

## **NURS 221 HEALTH ASSESSMENT (Practical)**

### **Procedure Guide and Performance Checklist**

#### **Module four**

#### **Physical examination of the Respiratory System**



**Preparation:**

**A. Equipment needed:**

- A. Good lighting
- B. centimeter ruler
- C. Gloves
- D. Examination gown and drape
- E. Stethoscope
- F. Alcohol swab

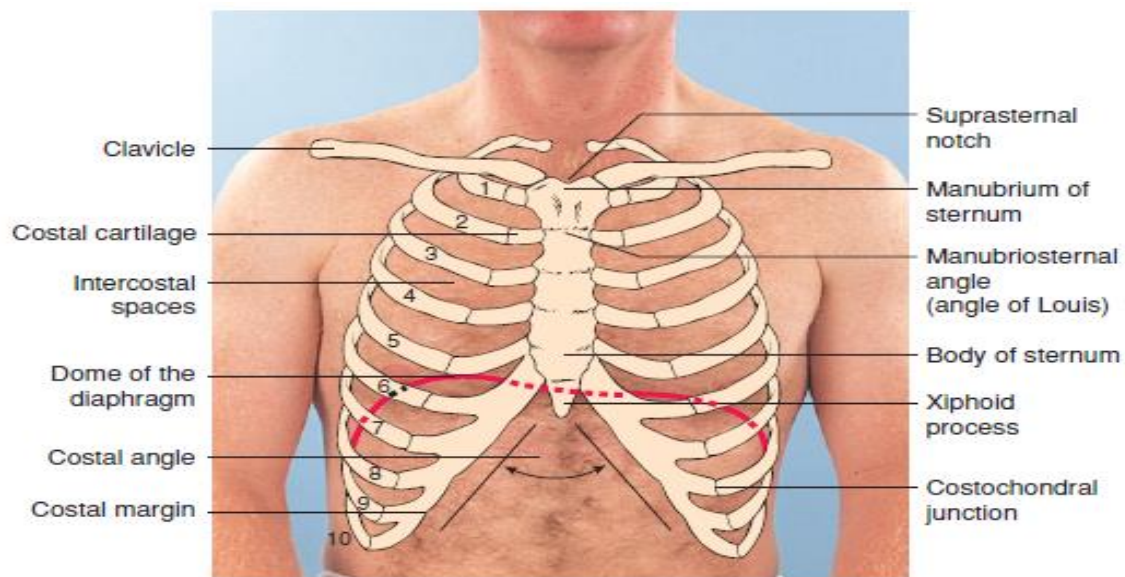
**B. Patient and Environment**

1. Explain the procedure to the patient. Provide instructions to the patient as appropriate in the order of your examination. As the examiner changes the focus of assessment (from anterior to posterior structures), relevant instructions may vary ( e.g. position and the mechanism of breathing) as needed for the procedure.
2. Position the client appropriately.
3. Ask the patient to undress and drape himself/herself appropriately.
4. Make sure the room is warm, quiet and adequately lighted.
5. Ensure patient privacy.
6. Wash hands.

