



King Saud University

Collage of Nursing

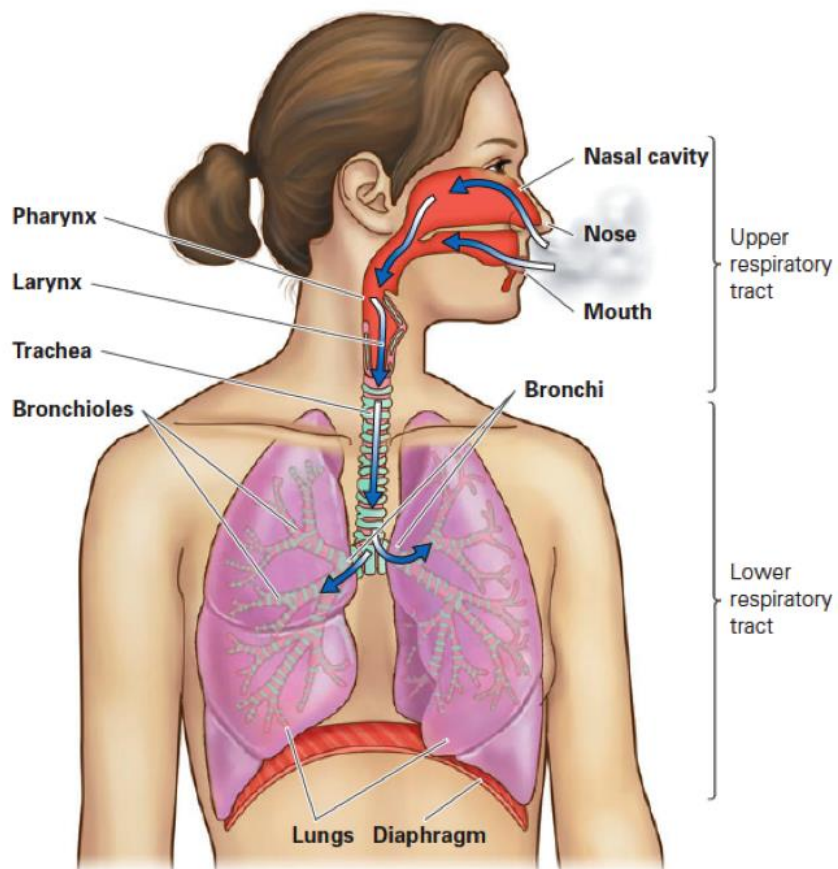
Medical Surgical Nursing department

## Application of Health Assessment

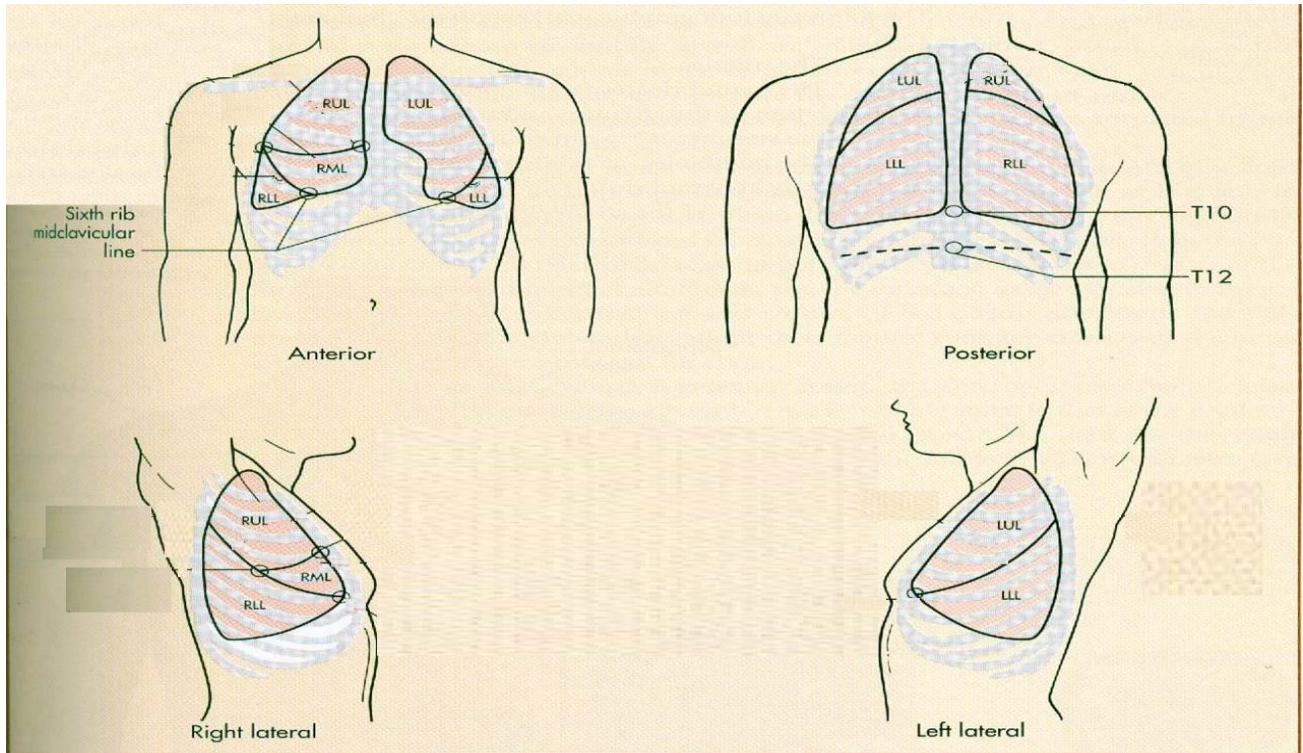
NUR 225

### Module Four

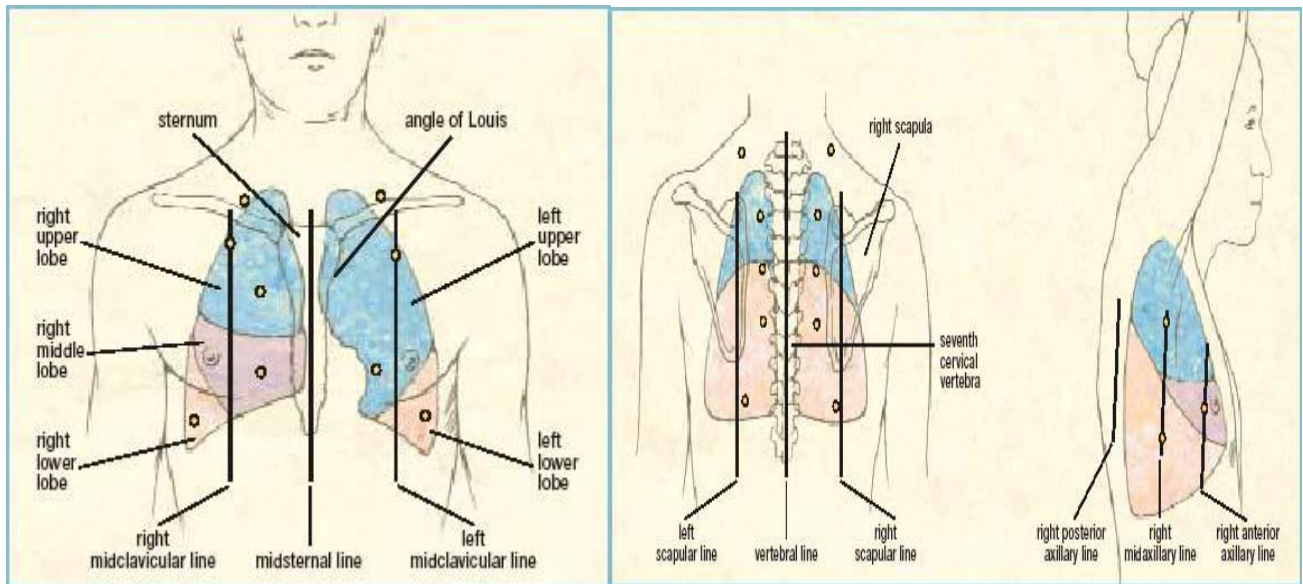
#### Physical examination of Respiratory System



**Lungs borders:**



**Lungs landmark:**



# Respiratory system assessment

## NORMAL RANGE OF FINDINGS

### 1- Inspection

#### Chest

Shape and configuration

Symmetry

Movement should be symmetrical bilaterally and coordinated with breathing

Position of nipples should be even.

