PHYSIOTHERAPY IN THE MANAGEMENT OF INJURIES TO THE CHEST†

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Die rol van die fisioterapeut in die hantering van 'n onstabiele ("flail") toraks, hoë trompsnelheidswonde en veral in die intensiewe sorgeenheid word beskryf. Haar bekwaamheid in die hantering van 'n nood toestand, die voorkoming en behandeling van komplikasies, en finale rehabilitasie van die pasiënt is van innerste belang.

The purpose here is to outline the place of physiotherapy in the pre-operative preparation and post-operative or post-traumatic care of injuries and high velocity wounds of the lung.

In the context of intensive care the physiotherapist is part of a team which includes doctors and nurses. Her activities must be dove-tailed to suit the requirements of team work which has as its aim the effective management of seriously ill patients. The physiotherapist who treats such patients must be aware of the significance of monitors, intravenous therapy, intercostal drainage and ventilators and modify her approach to the patient so as not to disturb these impedimenta. She should be able to precisely register the base lines of monitored parameters at the commencement of treatment and recognise and record changes in these induced by her activities. Nearly all the duties of a nurse in the intensive care area are shared by the physiotherapist. If the physiotherapist, by her activities, induces an emergency it is she who is required to reverse the state of acute disequilibrium. A dislodged tracheostomy tube, an electrocardiograph electrode detached, an intravenous drip dislodged, a respirator that fails during a brief period of detachment for the purpose of bronchial toilet in relation to physiotherapy are all examples of minor but real emergencies, without danger to the patient if properly rectified by an expert and which it may well be the function of the physiotherapist to rectify.

The prime purpose of physiotherapy is the restoration of every normal function and range of movement. However, even minor additional demands on the patient's capacity for exertion may tip the balance between respiratory and cardiac equilibrium and failure. The physiotherapist therefore must be able to recognise the clinical features of failure of the patient to be able to cope with an increase in demand. Major dysfunctions such as cardiac arrest may occur coincidentally during, or be induced by, properly graded physiotherapy so that it becomes the duty of the physiotherapist to initiate treatment while doctors and nurses are summoned. The alert and informed physiotherapist with trained hands and familiar with the use of a stethoscope should be the first to recognise and nearly always, by appropriate action, be able to abort bronchial obstruction from mucus or other foreign material, thereby avoiding the need for therapeutic bronchoscopy, which in some cases may endanger life.

Pulmonary embolism is usually an event of later convalescence, and is rare in the early post-operative period, but nonetheless is not uncommonly precipitated by an increase in activity under the control of the physiotherapist, who must be aware of the possibility, recognise the peripheral manifestations of venous obstruction and clinical features of minor or acute massive pulmonary embolism and take the necessary immediate action. Neither is an indication for the physiotherapist to abandon the patient. Nothing demanded of a nurse in an emergency is out of the province of a physiotherapist.

The approach of the physiotherapist to the patient in physical pain and mental shock, who finds himself suddenly in strange surroundings, is of utmost importance. There is no place for the inefficient, uninformed physiotherapist. Whatever the injury, treatment must be carried out with confidence, firmness and kindness.

FLAIL CHEST

The patient with gross degrees of flail chest is usually managed by intermittent positive pressure ventilation. Augmented inflation either by interruption of the ventilator or by use of the Ambu Bag can simulate sighing and coughing, and if the physiotherapist adds fine vibrations, without pressure, to each quadrant of the chest in turn, the proximal flow of secretions is assisted. Provided there are no abdominal injuries, forced expiration is facilitated by gentle pressure on the abdominal wall, which elevates the domes of the diaphragm. Precisely timed suction by an assistant completes the purpose of the exercise. In consideration of the patient's comfort, the drip should be knocked from the tip of the suction catheter before insertion. The patient is turned from one half lateral position to the other at least every two hours and physiotherapy is timed to coincide with changes in the position. Pleural drains and other injuries may modify access and mobility. The physiotherapist plays an important role in weaning the patient from the ventilator. The patient is made consciously aware of the rhythm of the respiration by manual pressure on the chest by the physiotherapist, with vocal encouragement to breathe in and out rhythmically, which is stimulated during increasing periods of detachment from the ventilator. The spontaneous rhythm of normal respiration is seemingly forgotten and patients need constant encouragement to relearn this. It is the function of the physiotherapist to teach them, and ultimately break their dependence on the ventilator.

HIGH VELOCITY WOUND

The management of the high velocity wound is concentrated initially on the complications as they arise, for example, pneumothorax and haemopneumothorax, then on pre-operative preparation and finally post-operative care. It is of utmost importance and vital to the patient's general well-being that the lungs should function as efficiently as possible. The patient is trained in respiratory exercises and to cough effectively. It is necessary to train the average patient to increase costal ventilation as well as the range of diaphragmatic ventilation and to co-ordinate these. In this training the hemithoraces are halved transversely, and to encourage movement of the basal half of each hemithorax the physiotherapist places her hands, fore and aft, over the lower ribs of one side and the patient consciously and actively expands that quadrant by deep inspiration. In order to encourage deeper inspiration and the move-

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ment of mucus, pressure with vibrations and shaking is applied by the physiotherapist to prolong exhalation. If performed in side lying, excursion of the hemithorax, not being selectively exercised, is limited. Expansion of each quadrant is similarly and independently encouraged, especially in the posterior basal and apico-lower segments which in the recumbent patient are subjected to constant pressure against the pillows and in which, because of diminished movement and retained secretions, infection commonly commences.

Training in coughing is also a necessary part of both treatment and pre-operative preparation. Coughing is a strenuous and painful exertion but necessary in order to clear bronchi of mucus and perhaps blood. The technique of coughing can be improved and trick movements taught which diminish effort and strain on the incision. During the period of observation until the final extent of the damage is known there is ample time for both to be accomplished efficiently. The propulsion of bronchial mucus to a level at which it can be expectorated is often difficult, and unless there is a bacteriological reason for a specimen to be made available, it is of no consequence if mucus is swallowed. Physiotherapy in post-operative care will depend on the operative procedure undertaken.

In conclusion, these techniques can be adapted for any thoracic surgical procedure and the aims of physiotherapy in the treatment of any injury to the chest include the maintenance of clear airways and maximum lung function, the prevention and treatment of complications, and the final rehabilitation of the patient to normal life.