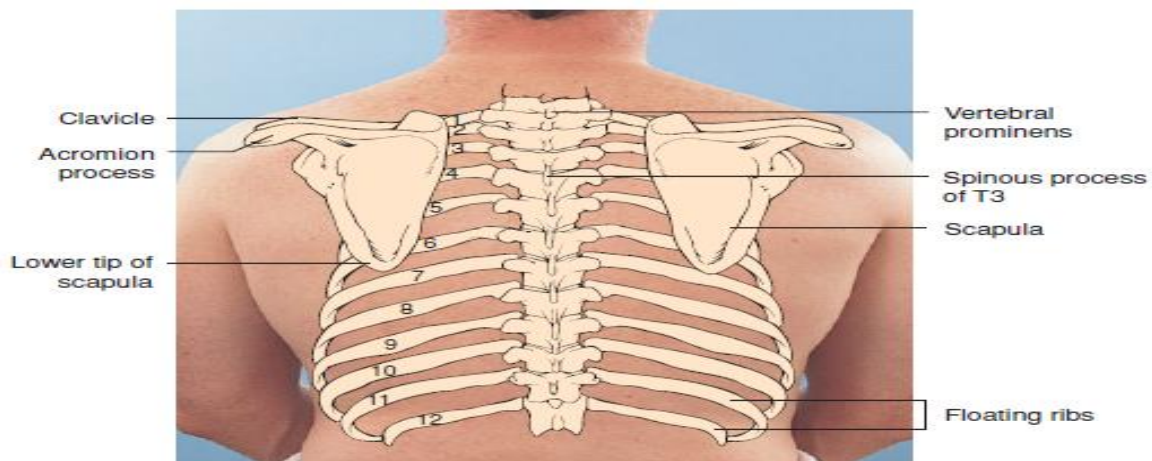
**C. Obtain Health History**

**D. Conduct complete physical examination.**

## THORACIC CAGE:

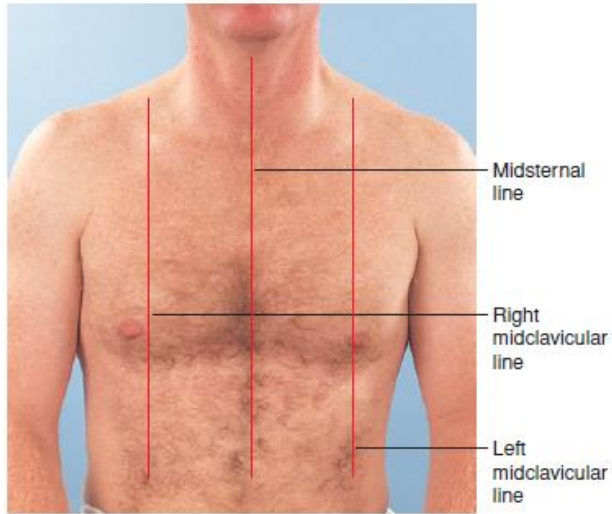


**Anterior thoracic cage**

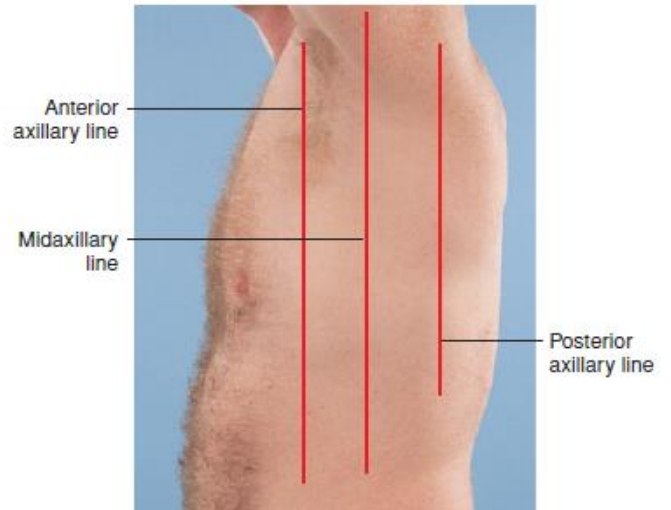


**Posterior thoracic cage**

**Reference lines:**

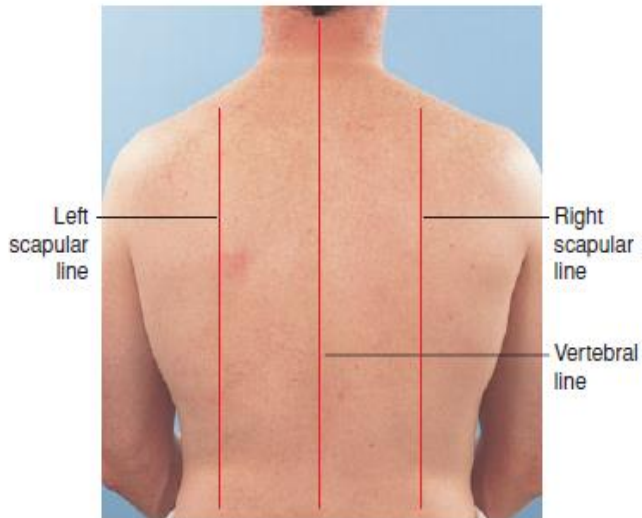


**Anterior vertical lines**



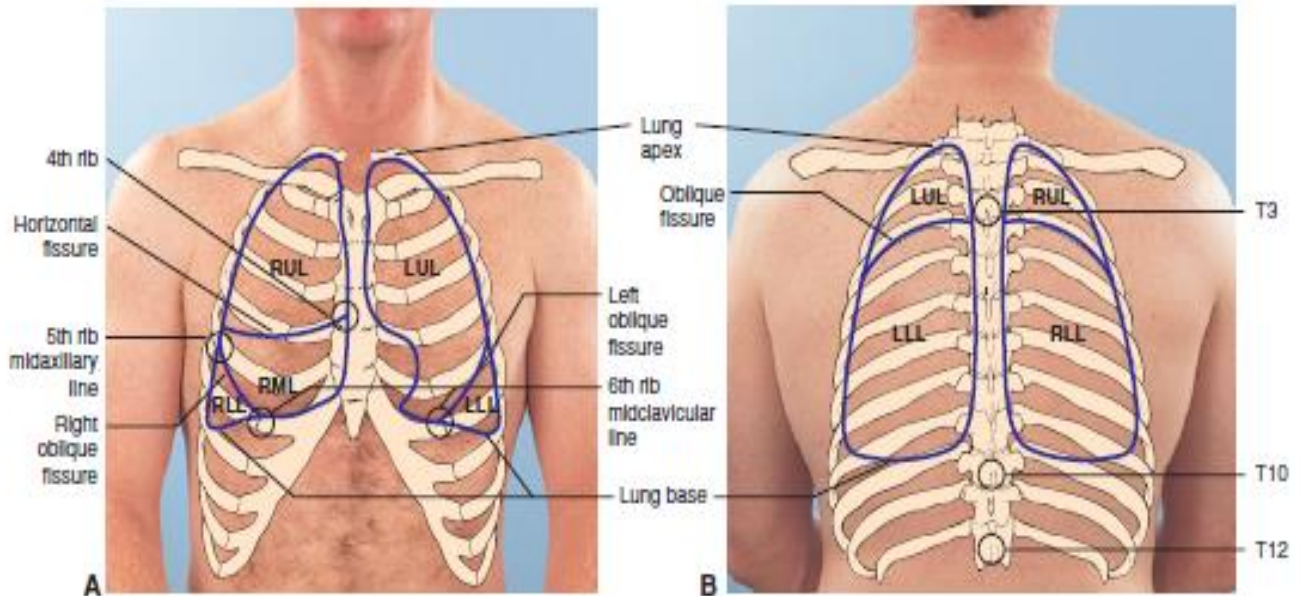
**Lateral vertical line**

**Posterior vertical lines**

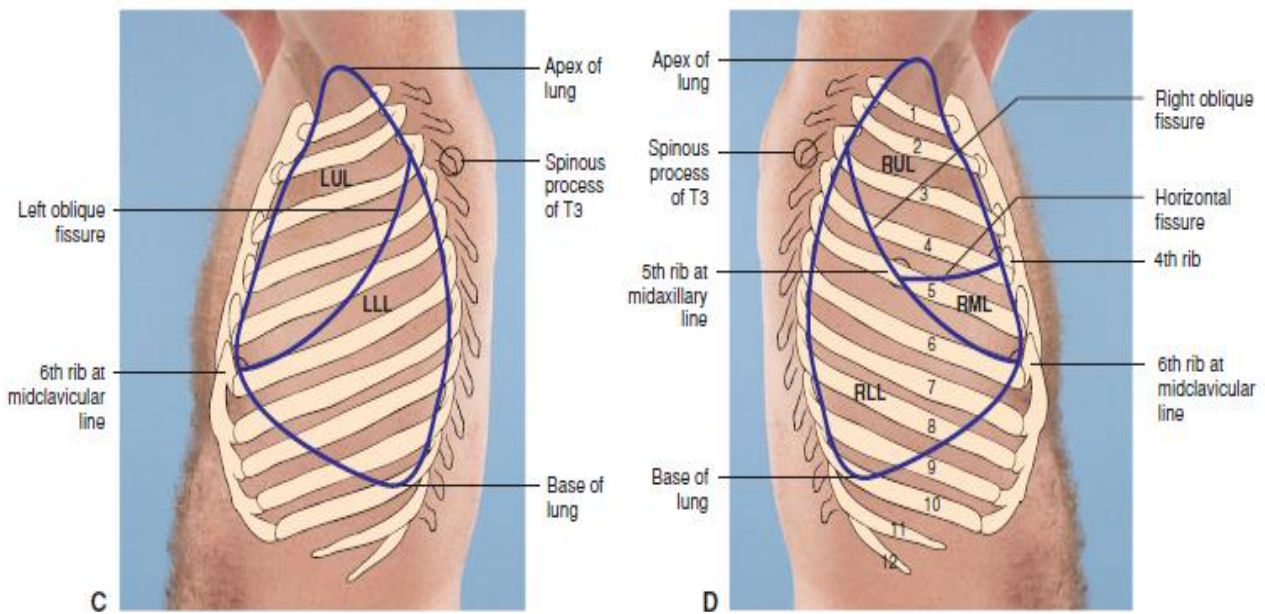




**Position of the Lungs:**



**(A) Anterior view of lung position (B) Posterior view of lung position**



**(C) Lateral view of left lung position (D) Lateral view of Right lung position**

### Inspection of the Anterior of Lateral Thorax

Procedure and Rationale	Normal Findings
<p><b>1. Position the patient.</b></p> <ul style="list-style-type: none"> <li>➤ The patient should be in a sitting position with clothing removed except for an examination gown and drape.</li> <li>➤ Stand in front of the patient for anterior inspection and to the side of the patient for lateral inspection. Lighting must be adequate to detect color differences, lesions, and chest movements.</li> </ul>	
