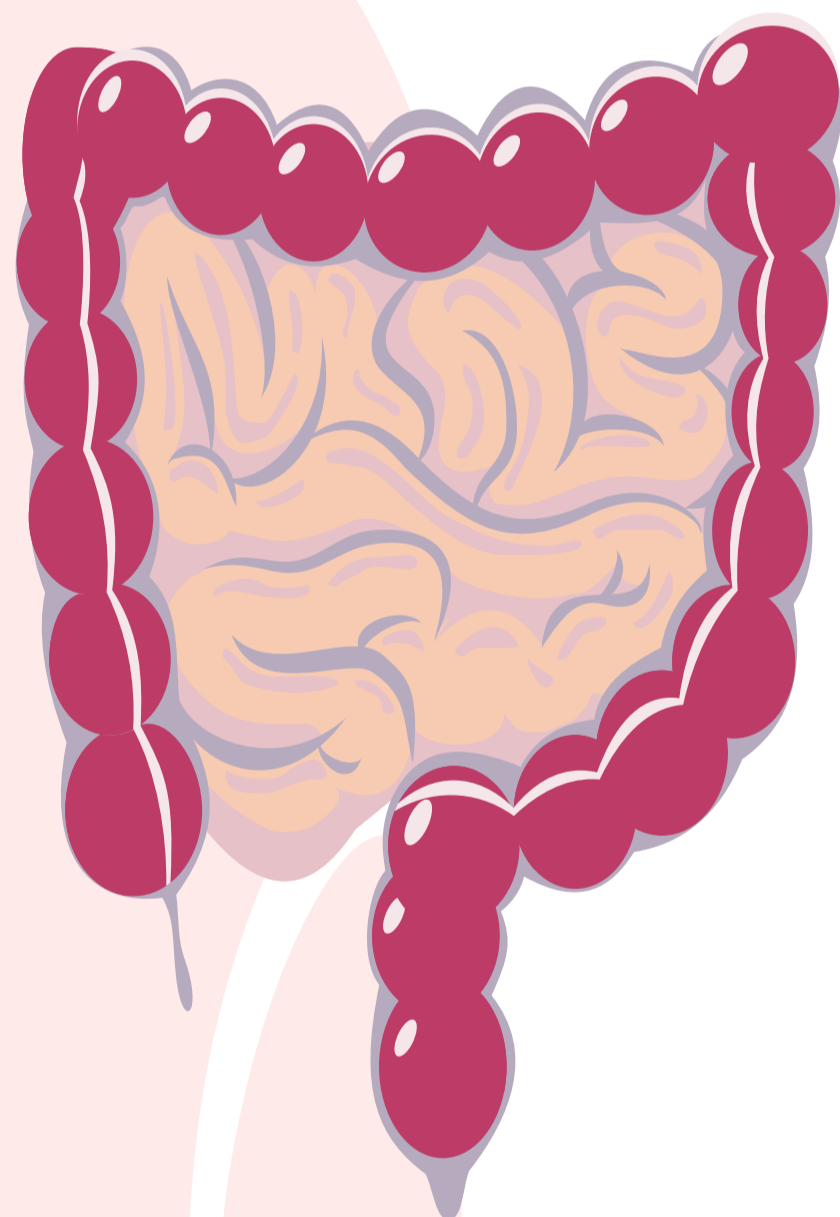


Esophagus & Stomach



Color index:

- Main text
- important
- female slides
- male slides
- Dr.note
- Extra

Editing File

[Gastrointestinal & Nutrition Block | Histology]

Objectives



At the end of this lecture you should be able to answer the following :

- Microscopic structure in correlation with the function of:

1. Esophagus.

2. Stomach.

Table of contents:

- **Alimentary canal**
- **Esophagus**
- **Stomach**
- **Fundus vs pylorus**
- **Stomach glands cell types**

