

MANUAL CHEST THERAPY – TREATMENT DEFINITIONS

1. RATIONALE

Manual chest therapy is time consuming, labour intensive treatment requiring significant skill and strength on the part of the therapist and the mental and physical cooperation of the patient.

Manual Chest Therapy is designed to:

- Improve the mobilisation of bronchial secretions (1-8)
- Match ventilation and perfusion (9-13)
- Normalise functional residual capacity (14-21)

These outcomes are based on the effects of gravity and external manipulation of the thorax. This includes turning, postural drainage, percussion, vibration and cough.

2. TURNING

Turning is the rotation of the body around the longitudinal axis to promote unilateral or bilateral lung expansion (9,12) and improve arterial oxygenation (9-11,22). Regular turning can be to either side or the prone position (23) with the bed at any degree of inclination (as indicated and tolerated). Patients either turn themselves, are turned by the therapist or using a special bed or device (11,12,24-26).

3. POSTURAL DRAINAGE

Postural drainage is the drainage of secretions by the effect of gravity, from one or more lung segments to the central airways where they can be removed by cough or mechanical aspiration (1-3,7,8,14,17,20,27-29,30,31). Each position consists of placing the target lung segment(s) superior to the carina. Positions are generally held for 3-15 minutes but may be held for longer in particular situations (2,7,8,10,20,29,32-35). Standard positions are often modified by the therapist depending on the patient's condition and tolerance.

4. PERCUSSION

Percussion involves the external manipulation of the thorax. It is also referred to as cupping, clapping, and tapotement. The purpose of percussion is to intermittently apply kinetic energy to the chest wall and lung. This is accomplished by using a cupped hand (Figure 1) with rhythmical flexion and extension action of the wrist.

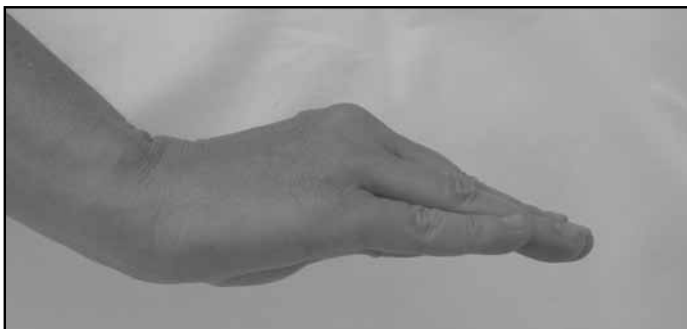


Figure 1.

Cupped hand position
adopted during percussion

The force of percussion should be adapted to suit the individual. The technique is often done with two hands but, depending on the lung segment(s) being drained, it may be more appropriate to use one hand. No conclusive evidence demonstrates the superiority of one method over the other (2,8,36-39). To minimise the risk of desaturation in patients with moderate or severe lung disease, it is recommended that percussion is performed in 15-20 second 'bursts' with pauses for 5 seconds or longer between bouts (40).

4. VIBRATION

Vibration involves the application of a tremorous action over the area being drained. This is performed by manually pressing with both hands (Figure 2) in the direction of the normal movement of the ribs during expiration. The vibratory action may be coarse or fine. No conclusive evidence supports the efficacy of vibration or an optimum frequency of delivery (1,2,7,18,19,21,30,33,34,41-43).

Figure 2.
Hand position
adopted during vibration



5. COUGH

A *spontaneous effective cough* is a reflex mechanism utilizing maximum forced exhalation to clear irritants or secretions from the airway. The forced exhalation is preceded by a maximal inspiratory effort followed by closure of the glottis. Contraction of expiratory muscles produces increased intrathoracic pressures against the closed glottis, which culminates in an explosive release of gas at high velocity as the glottis opens (44).

Directed cough seeks to mimic the attributes of an effective spontaneous cough to help to provide voluntary control over this reflex and to compensate for physical limitations. For example; by increasing glottic control, inspiratory and expiratory muscle strength, coordination, and airway stability (44).

Forced Expiratory Technique (FET), also known as "huff coughing," consists of one or two huffs (forced expirations) from mid-to-low lung volumes with the glottis open followed by a period of relaxed, controlled diaphragmatic breathing (44). The process is repeated until maximal bronchial clearance is obtained. It can be reinforced by self-compression of the chest wall using a brisk adduction movement of the upper arms.

Manually assisted cough is the external application of mechanical pressure to the epigastric region or thoracic cage coordinated with forced exhalation (44).

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