<p><b>2. Observe skin color.</b></p>	<p><i>pink undertones indicate normal oxygenation. Skin color of the thorax should be consistent with the rest of the body.</i></p>
<p><b>3. Inspect the structures of the thorax.</b></p>	<p><i>The clavicle should be at the same height. The sternum should be midline. The costal angle should be less than 90 degrees.</i></p>
<p><b>4. Inspect for symmetry.</b></p>	<p><i>The structures of the chest and chest movement should be symmetric.</i></p>
<p><b>5. Inspect chest configuration.</b></p>	<p><i>The adult transverse diameter is approximately twice that of the anteroposterior diameter (AP:T = 1:2)</i></p>
<p><b>6. Count the respiratory rate.</b></p> <ul style="list-style-type: none"> <li>➤ Count the number of respiratory cycles per minute.</li> </ul> <p>Do not tell the patient that you are counting respirations – it may alter the normal breathing pattern.</p>	<p><i>Normal adult respiratory rate is <b>12 to 20</b>. Respirations should be even and smooth.</i></p>

### INSPECTION OF THE POSTERIOR THORAX

Procedure and Rationale	Normal Findings
<p><b>1. Observe the skin color.</b></p>	<p><i>should be consistent with that of the rest of the body.</i></p>
<p><b>2. Inspect the structures of the posterior thorax.</b></p>	<p><i>The height of the scapulae should be even; the vertebrae should be midline.</i></p>
<p><b>3. Inspect for symmetry.</b></p>	<p><i>The structures of the chest and chest movement should be symmetric.</i></p>
<p><b>4. Observe respirations.</b></p>	<p><i>Respirations should be smooth and even.</i></p>

### PALPATION OF THE POSTERIOR THORAX

Procedure and Rationale	Normal Findings
<p><b>1. Lightly palpate the posterior thorax.</b></p> <ul style="list-style-type: none"> <li>➤ Use the finger pads to lightly palpate symmetric areas on the posterior thorax. Include the entire thorax by starting at the areas above each scapula and move from side to side to below the 12<sup>th</sup> rib and</li> </ul>	

- laterally to the midaxillary line on each side.
- Assess muscle mass.
- Assess for growths, nodules and masses.
- Assess for tenderness.

*Muscle mass should be firm and underlying tissue smooth. The chest should be free of lesions or masses. The area should be non-tender to palpation.*



FIGURE 1 : Pattern for Palpating the Posterior Thorax

**2. Palpate and count ribs and intercostal spaces.**

- Instruct the patient to flex the neck, round the shoulders, and lean forward. Instruct the patient to breathe normally and to tell you of pain or discomfort.
- Use the finger pads to palpate each spinous process.

