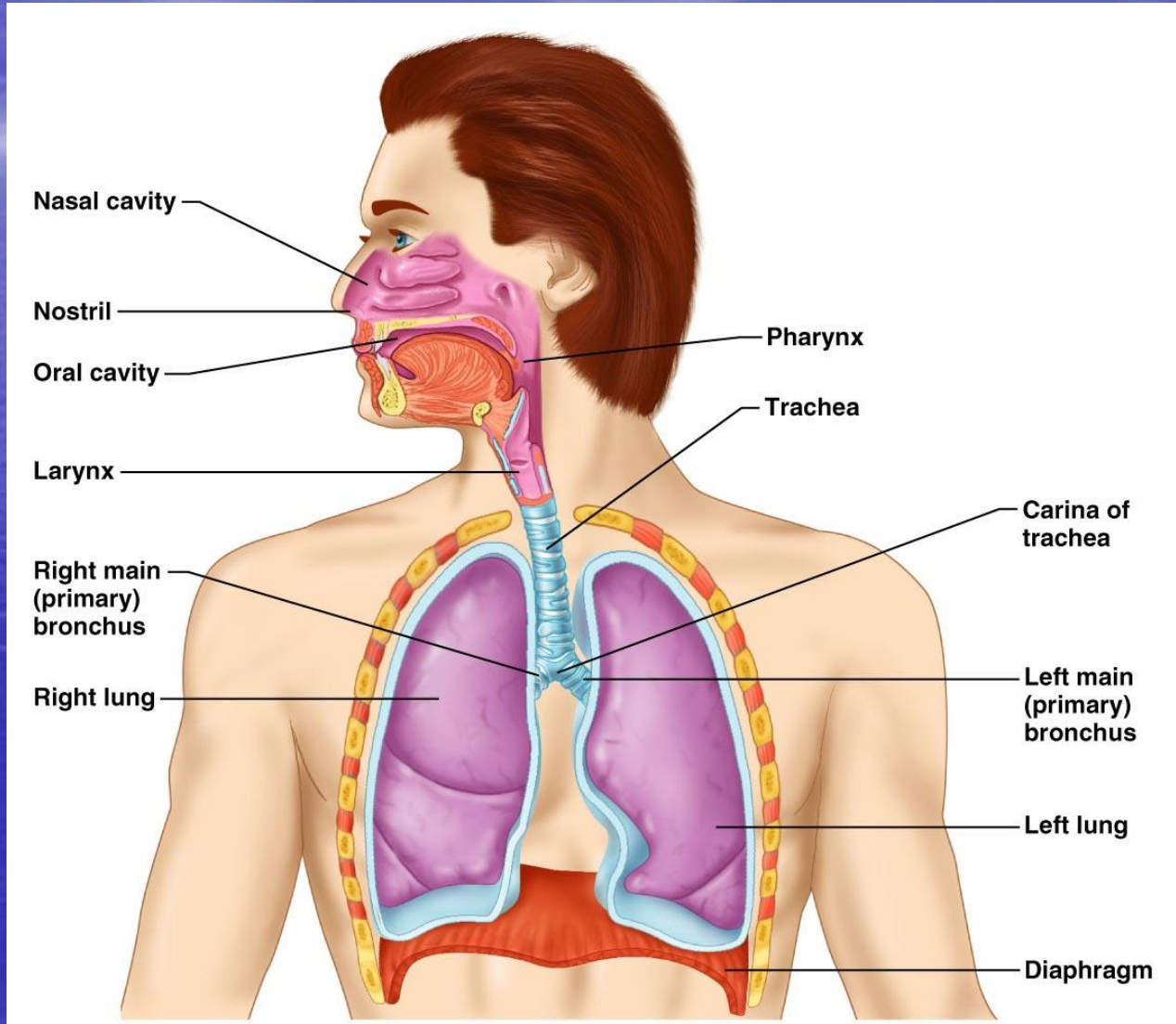
Chapter 22: Respiratory System

Parts of the Respiratory System

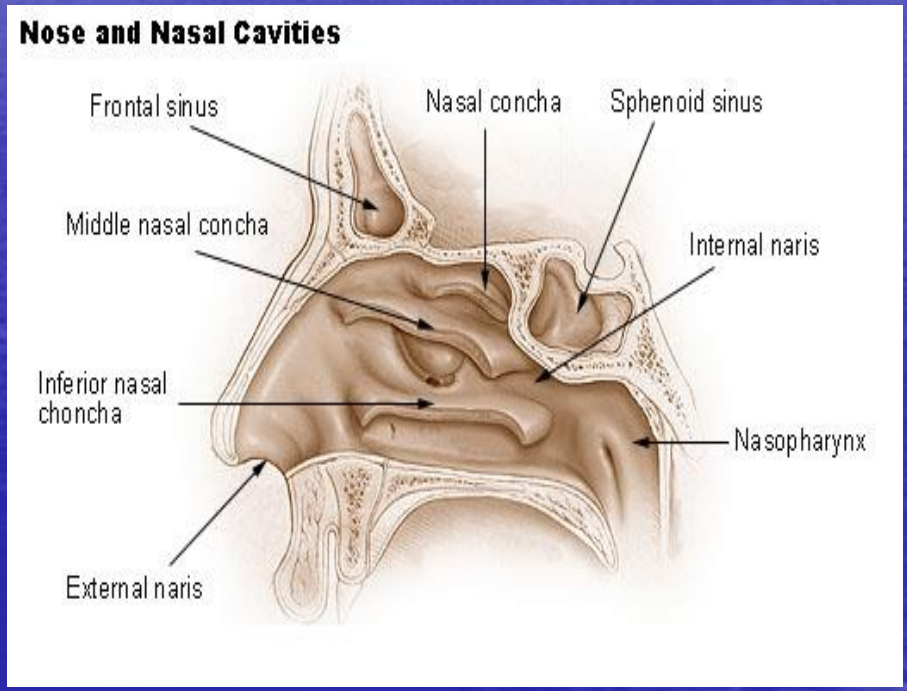
Parts

- Nose, pharynx (throat), larynx (voice box), trachea (windpipe), bronchi, and lungs.



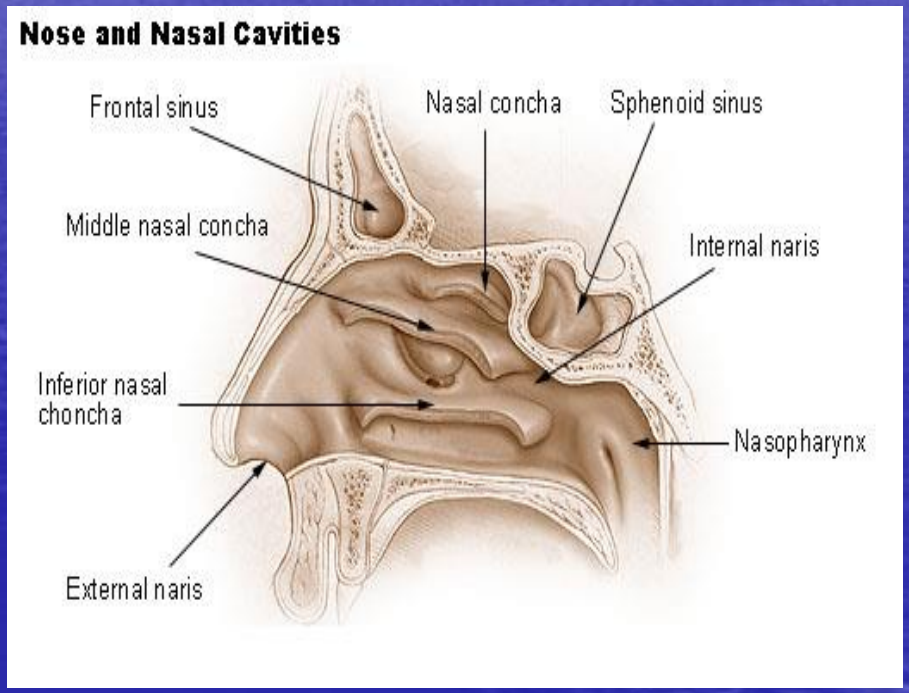
Parts of the Respiratory System

- Nose & nasal cavity
  - Only external part of the respiratory system.
  - Provides an airway for respiration.
  - Moistens, warms and filters air.
  - Resonating chamber for speech
  - Has olfactory (smell) receptors.