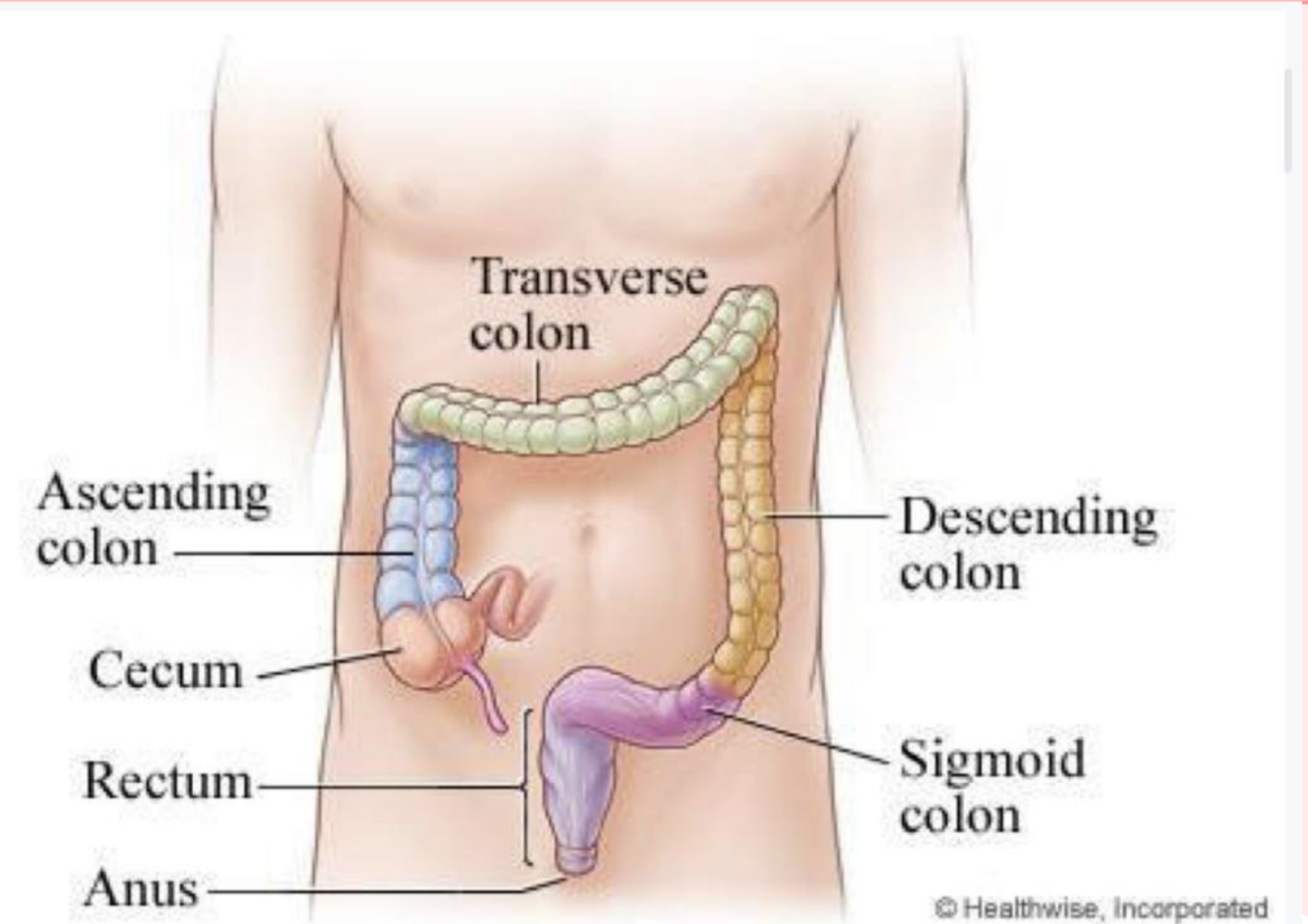