*When the neck is flexed, the spinous process of C7 is most prominent. When two spinous processes are equally prominent, they are C7 and T1.*

*The spinous processes should form a straight line.*

**3. Palpate for respiratory expansion.**

Place the palmar surface of your hands, with thumbs close to the vertebrae, on the chest at the level of T10. Pinch up some skin between your thumbs. Ask the patient to take a deep breath.

*Your hands should lift symmetrically outward when the patient takes a deep breath.*



Fig. 2: Palpation for Respiratory Expansion

**4. Palpate for tactile fremitus.**

- Use the ulnar surface of the hand or the palmar surface of the hand at the base of the fingers at the metacarpophalangeal joints when palpating. Palpate and compare symmetric areas of the lungs by moving from side to side, from apices to bases as the patient repeats: ninety-nine” or one, two, three” in a clear loud voice.

Fremitus is the palpable vibration on the chest wall when the patient speaks. Fremitus is strongest over the trachea, diminishes over the bronchi, and becomes almost nonexistent over the alveoli of the lungs.



Fig. 3: Pattern for palpating for tactile fremitus.

**PERCUSSION OF THE POSTERIOR THORAX**

**Procedure and Rationale**

- Tell the patient to breathe normally through this examination. Ask the patient to lean forward and round the shoulders. This position moves the scapulae laterally, permitting more area at the upper vertebral borders, and widens the intercostal spaces for percussion.
- Position the patient so that your arms are at almost fully extended throughout the percussion.

**Normal Findings**

**1. Percuss the lungs.**

- Place the pleximeter in the intercostal space parallel to the ribs during percussion. Standing slightly to the side of the patient allows the pleximeter finger to lie more firmly on the chest as you move through all thoracic area.
- Percuss on the apex of the left lung, then the apex of the right lung. Percuss from the side to side, comparing sounds, in the intercostal spaces as you percuss to the bases of the lungs and laterally to each midaxillary line.

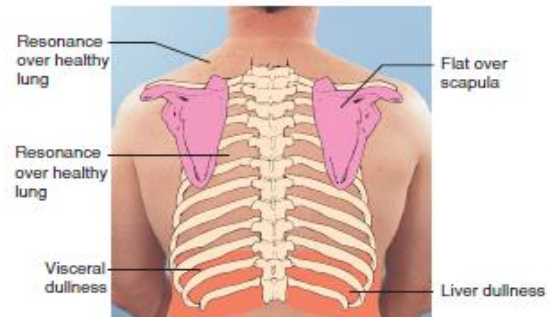


Fig 4. Expected normal sounds on percussion on posterior thorax





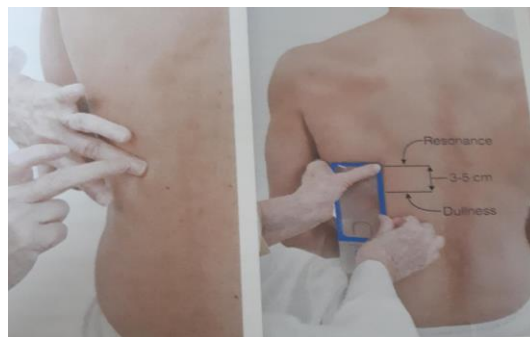
**Fig 5: Pattern for percussion: Posterior thorax**

**2. Percuss for movement of the diaphragm (Diaphragmatic Excursion)**

- Percuss to map out the lower lung border, both in expiration and inspiration. First, ask the person to “exhale and hold it” briefly while you percuss down the scapular line until the sounds changes from resonant to dull on each side. Mark the spot. It may be somewhat higher on the right side (about 1-2 cm) because of the presence of the liver.
- Now ask the person to “take a deep breath and hold it.” Continue percussing down from your first mark and mark the level where the sound changes to dull on this deep inspiration.

