- **Gallbladder** : Stores and concentrate Bile.    3- **Bile duct** : Transport Bile to duodenum.

**The common bile duct at the posterior surface of head of pancreas will come into contact with which structure & Where the bile duct ends?**

Main pancreatic duct / It ends below by piercing the medial wall of second part of duodenum.

**What is the name of opening that receive pancreatic and bile duct ? and at what is the sphincter that control this opening ?**

They open into hepatopancreatic ampulla (ampulla of Vater) by the "major duodenal papilla" at the "sphincter of Oddi"

**Which part of Gallbladder come in contact with anterior abdominal wall and where exactly?**

Fundus :at the level of tip of ninth right costal cartilage.

**Which duct the gallbladder forms ,where & What is the name of the folds in that duct and its function?**

Cystic duct in the lesser omentum to join common hepatic duct. / spiral valve keep the lumen constantly open.

Small intestine is divided into 2 parts list them and what is their point of differentiation?

	Fixed part : <u>duodenum</u> <b>NO MESENTERY</b>	Free part : <u>jejunum &amp; Ileum</u> <b>WITH mesentery</b>
<b>Origin</b>	Foregut & Midgut	Midgut
<b>Arterial Supply &amp; Lymphatic drainage</b>	Coeliac artery & <u>Superior mesenteric arteries.</u>	Superior mesenteric artery & lymph node
<b>Venous Drainage</b>	Superior mesenteric A & Portal veins.	Superior mesenteric vein

.Regarding the duodenum mention the beginning , termination , peritoneal covering

**Beginning:** at pyloro-duodenal junction

**Termination:** at duodeno-jejunal flexure

**Peritoneal covering:** retroperitoneal

.Duodenum is divided into 4 parts mention each part with its surface anatomy

First part (horizontal or superior) → L1 Transpyloric plane

Second part (descending) → descends from L1 to L3

Third part ( Inferior ) → L3 subcostal plane

Fourth part (ascending) →ascends from L3 to L2

**What are the two openings of the 2nd part of duodenum?**

1- common openings of bile duct & main pancreatic duct : on major duodenal papilla.

2- opening of accessory pancreatic duct : on minor duodenal papilla.

**List two differences between Jejunum & Ileum.**

	<b>JEJUNUM</b>	<b>ILEUM</b>
<b>Wall</b>	Thicker (more plicae circulares)	Thinner (less plicae circulares)
<b>Appearance</b>	Dark red (more vascular)	Light red (less vascular)
<b>Lymphoid tissue</b>	Few aggregations	Numerous aggregations(Peyer's patches)

Part	Anterior	Posterior	Medial	Lateral
1 <sup>st</sup>	Liver	-Bile duct -Gastroduodenal artery -Portal vein		
2 <sup>nd</sup>	-Liver -Transverse Colon -Small intestine	Right kidney	Pancreas	R Colic Flexure
3 <sup>rd</sup>	-Small intestine -Superior mesenteric vessels	-Right psoas major -Inferior vena cava -Abdominal aorta -Inferior mesenteric vessels.		
4 <sup>th</sup>	Small intestine	Left psoas major		

**Relations**





# Large Intestine

## Classify the parts of large intestine according to their regions

- Cecum , Appendix - Ascending , Transverse , Descending colon in abdomen
- Sigmoid colon & rectum in pelvis - Anal canal in perineum

## List the three main CHARACTERISTICS OF COLON. (Remember they are not found in Rectum & Anal canal )

- 1- Teniae coli.
- 2- Sacculations (haustra)
- 3- Epiplioic Appendices.

## List the different parts of the colon according their peritoneal covering.

- Parts with mesentery: Transverse colon ,sigmoid ,appendix , cecum.
- Retroperitoneal : ascending& descending , upper 2/3 of rectum.
- Parts devoid of covering : lower1/3 of rectum , anal canal.

## What is the surface anatomy of appendix and list its possible positions.

Surface anatomy: It's base is Marked by : Mc'Burney's point.

