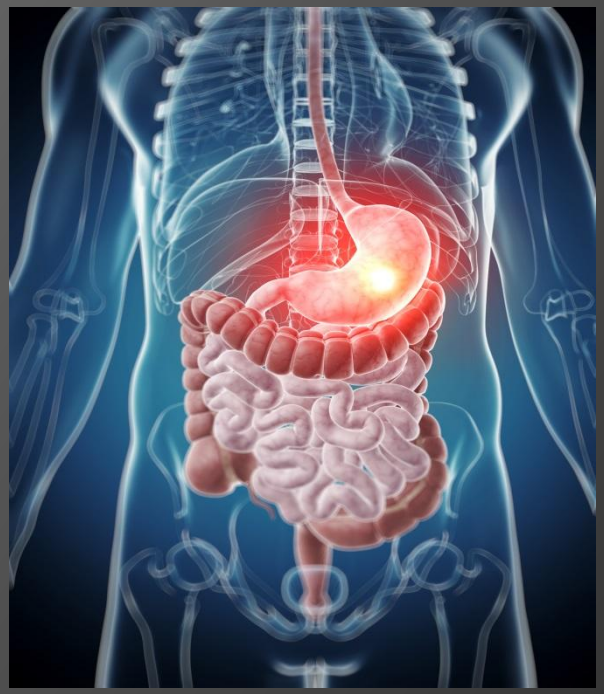
ETTU 2016 COACHING CONFERENCE

ANATHOMY AND PHISIOLOGY OF DIGESTIVE SYSTEM



Danijel Borković,dr.med.

Prague, 10.october 2016

Digestive system:

a) series of hollow organs joined in a long, twisting tube (gastointestinal tract) - food passes through them
b) accessory organs – food doesnt pass through them

- Other „helpers“: nerves, hormones, blood, bacteria in GI tract

- Digestive system turns food and drink into nutrients (carbohydrates, protein, fats and vitamins) which body uses for energy, cell repair and growth.

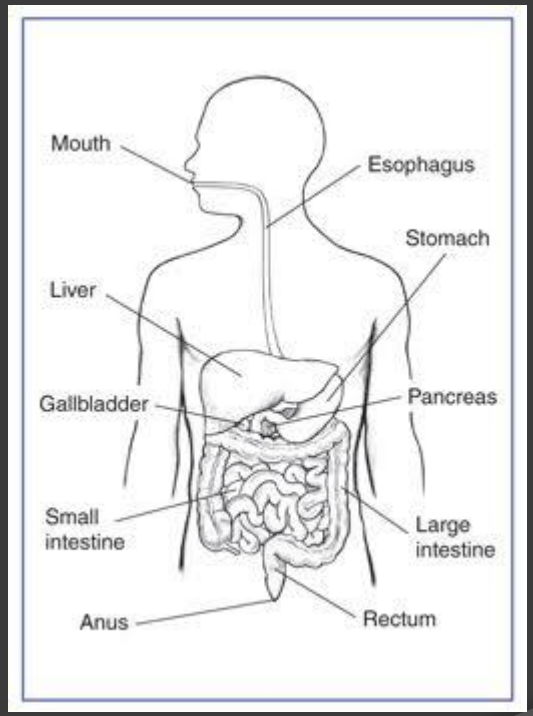
Gastrointestinal tract:

1.Upper GI tract:

