Respiratory Emergencies

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www.es26medic.net
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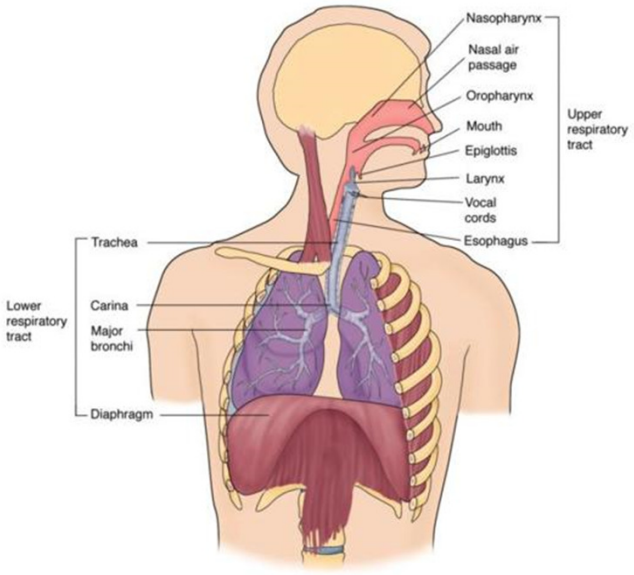
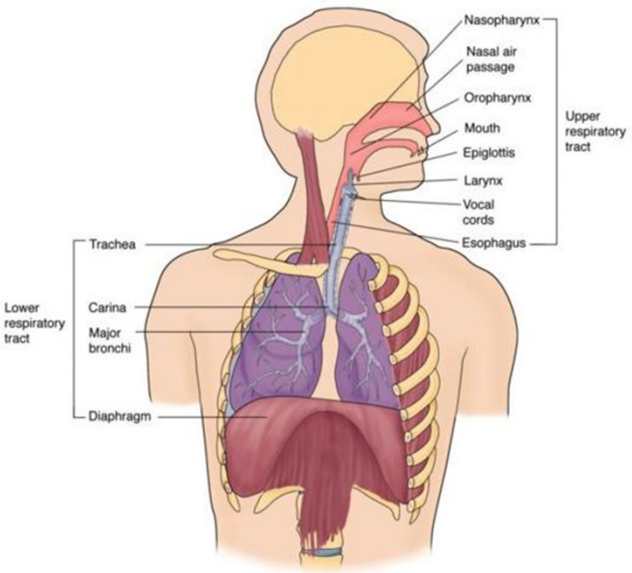