Postion: 1- Retrocecal - most common- 2- Pelvic 3- Subcecal 4- Preileal 5- Postileal -least common-

## Classify the parts of large intestine according to Its origin and supply.

- Cecum - end of right 2/3 of transverse colon ( midgut,superior mesenteric artery, autonomic nerves)
- Left 1/3 of colon -end of anal canal ( hindgut,inferior mesentric artery, autonomic nerves)
- Lower part of anal canal ( ectoderm , inferior mesentric artery , somatic : inferior rectal nerve)

## .Mention the 2 colic flexures, and specify which one is in a high position

Hepatic & Splenic flexure (high in position & have more acute angle

## Where does the appendix open? Postro-medial surface of cecum

## .Describe the beginning, termination and length of the rectum

Begins at the level of S3, Terminates one inch below coccyx and it's 13cm long

## Mention the venous & lymphatic drainage of GIT

Venous: Portal circulation / Lymphatic: Preaortic lymph node

## Relations

	Anterior	Posterior	Superior	Inferior
<b>Cecum</b>	<ul style="list-style-type: none"> <li>•Greater momentum</li> <li>•Small intestine</li> <li>•Abdominal wall</li> </ul>	<ul style="list-style-type: none"> <li>•Psoas major</li> <li>•Iliacus</li> </ul>		
<b>Ascending colon</b>		<ul style="list-style-type: none"> <li>•Iliacus</li> <li>•Q. lumborum</li> <li>•Right kidney</li> </ul>		
<b>Descending colon</b>		<ul style="list-style-type: none"> <li>•Left kidney</li> <li>•Q. lumborum</li> <li>•Iliacus</li> </ul>		
<b>Transverse colon</b>		<ul style="list-style-type: none"> <li>•2<sup>nd</sup> Duodenum</li> <li>•Pancreas</li> <li>•SMV</li> </ul>	<ul style="list-style-type: none"> <li>•Liver</li> <li>•Gall bladder</li> <li>•Stomach</li> </ul>	•Small intestine
<b>Male rectum</b>		<ul style="list-style-type: none"> <li>•Seminal vesicles</li> <li>•Posterior urinary bladder</li> <li>•Prostate gland</li> </ul>	<ul style="list-style-type: none"> <li>•Sacrum</li> <li>•Sacral Plexus</li> <li>•Coccyx</li> </ul>	
<b>Female rectum</b>	<ul style="list-style-type: none"> <li>•Posterior vegina</li> </ul>			



SMV = Superior mesentric vessels

# Liver & Spleen



## Where is the liver located ?

In the right hypochondrium and epigastrium and extend into the left hypochondrium .

## Enumerate the three boundaries of bare area ?

1-anterior:superior layer of coronary ligment . 2-posterior :inferior layer of coronary ligment .  
3-laterally :right and left triangular ligment

## Mention the surfaces of liver ?

1- convex diaphragmatic surface (superior) 2-concave visceral surface (posteroinferior)

## Mention the fissures of the liver ?

1-left fissure is the continuous groove formed :  
anteriorly by the fissure for round legment (ligment teres) .  
posteriorly by the fissure for the legmentum venosum

2-Right fissure is the continuous groove formed:  
anteriorly by the fossa for the gallbladder  
posteriorly by the groove for the inferior vena cava

## What are the structures passing through the porta hepatis ?

1- hepatic ducts 2-branches of hepatic artery 3- branches of portal viens 4- hepatic nodes

## Mention three of relations of visceral surface of the liver ?

1- stomach and duodenum , 2-lesser omentum 3- GallBladder

**Describe briefly the spleen ?** Largest single mass of lymphoid tissue and located in the left hypochondrium, deep to 9, 10 & 11 ribs

## Mention the ligaments the are asscioted with spleen ?

1-Gastrosplenic ligament to the greater curvature of stomach (**carrying the short gastric and left gastroepiploic vessels**)  
2-Lienorenal ligament to the left kidney (**carrying the splenic vessels and the tail of pancreas**)

## Mention the nerve and arterial supply, venous and lymphatic dranige of spleen ?

1- **Splenic artery branch of celiac artery** , 2- **celiac plexus (nerve supply)**  
3- **splenic vein ( to portal vein)** , 4- **celiac nodes**

## What are the structures passing through the porta hepatis ?

1- hepatic ducts 2-branches of hepatic artery 3- branches of portal viens .

