

HOSPITAL: _____

Respiratory Care Services Policy and Procedure Manual

Policy and Procedure Title:	Bubble CPAP for Neonates
Area: Respiratory Care Services	Performed by: Respiratory Care Practitioners

Policy Number:	Approved by:
	Date:

Current Effective Date	Approved by:
	Date:

Review Date	Approved by:
	Date:

Revised Date	Approved by:
	Date:

POLICY

This policy assures the standardized use of **The B&B Bubbler Water Seal CPAP Valve** that provides a proven method of delivering 0 – 10 cm H₂O continuous positive airway pressure (CPAP) recommended for use with infants weighing < 10 kg.

PURPOSE

The purpose of Bubble CPAP is to deliver an optimal CPAP level for the prevention or alveolar collapse, the recruitment of collapsed alveoli, improved ventilation/perfusion ratios, and to provide adequate arterial oxygenation.

DEFINITION

The **B&B Bubbler** is intended to provide CPAP to spontaneously breathing neonates and infants who require breathing support due to conditions associated with prematurity or other conditions where CPAP is prescribed by a physician.

SPECIFICATIONS AND OPERATION

The B&B Bubbler has an internal overflow chamber which limits the water level to the targeted and desired height throughout the course of therapy. External ports enable the user to drain water in the overflow chamber and add water to the system without disengaging the device, allowing the B&B Bubbler to remain a closed system.

The Bubbler is a double-walled vessel. The inner vessel controls the CPAP level. There is a small passage which opens to the outer vessel where the oscillations of the bubbling of water is dampened. The mean water level can be accurately read in the outer vessel without interrupting the delivery of CPAP to the patient.

SPECIFICATIONS

1. **Connector:** ISO 5356-1:2004 compliant 15mm x 22mm, 360 degrees single swivel connector
2. **Pressure:** Range 0-10 cmH₂O
3. **Accuracy:** +/- 1.0 cmH₂O
4. **Gas Flow Range:** 1 to 12 LPM
5. **Material:** Polypropylene and ABS
6. **Operating Temperature:** 50 degrees Fahrenheit to 104 degrees Fahrenheit (10 degrees Celsius to 40 degrees Celsius)
7. **Storage Temperature:** -40 degrees Fahrenheit to 140 degrees Fahrenheit (-40 degrees Celsius to 60 degrees Celsius)

SETTINGS

To ensure patient safety the device is intended to be used under medical supervision by trained healthcare professionals.

INDICATIONS

1. Provide CPAP, in a hospital setting, to spontaneously breathing neonates and infants < 10kg.
2. Infants spontaneously breathing, in respiratory distress, requiring oxygen.
3. Respiratory Distress Syndrome
4. Transient Tachypnea of the Newborn (TTN)
5. Respiratory support after extubation.

CAUTIONS

The B&B Bubbler is intended to be used by qualified medical personnel trained in oxygen delivery, ventilation, cardiopulmonary monitoring, and assessment of the newborn.

Evaporation or condensation of water may occur during operation of this device. Frequent monitoring of the water level is required to assure consistent delivery of set pressure.

CONTRAINDICATIONS

1. Contraindicated in patients not requiring elevated lung pressure therapy
2. Choanal atresia
3. Nasopharyngeal obstruction
4. Cleft palate

WARNINGS

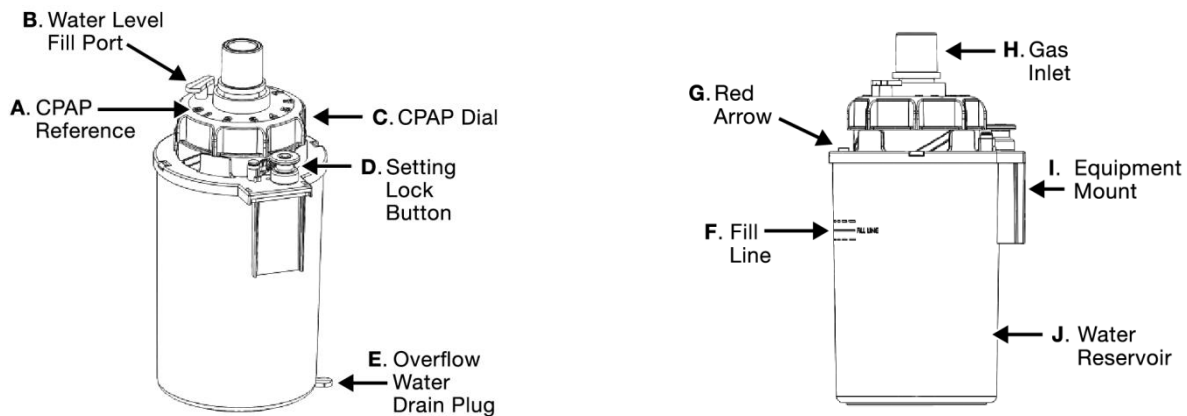
CPAP therapy may have an adverse effect on the cardiopulmonary status of the patient and must be prescribed by a licensed physician.