Size and shape equal

Respirations: Rate, Rhythm

Effort, depth

Breathing should be free and easy

Breathing pattern

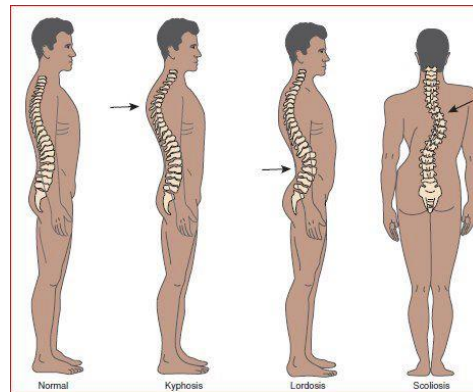
The neck and Trapezius muscles development are normally developed for age occupation.

Position the client takes to breathe.

Skin condition and nail beds

## ABNORMAL FINDINGS

Kyphosis, Scoliosis, funnel and pigeon chest  
Unequal symmetry may denote decreased air entry on the affected side



Pigeon chest      funnel chest

Shallow breathing may indicate pain, head injury or be related to medications

Note signs of respiratory distress

**Kussmaul's breathing:** deep and laboured breathing, often associated with severe metabolic acidosis.

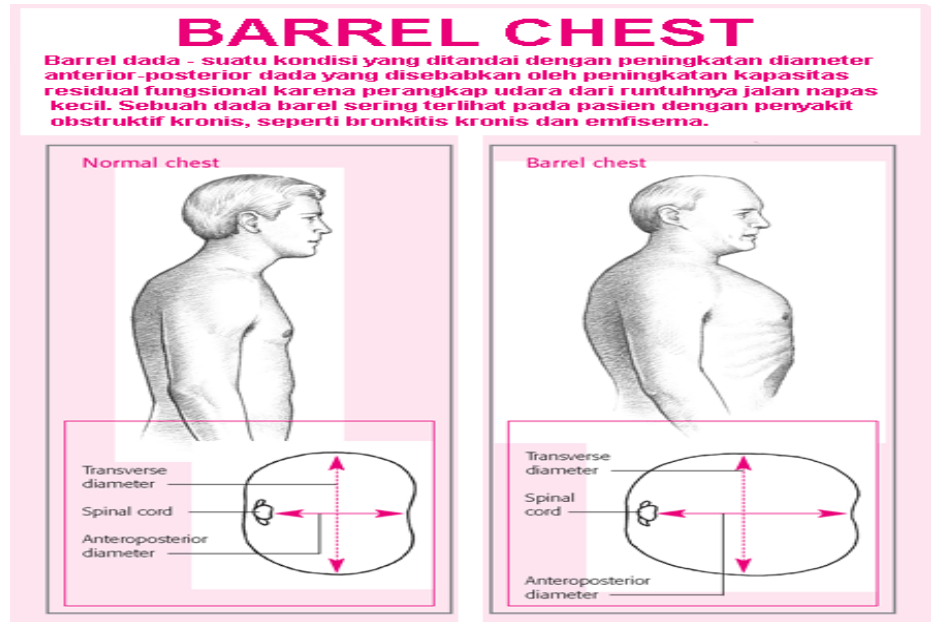
**Cheyne-Stokes' breathing:** progressively deeper breathing followed by temporary apnoea, which may occur with heart failure, cerebrovascular accident

Cyanosis nail beds indicate hypoxemia

### The anteroposterior diameter:

Anteroposterior diameter is less than the transverse diameter. The ratio of anteroposterior: transverse diameter is from 1:2

If anteroposterior diameter is larger than transverse diameter this indicates barrel chest most commonly occurred in emphysema client

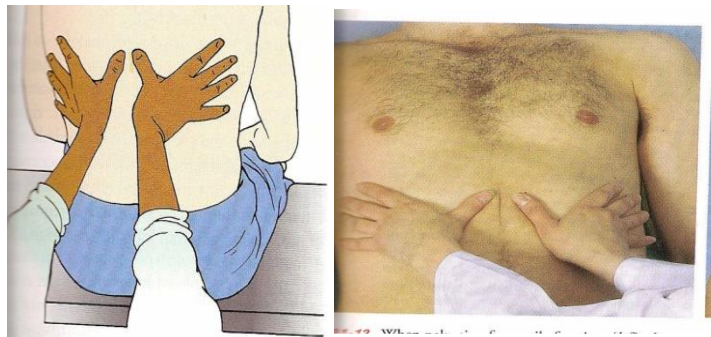


### 2- Palpation of chest:

Areas of tenderness, Skin (temperature, moisture, texture, superficial lumps or masses, and crepitus.

