Assessment of the Thorax and Lungs

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Anatomy of Lungs

- Organs of respiration
- Located in thoracic cavity
- Right lung- 3 lobes
- Left lung- 2 lobes
- Important to know landmarks of thorax
- Composed of trachea, bronchioles & alveoli

Structures of the Respiratory System

Mechanics of Respiration (cont.)
Anatomical Landmarks

- Anteriorly: Apex of lung ¾ - 1 and ½” (2-4cm) above clavicle.
- Anteriorly: Base to 6th rib midclavicular, 8th rib midaxillary.
- Posterior: Apex- first thoracic vertebrae.
- Posterior: Base T-10 expiration and T -12 deep inspiration.
Subjective Data

- Cough
- Sputum
- Shortness of Breath (SOB)
- Smoking
- Past Hx respiratory disorders
- Environmental factors
- Self-care behaviors

Inspection of Thorax and Lungs

- With patient sitting up- uncovered
- Observe for lesions, chest symmetry, ventilatory pattern, depth, rate and rhythm, muscles used & skin color
- Note both posterior view and anterior view.
- Note spinal deformities
- AP (anteroposterior) diameter should be less than transverse (1/2)
**Palpation of Posterior Thorax**

- Using fingers palpate chest wall note:
- Tenderness
- Alignment
- Any Bulging or retractions
- Palpate for masses
- Palpate for any crepitus- coarse, crackling sensation palpable over skin surface in subcutaneous emphysema. May follow thoracic injury or surgery.

**Palpate Tactile Fremitus**

- First say “ahhhh” and feel own neck = fremitus.
- Palpate the patient’s back to right and left of spine as the pt. says 99 and examiner palpates with palm of hand, compare bilaterally.
- Decreased fremitus- anything obstructs transmission of vibrations, e.g., obstructed bronchus, pneumothorax, emphysema. It is decreased when space is filled with air or fluid.

**Palpate Chest Expansion/Excursion**

- Posterior- place hands along outer edge of costal margin with thumbs toward middle of spine
- Have patient take a deep breath
- Should observe yours hands moving equally far apart.
- Unequal expansion could be due to marked atelectasis, pneumonia, trauma to thorax. Or pneumothorax.
Percuss the Thorax

- Apices to bases
- Anterior
- Lateral
- Posterior- fold arms across chest
- Hear resonance and dullness alternately with lung or ribs.
- Avoid percussion over scapulae and ribs.

Hyperresonance found when too much air is present (emphysema, pneumothorax) Dullness signals abnormal density (pneumonia, tumor)

Diaphragmatic Excursion

- Distance between deep inspiration and full expiration.
- Normally ranges from 3-6 cm
- Exhale and hold, percuss and mark location of diaphragm: change dull-resonance
- Deep inspiration and hold it, percuss + mark change again
**Auscultation**
- Beginning at apices to base, compare bilaterally.
- Listen for full cycle, note quality and intensity
- Instruct patient to breathe through mouth, a little deeper (but not faster) than usual
- Use stethoscope diaphragm firmly vs chest wall

**Normal Breath Sounds**
- **Bronchial** - heard over trachea and larynx. High pitch, loud, harsh. Inspiration < expiration
- **Bronchovesicular** - heard over major bronchi. Moderate pitch and loudness. Inspiration = expiration
- **Vesicular** - heard over lung fields. Low pitch, soft sound. Inspiration > expiration
Adventitious sounds

- **Crackles** - (rales) rub hair between fingers cracking/popping sound. Secondary to fluid in airway or to opening of collapsed alveoli in atelectasis.
- **Wheeze** - continuous musical and high pitched, due to constricted bronchi.
- **Rhonchi** - lower pitched, coarse, snoring, due to thick secretions.
- **Pleural friction rub** - rough, grating, inflamed surfaces, as in pleurisy.

Assess Lungs

- Note: decreased or absent breath sounds
- Bronchial tree obstructed at some point by secretions, mucus plug or foreign body
- **Emphysema**
- Anything that obstructs sound transmission: pleurisy, pleural thickening, air (pneumothorax), fluid (pleural effusion), in pleural space.

Increased Breath Sounds

- Sounds are louder than they should be, e.g., bronchial sounds heard over peripheral lung fields.
- They occur when consolidation e.g., pneumonia or compression creates a denser lung area that enhances sound transmission.

Further Assessment

- **Bronchophony** - say “99”, if heard loud and distinct, it is abnormal
- **Whispered pectoriloquy** - whisper “1,2,3” should be muffled. Abnormal= loud & distinct means there is consolidation.
- **Egophony** – say “E”, the E changes to an “A” sound over area of consolidation, pleural effusion or abscess.

Sample Charting

- **SUBJECTIVE**
  - No cough, shortness of breath, or chest pain with breathing. No history of respiratory diseases. Has “one or no” colds per year.
  - Has never smoked. Works in well-ventilated office-smoking coworkers are restricted to smoke in lounge. Last TB skin test 4 years PTA, negative. Never had chest x-ray.
• OBJECTIVE
  – Inspection AP < transverse diameter. Respirations 16/min, relaxed and even
  – Palpation. Chest expansion symmetric. Tactile fremitus equal bilaterally and decrease at the base. No tenderness to palpation. No lumps or lesions.
  – Percussion. Resonant to percussion over lung fields. Diaphragmatic excursion 5 cm and = bilaterally.
  – Auscultation. Vesicular breath sounds clear over lung fields. No adventitious sounds.

Summary:
Respiratory Assessment
• Respiratory rate and rhythm
• Lung sounds
• Use of accessory muscles?
• Nasal flaring?
• Color- skin, nail beds, lips.
• Clubbing of nails.
• Pulse Ox +/- ABG
• Orthopnea?, SOB?, Dyspnea?