Digestive System

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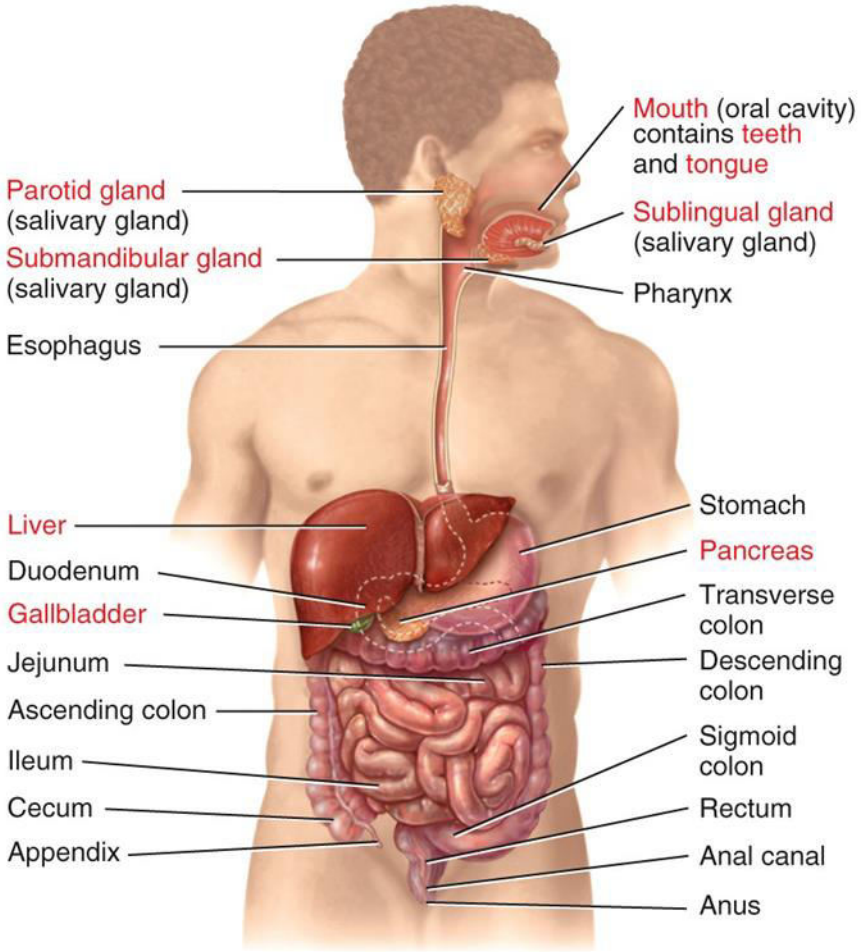
Overview of the Digestive System

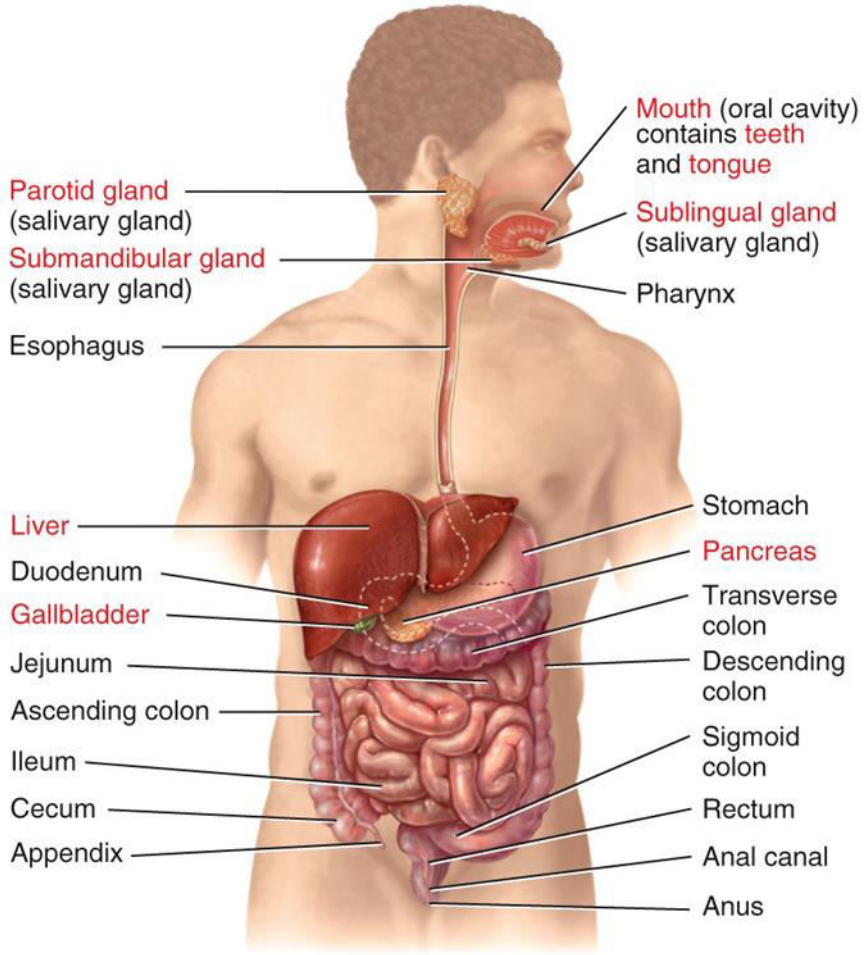
- Gastrointestinal (GI) tract, or alimentary canal, consists of:
  - Mouth
  - Pharynx
  - Esophagus
  - Stomach
  - Small intestine
  - Large intestine



