



INE | INSTITUTE OF
NUTRITIONAL
ENDOCRINOLOGY

Digestion: Upper GI - Anatomy and Physiology

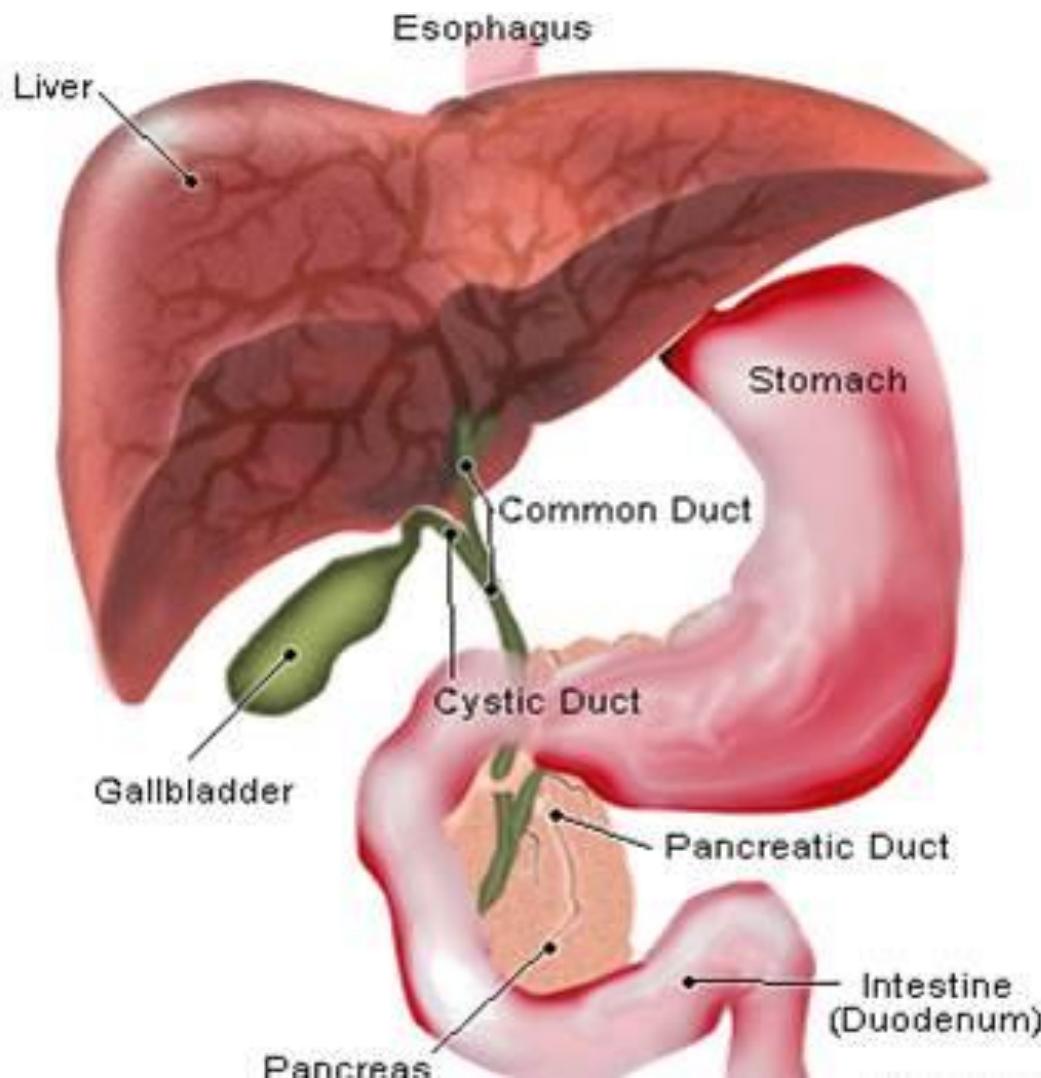
Dr. Ritamarie Loscalzo

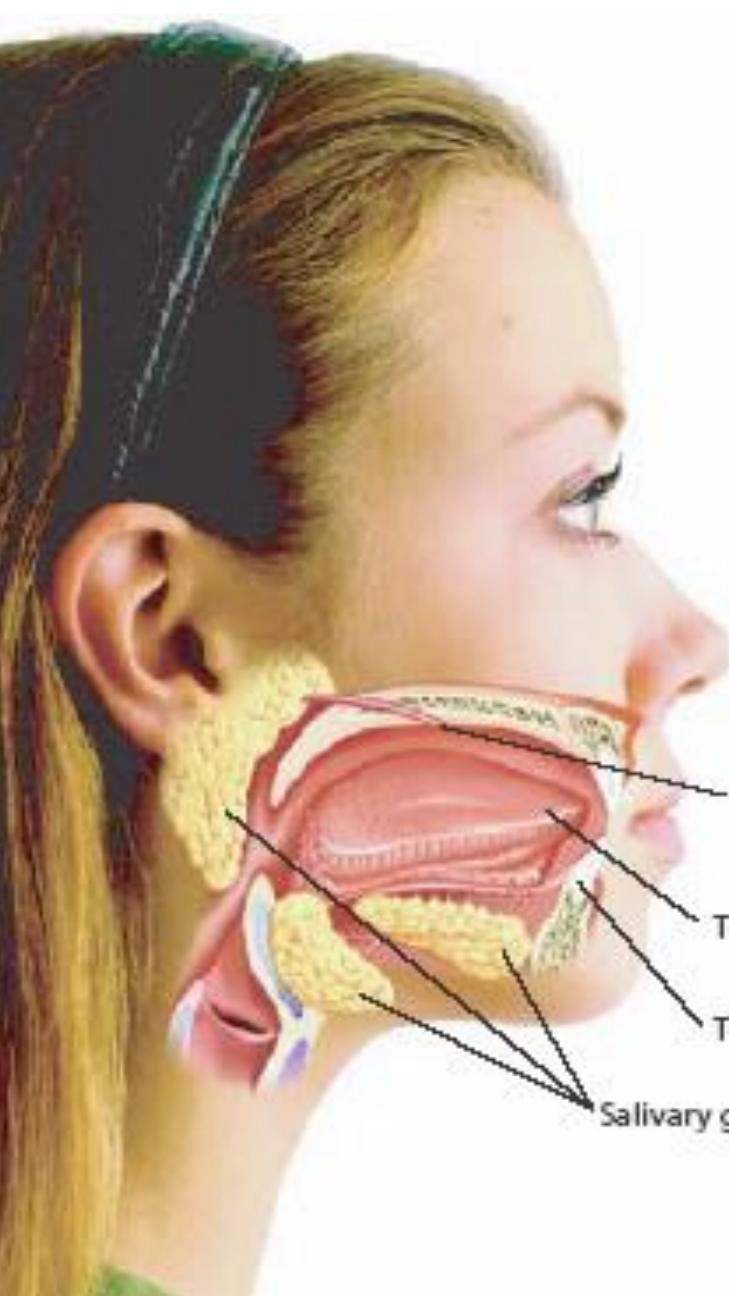


Medical Disclaimer: The information in this presentation is not intended to replace a one-on-one relationship with a qualified health care professional and is not intended as medical advice. It is intended as a sharing of knowledge and information from the research and experience of Dr. Ritamarie Loscalzo, drritamarie.com, and the experts who have contributed. We encourage you to make your own health care decisions based upon your research and in partnership with a qualified health care professional.



