

# RESPIRATORY SYSTEM

U3L6

The four main functions of the respiratory system are...

- 1) Gas Exchange
- 2) Produce Sounds
- 3) Smell
- 4) Balance pH of Blood



## Respiration Events

Breathing

Moving the air into and out of the lungs, also called "ventilation."

External  
Respiration

Exchanging gases between the air in the lungs and the blood.

Gas Transport  
by Blood

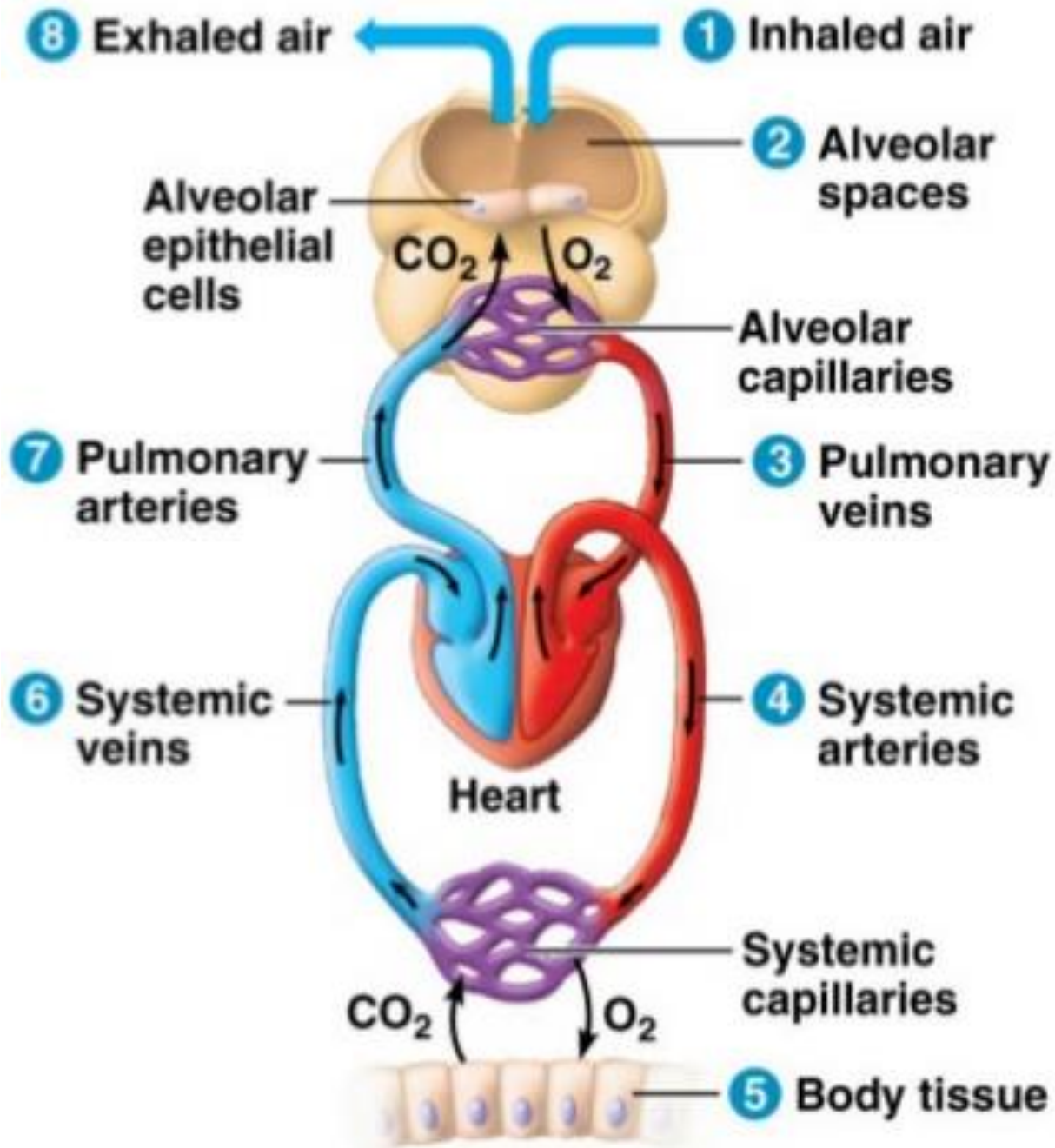
Transport of oxygen to the body cells and the return of carbon dioxide.

Internal  
Respiration

Exchanging gases between the blood and the body cells.

Cellular  
Respiration

Using the oxygen in cell processes and the production of carbon dioxide.



WHERE  
DOES  
THE  
BREATH  
GO?

[ ]

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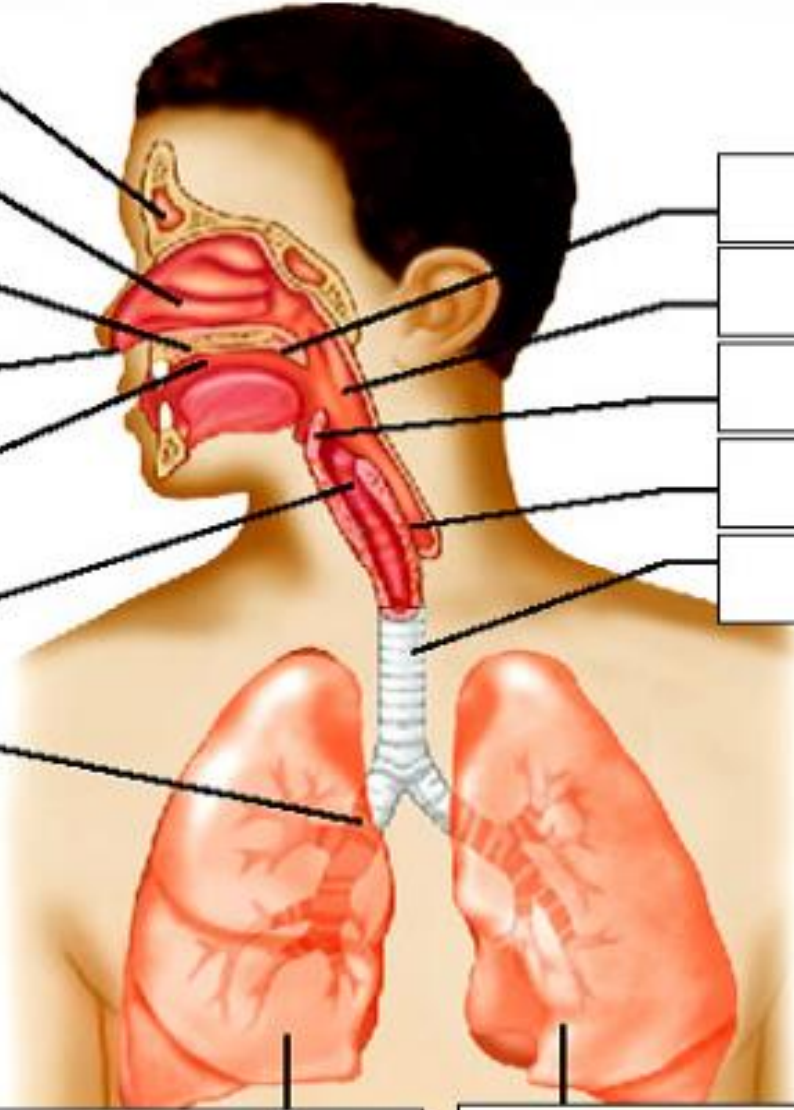
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**Nostril**