a) Mouth
b) Throat (pharynx)
c) Esophagus
d) Stomach

2. Lower GI tract:

a) Small intestine
b) Large intestine (with rectum)
c) Anus

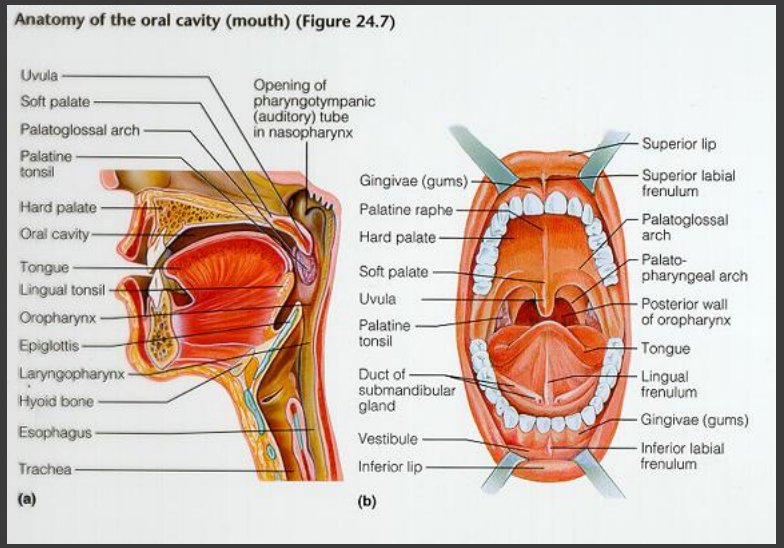


Six major functions take place in digestive system:

a) Ingestion of food
b) Secretion of fluids and digestyve enzymes
c) Mixing and movement of food and wastes through the body
d) Digestion of food into smaller pieces
e) Absorption of nutrients
f) Excretion of wastes

Mouth (oral cavity):

a) Teeth
b) The tongue
c) Salivary glands



Function:

a) Chewing food: breaks it into pieces which are more easily digested.
b) Saliva: mixes food to begin process of breaking it down in a form our body can absorb and use.

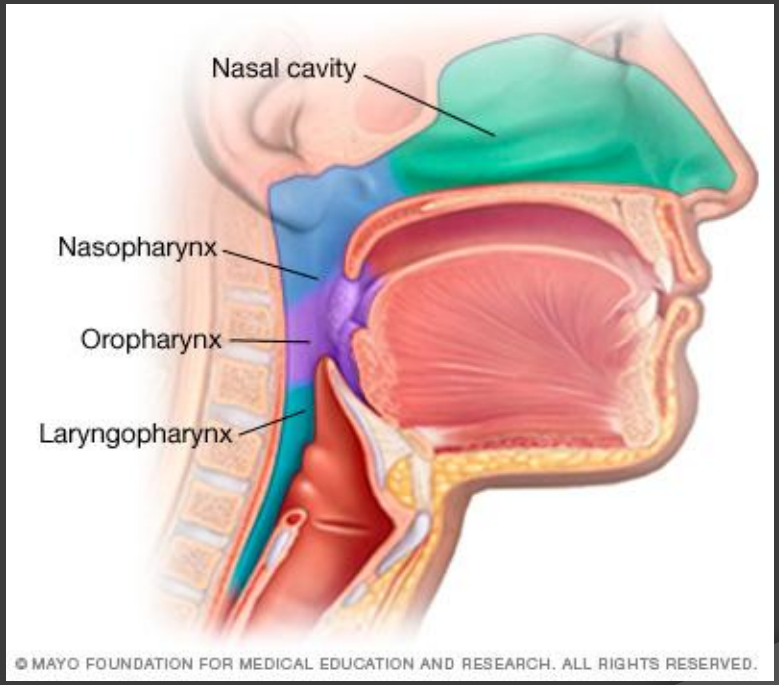
- Throat (pharynx): epiglottis as a switch between GI and RI tract

- Esophagus: muscular tube extending from the pharynx to stomach.

- Function:

a) Deliveres food to stomach with series of contractions – peristalsis.

b) Lower esophageal sphincter: circular muscle which keeps food passing backwards into esophagus.