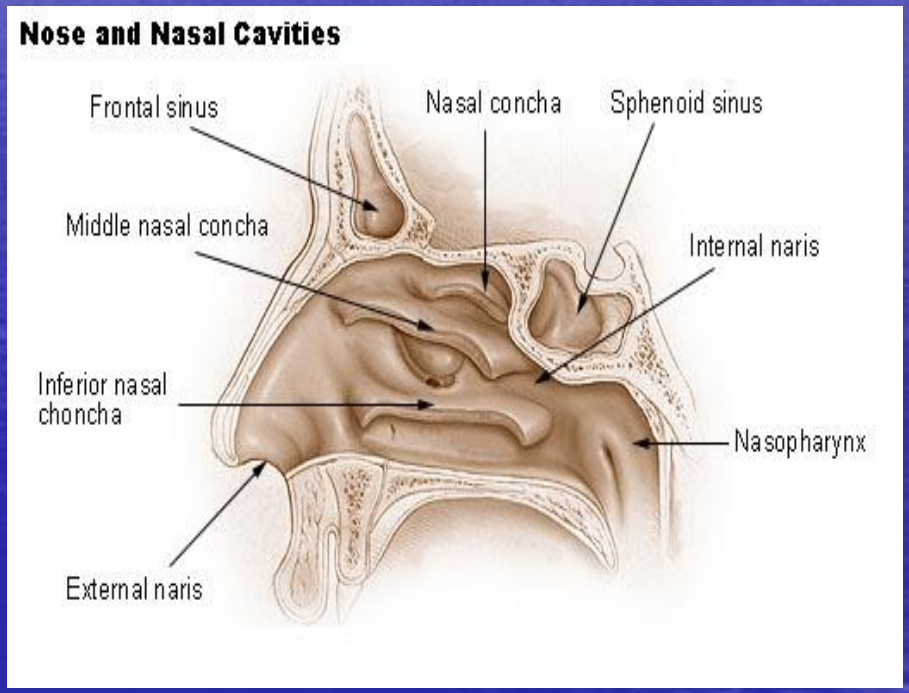
Nasal Cavity

- Space within internal nose
- Cavity is divided by the nasal septum
- During breathing air enters the cavity by passing through the nostrils (external nares).



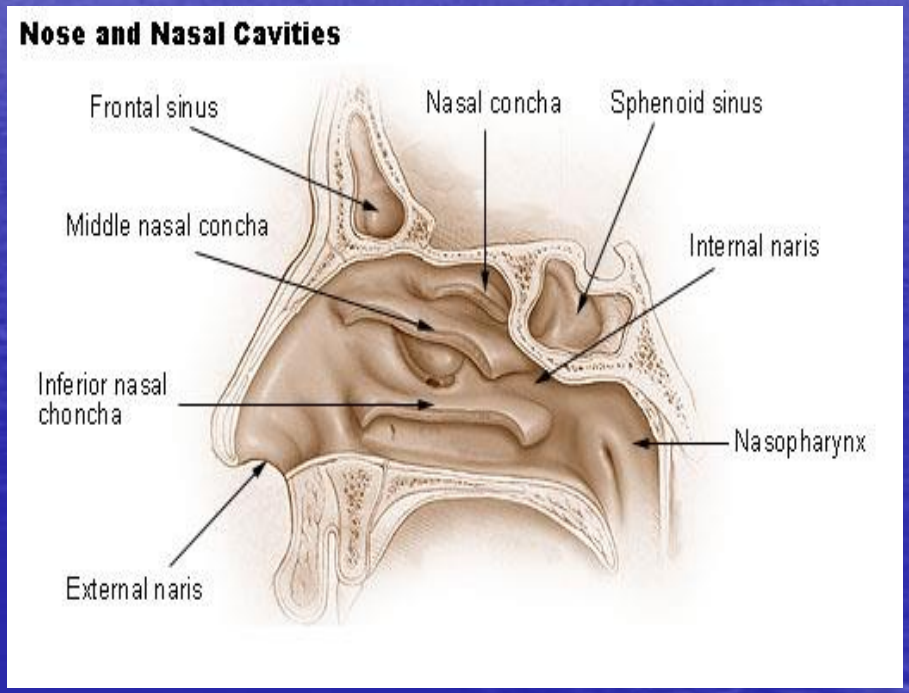
Nasal Conchae

- Superior, middle, and inferior
- Protrude medially from the lateral wall in the nasal cavity (like shelves)
- Greatly increase the surface area and enhance air turbulence → gases swirl and turn the heavier particles fall out and become trapped in mucous covering the "shelves"



Paranasal Sinuses

- Surround the nasal cavity
- Located in the frontal, sphenoid, ethmoid, and maxillary bones.
- "Spaces" in the facial bones
- Lighten skull
- Warm and moisten air
- Produce mucous – flows into the nasal cavity.
- Blowing your nose helps drain the sinuses

