Respiratory system Assessment

(A) Taking a Respiratory History

Personal and social history:

- Age.
- Smoking. - No of packs per day.
  - Years of smoking.
  - Exposure to secondhand smoke.
  - History of attempts to quit, methods and results.
- Ask about possible precipitating factors or triggers such as medications, pollen, smoke, mold, or pet exposure.
- Environmental toxic exposure —”air pollution, pesticides, smoke”
- Occupation: —coal, dust, insecticides.

Past Health History

- Determine frequency of respiratory problems (e.g., colds, sore throats, sinus problems, allergies).
- Document characteristics and severity of the allergic reaction such as runny nose, wheezing, or chest tightness.
- Inquire about a past history of respiratory problems, such as asthma, COPD, pneumonia, and tuberculosis (TB).
- Ask about a history of additional health problems e.g. heart failure.

Chief complaint / Present illness

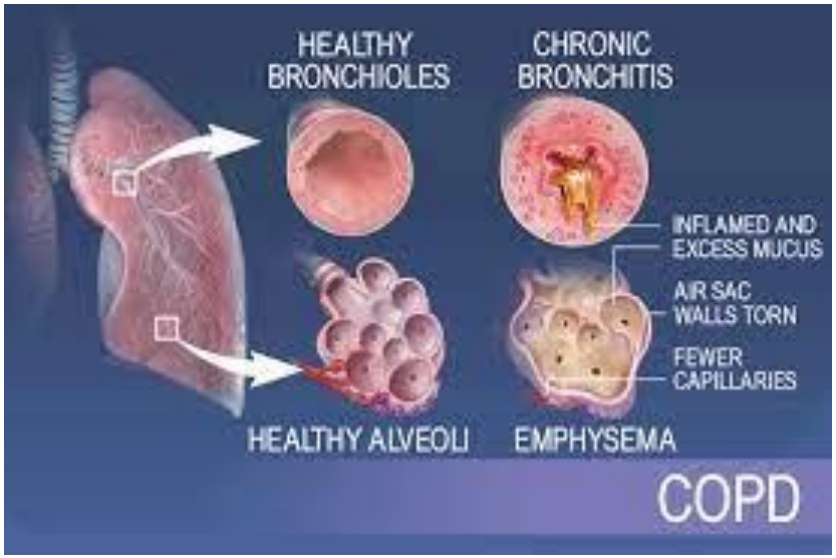
- Ask about presence of any of the following respiratory symptoms:
  - Cough (Dry or productive)
  - sputum production(amount, color, consistency, and odor. The normal color is clear or slightly whitish.)
  - dyspnea,
  - hemoptysis,
  - chest pain,
  - wheezing
  - sleep apnea.

Medications

- Ask about both prescription and over-the-counter medications.
- Assess for overuse of short-term bronchodilators.
- Ask the patient whether or not he or she has had an annual flu immunization and pneumonia vaccine

Family history

- Do you have a family history of asthma, tuberculosis, lung cancer, chronic bronchitis, emphysema, or any other lung disease?



(B) Physical examination:

Inspection

- Look for symmetry of chest wall movement.
- Assess the patient's respiratory characteristics. (In a healthy adult, a respiration is regular, between 12 and 20 times per minute).

Abnormalities

- Tachypnea is rapid, shallow breathing
- Bradypnea is a slow respiratory rate than normal
- Hyperpnea or hyperventilation is a rapid deep breathing occurs as a result of physical exercise, anxiety, and metabolic acidosis
- Kussmal respiration: It is characterized by deep breathing, occurs in patients with diabetic acidosis and coma.
- Cheyne-Stokes respiration occurs when there are periods of deep breathing alternating with periods of apnea. It may be seen in a patient with heart failure, and brain damage.

- Observe patient's position during respiration.

- Orthopnea is inability to breathe in laying position

❖ Observe color of skin, lips, nails and tongue.

- Central cyanosis: Blue discoloration seen in the tongue ,the lips mucous membrane present in COPD patient due to abnormal amount of deoxygenated hemoglobin in arteries

- Peripheral cyanosis: Blue discoloration seen in the finger tips, occurs with exposure to cold, left ventricular failure and shock.