[ ]

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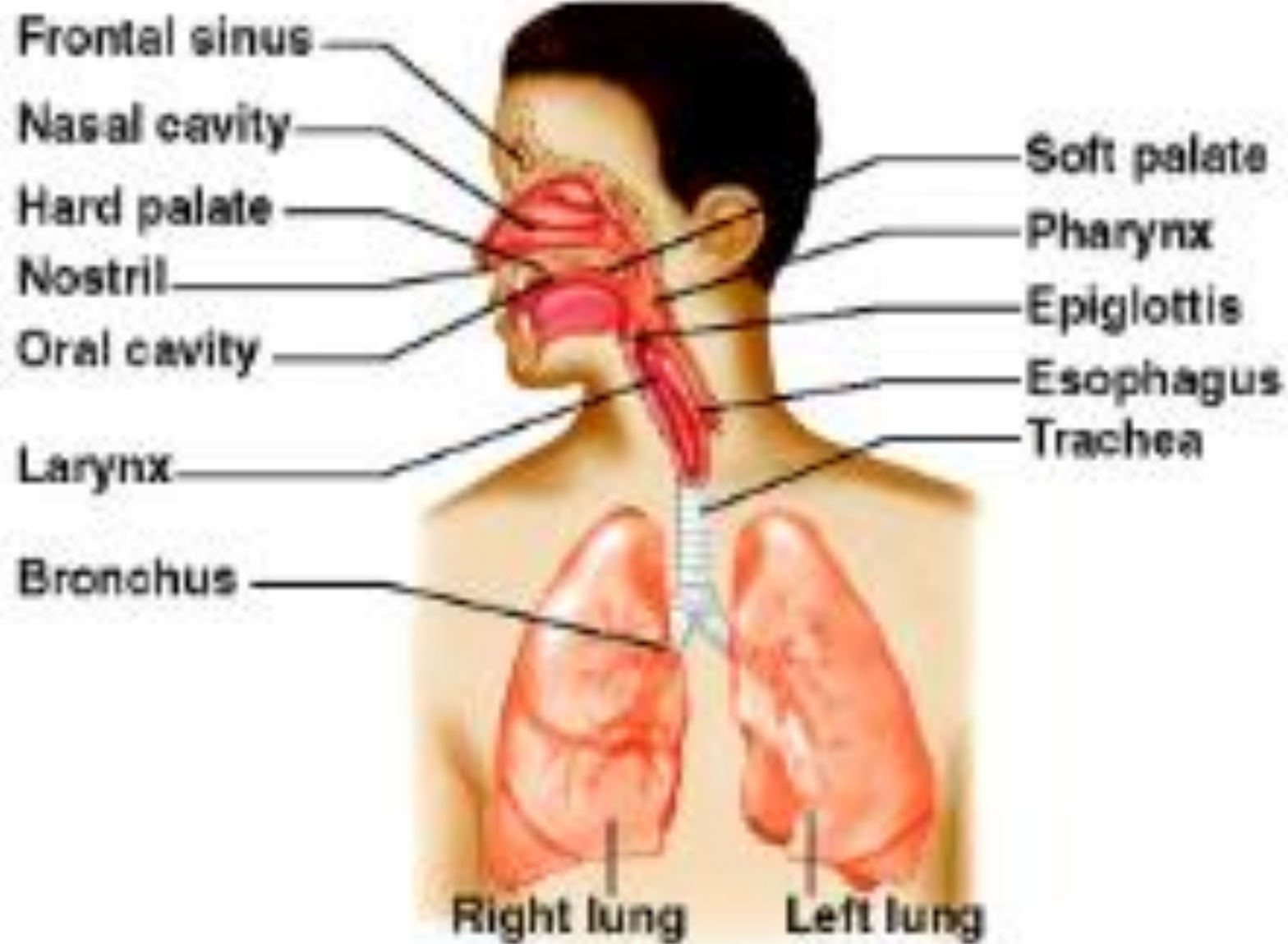
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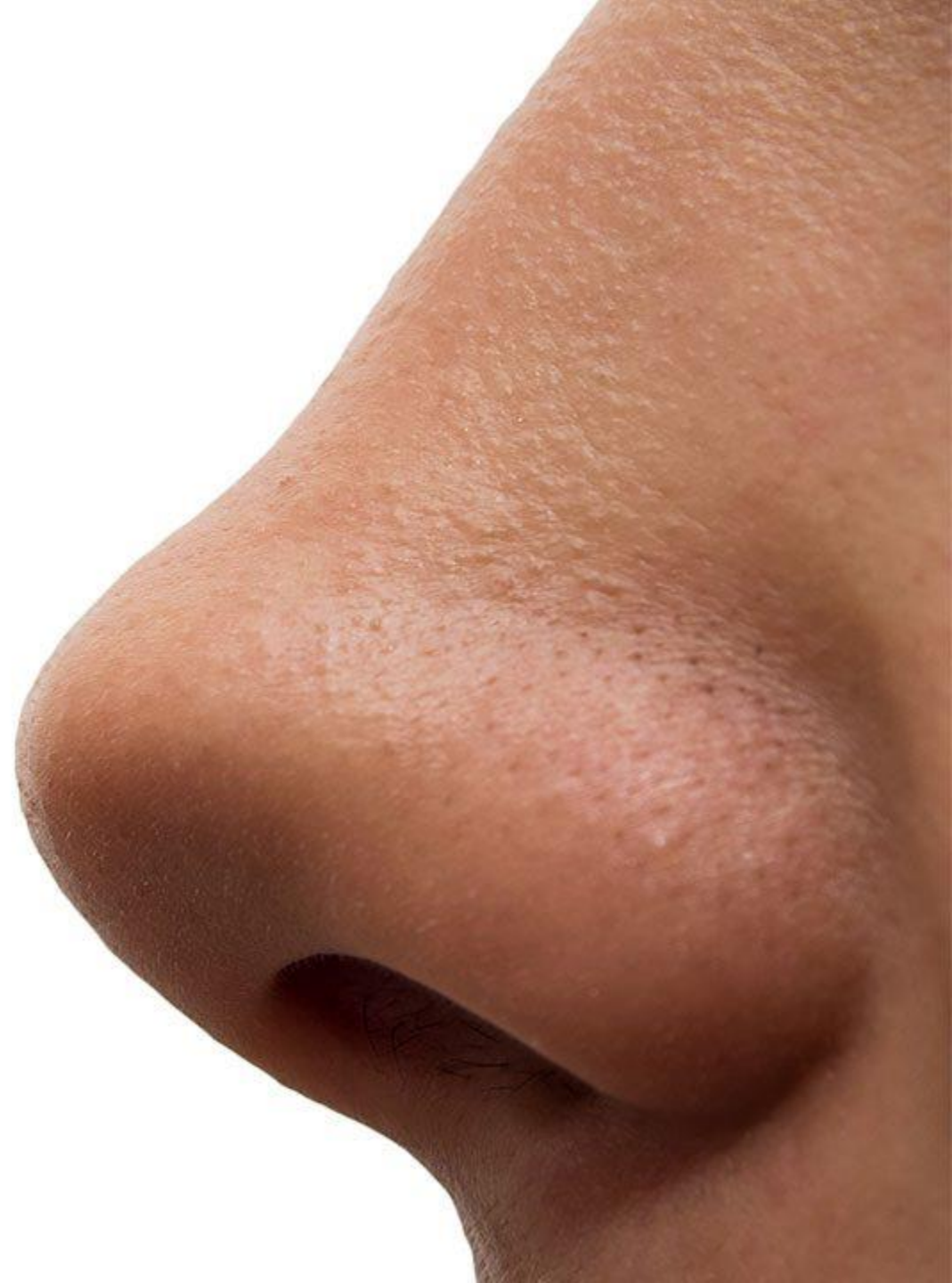
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# NASAL BREATHING