(a) Right lateral view of head and neck and anterior view of trunk

Overview of the Digestive System

- The accessory digestive organs include:
  - Teeth
  - Tongue
  - Salivary glands
  - Liver
  - Gallbladder
  - Pancreas



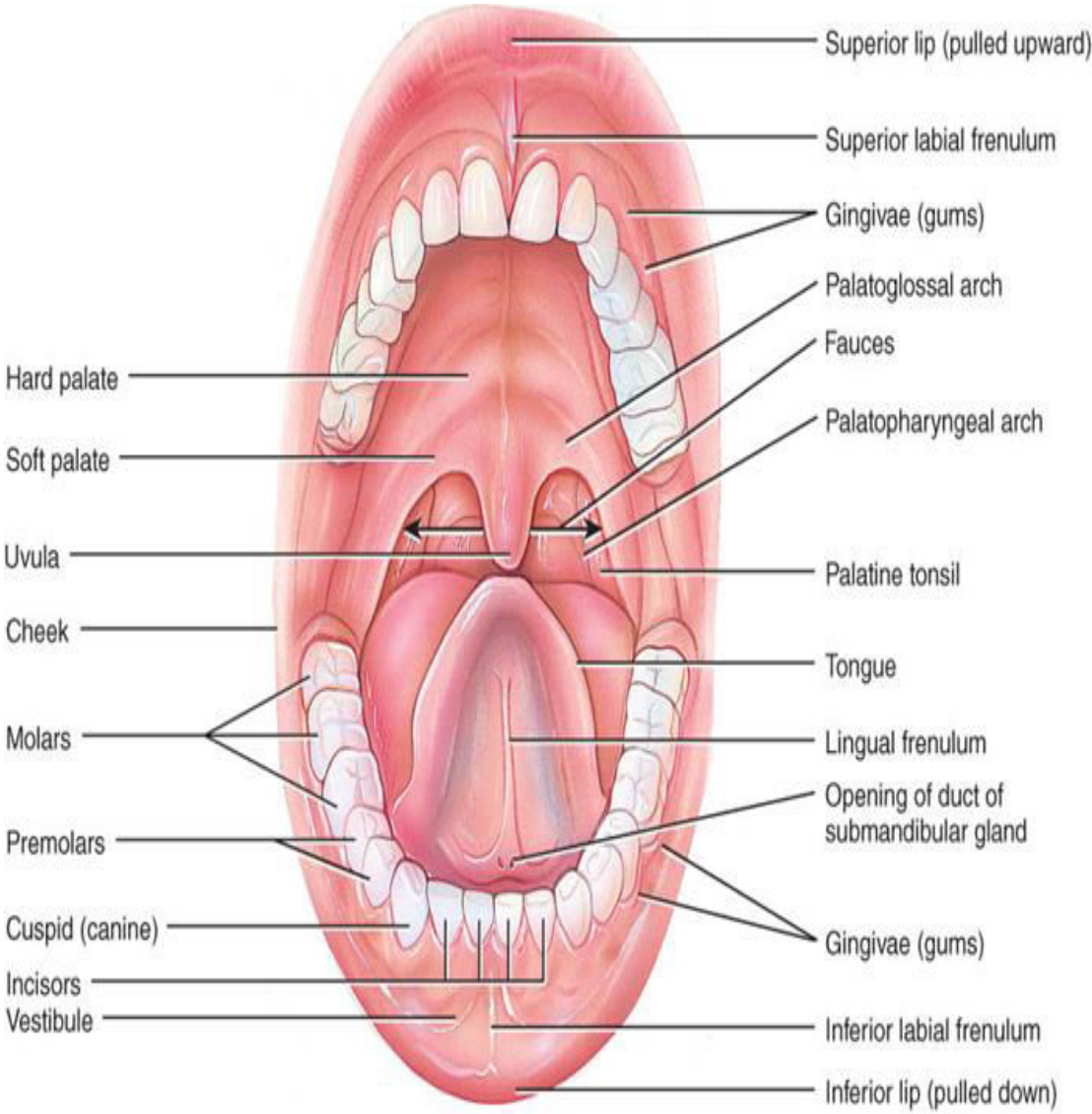
(a) Right lateral view of head and neck and anterior view of trunk