## Mention ligments of the liver ?

1- The falciform ligment.  
2-Ligamentum teres of liver the remains of the umbilical vein (**oblitrated umbilical vein**)  
3-Ligmentum venosum . Fibrous remnant of the fetal ductus venosus (**Oblitrated ductus venosus**)

## What are the lobes of the liver ?

1- Large right lobe → which is devided by caudate process into caudate and quadreate lobes .  
2- Small left lobe .

## Mention two of sites of portacaval anastemosis ?

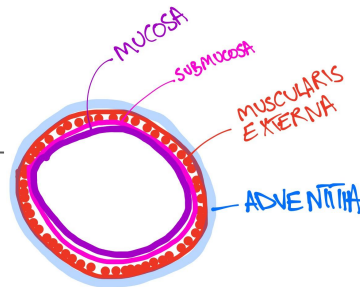
1- lower third of esophagus 2-upper anal canal

# Esophagus and stomach

**Mention the four layers that forms the general architecture of the alimentary tract, (from outside to inside)**

- 1- Adventita or Serousa
- 2- Muscularis externa
- 3- Submucosa
- 4- Mucosa

You can support your answer with a simple diagram :)



**What is the type of epithelial lining covering the mucosa of the Esophagus?**

Non-keratinized stratified squamous epithelium

**What is the type of epithelial lining covering the mucosa of the Stomach?**

Simple columnar epithelium mucus-secreting cells

**Mention the 2 layers of muscles in muscularis externa. (from inside to outside)**

- 1- Inner circular
- 2- Outer longitudinal

**Mention the additional layer in muscularis externa of the Stomach.**

Inner oblique

**Enumerate the 5 cells found in the fundus of stomach, and mention one feature of each.**

- 1- Parietal cells: Pyramidal, acidophilic cytoplasm and secrete HCl and gastric intrinsic factor.
- 2- Peptic cells: Columnar, basophilic cytoplasm and secrete pepsinogen.
- 3- Mucous neck cells: Secrete mucus.
- 4- Enteroendocrine cells: Secrete hormones.
- 5- Stem cells: Regenerative cells.

**What is the difference between the fundus pits and the pyloric pits?**

Fundic glands have short pits occupy one fourth of mucosa.

Pyloric glands have deep pits which occupy about half of mucosa.

**Mention the 2 types of plexuses and in which layer each can be found?**

Meissner's plexus > Found in Submucosa of esophagus

Auerbach's plexus > Found in Muscularis externa of esophagus

Mention the cell of PYLORIC gland .

- 1- Mucus neck cells (Mucus secreting cells)
- 2- Enteroendocrine cells: ( EC , G , D & A cell )
- 3- Stem cells.
- 4- Parietal cells.

# Salivary Glands



## Mention some minor salivary glands?

labial, buccal, palatine and lingual.

## Mention the types of salivary acini and what they are composed of:

- 1- serous acini (only serous cells)
- 2- mucous acini (only mucous cells)
- 3- mucoserous acini (mucous cells with a cap of serous cells)

## :Describe the shapes of each cells of salivary acini

**Serous** cells: pyramidal and round nuclei

mucous cells: pyramidal or cuboidal and flattened nuclei

## Write the all types of the duct system of salivary glands:

### 1-Intralobular ducts

A-Interclated ducts (lined by small cuboidal cells)

B-Striated ducts ( lined by columnar cells )

### 2-Interlobular ducts (lined by simple columnar epithelium)

3-Main duct (lined by stratified columnar epithelium which becomes nonkeratinized in the distal end

The gland	Submandibular	Parotid	Sublingual
<b>Briefly</b>	Produces 60% of saliva	Produces 30% of saliva and it is the largest one	produces 5% of saliva and it is the smallest one
<b>Type of cells</b>	Mixed but mostly serous	Purely serous	Mixed but mostly mucous
<b>Type of ducts</b>	---	Intralobular duct	---