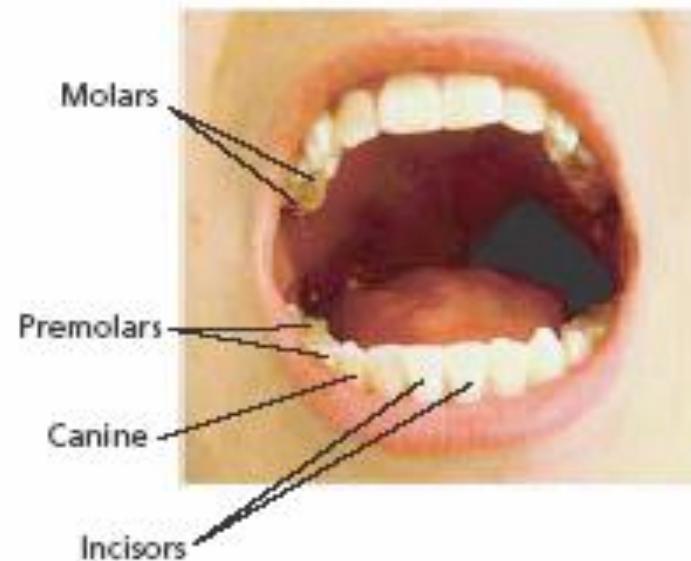
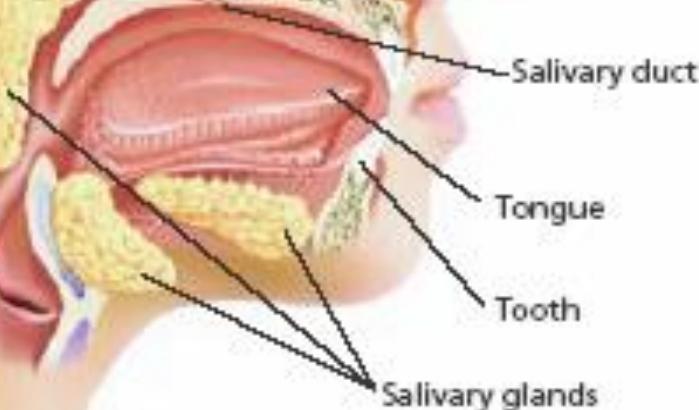
Upper Gastrointestinal System