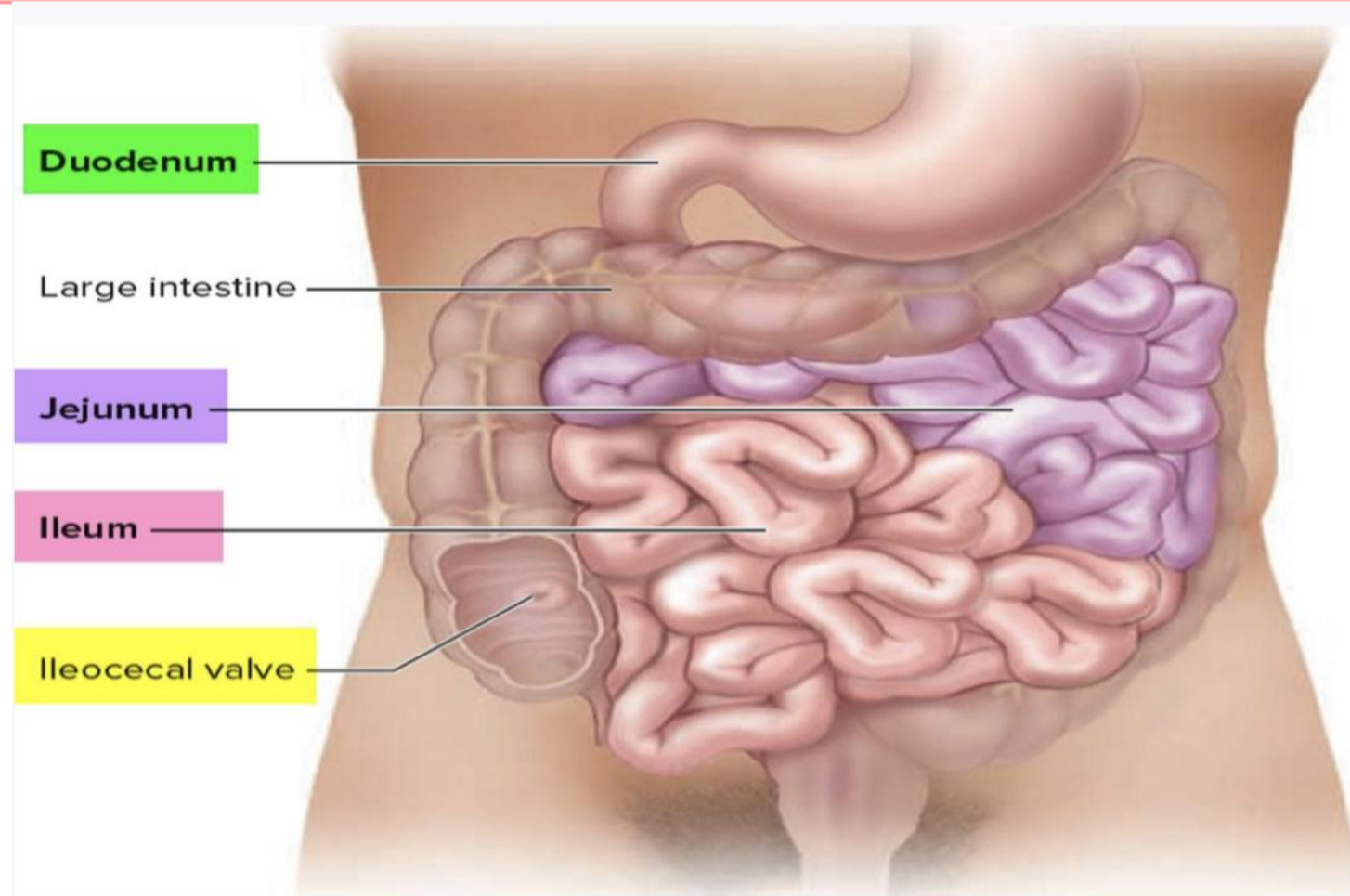
Alimentary Canal

