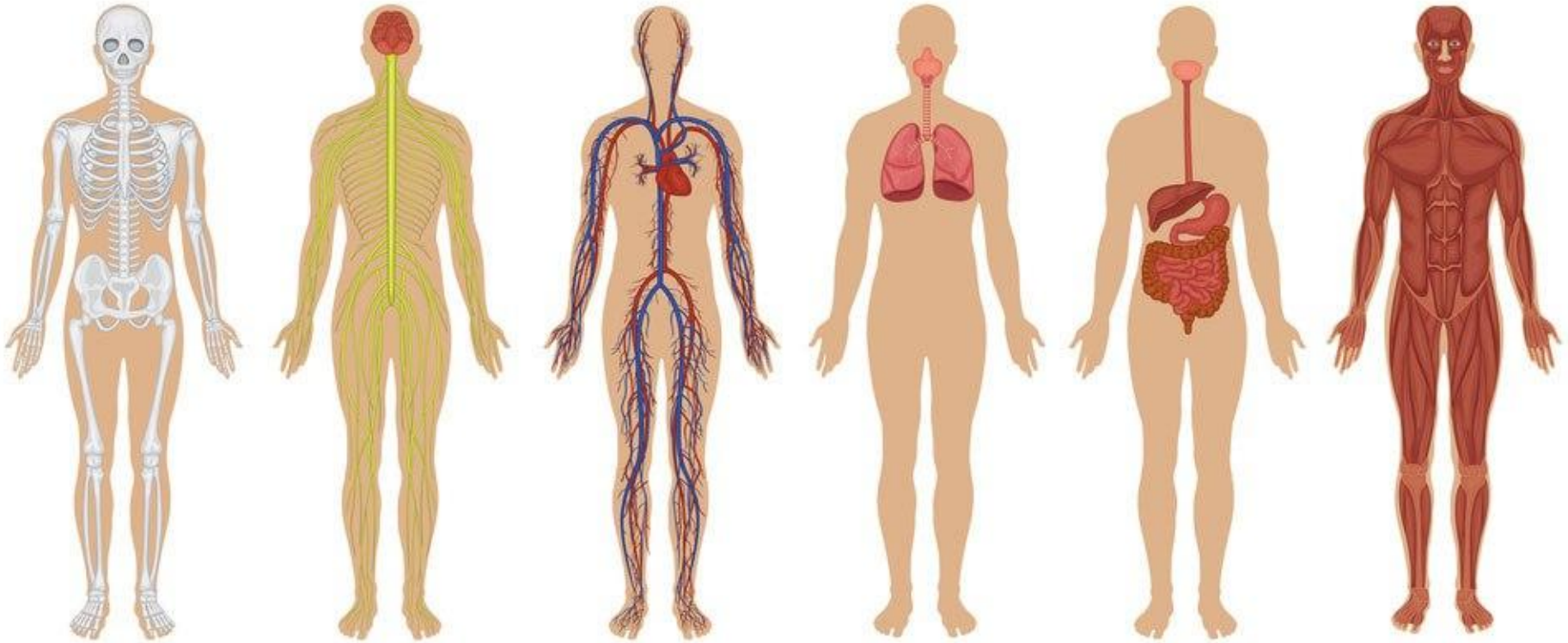
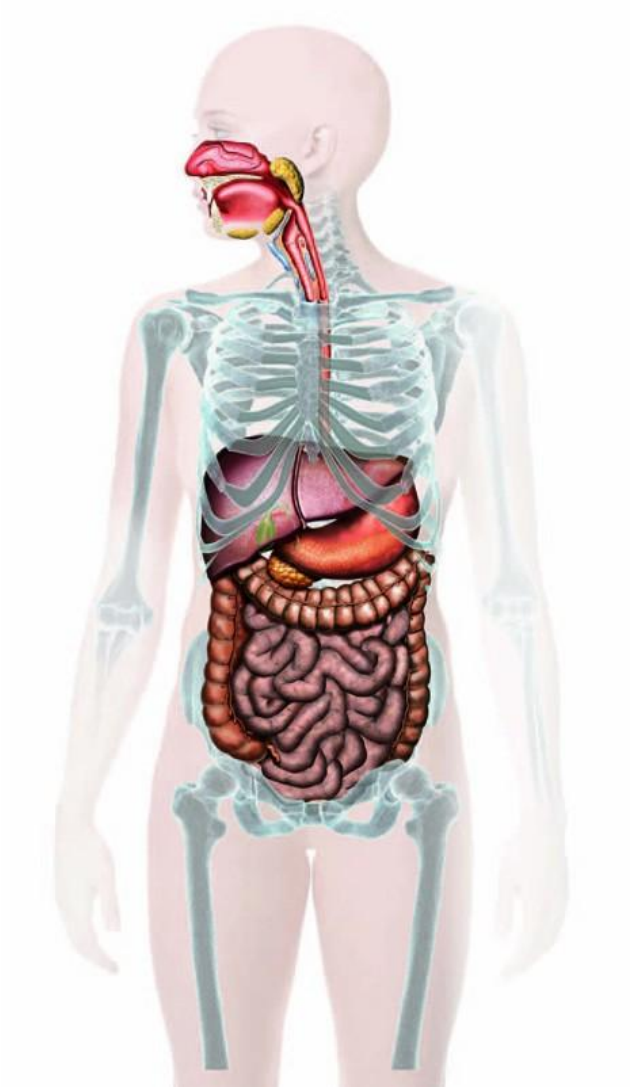


THE HUMAN DIGESTIVE SYSTEM



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ORGANA INTERNUS

SYSTEMA DIGESTORIUM (ALIMENTARIUM)

1.CAVITAS ORIS
2.PHARYNX
3.OESOPHAGUS
4.GASTER
5.INTESTINUM TENUE
6.HEPAR
7.PANCREAS
8.INTESTINUM CRASSUM

SYSTEMA RESPIRATORIUM

1.NASUS
2.CAVITAS NASI
3.SINUS PARANASALES
4.LARYNX
5.TRACHEA
6.BRONCHI
7. PULMONES

SYSTEMA GENITALIA

ORGANA GENITALIA FEMINA

ORGANA GENATALIA FEMININA INTERNA

1.OVARIUM
2.TUBA URETINA
3.UTERUS(METRA)
4.VAGINA
5.EPOOPHORON
6.ПРИЯЄЧНИК

ORGANA GENATALIA FEMINA EXTERNA

1.PUDENDUM FEMININUM(VULVA)
2.CLITORIS
3.URETHRA FEMINIMUM
4.PERINEUM

ORGANA GENITALIA MUSCULINA

ORGANA GENATALIA MUSCULINA INTERNA

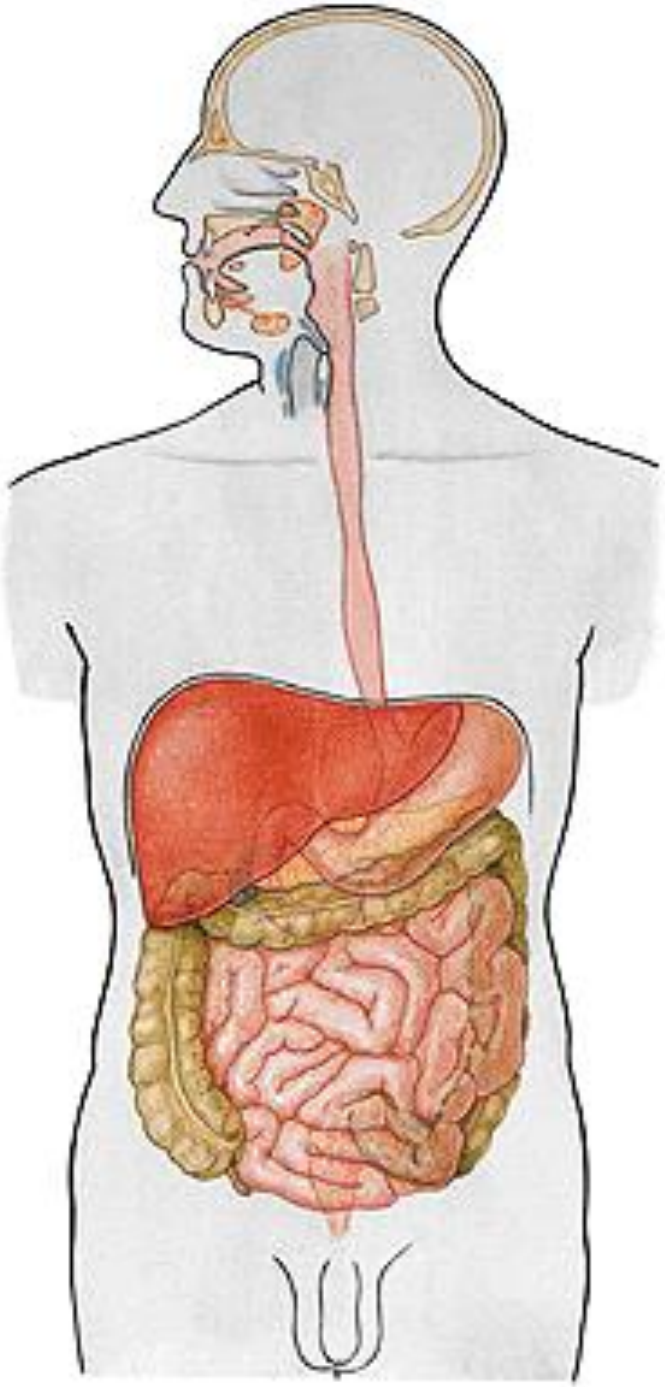
1.TESTIS
2.EPIDIDYMIS
3.ПРИЯЄЧНИК
4.DUCTUS DEFERENS
5.VESICULI SEMINALIS
6.DUCTUS EJACULATORIUS
7.PROSTATA
8.GLANDULA BU[illegible]ETHRALIS

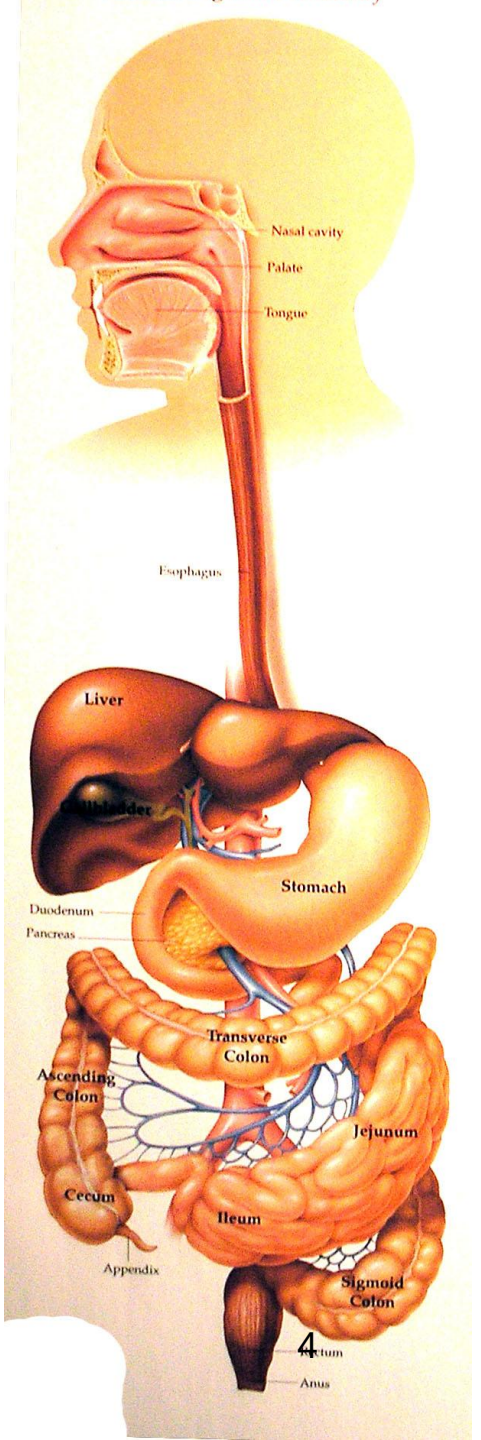
ORGANA GENATALIA MUSCULINA EXTERNA

1.PENIS
2.URETHRA MUSCULINUM
3.SCROTUM
4.PERINEUM

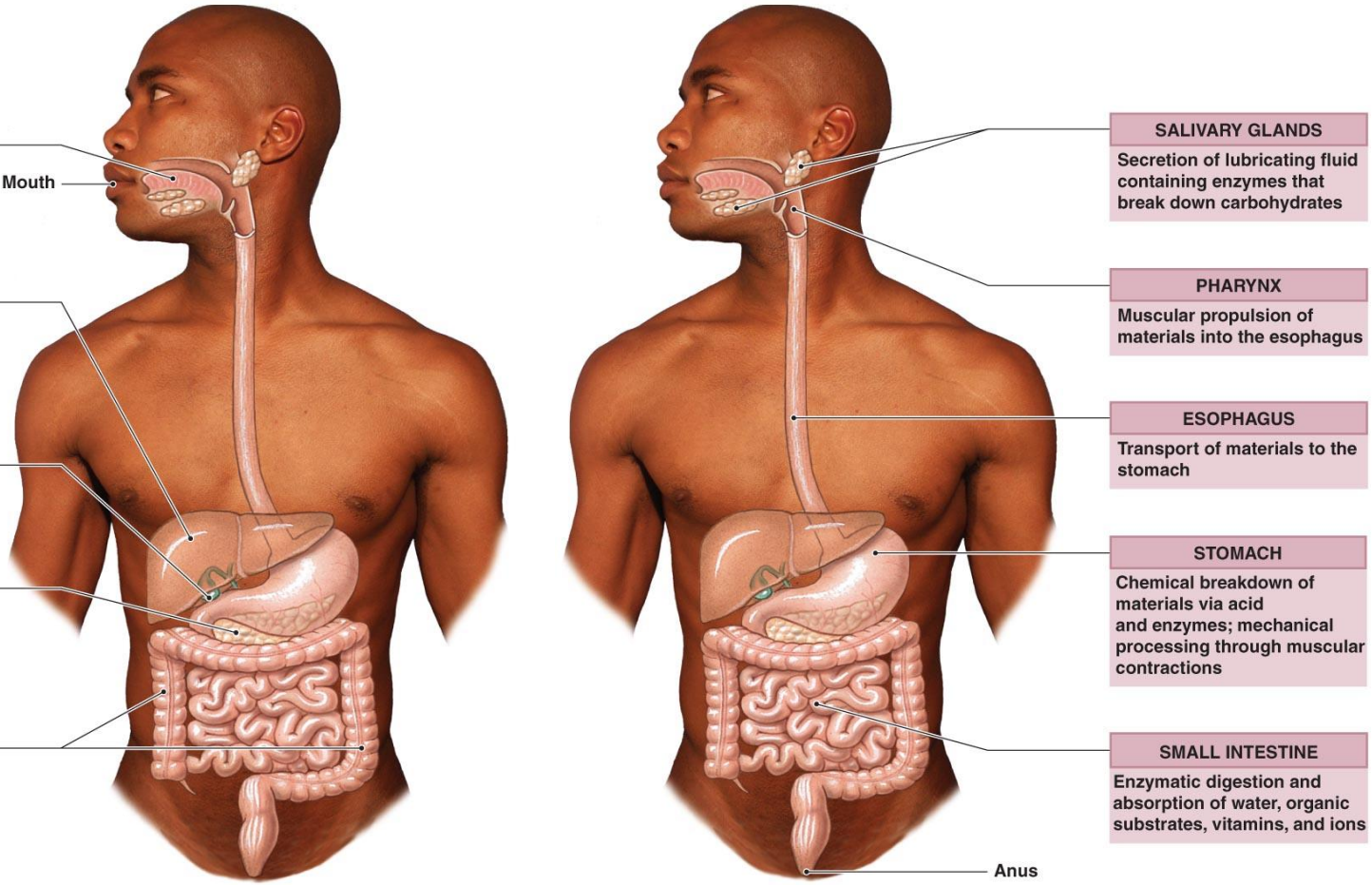
SYSTEMA URINARIUM

1.REN
2.URETER
3.VESICA URINARIA
4.URETHRA (femininum, musculinum)




Nasal cavity
Palate
Tongue
Esophagus
Liver
Gallbladder
Stomach
Duodenum
Pancreas
Transverse Colon
Ascending Colon
Jejunum
Cecum
Ileum
Appendix
Sigmoid Colon
Rectum
Anus

Digestive Tract



ORAL CAVITY, TEETH, TONGUE
Mechanical processing, moistening, mixing with salivary secretions

LIVER
Secretion of bile (important for lipid digestion), storage of nutrients, many other vital functions

GALLBLADDER
Storage and concentration of bile

PANCREAS
Exocrine cells secrete buffers and digestive enzymes; endocrine cells secrete hormones

LARGE INTESTINE
Dehydration and compaction of indigestible materials in preparation for elimination

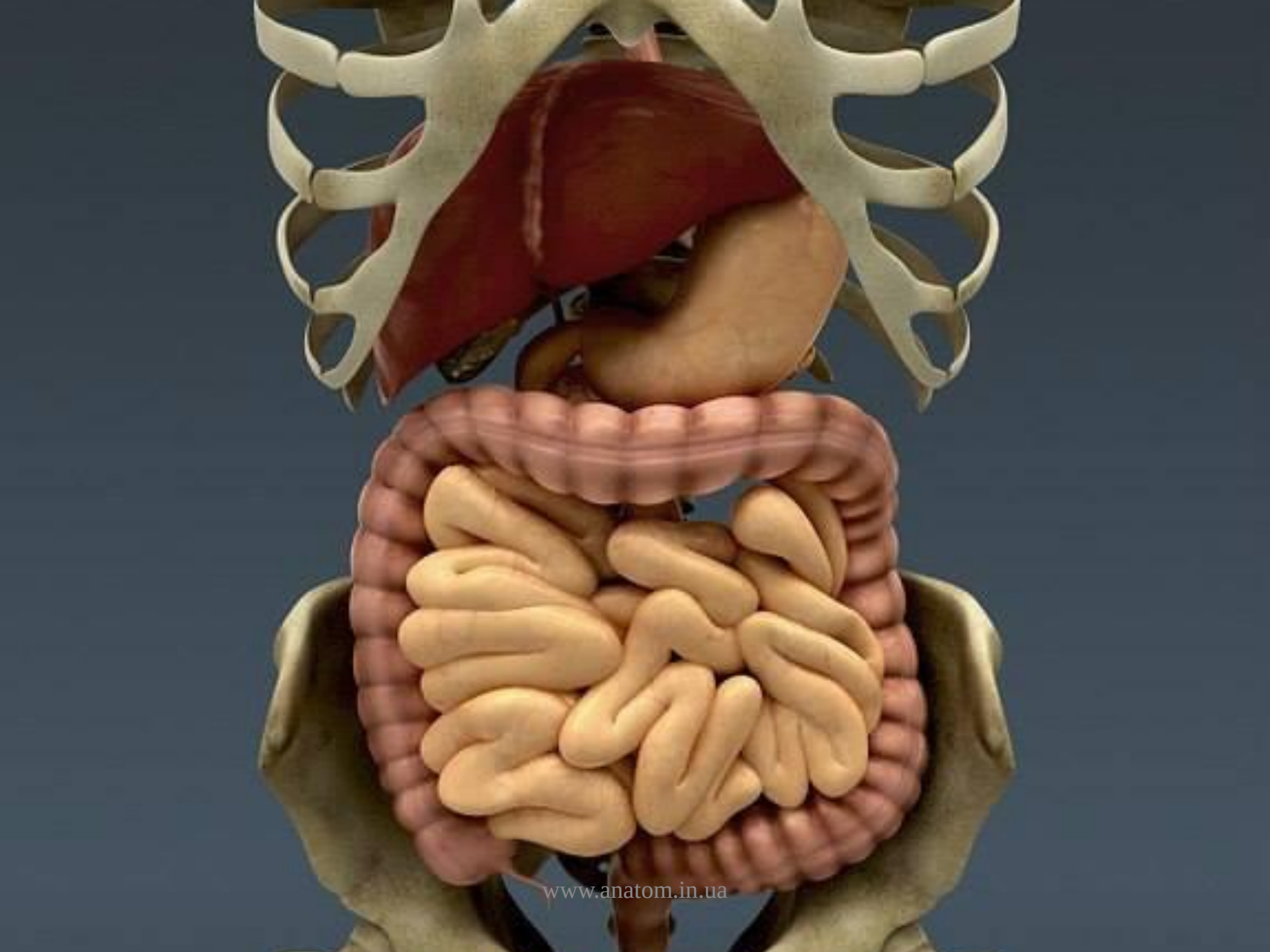
SALIVARY GLANDS
Secretion of lubricating fluid containing enzymes that break down carbohydrates

PHARYNX
Muscular propulsion of materials into the esophagus

ESOPHAGUS
Transport of materials to the stomach

STOMACH
Chemical breakdown of materials via acid and enzymes; mechanical processing through muscular contractions

SMALL INTESTINE
Enzymatic digestion and absorption of water, organic substrates, vitamins, and ions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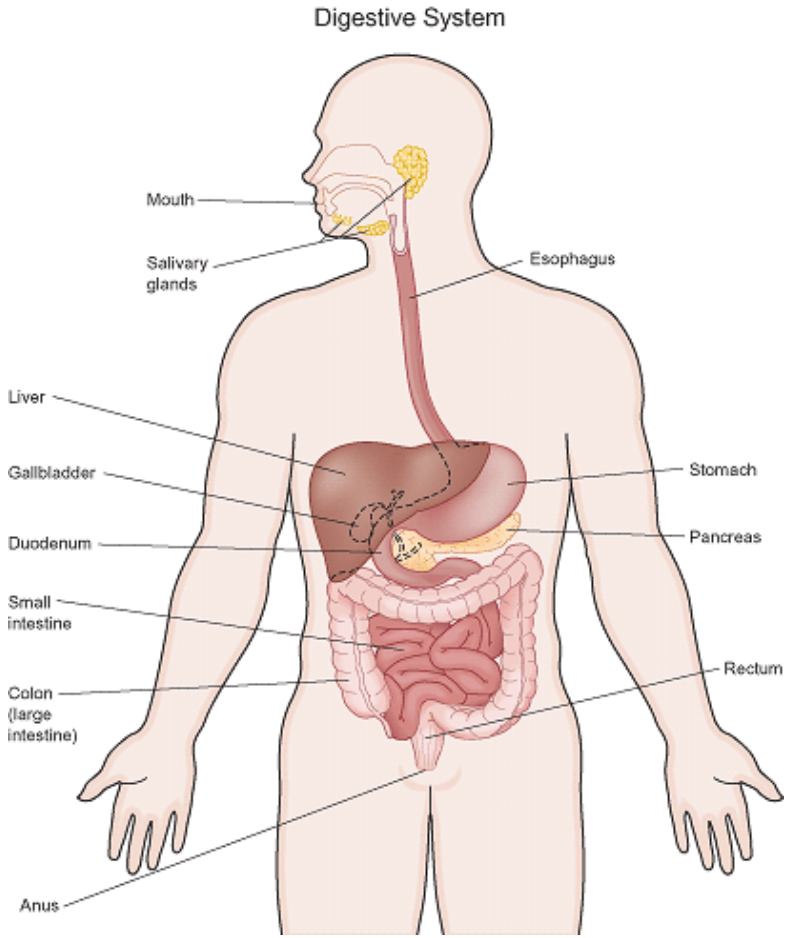
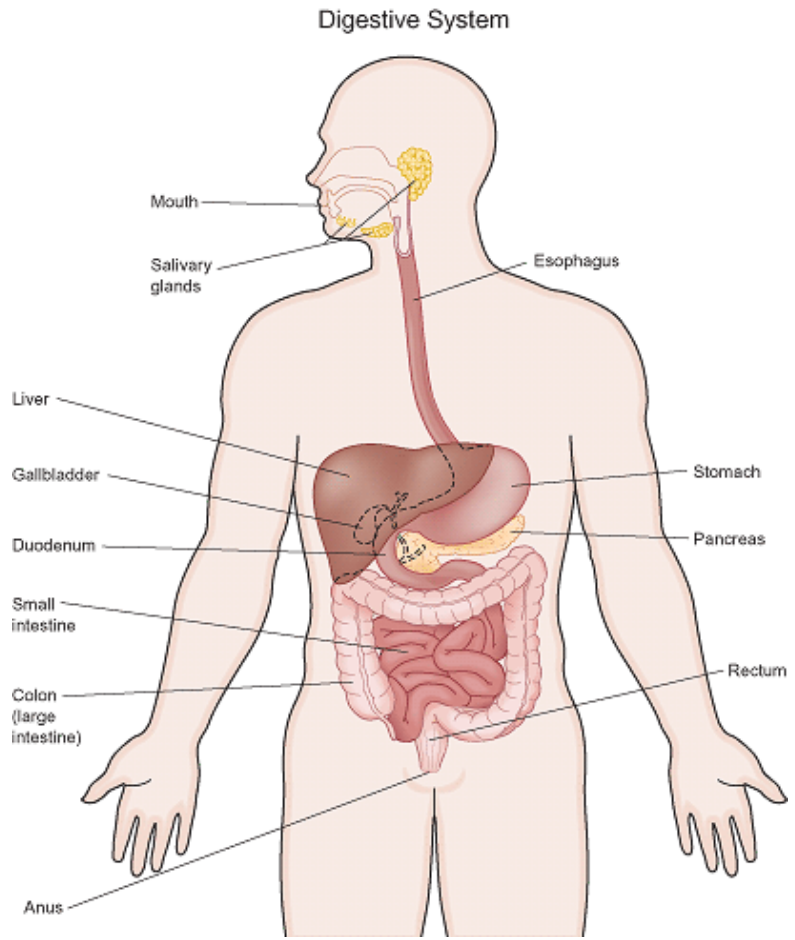
Introduction

- The digestive system is used for breaking down food into nutrients which then pass into the circulatory system and are taken to where they are needed in the body.