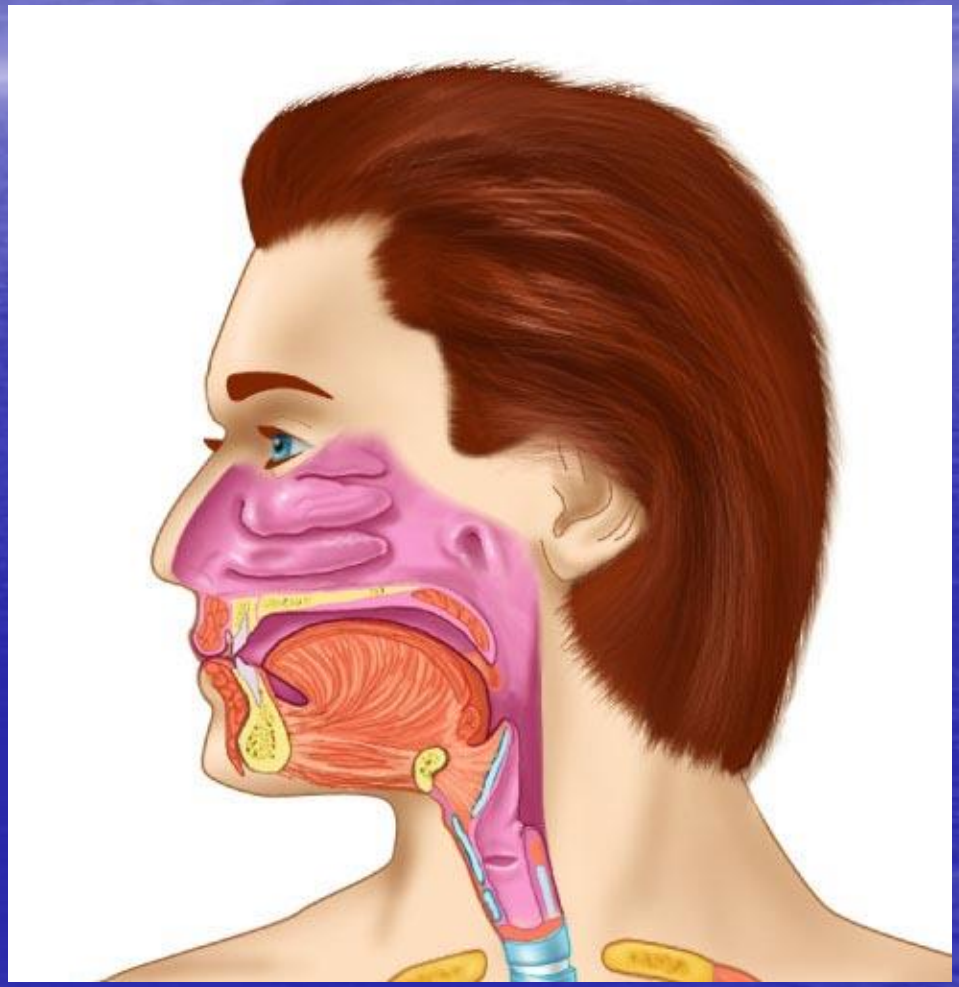


Homeostatic Imbalance

- Viruses, streptococcal bacteria, allergens can cause rhinitis → inflammation of the nasal mucosa that is accompanied by excessive mucus production, congestion and postnasal drip.
- Sinusitis → When the passageways to the sinuses are blocked, the air in the cavity is absorbed causing a partial vacuum and a sinus headache