Is the Tubular portion of digestive system

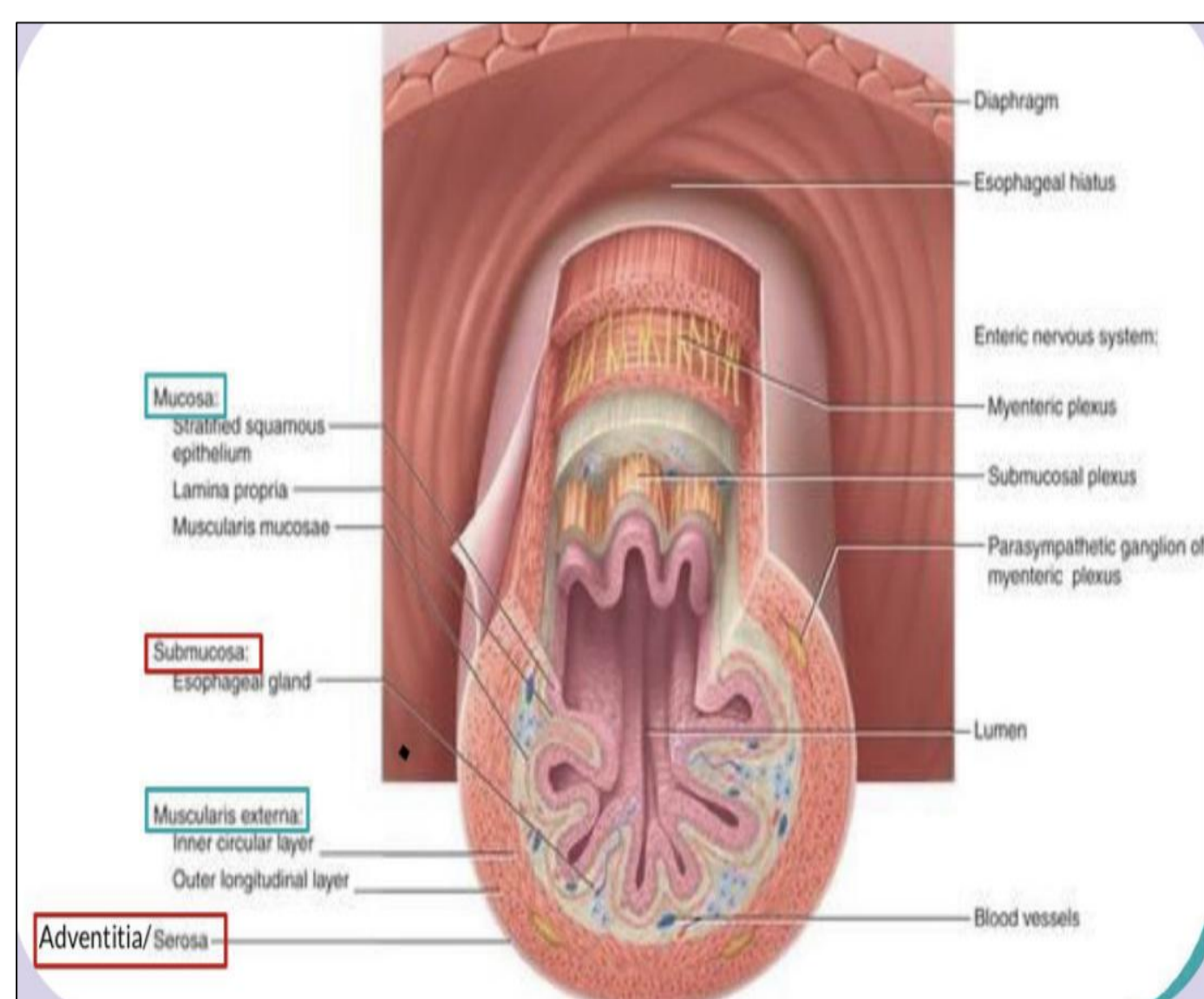
Subdivided into: Esophagus, Stomach, Small intestine, large intestine.

small intestine
(duodenum, jejunum and ileum)

large intestine (cecum, colon, rectum, anal canal, and appendix).



General Architecture of L/M Structure of Alimentary Canal:

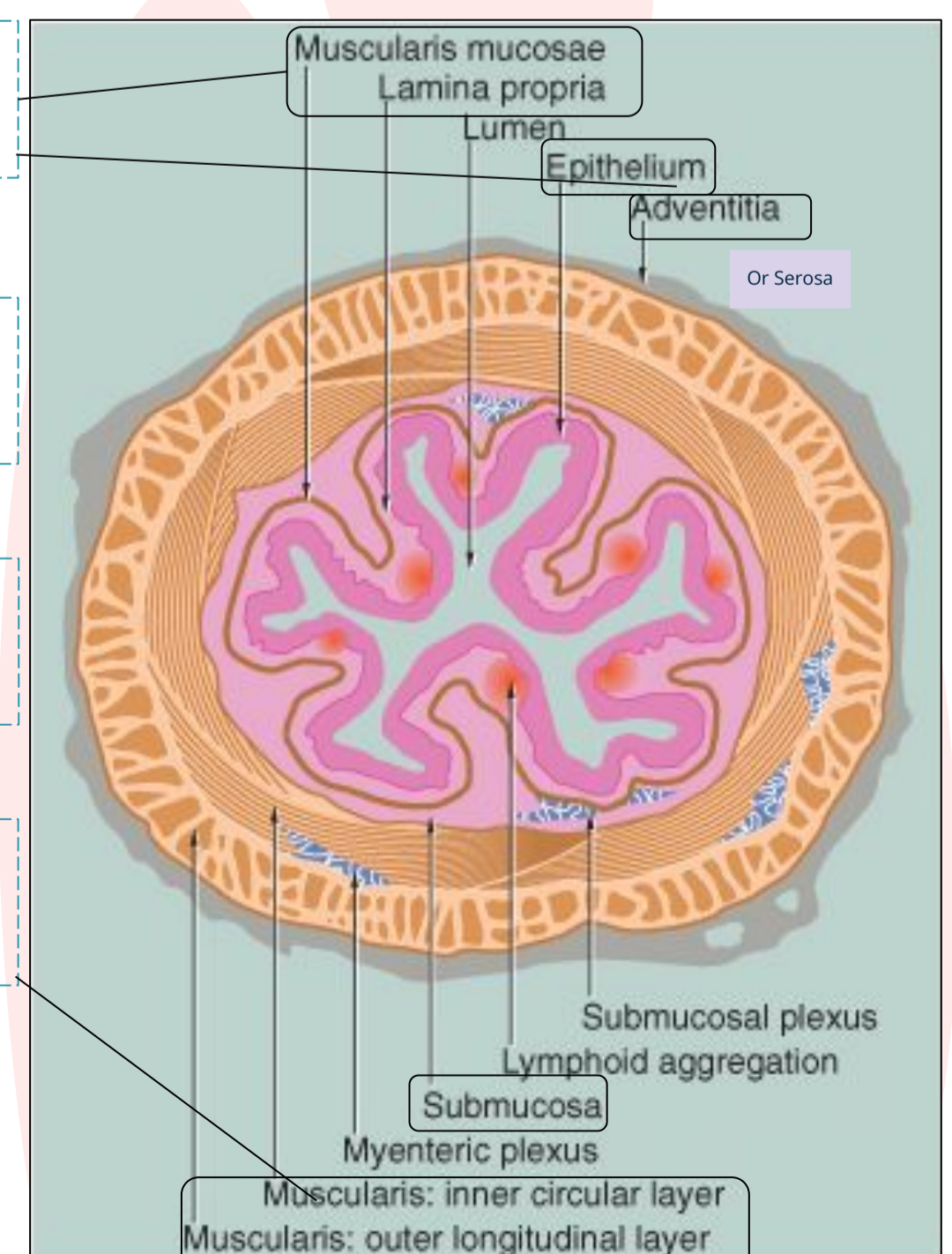


Mucosa

Submucosa

Adventitia/Serosa

Muscularis externa



Esophagus

Four concentric Layers:

Majority of the esophagus is in the thoracic Esophagus

Mucosa

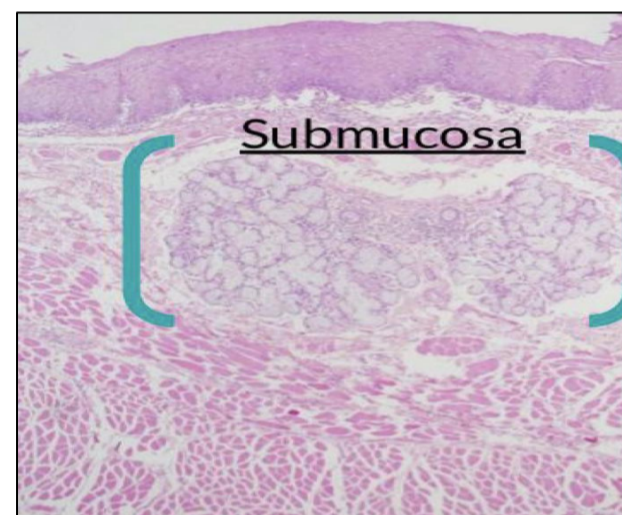
Is irregular to change the diameter for squeezing and conducting the food

- **Epithelial Lining:** Non-Keratinized **Stratified Squamous** Epithelium.
- **Lamina propria:** Loose areolar C.T. with mucosal **esophageal glands (secretion of mucus)** for lubrication found in the upper and lower ends. with little or no in the mid & lymphoid aggregations (nodules)
- **Muscularis mucosae:** Few layers of smooth muscle fibers.



Submucosa

Loose areolar C.T. with blood vessels, nerves, **submucosal esophageal glands** (secretion of mucus) and **Meissner's plexus** of nerve fibers and nerve cells.