There are four stages to food processing:

- Ingestion: taking in food
- Digestion: breaking down food into nutrients
- Absorption: taking in nutrients by cells
- Egestion: removing any leftover wastes



CAVITAS ORIS
- Vestibulum oris
- Cavitas oris propria

PHARYNX
- Pars nasalis
- Pars oralis
- Pars laryngea

OESOPHAGUS
- Pars cervicalis
- Pars thoracica
- Pars abdominalis

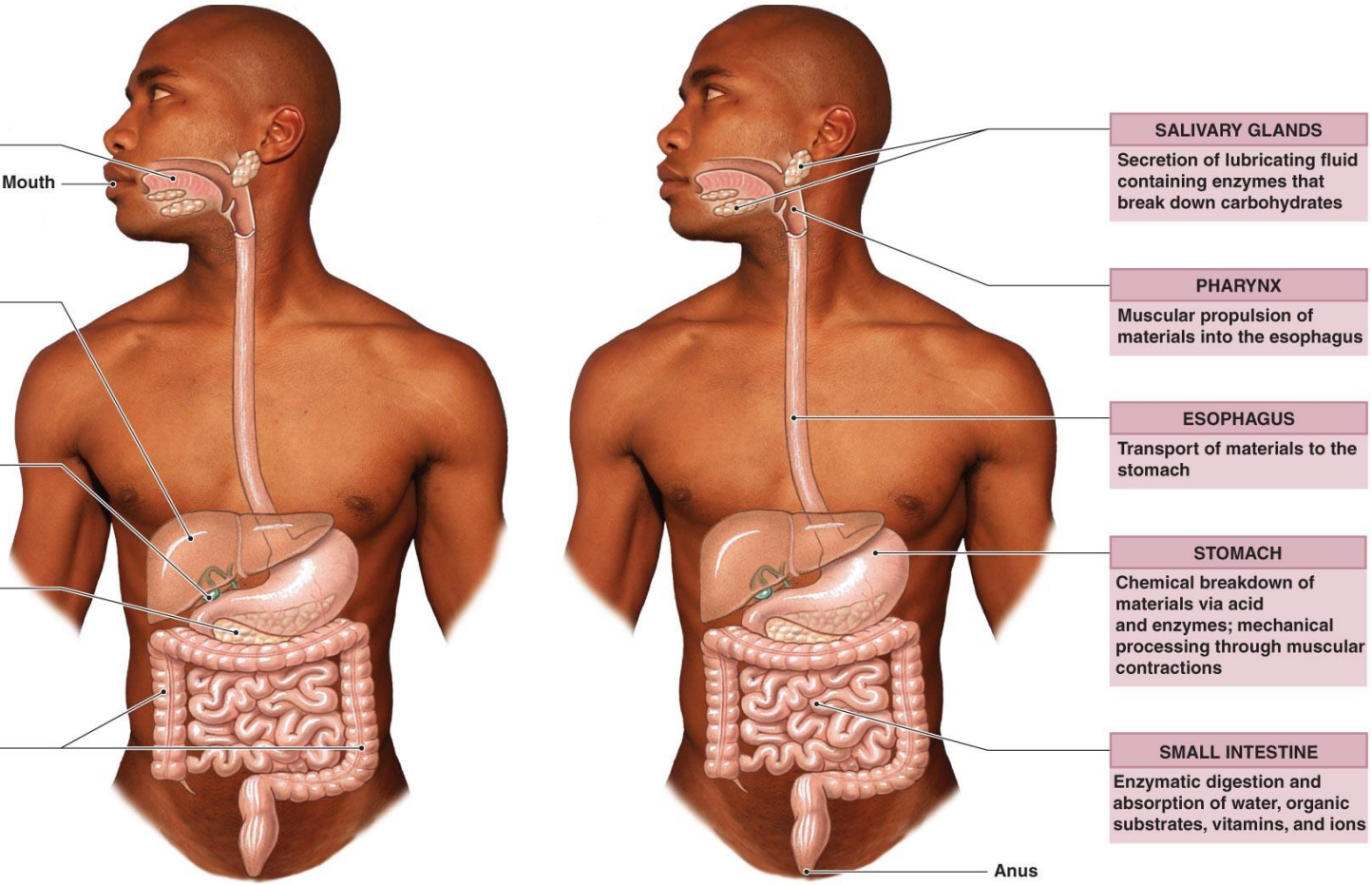
GASTER
- Pars cardiaca
- Fornix s. fundus ventriculi
- Corpus ventriculi
- Pars pyloricum

Intestinum tenue
- Duodenum
  - pars superior
  - pars descendens
  - pars horizontalis
  - pars ascendens
- Jejunum
- Ileum

INTESTINUM CRASSUM
- Caecum s.Typhlon
- Colon
  - colon ascendens
  - colon transversus
  - colon descendens
  - colon sigmoideum
- Rectum s.Proktos

ANUS

Digestive Tract



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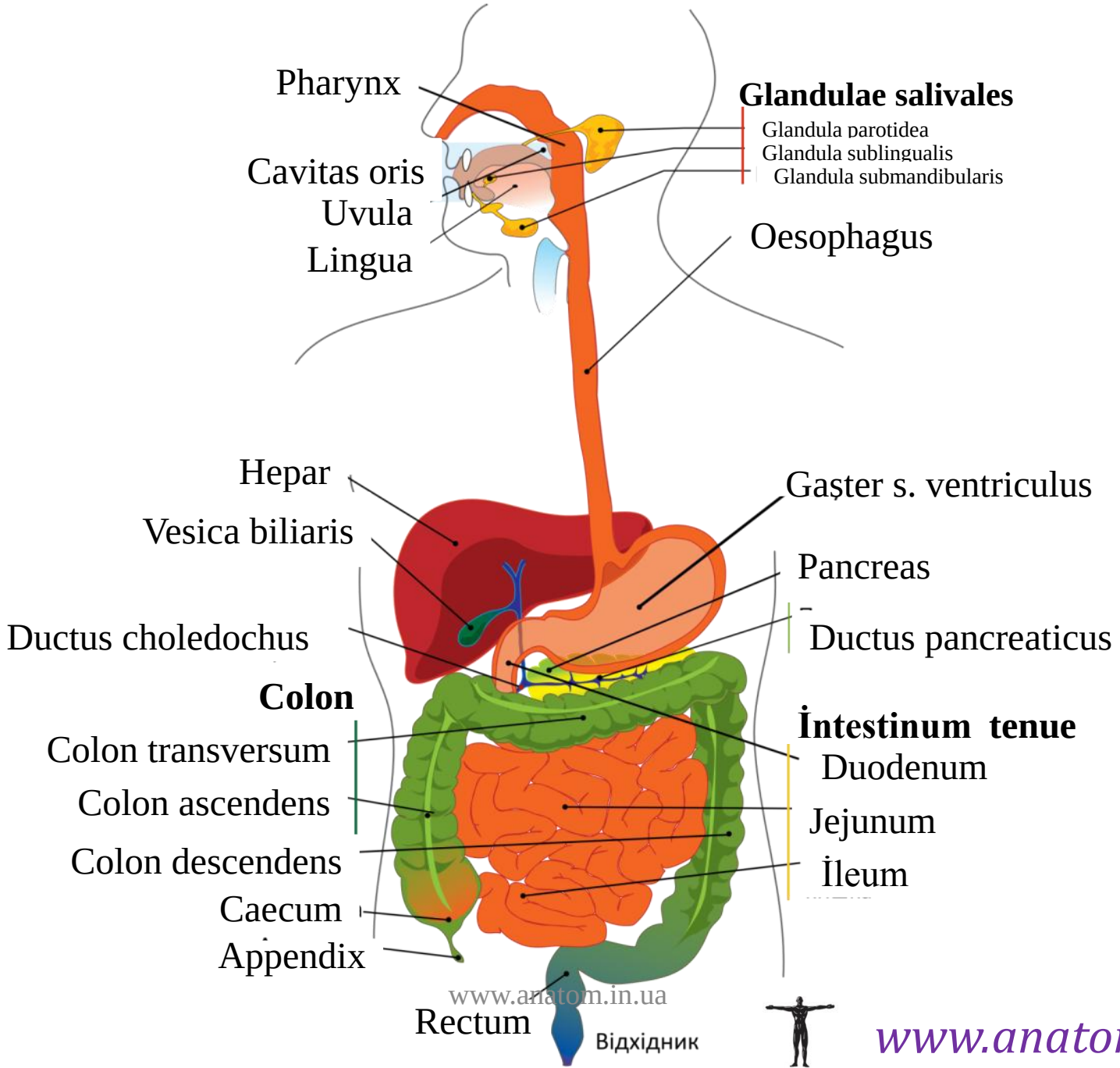
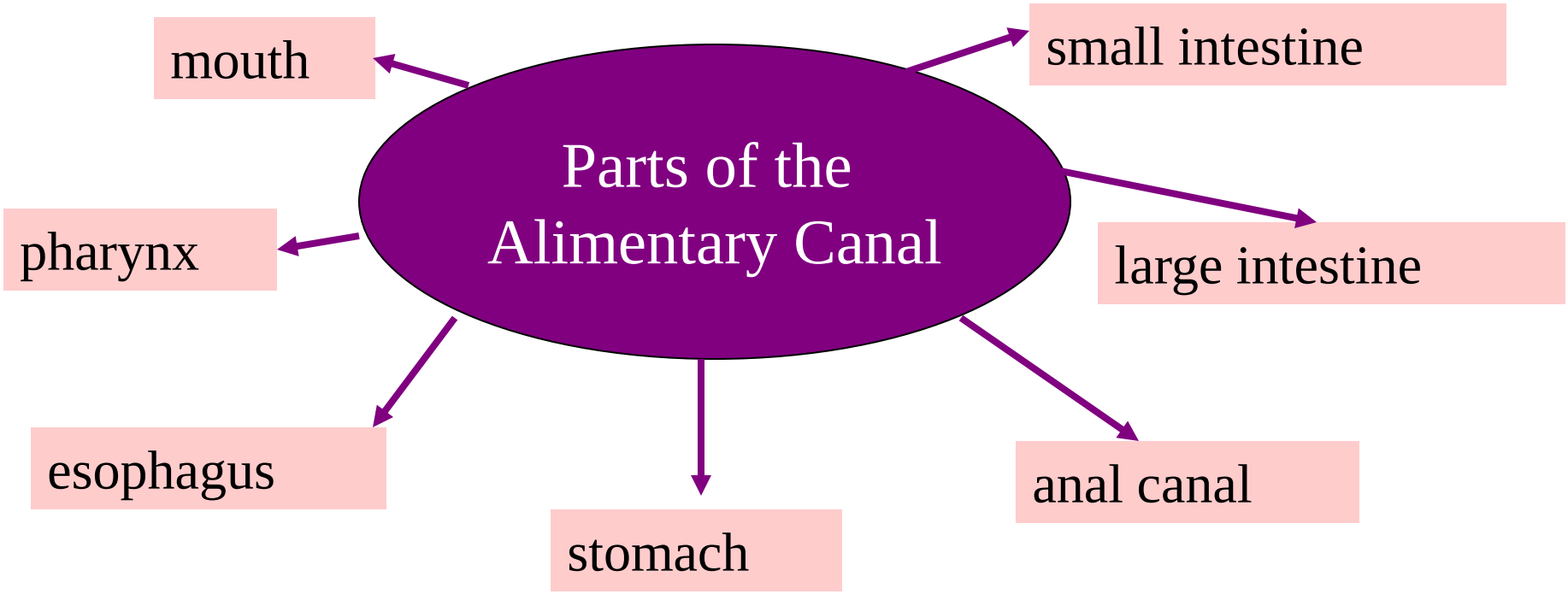


STRUCTURE AND FUNCTION THE DIGESTIVE SYSTEM

Consists of the alimentary canal and several accessory organs.



SYSTEMA DIGESTORIUM

- CAVITAS ORIS
- PHARYNX
- OESOPHAGUS
- GASTER
- INTESTINUM TENUE
- INTESTINUM CRASSUM
- **HEPAR**
- **VESICA FELLEA**
- **PANCREAS**
- **PERITONEUM…**

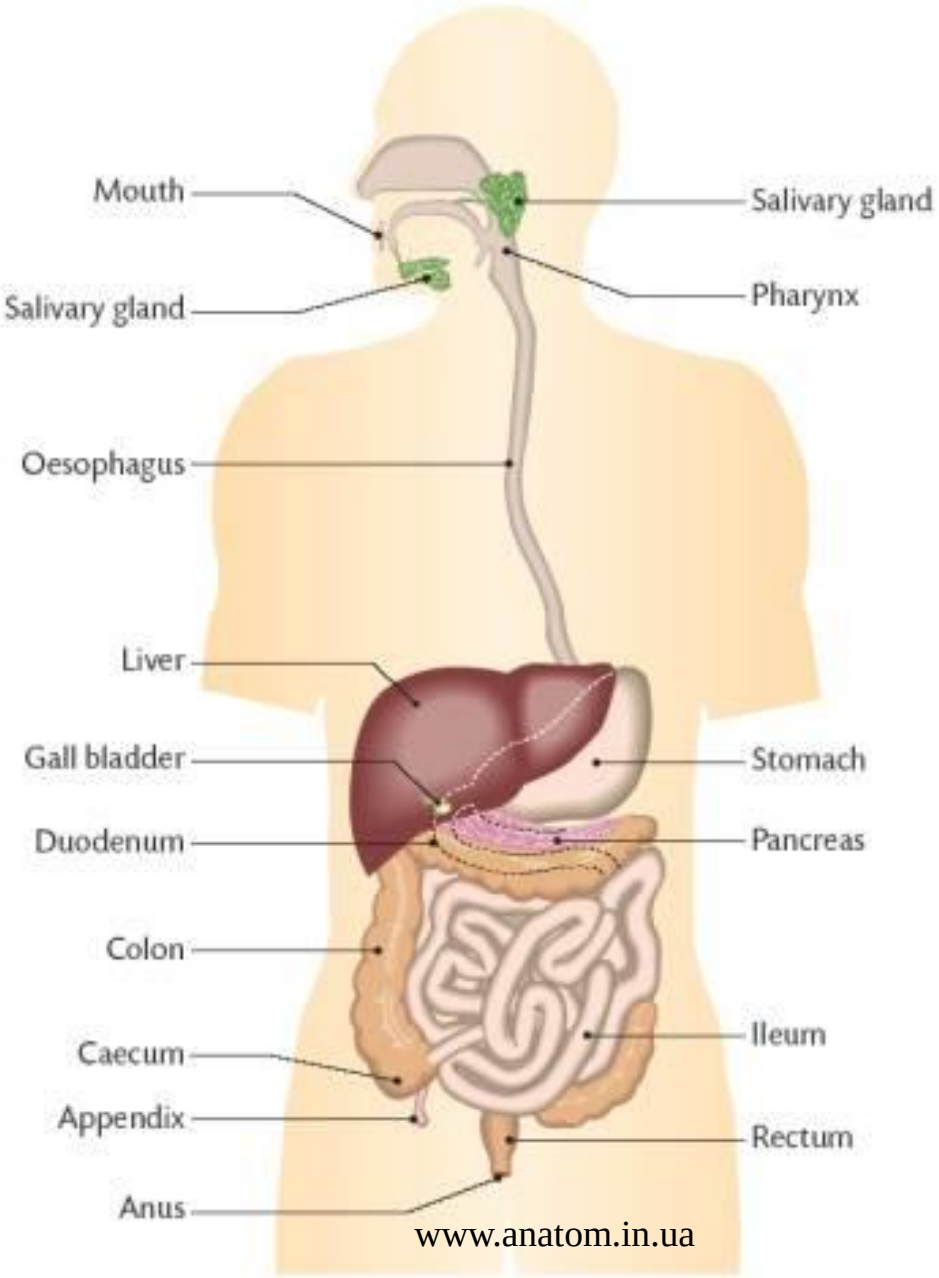
SYSTEMA DIGESTORIUM

DIVISIONES

- CAVITAS ORIS
- PHARYNX
- OESOPHAGUS
- VENTRICULUS
- INTESTINUM TENUE
  - DUODENUM
  - JEJUNUM
  - ILEUM
- INTESTINUM CRASSUM
  - CAECUM
    - APPENDIX VERMIFORMIS
  - COLON
    - COLON ASCENDENS
    - COLON TRANSVERSUS
    - COLON DESCENDENS
    - COLON SIGMOIDEI
  - RECTUM
    - RECTUM AMPULLAE
  - CANALIS ANALIS

GLANDULAE

- ПРИСІНКОВІ ЗАЛОЗИ
- GLANDULAE ORIS
- GLANDULAE SALIVATORES MAJORES
  - GLANDULA SUBMABDIBULARIS
  - GLANDULA SUBLINQUALIS
  - GLANDULA PAROTIDEA
- GLANDULAE SALIVATORES MINORES
- HEPAR
- PANCREAS



Functions

- Ingest food
- Break down food
- Move through digestive tract
- Absorb digested food and water
- Eliminates waste materials

The Alimentary Canal

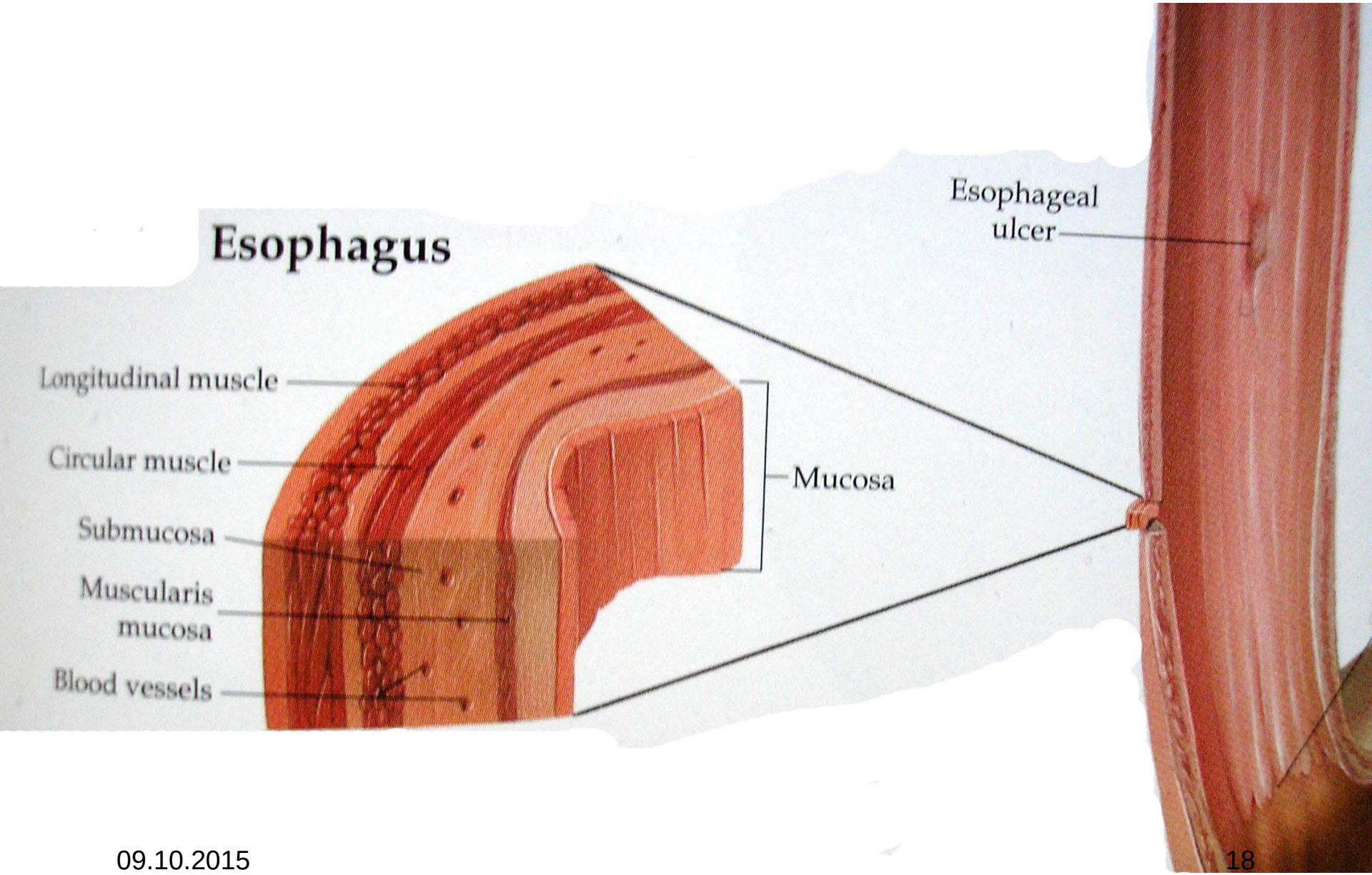
•A tube that extends from the mouth to the anus

•Consists of four layers:
-outer layer (protects)

-second layer (muscular; contracts and expands in wavelike motions called peristalsis)

-third layer (vessels, nerves and glands that nourish and carry away waste)

-innermost layer (mucous membrane that secretes mucus and digestive enzymes)


Esophagus
Esophageal ulcer
Longitudinal muscle
Circular muscle
Submucosa
Muscularis mucosa
Blood vessels
Mucosa

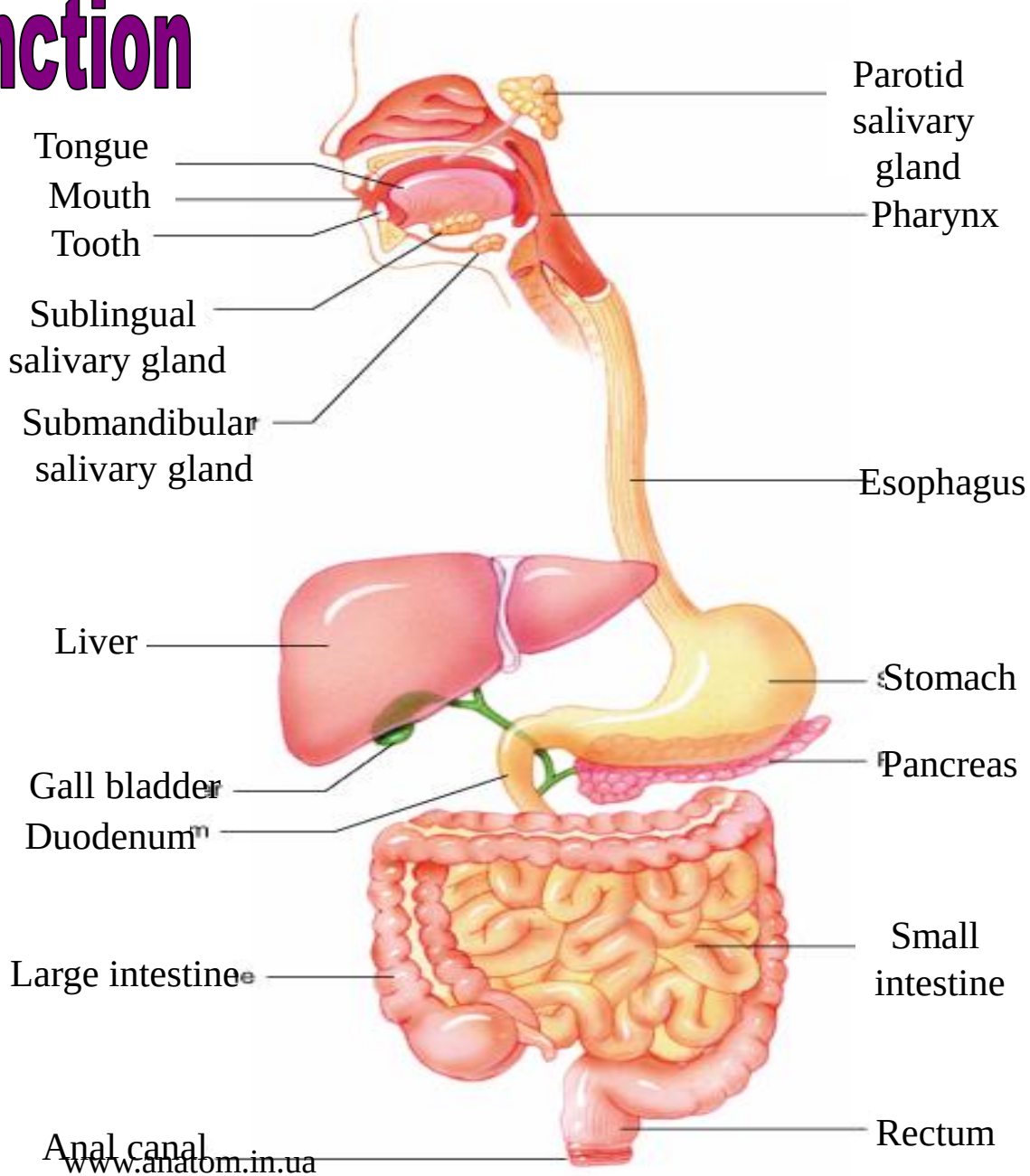
STRUCTURE AND FUNCTION DIGESTIVE ENZYMES

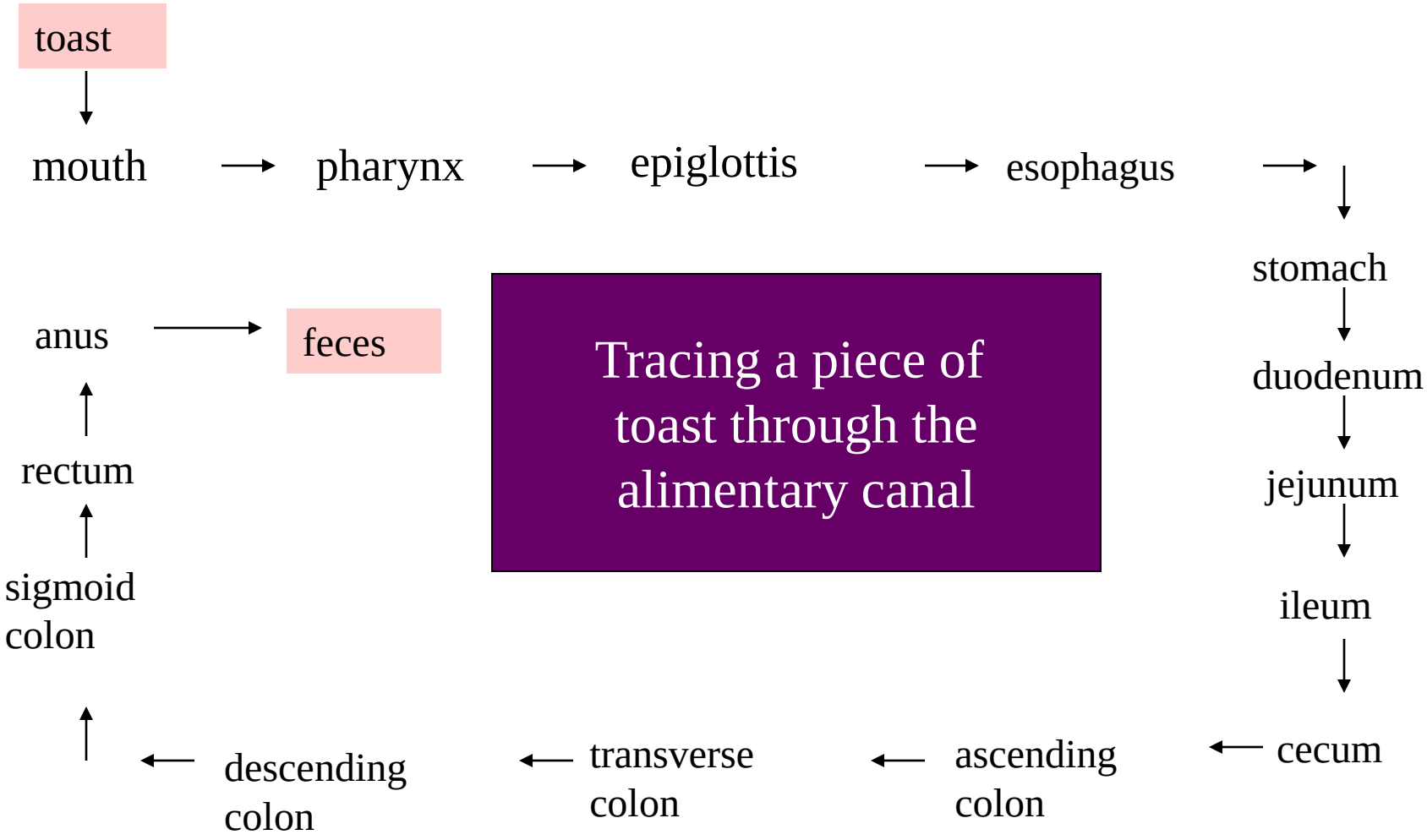
Break down complex substances into simpler substances that can be absorbed by the body

