DYSPNEA

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The Mechanics of Breathing

- Inhalation: Oxygen enters through the nose or mouth, expanding the chest and diaphragm, and fills the lungs.
- Exhalation: Carbon dioxide exits through the lungs, causing the diaphragm to contract and the chest to return to its original position.
• Dyspnea, the sensation of breathlessness or inadequate breathing, is the most common complaint of patients with cardiopulmonary diseases.
Dyspnea - common complaint/symptom

- "shortness of breath" or "breathlessness"

Defined as abnormal/uncomfortable breathing

Multiple etiologies -

- 2/3 of cases - cardiac or pulmonary etiology
• There is no one specific cause of dyspnea and no single specific treatment

• Treatment varies according to patient’s condition
  • chief complaint
  • history
  • exam
  • laboratory & study results
Differential Diagnosis

- Composed of four general categories
  - Cardiac
  - Pulmonary
  - Mixed cardiac or pulmonary
  - non-cardiac or non-pulmonary
Pulmonary Etiology

- COPD
- Asthma
- Restrictive Lung Disorders
- Hereditary Lung Disorders
- Pneumonia
- Pneumothorax
Cardiac Etiology

- CHF
- CAD
- MI (recent or past history)
- Cardiomyopathy
- Valvular dysfunction
- Left ventricular hypertrophy
- Pericarditis
- Arrhythmias
Mixed Cardiac/Pulmonary Etiology

- COPD with pulmonary HTN and/or cor pulmonale
- Deconditioning
- Chronic pulmonary emboli
- Pleural effusion
Noncardiac or Nonpulmonary Etiology

- Metabolic conditions (e.g. acidosis)
- Pain
- Trauma
- Neuromuscular disorders
- Functional (anxiety, panic disorders, hyperventilation)
- Chemical exposure
Easily Performed Diagnostic Tests

- Chest radiographs
- Electrocardiograph
- Screening spirometry
• In cases where test results inconclusive
  • complete PFTs
  • ABGs
  • EKG
  • Standard exercise treadmill testing/ or complete cardiopulmonary exercise testing
  • Consultation with pulmonologist/cardiologist may be useful
ABGs

- Commonly used to evaluate acute dyspnea
- Can provide information about altered pH, hypercapnia, hypocapnia or hypoxemia
- Normal ABGs do not exclude cardiac/pulmonary dx as cause of dyspnea
  - Remember- ABGs may be normal even in cases of acute dyspnea - ABGs do not evaluate breathing
PULSE OX

- Rapid, widely available, noninvasive means of assessment in most clinical situations-
  - insensitive (may be normal in acute dyspnea)
- The % of Oxygen saturation does not always correspond to PaO$_2$
- The hemoglobin desaturation curve can be shifted depending on the pH, temperature or arterial carbon monoxide or carbon dioxide levels
Laboratory Testing

- BNP
- CBC
- Chem 7
COPD
PNEUMONIA
Pneumothorax

Air leaked outside lung (pneumothorax)

Lung compressed by pneumothorax

Rib Cage
Pulmonary Embolism
CHF

Blood/fluids backup into the lungs

Pressure in the heart increases

Heart muscle is weakened or stiff
Left sided Failure

- Blood/fluid back-up into the lungs - result in
  - SOB
  - Fatigue
  - Cough (especially at night)
  - PND
  - orthopnea
Right sided Failure

- Build-up of fluid in the veins -
  - Edema of feet, legs and ankles

- may effect liver/portal circulation and 3rd spacing into soft tissue/ascites/pleural effusion
Causes of CHF

- Variety of cardiac diseases –
  - Systolic Heart Failure
  - Diastolic Heart Failure
- Specific Etiologies - valvular heart disease, HTN, cardiomyopathies, myocarditis, renal dx, fluid overload, liver disease w/loss of protein and osmotic forces, high altitude and many others
Diagnostic Work-Up

- History
- Physical exam
- EKG
- Echo
- Chest x-ray
- BNP
- ABG/pulse ox
Questions ?