



## **In-Line Passy Muir Valve**

### Policy and Procedure Text Policy Statement

In keeping with the Mission, Vision and Core Values of the hospital, this procedure may be performed by a qualified caregiver who has been trained in the procedure, to assure quality service to our patients. If there are questions about the procedure or problems encountered in the performance of this procedure, the Respiratory Care associate will act as a resource for clarification, support, education or assistance.

### Procedure Statement

#### **Information:**

The Passy Muir Valve (PMV) is a bias-closed, one-way valve, which allows the trach patient to inspire via the trach tube and exhale through the upper airway and vocal cords. It requires minimal effort to open and closes itself when inspiratory flow stops (“Bias close,” “Positive closure”). The PMV was initially designed to provide speech for long term trach and ventilator patients, but its use has been expanded to include the ventilator weaning process and rehab. The PMV also improves secretion management and swallowing (reducing aspiration risk) and restores the patient’s sense of smell and taste. The PMV is not a voice prosthesis however, and cannot be used for laryngectomy patients. The PMV is to be initiated as early as 72 hours post-tracheotomy, and can be used whether or not the patient requires mechanical ventilation. These assessments are done by RCP’s and Speech Therapy.

#### **Conditions for use with tracheostomy patients requiring mechanical ventilation:**

- Sleep apnea
- Tracheomalacia
- Mild Stenosis
- Patients who emotionally or physically cannot tolerate trach plugging
- COPD
- Traumatic Brain Injury
- Quadriplegia
- Amyotrophic Lateral Sclerosis
- Bronchopulmonary Dysplasia
- Laryngeal tumors
- Neuromuscular disease

## Contraindications:

1. Severe medical instability.
2. Severe risk for gross aspiration
3. Inability to tolerate cuff deflation
4. Foam-filled cuff (Bivona Trach)
5. Severe stenosis/airway obstruction
6. Thick and copious secretions
7. Tracheal edema, which may develop immediately post-op or after a trach tube change.

## Assessment Criteria for Use of the Passy Muir Valve:

1. Medically stable: PMV will be initiated within 72 hours of admission and pending MD order.
2. Ability to tolerate cuff deflation: Allows air to pass around the trach tube. Many patients can be successfully ventilated with a deflated cuff, adjusting tidal volumes as needed.  
Secretion management: The trach tube itself can cause an increase in secretions which the patient needs to be able to expectorate or swallow along with oral secretions.
3. Airway patency: The patient must be able to exhale efficiently around the tracheostomy tube, through the pharynx and larynx and out the mouth and nose. The trach tube itself and cuff may cause obstruction requiring switching to a smaller or uncuffed tube.
4. Bedside assessment of cuff deflation: Suction trach and oropharynx, deflate cuff, and have patient inhale. Achieve cuff deflation, look for loss of exhaled Vt and drop in PIP. The patient may not be able to vocalize initially; this does not preclude use of PMV.
5. Lung compliance: Severe COPD causes a loss of lung elasticity and recoil, prolonged exhalation and air trapping. Trach tube size must allow for adequate expiratory flow. RT may also optimize ventilator settings to increase the patient's expiratory time.

## Procedure for Initiating PMV:

The PMV assessment is initiated within 72 hours of admission and receipt of MD order. The Respiratory Therapist and/or Speech Therapist will complete a PMV assessment.

## Guidelines for completion of PMV Assessment

General Patient Information will be completed before proceeding to the actual procedure and will include:

- 1) **Primary Dx:** The admitting diagnosis
- 2) **Airway Hx:** Any pertinent information relating to possible airway damage.
- 3) **Date of Tracheostomy/Type/Size:** Original date of surgery with type and size of trach placed, include any changes in trach with date of most recent change out.

The following to be completed by Respiratory Therapist Only (parts A, B, and C):

- A. Bedside Assessment will be completed prior to PMV placement and will include:
  - a. **Vital Signs:** To include Pre and Post HR, RR, SpO2 and may also include BP.
  - b. **Secretions:** Amount, Consistency and Color
  - c. **Vent Settings:** To include mode, Vt, resp rate, pressure support, Peep, and FiO2.
  - d. **Weaning:** To include the patient's current weaning schedule with the date order written and how patient is tolerating
  - e. **Air flow/Cuff Leak:** When the cuff is fully deflated, note tidal volume leaking around the cuff.

