



CPAP for BLS

Goals and Objectives

- To provide additional education on the anatomy and physiology of the respiratory system
- To provide additional physical assessment skills
- To provide a baseline education on the application of the CPAP device
- Ensure all providers are comfortable with the application of CPAP

Introduction

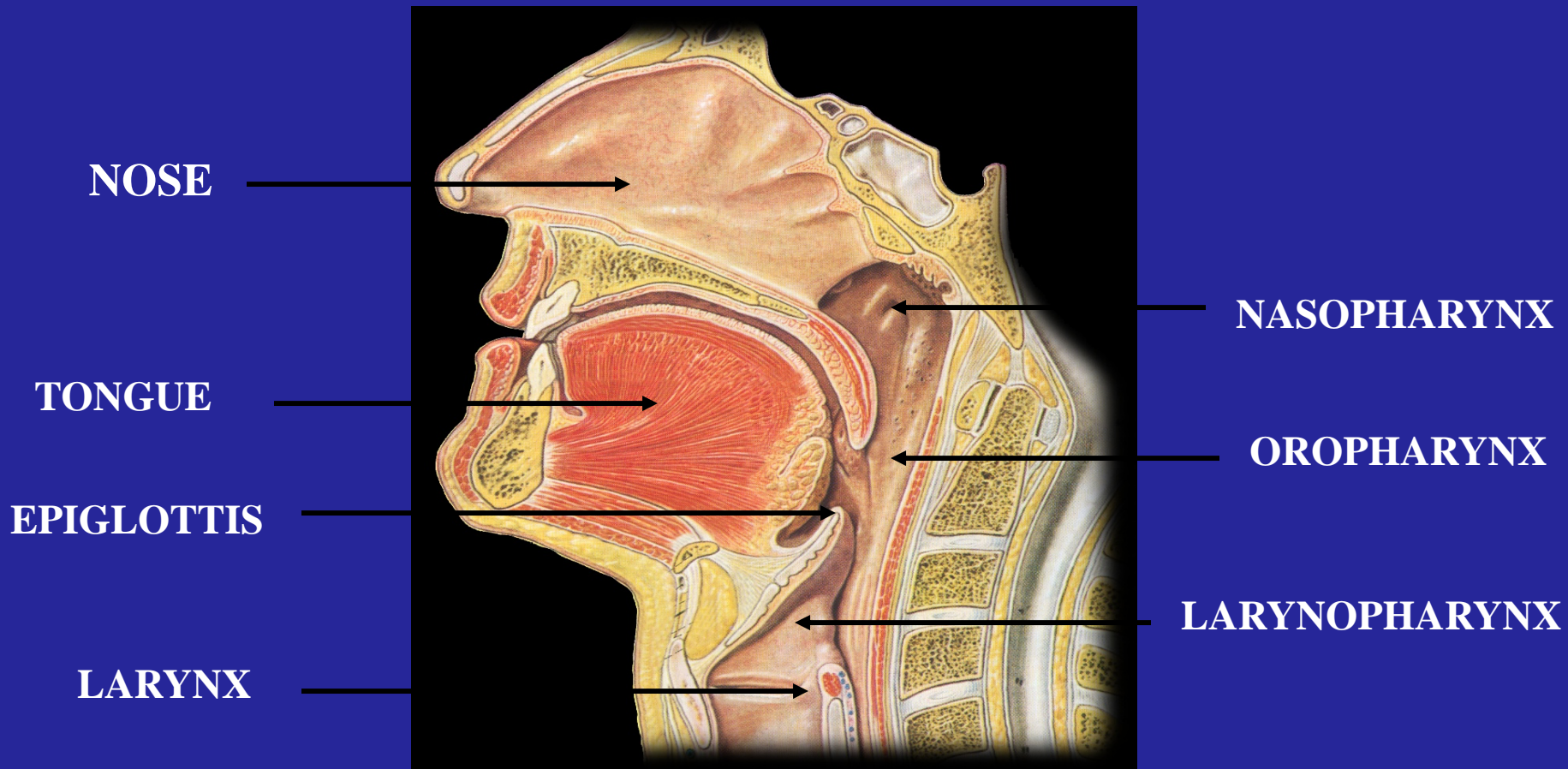
- CPAP is a non-invasive procedure that is easily applied and can be easily discontinued without patient discomfort
- CPAP application in cardiogenic pulmonary edema and COPD/Asthma is beneficial to patient outcome

Anatomy and Physiology



- Upper airway
 - Components
 - Purpose
- Lower airway
 - Components
 - Purpose
 - Inspiration/expiration

