

## Advanced Assessment in Clinical Practice: Pulmonary Disorders

### I. Pulmonary disorders

#### A. Respiratory obstruction

##### 1. Signs of obstruction

- Inspiratory stridor.
- Hoarse cough or cry.
- Flaring of the nares.
- Suprasternal retractions.

##### 2. Signs of severe obstruction

- Inspiratory and expiratory stridor.
- Barking cough.
- Suprasternal, subcostal and intercostal retractions.
- Cyanosis even with oxygen.

##### 3. Obstruction above the glottis

- Stridor is quiet.
- Voice is muffled.
- Swallowing difficult.
- No cough.
- Head and neck positioned to preserve the airway.

4. Obstruction below the glottis
  - Stridor loud and rasping.
  - Hoarse voice.
  - Swallowing OK.
  - Harsh, barking cough.
  - Position of the head is not affected.
  
- B. Acute bronchitis is inflammation of the main airways or the bronchi. It is usually caused by an infection which is usually viral in origin. Symptoms of acute bronchitis may last several weeks.
  1. Cough and sputum production. Stays steady or gets increasingly worse for 10 days to 2 weeks. Worse at night. Starts out dry and irritating, but becomes increasing loose over time. May last for 6-8 weeks.
  2. Other symptoms may include dyspnea, wheezing, slight fever, and chest pain.
  
- C. Asthma: Inflammatory disease of the upper airways, resulting in airway hyperresponsiveness, mucosal edema, and mucus production. The inflammation ultimately leads to recurrent episodes of asthma symptoms.
  1. Wheezing: Inspiration-expiration ratio reveals prolongation of the expiratory phase.
    - 1:1 mild
    - 1:3 severe
  2. Stridor
  3. Decreased breath sounds
  4. Position may be flat with mild attack. Sitting to tripod position with severe attacks.
  5. Accessory muscle use and retractions.
  6. Chest tightness or pain.

- D. Chronic bronchitis: Inflammation of the bronchi, the main air passages in the lungs, which persists for a long period or repeatedly recurs. The condition is characterized by excessive bronchial mucus and a productive cough that produces sputum for 3 months or more in at least 2 consecutive years, without any other disease that could account for this symptom.
1. Cough and sputum production.
  2. Shortness of breath aggravated by exertion or mild activity.
  3. Frequent respiratory infections that worsen symptoms.
  4. Wheezing
  5. Fatigue
  6. Ankle, foot and leg swelling.
  7. Pulsus alternans
  8. Increased AP diameter.
- E. Emphysema: Loss of elasticity of the lung tissue with destruction of structures supporting the alveoli and destruction of capillaries feeding the alveoli.
1. Progressive dyspnea.
  2. Nonproductive cough.
  3. Cachexia, barrel chest and respiratory failure.
  4. Pursed lips and use of accessory respiratory muscles.
  5. Tripod sitting position.
  6. The chest may be hyperresonant, and wheezing may be heard.
  7. Heart sounds are very distant.
  8. Pulsus alternans
  9. Barrel chest common.
  10. Decreased fremitus.

11. Clubbing of the fingers may be observed, a feature of longstanding hypoxia.
12. Emphysema patients are sometimes referred to as "pink puffers".

F. Pulmonary embolus

1. Massive occlusion: An embolus that occludes a major portion of the pulmonary circulation.
2. Embolus with infarction: An embolus that is large enough to cause infarction (death) of a portion of the lung tissue.
3. Embolus without infarction: An embolus that is not severe enough to cause permanent lung injury.
4. Multiple pulmonary emboli may also be seen.
5. Risk factors: Virchow's triad

Lab effects: Pulmonary embolus  
 C reactive protein a screen  
 D-dimer elevated  
 Helical CT scan for diagnosis

Venous stasis

- Bedrest
- Standing in one place
- Sitting for prolonged period
- Age > 55 years
- Obesity
- Varicose veins
- Atrial fibrillation
- Heart failure
- Burns
- Pregnancy