#### 1- Symmetric Expansion

- Place your warmed hands on the posterolateral chest wall with thumbs at the level of T9 or T10 and on the anterolateral wall with the thumbs along the costal margins and pointing toward the xiphoid process. Ask client to take a deep breath.
- Slide your hands medially to pinch up a small fold of skin between your thumbs.
- Ask client to take a deep breath.
- As the client inhales deeply, inspect the movement of your thumbs for symmetrically movement. Noting any lag in expansion.



Asymmetrical reduction of chest wall expansion: absent expansion (e.g. [empyema](#) and [pleural effusion](#)) or reduced expansion (e.g. pulmonary consolidation and collapse).

## 2- Tactile Fremitus :

(a palpable vibration Sounds generated from the larynx are transmitted through patent bronchi and through the lung parenchyma to the chest wall where vibrations can be felt.

- Use the palmar base (the ball) of the fingers or the ulnar edge of one hand,
- Touch the client's chest while he or she repeats the words "ninety-nine" or "blue moon [Resonant phrases that generate strong vibrations].
- Start over the lung apices and palpate from one side to another
- Avoid palpating over the scapulae



Tactile vocal fremitus is increased over areas of consolidation and decreased or absent over areas of effusion or collapse

## 3- Percussion on chest:

### ■ Lung Fields

(predominant resonant note over the lung fields is normal).

- Start at the apices and percuss across the top of both shoulders
- percuss in the interspaces, make a side-to-side comparison all the way down the lung region.
- Percuss at 5-cm intervals.
- Avoid the damping effect of the scapulae and ribs.



A hyper-resonant sound suggests hyperinflation or a pneumothorax. A dull sound is easier to distinguish from normal. It may suggest collapse or consolidation, or a pleural effusion

## Ascultation

### Normal Breath sounds

#### Bronchial sounds

Heard over large airways, i.e. trachea  
shorter inspiratory phase and longer  
expiratory

#### Bronchiovesicular sounds

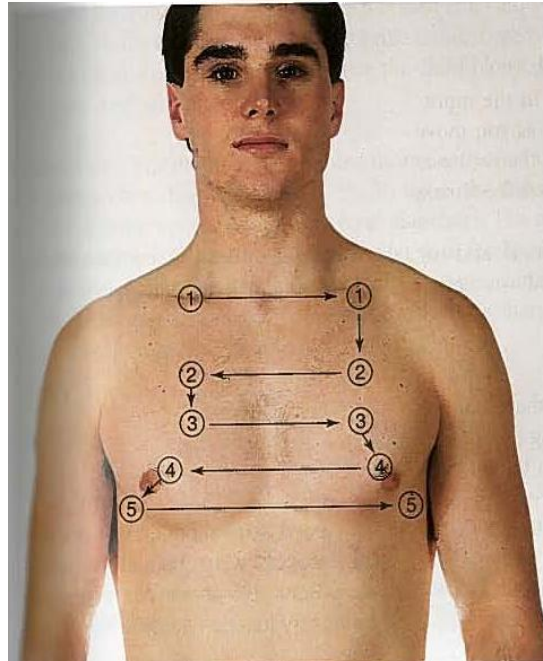
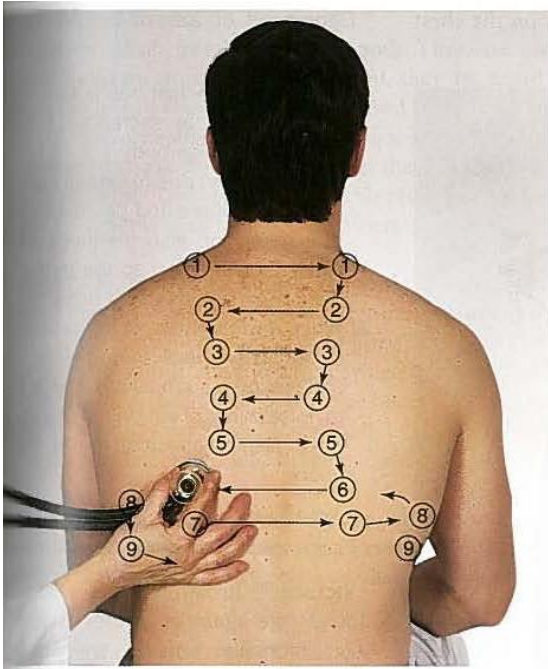
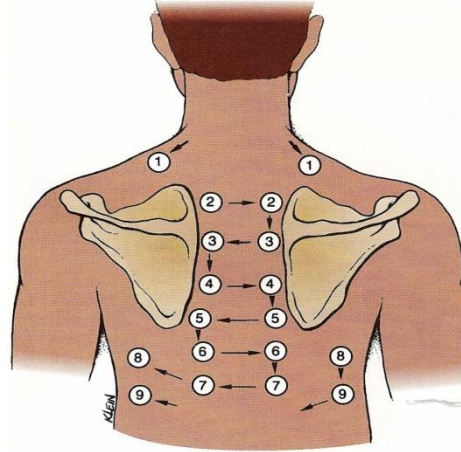
Heard upper intrascapular areas.  
Inspirations and expirations are equal

