جامعة ساوة الاهلية
كلية التقنيات الصحية والطبية
قسم التخدير - اللجنة العلمية

SAWA UNIVERSITY

ASTRO INTESTINAL TRACT GENERAL REVIEW AND SURGICAL APPROACHES

جامعة ساوة

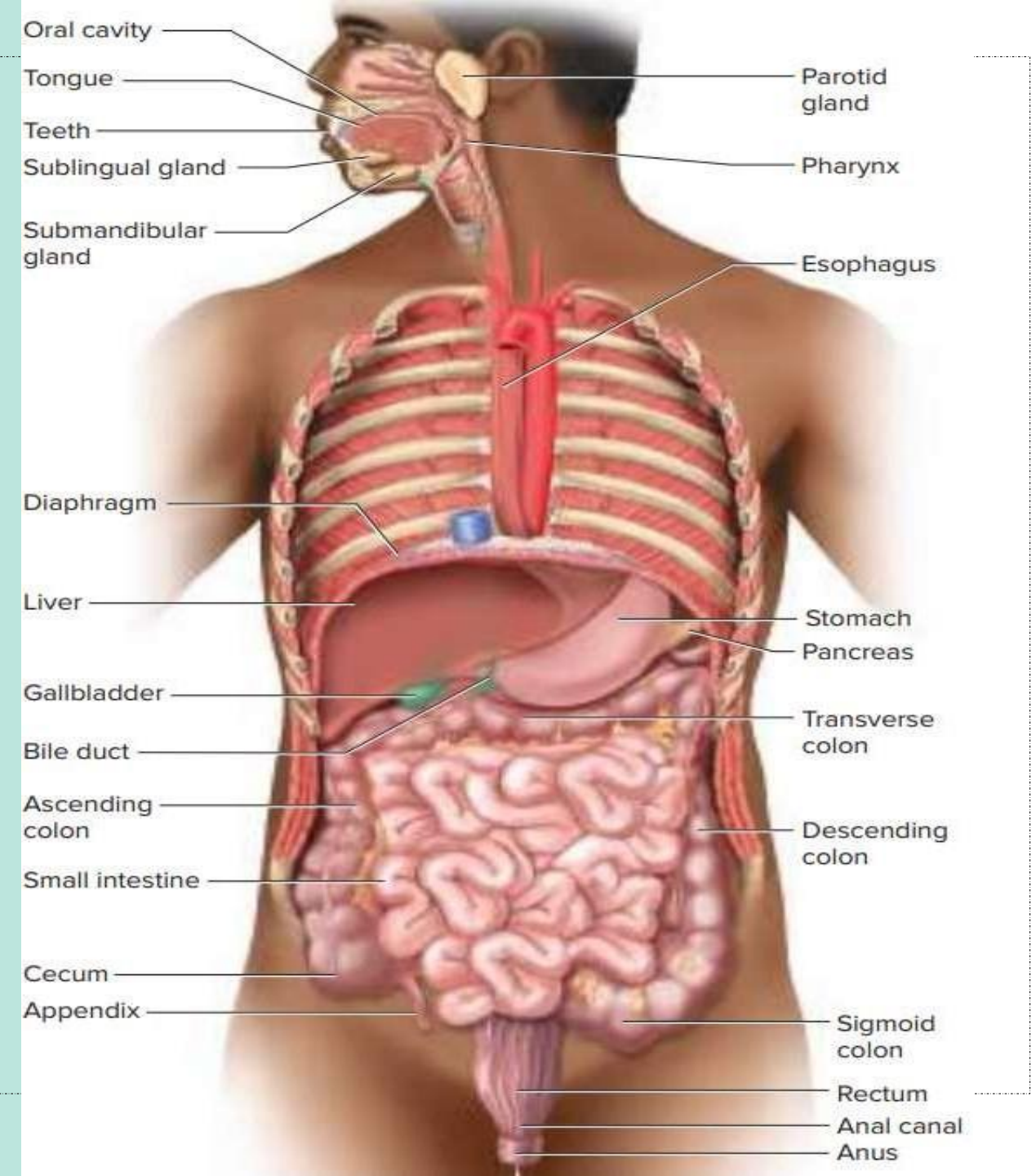
كلية التقنيات الصحية والطبية

قسم تقنيات التخدير

المرحلة (الثالثة)