Overview of the Digestive System

- Functions of the digestive system:
  - Ingestion: taking food into the mouth.
  - Secretion: release of water, acid, buffers, and enzymes into the lumen of the GI tract.
  - Mixing and propulsion: churning and propulsion of food through the GI tract.
  - Digestion: mechanical and chemical breakdown of food.
  - Absorption: passage of digested products from the GI tract into the blood and lymph.
  - Defecation: the elimination of feces from the GI tract

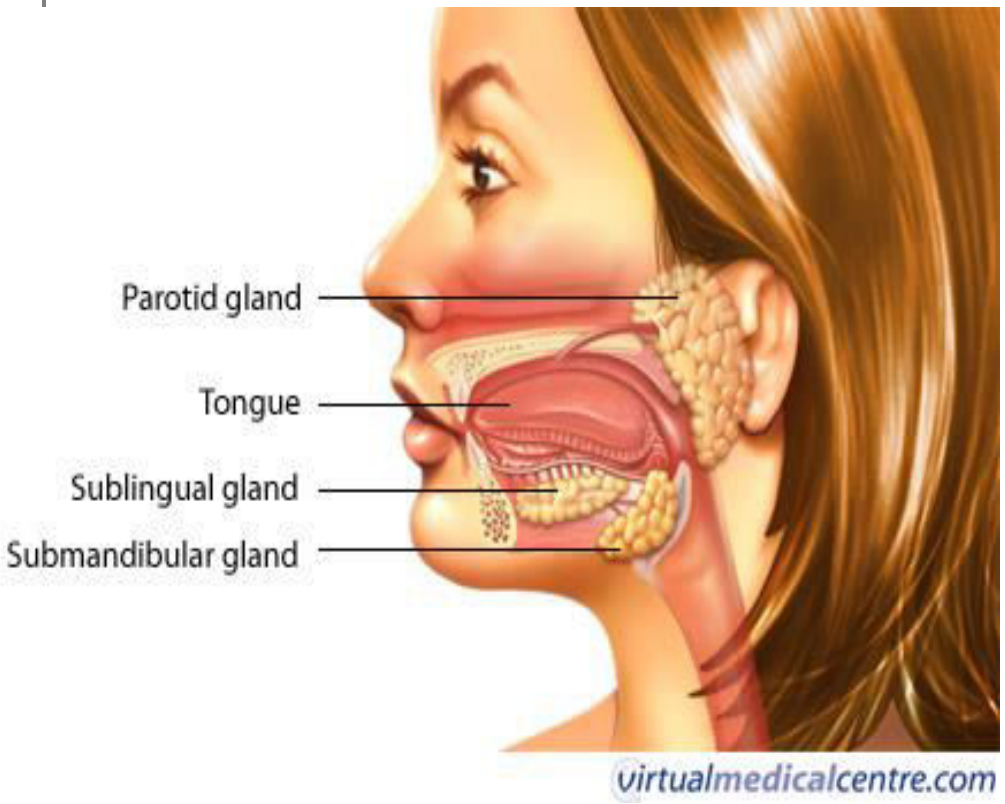
Mouth

- The *mouth* (*oral* or *buccal cavity*) is formed by the cheeks, hard and soft palate, lips, and tongue.
- The *oral cavity* is a space that extends from the gums and teeth to the *fauces* (the opening between the oral cavity and the pharynx or throat).



Anterior view

Salivary Glands



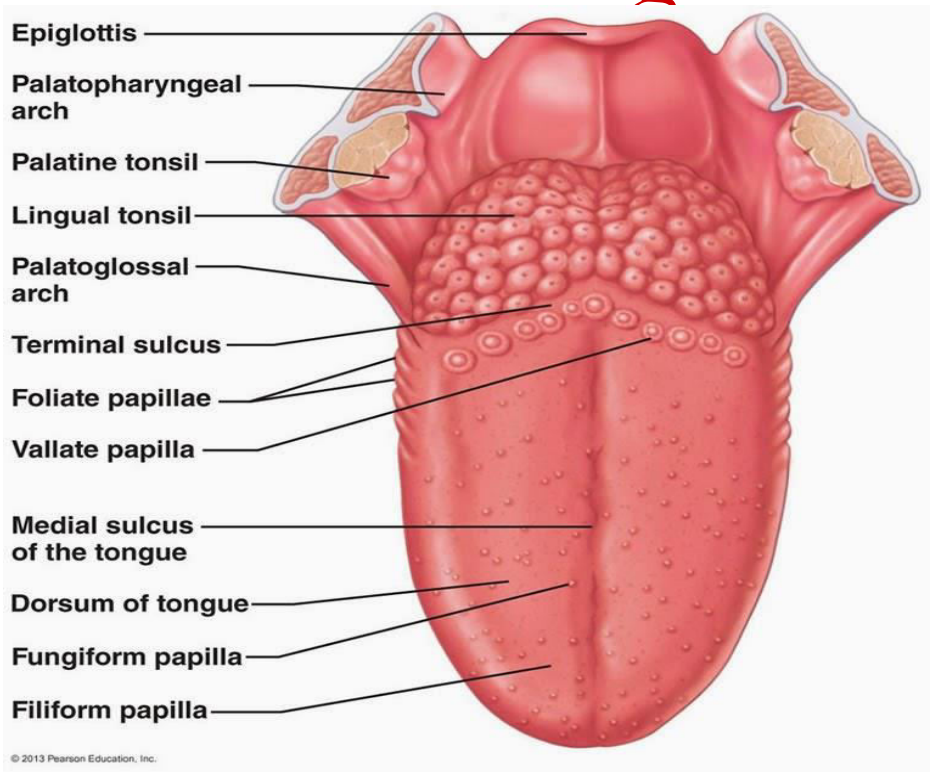
- Parotid below your ear and over the masseter
- Submandibular is under lower edge of mandible
- Sublingual is deep to the tongue in floor of mouth
- All have ducts that empty into the oral cavity