Components of the Upper Airway

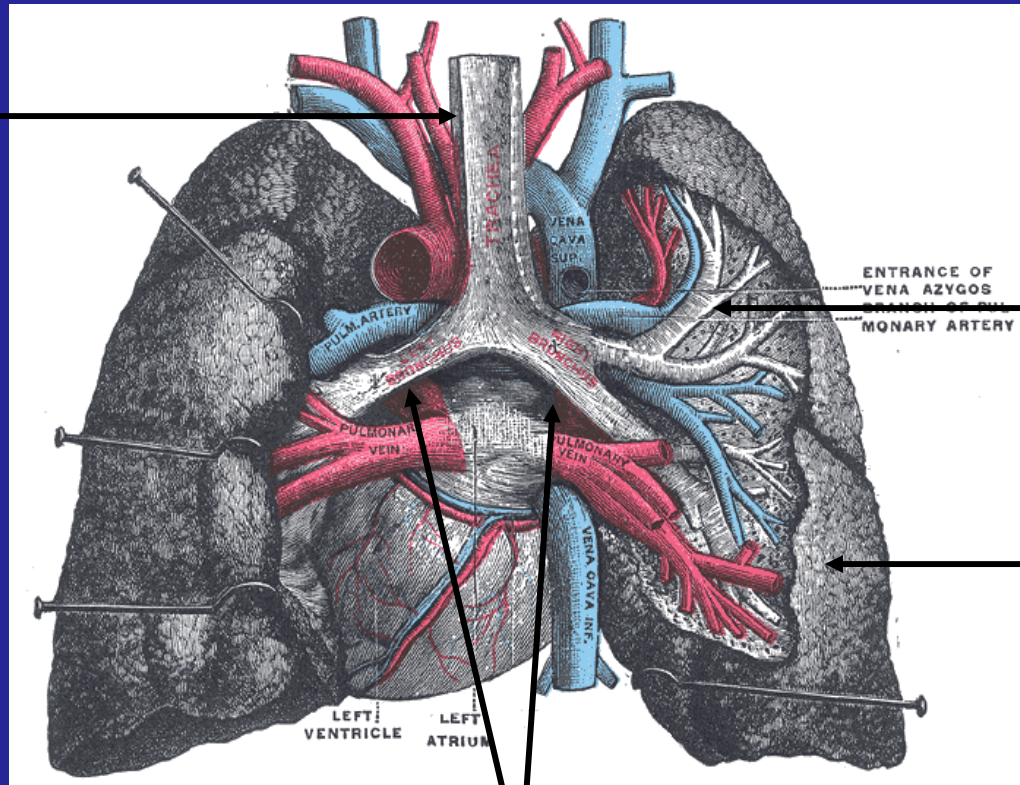


Purpose of the Upper Airway

- Provides protection
- Provides humidification
- Provides filtration
- It transmits air, liquids and solids
- It is a common pathway for respiratory, digestive and vocal functions.

Components of the Lower Airway

TRACHEA



BRONCHIOLES

**TERMINAL
BRONCHIOLES**

MAINSTEM BRONCHI

Purpose of the Lower Airway

- Filtration
- Transmission of air

CPAP and the effects on the lungs

CPAP:

- Maintains a constant pressure in the patients airway
- Holds the tongue back and keeps soft throat tissue open
- Opens bronchioles and alveoli
- Prevents collapse of bronchioles and alveoli
- Improves inhalation and exhalation
- Relieves respiratory distress symptoms
- Provides time

CPAP and the effects on the lungs

CPAP

- Does not affect the disease process
- Reduces the need for intubation
- Reduces length of hospital stay
- Reduces intubation related complications
 - Laryngeal edema
 - Laryngospasms
 - Cord Injury
 - Infections

Review of Respiratory Distress

Signs and Symptoms

- Increase work of breathing
- Retractions and accessory muscle use
- Inadequate chest expansion
- Diminished, absent or noisy breath sounds
- Anxiety and/or restlessness
- Respiratory >25 breaths per minute
- SPO2 less than 90%
- Pale, cyanotic, cool moist skin

Pulmonary Edema/CHF

- Profound respiratory distress
- Accessory muscle use
- JVD
- Diaphoresis
- Cyanosis
- Anxiety
- Fatigue
- Pulmonary Edema (Heart Failure)
- Crackles
- Productive cough/frothy sputum (pink in color)
- Chest Pain
- Tachycardia