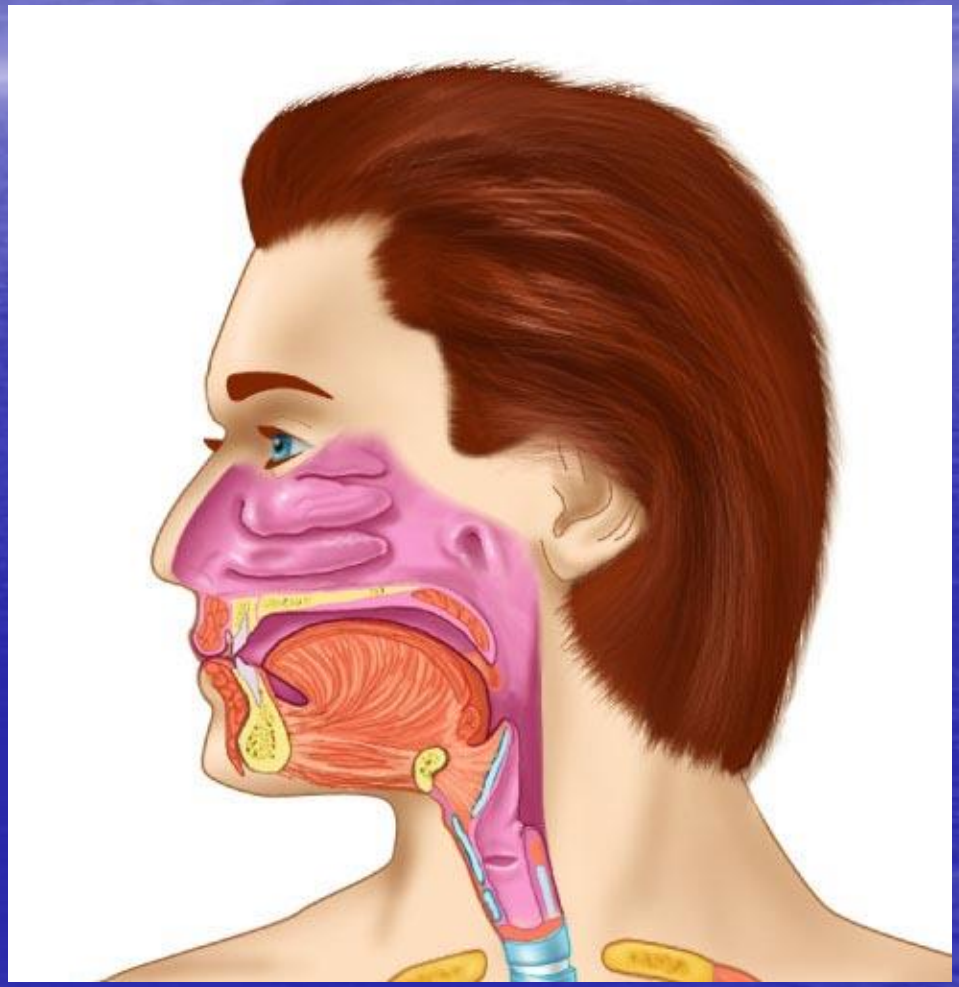
Pharynx

- AKA - Throat.
- Muscular tube extending from behind the nasal cavity to the larynx
- Passageway for food and air, resonating chamber for speech, houses tonsils