*The distance between the marks should be **3 to 5cm (1 ¼ to 2 in.)** and even on each side. The right side may be **1 to 2cm (0.39 to 0.78 in.) higher** because of the location of the liver.*

*On physically fit patient, anticipate a greater distance.*



**Fig 6: Diaphragmatic movement, percussion and measurement.**

## AUSCULTATION OF THE POSTERIOR THORAX

Procedure and Rationale	Normal Findings
<ul style="list-style-type: none"> <li>➤ Auscultation of the respiratory system refers to listening to the sounds of breathing through the stethoscope. The sound are produced by air moving through the airways. Sounds change as the airway size changes or with the presence of fluid or mucus.</li> <li>➤ The pattern for auscultation of the respiratory system is the same as that for percussion.</li> </ul>	<p>Four normal <u>breath sounds</u> are heard during respiratory auscultation.</p> <p><b>Tracheal sounds</b> are harsh, high-pitched sounds heard over the trachea when the patient inhales and exhales.</p> <p><b>Bronchial sounds</b> are loud, high-pitched sounds heard next to the trachea and are longer on exhalation.</p> <p><b>Bronchovesicular</b> sounds are medium in loudness and pitch. They are heard over between the scapulae, posteriorly and next to the sternum, and anteriorly upon inhalation and exhalation.</p> <p><b>Vesicular sounds</b> are soft and low pitched and hear over the remainder of the lungs. Vesicular sounds are longer on inhalation than exhalation.</p>



Fig 7: Pattern for auscultation: Posterior Thorax

<p><b>1. Instruct the patient.</b></p> <ul style="list-style-type: none"> <li>➤ Explain that you will be listening to the patient’s breathing with the stethoscope.</li> <li>➤ The patient will be in the same position as during percussion. Ask the patient to breathe deeply through the mouth each time the stethoscope is placed on a new spot. Tell the patient to let you know if he or she is becoming tired, short of breath, or dizzy and if so, you will stop and allow time to rest.</li> </ul>	
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<p><b>2. Visualize the landmarks.</b></p> <ul style="list-style-type: none"> <li>➤ Visualize the landmarks as you did before percussing the posterior thorax.</li> </ul>	
<p><b>3. Auscultate for bronchovesicular sounds.</b></p> <ul style="list-style-type: none"> <li>➤ The right and left primary bronchi are located at the level of T3 and T5. Auscultate at the right and left to the vertebrae at those levels.</li> </ul>	<p><i>The breath sounds will be bronchovesicular.</i></p>
<p><b>4. Auscultate for vesicular sounds.</b></p> <ul style="list-style-type: none"> <li>➤ Auscultate the lungs by following the pattern used for percussion. Move the stethoscope from side to side while comparing sounds. Start at the apices and move to the bases of the lungs and laterally to the midaxillary line.</li> </ul>	<p><i>The breath sounds over most of the posterior surface are vesicular.</i></p>

**Palpation of the Anterior and Lateral Thorax**

<b>Procedure and Rationale</b>	<b>Normal Findings</b>
<p><b>1. Position the patient.</b></p> <ul style="list-style-type: none"> <li>➤ The patient is usually in a supine position for palpation, percussion, and auscultation of the anterior thorax. If the patient is experiencing discomfort or dyspnea, a sitting position may be used, or the patient may be in a Fowler’s position. The breasts of female patients normally flatten when in supine position. Large and pendulous breasts may have to be moved to perform a complete assessment. Explain this to the patient and inform her that she may move and lift her own breasts if that will make her more comfortable.</li> </ul>	
<p><b>2. Palpate the sternum, ribs, and intercostal spaces.</b></p> <ul style="list-style-type: none"> <li>➤ Locate the suprasternal notch; palpate downward to the sternal angle (angle of Louis) where the manubrium meets the body of the sternum. Palpate laterally to the left and right to locate the second rib and second intercostal space. Continue palpating the sternum to the xiphoid process and to the left and right of the sternum to count the ribs.</li> </ul>	<p><i>The sternum should feel flat except for the ridge of the sternal angle and should taper to the xiphoid. The ribs should feel smooth and the spacing of ribs and intercostal spaces should be symmetric.</i></p>
<p><b>3. Lightly palpate the anterior and lateral thorax.</b></p> <ul style="list-style-type: none"> <li>➤ Use the finger pads to lightly palpate symmetric areas of the anterior thorax. Include the entire thorax by starting at the areas above each clavicle and move from</li> </ul>	

- side to side to below the costal angle and laterally to the midaxillary line.
- Assess muscle mass.
  - Assess for growths, nodules and masses.
  - Assess for tenderness.

*Muscle mass should be firm and the underlying tissue should be smooth. The thorax should be free of lesions or masses. The area should be non-tender to palpation.*



**Fig 8. Palpation of the anterior thorax**

**4. Palpate for respiratory expansion.**

Place the palmar surface of your hands along each costal margin with thumbs close to the midsternal line. Pinch up some skin between your thumbs. Ask the patient to take a deep breath.