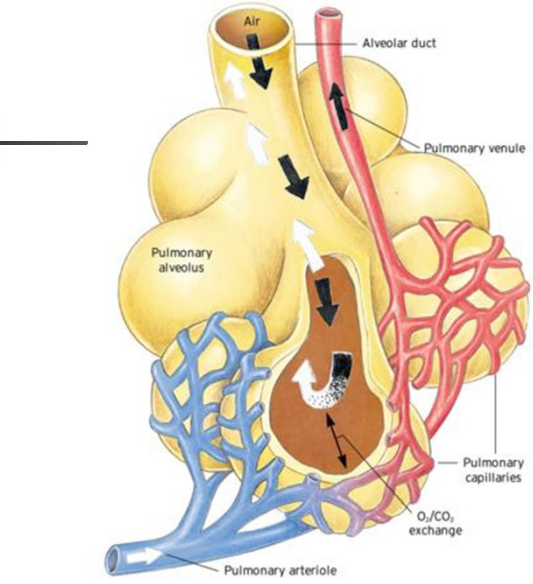
Review of airway anatomy

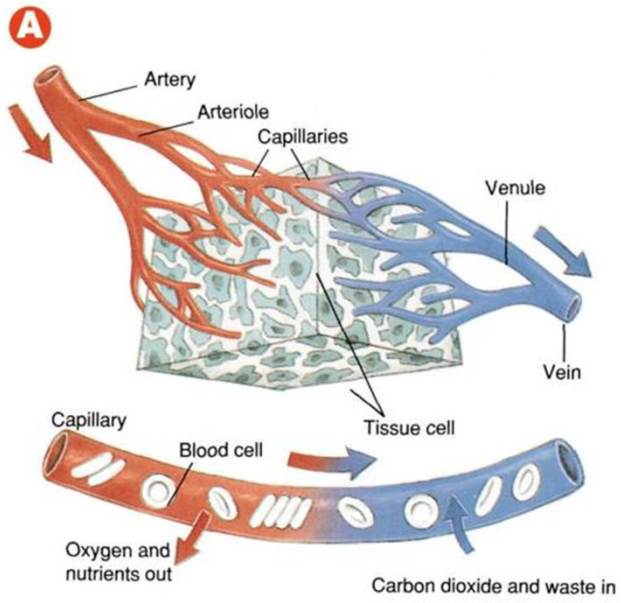
- Nose/Mouth
- Oropharynx/Nasopharynx
- Epiglottis
- Trachea
- Cricoid cartilage
- Larynx/vocal cords

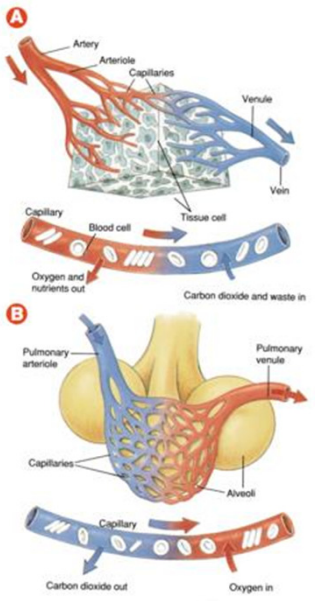
Review of airway anatomy-2

- Bronchi
- Bronchioles
- Lungs
- Alveoli
- Diaphragm


Nasopharynx
Nasal air passage
Oropharynx
Mouth
Epiglottis
Larynx
Vocal cords
Esophagus
Upper respiratory tract
Trachea
Carina
Major bronchi
Lower respiratory tract
Diaphragm


Air
Alveolar duct
Pulmonary venule
Pulmonary alveolus
Pulmonary capillaries
O_2/CO_2 exchange
Pulmonary arteriole


A
Artery
Arteriole
Capillaries
Venule
Vein
Tissue cell
Capillary
Blood cell
Oxygen and
nutrients out
Carbon dioxide and waste in


A
Artery
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Capillaries
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Tissue cell
Capillary
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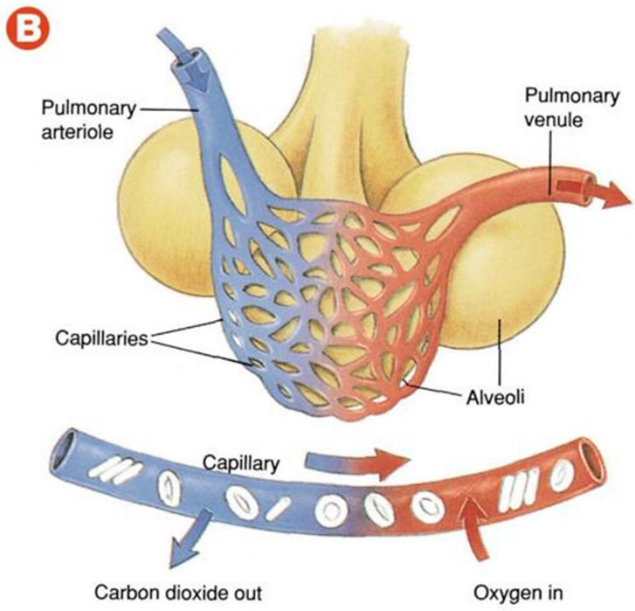
Oxygen and
nutrients out
Carbon dioxide and waste in
B
Pulmonary
arteriole
Pulmonary
venule
Capillaries
Alveoli
Capillary
Carbon dioxide out
Oxygen in



Physiology

- Inspiration
- Expiration

Signs of normal breathing

- Normal rate & depth
- **Regular pattern** of inhaling/exhaling
- "Good" breath sounds bilaterally
- Regular rise and fall of the chest – bilaterally
- "Some" movement of the abdomen
  - More in small children

