

**DEPARTMENT OF PHYSIOTHERAPY
C.S.J.M. UNIVERSITY, KANPUR.**

FIRST MID SEMESTER EXAMINATION

**MPT (Cardiopulmonary)
Cardiopulmonary disorders & management-I (MPT 303 C)
Semester: 2022-23 (Odd Sem)**

Model Answers

1, Section A

- a. Apnoea
- b. Rate of perceived exertion
- c. Quincke's
- d. Cyanosis
- e. Pulsus alterans
- f. Pectus carinatum
- g. Left, fifth
- h. Mitral

2. Section B

- a. Mediastinal shift

Ans: Mediastinal Shift:

It is a technique of palpation in cardiorespiratory assessment. Mediastinum is the central space between two lungs. In pathological state it may get deviated.

Technique to perform the mediastinal shift

Use the index finger to feel the trachea and to determine whether the trachea feels central or is deviated:

The trachea is deviated away from pneumothorax and effusion and towards collapse and consolidation.

The trachea may also be deviated by a mass - eg, enlarged lymph nodes.

- b. Grades of Pitting oedema

Ans: Oedema refers **to swelling caused by excess fluid**. When swollen skin remains indented after being pressed, this is called pitting edema.

Grade +1: up to 2mm of depression, rebounding immediately.

Grade +2: 3–4mm of depression, rebounding in 15 seconds or less.

Grade +3: 5–6mm of depression, rebounding in 60 seconds.

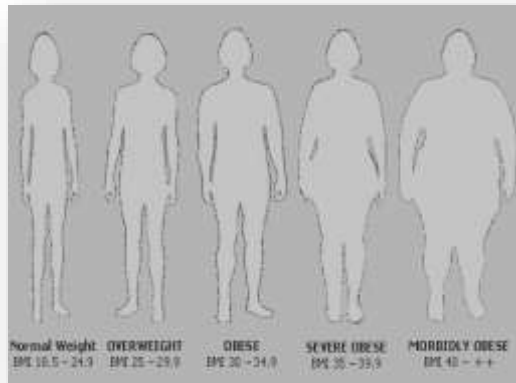
Grade +4: 8mm of depression, rebounding in 2–3 minutes.

- c. BMI classification

Ans: BMI is Body mass Index. It is calculated with the following formula

$$\text{BMI} = \text{Weight (Kg)} / \text{Height}^2 (\text{m}^2)$$

BMI classification



3. Section C

a. Auscultation of chest

- Ans. Heart sounds:

First heart sound S_1

- "LUB" is produced by the reverberation of ventricular blood caused by the closure of the AV (mitral and tricuspid) valves at the beginning of systole. Although it is seldom audibly obvious, mitral valve closure comes before tricuspid valve closure (higher pressure on the left side).
- Occurs shortly after the the QRS and indicates the beginning of ventricular contraction.
- Precedes carotid pulse .
- Best heard at the apex.
- Is a high frequency sound.
- Hard to hear a split (mitral preceding tricuspid closure).

B. Second heart sound S_2

- "DUB" is Produced by reverberations of the pulmonary artery and aorta caused by closure of aortic and pulmonic valves.
- Occurs after S_1 .
- Aortic valve closure comes before pulmonic valve closure.
- It occurs just after the T wave of the EKG.
- Normally splits during inspiration as the blood is sucked into the right heart (not only is air sucked into the chest during inspiration but also blood) delays closure of PV, so PV separates from AV and occurs later in time.
- Best heard at the base of the heart.
- Shorter and sharper and of higher frequency than S_1 .

Breath sounds:

- ✓ over each of the five lobes of the lungs in turn, on the front and back of the chest. Ask the patient to take deep breaths.
- ✓ Normal breath sounds are described as quiet and gentle.
- ✓ Rhonchi :
 - Musical sound heard on expiration. In severe cases they may be both inspiratory and expiratory. Imply narrowing of the airways.
 - The loudness of rhonchi gives no indication of the severity of the condition.

- ✓ Wheeze
- ✓ Rales (sometimes called crackles)
 - Probably represent opening of small airways and alveoli.
 - They may be normal at the lung bases if they clear on coughing or after taking a few deep breaths.
 - Basal rales are a classical feature of pulmonary congestion with left ventricular failure. They may be more diffuse in pulmonary fibrosis.
- ✓ Bronchial breathing:
 - The sounds of bronchial breathing are generated by turbulent air flow in large airways (similar sounds can be heard in healthy patients by listening over the trachea.
 - Sounds are harsh and poor in nature. Unlike normal vesicular breath sounds, there is a gap between the inspiratory and expiratory phase sounds.
 - Bronchial breathing suggests consolidation or fibrosis, which permits the sound to be conducted more effectively to the chest wall.
- ✓ Pleural rub: a creaking sound caused by stiff pleural membranes such as with pleurisy.
- ✓ Stridor: harsh inspiratory sound caused by partial obstruction of a large airway.
- ✓ Vocal resonance:
 - Place the stethoscope at various levels over the back and ask the patient to whisper "ninety-nine" each time. Note how well the sound is transmitted.
 - The sound is muffled over a normal lung, increased if there is consolidation and decreased or absent if there is effusion or collapse.
- ✓ Whispering pectoriloquy:
 - Is elicited as for vocal fremitus but ask the patient to whisper "one, two, three".
 - Whispering pectoriloquy is the increased quality and loudness of whispers that are heard with a stethoscope over an area of lung consolidation

b. Observation in pulmonary assessment

Ans The following things should be observed while assessing a pulmonary patient

- Level of consciousness
- Body type
- Skin:
 - ✓ Cyanosis (Central or peripheral)
 - ✓ Pallor
 - ✓ Scaring,
 - ✓ Bruises
 - ✓ Erythema
- Facial signs or expression:
- Jugular vein engorgement:
- Pattern of breathing:
 - Abdominothoracic or thoracoabdominal/
 - 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 disease, head injury, carbon monoxide

poisoning or brain tumours, or be a normal variant during sleep or at high altitude.

- Paradoxical chest movement may indicate a fractured rib.
- Pursed lip
- Upper chest use? Use of secondary muscles
- Hyp/hyperventilation

- Swelling:

- Clubbing:

- Chest Wall Configuration:

Normal shape of the chest can be observed by the diameter of anterior and lateral views, where the ratio of diameter between anterior and lateral measurement should be more than 1.0.

- Mobility:

- External equipments/ lines/ drains:

Evidence of respiratory distress

- breathlessness,
- talking in short phrases rather than full sentences,
- use of accessory muscles
- exhalation with pursed lips.