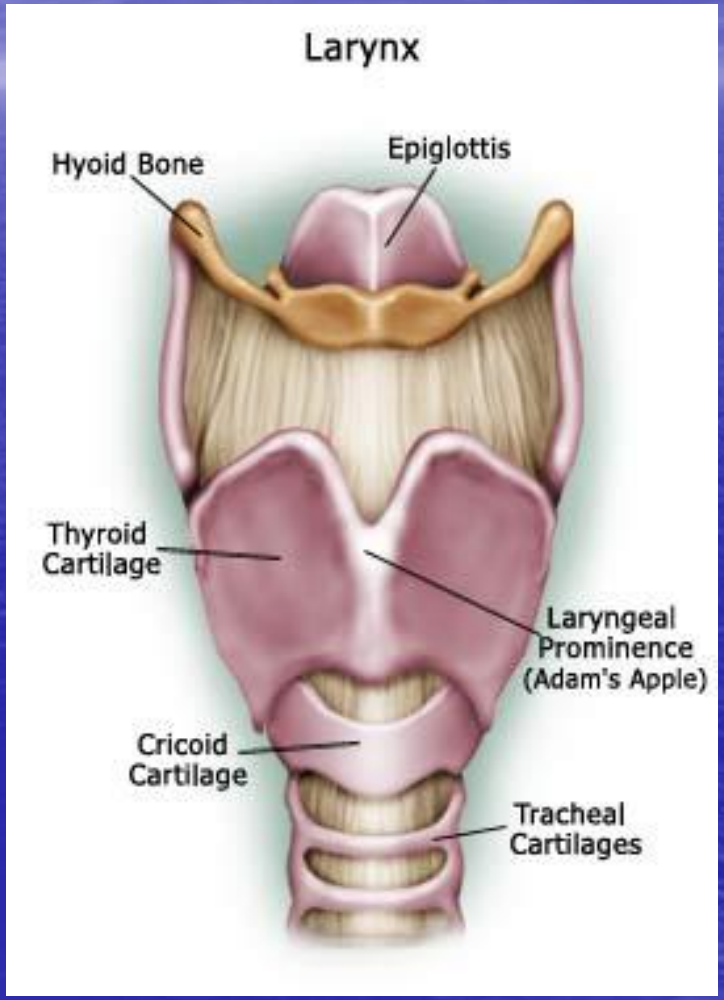
Pharynx

- Three regions: nasopharynx, oropharynx, laryngopharynx



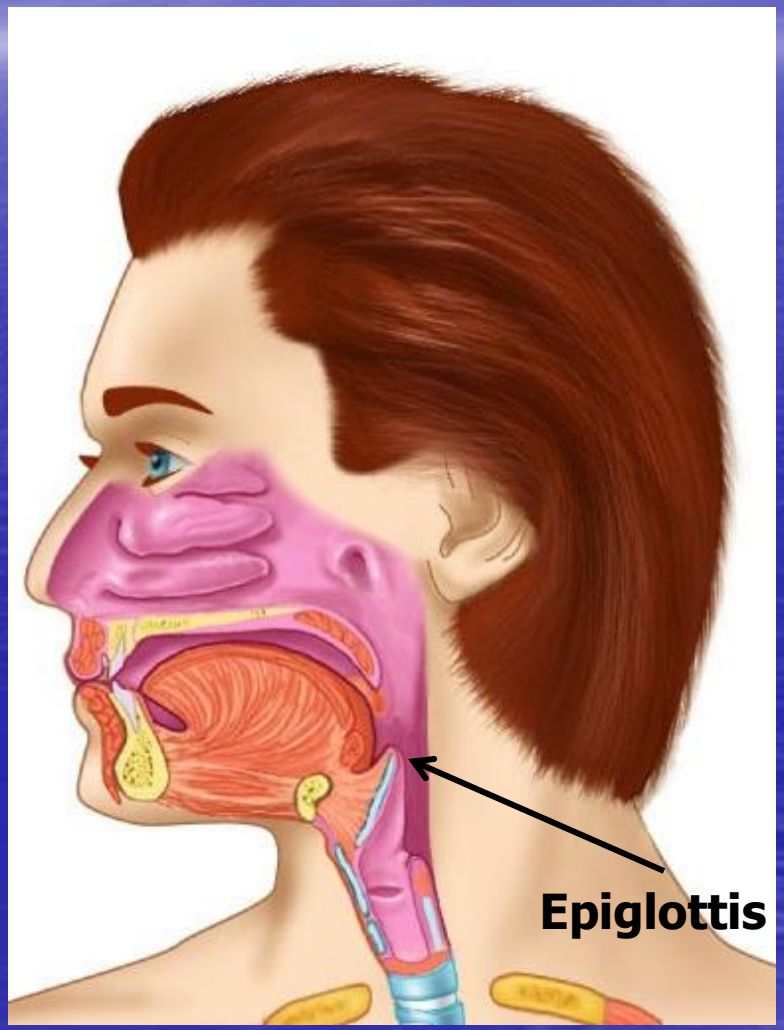
Larynx

- AKA - Voice box
- 3 main functions:
  - Provides an open airway
  - Acts as a switching mechanism for food and air.
  - Sound production