**The movement of the chest beneath your hands should feel smooth and even. Your thumbs should move apart and the skin move smoothly as the chest expands with inspiration.**

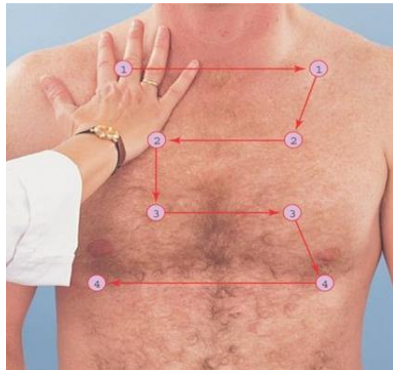


**Fig 9. Palpation for Respiratory expansion: Anterior**

**5. Palpate for tactile fremitus.**

Use the ulnar surface of the hand or the palmar surface of the hand at the base of the metacarpophalangeal joints when palpating for fremitus. Palpate and compare symmetric areas of the lungs by moving from side to side from apices to bases as the patient repeats "nine-nine" or "one, two, three" in a clear, loud voice. Displace female breasts as required.

*Fremitus normally diminishes as you move from large to small airways and is decreased or absent over the precordium.*



**Fig 10. Palpation for tactile fremitus: Anterior**

**PERCUSSION OF THE ANTERIOR AND LATERAL THORAX**

Procedure and Rationale	Normal Findings
<p>1. <b>Visualize the landmarks.</b> Observe the anterior thorax and visualize the horizontal and vertical lines, the level of the diaphragm and the lobes of the lungs.</p>	
<p>2. <b>Recall the expected findings.</b> Percussion allows assessment of underlying structures.</p>	<p><b>The usual sound in the thorax, over the lung tissue, is resonance which is a low-pitched, hollow sound.</b></p>
<p>3. Percuss the lungs.</p> <ul style="list-style-type: none"> <li>➤ Begin at the apices of the lungs. Ask the patient to turn the head to the opposite side of percussion to increase the size of the surface required for placing your pleximeter finger and to avoid interference from the clavicle. Move to the chest wall and place the pleximeter in the intercostal space parallel to the ribs during percussion.</li> <li>➤ Percuss the anterior chest from side to side, comparing sounds, in the intercostal spaces. Percuss to the bases and laterally to the midaxillary line.</li> <li>➤ Percuss the left lung lateral to the midclavicular line.</li> </ul>	<p><i>Resonance sound.</i></p>





Fig 11. Pattern for percussion: anterior thorax and left lateral thorax

**AUSCULTATION OF THE ANTERIOR AND LATERAL THORAX**

Auscultation is used to identify and discriminate between and among normal and adventitious breath sounds. Listen to the full respiratory cycle with each placement of the stethoscope.

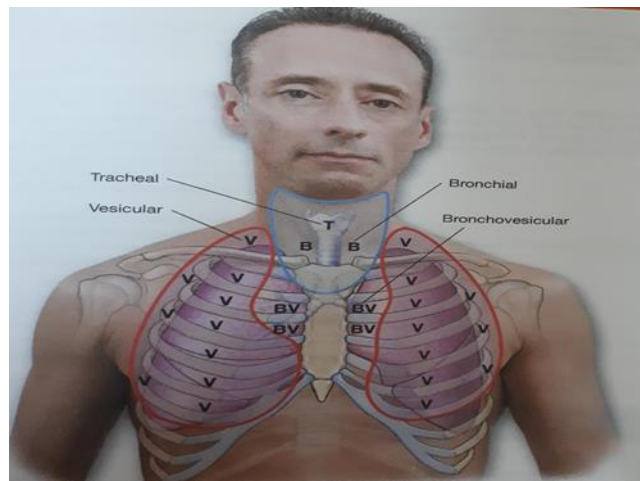


Fig. 12 Auscultatory breath sounds: Anterior thorax

Procedure and Rationale	Normal Findings
<p><b>1. Auscultate the trachea.</b> Place the stethoscope over the trachea above the suprasternal notch. You will hear tracheal breath sounds. Move the stethoscope to the left, then the right side of the trachea, just above each sternoclavicular joint.</p>	Bronchial breath sounds are heard.
<p><b>2. Auscultate the apices.</b> Place the stethoscope in the triangular areas just superior to each clavicle.</p>	Bronchial sounds are heard.
<p><b>3. Auscultate the bronchi.</b> The bronchi are auscultated at the first intercostal space at the manubrium and left and</p>	Bronchial sounds are heard. Auscultation of the major bronchi in the second and third