اسم المحاضر: م.م. عدنان صاحب الفرطوسي

رقم المحاضرة: 1


Oral cavity
Tongue
Teeth
Sublingual gland
Submandibular gland
Parotid gland
Pharynx
Esophagus
Diaphragm
Liver
Stomach
Pancreas
Gallbladder
Transverse colon
Bile duct
Ascending colon
Descending colon
Small intestine
Cecum
Appendix
Sigmoid colon
Rectum
Anal canal
Anus

- Digestive Function
- The digestive system is the organ system that processes food, extracts nutrients from it, and eliminates the residue. It does this in five stages:
- 1. ingestion, the selective intake of food;
- 2. digestion, the mechanical and chemical breakdown of food into a form usable by the body;
- 3. absorption, the uptake of nutrient molecules into the epithelial cells of the digestive tract and then into the blood or lymph;
- 4. compaction, absorbing water and consolidating the indigestible residue into feces; and finally,
- 5. defecation, the elimination of feces

- Digestive system includes the mouth, pharynx, esophagus, stomach, small intestine, and large intestine
- The teeth, tongue, salivary glands, liver, gallbladder, and pancreas are considered accessory organs of the digestive system.
- The digestive tract is a muscular tube extending from mouth to anus.

Anatomical feature

Most of the digestive tract with a wall composed of the following tissue layers in order from the inner to the outer surface:

- Mucosa (The inner lining of the digestive tract)
  - Epithelium
  - Lamina propria (a loose connective tissue layer)
  - Muscularis mucosae(a thin layer of smooth muscle)

- Submucosa(thicker layer of loose connective tissue containing blood vessels and lymphatics, a nerve plexus, and in some places, glands that secrete lubricating mucus into the lumen.
- Muscularis externa
  - Inner circular layer
  - Outer longitudinal layer
- Serosa
  - Areolar tissue
  - Mesothelium

Control of GIT functions:

1. **Nervous control (control motility and secretion):**

a. Intrinsic control (local) specific for GIT, it is called enteric nervous system (ENS) which has neurons, nerve fibers, receptors and chemical transmitters.

- The enteric nervous system is composed of two layers of neurons and connecting fibers, the outer layer called the **myenteric (Auerbach,s) plexus** which controls mainly the GIT movement. The inner layer called the **submucous(Meissner's) plexus**, which is important in controlling secretion and blood flow and also subserves many sensory functions, receiving signals from the gut epithelium and from stretch receptors in the gut wall.

All these plexuses are connected to each other in some way, and the plexus in the upper GIT are continuous with neurons plexus in lower GIT.

- The Meissner's plexus are usually attach to receptors in mucosa, these receptors are of 2 types (chemoreceptors :stimulated by chemical nature of food, and mechanoreceptors :stimulated by mechanical stimuli e.g. stretch and pressure)
- Chemical transmitters of GIT: The usual chemical transmitter is acetylcholine but in some neurons there are other transmitters (peptide in nature)→Glucagons, substance P (pain), and VIP (vasoactive intestinal polypeptide).

- If we remove all neurons from GIT except enteric nervous system, all parts of GIT with

  work normally.
- **b. Extrinsic control related to autonomic nervous system:**
- 1. Parasympathetic : supply to the gut is divided into cranial and sacral

  divisions. The cranial division is mediated almost entirely through the vagus.

  Vagus nerves innervate esophagus, stomach, little innervations to small

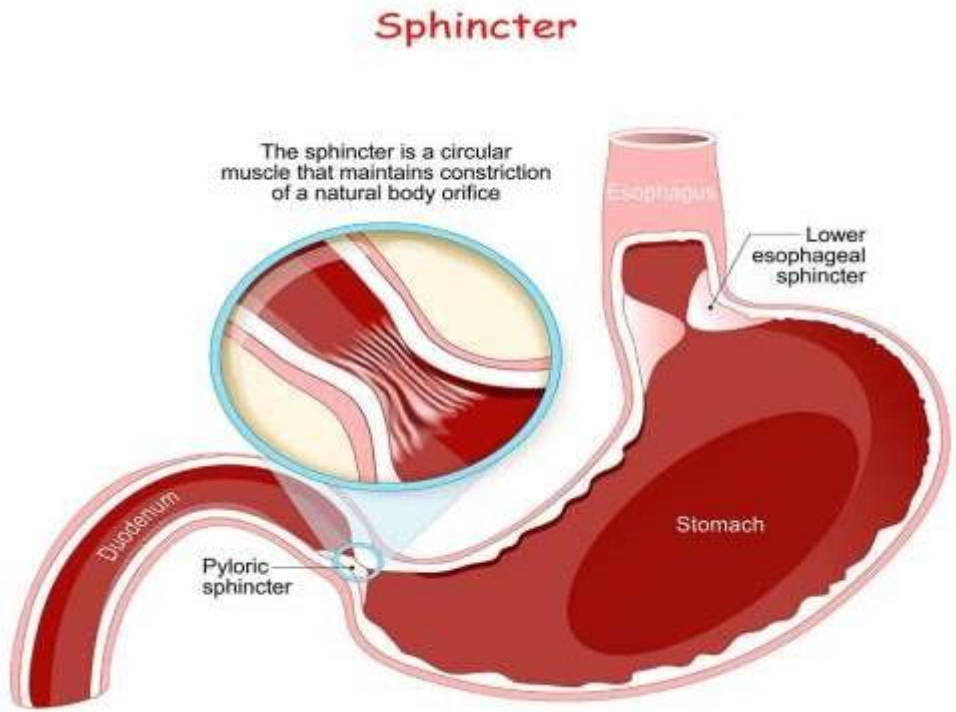
  intestine, pancreas, and first half of the large intestine. The sacral fibers