(a) Peripheral cyanosis (©iStockPhoto)

(b) Central cyanosis (source:[9])

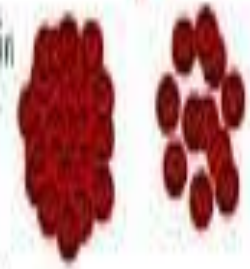
Central cyanosis

Heart failure
Congenital heart defect

Asthma
Chronic obstructive pulmonary disease
Pneumonia

Carbon Monoxide poisoning

Anemia: Deficiency in red blood cells



Pulmonary Embolism

Peripheral cyanosis

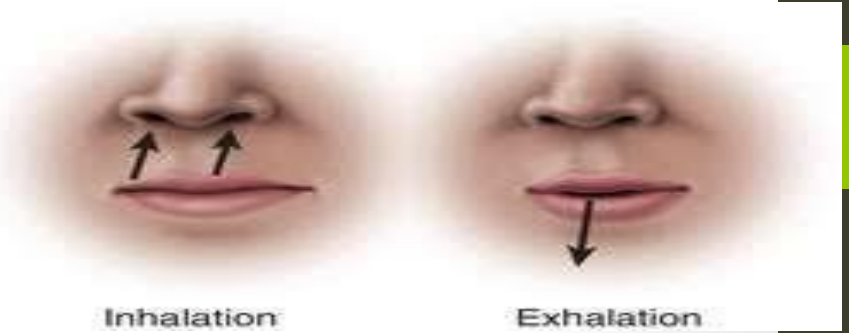
Vasoconstriction
Cold exposure
Shock
Congestive failure
Peripheral vascular disease

Raynaud's disease

- Look to see if the patient uses accessory muscles of respiration, neck, shoulder, or abdominal muscles.

- Observe for nasal flaring, or pursed lip breathing, all of which indicate airflow obstruction and poor ventilation.

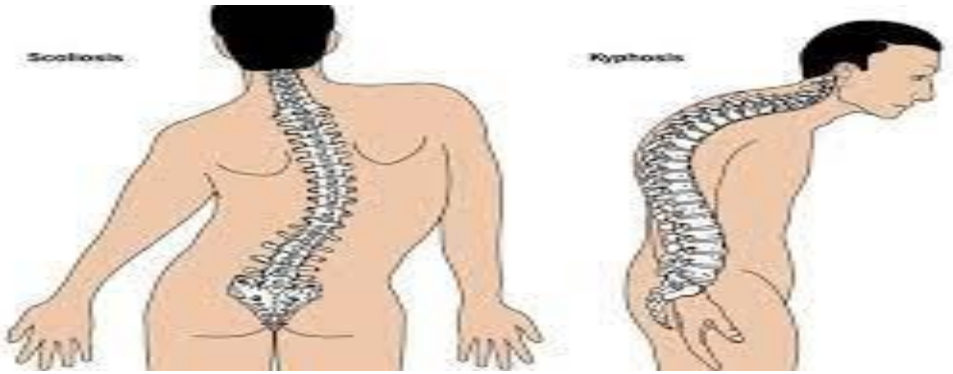
- Pursed-lip breathing (exhalation through mouth with lips pursed together to slow exhalation) indicates COPD, or asthma



- Look at the patient's posture. (A patient with COPD will lean forward to improve breathing.)

- Inspect the chest wall for deformities as:

- Kyphosis: Abnormal curvature of the spine-anterior-posterior.
- Scoliosis: Lateral curvature of thoracic spine.



- Barrel chest: Increasing the anteroposterior diameter of the chest; typical of hyperinflation seen in COPD.

- Funnel chest: Depression of the lower portion of the sternum.

- Observe patient's finger nails for clubbing
- Clubbing fingers is a sign indicating hypoxia as seen in COPD.

(B) Physical examination: (cont.)

Palpation

- Assess Symmetry of chest expansion at the level of the diaphragm.

- Unequal expansion occurs when air entry is limited by conditions involving the lung (e.g., atelectasis, pneumothorax) or the chest wall (e.g., incisional pain)

(B) Physical examination: (cont.)

Percussion

- Perform chest percussion to assess the density or aeration of the lungs

(B) Physical examination: (cont.)