Muscularis Externa

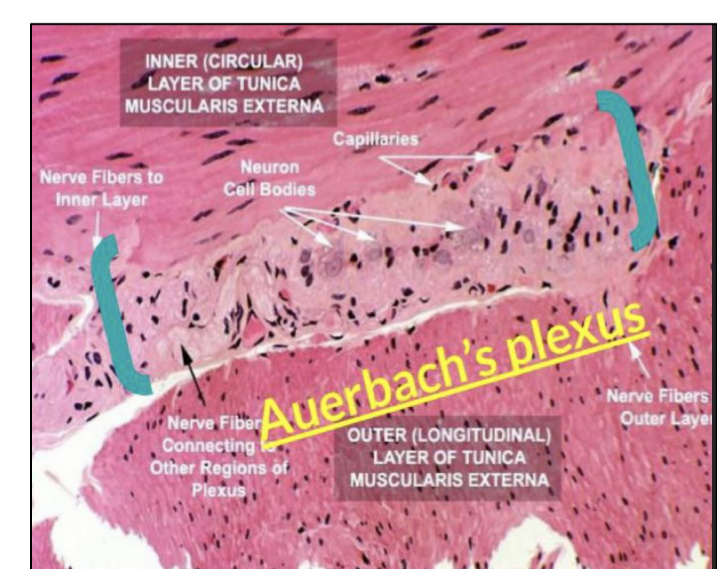
1- Two muscle layers : Inner circular & Outer longitudinal layers

- **Upper 1/3 :** Both are skeletal muscles (عشان كذا تقدر ترجع) (Near the oral cavity = skeletal muscle but involuntary)
- **Middle 1/3 :** Inner is smooth muscle & Outer is skeletal muscle
- **Lower 1/3 :** Both are smooth muscles (Near the stomach = smooth muscle)

2- **Auerbach's (myenteric) plexus** in between two layers.