U3L6

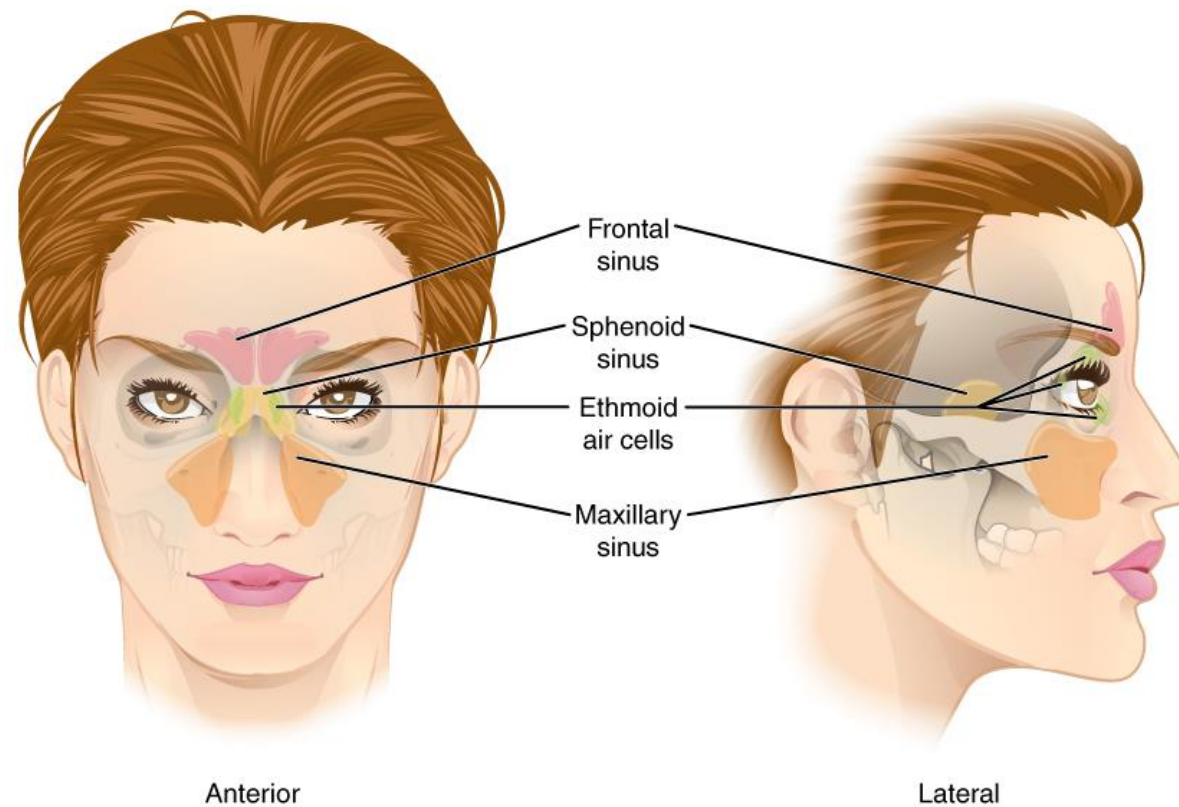
The main function of the nose is to allow air to enter the body during inhalation and to leave the body during exhalation.





The **sinuses** help to warm and moisten the air.