Signs of *abnormal* breathing

- RR<8 or RR>24
- Excessive respiratory muscle usage
- Pale or cyanotic skin
- Cool, diaphoretic ("clammy") skin
- Shallow or irregular respiration
- Pursed lips

Signs of *abnormal* breathing

- **Pursed lips – AHA recomendation**
- Nasal flaring
- Tripod positioning
- Tachycardia
- Altered mental status ("AMS")
  - Agitated → sleepy
  - **Look for the yawn!**

Some terms

- Dyspnea
  - Difficulty breathing
  - Shortness of breath (SOB)
- Apnea
  - No breathing
- Hypoxia
  - Not enough oxygen

What causes us to breath

- Normal individuals
  - Excessive CO_2 levels in arterial blood
- COPD patients
  - Low levels of O_2 in arterial blood
- COPD
  - **C**hronic **O**bstructive **P**ulmonary **D**isease
  - Emphysema
  - Chronic bronchitis

Causes of dyspnea

- Obstructed lower airways
  - Due to fluid, infection, collapsed alveoli
- Damaged alveoli
- Damaged cilia in lower airways
- Spasms, mucus plugs, floppy airways
- Obstructed blood flow to lungs
- Pleural space filled with air or fluid

Common respiratory disorders causing dyspnea

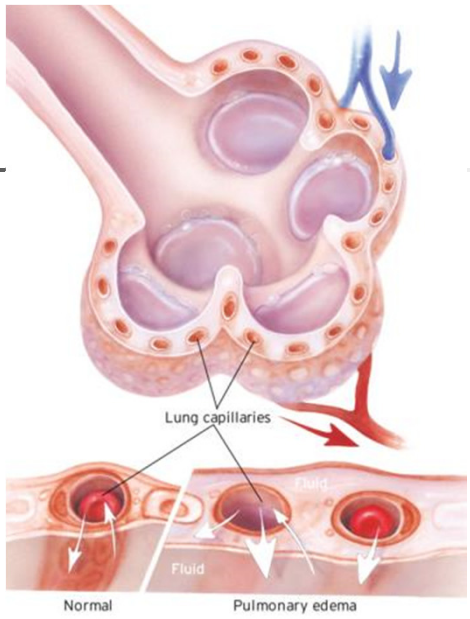
- Airway infections
- Acute Pulmonary Edema ("APE")
- COPD
- Spontaneous pneumothorax
- Asthma, allergies, anaphylaxis
- Pleural effusion
- Prolonged seizures
- FBAO
- Pulmonary embolism
- **Hyperventilation syndrome**
- Severe pain

Infections

- Colds/flu
- Bronchitis
- Bronchiolitis
- Pneumonia
- Croup
- Epiglottitis
- → **History will often "tell the story"**