Complex proteins	→	Amino acids
Complex sugars	→	Glucose
Fat molecules	→	Fatty acids

Structure and Function

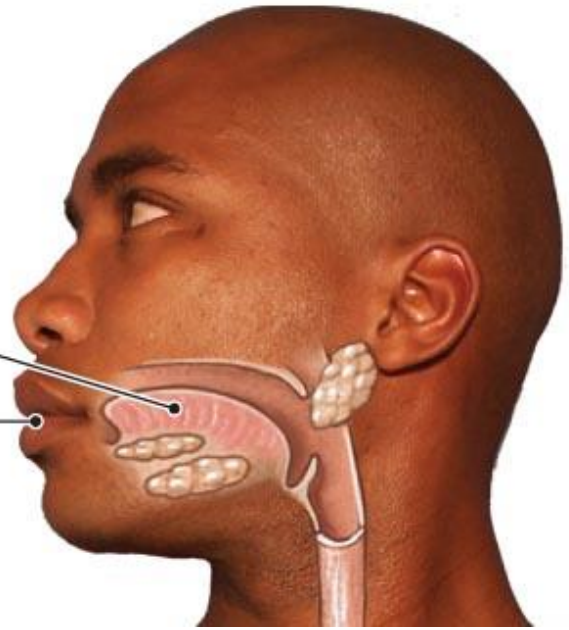
Organs of the Digestive System



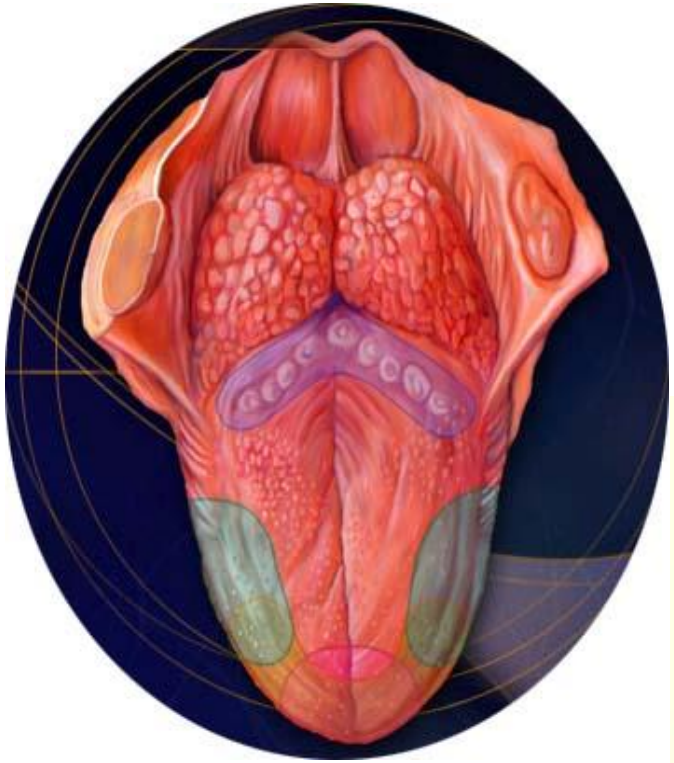

toast
mouth
pharynx
epiglottis
esophagus
stomach
duodenum
jejunum
ileum
cecum
ascending colon
transverse colon
descending colon
sigmoid colon
rectum
anus
feces
Tracing a piece of toast through the alimentary canal

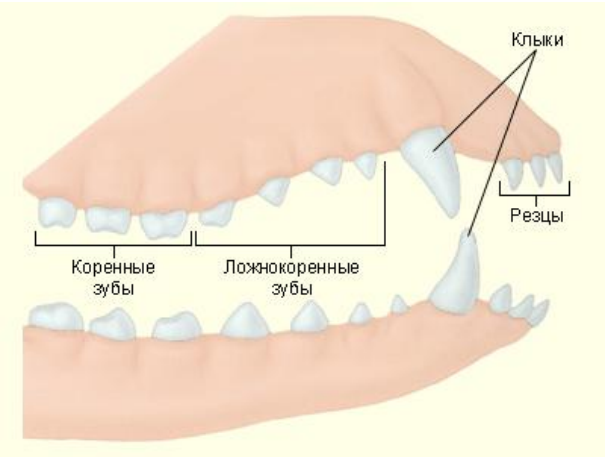
ORAL CAVITY, TEETH, TONGUE

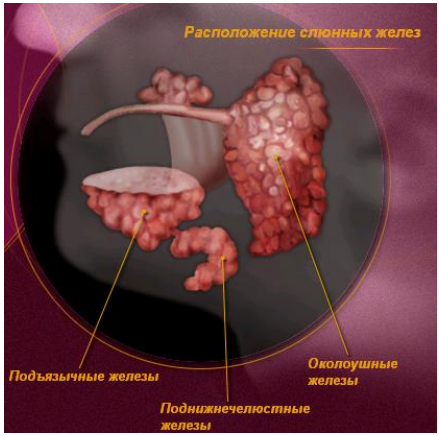
Mechanical processing, moistening, mixing with salivary secretions



CAVITAS ORIS





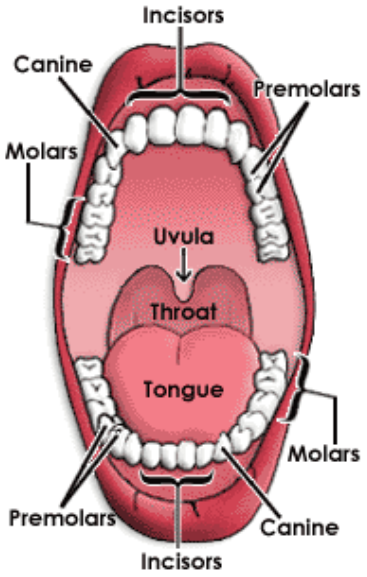


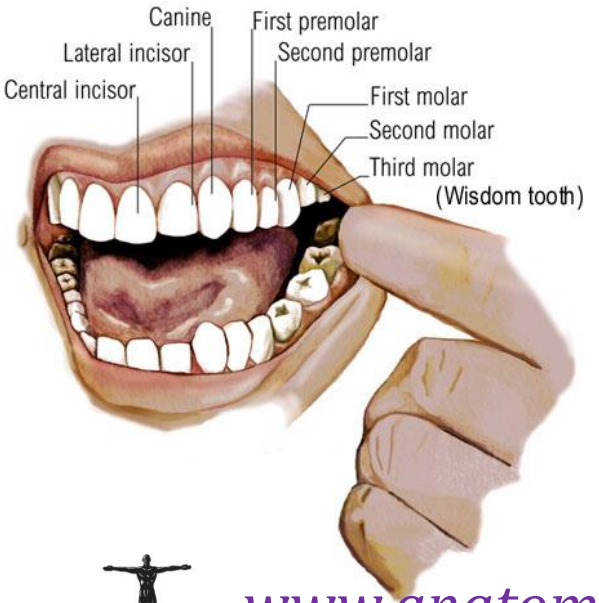
CAVITAS ORIS, s. STOMA

- VESTIBULUM ORIS
  - RIMA ORIS
  - LABIA ORIS
- CAVITAS ORIS PROPRIA
  - DENTES
  - GINGIVA
  - PALATUM
  - LINGUA
  - FAUCES

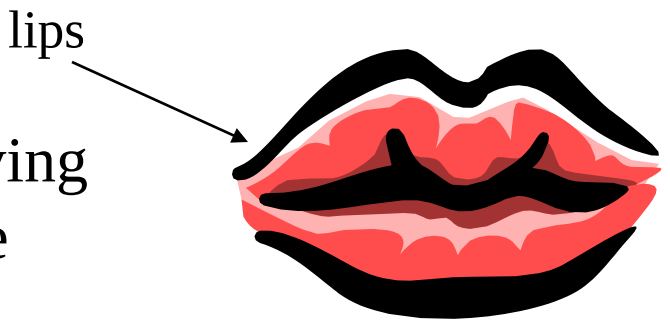
Mouth

- Breaks down food into small pieces
- Begins starch digestion (amylase)
- Saliva contains amylase and lubricates food
- Tongue moves food into pharynx (common passage of air and food)
- Esophagus begins at lower end of pharynx





Mouth



The lips protect the mouth from receiving food that is too hot or too rough on the surface.

- The mouth is also called the oral cavity
- Food is taken into the mouth and chewed with the assistance of the cheek muscles

•Process of chewing is called mastication

•The tongue moves the food around to prepare it for deglutition (swallowing)

•Small raised areas called papillae are located on the tongue and they contain taste buds.

•The frenulum connects the tongue to the floor of the mouth.

Mouth (cont'd)

Hard palate

•Hard anterior portion of the palate with irregular ridges of mucous membranes called rugae

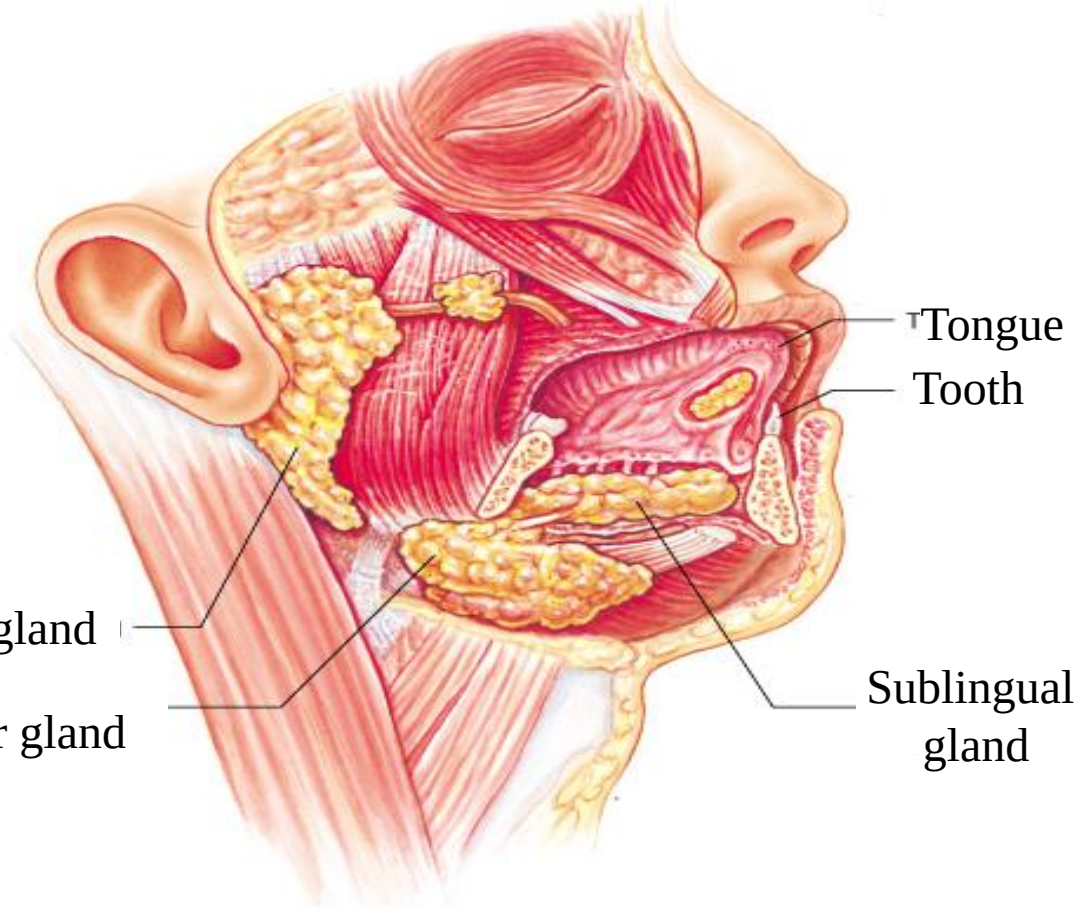
Soft palate

•Soft posterior portion of the palate. A downward cone shaped projection called the uvula is located at the back of the soft palate

Both the lingual tonsils and the palatine tonsils are located in the oral cavity and these play an important role in the immune system.

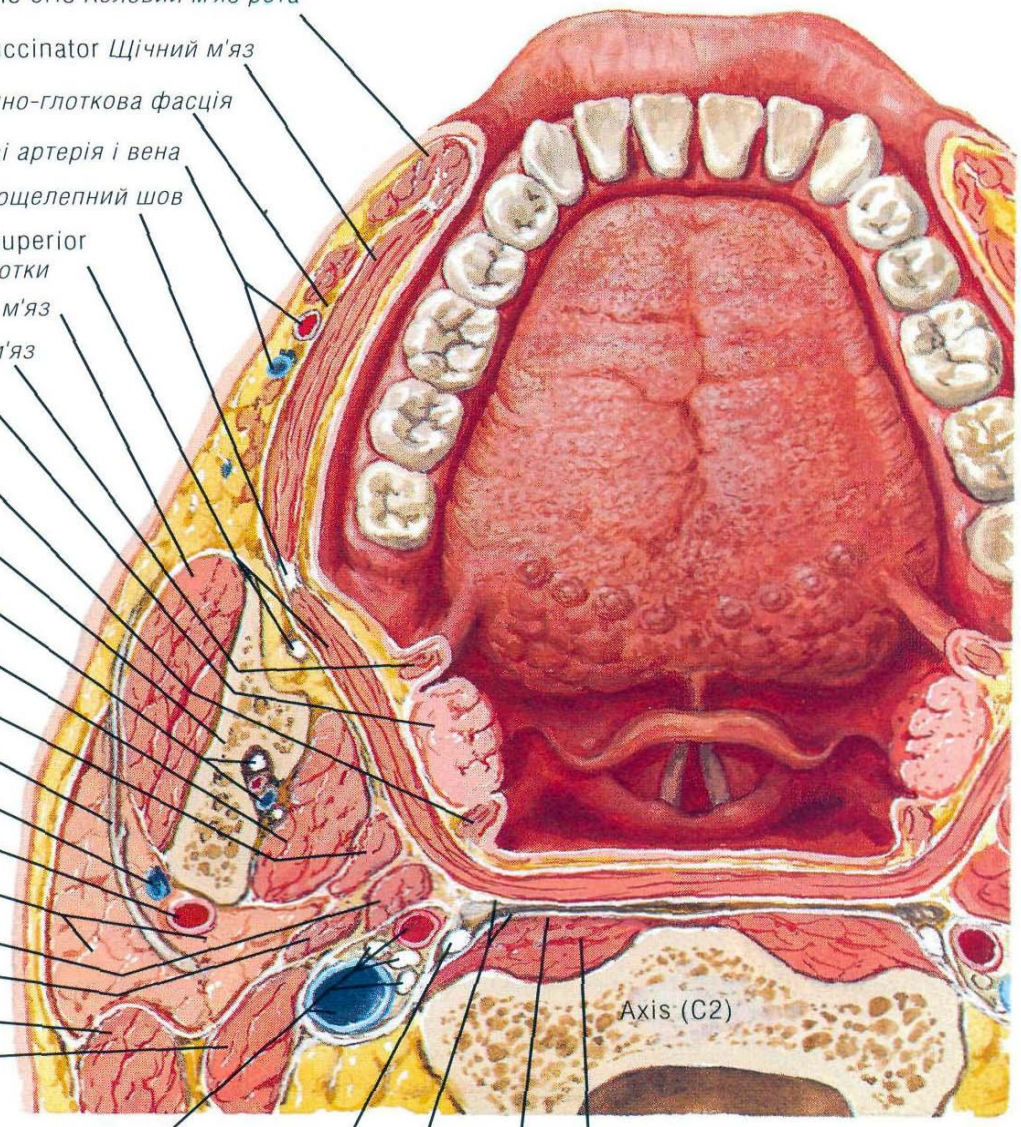
Salivary Glands

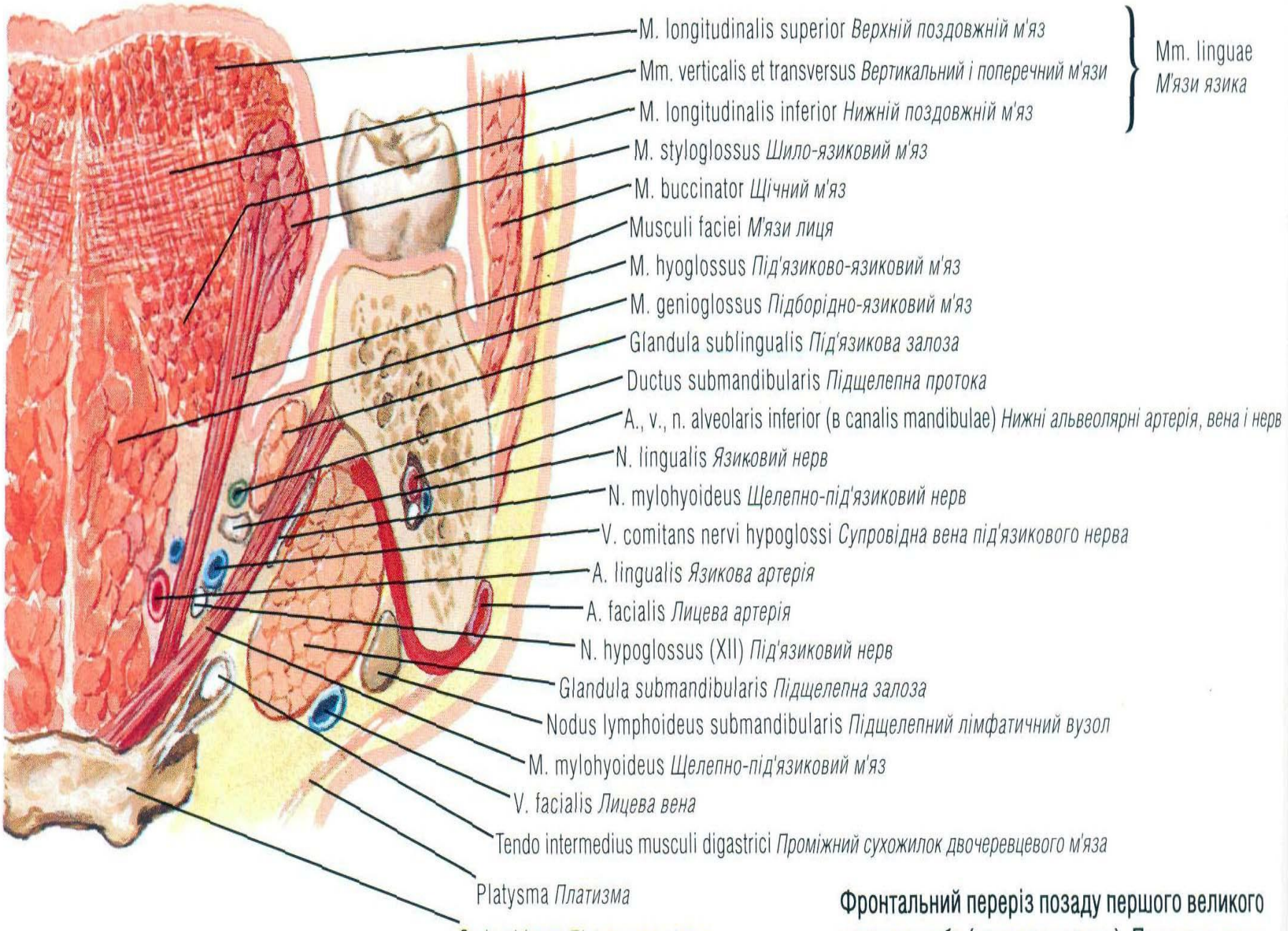
- parotid
- submandibular
- sublingual



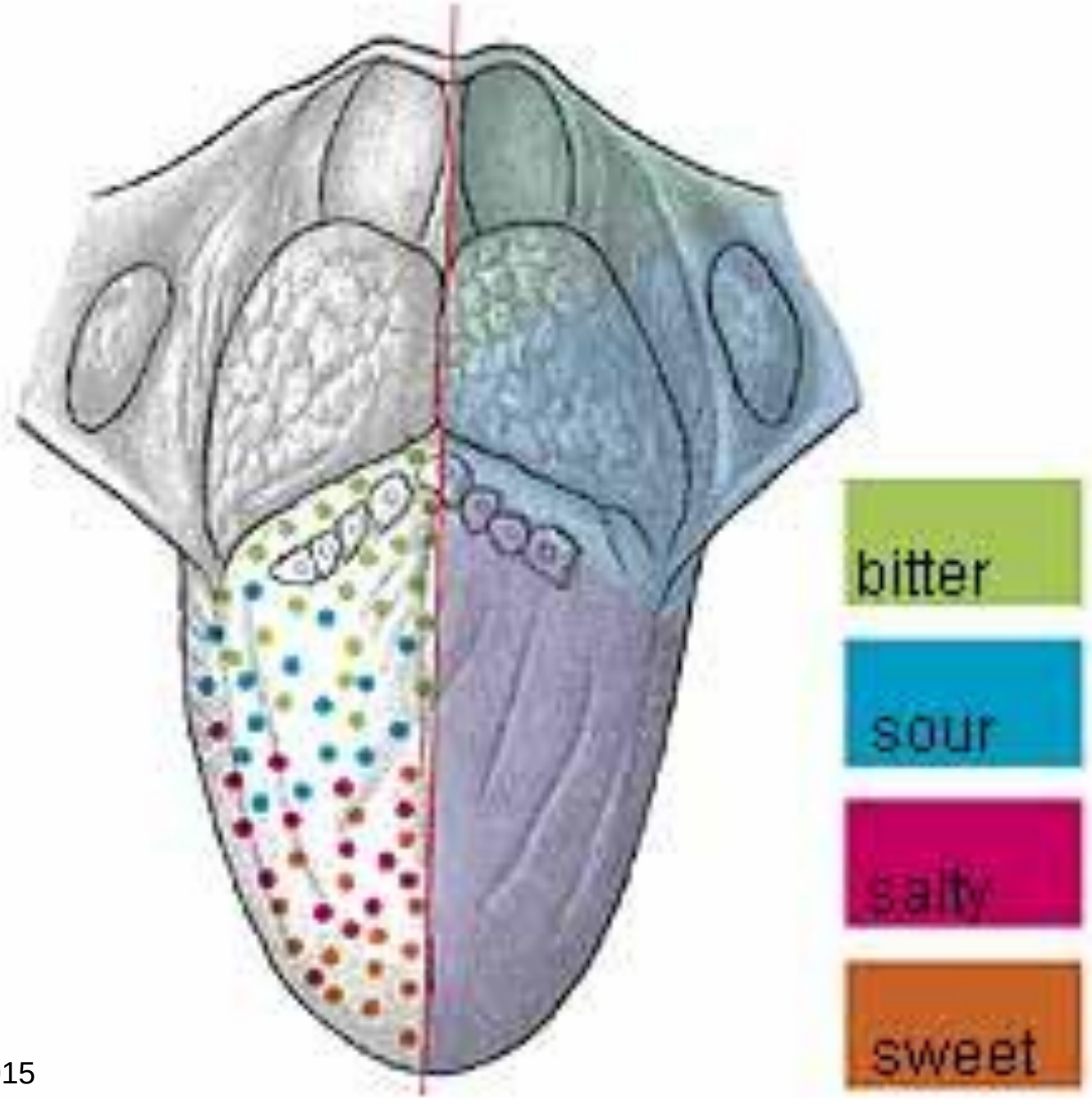
- Digestion of food begins in the mouth with mastication.
- Teeth are held in place by the fleshy sockets called gums.