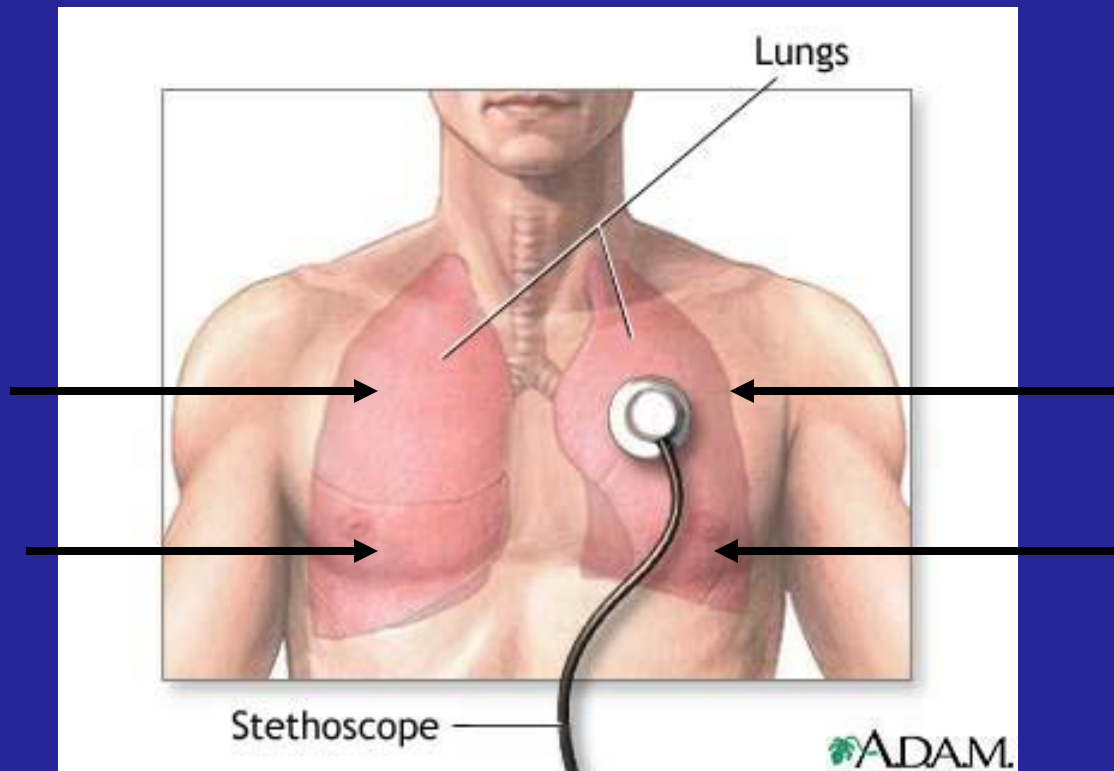


Assessment of Pulmonary Edema/CHF

- Assess the patients mental status (awake, alert and oriented)
- ABC's
 - Is the patient able to maintain and open airway
 - Is the patients breathing labored
 - Does that patient have distal pulses
- Is the patient cyanotic

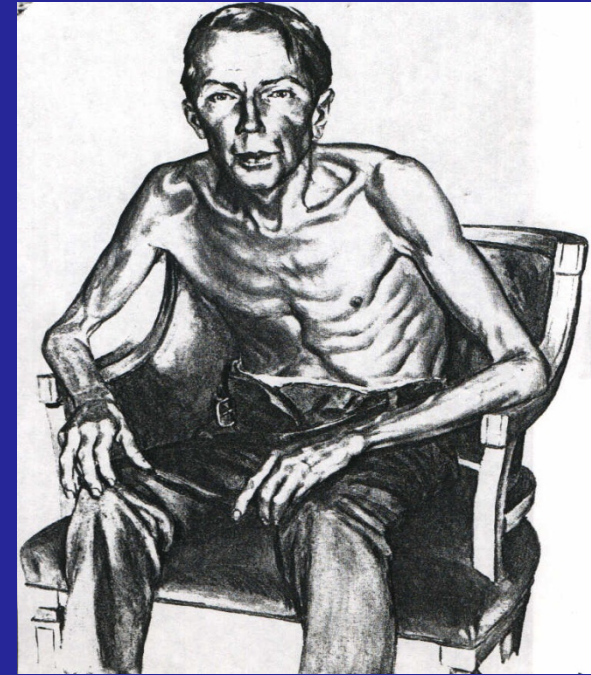
Assessment of Pulmonary Edema/CHF

- Breath sounds – listen to all areas of the chest



COPD

- Tachypnea (rapid breathing)
- Increased work of breathing / Accessory muscle use
- Audible expiratory wheezing
- Tripod positioning
- Cyanosis
- Anxiety
- Fatigue
- Tachycardia
- Flared Nostrils / Pursed lips
- Retractions
- Inability to speak in complete sentences

