**Intermittent Positive Pressure Breathing**

**Purpose:** To outline the procedure for delivering IPPB.

**Description:** IPPB is a technique used to provide short term or intermittent mechanical ventilation via mouthpiece or mask for the purpose of augmenting lung expansion or delivering aerosol medication.

**Indications:**
1. The need to improve lung expansion in the presence of atelectasis when other forms of therapy have been unsuccessful (incentive spirometry, CPT, positive airway pressure adjuncts).
2. Inability of the patient to clear secretions adequately because of pathology that severely limits the ability to ventilate or cough effectively and failure to respond to other modes of treatment.
3. The need to deliver aerosol medication to the patient described in “number 2”.

**Contraindications/Hazards/Complications:**

**Relative Contraindications**
1. Increased intracranial pressure.
2. Hemodynamic instability.
3. Recent facial, oral, or skull surgery.
4. Tracheoesophageal fistula.
5. Recent esophageal surgery.
6. Active hemoptysis.
7. Nausea.
8. Active, untreated tuberculosis.

**Hazards/Complications**
1. Increased airway resistance.
2. Barotrauma, pneumothorax.
3. Nosocomial infection.
4. Hyperventilation.
5. Gastric distension.
6. Hemodynamic compromise.
7. Air trapping, auto-PEEP, alveolar overdistension.

**Equipment:**
1. IPPB machine (PR-1, PR-2, Piper IPPB device or other).
2. Single patient use circuit.

**Personnel:**
Respiratory Therapy Technician I and II, Respiratory Therapist I and II.

**Procedure (PR-1, PR-2):**
1. Verify physician order for procedure to include medications and frequency.
2. Identify patient by comparing hospital and billing numbers on the armband to those on the physicians’ orders for therapy.
3. Explain procedure to patient.
4. Attach circuit corrugated tubing, expiratory valve line, and nebulizer tubing to IPPB machine. Pressure test the circuit and machine to insure proper function; open up nebulizer control, set inspiratory pressure level, and cycle the machine manually. Block the mouthpiece with a sterile gauze or the sterile circuit package. The machine should cycle off when the preset inspiratory pressure is reached.
5. Aseptically prepare medication as prescribed and insert in the IPPB nebulizer.
6. Instruct patient to:
   a. Purse lips around mouthpiece so air does not leak, keeping the tongue back.
   b. Breathe through the mouth only. Noseclip may be used if necessary. Mask may be used if patient is unable to cooperate with mouthpiece.
   c. Inhale slowly and deeply not letting air “puff” cheeks out. Pause briefly at end of inhalation then exhale.
7. After patient is comfortable with this technique, treatment can begin.
8. Set sensitivity to cycle on with patient’s inspiratory effort.
10. Adjust nebulizer controls to have medication nebulize adequately.
12. When treatment is complete, detach circuit from IPPB machine, discard any excess solution from nebulizer, and place circuit in plastic bag at bedside for use with next treatment.
13. Age appropriate considerations include assessing the patient’s ability to cooperate with a mouthpiece. An appropriate fitting mask may be used if necessary in geriatrics.

Procedure (Piper IPPB System):
1. The Piper IPPB is a single patient use, disposable intermittent positive pressure device for use on adult patients greater than 30 Kg body weight.
2. Tighten all connections upon removal from package.
3. Set the desired inspiratory pressure.
4. Remove the nebulizer reservoir and add desired medication and additional diluent. The nebulizer will typically produce 1 ml/min of aerosol.
5. Connect oxygen tubing to flowmeter and set on greater than 12 Lpm flow.
6. Adjust the pressure and observe manometer for the desired peak inspiratory pressure.
7. Adjust the rate dial so Piper IPPB is set in a spontaneous mode by turning clockwise until the mandatory rate stops.
8. Observe for appropriate chest expansion and aerosol production.
9. After the treatment is finished, shake residual solution from the nebulizer (be careful not to drop baffle component).
10. Place the Piper IPPB unit in a patient setup bag at the bedside. This is a single patient use item and is to be discarded upon patient’s discharge from the hospital.

Infection Control:
1. Standard universal precautions shall be observed at all times.
2. Single patient use items shall be disposed of between patients.
3. IPPB machine will be aseptically cleaned between patients.

References:
1. AARC Clinical Practice Guidelines
2. Burton, Gee, Hodgkin, Respiratory Care 1977
3. Vortran Medical Technology, Inc., Sacramento, CA

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