### Mention the contents of the Intrahepatic & Extrahepatic passages

Intrahepatic passages	Extrahepatic passages
Bile canaliculi.	Right & left Hepatic ducts.
Bile ductules (canals of Hering).	Common hepatic duct.
Interlobular bile ducts.	Common bile duct

**What is the first portions of the bile duct system ?** Bile canaliculi.

**What is the function of the Microvilli & the tight junction ?**

**Microvilli :** project from the hepatocyte into the bile canaliculi, thus increasing the surface area.

**Tight junction :** between the cell membranes of the 2 hepatocytes prevent leakage of bile.

**What is the type of epithelium in Bile Ductules ?**

Near the peripheral portal areas, bile canaliculi empty into bile ductules composed of cuboidal epithelial cells called *cholangiocytes*.

**What is the sequence of bile formation and transportation.**

Bile secrete from heptocytes then is carried by Bile canaliculi → interlobular duct → intrahepatic duct → right and left hepatic duct → common *hepatic* duct (within free margin of lesser omentum) join cystic duct (on right side) → common Bile duct (Bile duct)

**What is the type of epithelium in interlobular bile ducts ?**

Simple cuboidal epithelium (becomes simple columnar epithelium near the porta hepatis).

**Talk about the gallbladder briefly ?** A saclike structure that stores, concentrates and releases bile.

Mucosa: highly folded. –Simple columnar epithelium.

–Lamina propria: contains mucous glands in the neck of gall bladder.

**What is the type of gland that is located in the pancreas ?**

Pancreas is a mixed gland:

–Exocrine part (acini & ducts):serous acini produces digestive pancreatic enzymes + Centroacinar cells.

–Endocrine part (islets of Langerhans): produces hormones.

# Small Intestine



**Mention three regions of the small intestine ..**

1- Duodenum. 2- Jejunum. 3- Ileum.

**To increase the surface area .. the mucosa has :**

- Plicae circulares. - Villi. - Intestinal crypts (crypts of Lieberkühn). -Microvilli (Brush border)

**What is the type of Epithelium in Duodenum ?** simple columnar epithelium with goblet cells.

**The Central core of Intestinal villi is contain ? ( mention 3 )**

1- Lymphocytes. 2- Fibroblasts. 3- Smooth muscle cells.

**Talk briefly about Surface columnar absorptive cells that covering the Villi?**

- They have brush border (microvilli).
- They are covered with thick glycocalx that has digestive enzymes.
- They have Junction complex (tight, adhering and desmosome junctions)

**Mention the cells that involved in the structure of Intestinal Glands (Crypts) ?**

1. Columnar absorptive cells. 2. Goblet cells 3. Enteroendocrine (EE) (DNES) cells  
4. Paneth cells 5. Stem cells

**Mention 3 types of Enteroendocrine cell and thier function:**

**EC :** secrete endorphin and serotonin. **S cells:** secrete secretin. **D cells:** secrete somatostatin

**What is the function of the M cell ( Microfold cells ) ?**

contains intraepithelial lymphocytes and macrophages. They phagocytose and transport antigens present in the intestinal lumen to the underlying lymphoid tissue cells to initiate the immune response to these antigens leading to the secretion of IgA.

**What are the Regional differences of small intestine ?**

Duodenum	Jejunum	Ileum
<ul style="list-style-type: none"> <li>- Its submucosa has <u>Brunner's glands</u></li> <li>- It is invested by serosa or adventitia</li> </ul>	<ul style="list-style-type: none"> <li>- has neither Brunner's glands nor Peyer's patches.</li> <li>- It is invested by serosa.</li> </ul>	<ul style="list-style-type: none"> <li>- Its lamina propria, opposite the attachment of the mesentery, has lymphoid nodules <u>Peyer's patches</u> that extend to the submucosa.</li> <li>- It is invested by serosa.</li> </ul>



**What is the type of Epithelium in Duodenum ?** simple columnar epithelium with numerous goblet cells.

**What are the components of the Colon's Mucosa ?** Shows only crypts (NO VILLI)

**What are the cells lining the crypts of Colon ?** (Hint : Like Small intestine & Vermiform appendix but without paneth cells)

1. Surface Columnar absorptive cells.
2. Goblet cells
3. Enteroendocrine (EE) (DNES) cells
4. M-cells
5. Stem cells .

**What is the special characteristic of muscularis externa of colon ?**

The longitudinal layer is not continuous but in the form of 3 ribbons ( Teniae Coli )

**What are the components of the Colon's Serosa ?**

- C.T covered by mesothelium.
- Has a fat-filled pouches called appendices epiploicae.

