

## **REVIEW ARTICLE**

# **Non-Respiratory Aspect Of Physiotherapy For The Critically Ill Patient**

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Physiotherapy provides both therapeutic and prophylactic intervention for the critically ill patient. The specific goals relate first to the attainment of optimal cardiopulmonary function and secondly to the attainment of optimal musculo-skeletal and neurological function. In addition the physiotherapist helps prevent the multitude of side effects of immobility and confinement to bed. Though primary goals are focused in cardio-respiratory functions, it is important to remember that promoting optimal function of the patient as a whole is equally important. In this chapter we will discuss the non-respiratory aspect of physiotherapy management in the I.C.U.

Physiotherapy treatment in the I.C.U. is selected in a goal-oriented manner. Unlike other patient care areas, the frequency depends on the patients specific treatment goal, the aggressiveness of treatment indicated, interfering related problems, patient co-operation and tolerance for the treatment prescribed. Although dynamic exercises over prolonged period of time is not an immediate priority in the I.C.U. the physiotherapist needs to assess the patient's tolerance with respect to duration, intensity and frequency of treatment.

Physiotherapy treatment in the I.C.U. is prudently selected, and the frequency of treatment may range from one to several treatments daily. These include:

### **MOBILISATION**

To help prevent sequelae of bed rest, maximum patient mobility is initiated in the I.C.U. This may be done by:

- 1) Positioning.
- 2) Passive Exercises.
- 3) Active Assisted Exercises.
- 4) Active Exercises.
- 5) Strengthening Exercises.
- 6) Sitting and early ambulation.

Passive Positioning is necessary to maintain normal joint and muscle ranges. This also helps to avoid soft tissue and vascular changes seen with prolonged bed rest. When spasticity is present, the supine position is known to increase extensor tone.<sup>1</sup> Side lying has been found to diminish this abnormal tone.<sup>2</sup> Footboards can prevent plantar-flexion contractures, especially beneficial for patients with peripheral nerve injuries or complete spinal cord lesion. Ankle casting can be used to maintain or regain functional joint position and may decrease abnormal muscle tone. Ankle splint is another means by which joint support is achieved. Positioning can be achieved for the upper extremity by using arm boards and resting arm splints. Guttman<sup>3</sup> states that upper extremity contractures involving shoulder adduction and forearm pronation can be prevented in patients with spastic lesions of C5 and above. This is achieved by proper positioning of the arm in shoulder abduction and supination in the initial weeks following injury.

Decubitus ulcer formation can be easily prevented by frequent turning and careful positioning.

Passive Exercise are given when the patient is unable to actively participate in the exercises. The role of passive exercises is to improve:

- 1) Range of motion.
- 2) Tissue healing.
- 3) Decrease pain and edema.
- 4) Prevent atrophy of muscles.
- 5) Prevent contractures or changes in the periarticular and intrarticular tissue. The continuous passive motion machine (CPM) is used to improve range of motion and tissue healing, as well as decrease pain and edema following joint replacement or repair. 4.

Once the patient is able to actively participate in the exercises, active assisted and active exercises are encouraged. Active exercises are the most important means of stimulating circulation. The incidence of post-operative thromboemboli can be prevented by foot, knee and hip exercise carried out in full range.

Besides the above mentioned effects, these exercises help to increase both cardiovascular and respiratory functions. Repetitive exercises increase strength and endurance. However, they are not carried out in patients requiring high levels of FIO and PEEP with mechanical ventilation. These patients can perform simple active exercises and functional activities such as rolling and positioning. Strength may be improved further by resisted exercises and these can be achieved by giving manual resistance or with the help of weight or pulleys. If edema is present antigravity exercise and pressure garments are helpful.

Sitting: Patients in I.C.U. are encouraged to assume the sitting posture either independently or with assistance. Patients can be passively positioned even during mechanical ventilation.

Patients with spinal cord transections often exhibit hypotension when sitting is initiated due to loss of sympathetic control. This can be minimized by wrapping the lower extremities with elastic bandages from toe to groin before moving the patient. Appropriate braces or corsets can be used to provide trunk or abdominal support. To reduce the ischial pressure weight, shifting from side to side should be taught. Another means is to start chair push ups, as these help to strengthen the upper extremity.

Ambulation: Ambulation is encouraged as soon as possible as this diminishes the need for vigorous chest physiotherapy. Spontaneous coughing is achieved following exertion, and it improves breath sounds. Early ambulation is good form of prophylaxis against post operative secretion retention. Some of the walking aids are crutches and walkers.

Self care: To promote self care as much as possible e.g. grooming, washing, feeding, dressing, bed arrangement, access to tissue paper, water and call button.

Transcutaneous Nerve Stimulator (T.N.S.): A useful device to relieve pain in the I.C.U. The T.N.S. is the application of an electric current through the skin to the peripheral nerves, for control of episodes of acute pain. In each instance the nerve impulse carrying pain from peripheral areas are blocked, thus relieving pain. Management of the dying patient : The dying patient and his or her family have special needs that must be included in and in fact constitute an integral part of patients overall care. Compassion, understanding and respect for the patient and his family must be forthcoming from the I.C.U. team. If support systems are being continued the physiotherapist may provide treatment to keep the patient as comfortable as possible. Conservative prophylactic chest care may be provided to reduce the work of breathing. Treatments are kept to a minimum in terms of number and duration. Range of

movement exercises help to reduce the discomfort of immobility and facilitate nursing management and basic care of patient.

## SUMMARY AND CONCLUSION

Optimal patient mobility can be achieved without interruption of monitoring or life sustaining equipment. To minimize the detrimental effects, chest physiotherapy, passive range of motion, postural changes and active exercises can be incorporated into the care of the critically ill patient. These methods not only counteract the complications but also decrease rehabilitation time and thus minimize the total hospital stay of the patient.

## REFERENCES

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