Mouth

- ✓ Gateway
- ✓ Saliva: moistens food
- ✓ Teeth: mechanically break it down



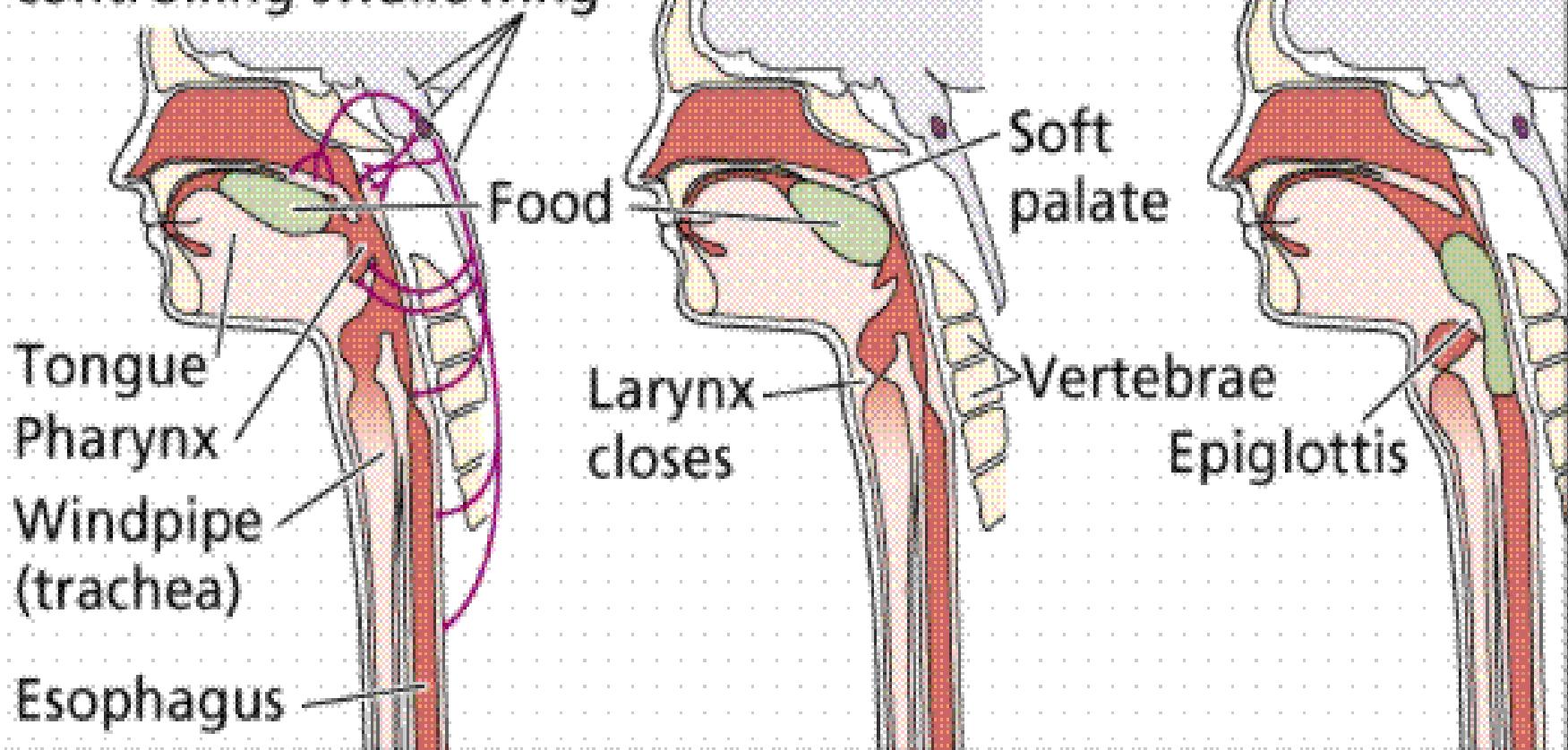
Chewing

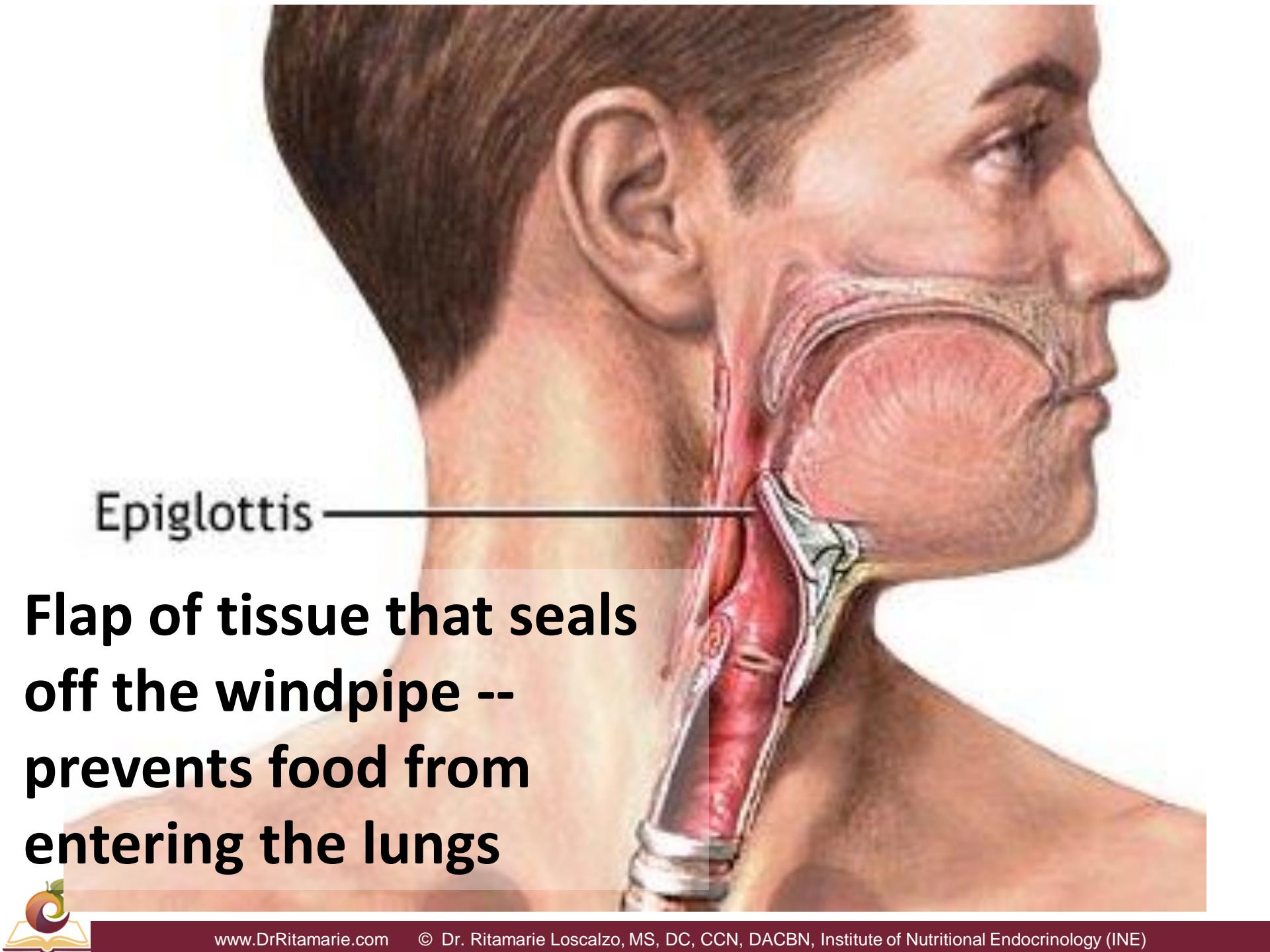
- ✓ Only mouth has teeth.
- ✓ **Unchewed food comes out the other end intact.**
- ✓ Loss of nutrient value when food not chewed.
- ✓ **Digestive process starts in mouth when food properly chewed.**
- ✓ Eating too quickly can lead to overeating.
- ✓ **Not chewing properly can lead to reflux.**
- ✓ Poorly chewed food can lead to flatulence, indigestion, heartburn, gas, and IBS.