Mumps

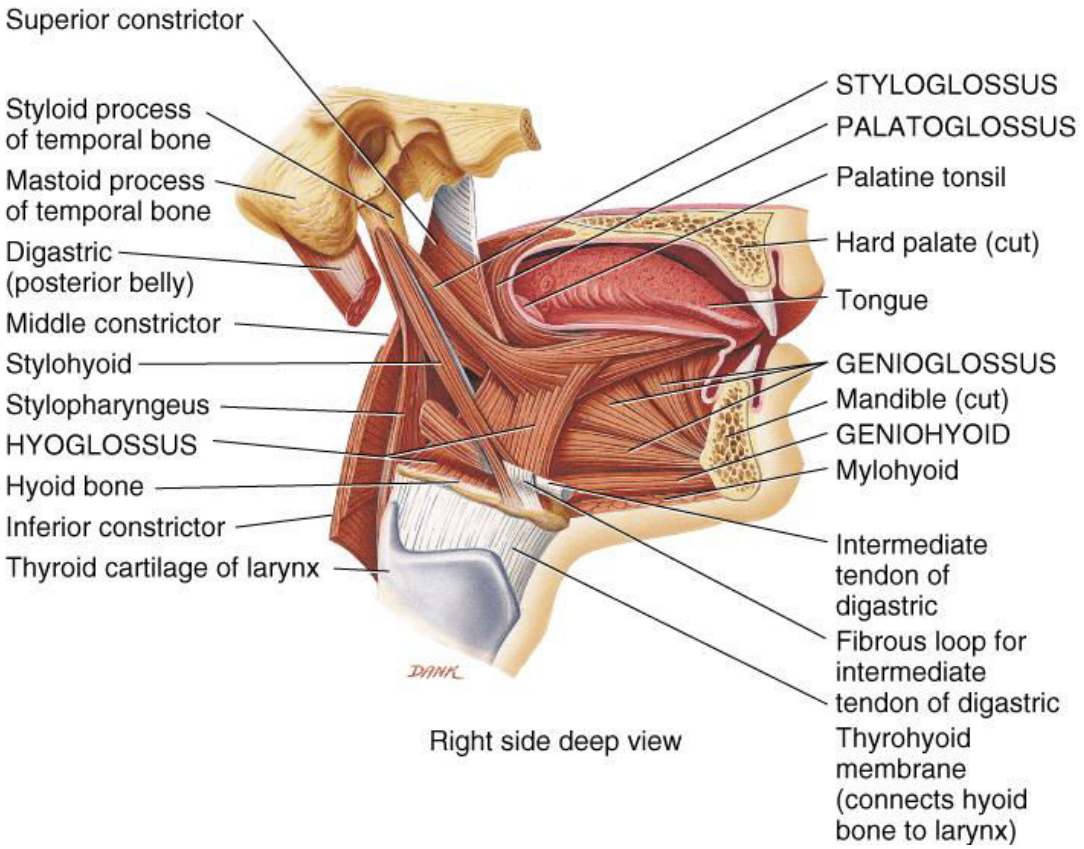
- Mumps is an inflammation and enlargement of the parotid salivary glands caused by infection with the mumps virus (myxovirus). Symptoms include fever, malaise, pain, and swelling of one or both glands. If mumps is contracted by a male past puberty, it is possible to experience inflammation of the testes and, occasionally, sterility.

Structure and Function of the Tongue

- The *tongue*, Accessory digestive organ together with its associated muscle, forms the floor of the oral cavity. It is composed of skeletal muscle covered with mucous membrane.
- Extrinsic and intrinsic muscles permit the tongue to be moved to participate in food manipulation for chewing and swallowing and in speech.
- The *lingual frenulum* is a fold of mucous membrane that attaches to the midline of the undersurface of the tongue.
- The upper surface and sides of the tongue are covered with *papillae*. Some papillae contain taste buds .
- On the dorsum of the tongue are glands that secrete lingual lipase, which initiates digestion of triglycerides.