**Mention some differences between Colon and Vermiform appendix ?**

Similar to the colon, but with much smaller diameter, shallow crypts, more lymphoid nodules, and more EE cells

## Liver & Spleen

**What are the Contents of the Stroma & Classic Liver Lobule?**

**Stroma:** 1-Glisson's Capsule 2-Septa (Absent in humans) & Portal Areas (Portal tracts) 3-Network of reticular fibers

**Classic Liver Lobule:**

- 1- Central vein
- 2- Anastomosing plates of hepatocyte
- 3- Bile canaliculi
- 4- Liver sinusoids (hepatic blood sinusoids) In between the plate
- 5- Spaces of Disse (perisinusoidal spaces of Disse)

**Mention the contents of Portal Areas (portal tracts)?**

- 1- Arteriole (Branch of hepatic artery)
- 2- Venule (Branch of portal vein)
- 3- Bile ducts (interlobular bile ducts)

**Talk briefly about the Hepatocyte & mention some of its organelles and inclusions (deposits)**

**Hepatocyte:** Grouped in interconnected plates, liver sinusoids are located in the spaces between these plates.

Polyhedral in Shape with 1 or 2 nuclei (*vesicular with prominent nucleoli*) & Cytoplasm is acidophilic

**Organelles:** Mitochondria , Abundant ER , Golgi complex , Lysosomes & Peroxisomes

**Inclusions:** Glycogen , Lipid (few droplets) & Lipofuscin (old age).

**What is the type of Endothelial Cells of the liver sinusoids?**

- Fenestrated & discontinuous → free passage of plasma.
- Basal lamina is absent.

**What is a Kupffer cells and mention the function of it ?**

Are macrophages found on the luminal surface of the endothelial cells. The Function is phagocytosis.

**Mention the contents of space of Disse ( perisinusoidal spaces )**

- 1- Fat-storing cells (Ito cells): contain vitamin A-rich lipid & form reticulin.
- 2- Reticular fibers: (type III collagen)
- 3- Plasma of blood.
- 4- Microvilli of hepatocytes

**List some characteristic of white & red pulp that located in parenchyma of spleen?**

White Pulp	Red Pulp
<i>Periarterial lymphatic sheaths (PALS):</i> Housing T-lymphocytes	<i>Pulp (splenic) cords:</i> Extravasated blood cells, plasma cells, macrophages, and reticular cells and fibers
<i>Lymphoid nodules (with germinal centers):</i> Housing B-lymphocytes	<i>Blood sinusoids:</i> Are lined with elongated <i>fusiform</i> endothelial cells with large intercellular spaces & supported by discontinuous, circular basement membrane.

### From which part the duodenum develops ?

endoderm of primordial gut of : •Caudal part of foregut.

•Cranial part of midgut & from : Splanchnic mesoderm.

### List some of the congenital anomalies that may affect the duodenum with a brief explanation

- Duodenal stenosis**; results from **incomplete recanalization** of duodenum.
- Duodenal atresia**; results from **failure** of **recanalization** leading to **complete occlusion of the duodenal lumen**, (autosomal recessive inheritance).

### Talk about the development pancreas.

The pancreas develops from 2 buds arising from the **endoderm** of the **caudal part of foregut** :

- A ventral pancreatic bud** : which develops from the proximal end of hepatic diverticulum (forms the liver & gall bladder).
- A dorsal pancreatic bud** : which develops from dorsal wall of duodenum slightly cranial to the ventral bud.
- Most of pancreas** is derived from the dorsal pancreatic bud.