Stomach:

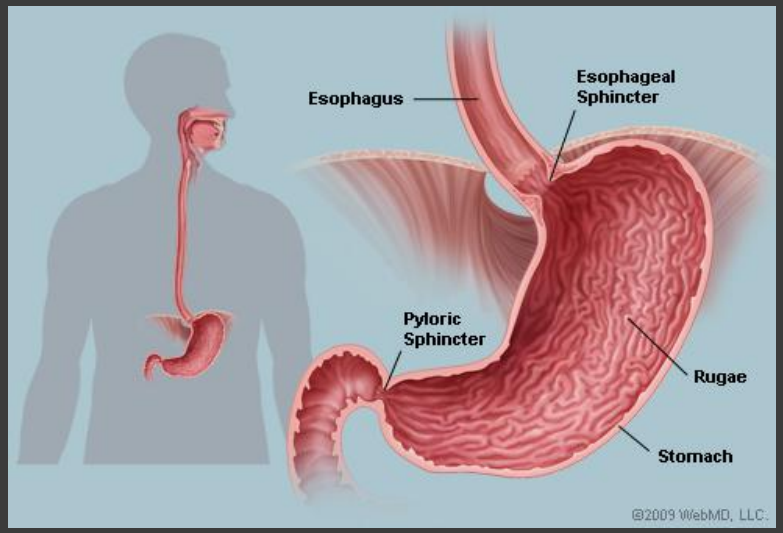
- sac-like organ with strong muscular walls

- Function:

a) Storage tank: it holds food, mixes it and grinds it

b) Secrets hydrocloric acid and powerfull enzymes

- When food leaves the stomach is the consistency of liquid or paste



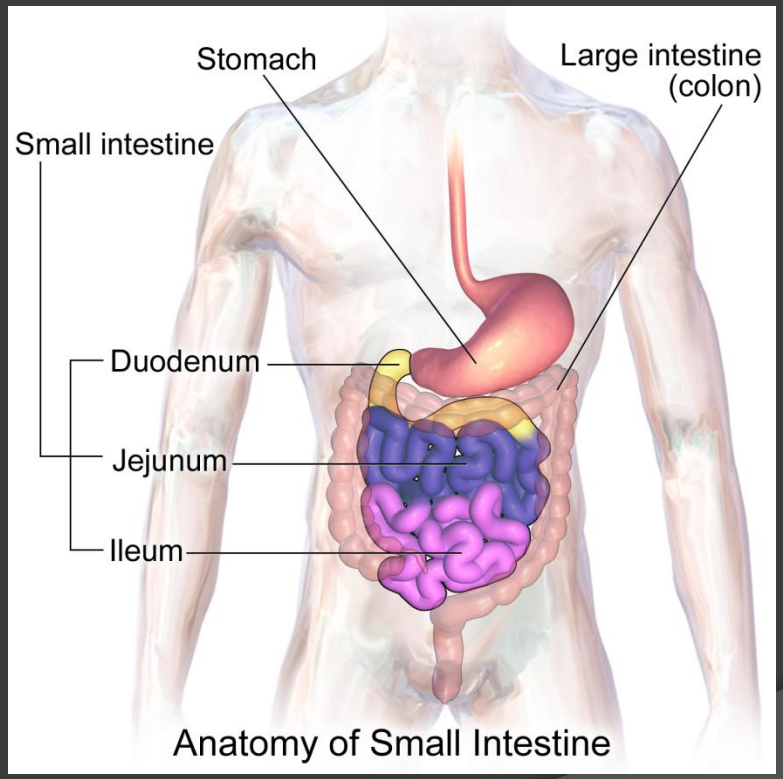
Small intestine:

- long tube loosely coiled in abdomen, inside surface is full of many ridges and folds – maximallization of digestion of food and absorption of nutrients

- Length: 6.9 m in adult male, 7.1 m in adult female

- Consists of three parts:

