Positive Expiratory Pressure (PEP) Therapy

Purpose

To standardize the use of Positive Expiratory Pressure (PEP) mask therapy, a bronchial hygiene technique used for secretion mobilization.

Scope

Respiratory Care Services utilizes PEP therapy, per physician order, as a bronchial hygiene technique and in the treatment and prophylaxis of postoperative pulmonary atelectasis.

Accountability/Training

PEP therapy may be administered by a Licensed Respiratory Care Practitioner trained and checked off in the proper procedure with an understanding of age specific requirements of the patient population treated.

Physician's Order

- Order for PEP Therapy.
- Frequency of PEP Therapy.

Indications

- Patients with chronic pulmonary conditions, such as Cystic Fibrosis and Chronic Bronchitis, which predispose them to large volume sputum production.
- To reduce air trapping in asthma and COPD.
- To optimize delivery of bronchodilators in patients receiving bronchial hygiene therapy.

Contra-indications

- Patients who are uncooperative and will not comply with therapy.
- Patients with a history of epistaxis (only if PEP used with mask).

Although no absolute contraindications to the use of PEP therapy have been reported, the following should be carefully evaluated before a decision is made to initiate mask therapy:

- Patient unable to tolerate the increased work of breathing (acute asthma, COPD)
- Intracranial pressure (ICP) > 20 mm Hg.
- Hemodynamic instability
- Recent facial, oral, or skull surgery or trauma
- Acute sinusitis
- Epistaxis
- Esophageal surgery
- Active hemoptysis
- Nausea
- Known or suspected tympanic membrane rupture or other middle ear pathology
- Untreated pneumothorax

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Possible Hazards/ Compli-cations

- Increased work of breathing that may lead to hypoventilation and hypercarbia.
- Increased intracranial pressure.
- Cardiovascular compromise.
- Myocardial ischemia
- Decreased venous return
- Air swallowing, with increased likelihood of vomiting and aspiration.
- Claustrophobia.
- Skin break down and discomfort from mask.
- Pulmonary barotrauma.

Equipment

- Clear Anesthesia Mask (or mouthpiece)
- PEP device
- Manometer (calibrated in cmH_20 with O_2 connecting tubing).
- Optional - hand held nebulizer with large hose tubing adaptor.
- Optional - nose clips (if therapy is to be done with mouthpiece)

Equipment Care

Following each PEP treatment, place PEP equipment in a patient care bag at the bedside. If nebulized bronchodilators are being given in conjunction with PEP, the PEP equipment should be rinsed out following each treatment, shaken dry, cleaned with alcohol and placed in the bag at the bedside. The nebulizer should be changed in accordance with RCS's equipment change policy.

Procedure

Step	Action
1	Verify physician order.
2	Wash hands. Verify patient I.D.
3	Collect and assemble equipment. Attach one-way valve on the inspiratory end, resistor on the expiratory end. Connect manometer to assemble. Select largest expiratory resistor setting when initiating therapy.
4	Explain procedure to patient. Have patient sit up straight, preferably at a table, with their elbows resting on the table
5	Instruct patient to place mouthpiece in mouth. If mask is used, apply mask tightly but comfortably over mouth and nose.
6	Instruct patient to take in a breath larger than a normal tidal volume, but not up to Total Lung Capacity.

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Procedure Continued

Step	Action
7	Instruct patient to perform 10-20 breaths as above, then remove mask, and have the patient perform 2-3 HUFF expiratory maneuvers. A Huff maneuver is performed by inspiring a large volume, and exhaling through an open glottis down to mid lung volume. The patient may be instructed to whisper the word "huff" when exhaling.
8	Cough to expectorate raised sputum. Quantify estimated sputum in cc's.
9	This sequence of 10 - 20 PEP breaths, huff, and expectoration should be repeated 4-8 times, for a total PEP session not to exceed 20 minutes.
10	If the patient is on nebulized bronchodilators, they should be given in conjunction with the PEP treatment. Connect the nebulizer directly to the inspiratory end of the PEP assembly, using a large bore adapter. The oxygen tubing for the nebulizer should be disconnected during the Huff maneuvers, so as to conserve medication. Attempts should be made to administer the combined therapy via a mouthpiece (with nose clips), if tolerated by the patient. Some patients have demonstrated that they can successfully mouth breathe and maintain their PEP pressures, without necessitating the use of nose clips. NOTE: Patients using MDI bronchodilators should be instructed to administer the MDI puffs just prior to PEP therapy.
11	Document in EPIC and Treatment Card as outlined in RCS Policies 7.1.1 and 7.1.2.

Discontinuation of Orders

Patients will be evaluated after every treatment. A complete pulmonary assessment will be done every 72 hours as indicated. Based on the assessment, the therapist will make recommendations for changes in therapy or discontinuance as needed.

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Infection Control

Follow procedures outlined in Healthcare Epidemiology Policies and Procedures #2.24; Respiratory Care Services.
http://www.utmb.edu/policy/hcepidem/search/02-24.pdf

References

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