Swallowing

Brainstem reflex center and nerves controlling swallowing





Epiglottis

**Flap of tissue that seals
off the windpipe --
prevents food from
entering the lungs**



Esophagus

- ✓ Muscular tube
- ✓ Connects the mouth with the stomach

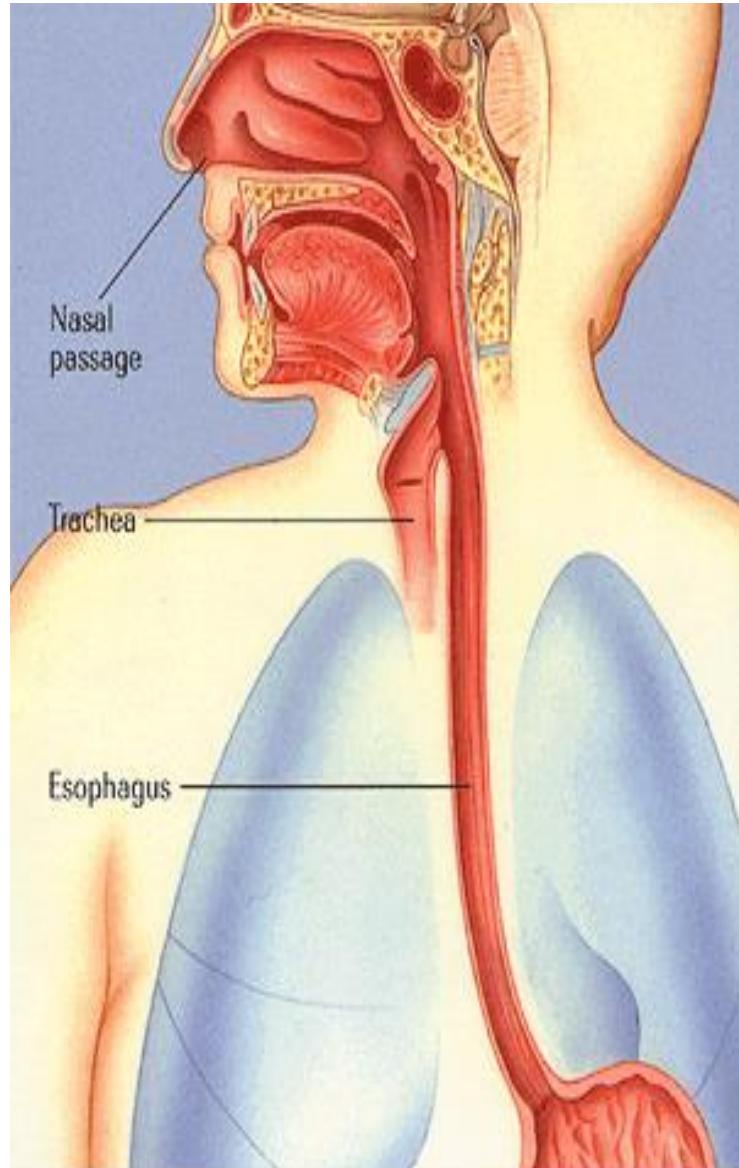
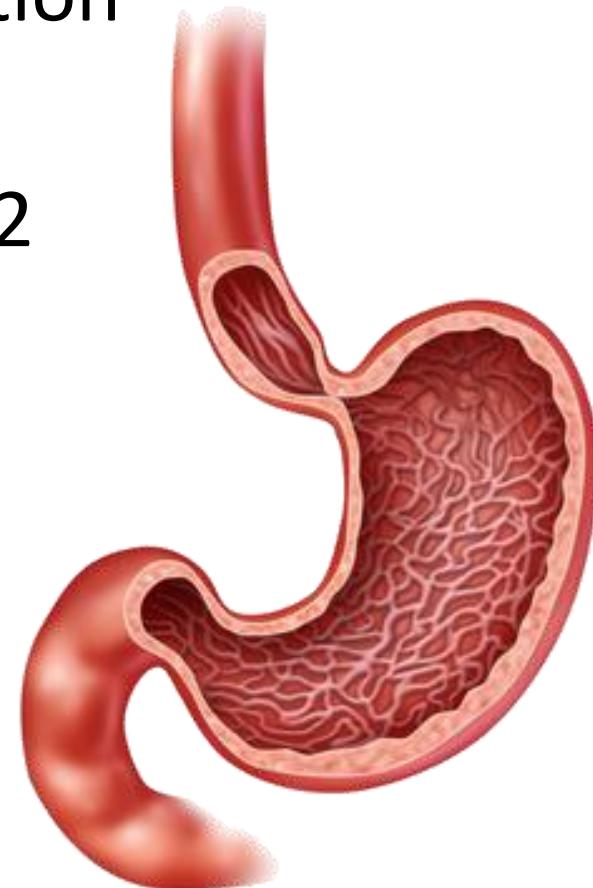