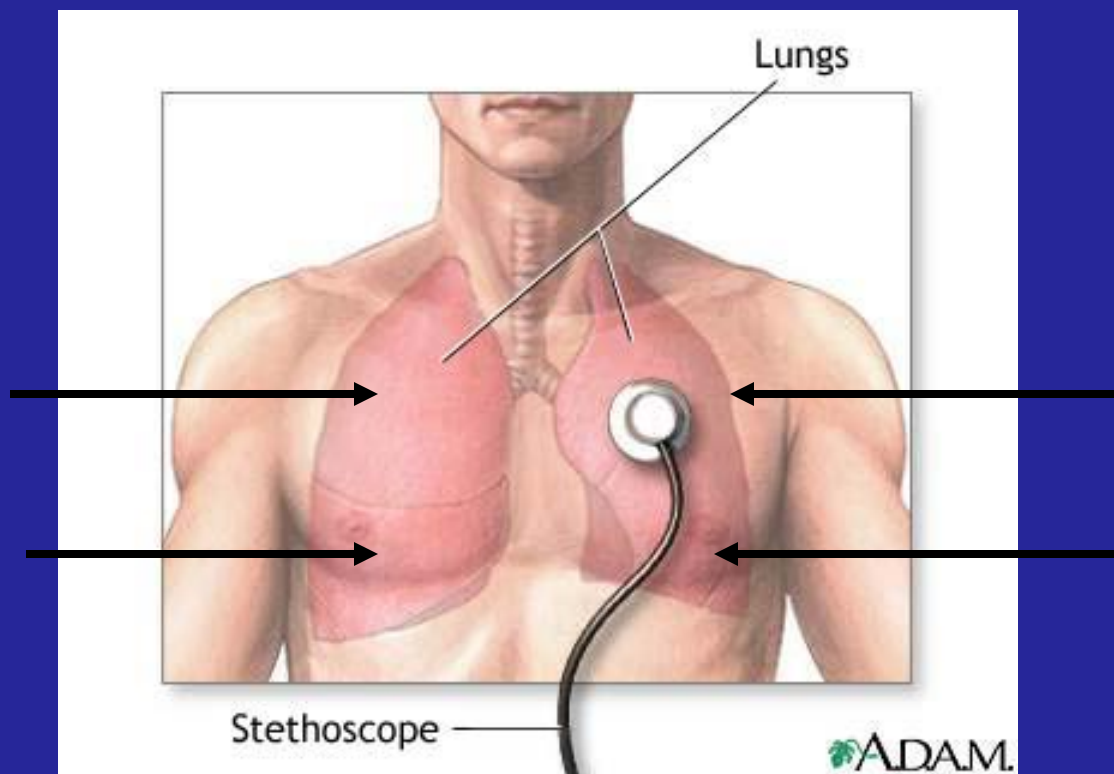


Assessment of COPD Patient

- Assess the patients mental status (awake, alert and oriented)
- ABC's
 - Is the patient able to maintain and open airway
 - Is the patients breathing labored
 - Does that patient have distal pulses
- Is the patient cyanotic

Assessment of COPD

- Breath sounds – listen to all areas of the chest



Is Your Patient a Candidate for CPAP?

- Awake and able to follow commands
- Is at least 14 years old and is able to fit the CPAP mask
- Has the ability to maintain and open airway
- AND...

Exhibits *two or more* of the following

- A respiratory rate > 25 bpm (severe respiratory distress)
- Pulse oximetry of less than 90% at any time
- Use of accessory muscles during respirations

CPAP Exceptions

- Patient is in respiratory arrest/apneic
- Patient is suspected of having a pneumothorax or has suffered trauma to the chest
- Patient has a tracheostomy
- Patient is actively vomiting or has upper GI bleeding
- Patient who is unable to follow verbal commands

What to expect...

- Patients will be anxious
- Patients may become combative
- Patient will be restless
- You will need to coach the patient

Let's review the protocol...

Respiratory Distress / Respiratory Failure

Now We Practice...

So how was the pilot?

- 32 chosen to participate
- 27 services completed the agreement
- 25 services attended the education session and participated in the initiative
- Over 200 EMTs attending the training

And...The patients?

- 39 applications occurred
- Mean age was 71 years old
- 18 patients were female
- 21 patients were male

Come on...what about the good stuff?

- Data reports a mean decrease in:
 - Heart rate by two (2) beats per minute
 - Respiratory rate by nine (9) breaths per minute
 - Systolic BP by 13 mmHg
- Data reports an increase in pulse ox of 15%
- A change in the respirator distress scale from 8 to 5 was also noted (mean values)

Additional Findings

- The manometer use was validated
- Issues with oxygen regulators was noted
- THORPE TUBE style regulators with the use of a manometer was superior

BLS CPAP WORKS!!!!

QUESTIONS????