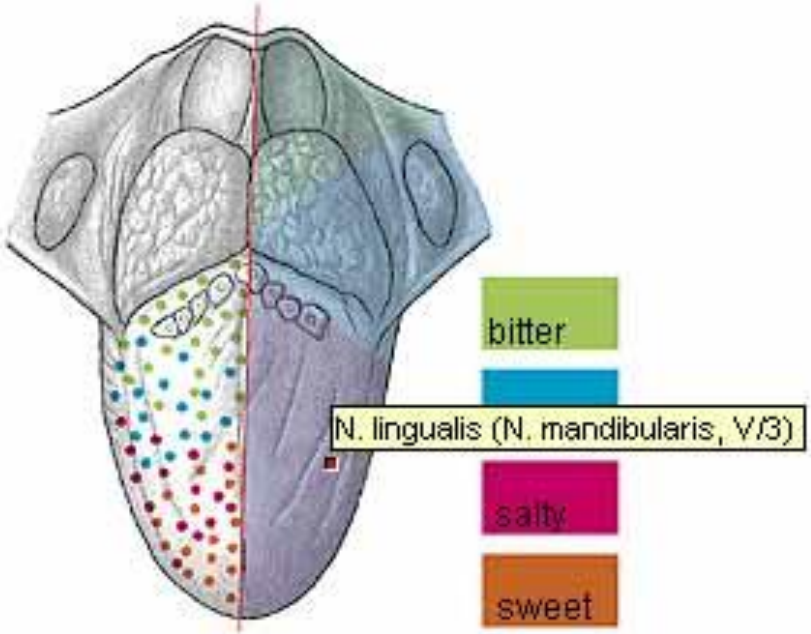
Горизонтальний переріз на рівні foramen mandibulae (вигляд зверху). Показано ложе привушної слинної залози

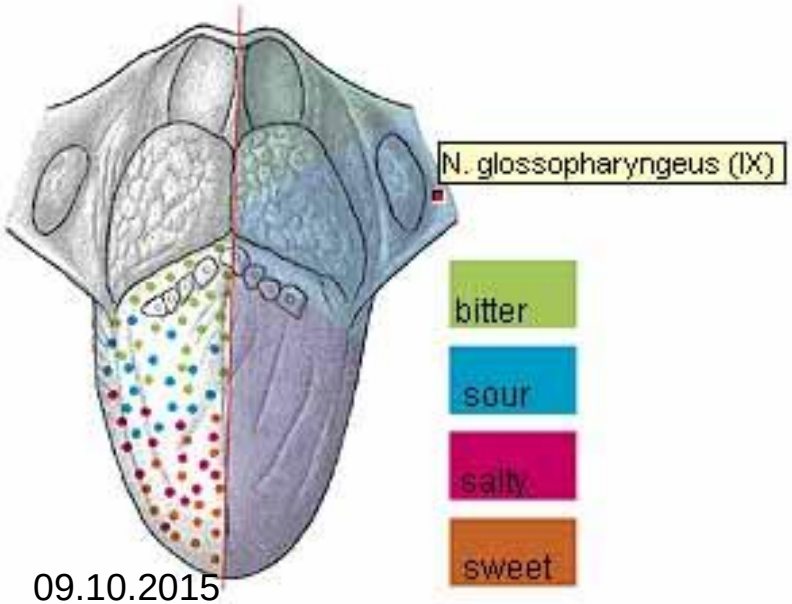


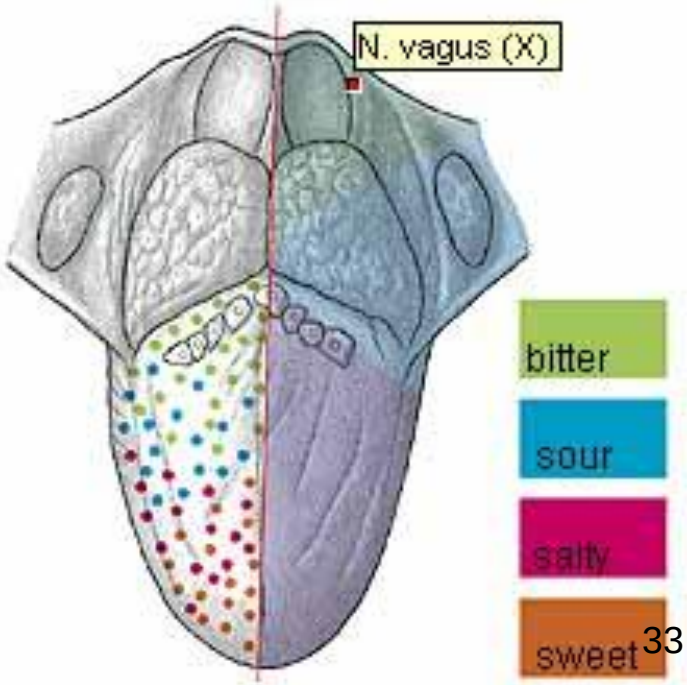


Фронтальний переріз позаду першого великого кутнього зуба (вигляд спереду). Показано ложе підщелепної і під'язикової слинних залоз

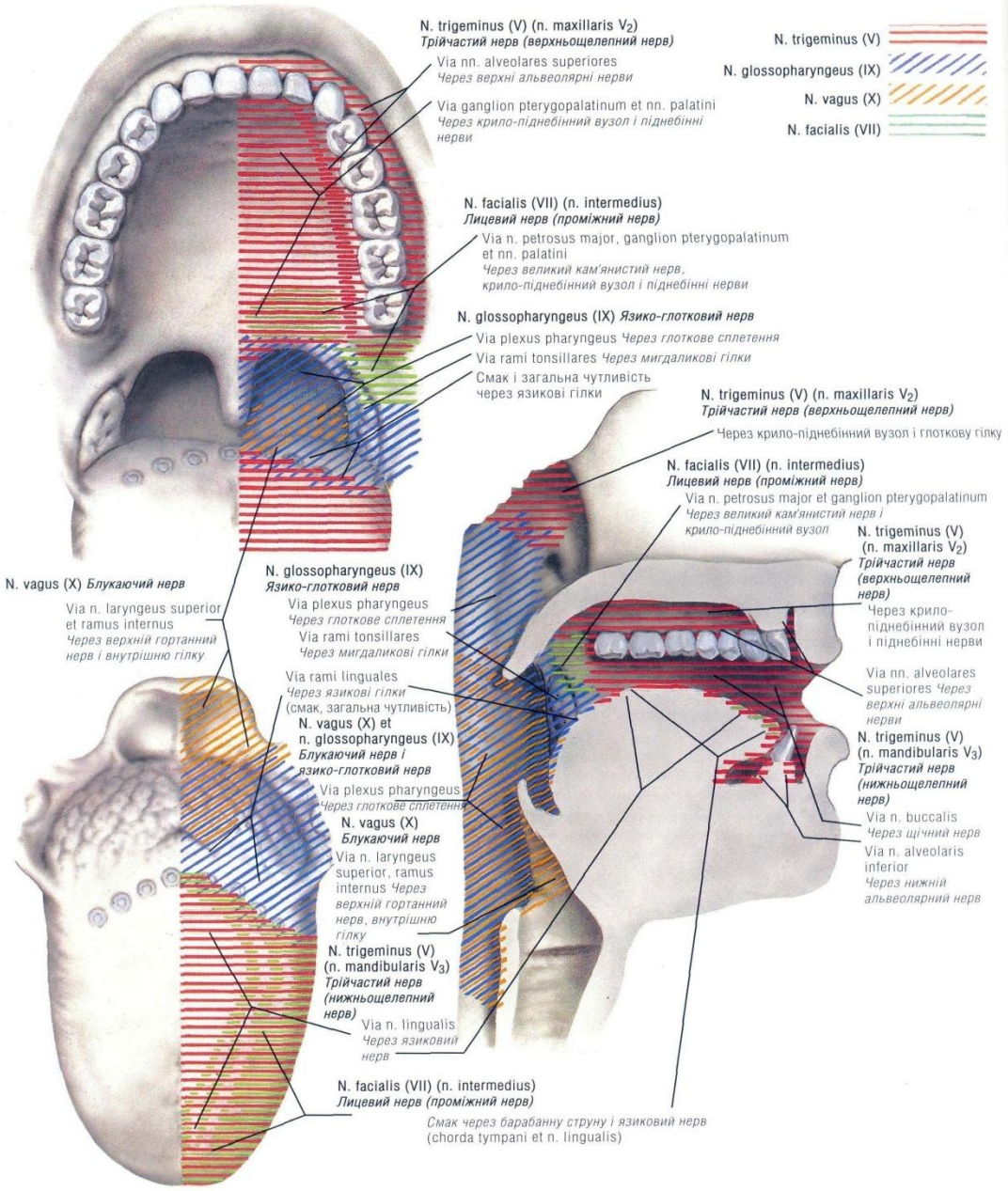

bitter
sour
salty
sweet


bitter
N. lingualis (N. mandibularis, V/3)
salty
sweet


N. glossopharyngeus (IX)
bitter
sour
salty
sweet

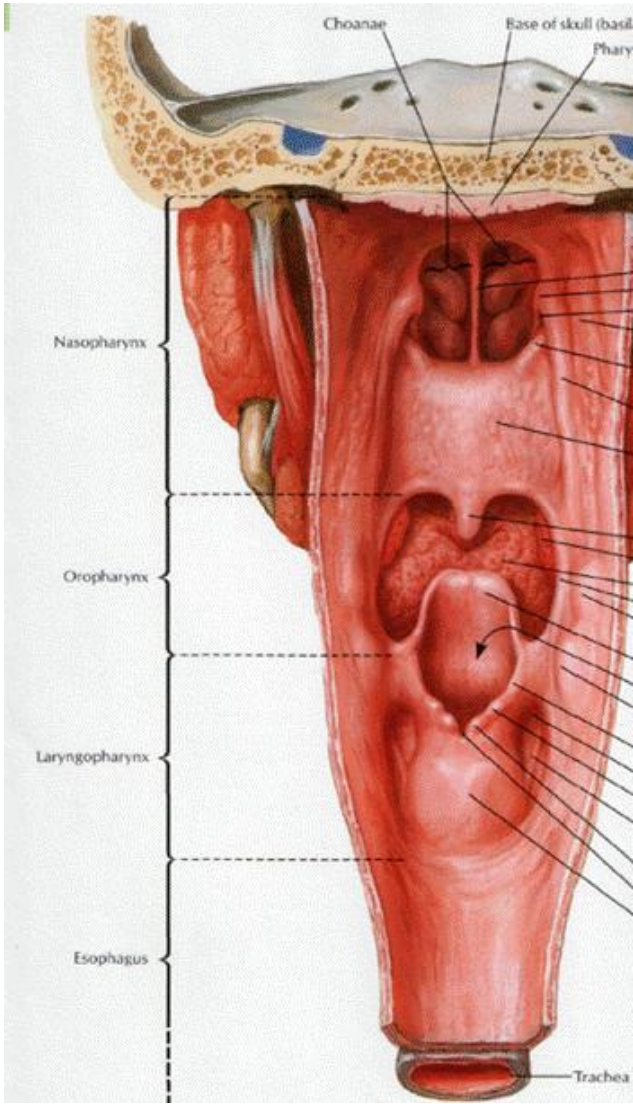

N. vagus (X)
bitter
sour
salty
sweet

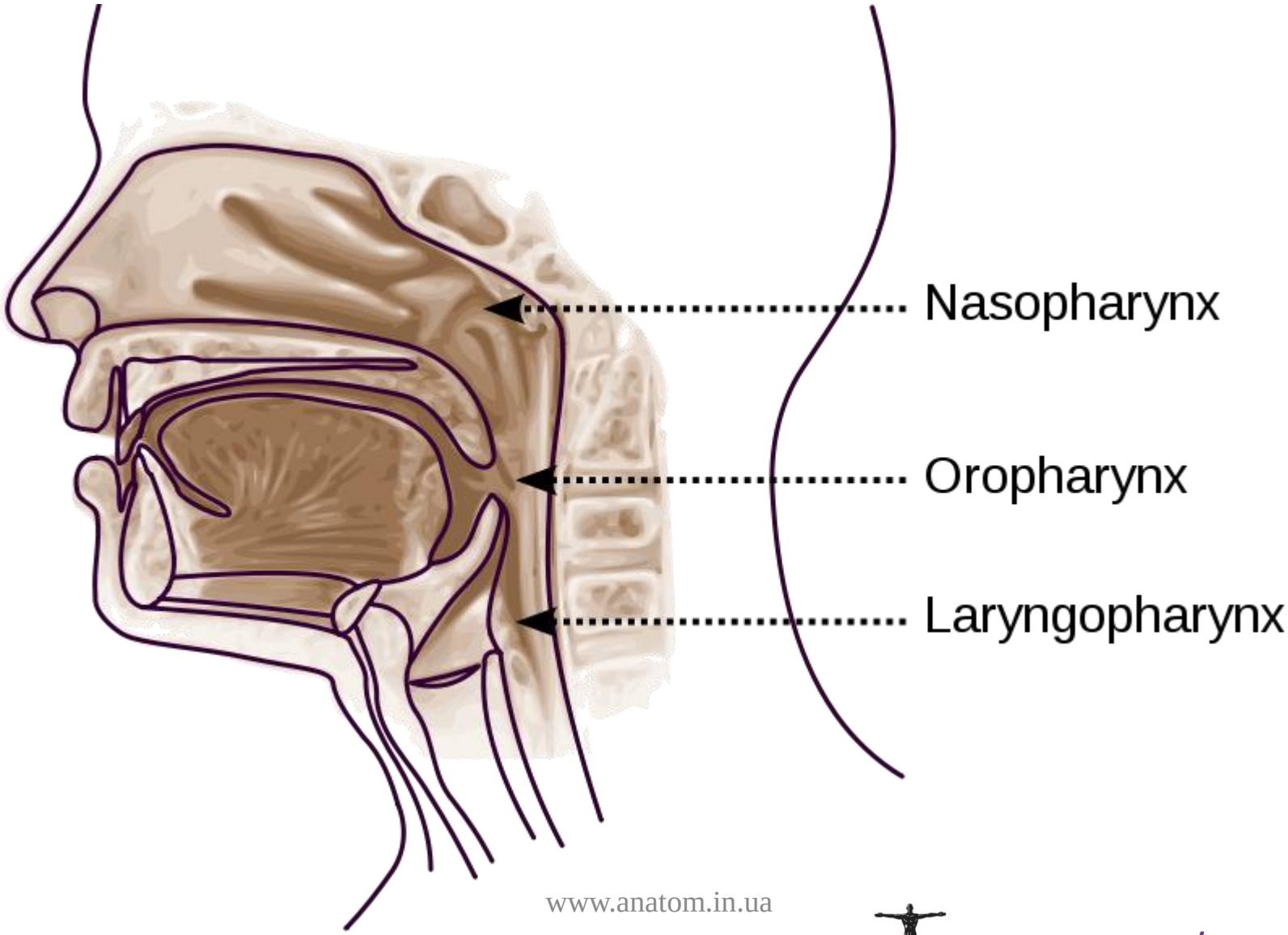
Чутлива (аферентна) іннервація порожнини рота і глотки



PHARYNX

- PARS NASALIS
- PARS ORALIS
- PARS LARYNGEA

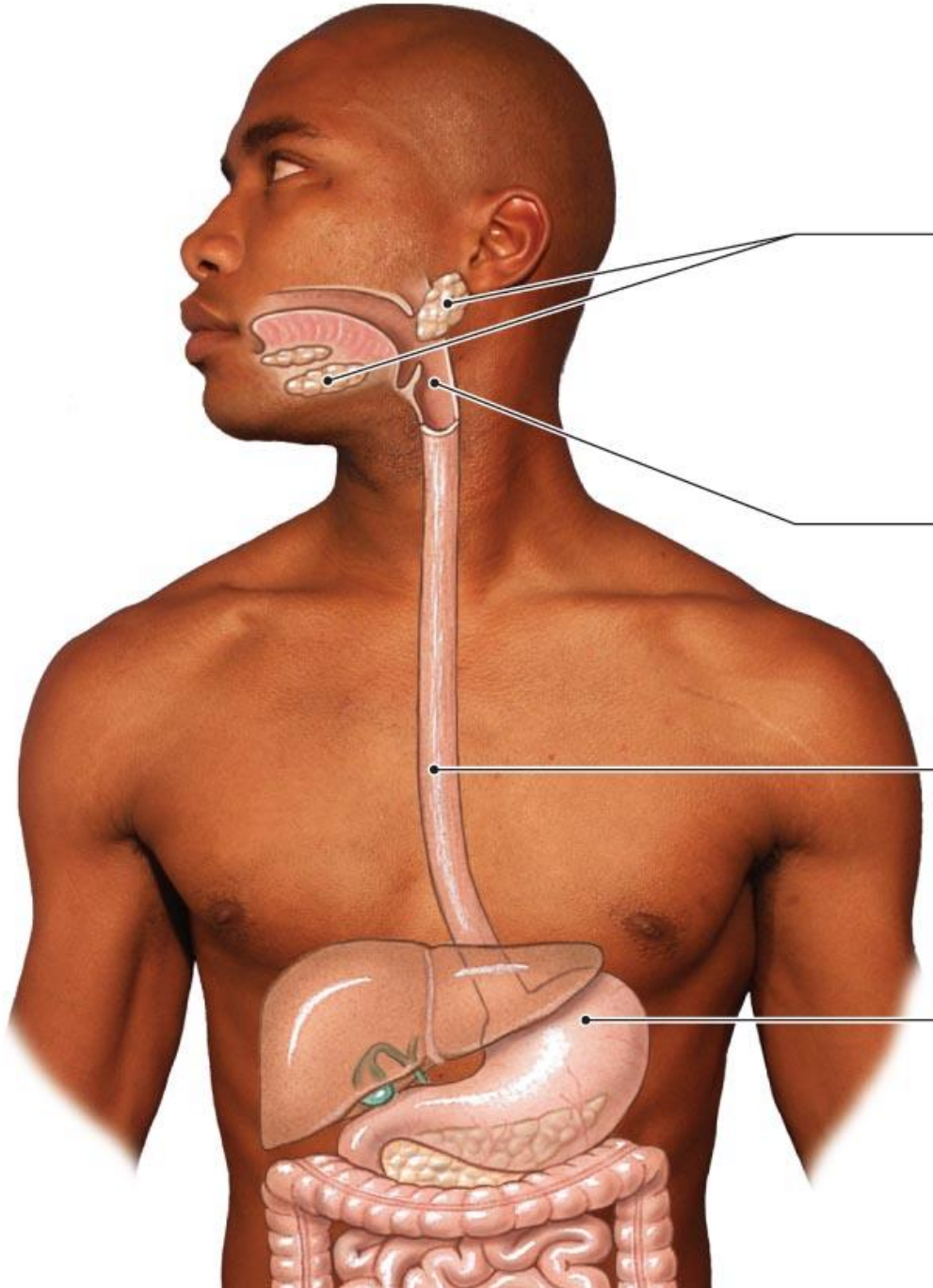




Structure and Function

Pharynx

- Muscular tube about 5 inches long in adults
- Also known as the throat
- Transmits food into the esophagus
- The epiglottis (a flap of tissue) covers the trachea to prevent food from entering the larynx during swallowing which causes choking



SALIVARY GLANDS

Secretion of lubricating fluid containing enzymes that break down carbohydrates

PHARYNX

Muscular propulsion of materials into the esophagus

ESOPHAGUS

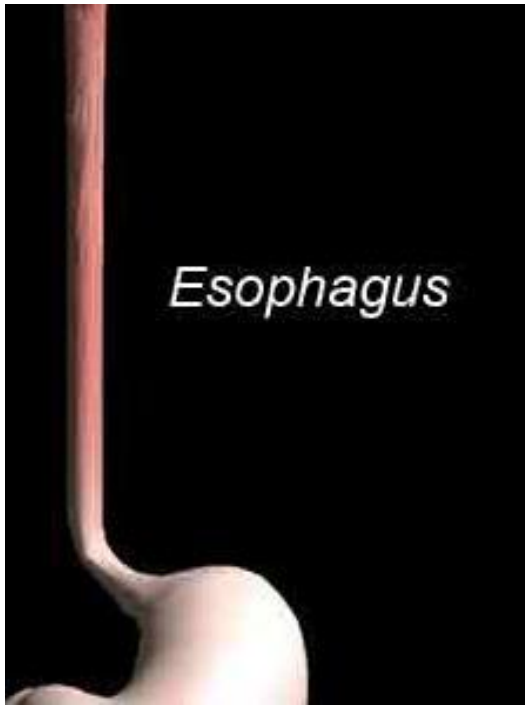
Transport of materials to the stomach

STOMACH

Chemical breakdown of materials via acid and enzymes; mechanical processing through muscular contractions

OESOPHAGUS

- PARS CERVICALIS
- PARS THORACICA
- PARS ABDOMINALIS

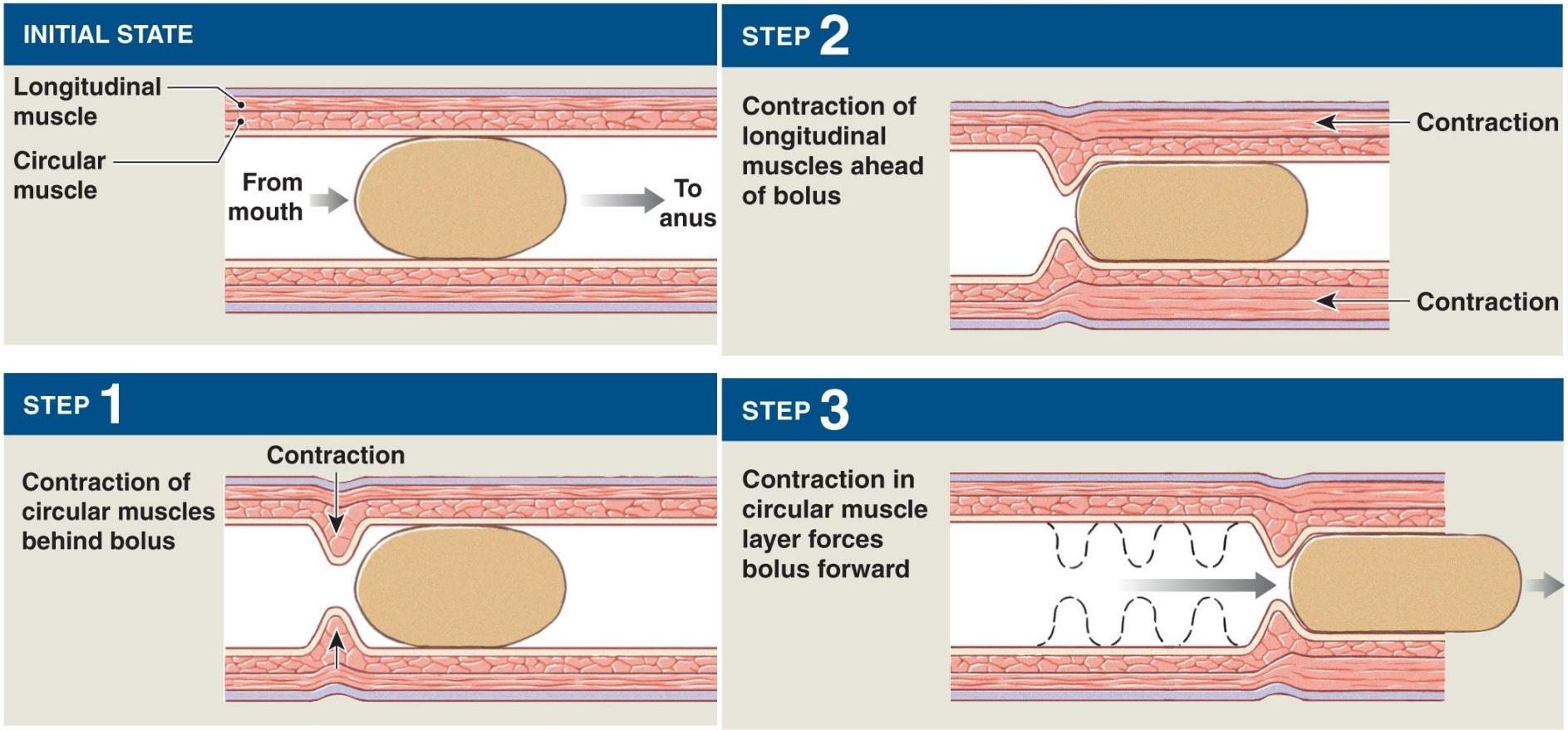


Esophagus

•Muscular tube about 9 to10 inches long in the adult that contracts rhythmically (peristalsis) to propel food toward the stomach

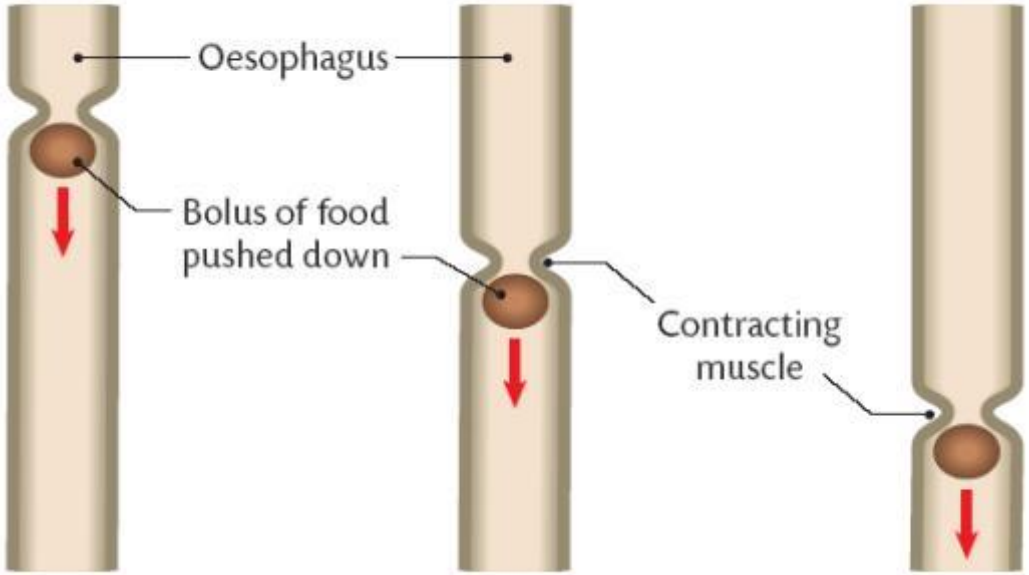
•Contains a group of muscles called the lower esophageal sphincter that closes off the entrance to the stomach to prevent reflux of food, emesis or regurgitation (vomiting).

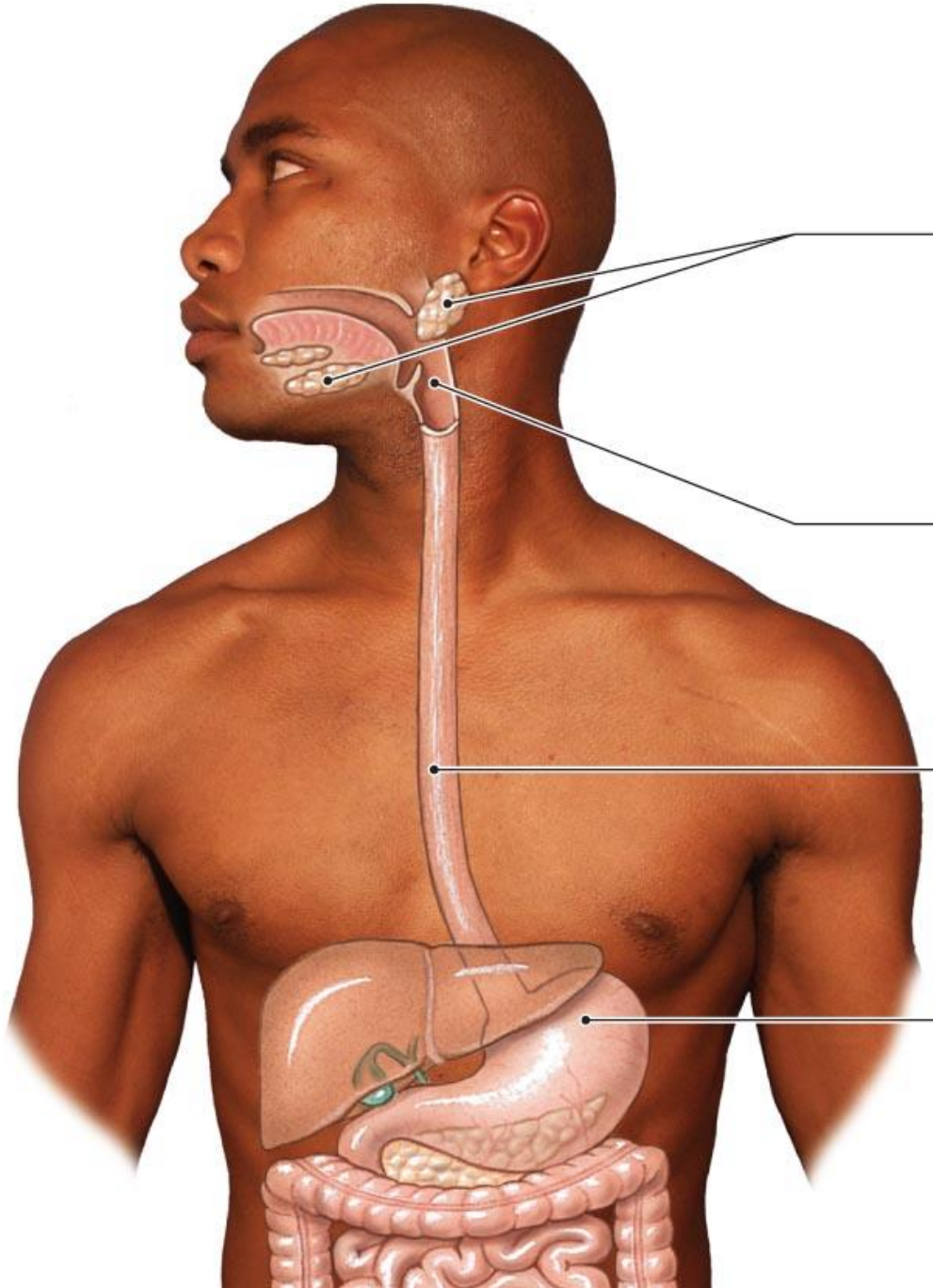
Peristalsis



Esophagus

- Epiglottis covers trachea (prevents food entering the lungs!)
- Peristalsis moves food to stomach
- It is possible to swallow while hanging upside down