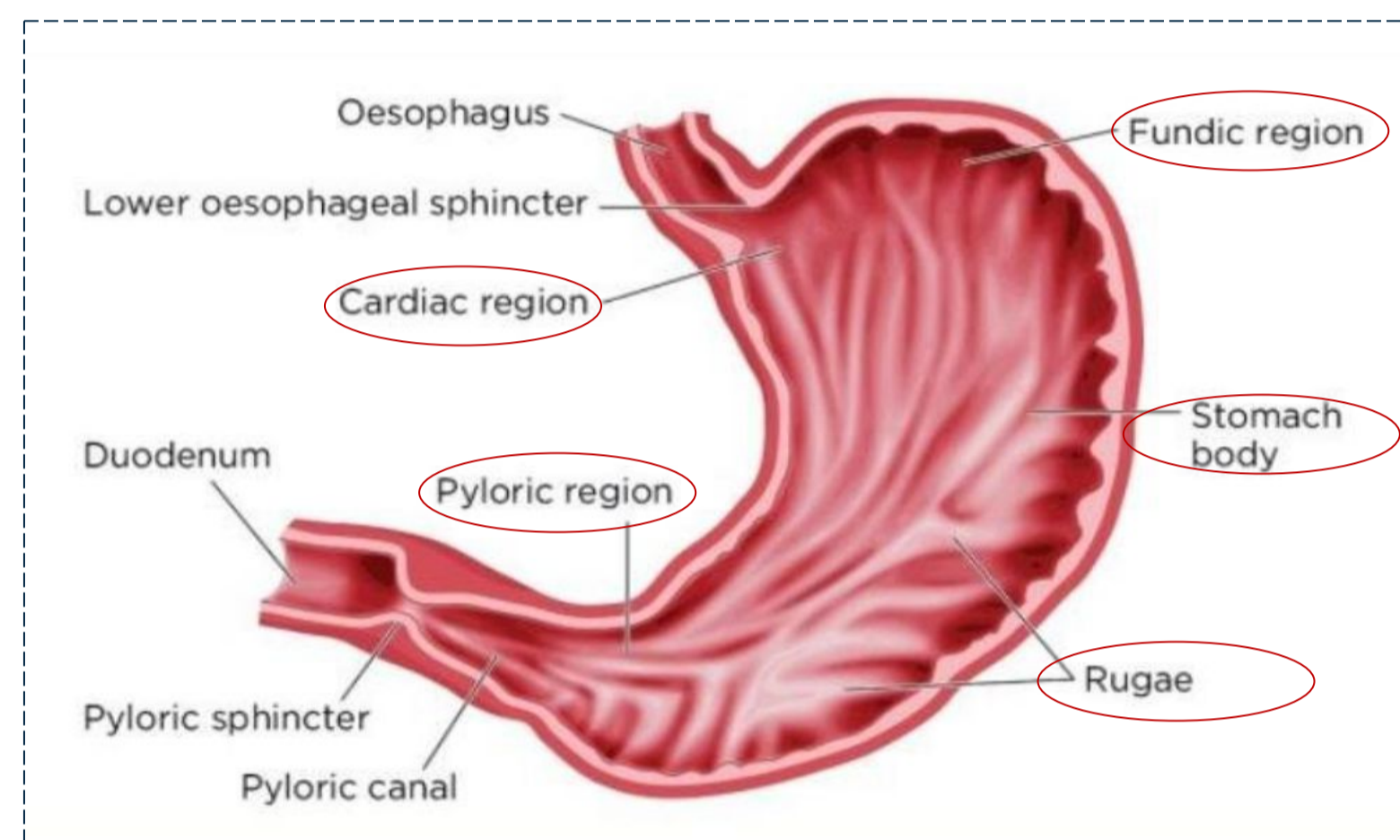
Serosa/Adventitia

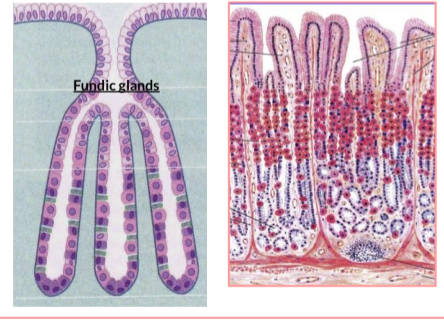
- **Adventitia:** Loose areolar C.T. **not covered by mesothelium** in the Cervical & Thoracic parts
- **Serosa:** Loose areolar C.T. **covered by mesothelium** (simple squamous epithelium) in the abdominal part of the esophagus (**Mesothelium present at 3Ps: Pleura & Pericardium & Peritoneum**)



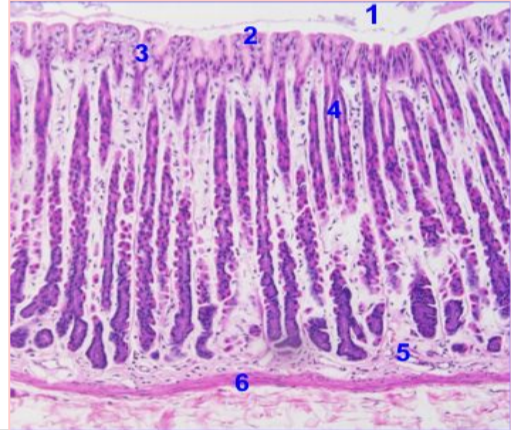
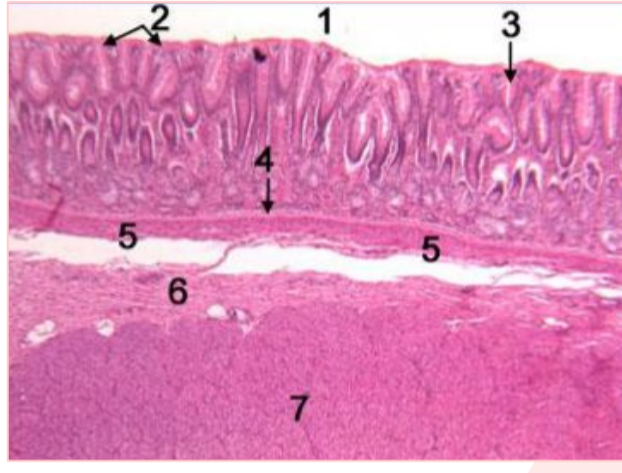
Stomach

- It has **4** regions : **1-cardia 2-fundus 3-body 4-Pylorus.**
- Mucosa has folds known as **rugae** that disappear in the distended stomach. **to (↑the surface area to ↑capacity).**



| Layers | Fundus(and body) of stomach | Pylorus of stomach |
|--------------------|---|---|
| Mucosa | Surface epithelium: simple columnar mucus-secreting cells. | |
| | <p>Composed of:</p> <ol style="list-style-type: none"> Surface columnar epithelium : simple columnar epithelium secretes mucus. Lamina propria : (C.T) Invaded by numerous Fundic glands & lymphoid elements. Muscularis mucosae: 2 layers of smooth muscle fibers.  | <ul style="list-style-type: none"> ● Invaded by pyloric glands. (It secretes mucus which coats and protect stomach) |
| Submucosa | <ul style="list-style-type: none"> ● Connective tissue containing blood vessels & nerves & Meissner's (submucosal) plexus. ● No glands. | |
| Muscularis Externa | <ul style="list-style-type: none"> ● Three smooth muscle layers: Inner oblique , Middle circular , Outer longitudinal. ● Auerbach's (myenteric) plexus. | <ul style="list-style-type: none"> ● Two smooth muscle layers : Inner circular , outer longitudinal. ● Auerbach's (myenteric) plexus. |
| Serosa | C.T. covered by mesothelium | |