right sternal borders.	intercostal spaces and the interscapular area will result in hearing bronchovesicular sounds.
<p><b>4. Auscultate the anterior and lateral lungs.</b>  Auscultate the lungs by following the pattern for percussion. Move the stethoscope from side to side as you compare sounds. Move down to the sixth intercostal space and laterally to the midaxillary line.  When auscultating the lateral lungs, ask the patient to sit up straight with the patient's arms raised over his or her head.</p>	Vesicular sounds are heard.
<b>5. Interpret the findings.</b>	



**NURS 221 HEALTH ASSESSMENT (Practical)**  
**Performance Checklist**  
**Respiratory Assessment**

Students Name: \_\_\_\_\_ Rating: \_\_\_\_\_  
 Student Number: \_\_\_\_\_ Date Performed: \_\_\_\_\_

**The student nurse should be able to:**

Performance Criteria	Competency Level			Comments
	Done Correctly	Done with Assistance	Not Done	
<b>PREPARATION</b>				
Prepare necessary equipment.				
Prepare the patient and environment.				
<ul style="list-style-type: none"> <li>• Explain the procedure to the patient.</li> </ul>				
<ul style="list-style-type: none"> <li>• Position the client appropriately.</li> </ul>				
<ul style="list-style-type: none"> <li>• Ask the patient to undress and drape himself/herself appropriately.</li> </ul>				
<ul style="list-style-type: none"> <li>• Make sure the room is warm, quiet and adequately lighted.</li> </ul>				
<ul style="list-style-type: none"> <li>• Ensure patient privacy.</li> </ul>				
<ul style="list-style-type: none"> <li>• Wash hands.</li> </ul>				
Obtain Health History				
Ensure there is adequate lighting.				
Conduct complete physical examination following the proper sequence.				
<b>Inspection of the Anterior and Lateral Thorax</b>				
1. Position the patient.				
2. Observe skin color.				
3. Inspect the structures of the thorax.				
4. Inspect for symmetry.				
5. Inspect chest for configuration.				
6. Count the respiratory rate.				
<b>Inspection of the Posterior Thorax</b>				
1. Observe skin color.				
2. Inspect the structures of the posterior thorax.				

3. Inspect for symmetry.				
4. Observe respirations.				
<b>Palpation of the Posterior Thorax</b>				
1. Lightly palpate the posterior thorax. - Assess for muscle mass. - Assess for growths, nodules and masses. - Assess for tenderness.				
2. Palpate and count ribs and intercostal spaces.				
3. Palpate for respiratory expansion.				
4. Palpate for tactile fremitus.				
<b>Percussion of the Posterior Thorax</b>				
1. Percuss the lungs.				
2. Percuss for movement of the diaphragm (Diaphragmatic Excursion)				
<b>Auscultation of the Posterior Thorax</b>				
1. Instruct the patient.				
2. Visualize the landmarks.				
3. Auscultate for bronchovesicular sounds.				
4. Auscultate for vesicular sounds.				
<b>Palpation of the Anterior and Lateral Thorax</b>				
1. Position the patient.				
2. Palpate the sternum, ribs and intercostal spaces.				
3. Lightly palpate the anterior and lateral thorax. - Assess muscle mass. - Assess for growths, nodules, and masses. - Asses for tenderness.				
4. Palpate for respiratory expansion.				
5. Palpate for tactile fremitus.				
<b>Percussion of the Anterior and Lateral Thorax</b>				
• Visualize landmarks and recall the expected findings.				
1. Instruct the patient.				
2. Percuss the lungs.				
<b>Auscultation of the Anterior and Lateral Thorax</b>				
1. Auscultate the trachea.				
2. Auscultate the apices.				
3. Auscultate the bronchi.				
4. Auscultate the anterior and lateral lungs.				
5. Interpret the findings.				

Evaluated by: \_\_\_\_\_

Date Evaluated: \_\_\_\_\_