**Mucus** produced by the sinuses traps the particles suspended in air and channels them to the nasal cavity.

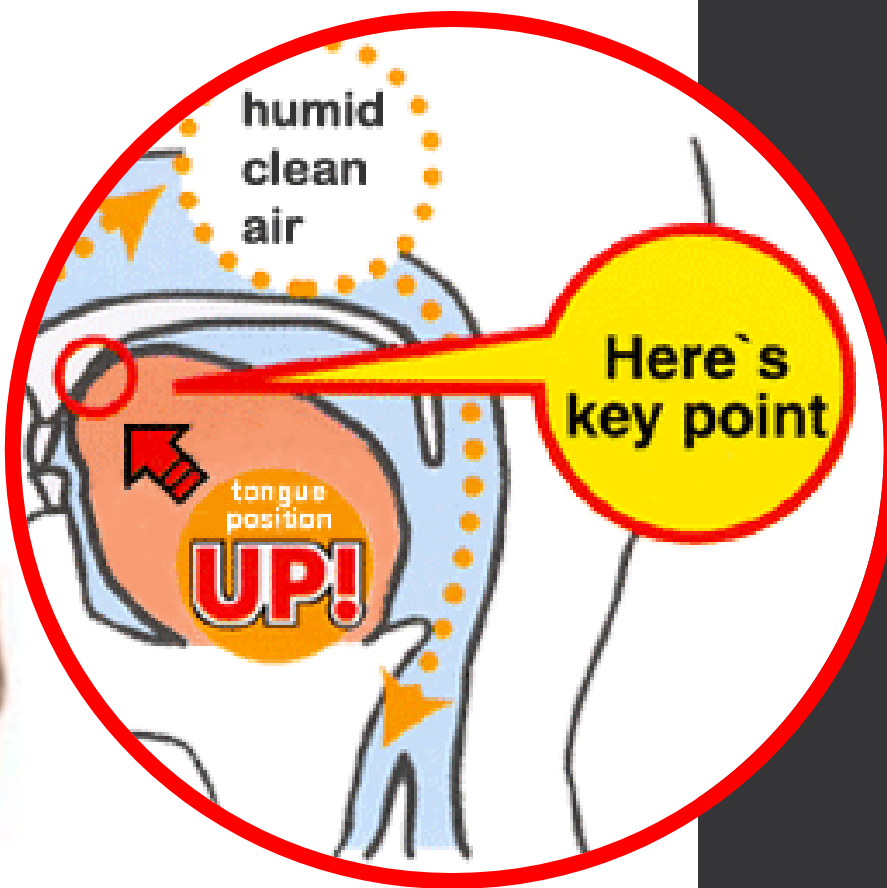


# NOSE or MOUTH ???



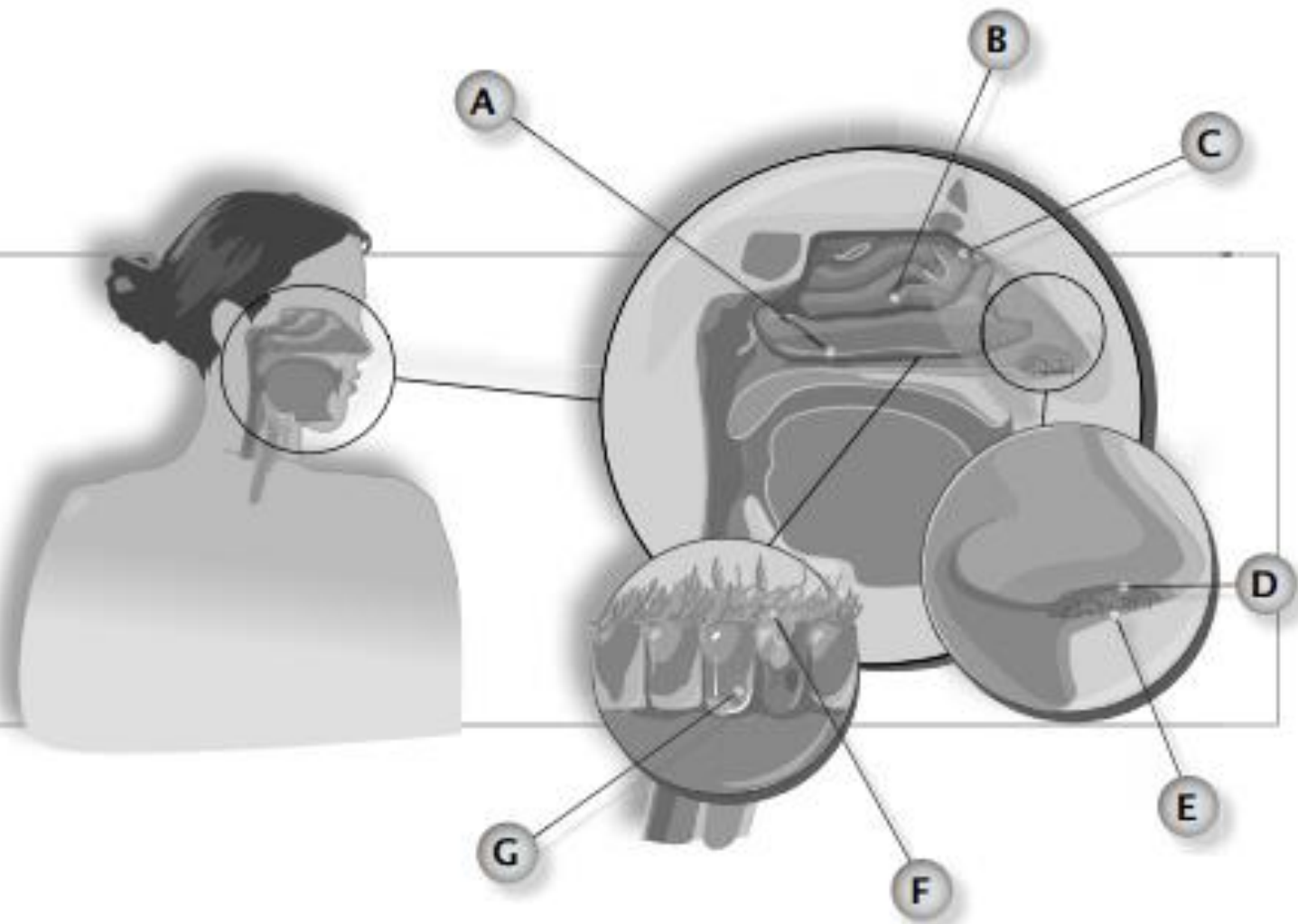
The air in the mouth is less warm and moist, and microbes and other particles in the air may enter the lungs.

When our body needs a greater supply of oxygen such as during physical activity, or when we are congested, we tend to breathe through the mouth.





