



PHYSICAL THERAPY MANAGEMENT OF PATIENTS IN THE ICU




INTENSIVE CARE UNIT



Breathing Machine (Mechanical Ventilator)

- A breathing machine helps the patient breathe.
- It is designed to help patients who cannot breathe adequately on their own.
- The breathing machine does not fix any problems of the lungs

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- It is a device that simply pushes air and oxygen into the lungs and withdraws carbon dioxide from the lungs. The lungs must function in order for the breathing machine to be effective.

Breathing Bag (Manual Resuscitator)

- A breathing bag is a device used to temporarily help a patient breathe.
- When a patient needs help breathing, a respiratory therapist, physiotherapist, doctor or nurse places the breathing bag face mask over the patient's mouth and nose.

- The breathing bag is connected to an oxygen source.
- The bag is then squeezed and oxygen is pushed into the patient's lungs.
- If the patient has a breathing tube in place, the breathing bag may be directly connected to the breathing tube.



Bi-Level Positive Air Pressure BIPAP

- The BIPAP machine is a specific type of breathing machine that helps the patient breathe.
- It is a small, bedside respiratory machine connected to tubing and a facemask worn by the patient.
- The BIPAP machine does two things - it helps push air into the lungs and helps hold the lungs open to allow more oxygen to enter the lungs.



BIPAP

- It is used during noninvasive positive pressure ventilation.
- It delivers a preset inspiratory positive airway pressure (IPAP) during inspiration and expiratory positive airway pressure (EPAP).

Continuous Positive Air Pressure Machine (CPAP)

- CPAP is a type of breathing machine that is designed to help oxygen enter the lungs.
- CPAP does not breathe for the patient. CPAP does help hold the lungs open to allow more oxygen to enter the lungs.

- The CPAP machine is connected to tubing and a facemask worn by the patient.
- CPAP is the use of continuous positive pressure to maintain a continuous level of positive airway pressure in a spontaneously breathing patient.

CPAP



Primary Cardiopulmonary Dysfunction in the ICU:

1. Respiratory failure
2. Heart Failure
3. Cardiac Surgeries
4. Thoracic Surgeries

Secondary Cardiopulmonary Dysfunction :

1. Burns
2. Head Injuries
3. Musculoskeletal Trauma
4. Neuromuscular Dysfunction
5. Acute Spinal Cord Injury
6. Renal Failure
7. Complicated General Surgeries

- Patient Referral:
- Patient Assessment:

PHYSICAL THERAPY GOALS

1) Improve / Maintain Normal or Baseline Ventilation and Oxygenation.

- a) Clearance of Airways
- b) Improve Chest Expansion
- c) Improve Breath Sound
- d) Improve Cough Effectiveness
- e) Improve Breathing Pattern

Goals cont:

2) Improve / Maintain Musculoskeletal System within Functional Limit.

- a) Improve ROM
- b) Improve Muscle Strength and Endurance
- c) Prevent Joint Deformities and Contractures

Goals cont:

3) Improve Circulatory System Function

- a) Prevent DVT
- b) Prevent Swelling

4) Improve / Maintain Neurological System and Cognitive Status within Functional Limits.

5) Improve / Maintain Level of Functional Status within Patient's Tolerance.

General Guidelines

1. Monitor physiological responses such as heart rate, blood pressure, respiratory rate and oxygen saturation at all times.
2. The physical therapist should be aware of effects of positioning and mobility of the patient on the various monitoring devices and their readings.
3. The physical therapist should always deal with the patient as if he/she were conscious and awake even if the patient appears not to. This may help to relax the patient and decrease patient anxiety and possible subsequent increase in muscle tone.
4. Frequency and intensity of treatment sessions will be determined by patient condition, but should generally be at least twice a day.

5. Treatment should be carried out at least 1 1/2 hrs after feeding time.
6. The physical therapist must be aware of patient's medication , relevant laboratory test results, patient's management by other health care team, and patient's / family concerns.
7. The physical therapist should be familiar with all ICU equipment.

Pulmonary System

INTUBATED PATIENTS: (endotracheal tube or tracheostomy) unconscious :

1. Pre-treat with bronchodilator
2. Modified postural drainage positions
3. positioning for relaxation, decreased dyspnea and improved ventilation and oxygenation are with the head of the bed elevated to 30 degrees and lying on well aerated lung.

If there are no other contraindications, then the following should be done by two therapists:

- a) manually hyperventilate the patient using the "ambo bag" and hyperoxygenate using 10-15 L O₂; if the patient who can't be taken off ventilator, set the ventilator FIO₂ 100%)
- b) Use pulmonary hygiene techniques to mobilize secretions.
- c) Endotracheal suctioning to clear retained secretions.

Conscious patient

Proceed with the same procedures done with the unconscious patient, and then encourage the following:

1. Independent efforts of inspiration and coughing
2. Coordinate upper extremities mobility with inspiration and expiration to improve lung expansion

EXTUBATED OR NON-INTUBATED PATIENTS

1. MPD position, head side elevated to 30 degrees followed by
2. Pulmonary hygiene techniques to mobilize secretions., facilitate deep breathing to increase lung volume and increase thoracic expansion.
3. Use tracheal tickle technique to elicit a cough, or nasopharyngeal suctioning to clear the retained secretions

4. If the patient has a tracheostomy, then manually hyperventilate and hyperoxygenate the patient before suctioning.
5. Side lying is the best positions to improve oxygenation and ventilation.

Conscious

1. MPD then encourage the patient to perform effective coughing and huffing to clear retained secretions.
2. If cough is non-effective and productive, then nasopharyngeal suctioning is required
3. Restrictive lung disease, teach patient segmental, sustained maximal inspiration, diaphragmatic breathing exercises.
4. COPD pursed lip breathing exercises.

Musculoskeletal System**Unconscious**

To avoid contractures and deformities, concentrate on the following:

1. Passive ROM of upper and lower extremities including prolonged stretching.
3. Proper positioning for all joints of the body

Conscious

In addition to above:

1. Active, active assistive ROM of upper and lower extremities.
2. Strengthening exercises of upper and lower extremities

Circulatory System**Unconscious**

- To prevent DVT, swelling or edema, concentrate on the following:
- PROM, elastic crepe bandage, compression unit, limb elevation and ankle pumping.
- Use ice pack to decrease swelling.
- Encourage active exercise of all extremities and trunk. (in conscious pt)

Neurological System, Cognitive and Functional Status

Unconscious (GCS below 9 + Rancho los Amigos cognitive scale below level 4)

Work with the patient to reach the next higher cognitive level and increase level of arousal and response using different familiar auditory, visual, tactile and proprioceptive stimuli.

Careful documentation should be kept on any response observed and type of stimuli used as well as their frequency, duration and intensity.

Patient should be in the upright position as soon as possible by :

1. raising the head
2. using the tilt table
3. transferring patient to the high chair
(to prevent osteoporosis, to improve lung function, to increase the environmental interaction, and to provide stress on the cardiovascular system)

Conscious (or Patient regaining consciousness)

- Treatment activities should be kept simple and automatic to succeed with most tasks.
- use of a task-oriented approach
- Work according to the patient's attention span.
- Rest periods must be provided frequently for the patient during the treatment session.

THANK YOU