Use of this device at gas flow rates greater than 12 LPM is not recommended and may result in the delivery of higher pressures than what is set.

EQUIPMENT

1. Bubble CPAP setup; The B&B Bubbler (Bubble generator), heated wire circuit (recommended), Pressure Relief Manifold (pop-off valve), humidifier, and sterile water.
2. CPAP prongs, size appropriate
3. CPAP headgear, size appropriate
4. Medical air/oxygen blender, medical oxygen and medical air, flow meters, quick connects, and mounting (B&B Pole Clamp) equipment

5. Skin protectant barrier
6. Pressure manometer
7. Suction equipment



PROCEDURE

1. Verify physician order
2. Size the patient for the appropriate size NCPAP prongs and headgear. Prongs should fit snug in the infant's nares, but do not place undue pressure or cause blanching on the septum.
3. Nasal CPAP setup:

NCPAP with B&B Bubblers Water Seal CPAP Valve:

1. Inspect the device for damage and discard if damaged.
2. Fill the water reservoir to the solid fill line with sterile water or sterile 0.25% acetic acid solution (Refer to F and J). Add water to Bubblers through either the gas inlet adapter (H) or by instilling water through the water level fill port (B).
3. Slide the Bubblers into a 30mm pole or a rail-mount bracket to assure that the device remains in an upright position using the equipment mount located on the rear side of the Bubblers (I).
4. While holding the CPAP dial (C), press the Setting Lock Button (D) and rotate dial counterclockwise to align the red arrow with the prescribed CPAP level (G and A). Release the Setting Lock Button to lock the Dial in place.
5. Assemble the patient circuit and set flow between 5 to 8 LPM, assuring that there is no resistance in the patient circuit with the smaller prong sizes. Set the PEEP level +5 cmH₂O (unless otherwise instructed) and connect expiratory limb of the circuit to the gas inlet (H). Connect an airway pressure manometer to the circuit between the patient interface and the inspiratory limb of the circuit. Connect a pressure relief manifold (pop-off valve) between the blended gas supply and the inlet port of a humidifier.
6. Prior to patient application, occlude circuit to assess for leaks in the system and assure adequate bubbling. Set FiO₂ prescribed by physician.
7. Suction the nares of the patient to assure patency.

8. With the infant in the supine position, head elevated about 30 degrees and neck supported with a small roll; position the prongs gently into the nares so that there is no upward pressure on the septum. Place prongs curve side down, and connect them to the patient circuit. Adjust the angle at the corners, to curve the prongs slightly, matching the curved plane across the upper lip. To minimize the risk of irritation to the nasal septum, the bridge between the prongs should not be in direct contact with the infant's nose.
9. Secure the airway in place. Assure ideal headgear size, position of tubing holders, and position of infant prongs.
10. The patient circuit should be adjusted so that the weight of the circuit does not place tension on the prongs.
11. Set the humidifier temperature at 37 degrees. Frequently assess the patient circuit for rainout and water condensation and drain the circuit as needed.
12. Document the patient setup.
13. CPAP function and patient tolerance should be evaluated frequently.
14. Monitor NCPAP routinely for the following:
 - a. Set FiO₂
 - b. Liter flow set 5 to 8 LPM (less flow indicated with prong size 0 and size 1)
 - c. PEEP set at +5 cmH₂O, or prescribed pressure
 - d. Correct water level in Bubbler (Bubble Generator)
 - e. Humidifier temperature stable at 37 degrees and rainout in the circuit is drained
 - f. Nasal prong size and positioning are correct
 - g. Headgear fit snugly, but not too tight
 - h. Septum is intact and checked for any skin breakdown
 - i. Skin integrity
 - j. Water is continuously bubbling
 - k. Patient work of breathing, breath sounds, respiratory rate, heart rate, and secretions
 - l. Once a shift, remove the infant's headgear and inspect head for evidence of breakdown. Assure that the areas are dry and free of compromise before reapplying the headgear and prong apparatus

4. Recommended care with CPAP Therapy
 1. Obtain a baseline blood gas within the first hour of initiation of CPAP and PRN with any change in clinical status including an increase in oxygen requirement, an increase in the severity, or frequency of apnea and bradycardia, or increase in respiratory distress.
 2. Monitor blood gas frequently per physician order.
 3. Assess chest x-rays routinely, per physician order.
 4. Assure that an orogastric tube is placed to vent air accumulation in the abdomen.
 5. Rotate patient position per hospital protocol.