Auscultation

- Use the diaphragm of stethoscope to listen to breathe sound in each area of the lung while instructing the patient to breathe slowly and deeply through the mouth.
- The breath sounds are assessed for:
- Duration (how long the sound lasts).
- Intensity (how loud the sound is).
- Timing (when the sound occurs in the respiratory cycle).

Abnormal (adventitious) Breath Sounds

The term “adventitious” breath sounds refers to additional sounds that are heard over normal breath sounds, that include; **crackles** , **wheezes**, **rhonchi** (low pitched wheezes), **pleural friction rubs** and **stridor**

- **Crackles** are referred to as discontinuous sounds; they are intermittent, nonmusical and brief sound. The sounds produced are created when air is forced through respiratory passages that are narrowed by fluid, mucus, or pus. As in pulmonary fibrosis, atelectasis, heart failure (HF), chronic bronchitis, or pneumonia.

- **Wheezes** are musical sounds that are heard continuously during expiration, but possibly on both inspiration and expiration as obstruction of airway increases. They are caused by narrowed or obstructed air moving through airways by constriction or swelling of airway or partial airway obstruction (Possibly audible without stethoscope). Wheezes may occur with bronchospasm (caused by asthma), airway obstruction (caused by foreign body or tumor) or COPD and bronchitis

- **Rhonchi** is continuous, snoring sounds caused by obstruction of large airways (trachea, bronchi) with secretions Most prominent on expiration. The sound usually clears after coughing or suctioning. Rhonchi occur in COPD, chronic bronchitis and pneumonia.

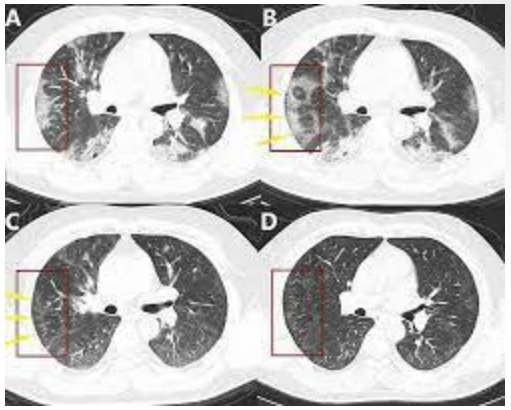
- **Pleural friction rubs** are grating sound from inflamed pleural surfaces rubbing together. Evident during inspiration, expiration, or both. Usually uncomfortable, especially on deep inspiration. A pleural rub stops when breathing stops. Pleural friction rubs indicating pneumonia

- **Stridor** refers to continuous musical or crowing sound of constant pitch. It is caused by partial obstruction of upper airway (larynx or trachea) and thus requires immediate attention. It is best heard louder over the throat. Stridor is a sign of croup, laryngeal spam, epiglottitis, vocal cord edema after extubation, or presence of foreign body.

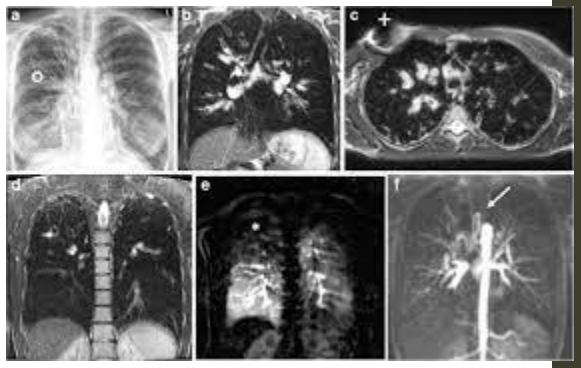
Diagnostic Studies of Respiratory System

- Sputum examination: Including culture and sensitivity, cytology
- Chest X-ray

- Computed Tomography (CT Scan)

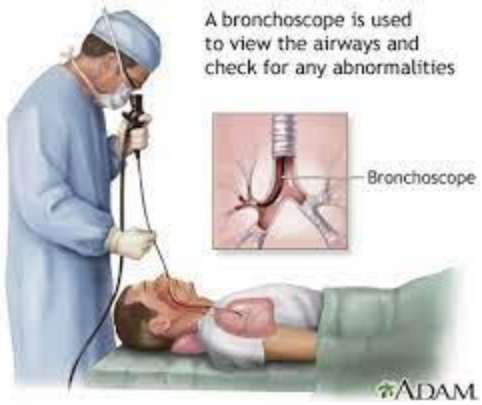


- Magnetic Resonance Imaging (MRI)