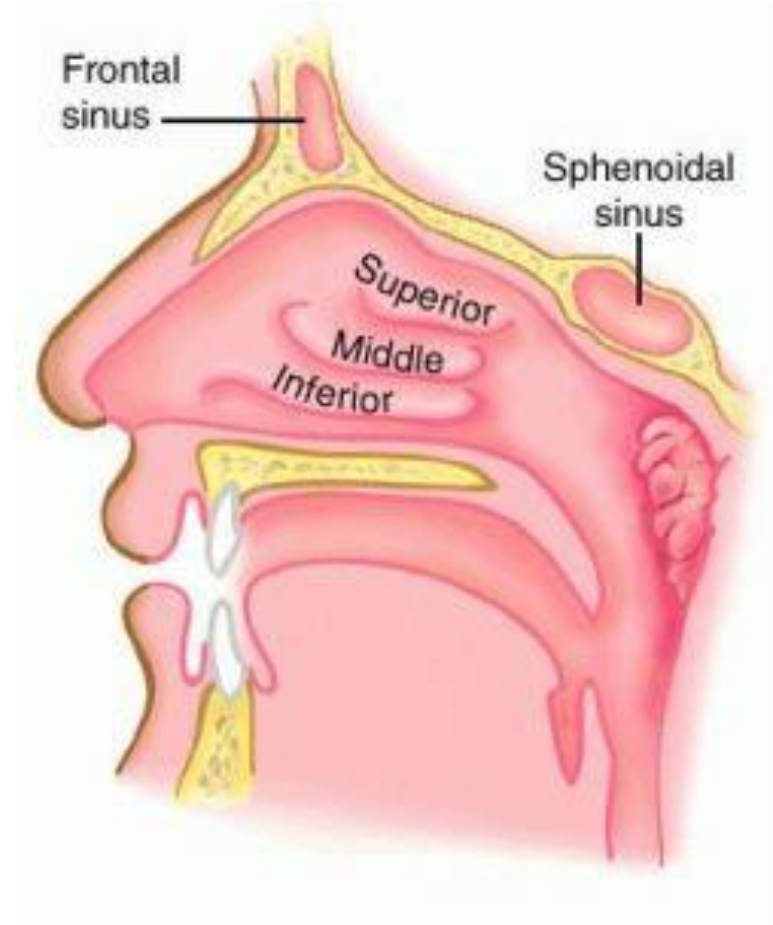
- A- Inferior concha
- B- Middle concha
- C- Superior concha
- D- Nares
- E- Hairs
- F- Cilia
- G- Mucous gland



A- The **inferior concha** is the lowest of the three conchae. It opens into the pharynx.

B- The **middle concha** is rich in mucous glands and blood vessels. Air entering the nose is channeled towards this concha, where it is moistened and warmed.

C- The **superior concha** is used for olfaction, that is, for perceiving smells (sense of smell). The olfactory receptors are situated in this concha.



D- The **nares, or nostrils**, are the external openings of the nose; they allow air to pass into and out of the body.

E- The **hairs** inside the nostrils serve to filter out dust and other impurities in the air.

F- The **cilia** beat continuously in a wave-like motion that propels the mucus with its trapped debris toward the nasal cavity

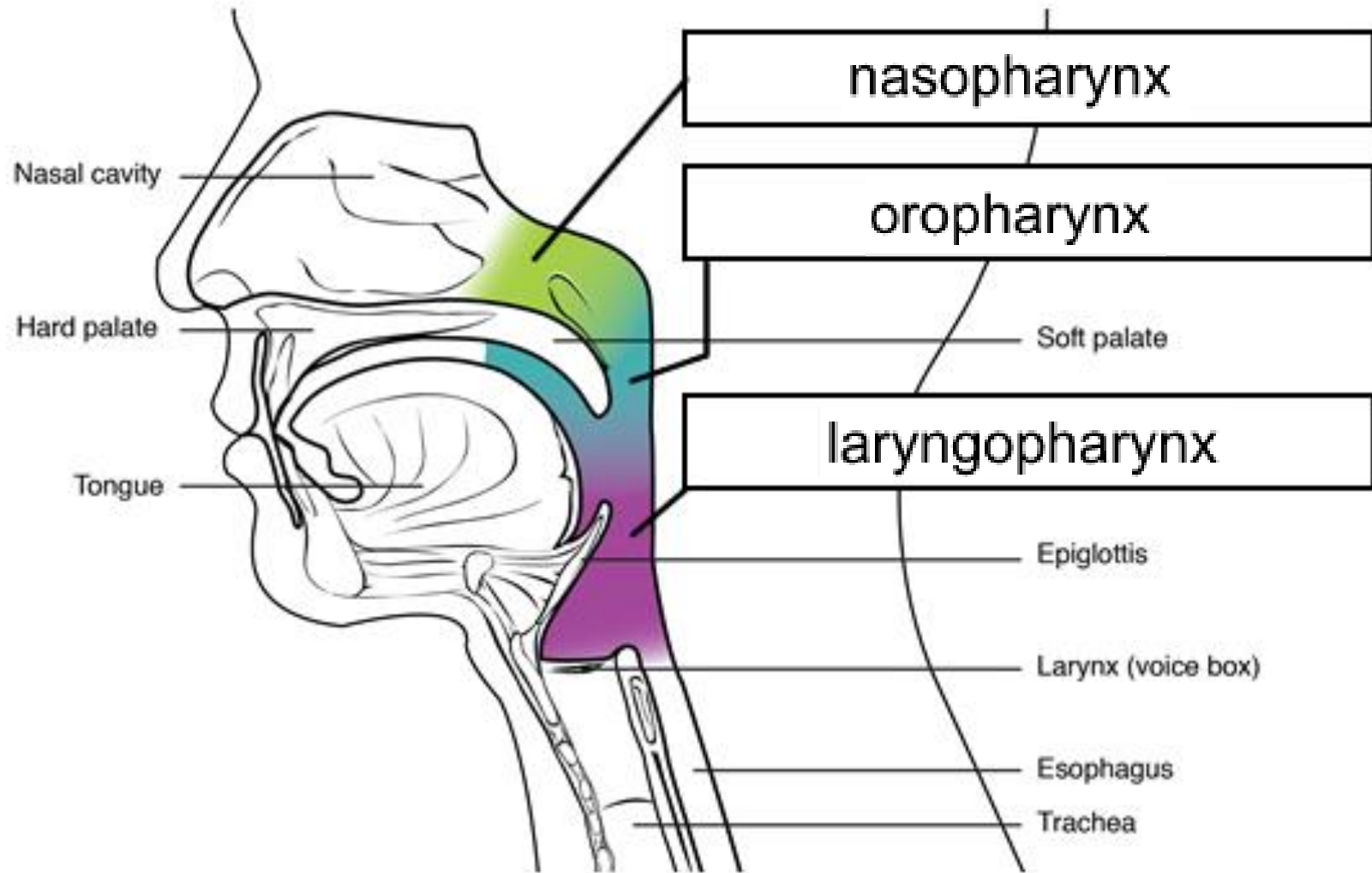


G- The **mucous glands** produce mucus, a clear, viscous substance, which moistens, warms and partially filters the air. The mucus is a sticky layer that traps dust and other impurities as they are inhaled and prevents them from blocking the respiratory tract.