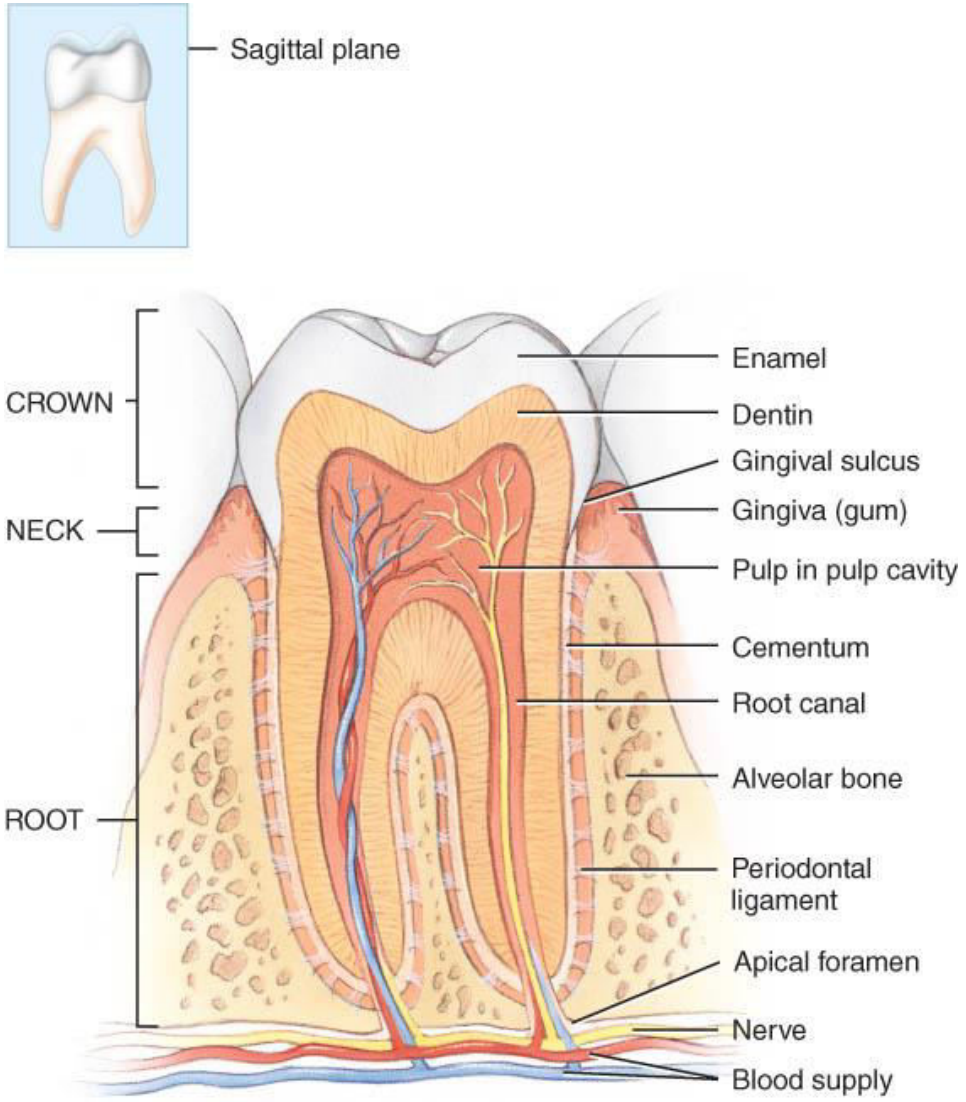
Structure and Function of the Tongue



Right side deep view

- Muscle of tongue is attached to hyoid, mandible, hard palate and styloid process

Structure and Function of the Teeth



Sagittal section of a mandibular (lower) molar

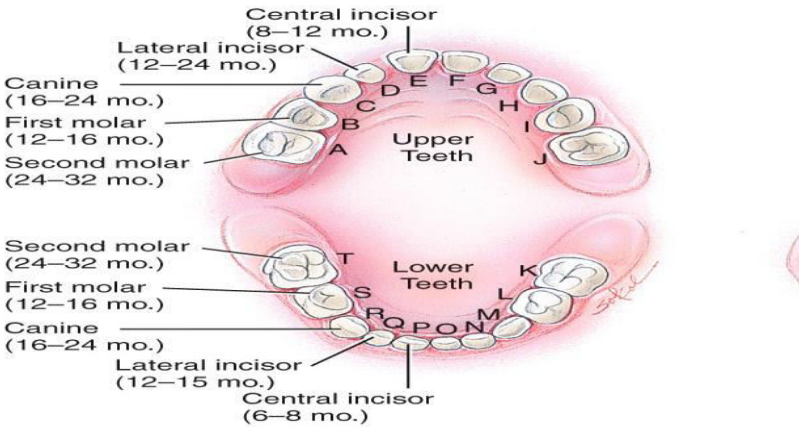
- The *teeth* project into the mouth and are adapted for mechanical digestion
- tooth consists of:
  1. Crown
  2. Neck
  3. Roots.
- Pulp cavity in the crown & root canals in roots.

