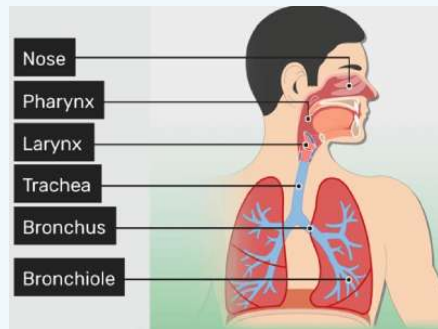


### Major Functions

- ☞ Gas exchange
- ☞ Blood pH regulation
- ☞ Voice production
- ☞ Olfaction
- ☞ Protection against airborne diseases

### Basic Respiratory Parts



### Associated Cells/Structures

#### Cilia

- ☞ Hair-like
- ☞ Traps and wafts out dirt, pathogens etc.

**Goblet Cells:** Makes mucous

#### Mucous Properties

- ☞ Sticky for trapping
- ☞ Has lots of H<sub>2</sub>O for air humidifying

### Age-Related Changes

- ☞ Decreased respiratory function, O<sub>2</sub> amount in blood & cilia/macrophage activity
- ☞ Stiffened lung tissue & rib cage
- ☞ Increased COPD/emphysema risk

### Key Respiration Terms

#### Ventilation

- ☞ Breathing

#### Respiration

- ☞ Gas exchange

#### Inspiration

- ☞ Inhaling
- ☞ Gas exchange between blood & lungs

#### Expiration

- ☞ Exhaling
- ☞ Gas exchange between blood & cells

### Gas Exchange (Diffusion)

- ☞ Gas exchange balances gas pressures on 'both sides'

### Partial Pressure (P)

- ☞ Air-caused pressure inside alveoli & blood vessels

#### Internal Respiration

- ☞ Between blood & cells
- ☞ O<sub>2</sub> from blood to cells
- ☞ CO<sub>2</sub> from cells to blood

#### External Respiration

- ☞ Between blood & alveoli
- ☞ O<sub>2</sub> from alveoli to blood
- ☞ CO<sub>2</sub> from blood to alveoli

### Upper Respiratory Tract (URT)

#### Organs Of URT

- ☞ Nasal cavity
- ☞ Pharynx
- ☞ Trachea
- ☞ Mouth
- ☞ Larynx

#### Roles

- ☞ Prevents infection

### Upper Respiratory Tract (URT) (cont)

- ☞ Warms/cool's air (via nasal cavity & pharynx)
- ☞ Cleans air (via mucous, nose hairs, cilia, tonsils and epiglottis)
- ☞ Humidifies air (via mucous)

### Nose & Nasal Cavity (URT)

- ☞ Lined by epithelial tissues and goblet cells
- ☞ Highly vascular

**Nose Hairs:** Traps pathogens, dirt & dust

### Pharynx (URT)

#### Sections

- ☞ **Nasopharynx:** Back of nasocavity
- ☞ **Oropharynx:** Back of oral cavity
- ☞ **Laryngopharynx:** Joins the larynx

#### Functions/Properties

- ☞ Passage for air and food
- ☞ Highly vascular
- ☞ Has goblet cells
- ☞ Fights infections via tonsils

### Larynx (URT)

- ☞ Produces speech
- ☞ Contains voice box & vocal cords
- ☞ Epiglottis seals off trachea when swallowing
- ☞ Has goblet cells

### Neural Control Of Breathing

#### Main Brain Structures Involved

#### Medulla Oblongata

- ☞ For normal, passive breathing
- ☞ Automatic signal spot

### Neural Control Of Breathing (cont)

- ☞ Signals from inspiration centre contract diaphragm & intercostal muscles

### Pons

- ☞ Increases breathing rate by overriding medulla oblongata's automatic signals
- ☞ Accommodates for exercise, fear etc.

### Trachea (LRT)

- ☞ Main passage for air
- ☞ Has cilia (stimulates cough reflex)

### C-Shaped Cartilage Rings

- ☞ Surrounds trachea
- ☞ Allows food accomodation
- ☞ Holds trachea open

### Bronchi (LRT)

- ☞ Both have cartilage rings

#### Right Bronchus

- ☞ Shorter, wider & more vertical
- ☞ Common site for foreign objects

#### Left Bronchus

- ☞ 2x longer than right
- ☞ Narrower

### Bronchioles (LRT)

- ☞ Branches off bronchi
- ☞ Air passage
- ☞ Has goblet cells
- ☞ Surrounded & lined by smooth muscle

### Pleura (LRT)

- ☞ Double-layered lining
- ☞ Fluid-filled

### Alveoli (LRT)

- ☞ Grape-like air sacs at end of bronchioles
- ☞ 1 cell thick
- ☞ Surrounded by capillaries

### O<sub>2</sub> Saturations

- ☞ Oxygen % in area of measurement

### O<sub>2</sub> Saturation Unit: SpO<sub>2</sub>

### O<sub>2</sub> Saturation Ranges

- ☞ **Normal:** 97-100%
- ☞ **Low:** 90-96%
- ☞ **Critical:** 89% and below

### Respirations (R or RR)

#### Normal Rate (No. Breaths/Min)

- ☞ **Adults:** 12-20 (16 average)
- ☞ **Children:** 20-28 (22 average)

### Rhythm (Regularity)

- ☞ Normal or irregular

### Depth (Breath Deepness)

- ☞ Shallow, normal or deep

### Sounds

- ☞ Normal: None
- ☞ Abnormal: Wheezing, bubbling, crackling and/or stridor

### Temperature

#### Peripheral Temperature

- ☞ Recorded from surface

#### Core Temperature

- ☞ Recorded from body's center

### Temperature Ranges

- ☞ **Normal:** 36°C - 37.4°C
- ☞ **Low:** Below 35°C
- ☞ **High:** 38°C and above

#### Low Temperature

- ☞ **Name:** Hypothermia
- ☞ **Causes:** Shock, liver/kidney disease, extreme cold, hyperthyroidism

#### High Temperature

- ☞ **Name:** Hyperthermia, pyrexia or febrile
- ☞ **Causes:** Infection, heat stroke, virus