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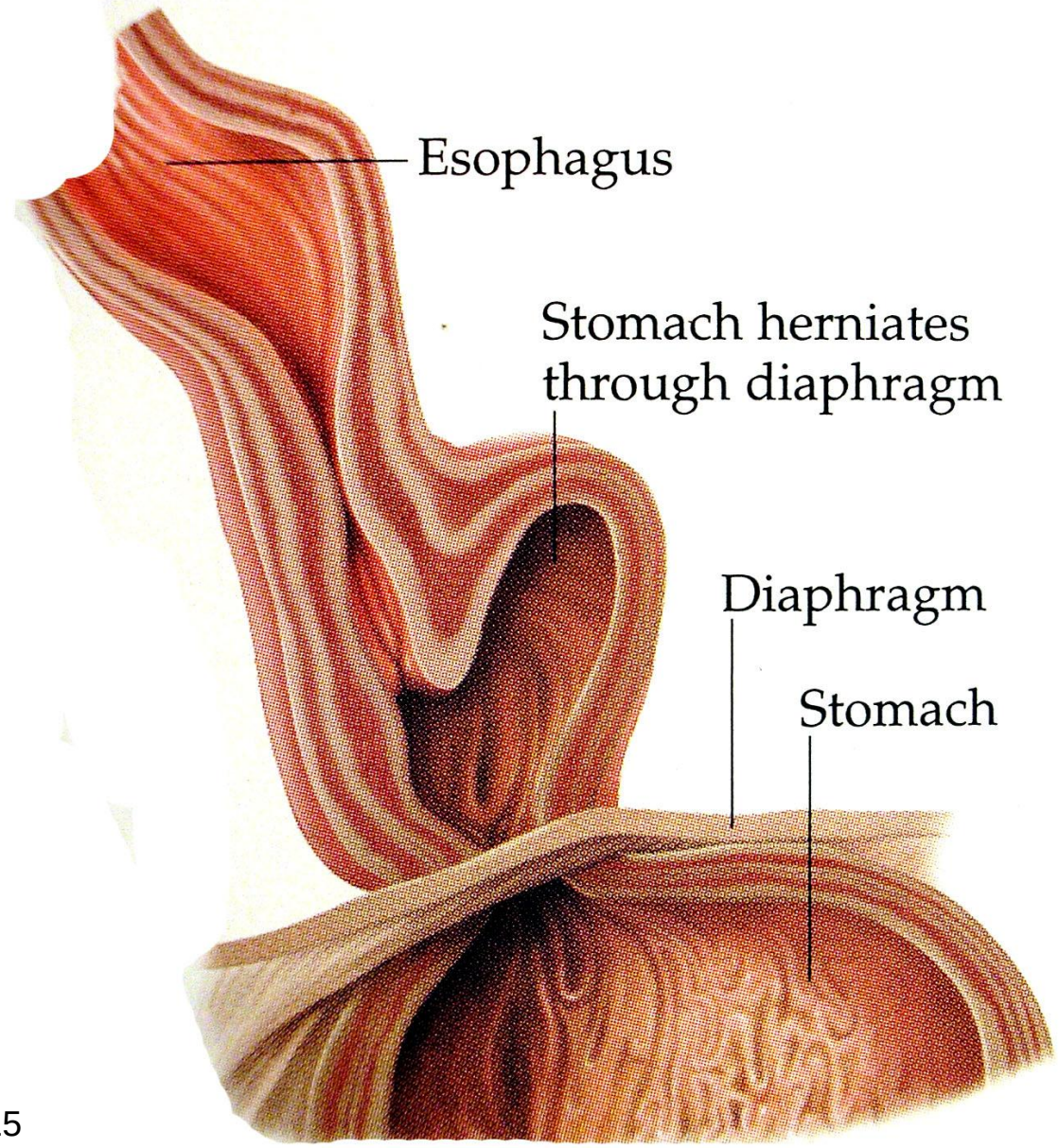
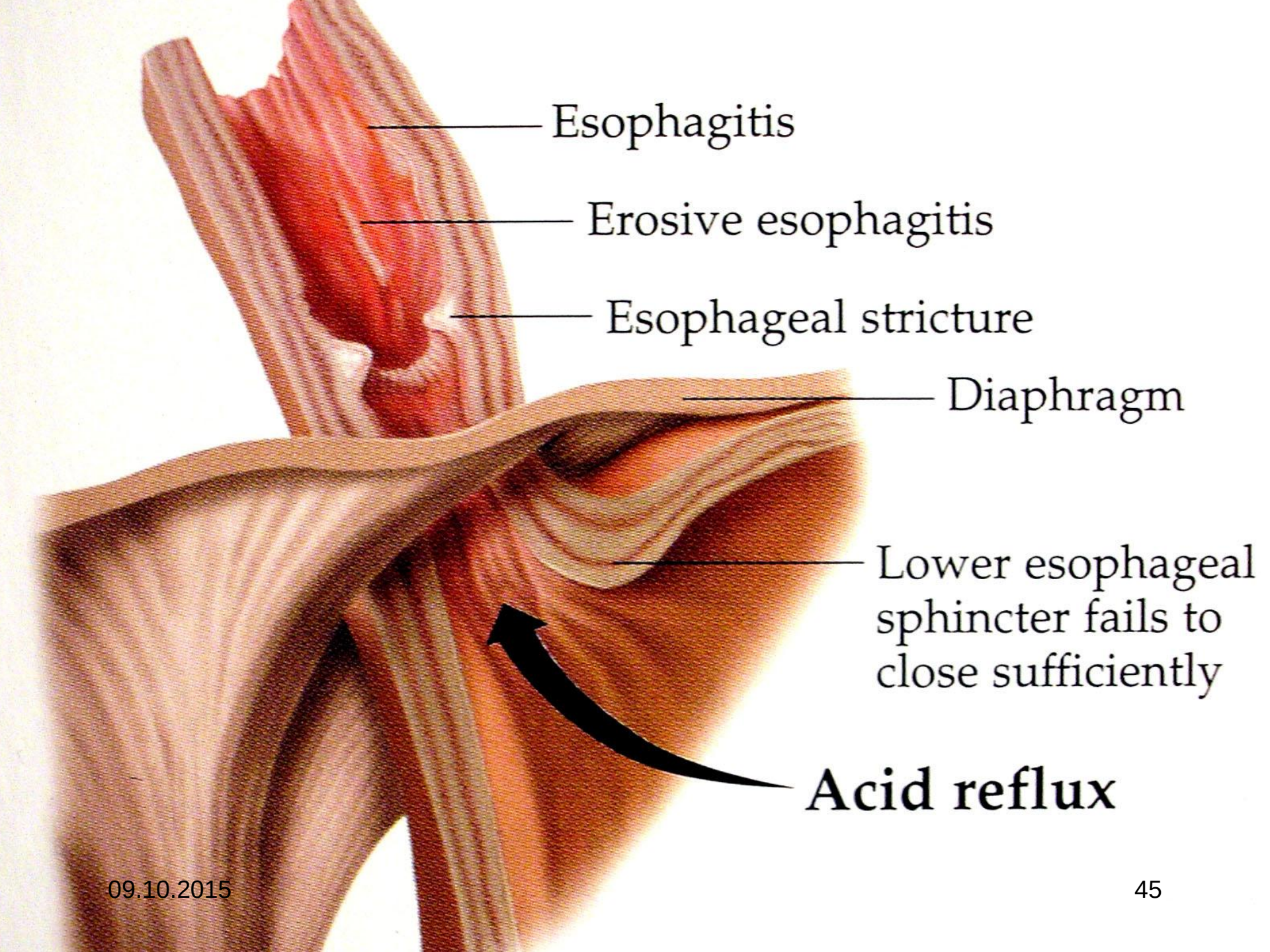
Chemical breakdown of materials via acid and enzymes; mechanical processing through muscular contractions

Hiatal Hernia




Esophagitis
Erosive esophagitis
Esophageal stricture
Diaphragm
Lower esophageal sphincter fails to close sufficiently
Acid reflux

Stomach

•Pouchlike organ located in the left hypochondriac region of the abdominal cavity
•Receives food from the esophagus and mixes it with gastric juices to form a semifluid mass called chyme

Gastric Juice	Function
pepsin	digests most proteins
hydrochloric acid	provides acidic environment for the action of pepsin
mucus	protects inside of stomach wall by providing an alkaline layer

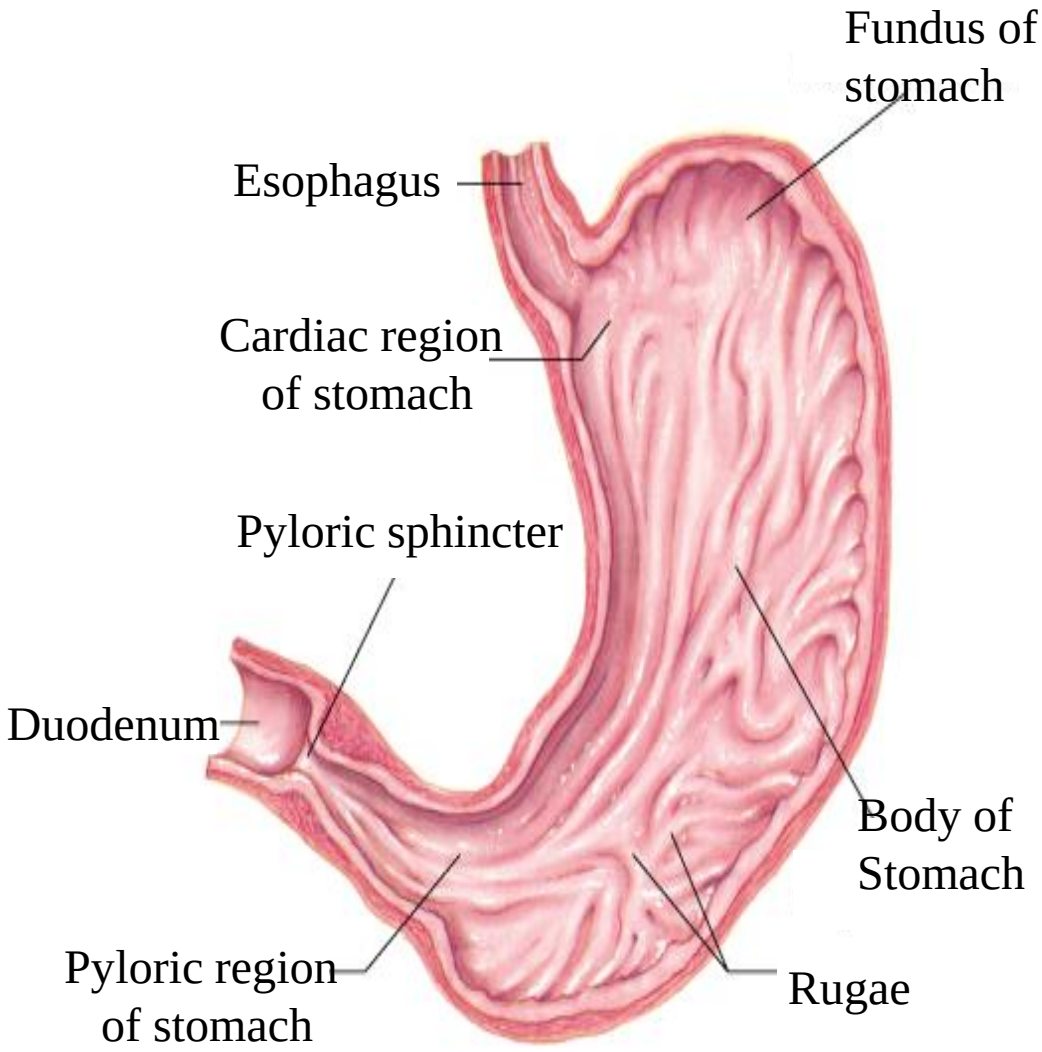
Stomach Regions

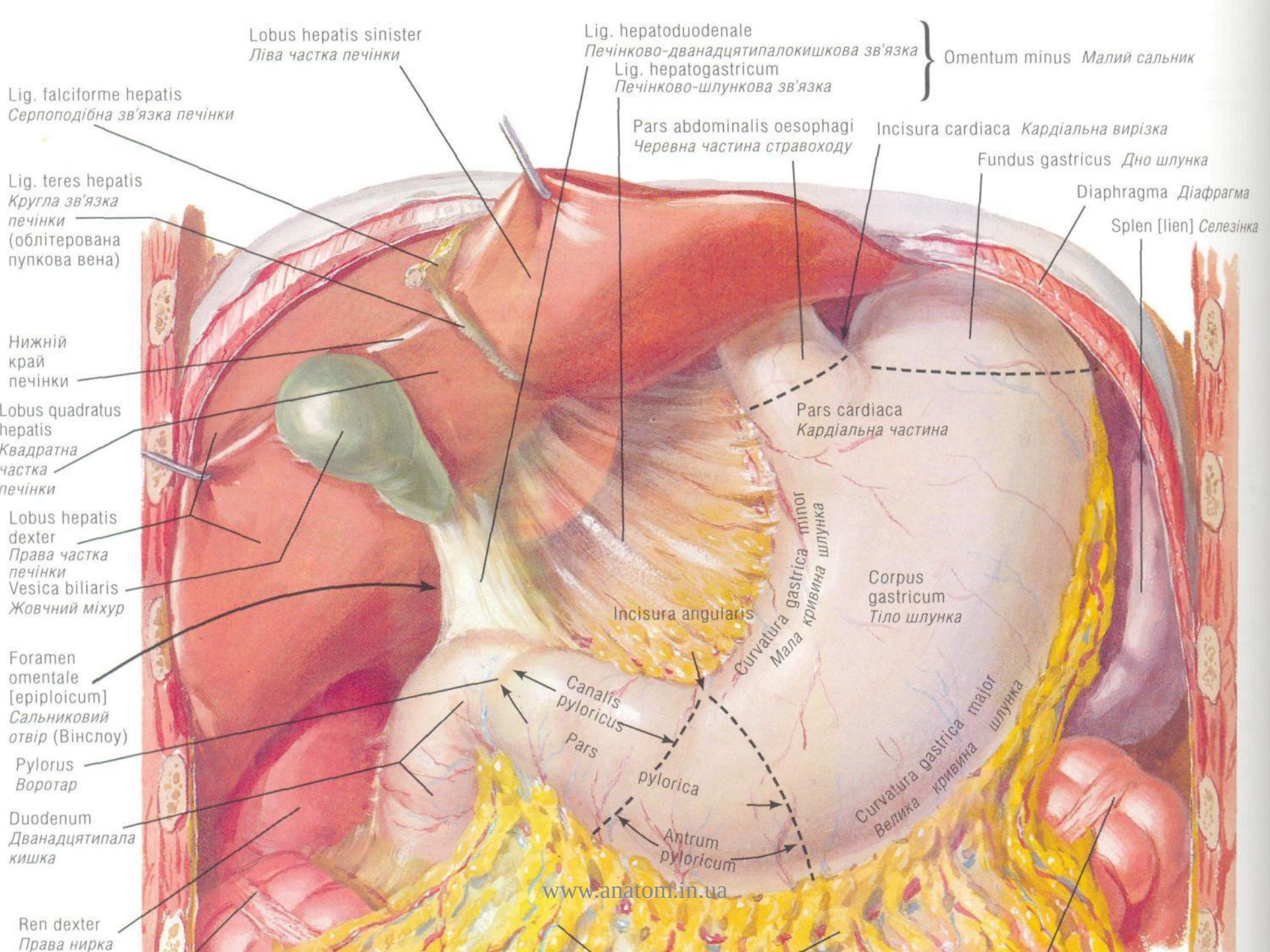
•Cardiac Region
-region closest to the heart

•Fundus
-upper rounded portion

•Body
-middle portion

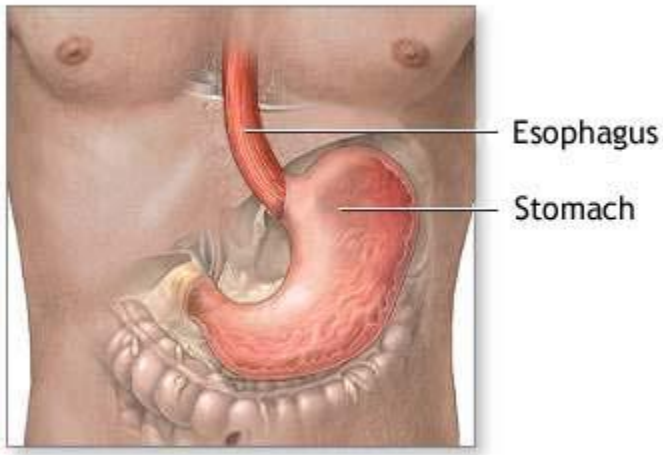
•Pylorus
-narrowed bottom portion that empties into the small intestine. The pyloric sphincter controls the emptying of the stomach.

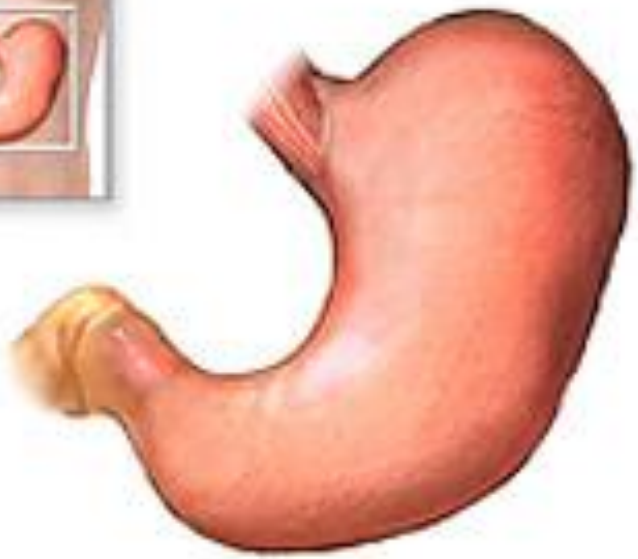




Stomach

- First opening – cardiac sphincter
- Muscles churn food – more mechanical digestion.
- Glands produce gastric juice = pepsin + HCl
- Pepsin breaks down proteins (only at pH 2)
- Food leaves after 2-4 hrs
- Second opening – pyloric sphincter





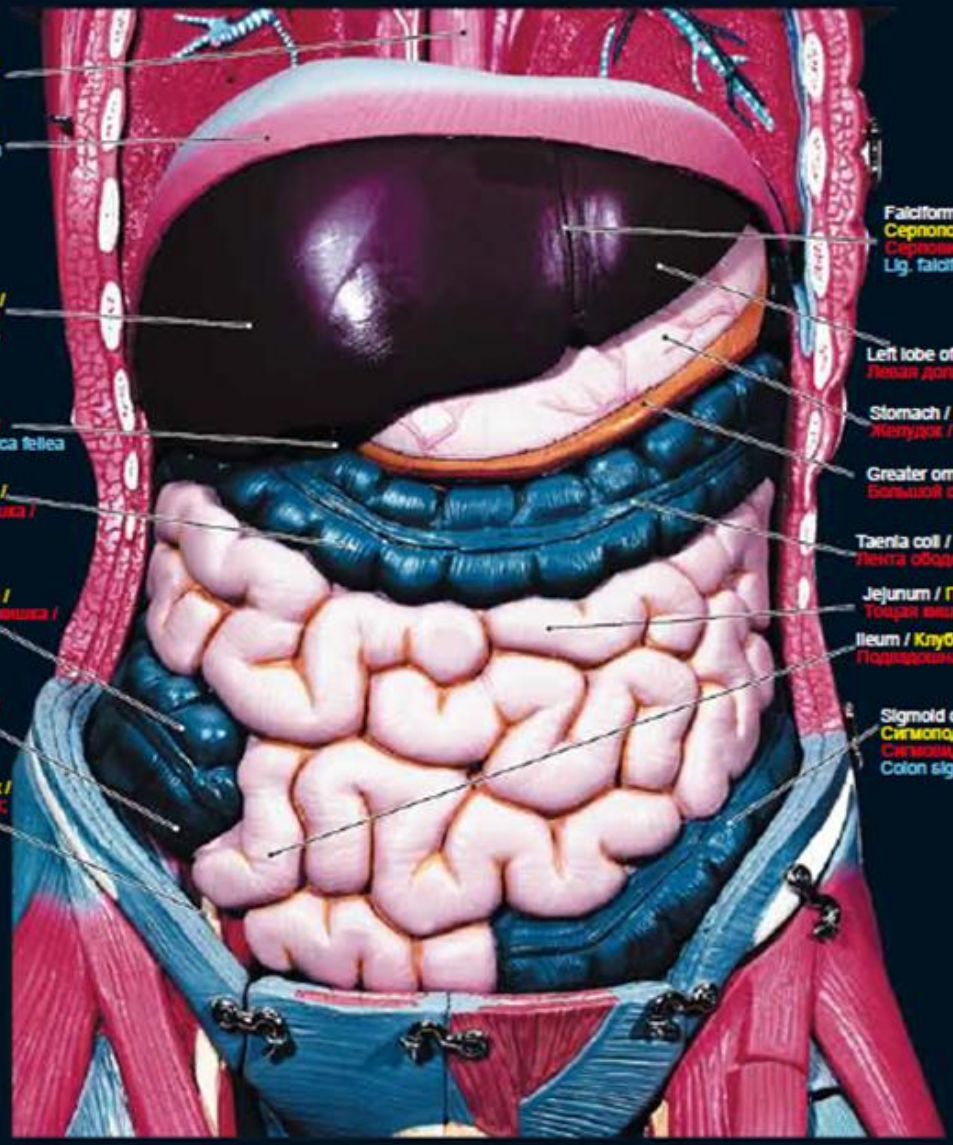
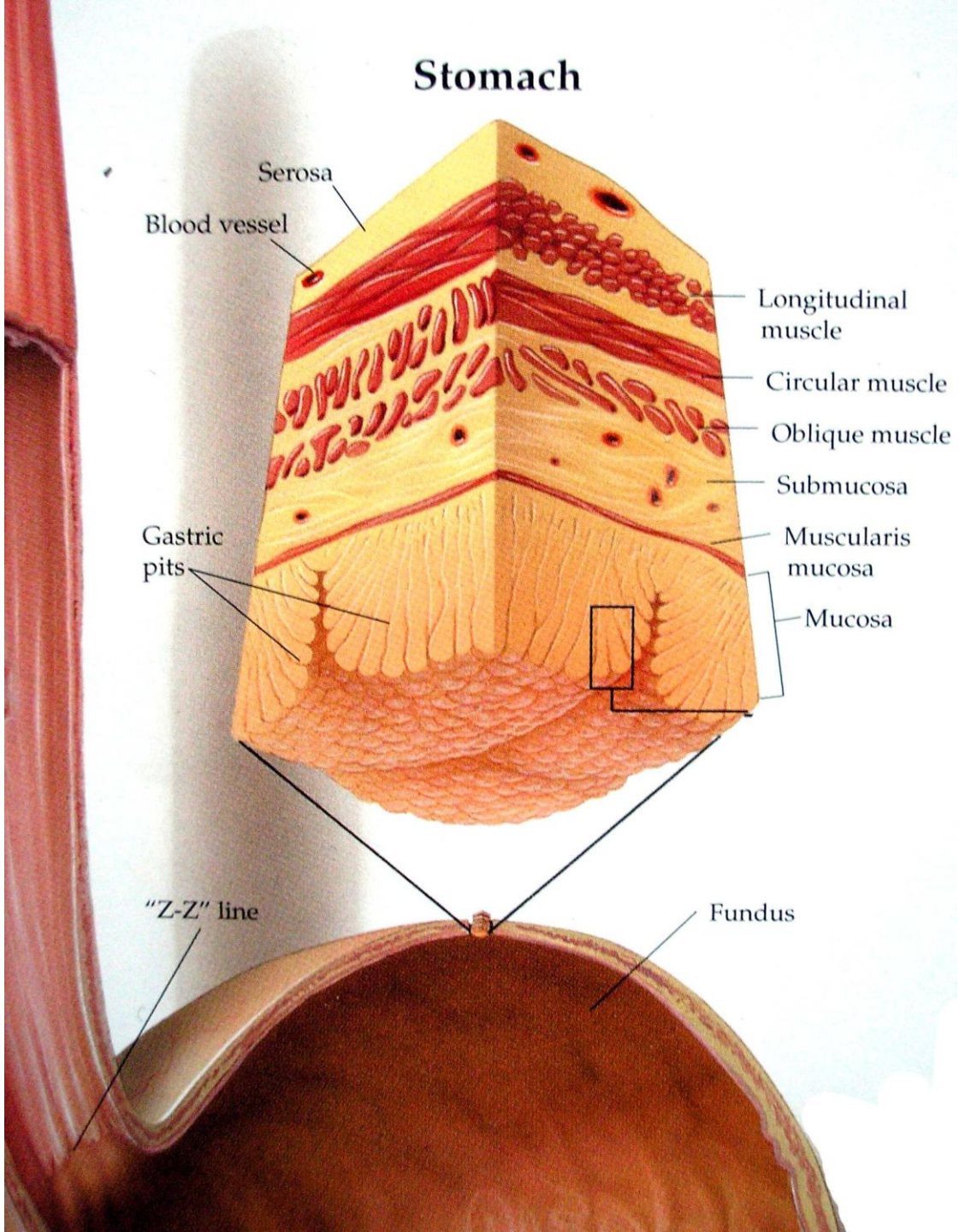
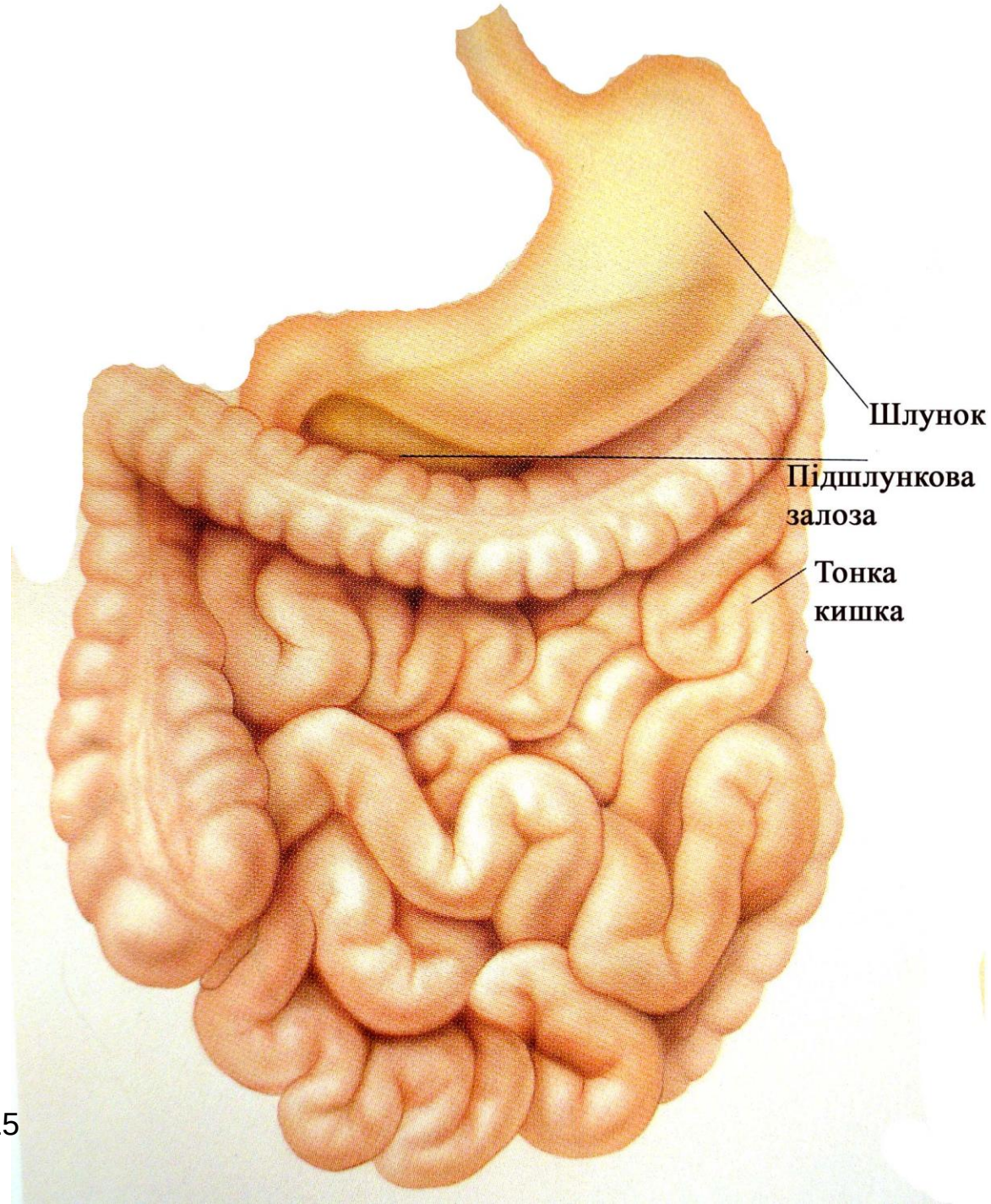