  originate in S2, S3 S4 sacral segments of the spinal cord, and supply the

  distal part of the large intestine.

- Stimulation of the fibers (parasympathetic) release acetylcholine and cause a general increase in the activity of the entire enteric nervous system which in turn enhances the activity of most GIT functions, and causing sphincters to relax, so they are stimulatory to GIT.

2. Sympathetic : The fibers originate in the spinal cord between the segmentsT8 and L2. Stimulation of the sympathetic nervous system inhibits activity in the GIT, causing sphincters to contract, they inhibit the secretion of acetylcholine, inhibit the motility and secretion, so they are inhibitory the GIT.



Humoral control (hormonal control):

- This is done through gastro intestinal hormones secreted from GIT mucosa including:
- 1.Gastrin hormone: It is polypeptide, released from antrum of the stomach by cells called G-cells. The main stimulus for its release is the presence of food in the stomach. Food in the stomach → stretch the stomach → stimulate mechanoreceptor and chemical materials in the food →stimulate chemoreceptor s → gastrin secretion
- 2.Action of gastrin:
- 1. Increases gastric motility and secretion.
- 2. Closing the lower esophageal sphincter (between esophagus and stomach).
- 3. Increases small intestinal motility →gastro-enteric reflex.
- 4. Increases large intestinal motility →gastro-colic reflex.
- 5. Relaxes pyloric sphincter.

3.Cholecystokinin-pancreazymin (CCK-PZ):

.Released by mucosa of upper part of small intestine, mainly the duodenum.

.Main stimulus for its release is the presence of fat in the duodenum.

Actions:

1. Decreases the secretion and motility of stomach, so delays digestion of food (delays the feeling of hunger).
2. Contract the gall bladder and causes release of bile.
3. Stimulates the pancreatic exocrine secretion (secretion of digestive enzymes).

3.Secretin:

- Released from mucosa of upper small intestine, mainly the duodenum.
- Stimulus for secretion: acid in duodenum.
- Actions:

1. ↓ Gastric secretion and emptying.
2. ↑ Pancreatic exocrine secretion (HCO3 -).

4.Gastric inhibitory peptide (GIP) :

- Released from duodenum.
- Stimulus for secretion: acid and fat in duodenum.
- Actions: Inhibits gastric secretion and emptying .

The movement of GIT (GIT motility): There are 2 types of movements in GIT:

1. Mixing movement: local mix the food with secretion in GIT, done by visceral smooth muscle of the organ.
2. Propulsive movement: push the food from one part of GIT to the other. It is also called peristalsis.

It is due to contraction of the smooth muscle and it's not unique for GIT it is also occurs in other

organs like ureters.

- Peristalsis has one direction of movement called oral to caudal direction

(oral to rectal) while in abnormal conditions e.g. vomiting, the direction will

be reversed (opposite).

• The stimulus for peristalsis is distention of lumen of GIT by food (or other material even a foreign body). This distention is going to stimulate the mechanoreceptor which will send impulse to Myenteric nerve plexus which will initiates peristalsis.

•Peristalsis in intestine need intact and integrated regularly distributed Myenteric nerve plexus. If any part of GIT is removed then re-sutured in opposite side → no peristalsis.

• Peristalsis is due to local Myenteric nerve plexus and it is controlled by extrinsic nerve system (sympathetic → inhibitory, parasympathetic → stimulatory).

• In vomiting the peristalsis is reversed and this is done by extrinsic nervous system.

THANK YOU

SCAN TO GET THE LECTURE