Stomach (Fundus vs Pylorus)

| Content | Fundus | Pylorus |
|---------|---|---|
| Mucosa | <p>Mucosa of Fundus of Stomach:</p> <ol style="list-style-type: none"> 1.Lumen 2.Surface columnar epithelium. 3.pits of fundic glands. 4.Fundic glands. 5.Lamina propria. 6.Muscularis mucosae.  |  <ol style="list-style-type: none"> 1.Lumen. 2.Surface epithelium. 3.pits of pyloric glands. 4.Lamina propria. 5.Muscularis mucosae. 6.Submucosa. (another layer, it isn't a component within mucosa layer). 7.Muscularis externa. (another layer, it isn't a component within mucosa layer). |
| Glands | <p>Fundic glands have :</p> <ul style="list-style-type: none"> • Short pits : one fourth of mucosa. • Simple branched tubular glands. • Are rich in parietal & chief cells. | <ul style="list-style-type: none"> • Their Pits are deep : about half of the length of mucosa. • They are branched and convoluted many cross sections. <i>(It's function is neutralizing the acidity before reaching the small intestine by secreting mucus)</i> |

Stomach Glands cell types

Female Dr: for MCQ know the difference between
 - Cells of mucosa of fundus → contain surface columnar epithelium
 - Cell of fundic glands → do not contain surface columnar epithelium

| Cell type | Fundic glands | Pyloric glands |
|--|--|--|
| Peptic (chief) cells | <ul style="list-style-type: none"> • The predominant cell type . • Nucleus: basal , round. • Shape: columnar cells. • Cytoplasm: basophilic with apical secretory granules. • Secrete: pepsinogen. (inactive form of pepsin) | No peptic cells |
| Parietal (oxyntic) cells -Oxy=acidic -Parietal =due to part of it not sharing the lumen. | <ul style="list-style-type: none"> • Shape: pyramidal or polygonal. • Nucleus: central , round. • Cytoplasm: 1-Deeply acidic, rich in SER and mitochondria. (40% of cell volume). (due to its need for energy). 2- C-shaped intracellular canaliculus. To increase surface area. • Secrete: 1-HCL 2-Gastric intrinsic factor that helps in absorption Of vitamin B12. | Few (or no) parietal cells |
| Mucous neck cells | Secrete mucus | The predominant cell secrete mucus |
| Enteroendocrine (EE, DNES) cells. DNES =Diffuse neuroendocrine system. | <p>Entero = GIT , endocrine= to the blood .</p> <ul style="list-style-type: none"> • Enterochromaffin (EC) cells (subclass of EE cells): Secretes hormones (serotonin , endorphin) | <ul style="list-style-type: none"> • EC cells . • G cells (secrete gastrin). • D cells (secrete somatostatin). • A cells (secrete glucagon). |
| Stem cells | Regenerative cells (renew the other cell types) | |

MCQs

01 Which of the following cells are not found in the pyloric glands?

| | | | |
|----------------------|---------------|------------|-----------------------------|
| A- Mucous neck cells | B- Stem cells | B- A cells | D- Parietal (oxyntic) cells |
|----------------------|---------------|------------|-----------------------------|

02 Which one of the following epithelium lines the stomach?

| | | | |
|--|------------------------------------|--------------------|------------------------------|
| A- Non-keratinized stratified squamous | B- Keratinized stratified squamous | C- Simple columnar | D- pseudostratified columnar |
|--|------------------------------------|--------------------|------------------------------|

03 Which of the following cells secretes pepsinogen?

| | | | |
|----------------|-------------------|--------------------|-------------------------|
| A- Chief cells | B- Parietal cells | C- Salivary glands | D- Inferior of duodenum |
|----------------|-------------------|--------------------|-------------------------|

04 Which one of the following is lined with stratified squamous epithelium?

| | | | |
|----------|-------------|--------------|------------|
| A- Colon | B- Duodenum | C- Esophagus | D- Stomach |
|----------|-------------|--------------|------------|

05 The predominant of pyloric glands are :

| | | | |
|------------------|----------------|--------------------|----------------------|
| A- Oxyntic cells | B- Chief cells | C- Enteroendocrine | D- Mucous neck cells |
|------------------|----------------|--------------------|----------------------|

Answer key:

1. D
2. C
3. A
4. C
5. D

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