PLATE 49a ABDOMINOPELVIC VISCERA, SUPERFICIAL ANTERIOR VIEW / НУТРОЩІ ЧЕРЕВНОЇ ТА ТАЗОВОЇ ПОРОЖНИН, ПОВЕРХНЕВИЙ ВИГЛЯД СПЕРЕДУ / ВНУТРЕННИЕ ОРГАНЫ БРЮШНОЙ И ТАЗОВОЙ ПОЛОСТЕЙ, ПОВЕРХНОСТНЫЙ ВИД СПЕРЕДИ


Stomach
Serosa
Blood vessel
Longitudinal muscle
Circular muscle
Oblique muscle
Submucosa
Muscularis mucosa
Mucosa
Gastric pits
"Z-Z" line
Fundus


Шлунок
Підшлункова
залоза
Тонка
кишка

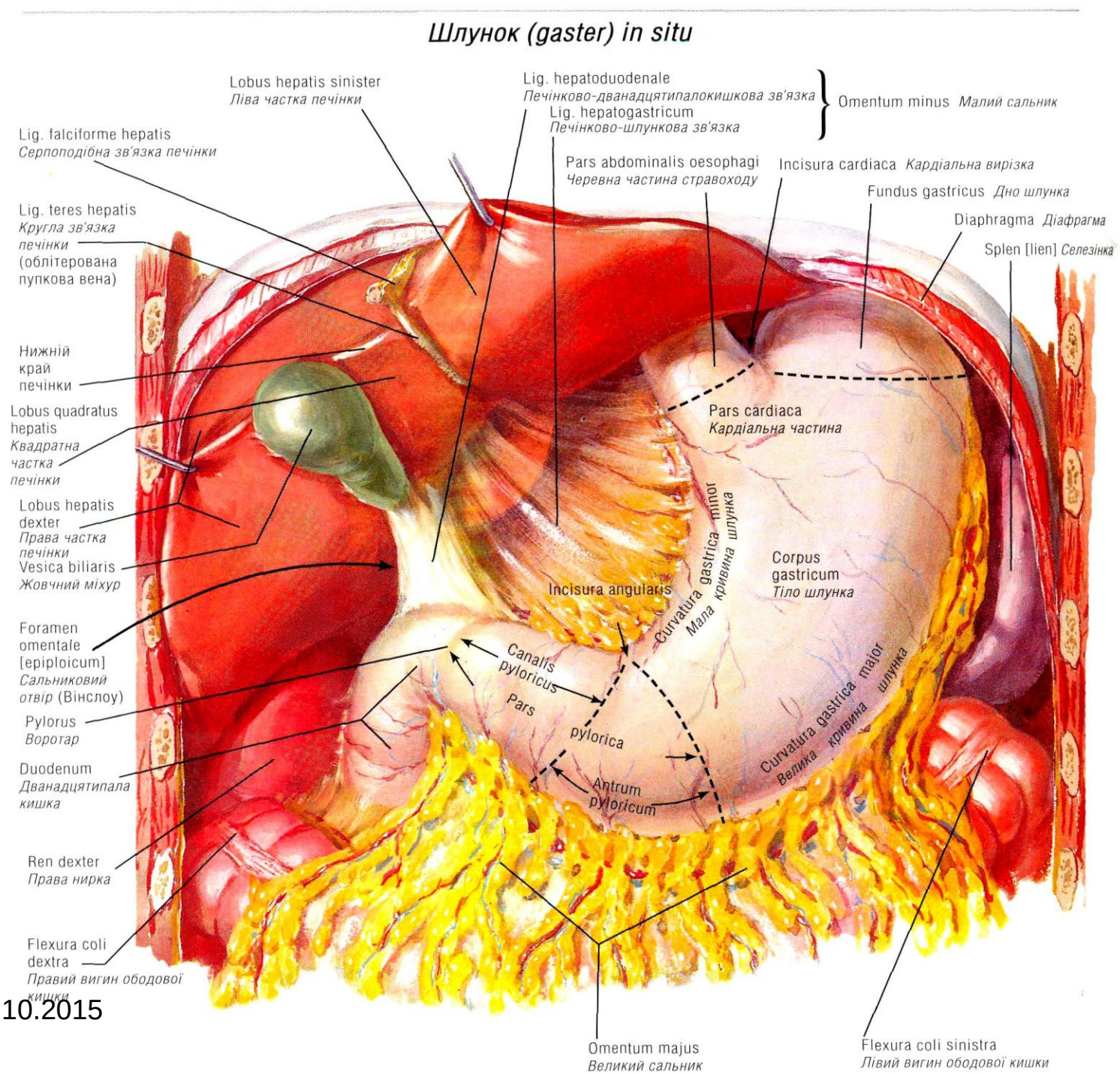
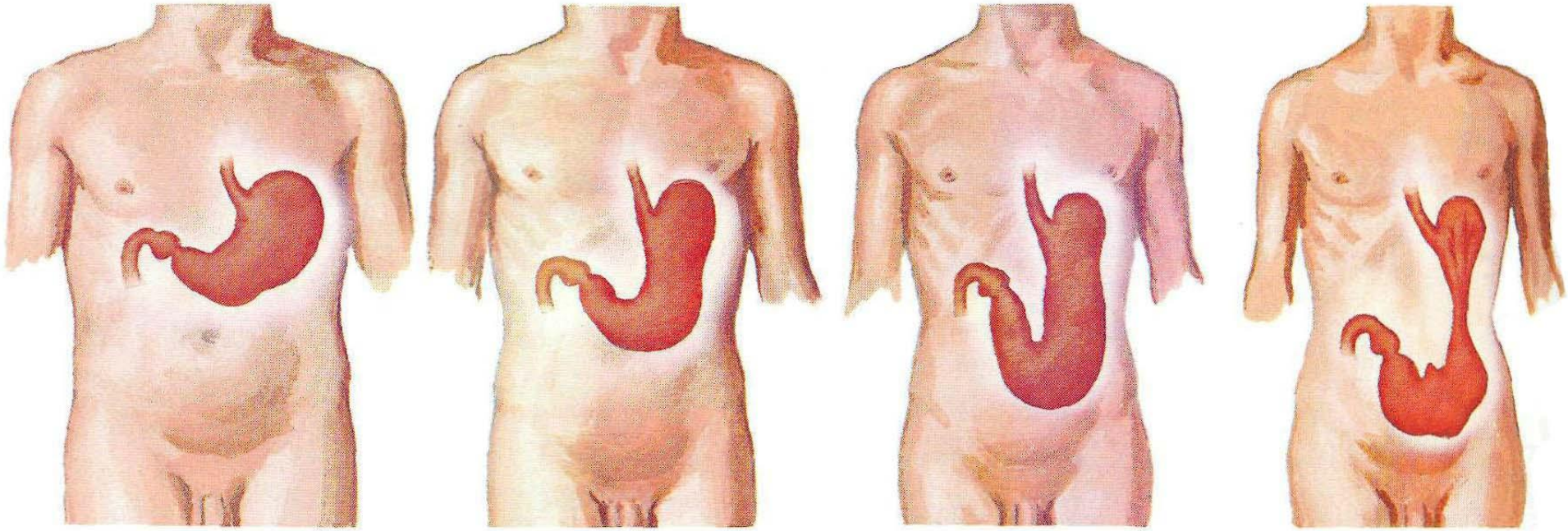

Шлунок (gaster) in situ
Lobus hepatis sinister
Ліва частка печінки
Lig. hepatoduodenale
Печінково-дванадцятипалокишкова зв'язка
Lig. hepatogastricum
Печінково-шлункова зв'язка
Omentum minus Малий сальник
Lig. falciforme hepatis
Серпоподібна зв'язка печінки
Pars abdominalis oesophagi
Черевна частина стравоходу
Incisura cardiaca Кардіальна вирізка
Fundus gastricus Дно шлунка
Diaphragma Діафрагма
Splen [lien] Селезінка
Lig. teres hepatis
Кругла зв'язка печінки
(облітерована пупкова вена)
Нижній край печінки
Lobus quadratus hepatis
Квадратна частка печінки
Pars cardiaca
Кардіальна частина
Lobus hepatis dexter
Права частка печінки
Vesica biliaris
Жовчний міхур
Incisura angularis
Curvatura gastrica minor
Мала кривина шлунка
Corpus gastricum
Тіло шлунка
Foramen omentale [epiploicum]
Сальниковий отвір (Вінслоу)
Canalis pyloricus
Pars pylorica
Antrum pyloricum
Curvatura gastrica major
Велика кривина шлунка
Pylorus
Воротар
Duodenum
Дванадцятипала кишка
Ren dexter
Права нирка
Flexura coli dextra
Правий вигин ободової кишки
Omentum majus
Великий сальник
Flexura coli sinistra
Лівий вигин ободової кишки

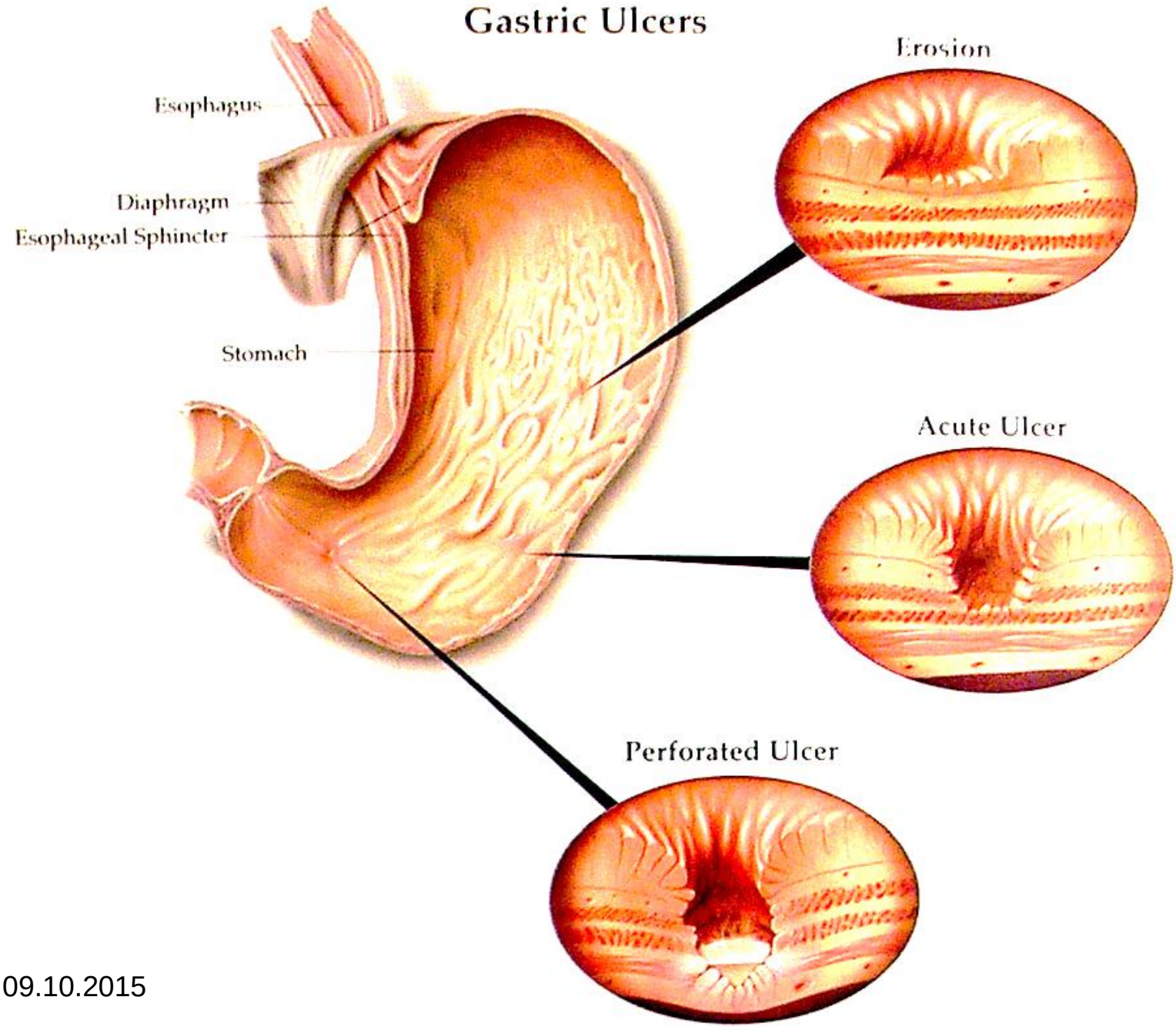
PLATE 50a GASTRIC RADIOGRAM 1 / ШЛУНКОВА РАДІОГРАМА 1 / ЖЕЛУДОЧНАЯ РАДИОГРАММА 1

PLATE 50b GASTRIC RADIOGRAM 2 / ШЛУНКОВА РАДІОГРАМА 2 / ЖЕЛУДОЧНАЯ РАДИОГРАММА 2

Варіанти положення і форм шлунка залежно від конституції людини



Гіпертонічний шлунок | Ортотонічний шлунок | Гіпотонічний шлунок | Атонічний шлунок


Gastric Ulcers
Esophagus
Diaphragm
Esophageal Sphincter
Stomach
Erosion
Acute Ulcer
Perforated Ulcer

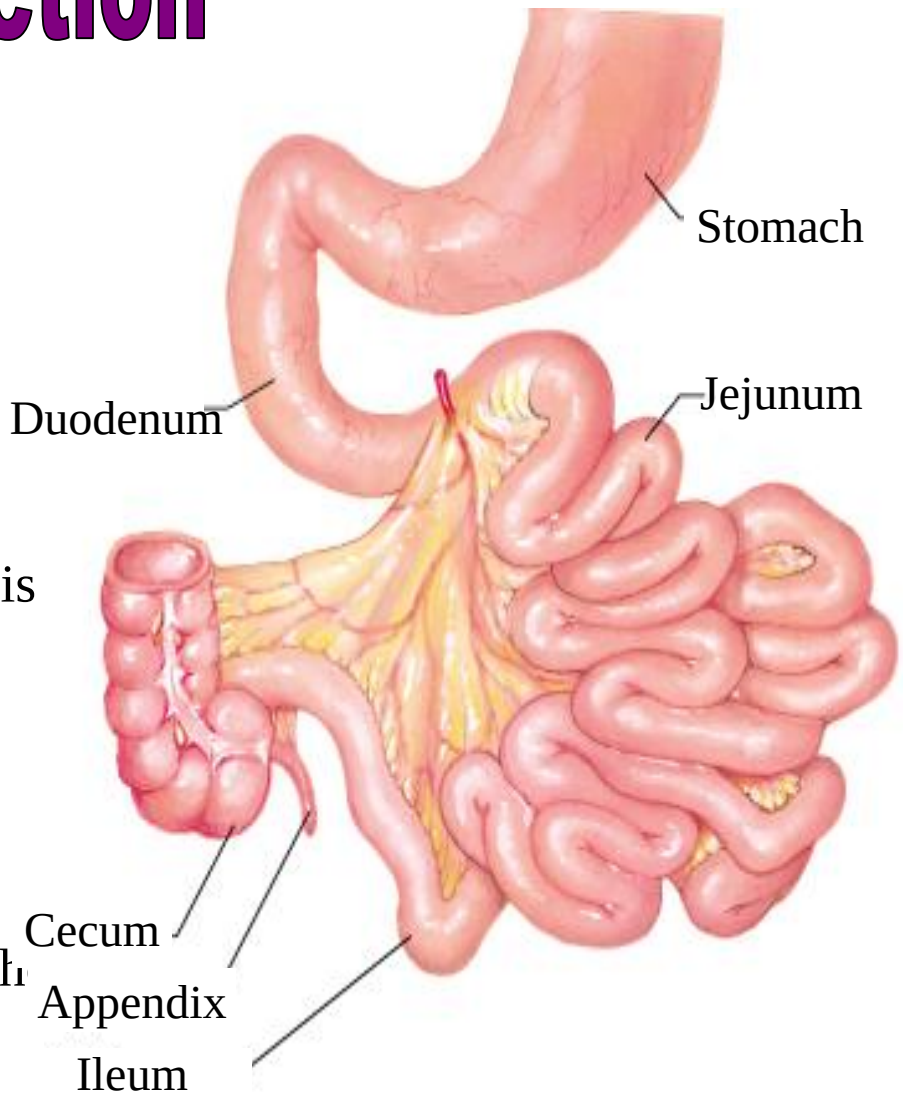
Structure and Function

Small Intestine

•Consists of three parts:
- -duodenum
- -jejunum
- -ileum

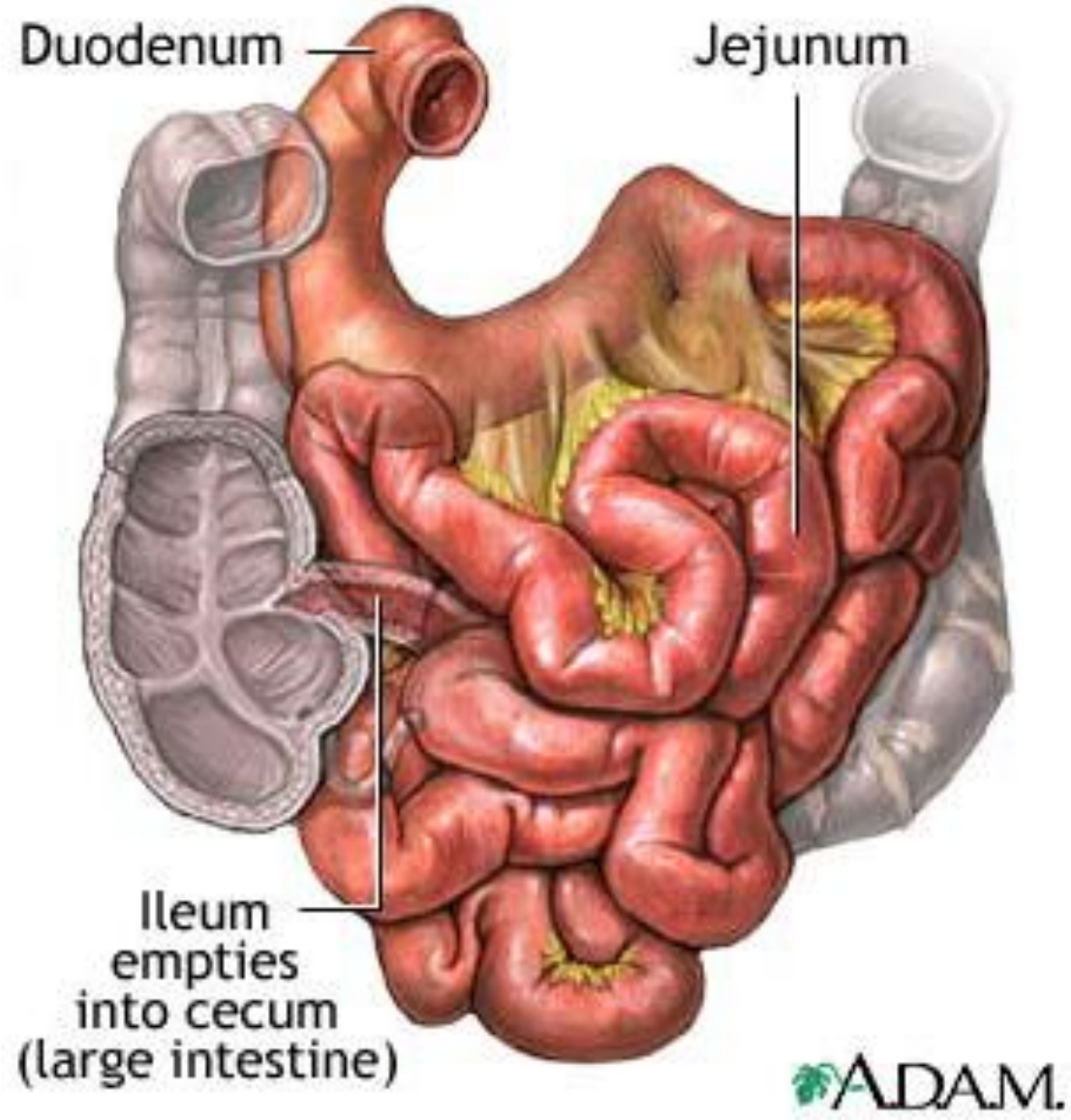
•Held in place by the mesentery which is a muscular membranous tissue that anchors both the small and large intestines to the abdominal wall

•First site of absorption and nutrients pass from the intestinal walls and into th bloodstream through the villi

