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CPAP

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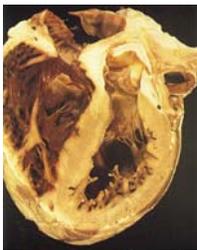
Objectives

- Define Congestive Heart Failure
- Define COPD
- Review standing orders for CHF and COPD
- Describe CPAP
- Practice usage of CPAP

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A congested heart



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Congestive Heart Failure

- Congestive Heart Failure (CHF) is a serious disease associated with excessive morbidity and mortality and of elevated health-care costs.
- Even with the advances in pharmacologic therapy, the mortality for the disease remains very high.

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Congestive Heart Failure

- Approximately 80% of patients with CHF showed restrictive spirometric pattern
- Extravascular volume expansion and fluid accumulation in interstitial compartments of the lungs
- Fluid accumulation is associated with increased heart size and reduced lung compliance.

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Congestive Heart Failure

- The accumulation of fluid leads to flooding of the alveoli resulting in a deficiency in gas exchange with several consequences,
 - Muscle weakness
 - Dyspnea with routine activities.
 - Dyspnea progresses into dyspnea at rest.

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Bronchioles and Alveoli

Oxygenated Blood to the Heart

Pulmonary Venule

Bronchus

Bronchiole

Alveoli

Smallest Blood Vessels (Capillaries)

Deoxygenated Blood from the Heart

Pulmonary Arteriole

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Pulmonary Edema Protocol

- Assess for
 - Cyanosis
 - clammy skin
 - absence of fever
 - coughing
 - wheezing, labored breathing
 - pitting edema
 - rales in bilateral lower fields
 - tachypnea
 - apprehension
 - JVD
 - Inability to talk.

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Treatment

- If CPAP is available, its use is encouraged prior to initiation of drug therapy
- If SBP > 100, NTG 0.4 mg SL up to 3, 1 every 5 minutes. Maintain SBP > 100
- Furosemide 80 mg slow IV push over 2 minutes. Maintain SBP > 100
- Morphine, up to 5 mg, Slow IV over 2 minutes. Maintain SBP > 100. May repeat morphine, up to 5 mg, slow IV over 2 minutes.

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Pulmonary Edema

Acute MI
Pulmonary edema
Butterfly distribution

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COPD

- COPD, or chronic obstructive pulmonary disease, is a progressive disease that makes it hard to breathe.
- "Progressive" means the disease gets worse over time.
- COPD can cause coughing that produces large amounts of mucus (a slimy substance), wheezing, shortness of breath, chest tightness, and other symptoms.

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COPD

- Airways and air sacs are elastic
- In COPD, less air flows in and out of the airways because of one or more of the following:
 - The airways and air sacs lose their elastic quality.
 - The walls between many of the air sacs are destroyed.
 - The walls of the airways become thick and inflamed (swollen).
 - The airways make more mucus than usual, which tends to clog the airways.

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COPD

- COPD can cause:
 - coughing that produces large amounts of mucus,
 - wheezing
 - shortness of breath
 - chest tightness
 - other symptoms.

COPD causes

- Cigarette smoking is the leading cause of COPD. Most people who have COPD smoke or used to smoke.
- Long-term exposure to other lung irritants, such as air pollution, chemical fumes, or dust, also may contribute to COPD.

Asthma/Emphysema/COPD

- Consider albuterol 2.5 mg and ipratropium 0.5 mg, nebulized with O₂ 8-12 LPM.
- May repeat Albuterol 2.5 mg nebulized X 2.
- COPD, CPAP or BiPAP
- If patient arrests, tension pneumothorax is a likely cause
- For asthmatics in severe distress: Epinephrine (1:1000) .3 mg SQ or autoinjector.
- With Med control approval, may repeat Epinephrine.

So what is CPAP?

CPAP

- Continuous positive airway pressure
- CPAP is a tool to be used for assisting ventilation and should not be confused with trying correct Oxygenation concerns

Indications

- Medical history and presenting complaints consistent with pulmonary edema
- Patient must be 16 or older
- COPD, Asthma
- Bibasilar or diffuse rales
- Near drowning
- Disasters or mass casualties such as Bioterrorism with cases of respiratory distress

Contraindications

- Respiratory or cardiac arrest
- Agonal respirations
- Severely depressed level of consciousness
- Systolic blood pressure < 90mmHg
- Signs and symptoms of pneumothorax
- Inability to maintain airway patency
- Major trauma, especially head injury with increased ICP or significant chest trauma
- Facial Anomalies, e.g., burns, fractures
- Vomiting
- If patient deteriorates while on CPAP (O₂ sats < 90), then prepare to intubate

Hazards of CPAP

- Hypotension
- Pneumothorax
- Corneal Drying

Benefits to CPAP

- The main direct benefits of CPAP are improved oxygenation, decreased respiratory effort, and decrease in left ventricular preload and afterload.
- A recent study showed that with 2 weeks of CPAP usage for patients with CHF, pulmonary function was improved.

Goals of CPAP

- Elimination of dyspnea
- Reduced respiratory rate
- Reduced heart rate
- Increased SpO₂
- Stabilized blood pressure

Important

- Once a patient is started on CPAP, only remove treatment if the patient deteriorates or under medical control direction.
- Call ahead to ER and inform them that patient is on CPAP, do not just unhook the patient and leave.

Summary

- CPAP has been found to be as affective or more affective than the conventional pharmacological interventions.
- CPAP is now being used as a part of GMVEMSC protocol