### What are the structures that formed by the ventral and dorsal bud ?

#### The ventral bud forms :

- Uncinate process.
- Inferior part of head of pancreas.
- main pancreatic duct

#### The dorsal pancreatic bud forms :

- Upper part of head.
- Neck.
- Body &
- Tail of pancreas.

Distal part : main pancreatic duct  
Proximal part : accessory pancreatic duct

### List some of the congenital anomalies that may affect the pancreas with a brief explanation

- Accessory pancreatic tissue**; located in the wall of the stomach or duodenum.
- Anular pancreas**; a thin flat band of pancreatic tissue surrounding the second part of the duodenum, causing **duodenal obstruction**.

### Talk about the development Small intestine .

- Derivatives of cranial part of the midgut loop** :
- **Distal part of the duodenum** (**proximal** part of **duodenum** is developed from **caudal part of foregut**)
- Jejunum
- Upper part of the ileum.

- Derivatives of the caudal part of midgut loop** :
- Lower portion of ileum.
- Cecum & appendix.
- Ascending colon + proximal 2/3 of transverse colon.
- Midgut is supplied by **superior mesenteric artery**.

### Name the STAGES OF DEVELOPMENT OF SMALL INTESTINE

- Preherniation stage.      •Stage of physiological umbilical hernia(6th week).      •stage of rotation of midgut loop.
- Stage of reduction of umbilical hernia (10th week) .      •Stage of fixation of various parts of intestine.

### List some of the congenital anomalies that may affect the small intestine with a brief explanation

**A- Congenital Omphalocele** : **due to** failure of reduction of physiological hernia to abdominal cavity at 10th week.

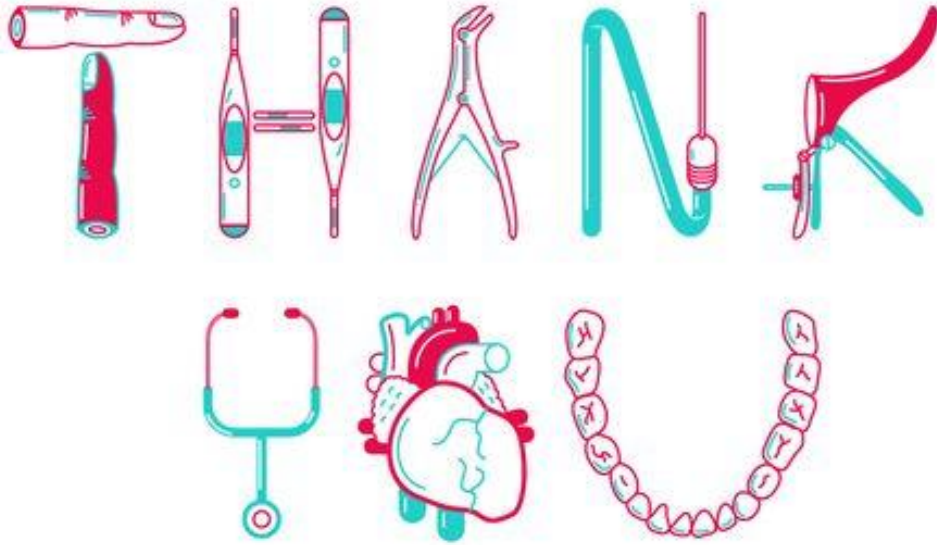
The hernial sac is covered by the **epithelium of the umbilical cord/ the amnion**.

**B- Umbilical Hernia imperfectly closed umbilicus** The hernial sac is covered by **skin & subcutaneous tissue**.

**C- Ileal (Meckel's) Diverticulum** It is a **small pouch from the ileum**, and may contain small patches of gastric & pancreatic tissues causing ulceration, bleeding or even perforation.

- It is the remnant of proximal part **nonobliterated part of yolk stalk** (or vitelline duct).





## DONE BY :

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- ☑ Abdulrahman Alkaff
- ☑ Yara Alzamil
- ☑ Moath Walbi
- ☑ Ebtihal al-mshawi
- ☑ Asmaa Rusaies
- ☑ Sarah AlSalman

Don't stop  
when you are tired.  
**STOP**  
when you are  
**DONE!**

*My Dear Valentine*