a) Dudenum
b) Jejunum
c) ileum



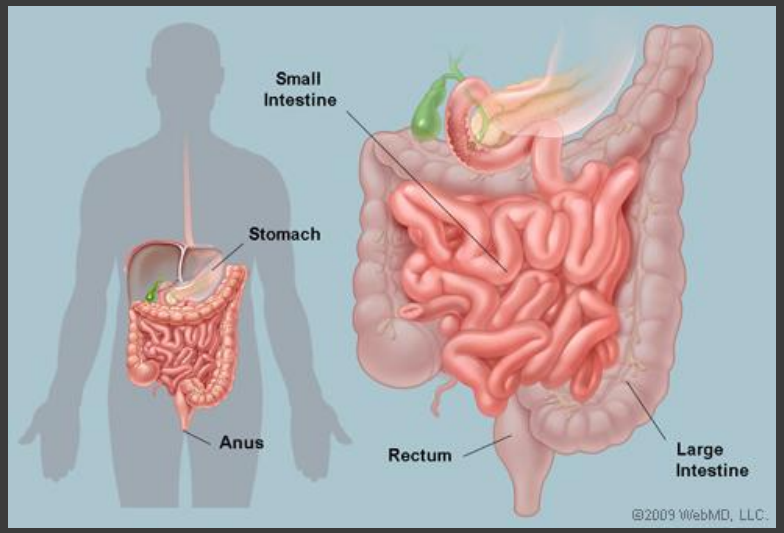
Function:

- Food pases through (peristalsis) and mixes with digestive secretions (enzymes from pancres and bile from liver)
- Duodenum: continues proces of breaking food down
- Jejunum and ileum: absorbtion of nutrients into the bloodstream

Large intestine (colon):

- muscular tube which is 155 cm in adult women and 166 cm in adult male

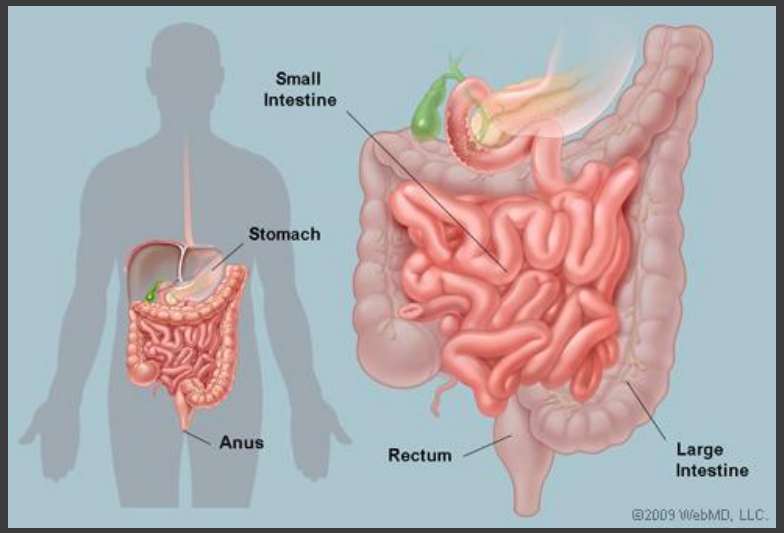
a) Cekum
b) The ascending (right) colon
c) The descending (left colon)
d) Sigmoid colon



- Removal water from food leftovers (stool) – 36 hours
- Stool: food debris and bacteria.

Rectum:

- connects colon to the anus
- Recives stool and holds it untill evacuation happens
- The brain decides if rectal content can be evacuated or not



Anus:

- last part of digestive tract

a) Pelvic floor muscles
b) Internal anal sphincter
c) External muscles

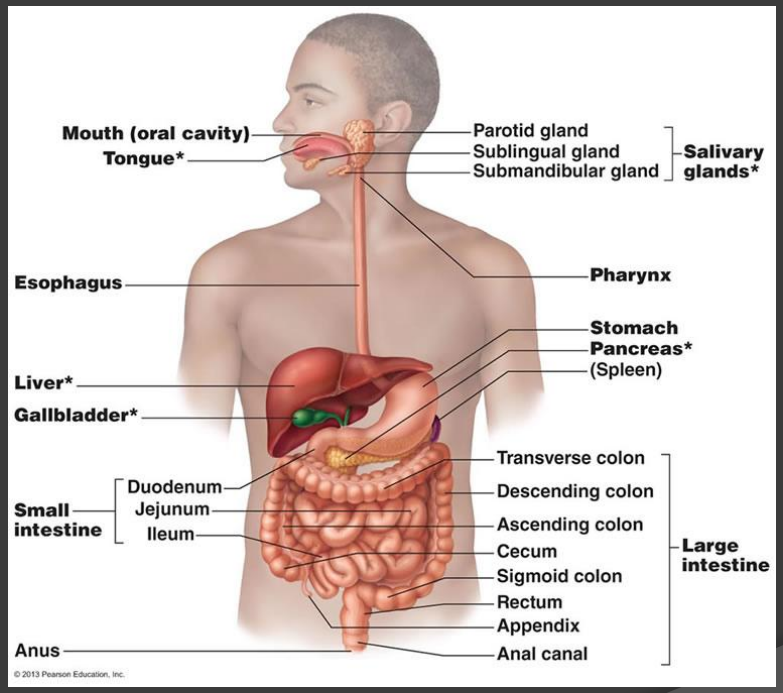
- Upper part of anus: specialized to detect rectal conntent (liquid, gas or solid)
- Pelvic floor muscles: creates angle between rectum and anus that stops stool from coming out when it is not supposed to.
- Internal anal sphincter: keeps us from going to the bathroom when asleep, or uthervise unaware of the presence of the stool.
- External sphincter: keeps the stool in until we gwt to the toilet when we get an urge to go to the bathroom.

