

Physiotherapeutic Management in Thoracic Surgery

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M. Ibrahim and Mehboob-ur-Rehman, Physiotherapists, Lady Reading Hospital, Peshawar state that the aim of physiotherapy is (1) to relieve the spasm of bronchi and bronchioles and thus facilitate normal breathing and easy expectoration, (2) to improve the blood circulation of legs so as to prevent venous thrombosis and (3) to maintain joints mobility and prevent postural defects.

There are two methods for the clearance of lung secretions :- (a) different drugs taken either orally or by inhalation and (b) physical means such as different type of manual breathing exercises and use of Continuous Positive Airways Pressure and Bubble Bottle exercises as low cost physiotherapy.

Continuous Positive Airways Pressure (C.P.A.P.) Breathing Exercises are used for thoracic surgery cases specially in haemothorax or pneumo-haemothorax where good expansion of the lungs is needed or in conditions where lungs are not fully expanding: reasons may be psychological or mechanical due to pain. The *apparatus* is a simple one: oxygen or mixed air cylinder with a flow meter, an input tube to the mask (which is to be put on the patient's mouth), an outgoing tube from the mask to a 4 litre balloon and then a connecting tube to be dipped in a 15 inches water bottle which provides resistance. To start with the treatment, 10-20 L oxygen is required which is noted from the flow meter. The mask is tight enough on the patient's mouth and the output tube dipped enough in the water bottle. This treatment is continued for 3-6 minutes, the bubble sounds are listened intermittently during expiration phase and the filling of balloon the same way. Breathing is also controlled by the patient to some extent voluntarily. Thus oxygen or mixed air is given positively to promote lung expansion. In some conditions where tracheostomy has been performed, it is easily done by just using a connector to the tracheostomy tube instead of using a mask. It promotes lung secretions to be expelled which are then easily taken out by using a suction machine.

C.P.A.P. is *indicated* :- (1) in chest surgery cases: the aim is to get good expansion of the lungs; in haemothorax or pneumo-haemothorax it is much valuable if chest drain is applied as it helps in drainage as well as expansion of the lungs; (2) in laparotomy cases, to loosen and expel the secretions when lower lobes of the lungs are not fully expanding due to pain as the patient prefers to

each short and shallow; (3) in respiratory muscle paralysis and crushed chest; (4) in respiratory distress syndrome; (5) in general rehabilitation of the patient by providing enough oxygen to the lungs and taking out the patient from hypoxia.

C.P.A.P. is *contraindicated* where lung segments are sutured or the airway ruptured somewhere as C.P.A.P. may re-open the lung sutures; C.P.A.P. is also contra-indicated in pulmonary oedema. Pure oxygen use is to be avoided because it saturates the breathing centre. Compressed air or nitrous oxide and oxygen combination is to be used.

Bubble Bottle Exercises : (alternate cheaper device). A 2-3 litre bottle containing water and a tube (of the length from the patient to the bottle), which is to be inserted in the water bottle, make a simple arrangement called Bubble Bottle; one can use infusion set tubes for this purpose. The patient is given one end of the tube while the other end is dipped in water. He is asked to take a deep breath-in through his nose and a long blow-out through his mouth.

Manual Breathing Exercises : Position of the patient is crook or half lying. The physiotherapist places his own or the patient's hand over the part he wishes to expand: on the diaphragm in the costal angle for *diaphragmatic* exercises; over the upper or lower ribs at the front or sides of the body for *costal* and *intercostal* exercises; over the apices of the lungs just above the clavicles for *apical* exercises; and just below the clavicles for *pecto-apical* exercises. The patient is told to draw in the muscles when breathing-out and push them away when breathing-in. These exercises are to be practiced by the patient under the supervision of the physiotherapist.

Physiotherapist pays attention not only to the chest and limbs but also to the feet in prevention of pressure sores. Passive movements of all the limbs are carried out at least once a day to prevent the development of contractures and also to reduce the occurrence of deep vein thrombosis.