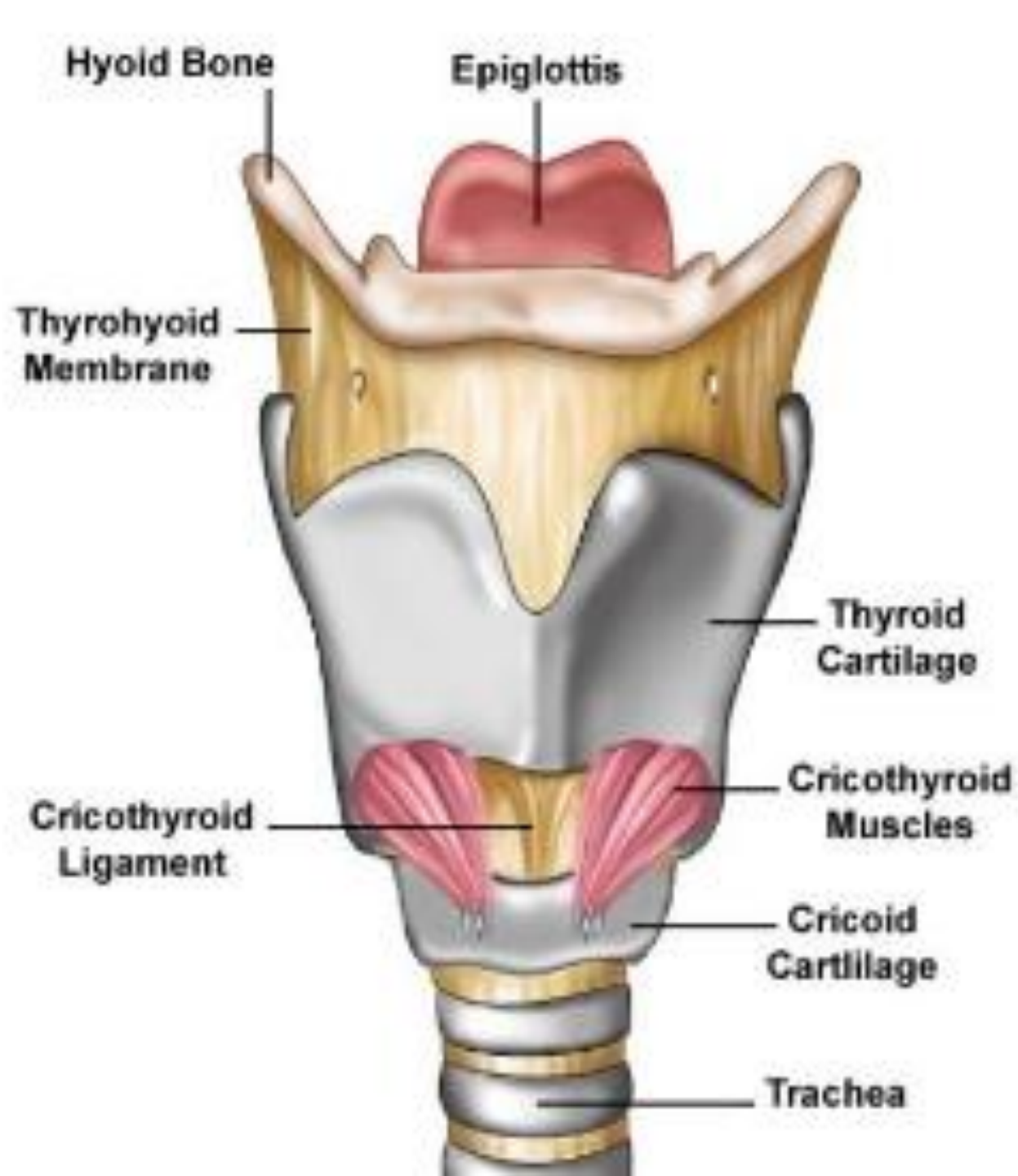
**Pharynx** - behind the oral cavity, 3 sections:



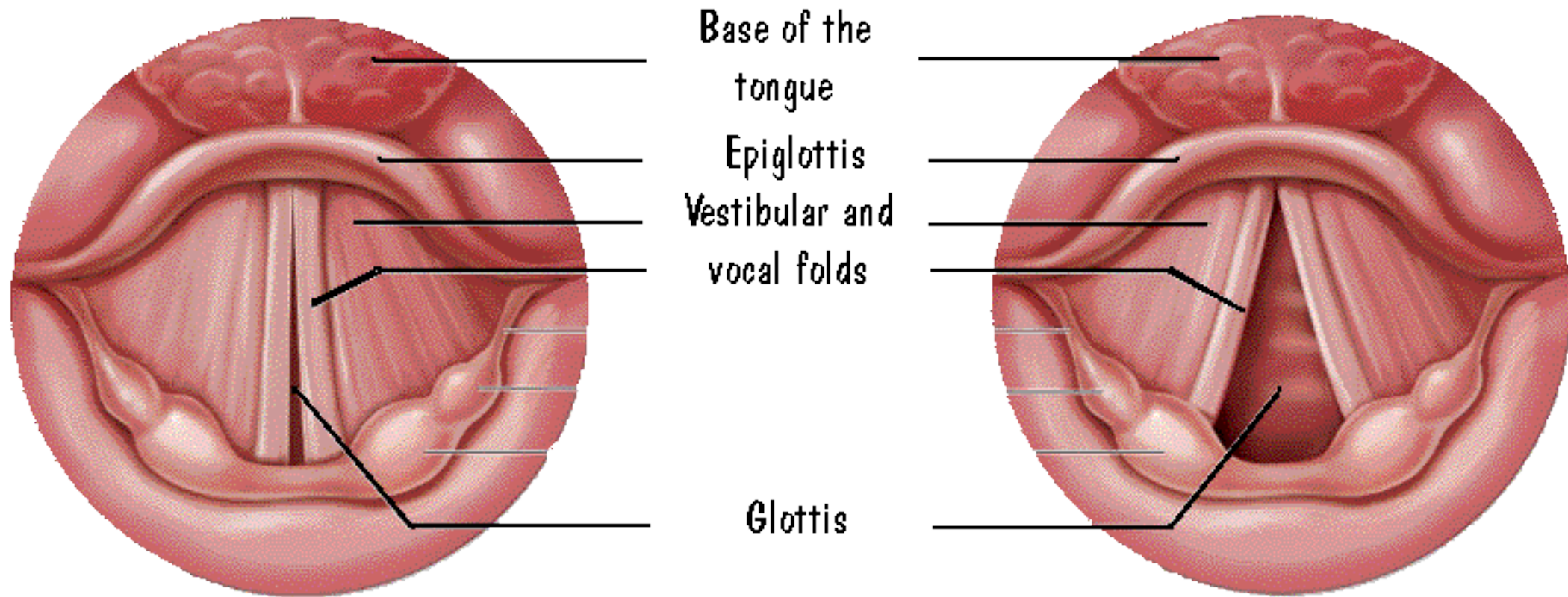
Larynx – enlargement at the top of the trachea, houses vocal cords