Dentition

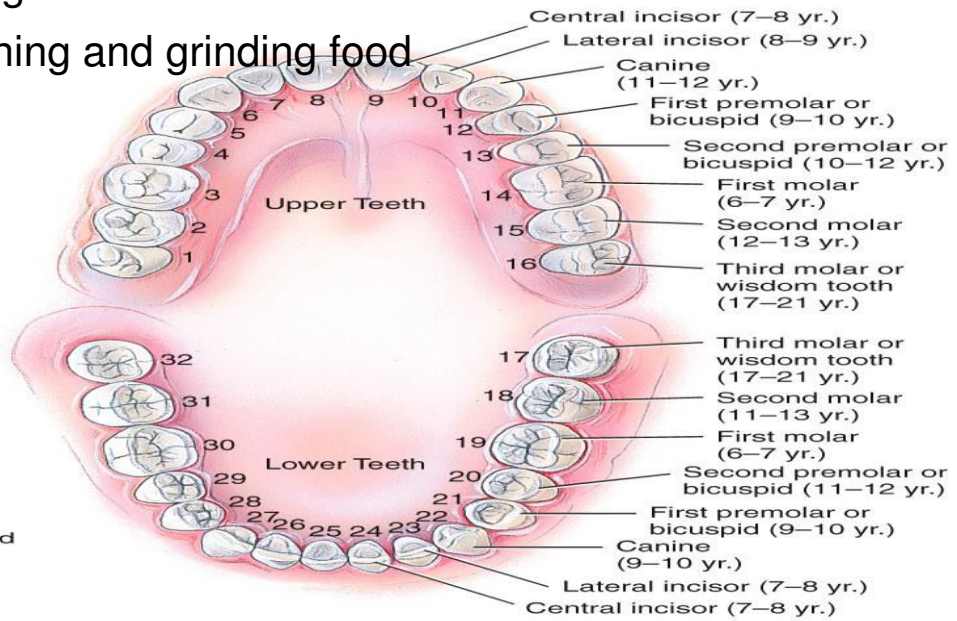
- There are two dentitions, or sets of teeth, in an individual's lifetime: *deciduous* (*primary*), milk teeth, or baby teeth; and *permanent* (*secondary*) *teeth* .
- Primary or baby teeth
  - 20 teeth that start erupting at 6 months
- Permanent teeth
  - 32 teeth that erupt after 6 year of age

different structures indicate function

- **incisors** for biting
- **canines or cuspids** for tearing
- **premolars & molars** for crushing and grinding food



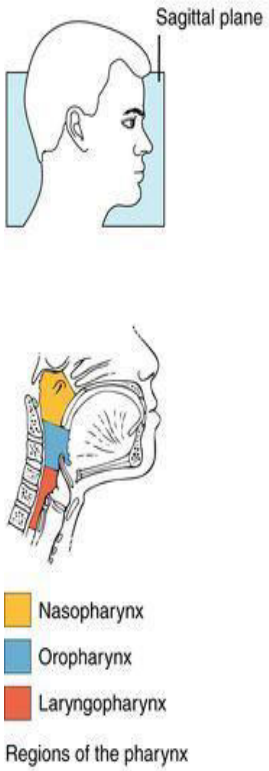
(a) Deciduous (primary) dentition; teeth designated by letters (with times of eruption)



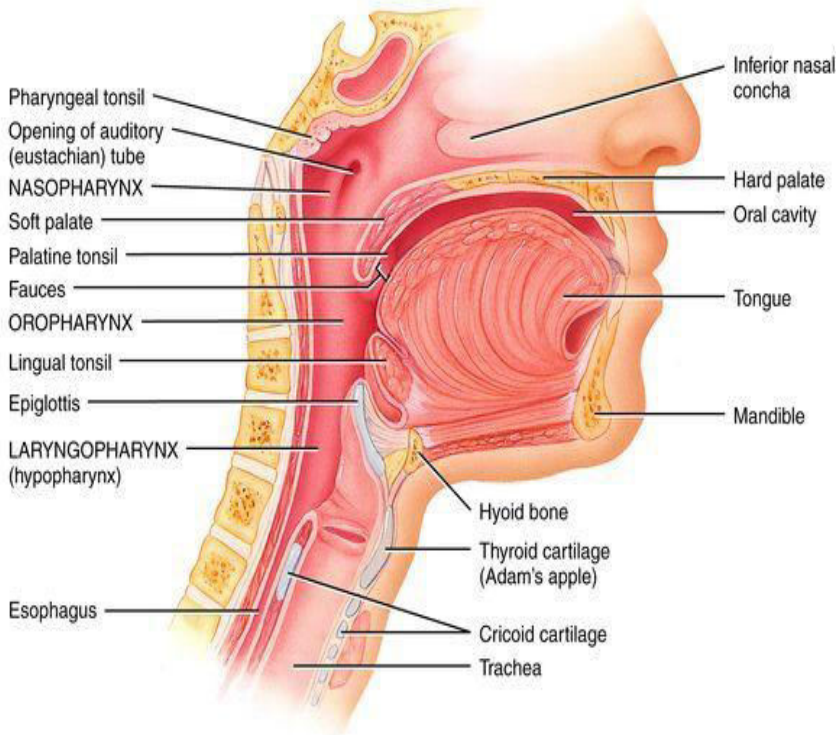
(b) Permanent (secondary) dentition; teeth designated by numbers (with times of eruption)