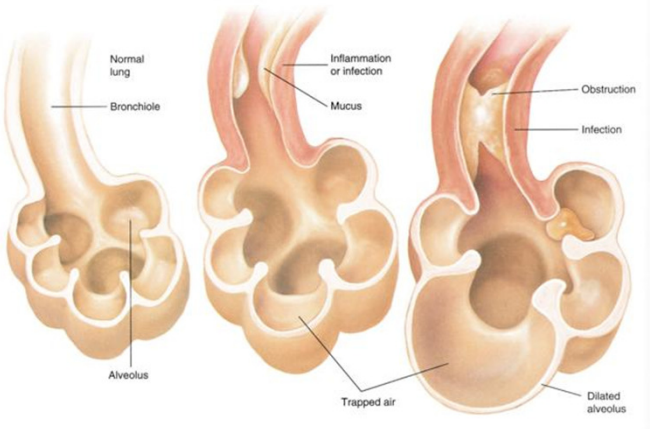
Acute pulmonary edema

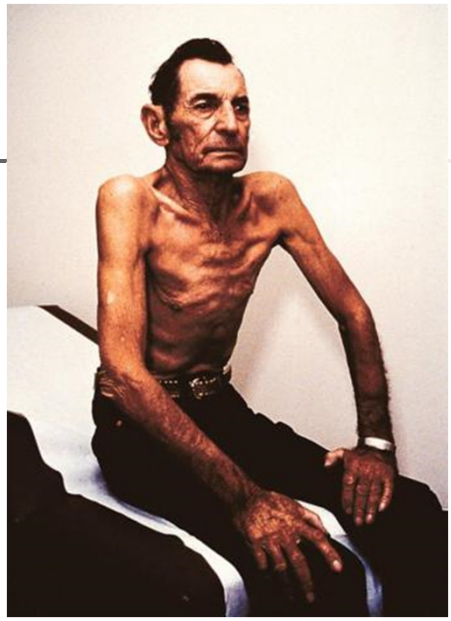
- Not really a respiratory problem
  - **A cardiac problem**
  - **Congestive Heart Failure ("CHF")**
- **TBD with cardiac emergencies**
- Severe dyspnea
- Pink frothy, blood-tinged sputum



COPD

- **Almost always caused by long-term smoking**
- Chronic bronchitis
- Emphysema





Chronic bronchitis

- Damaged respiratory pathway cilia
- Excessive mucus production
- Can't "cough out" effectively
- **Very frequent** bronchitis/pneumonia

Emphysema

- Loss of alveolar elasticity and shape
- Air pockets
  - Can not expel CO_2

COPD

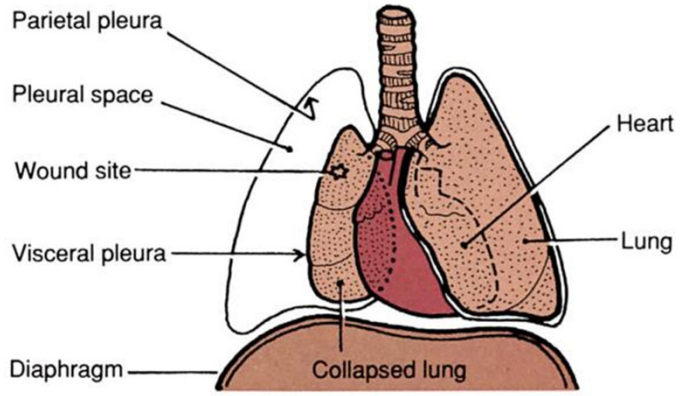
- Most have elements of both diseases
- Prolonged expiratory phase
- Most common lung sound
  - Expiratory wheeze
- Minor respiratory problems exacerbates COPD
- Patient is usually old

COPD

- Altered mental state over time
  - Due to CO_2 retention
- Barrel shaped chest
- Well developed respiratory muscles
- Long term COPD may cause heart failure

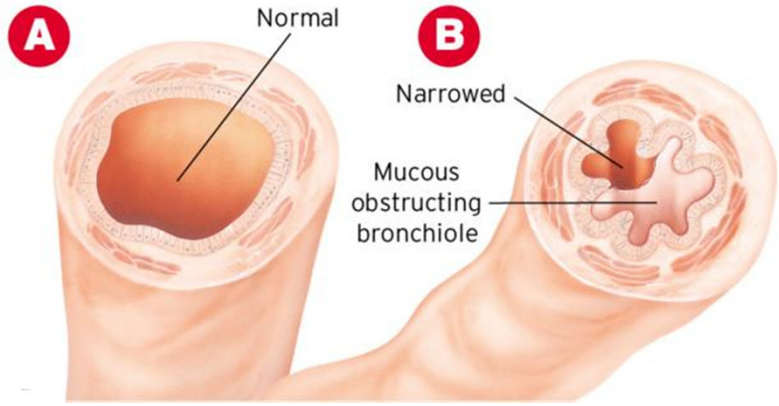
Spontaneous pneumothorax

- Collapsed portion of lung due to weakness in lung tissue
- No apparent cause
- **Sudden SOB**
- **Pleuritic chest pain**
- Common in asthmatic/COPD
- Common in tall thin men



Asthma/allergies

- **<u>Reversible</u>** spasm of bronchioles
- Excessive mucus production
- Normal inspiration
- Difficult expiration
- **Expiratory wheezing – common**
- **A quiet chest is an ominous sign**
  - **Be prepared for respiratory arrest**
  - **Be prepared to use BVM**