Hypercoagulation

- Dehydration
- Cancer
- COPD
- Birth control pills
- Smoking

Vascular injury

- Any condition that activates the coagulation cascade

6. Assessment

- Pleuritic chest pain
- Non-pleuritic chest pain
- Dyspnea
- Apprehension
- Cough
- Hemoptysis
- Diaphoresis
- Syncope
- Respiratory rate > 16/min
- Crackles
- Accentuated S2
- Pulse > 100/min
- Temperature elevation
- Phlebitis
- Gallop rhythm on auscultation
- Edema
- Murmur
- Cyanosis

G. Pneumothorax: Air in the pleural space causing partial or complete collapse of the lung. Usually due to blunt trauma but may occur spontaneously. Tension pneumothorax is life-threatening due to effects on the respiratory and cardiac functioning.

1. Assessment

- Sudden chest pain
- Dyspnea
- Cough
- ↓ Unilateral breath sounds
- Asymmetrical chest movement
- Anxiety
- Subcutaneous emphysema

Later signs

- Distended neck veins
- Hypotension
- Weak pulse
- Tracheal deviation to the unaffected side

2. CXR: Widening mediastinum

H. Tuberculosis: An infectious disease caused by the tubercle bacillus and characterized by the formation of tubercles on the lungs and other tissues of the body, often developing after the initial infection.

Lab effects: TB  
+ Mantoux  
+ AFB

1. Assessment

- Fatigue
- Malaise
- Anorexia
- Weight loss
- Night sweats
- Nonproductive cough in the AM initially.
- Pink, frothy cough develops.
- Hemoptysis in advanced state.
- Low grade temperature in the afternoon.

2. CXR: Cavitations or Ghon tubercules.

I. Pleural effusion: An abnormal accumulation of fluid in the pleural space. Excess fluid results from the disruption of the equilibrium that exists across pleural membranes.

1. Assessment

- Dyspnea and chest pain.
- Decreased tactile fremitus.
- Decreased breath sounds.
- Asymmetrical chest wall movement.
- Tracheal shift with very large effusions

2. Thoracentesis to drain the effusion. Careful monitoring afterwards.
  - Place on unaffected side afterwards for one hour for better lung expansion. May have subcutaneous emphysema after the procedure.
  - Monitor for re-expansion pulmonary edema or hypotension if lung compressed for > 7 days and/or a large amount of fluid drained off.
  
- J. Atelectasis: Complete or partial collapse of the lung. Normal perfusion but decreased ventilation. Stasis of secretions leads to bacterial growth and pneumonia. Develops 24-48 hours postoperatively.
  1. Assessment
    - Dyspnea
    - Tachypnea
    - Tachycardia
    - Low grade fever
    - Decreased breath sounds and crackles
    - Asymmetrical chest movement
    - Increased restlessness
  
- K. Pneumonia: An acute infection of the lung parenchyma including the alveolar spaces and interstitial tissue. May involve an entire lobe, a segment of a lobe, the alveoli and bronchi, or interstitial tissues.
  1. Bronchopneumonia
  2. Lobar pneumonia
  3. Aspiration pneumonia
  4. Assessment

<u>Bacterial</u> <ul style="list-style-type: none"><li>• High fever and chills</li><li>• Tachycardia and tachypnea</li><li>• Productive cough</li><li>• Fremitus on palpation</li><li>• Bronchial breath sounds</li><li>• Persistent crackles</li><li>• WBC: High</li><li>• CXR: Infiltrates</li><li>• Clinical course more severe</li></ul>	<u>Viral and atypical</u> <ul style="list-style-type: none"><li>• Low grade fever</li><li>• Nonproductive cough</li><li>• Malaise</li><li>• No evidence of consolidation</li><li>• WBC: Normal to low</li><li>• CXR: Minimal changes</li><li>• Clinical course less severe</li></ul>
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Fungal

  - Dry cough in Pneumocystis