PHARYNX

- The *pharynx* is a funnel-shaped tube that extends from the internal nares to the esophagus **posteriorly** and the larynx **anteriorly.**
- It is composed of skeletal muscle and lined by mucous membrane.
- The *nasopharynx* functions in respiration only, whereas the *oropharynx* and l*aryngopharynx* have digestive as well as respiratory functions.
- Function: Deglutition: is a mechanism that moves food from the mouth to the stomach.



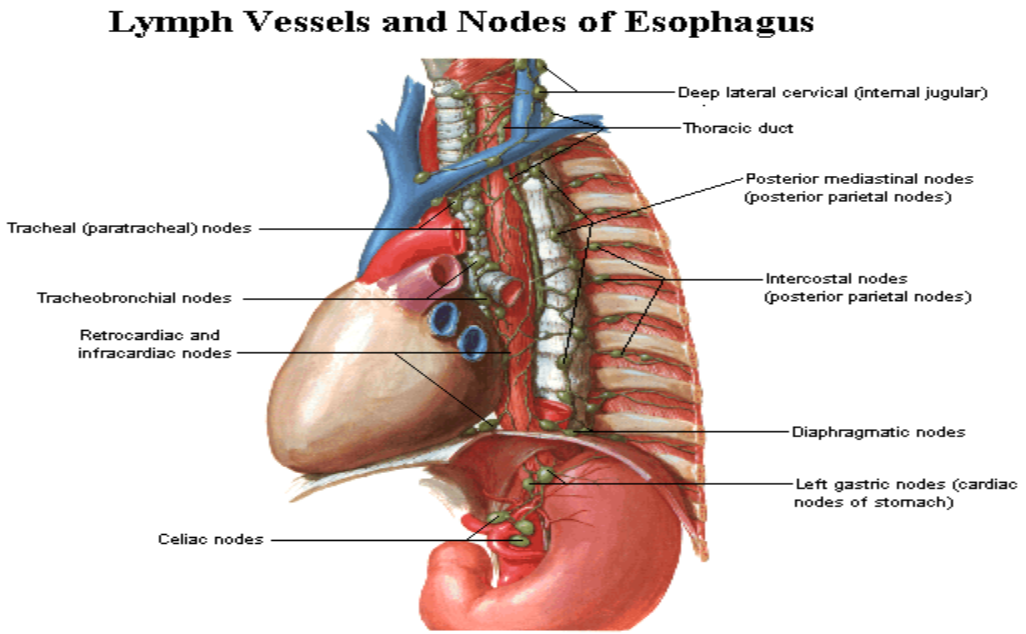
Regions of the pharynx

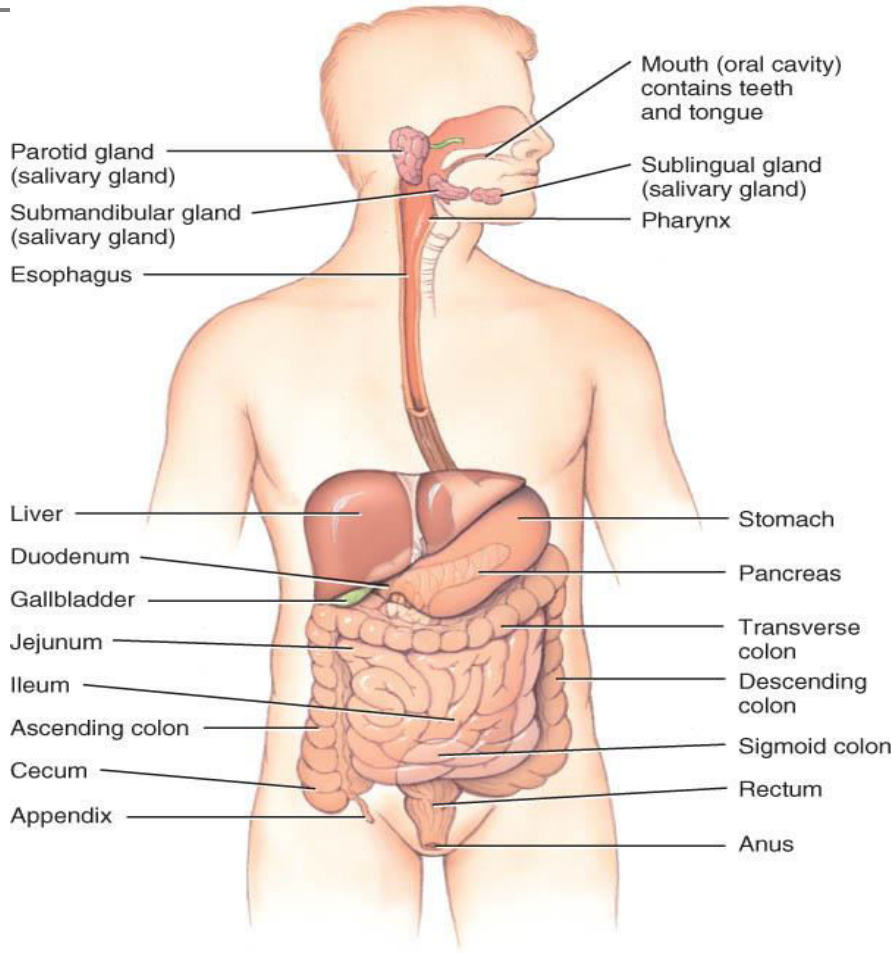


Sagittal section showing the regions of the pharynx

Esophagus

- **Collapsed muscular tube**
- **In front of vertebrae**
- **Posterior to trachea**
- **Posterior to the heart**
- **connects the pharynx to the stomach.**
- **The role of the esophagus is to secrete mucus and transport food to the stomach.**
- **Pierces the diaphragm at hiatus**



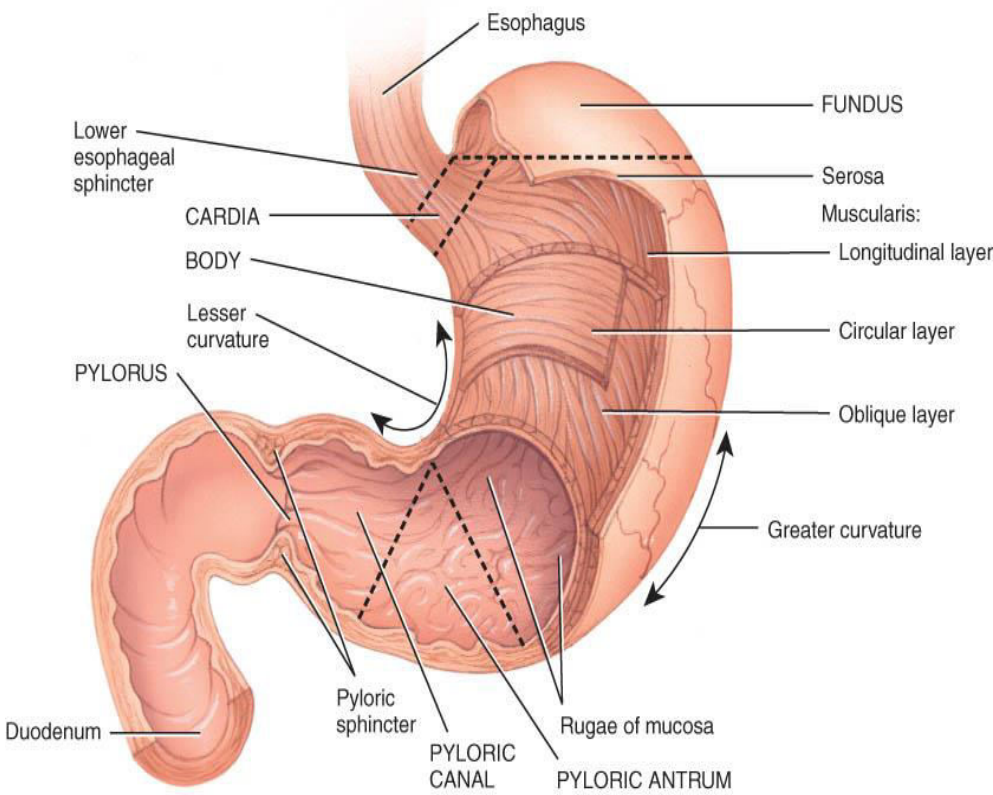


Right lateral view of head and neck and anterior view of trunk

Stomach

- The *stomach* is a J-shaped enlargement of the GI tract that begins at the bottom of the esophagus and ends at the pyloric sphincter .
- It serves as a mixing and holding area for food, begins the digestion of proteins, and continues the digestion of triglycerides, converting a bolus to a liquid called chyme. It can also absorb some substances.
- The gross anatomical subdivisions of the stomach include the:

1. *Cardia connects to esophagus*
2. *fundus*
3. *Body*
4. *pyloris* connects to dudenum



(a) Anterior view of regions of stomach

PANCREAS

- The *pancreas* is divided into a head, body, and tail and is connected to the duodenum via the pancreatic duct and accessory duct.
- Main duct joins common bile duct from liver
- *Pancreatic islets* (*islets of Langerhans*) secrete hormones and acini secrete a mixture of fluid and digestive enzymes called pancreatic juice.