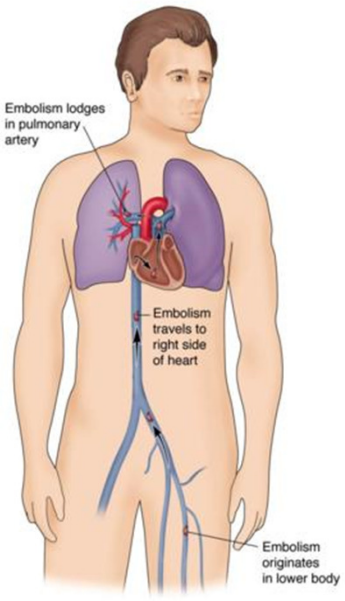


Status astmaticus

- An asthma attack that cannot be "broken" after repeated doses of bronchdilators
- **Needs aggressive airway management**
- **Needs rapid transport**
- **Needs BVM**

Pulmonary embolism

- Embolus: something in the circulatory system that travels from one place to a distant place – **and lodges there**
- Effective inspiration/expiration – **BUT**
- Vessels leading to alveoli are blocked by:
  - Blood clots
    - Often following long bed rest
  - Air bubbles
    - Often following open neck injuries
  - Bone marrow
    - Often following a long-bone fracture
  - Amniotic fluid
    - Often following an "explosive delivery"



Pulmonary embolism

- Very often a dangerous complication of a "DVT"
  - Common in pt with varicose veins
- **"perfusion/ventilation mismatch"**
- Small emboli may cause no S/S

Pulmonary embolism

- Common S/S
  - Dyspnea
  - Pleuritic chest pain
  - Hemoptysis
  - Cyanosis
  - Tachycardia
  - Tachypnia
  - Wheezing over area of embolism
- **A large embolus may cause sudden cardiac arrest**

Hyperventilation

- Overbreathing – reduces CO_2 level excessively
- **May be emotional in nature**
- **May be a sign of <u>MANY</u> serious medical conditions**
- **DO NOT WITHOLD Oxygen!**
- **DO NOT HAVE THEM BREATH INTO A BAG!**

Hyperventilation

- Patient may describe:
  - Numbness/tingling in hands/feet
  - Spasms in hands and feet
  - Called "carpal-pedal" syndrome
- **If all medical causes have been ruled out *IN THE HOSPITAL*, the condition is called "Hyperventilation Syndrome"**

Treating the dyspneic patient

- Calm approach!
- Position of comfort
  - Almost always sitting upright
  - NEVER lie them down
    - Especially an APE patient
- **High concentration oxygen**
  - **Even for COPD patients**
  - **NRB – if rate & depth are adequate**
  - **BVM – if not**

Treating the dyspneic patient

- Monitor V/S – especially resp rate
- **Look for signs of sleepiness**
  - Yawning
  - Slowing RR – especially in COPD pt.
  - → pt is becoming too tired to breathe
  - **Respiratory failure**
  - **Breathe for them → BVM**

Treating the dyspneic patient

- The "counting test"
- SAMPLE HISTORY
- OPQRST – medical assessment Q's
  - **O**nset
  - **P**rovocation/**P**alliation
  - **Q**uality (of any pain)
  - **R**adiation
  - **S**everity
  - **T**ime
- **Interventions**
  - **Also, help them with prescribed inhalers**

Treating the Wheezing Patient

- **** Note: This protocol covers patients over age 1 ****
  - **Now covers asthmatic, COPD and in some cases "early" APE patients.**
- Request ALS
- ABCs
  - If breathing is inadequate, be prepared to ventilate with a BVM
- **O_2**
- …

Wheezing Treatment – cont'd

- Position of comfort
- **Do not allow physical activity**
- Assess V/S, accessory muscle usage, ability speak full sentences, wheezing
- **NYS Protocol: For patients with cardiac histories, you must contact medical control prior to giving Albuterol**
  - Consult NYS protocols for specific cardiac diseases

Wheezing Treatment – cont'd

- Administer one standard unit dose of albuterol via nebulizer at a flow rate to deliver the albuterol in 5-15 minutes (about 6 LPM)
- **Begin transport**
- Reassess V/S and airway/breathing
- If S/S persist during transport, administer albuterol up to 2 more times
  - NYC Protocols – what we do, has significant differences