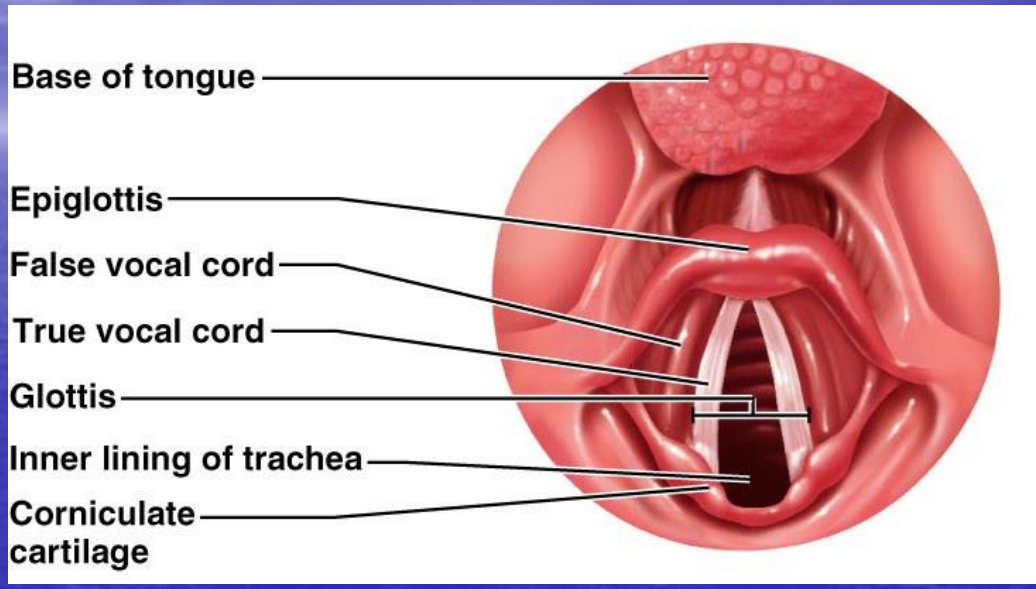
Anatomy of Larynx - Epiglottis

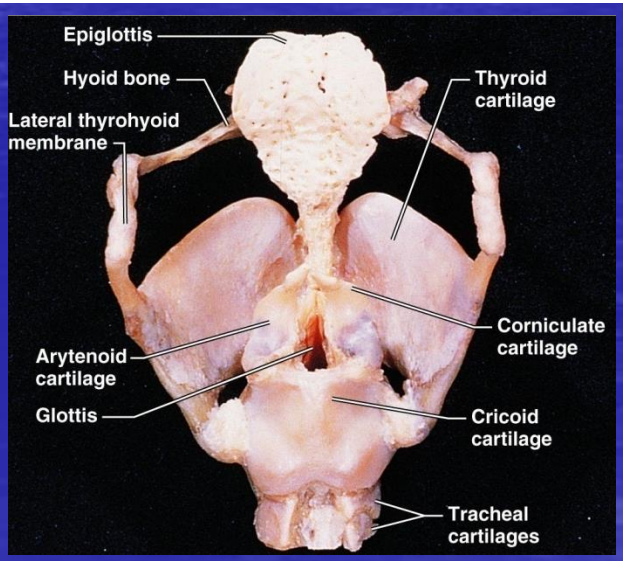
- Flexible, spoon shaped piece of elastic cartilage that covers the larynx when swallowing
- Keeps everything going down the correct "tube"
- If anything other than food enters the larynx, the cough reflex is triggered



Glottis

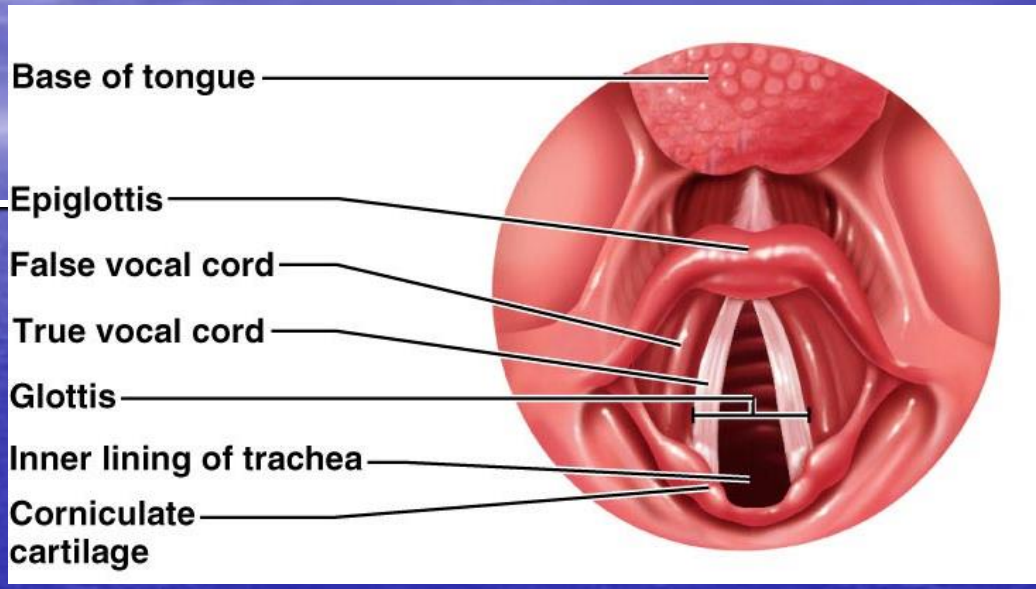
- The "hole" seen at the opening of the larynx.
- On either side you will see 2 strips of membranous tissue → vocal cords (sound production) appear white because lack blood vessels.