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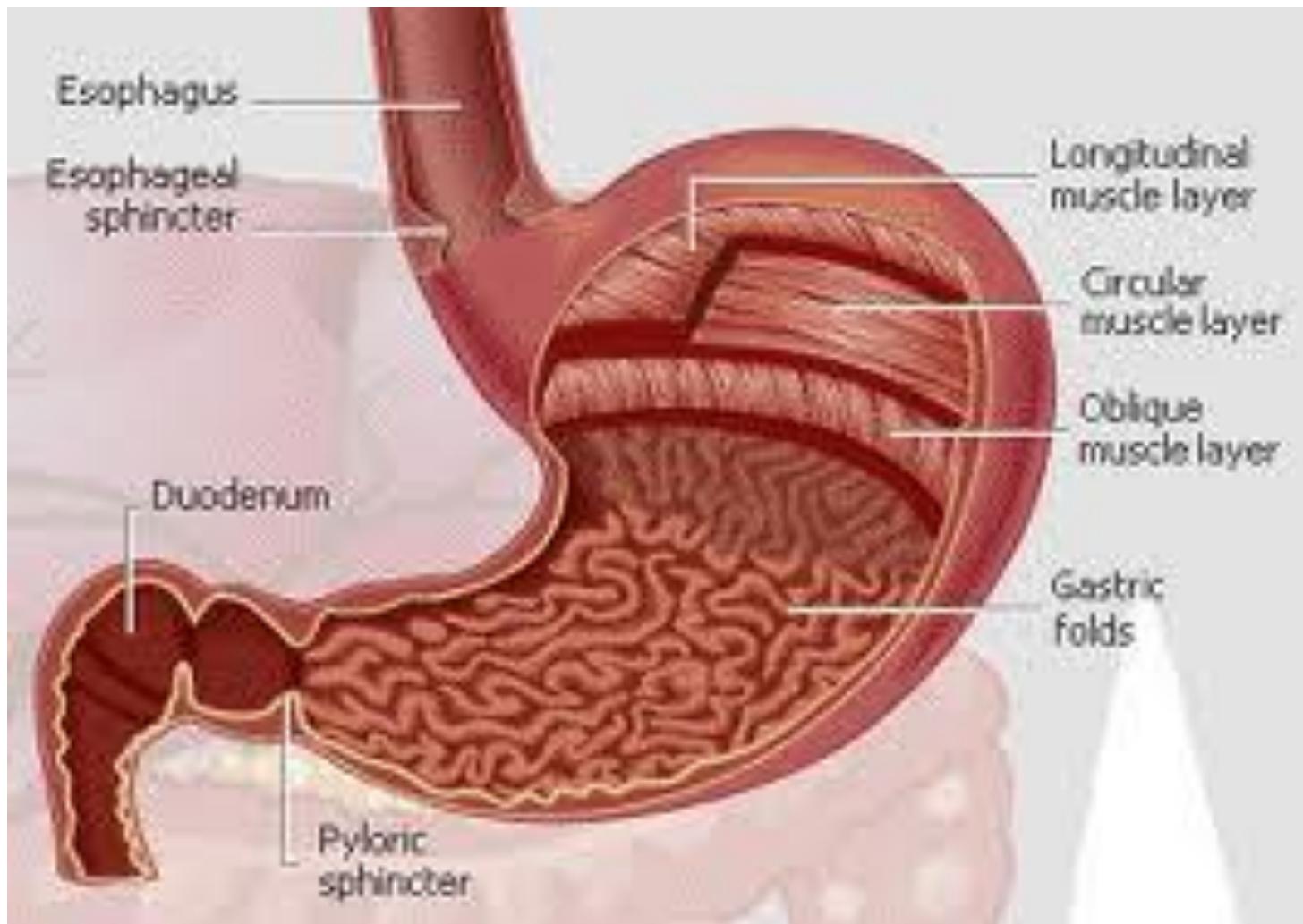