composed of muscles and cartilages

-thyroid (Adam's apple),  
-cricoids,  
-epiglottic cartilage



**GLOTTIS:** the part of the larynx consisting of the vocal cords and the opening between them. It affects voice modulation through expansion or contraction.

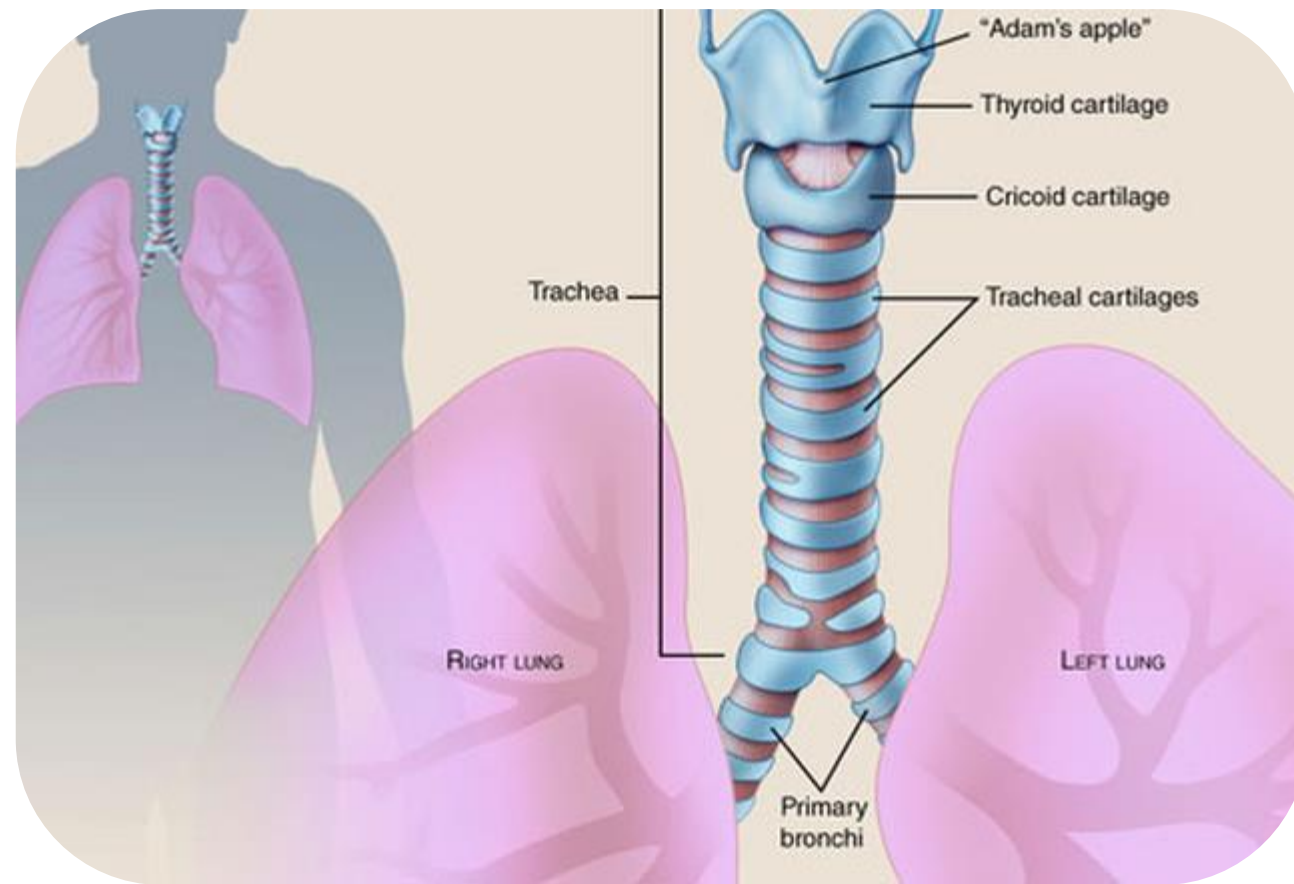




STROBOSCOPY

Epiglottitis – flaplike structure that stands upright, allows air to enter larynx, it closes during swallowing to prevent food from entering the airway