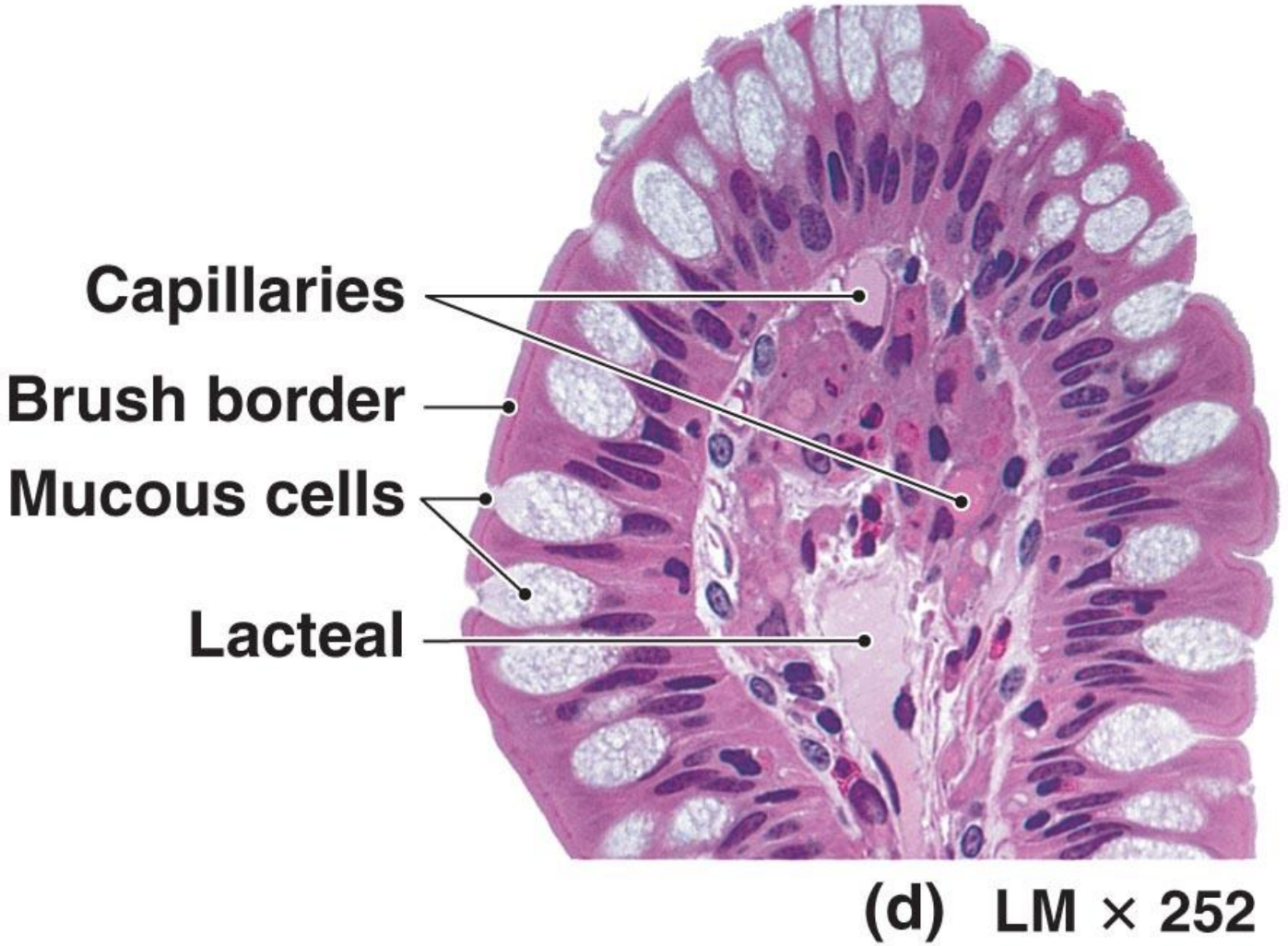


INTESTINUM TENUE

- DUODENUM
  - PARS SUPERIOR
  - PARS DESCENDENS
  - PARS HORIZONTALIS
  - PARS ASCENDENS
- JEJUNUM
- ILEUM

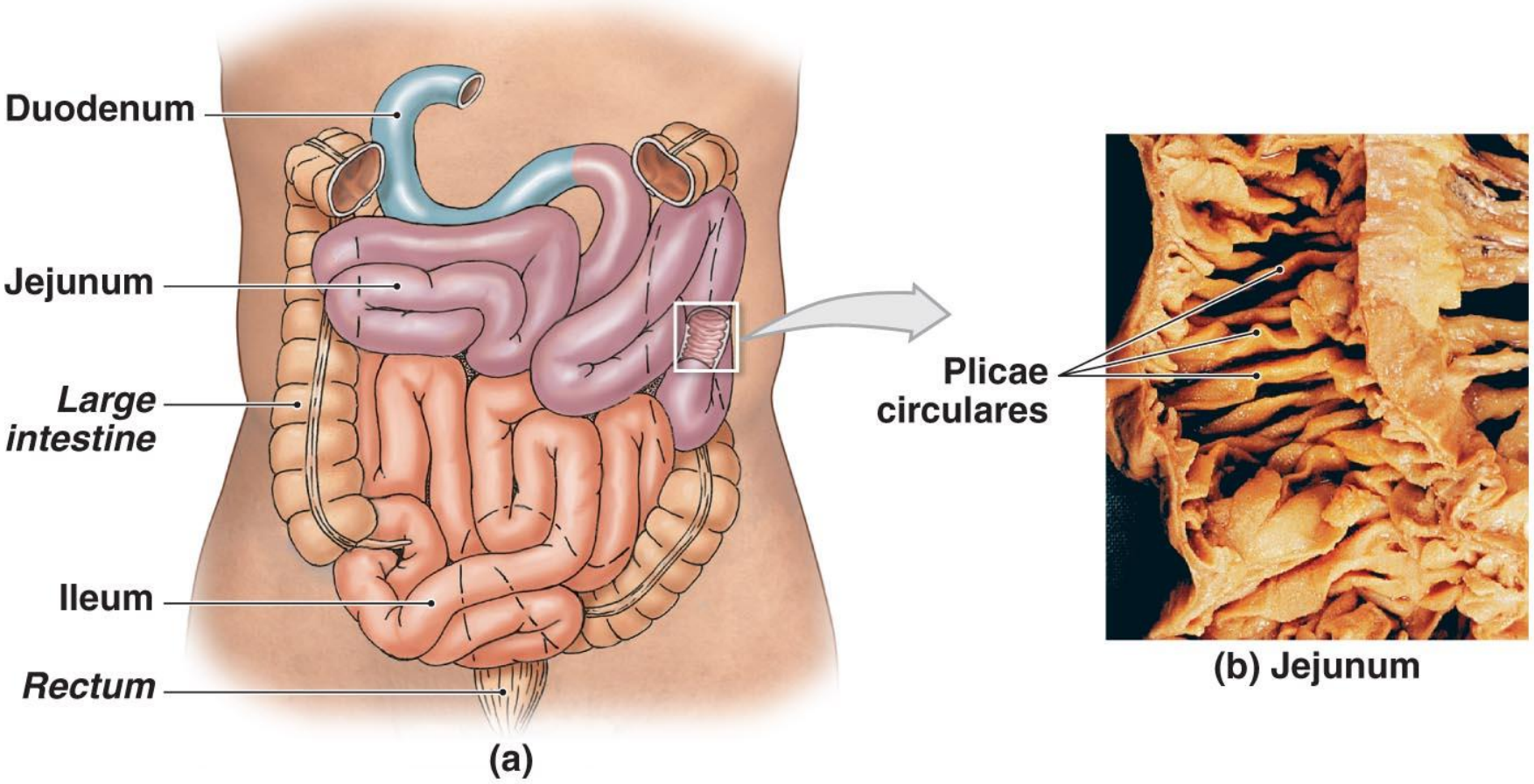


Small Intestine



Small Intestine

- 90% of absorption occurs in the small intestine

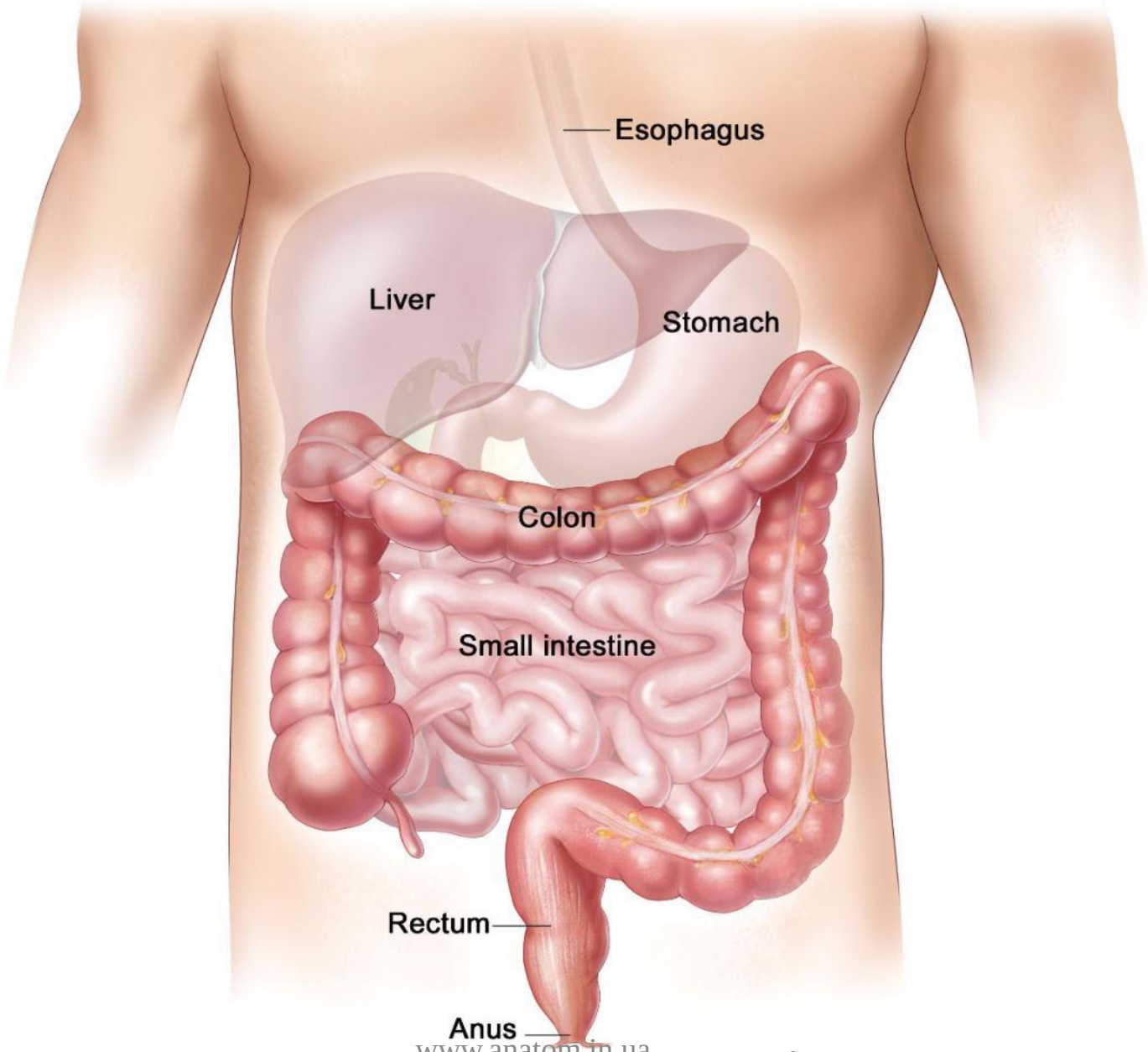


Small Intestine

- Intestinal Secretions
  - Watery intestinal juice
  - 1.8 liters per day enter intestinal lumen
  - Moisten chyme
  - Assist in buffering acids
  - Keep digestive enzymes and products of digestion in solution
- Intestinal Movements
  - Chyme arrives in duodenum
  - Weak peristaltic contractions move it slowly toward jejunum
    - Myenteric reflexes
    - Not under CNS control
    - Parasympathetic stimulation accelerates local peristalsis and segmentation

INTESTINUM CRASSUM

- CAECUM
- COLON
  - COLON ASCENDENS
  - COLON TRANSVERSUM
  - COLON DESCENENS
  - COLON SIGMOIDEUM
- RECTUM



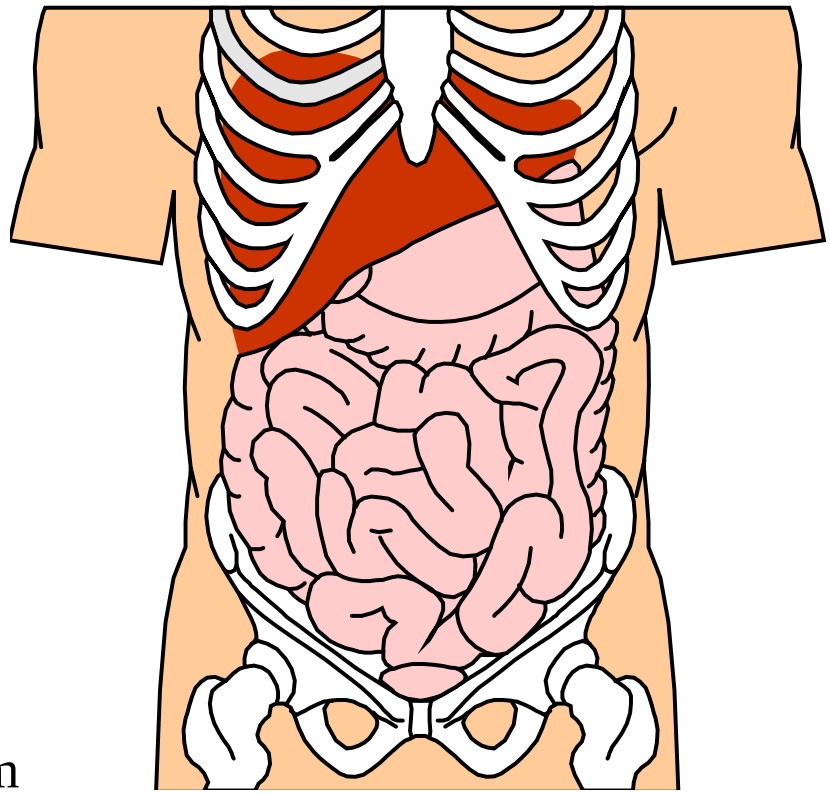
Large Intestine

•Consists of 3 parts:
-cecum
-colon
-rectum

•Undigested waste may remain in the large intestine from 12 to 24 hours

•A wormlike pouch (appendix) filled with lymphatic tissue extends from the cecum

•Process of turning waste material into a semisolid waste (feces) begins in the cecum

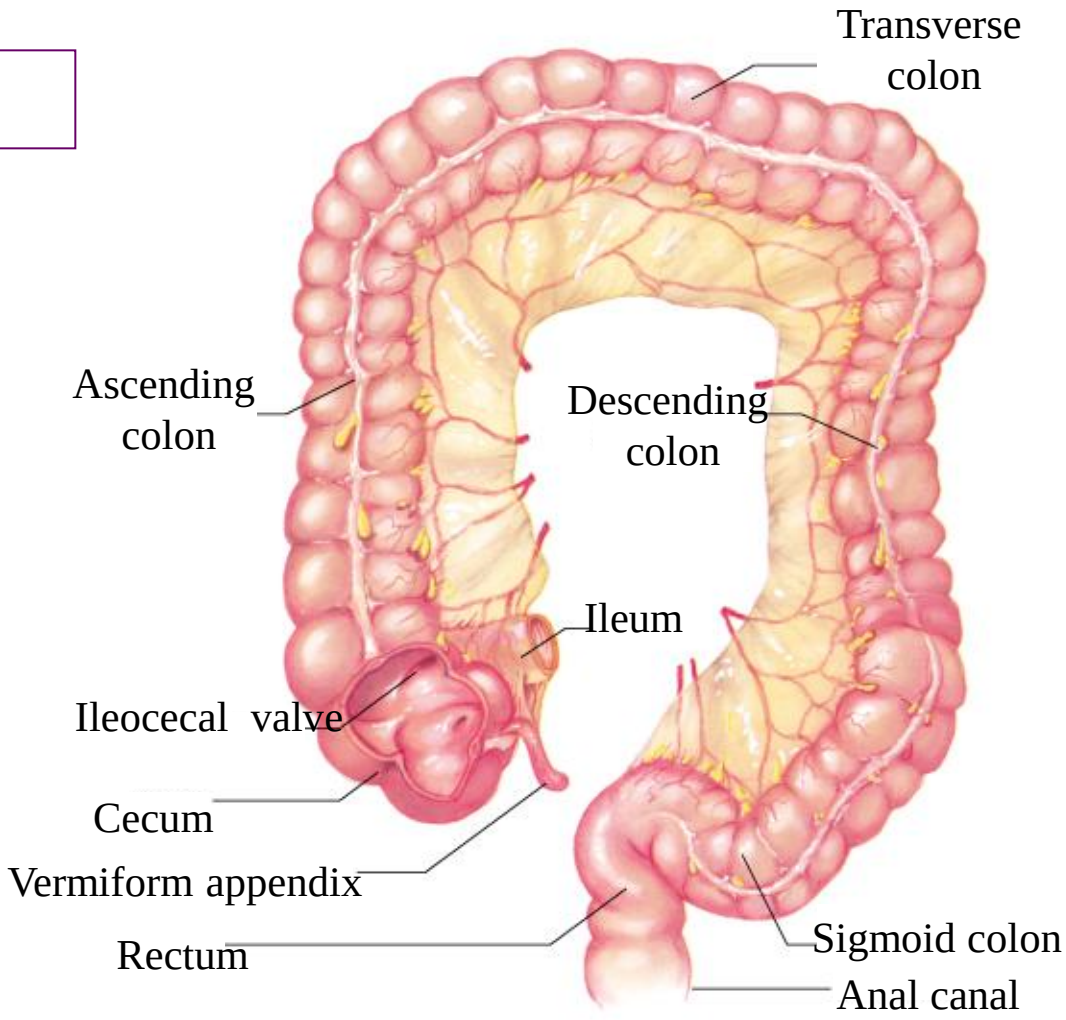


Large Intestine (cont'd)

•Colon consists of 4 parts:
-ascending colon
-transverse colon
-descending colon
-sigmoid colon is an s-shaped structure that connects to the rectum

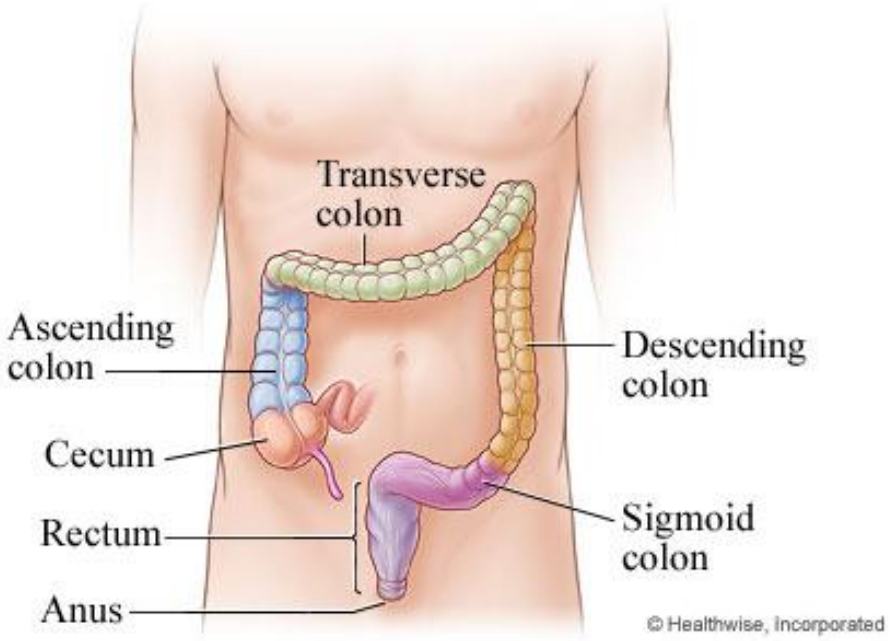
•Rectum connects to the anal canal

•Release of feces from the body is called defecation



LARGE INTESTINE

- **Absorbs water**
- **Bacteria live here (produce methane)**
- **Bacteria produce B vitamins and Vitamin K**
- **Stores solid waste in rectum until elimination.**



LIVER

Secretion of bile (important for lipid digestion), storage of nutrients, many other vital functions

GALLBLADDER

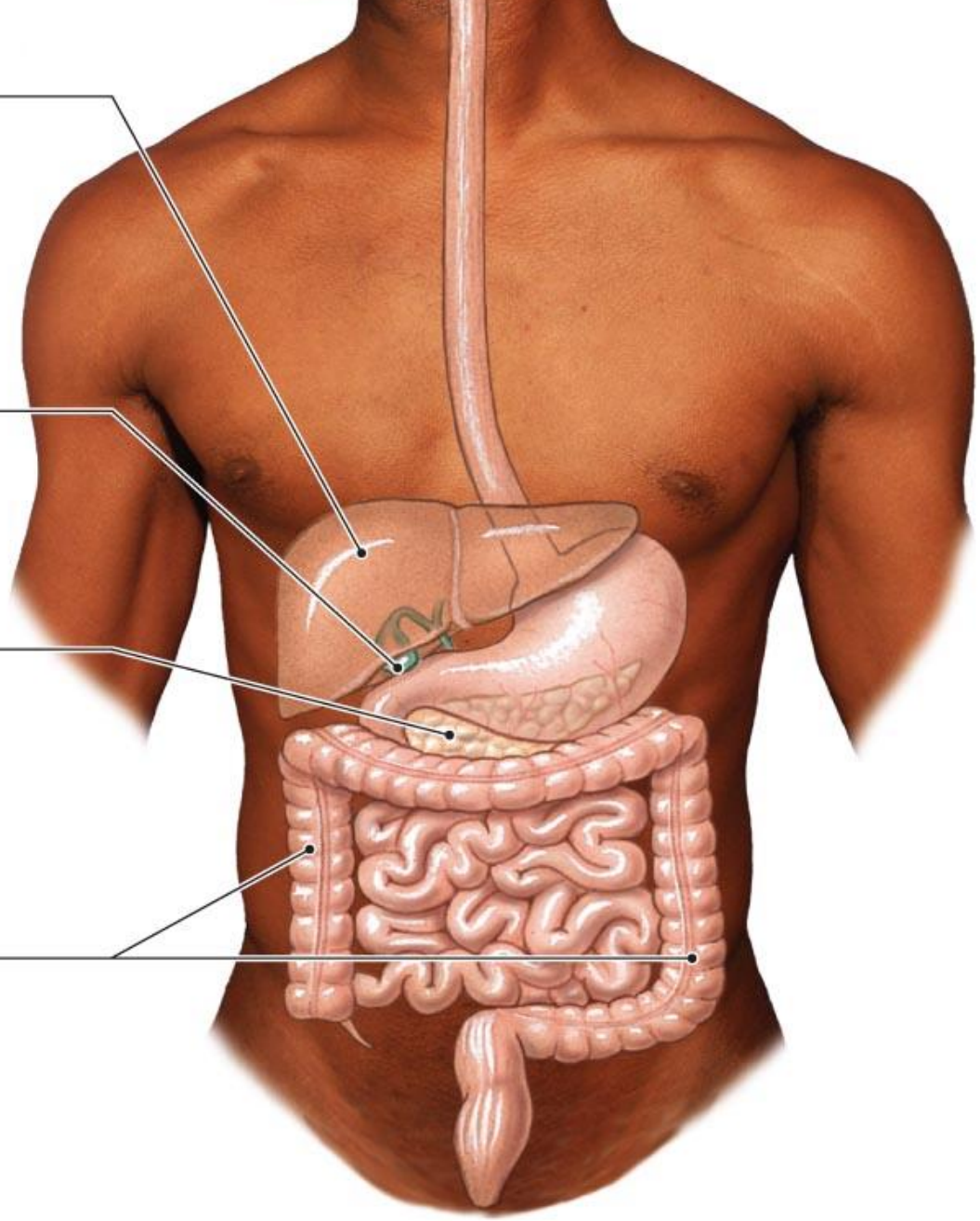
Storage and concentration of bile

PANCREAS

Exocrine cells secrete buffers and digestive enzymes; endocrine cells secrete hormones

LARGE INTESTINE

Dehydration and compaction of indigestible materials in preparation for elimination



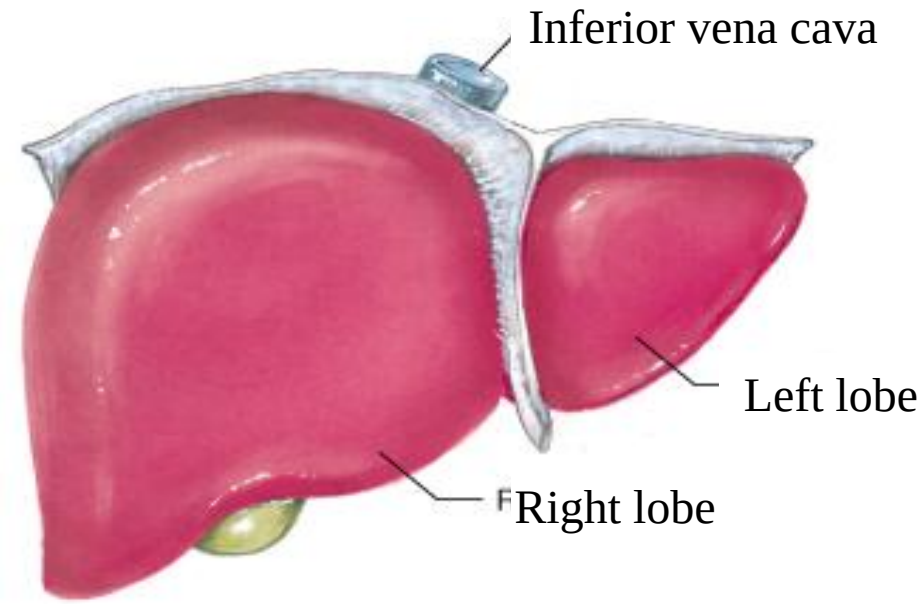
Liver Function

The Physiology of the Liver

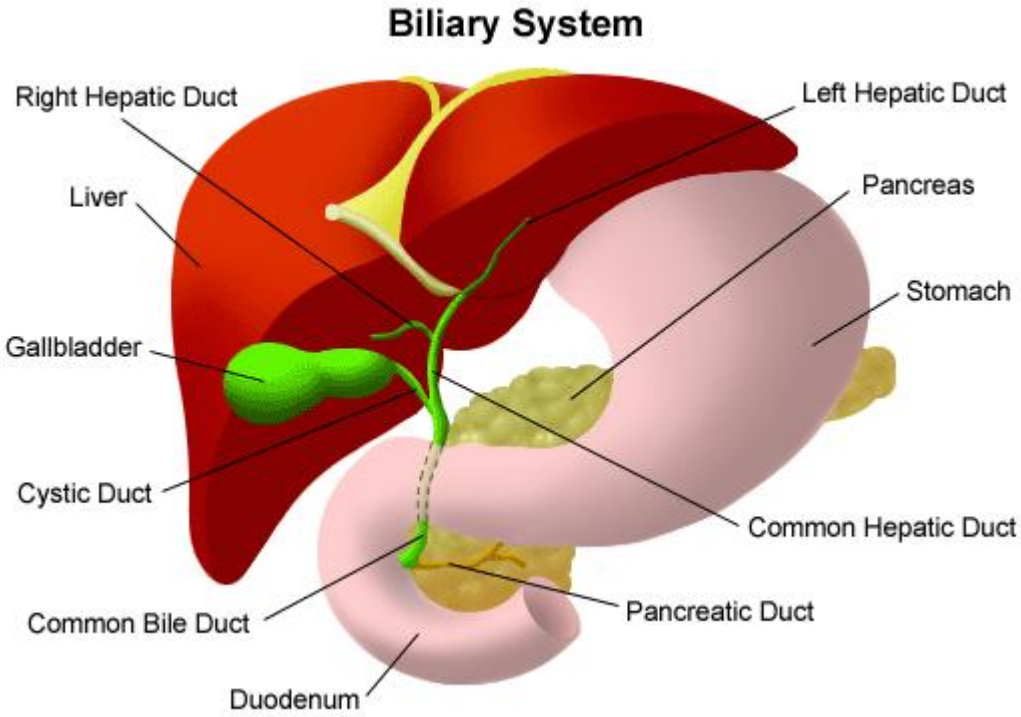
1. Metabolic regulation
2. Hematological regulation
3. Bile production

Liver

- Located in the right quadrant of the abdominal cavity
- Divided into right and left lobes
- Converts food nutrients into usable substances
- Secretes a yellowish-brown to greenish substance called bile which is stored in the gall bladder
- Stores glucose in the form of glycogen
- Secretes bilirubin, a bile pigment that is combined with bile and excreted into the duodenum



Liver

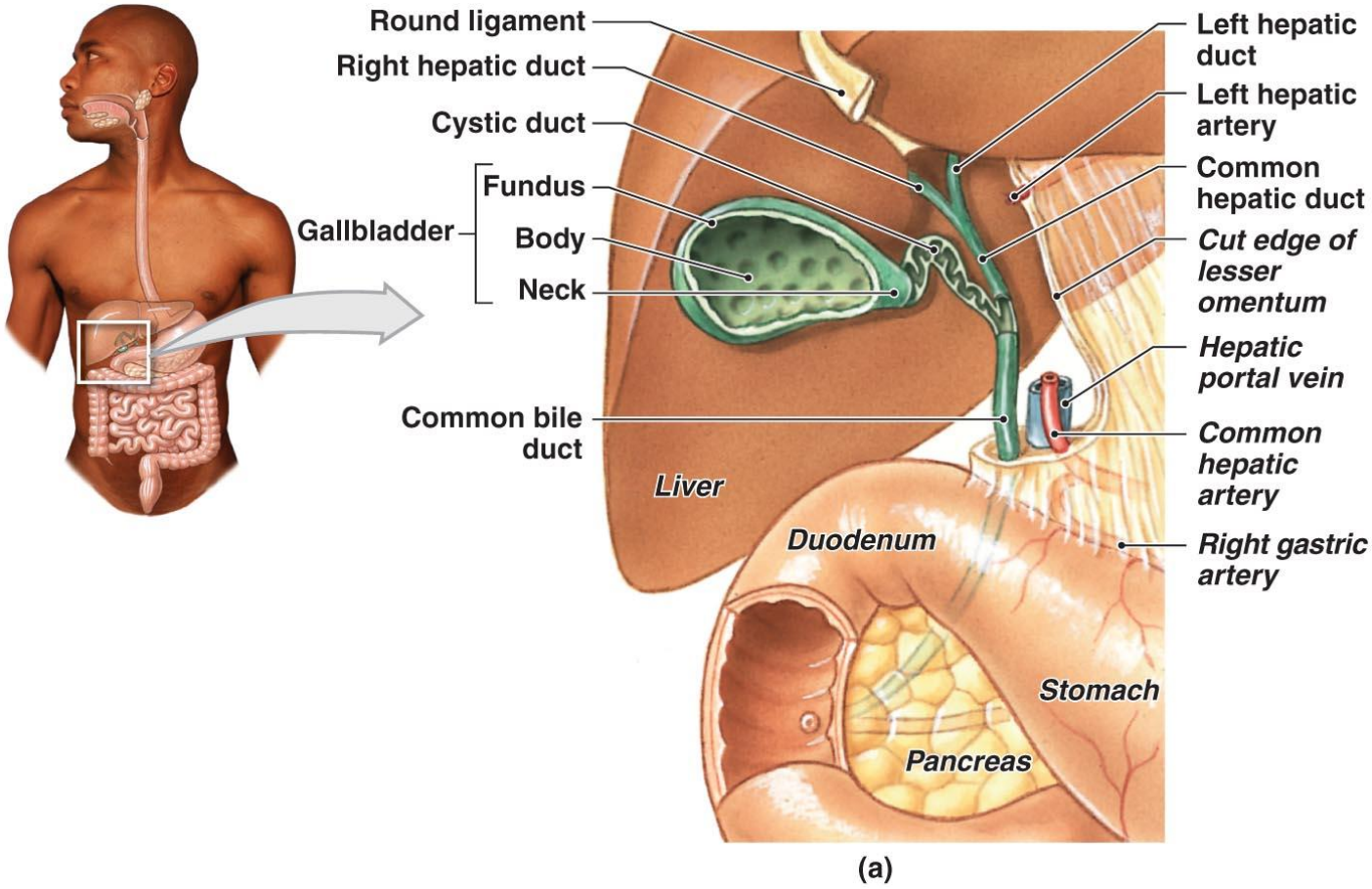


- Produces bile

Bile is stored in the gallbladder.