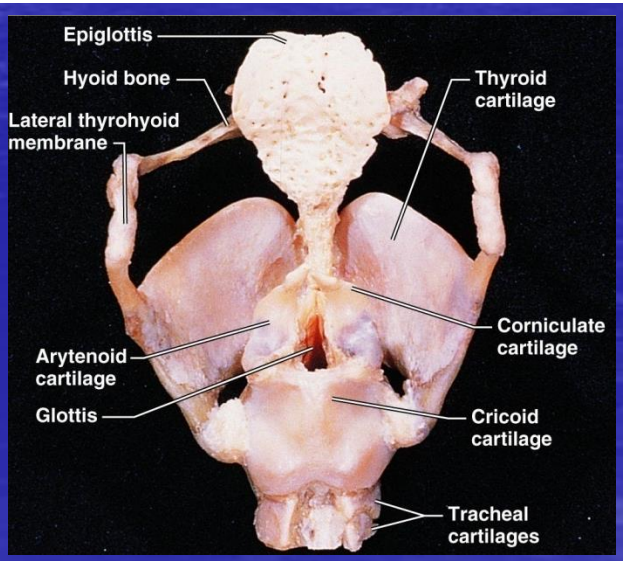




Glottis

- False vocal cords – above and lateral to the vocal cords. Play no part in sound production but help close the glottis when we swallow





Voice Production

- Speech involves the intermittent release of expired air and the opening and closing of the glottis

- Sound originates from the vibration of the vocal folds, but other structures are necessary for converting the sound into recognizable speech

Voice Production

- Vowel sounds – contract/relax muscles in pharynx
- Enunciate words – muscles of face, tongue, and lips
- Whispering – vocal folds don't vibrate → changing shape of oral cavity while enunciate produces speech

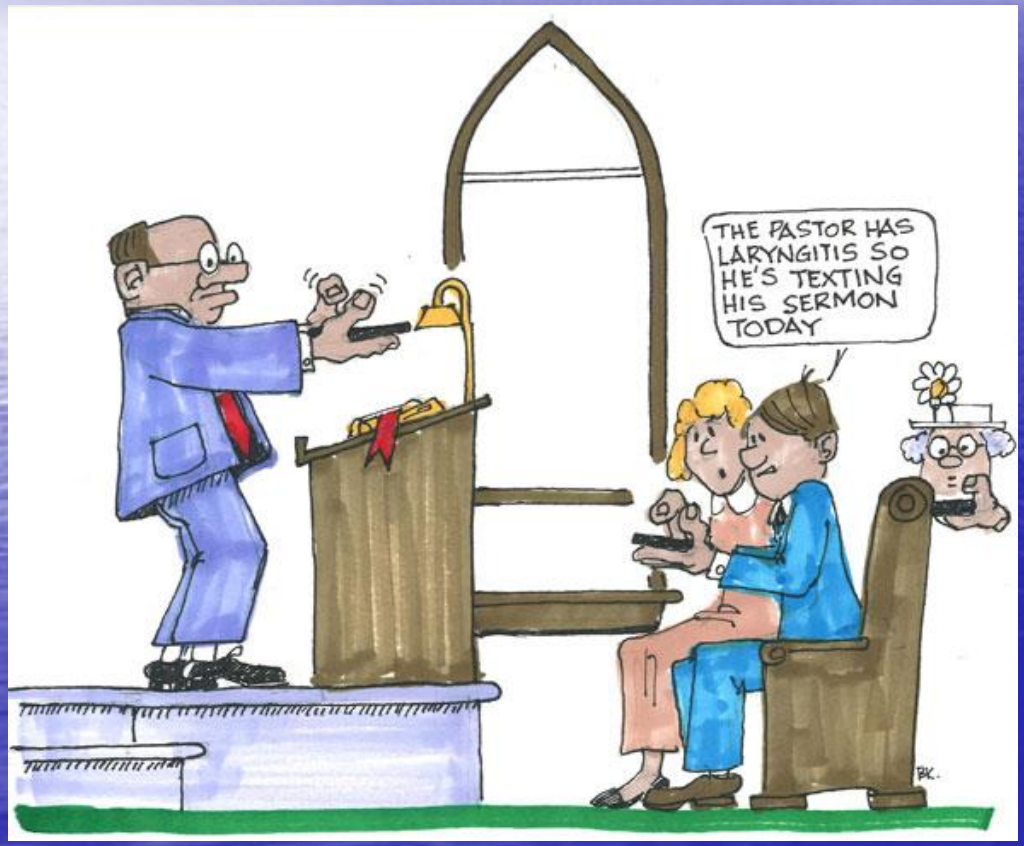
Voice Production

- Loudness depends on the force with which air rushes across the vocal cords.
  - Greater force → stronger vibration → louder

Voice Production

- During puberty a boy's larynx enlarges and his true vocal cords become longer and thicker → vibrates slower → voice becomes deeper (voice "cracks" until he learns to control the larger true vocal cords)

Laryngitis



- Inflammation of the vocal folds → interferes with their vibration → changes voice tone, hoarseness, or inability to talk.
- Caused by overuse, dry air, bacterial infection, tumors on vocal folds, inhalation of irritating chemicals