#### Vesicular sounds

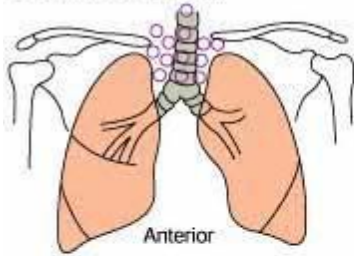
Heard over peripheral lung fields.  
Inspiratory phase longer than expiratory  
phase

Auscultate in a systematic manner from  
right to left from top of the lungs towards  
the bottom carefully comparing all entry  
from lobe to lobe

Identify type of abnormal breath sound is  
a skill acquired over time

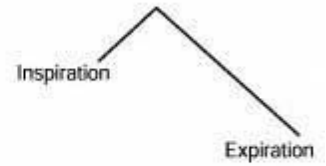


**Bronchial or Tubular**



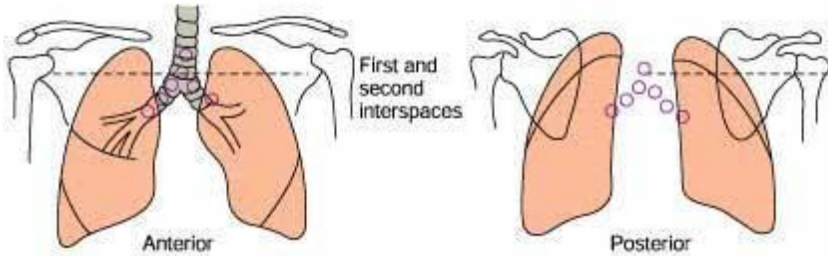
Blowing, hollow sounds auscultated over the trachea

Ratio of inspiration to expiration

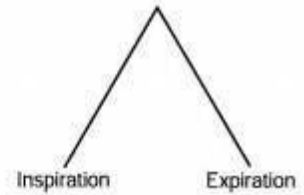


Inspiration is shorter than expiration. Expiration is longer, lower, and higher-pitched than inspiration.

**Bronchovesicular**

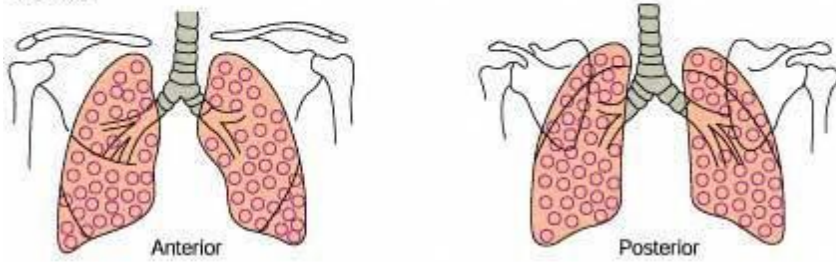


Medium-pitched, medium intensity, blowing sounds auscultated over the first and second interspaces anteriorly and the scapula posteriorly

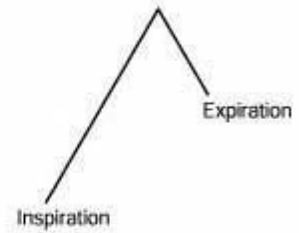


Inspiration and expiration have similar pitch.

**Vesicular**



Soft, low-pitched sounds auscultated over the lung periphery



Inspiration is longer, louder, and higher-pitched than expiration.