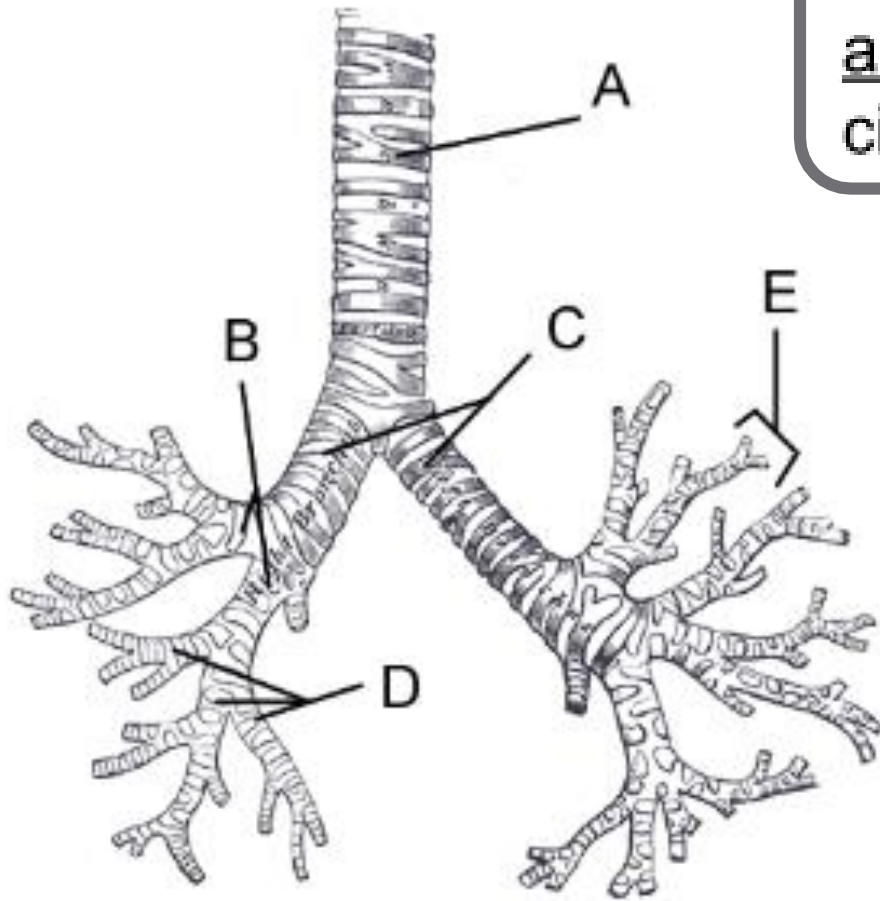




## Trachea (windpipe)

- flexible cylinder with cartilage to give it stiffness and keep it from collapsing
- Trachea leads to the BRONCHIAL TREE

Bronchioles have air sacs called alveoli which are connected to the circulatory system via capillaries



Trachea → Primary Bronchi

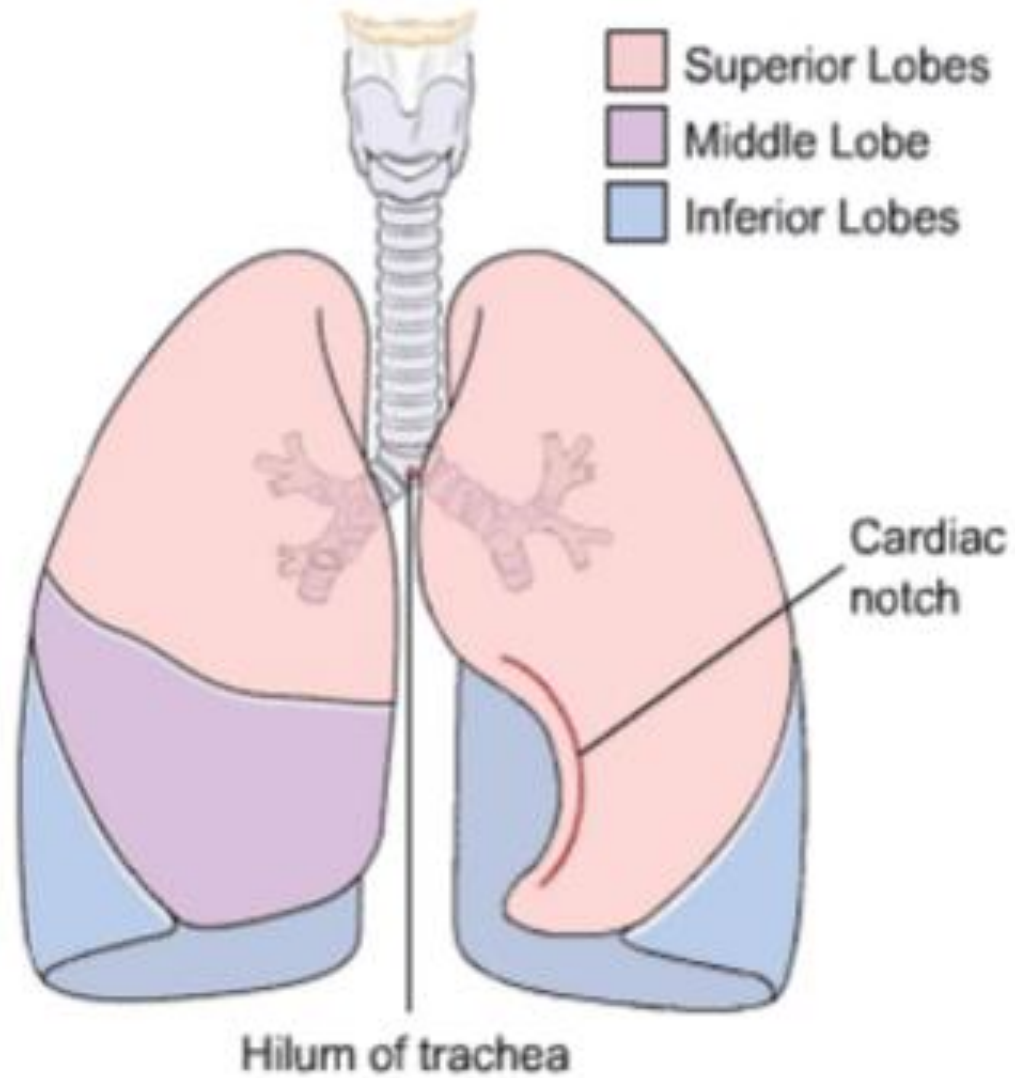
→ Secondary Bronchi → Tertiary Bronchi → Bronchioles

Right Lung  
= 3 lobes

Left Lung  
= 2 lobes

Cardiac notch -  
space for heart

Serous fluid  
lubricates lungs  
during breathing





# FACTORS THAT AFFECT BREATHING

1. Rise in CO<sub>2</sub>
2. Low blood oxygen
3. Emotional upset, fear and pain



# LUNG CAPACITY

U3L6

# VITAL CAPACITY

**The largest possible amount of air which can be exhaled after drawing in a deep breath.**



# EXPIRATORY RESERVE

The **additional** amount of air that can be expired from lungs (by determined effort) **after** normal exhalation.



# VITAL CAPACITY

The **volume** of air inspired or expired in a **single breath** during regular breathing.