<u>Question</u>: What is the function of bile?

Liver


Round ligament
Right hepatic duct
Cystic duct
Gallbladder
Fundus
Body
Neck
Common bile duct
Liver
Duodenum
Stomach
Pancreas
Left hepatic duct
Left hepatic artery
Common hepatic duct
Cut edge of lesser omentum
Hepatic portal vein
Common hepatic artery
Right gastric artery
(a)

Bile or **gall** is a dark green to yellowish brown fluid, produced by the liver of most vertebrates, that aids the digestion of lipids in the small intestine. In humans, bile is produced continuously by the liver (liver bile), and stored and concentrated in the gallbladder (gallbladder bile). After eating, this stored bile is discharged into the duodenum.

www.anatom.in.ua

Gallbladder

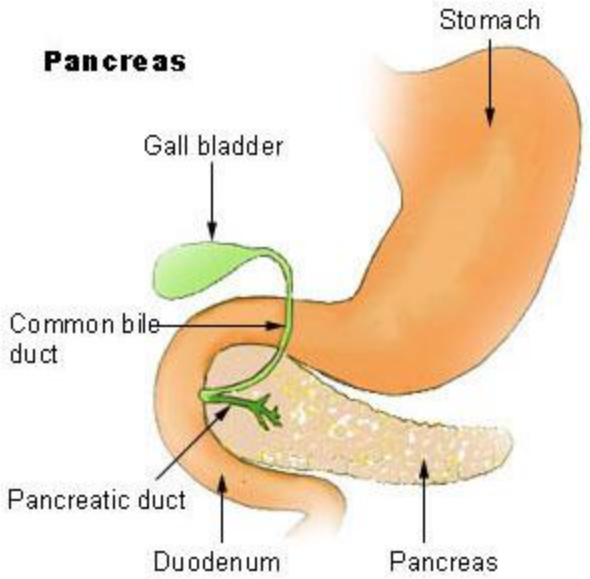
- Stores bile from the liver
- Three ducts connect the liver, gallbladder, and duodenum for the flow of bile (hepatic duct, cystic duct, and common bile duct)
- Releases bile when it is needed for the emulsification (breakdown) of fat

Pancreas

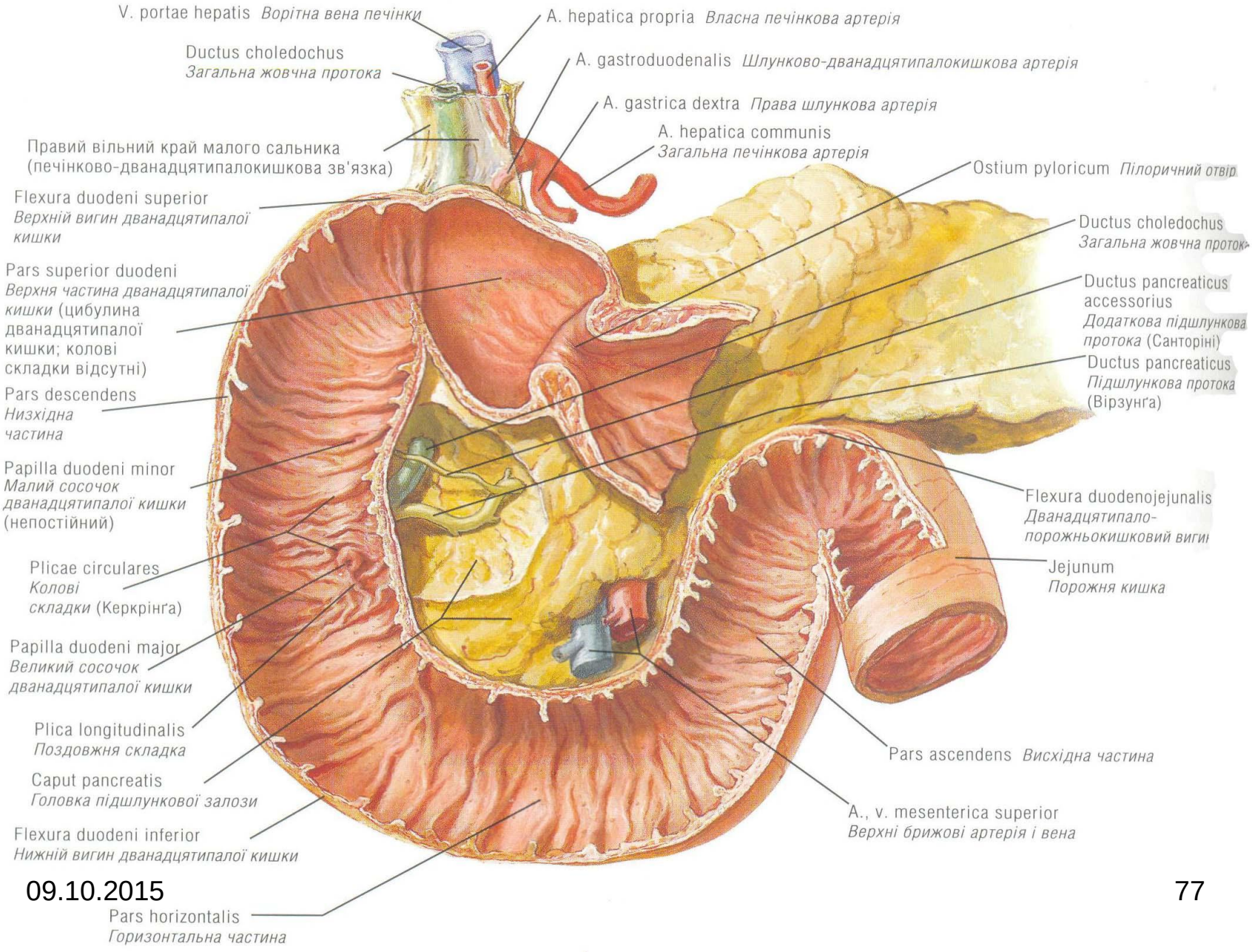
- Secretes a pancreatic juice that includes various enzymes such as amylase and lipase
- Also an endocrine gland

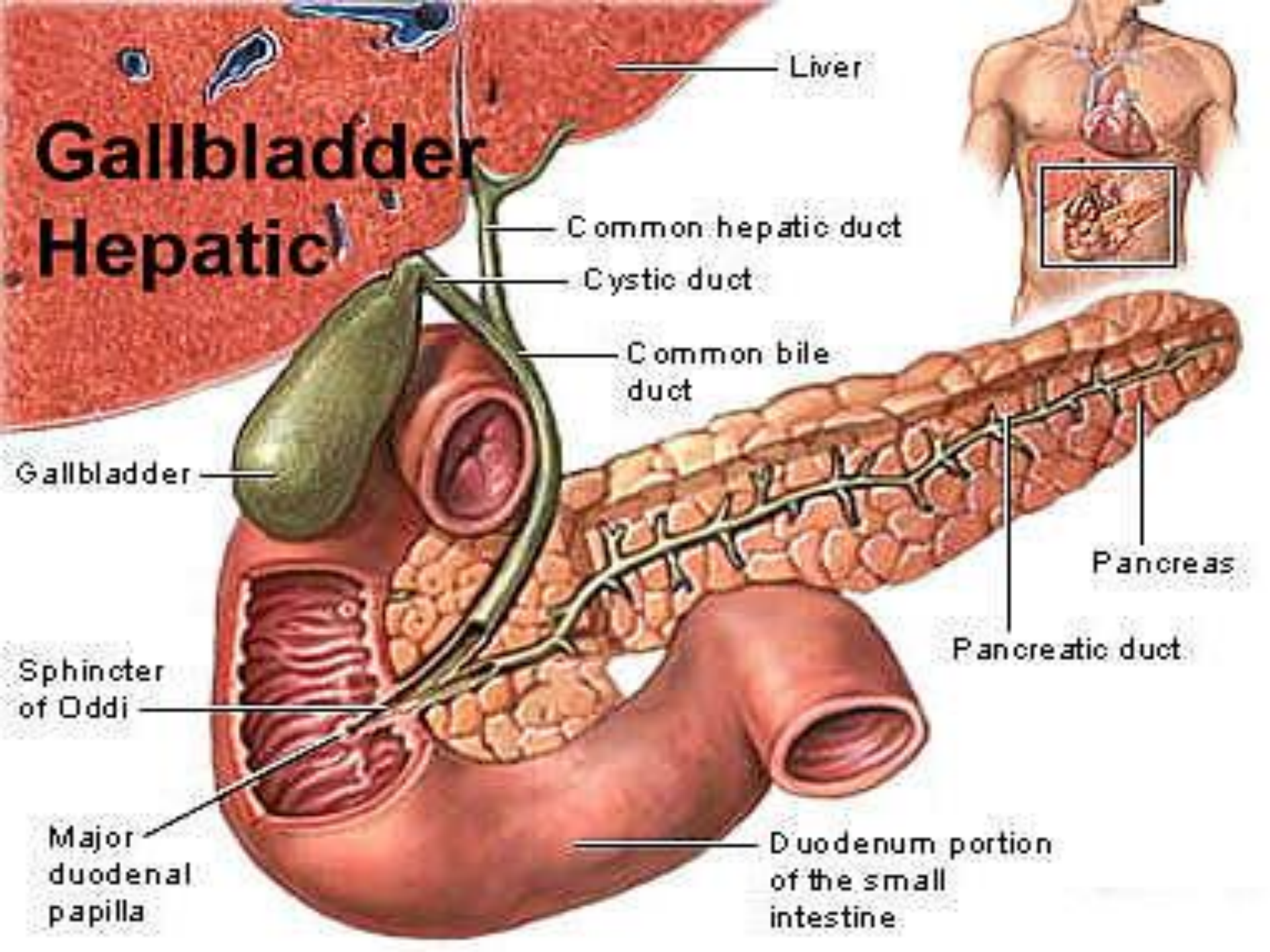
PANCREAS

- **Basic secretions neutralize stomach acid to protect duodenum (first part of small intestine)**
- **Enzymes enter duodenum via the pancreatic duct**
- **Secretes enzymes that digest carbs, fats and proteins**
- **Also produces insulin (released into bloodstream) which regulates blood sugar**

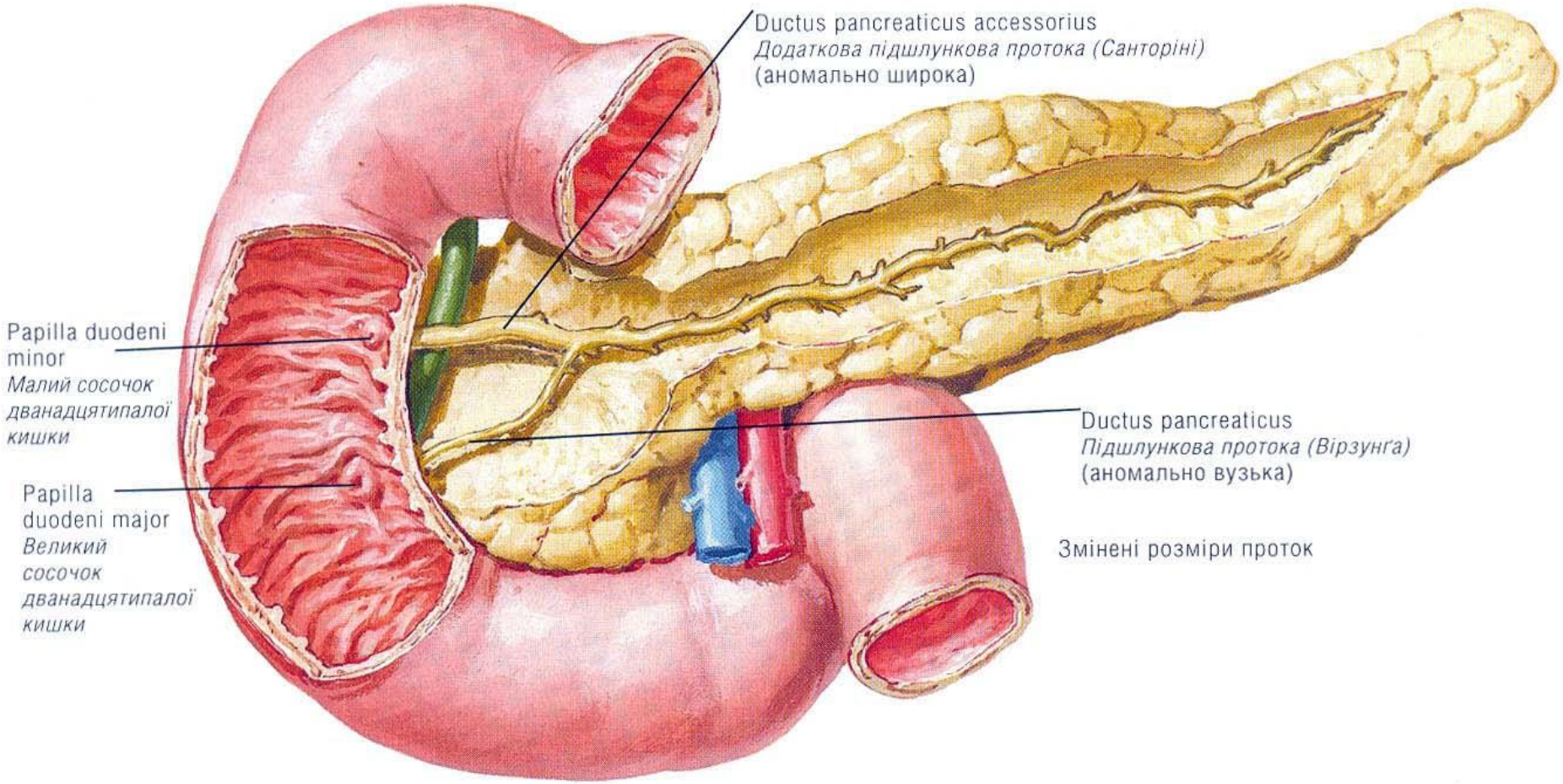


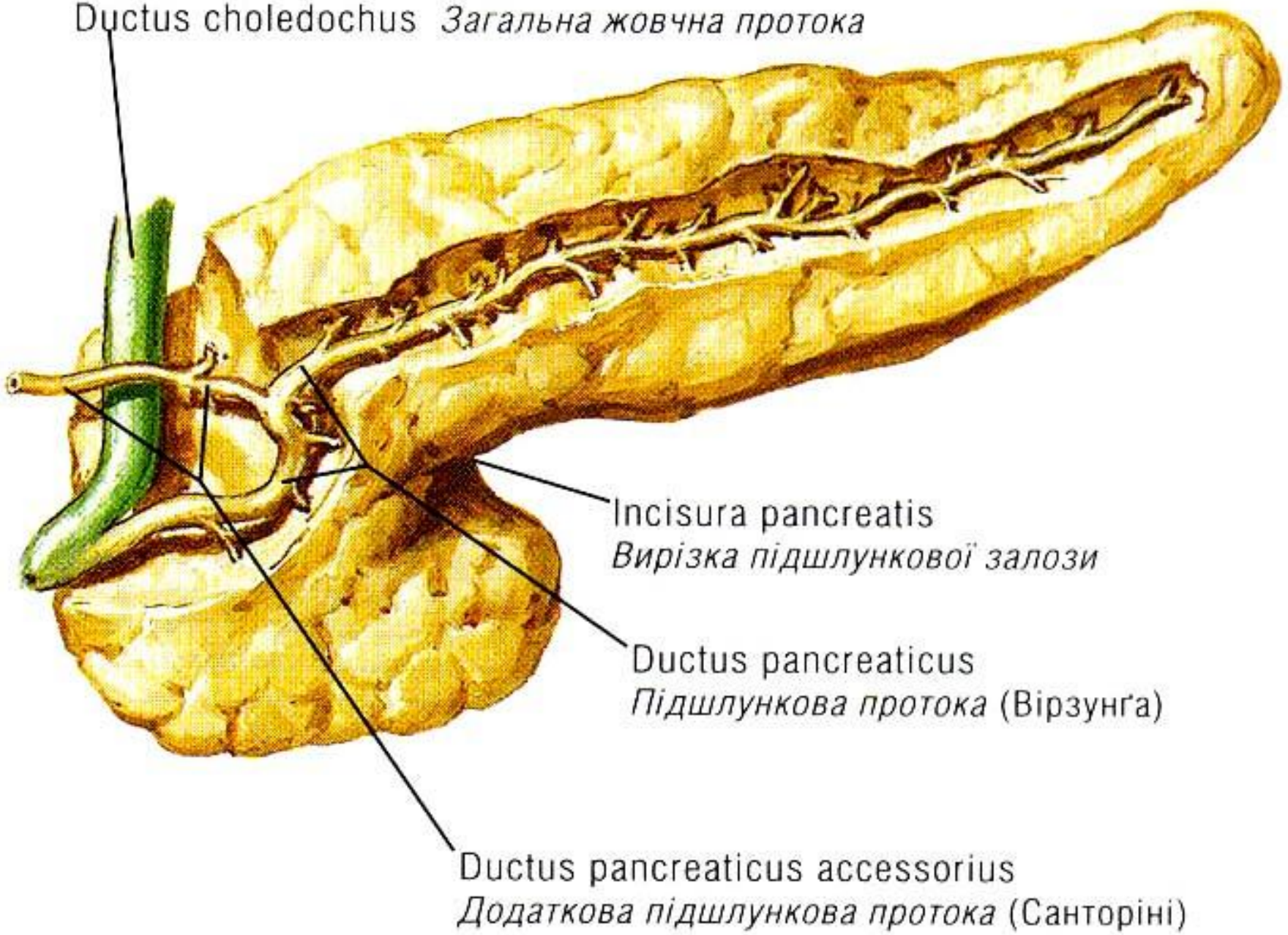
Слизова оболонка дванадцятипалої кишки

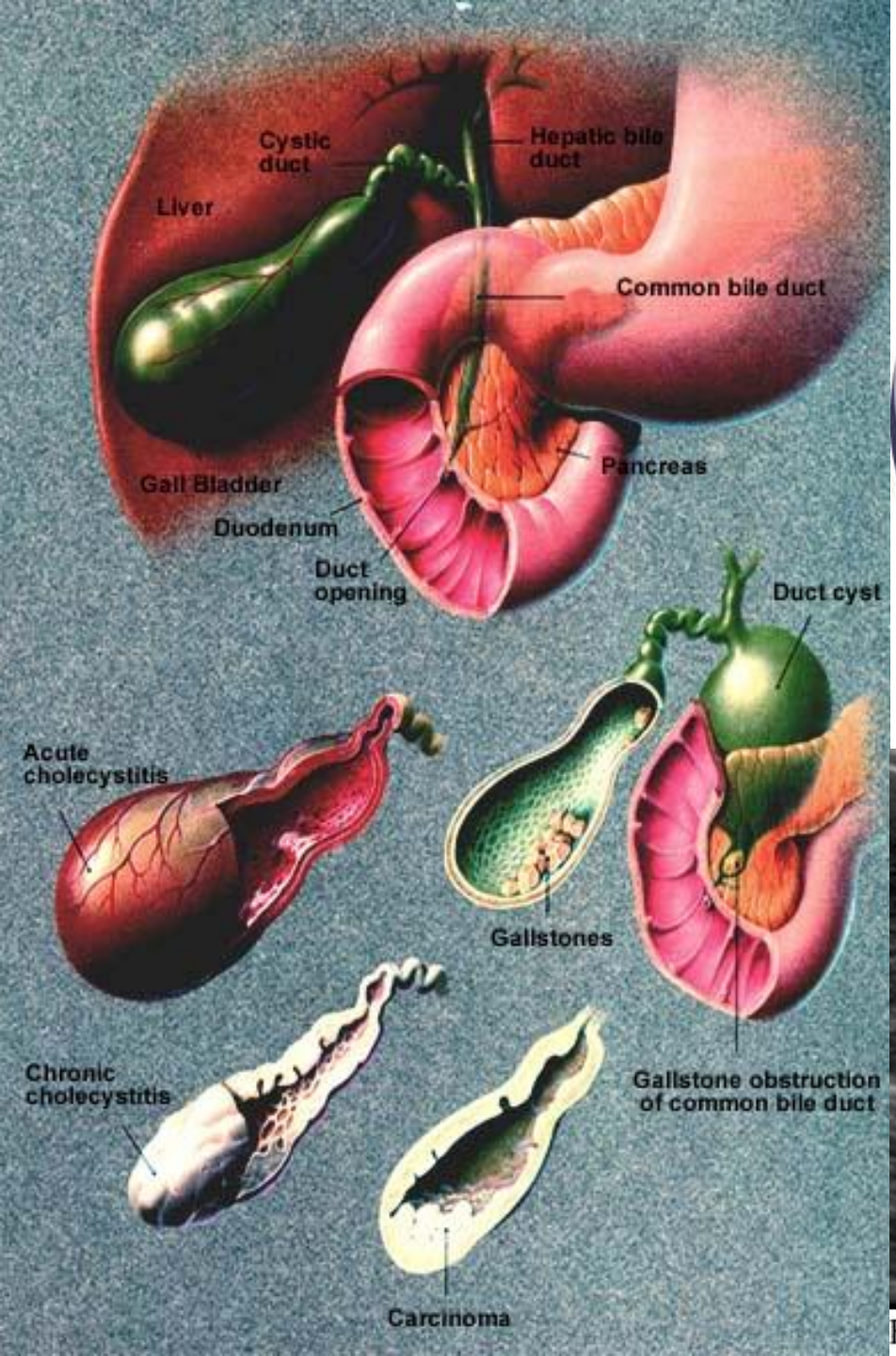


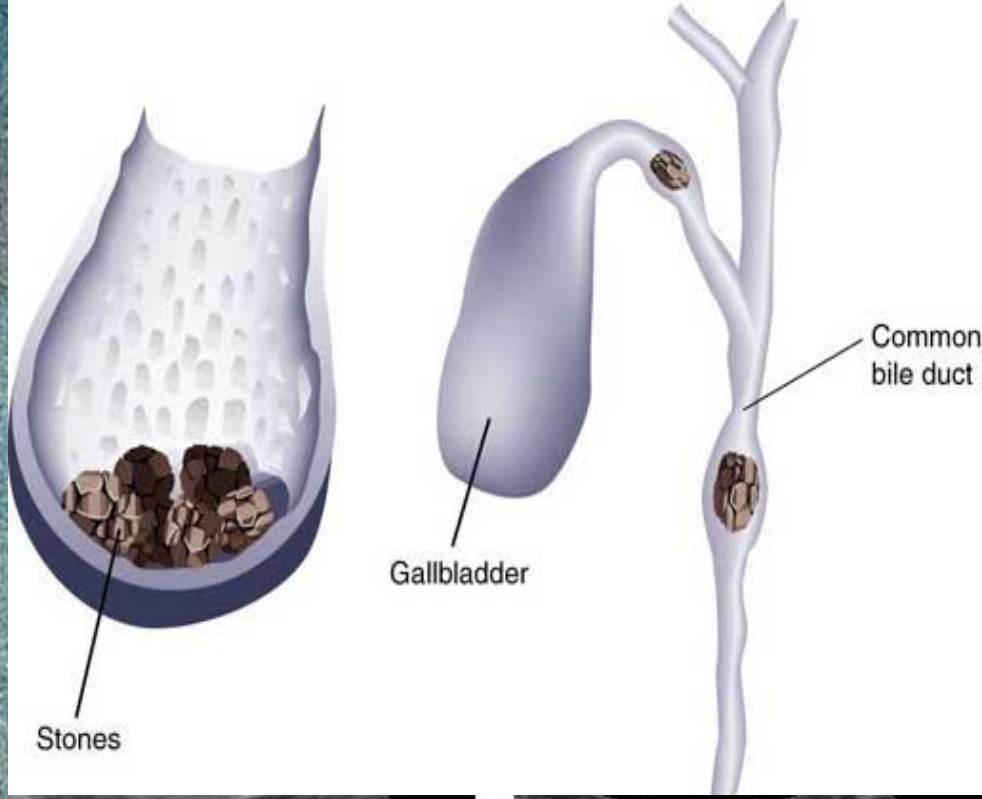

Gallbladder
Hepatic
Liver
Common hepatic duct
Cystic duct
Common bile duct
Gallbladder
Pancreas
Pancreatic duct
Sphincter of Oddi
Major duodenal papilla
Duodenum portion of the small intestine

Варіанти проток підшлункової залози




Ductus choledochus Загальна жовчна протока
Incisura pancreatis
Вирізка підшлункової залози
Ductus pancreaticus
Підшлункова протока (Вірзунґа)
Ductus pancreaticus accessorius
Додаткова підшлункова протока (Санторіні)





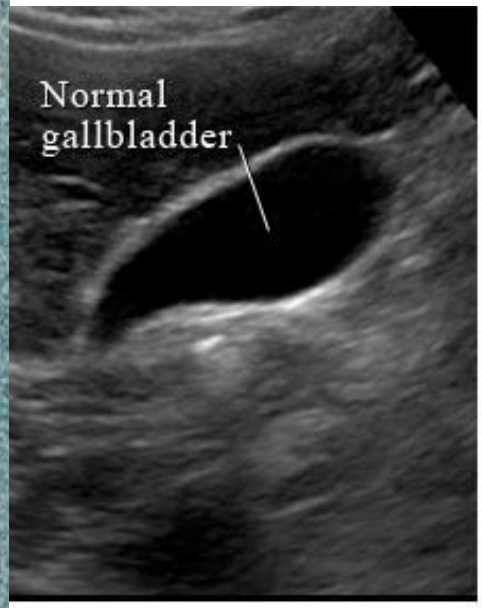
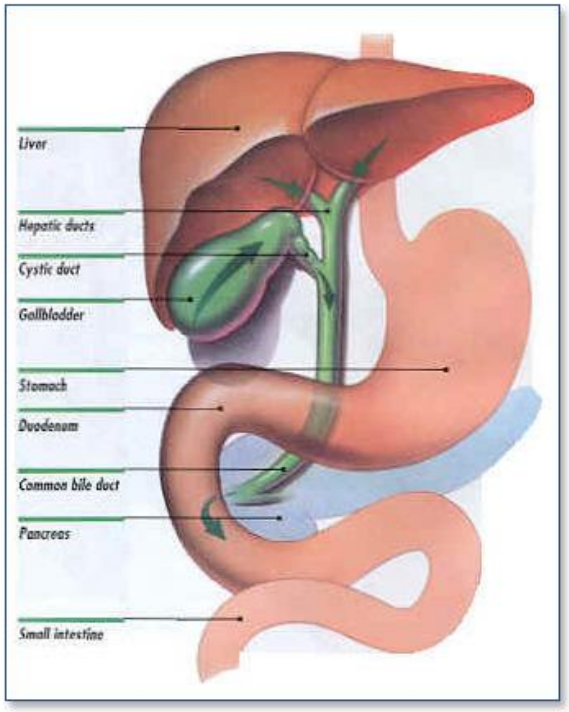


Figure 1

Figure 2

DIGESTIVE SYSTEM

SYSTEMA DIGESTORIUM
SEU ALIMENTARIUM



SYSTEMA DIGESTORIUM

- CAVITAS ORIS s. STOMA - 2
- PHARYNX - 3(2)
- OESOPHAGUS - 3
- GASTER - 4(3)
- INTESTINUM TENUE - 3
- INTESTINUM CRASSUM - 3

+ GLANDULAE (3+)