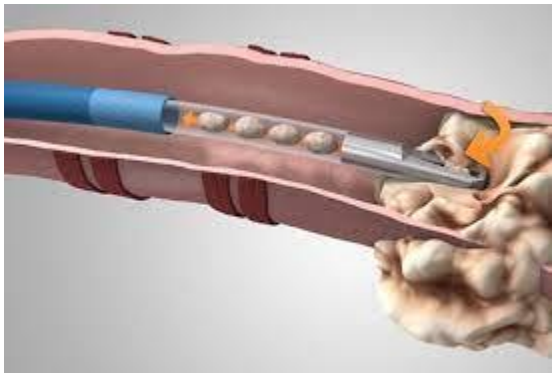


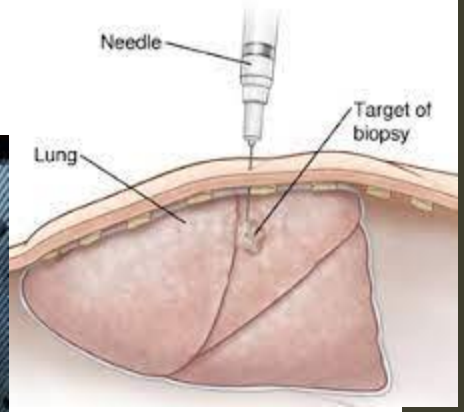
- Oximetry: Normal SpO2 = 95% - 100%

- Bronchoscopy



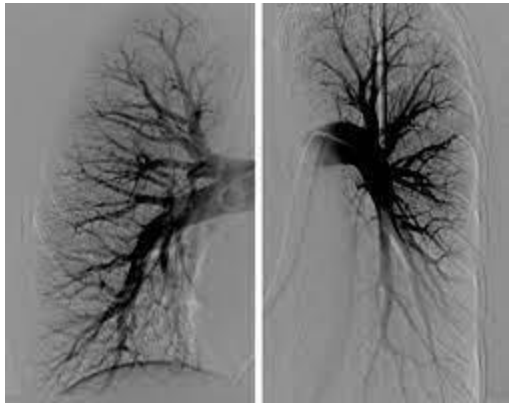
- Biopsy of the Lungs



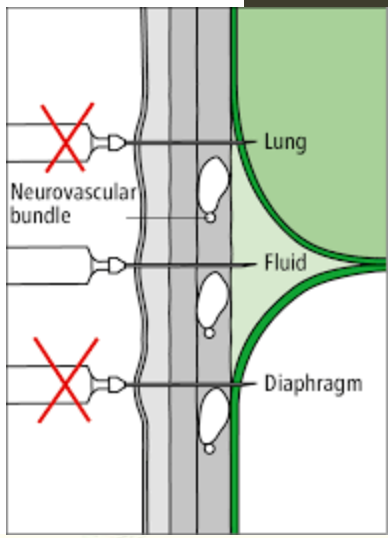


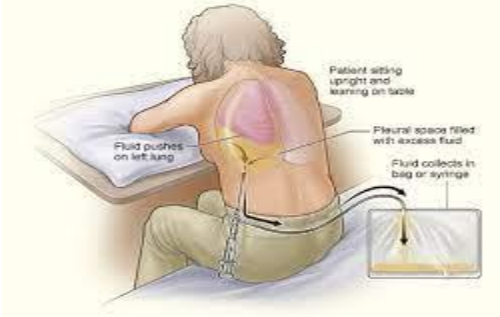
- Arterial Blood Gases (ABGs)
- Pulmonary Function Tests: measure lung volumes and airflow.

- Pulmonary Angiography: Used to visualize pulmonary blood vessels and locate obstruction or pathologic conditions (e.g., pulmonary embolus).



- Thoracentesis: It is the insertion of a large-bore needle through the chest wall into the pleural space to obtain specimens for diagnostic evaluation






Thank
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