Accessory organs:

a) Pancreas: secretes enzymes that break down protein, fat and carbohydrates from food we eat

b) Liver: making and secretion of bile, clensing and purification of blood coming from the small intestine

c) Gallbllader: stores bile



How does food travell through the GI tract?

- Hollow organs contain muscles – movement of organs is called peristalsis (segmentation in small intestine)
- Peristalsis propells food and liquid through GI tract and mixes the content within each organ
- After swallowing, process is involuntary.

Anathomy and phisiology of digestive system

- Esophagus: carries food from mouth to stomach (lower esophageal sphincter)
- Stomach: storess swallowed food and liquid, mixes it with digestive juices it produces and slowly empties its content (chyme). Storing of food allows us to est only few times a day.
- Small intestine: mixes food with digestive juices from pancreas, liver and intestine and then absorbs the digested nutrients into the bloodstream.
- Large intestine: absorbs water and any remaining nutrients and changes the waste from liquid into stool
- Rectum: stores stool until disposal

Digestive juices

- Contain enyzmes (substances that speed up chemical reactions in body) that break food down into different nutritiens – digestive system secrets aprox.7 litres of fluids/day.

- Salivary glands: saliva – moistening, enyzmes for breaking down starches
- Glands in stomach lining: stomach acid, enyzmes that digest proteins
- Pancreas: several enzymes that digest carbohydrates, fats and protein
- Liver: bile for digesting fat
- Small intestine: digestive juice which combines with pancreatic juice and bile – digestion of proteins and starches.

Anathomy and phisiology of digestive system

Organ	Movement	Digestive juices used	Food particles broken down
Mouth	Chewing	Saliva	Starches
Esophagus	Swallowing	None	None
Stomach	Upper muscle: relaxes to let food enter Lower muscle: mixes food with digestive juices	Stomach acid	Protein
Small intestine	Peristalsis	Small intestine digestive juices	Starches, protein, carbohydrates
Pancreas	None	Pancreatic juice	Starches, fats, proteins
Liver	None	Bile acids	Fats

Controll of digestive system

- Hormone regulators: cells in the lining of the stomach and small intestine produces hormones that controll the functions of digestive system (stimulation of production of digestive juices and regulation of apetite)

- Nerve regulators:

a) Extrinsic system: brain and spinal cord
b) Intrinsic system: nerves within GI tract

TO REMEMBER…

- Digestion:

a) Begins in mouth and ends in the small intestine
b) Works by moving food through the GI tract
c) is important for breaking down food into nutrients which body uses for cell repair, growth and energy

- When food passes through GI tract, it mixes with digestive juices which contain enyzmes. Enzymes break large molecules down into small ones – body absorbs them through the wall of small intestine into bloodstream, which delivers them to the rest of the body

TO REMEMBER…

- Waste products of digestion pass through the large intestine and out of the body as a solid matter called stool.
- The small intestine absorbs most digested food molecules, as well as water and minerals, and passes them on to other parts of the body for storage or further chemical change.
- Hormone and nerve regulators control the digestive process.