# Quick Quiz

**Choose the correct answer for each of the following questions:**

**1-To auscultate the apex of the lungs, the stethoscope is placed in which of the following locations?**

- a- Near the anterior axillary line on the 7<sup>th</sup> interspace
- b- Above the clavicle, medial to the midclavicular
- c- Below the scapula, medial to the mid scapular border

**2- Kussmaul respiration is defined as:**

- a- Rapid, deep, sighing breathing
- b- Deep breaths alternate with short periods of apnea
- c- Periodical absence of breathing

**3- In adults with chronic respiratory diseases the rib cage increases in anteroposterior diameter.**

**What is the name given to this finding?**

- a- Funnel chest
- b- Pigeon chest
- c- Barrel chest

**4- What is the name of the normal lung sound, heard over the right lower lobe posteriorly?**

- a- Vesicular
- b- Tracheal
- c- Bronchovesicular

**5- On auscultation of the lungs, an adventitious sound with a high musical quality occurred at the end of inspiration. What is the name of this sound?**

- a- Crackles
- b- Rhonchi
- c- Wheeze

**6- Kussmaul respiration is main sign in which of the following condition:**

- a- Diabetic ketoacidosis
- b- head injury
- c- cerebrovascular accident.



Medical-Surgical Nursing

Performance checklist

Respiratory System

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

Performance criteria	Competency Level						Comment
	Trial 1			Trial 2			
	Done correctly (2)	Done with assistance (1)	Not done (0)	Done Correctly (2)	Done with assistance (1)	Not done (0)	
-Collect appropriate objective data about respiratory system related to general survey. -Collect appropriate subjective data related to respiratory system. - Chest pain, shortness of breath (dyspnea), wheezing, cough dry or produce sputum, sputum or hemoptysis. - Sputum or hemoptysis characteristics: color, odor, amount, frequency and consistency.							
<b>Physical examination</b>							
<b>Inspection</b>							
1- Inspect chest for: - Shape and symmetry of the anterior and posterior chest. - Movement. - Nipple position, size and shape. - Respiration rate, rhythm, effort and depth, 2-Inspect neck and trapezius muscle development. 3- Skin color. 4- The anteroposterior diameter. 5- Accessory muscle use. 6- Nails beds and clubbing nail. 7- Position of the trachea.							
<b>Posterior Chest</b>							
<b>PALPATION</b>							
1- Assess any tender areas, masses, temperature, moisture, texture and crepitus. 2- Test chest expansion-at the level of T9 or T10. 3- Tactile fremitus- repeat “1 – 2 – 3” or “99”.							

<b>percussion</b>							
1- Symmetry. 2- Normal sound and location. 3- Abnormal sound and location. 4- Diaphragmatic excursion.							
<b>Auscultation</b>							
1- Symmetry. 2- Normal breath sound, location and I:E. 3- Abnormal breath sound and location							
Anterior chest							
<b>palpation</b>							
1- Assess any tender areas, masses, temperature, Moisture, texture and crepitus. 2- Test chest expansion-at the level of costal margin. 3- Tactile fremitus- repeat "1 – 2 – 3" or "99".							
<b>Percussion</b>							
1- Symmetry. 2- Normal sound and location. 3- Abnormal sound and location.							
<b>Auscultation</b>							
1- Symmetry. 2- Normal breath sound, location and I:E. 3- Abnormal breath sound and location.							
Documentation.							

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

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

Name and Signature of Faculty

Total grade \_\_\_\_\_

Medical-Surgical Nursing

Respiratory System

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

	Normal finding	Patient finding
<ul style="list-style-type: none"> <li>-Collect appropriate objective data about respiratory system related to general survey.</li> <li>-Collect appropriate subjective data related to respiratory system.</li> <li>- Chest pain, shortness of breath (dyspnea), wheezing, cough dry or produce sputum, sputum or hemoptysis.</li> <li>- Sputum or hemoptysis characteristics: color, odor, amount, frequency and consistency.</li> </ul>		
<b>Physical examination</b>		
<b>Inspection</b>		
<ul style="list-style-type: none"> <li>1- Inspect chest for: <ul style="list-style-type: none"> <li>- Shape and symmetry of the anterior and posterior chest.</li> <li>- Movement.</li> <li>- Nipple position, size and shape.</li> <li>- Respiration rate, rhythm, effort and depth,</li> </ul> </li> <li>2-Inspect neck and trapezius muscle development.</li> <li>3- Skin color.</li> <li>4- The anteroposterior diameter.</li> <li>5- Accessory muscle use.</li> <li>6- Nails beds and clubbing nail.</li> <li>7- Position of the trachea.</li> </ul>		
<b>Posterior Chest</b>		
<b>PALPATION</b>		
<ul style="list-style-type: none"> <li>1- Assess any tender areas, masses, temperature, moisture, texture and crepitus.</li> <li>2- Test chest expansion-at the level of T9 or T10.</li> <li>3- Tactile fremitus- repeat “1 – 2 – 3” or “99”.</li> </ul>		
<b>percussion</b>		
<ul style="list-style-type: none"> <li>1- Symmetry.</li> <li>2- Normal sound and location.</li> <li>3- Abnormal sound and location.</li> <li>4- Diaphragmatic excursion.</li> </ul>		