The Stomach's Job Description

- ✓ Mix and churn the food into chyme
- ✓ Make stomach acid to start digestion of protein and minerals
- ✓ Make intrinsic factor to escort B12 into your blood
- ✓ Secrete pepsinogen to begin digestion of proteins
- ✓ Kill pathogens on food
- ✓ Nudges the other digestive organs to get ready

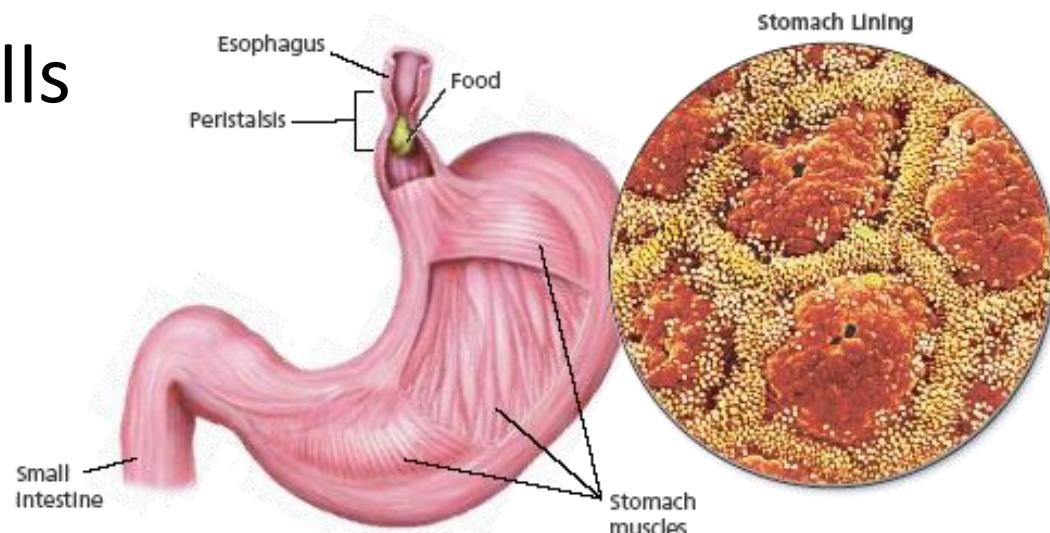


Stomach Anatomy and Function



Stomach Secretions

- ✓ **Mucous:** mucous cells
- ✓ **Hydrochloric Acid:** parietal cells
- ✓ **Pepsinogen:** chief cells and mucous cells
- ✓ **Gastrin:** gastric epithelial cells
- ✓ **Intrinsic Factor:** parietal cells
- ✓ **Ghrelin:** endocrine cells



Pancreas and Enzymes

- ✓ **Acinar cells produce enzymes** to chemically break down starches, proteins, and fats, and help digest all fat-soluble vitamins (E,A,K,D)
 - Protease
 - Amylase
 - Lipase
- ✓ **Ductal cells produce bicarbonate** to neutralize stomach acid
- ✓ Secrete juices into duodenum
- ✓ **Endocrine hormone function** not related to digestion:
insulin, glucagon