<b>Auscultation</b>		
1- Symmetry. 2- Normal breath sound, location and I:E. 3- Abnormal breath sound and location		
<b>Anterior chest</b>		
<b>palpation</b>		
1- Assess any tender areas, masses, temperature, Moisture, texture and crepitus. 2- Test chest expansion-at the level of costal margin. 3- Tactile fremitus- repeat “1 – 2 – 3” or “99”.		
<b>Percussion</b>		
1- Symmetry. 2- Normal sound and location. 3- Abnormal sound and location.		
<b>Auscultation</b>		
1- Symmetry. 2- Normal breath sound, location and I:E. 3- Abnormal breath sound and location.		
Documentation.		

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

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

Name and Signature of Faculty

Total grade \_\_\_\_\_

**Terminology:**

**Scoliosis:** is a medical condition in which a person's spine is curved from side to side.

**Kyphosis:** is a condition of over-curvature of the thoracic vertebrae (upper back).

**Lordosis:** is a condition of over-curvature of the lumbar vertebrae (lower back).

**Funnel chest:** congenital deformity of the anterior wall of the chest, in which several ribs and the sternum grow abnormally. This produces a caved-in or sunken appearance of the chest.

**Pigeon chest:** is a deformity of the chest characterized by a protrusion of the sternum and ribs.

**Kussmaul's breathing:** deep and laboured breathing, often associated with severe metabolic acidosis.

**Cheyne-Stokes' breathing:** progressively deeper breathing followed by temporary apnea, which may occur with heart failure, cerebrovascular accident.

**Trapezius muscle:** is a large superficial muscle that extends longitudinally from the occipital bone to the lower thoracic vertebrae and laterally to the spine of the scapula (shoulder blade).

**Barrel chest:** a rounded, bulging, almost barrel-like appearance of the chest that occurs as a result of long-term over inflation of the lungs.

**Costal margin:** is the lower edge of the chest (thorax) formed by the bottom edge of the rib cage.

**Empyema:** is a collection of pus in the space between the lung and the inner surface of the chest wall (pleural space).

**Pleural effusion:** excess fluid in the pleural space.

**Consolidation of the lungs:** is a condition whereby the lung tissues solidify because of the accumulation of solid and liquid material in the air spaces.

**Pneumothorax (collapsed lung):** is an abnormal collection of air or gas in the pleural space that separates the lung from the chest wall and which may interfere with normal breathing.

**Tactile Fremitus:** a palpable vibration Sounds generated from the larynx are transmitted through patent bronchi and through the lung parenchyma to the chest wall where vibrations can be felt.

**Crackles:** are discontinuous, explosive, "popping" sound produced by accumulation of secretion within the airway, collapse edema in surrounding pulmonary tissue.

**Wheezing:** is a high-pitched whistling sound during breathing. It occurs when air moves through narrowed breathing tubes.

**Stridor:** is an abnormal, high-pitched, musical breathing sound caused by a blockage in the throat or voice box (larynx). It is usually heard when taking in a breath

Links:

Breath sounds:

<http://www.youtube.com/watch?v=iizkdnIND84&feature=share&list=PLz27Rlp3y6Xt5VhIYamPYDooNDXG1Boxb&index=36>

Kussmaul's breathing:

<http://youtu.be/0YJxz-Sxx90>

Cheyne-Stokes' breathing:

[http://youtu.be/6\\_kxzDyV6J8](http://youtu.be/6_kxzDyV6J8)

Respiratory assessment:

<http://www.youtube.com/watch?v=W05VubK454M&feature=share&list=PLED6A4FC5E175A62E>