- B. PMV Placement Data will be completed after procedure and includes:
- f. Date and time of procedure: Tolerated or Not Tolerated
  - g. Use of accessory muscles: Yes or No
  - h. Patient able to clear secretions: Yes or No
  - i. Cough: Strong or Weak
  - j. Vocal Intensity: Strong or Weak
  - k. Voice Quality: Whisper/Clear/Raspy
  - l. Back Pressure resulting from air trapping: (Swoosh of air out of trach when PMV removed): Yes or No
  - m. Anxiety: Yes or No

Use the Comment section to summarize the procedure: How procedure was tolerated, indicate follow-up need and recommendations on usage.

The patient must have a completed assessment before other trained associates can place PMV.

**C. Steps of Procedure:**

1. Obtain baseline vital signs, SpO<sub>2</sub>, RR, and pattern, I:E ratio, breath sounds and work of breathing. Reassess throughout trial.
  2. Explain procedure to patient, family
  3. Position patient comfortably. Make sure vent circuit and trach tube are in proper position
  4. Suction trach tube and oral cavity
  5. Place 840 in NIV (noninvasive) mode
  6. Turn PEEP off.
  7. Slowly deflate trach tube cuff. Cuff must be completely deflated to maximize space for exhalation.
- Note: PMV cannot be used with foam cuff trach tubes (Bivona, etc.)**
8. Repeat suction if necessary
  9. Assess airway for valve consideration – loss of exhaled Vt, decreased PIP, and oral air may be heard coming out through mouth/nose.
  10. Place PMV in line with vent circuit or oxygen set up.  
 VENT PATIENTS: Adjust alarms and vent settings
    - a. Place that patient in NIV mode on the ventilator.
    - b. Adjust set VT to compensate for volume lost, if necessary. May Increase Vt until PIP matches pre-PMV PIP, patient has good voice, chest rise is adequate, patient is not tachypneic. (Not necessary with PC or PS ventilation)
    - c. Vent changes To be performed by Respiratory Therapist only
  11. Continue to monitor patient parameters (#1) for undesirable changes.  
 Tracheal obstruction, loss of compliance due to end stage COPD, non deflated cuff, upper airway obstruction, or too big of a trach tube can lead to prolonged exhalation and air trapping.
  10. Assess patient’s ability to cough and clear secretions. If patient cannot clear secretions (thick, poor cough, too many), they can cause an obstruction (see #9).
  11. Once the patient’s breathing is relaxed and PMV is in place, establish speech and assess quality, etc. Patient may require breathing/voice retraining; swallowing assessment. (Physician should request Speech to consult when PMV is ordered).
  12. When finished, Respiratory Therapist removes PMV, resets settings and alarms, then reinflates cuff.
  13. Some patients may only tolerate short periods of time initially, and tolerance

may vary from one day to the next. Increase as tolerated until weaned, decannulated or able to tolerate during waking hours.

**Note: Pt's should not wear PMV through the night. 100% supervision per hospital policy.**

### **Troubleshooting Intolerance:**

1. Check for secretions, swelling. Hold PMV use until corrected.
2. Evaluate for stenosis or granulation. May require bronchoscopy or an ENT consult.
3. Recheck cuff deflation. May need smaller size of trach tube if still obstructing.
4. If end stage COPD, may be physiological. Patients may not tolerate PMV use at this time.
5. If no evidence of obstruction etc, provide reassurance, re-education and limit use until patient is more comfortable.

**PMV Re-assessment:** If patient is unable to use the PMV, LIP should be notified to consider rationale for:

1. Trach tube downsizing
2. ENT consult regarding possible airway issues

**Care should be taken to either consult with an ENT, or read the physician's progress notes, for possible recommendations.**

After the PMV re-assessment is done, document the findings on the PMV assessment form.

### **Transitioning Issues:**

At times a patient will not tolerate the PMV although there is no physical reason such as obstruction. Other issues to look at include:

- Patient motivation
- Anxiety and fear; depression
- Staff motivation

### **Care and Cleaning:**

1. PMV should be cleaned as needed
2. Wash in pure soap (such as Ivory) and tepid water
3. Rinse thoroughly with cool to tepid water
4. Set aside to air dry
5. Single patient use ONLY. With proper use and care, will last 2 months
6. CAUTION: **DO NOT USE** hot water, peroxide, bleach, vinegar or alcohol as they will damage the silastic membrane. Also, **do not** autoclave, use ETO or radiation sterilization. **DO NOT** wipe or brush valve. Thoroughly rinse all residue to prevent sticking.

### **Appropriate Outcomes:**

1. Patient able to tolerate the Passy Muir Valve without breathing compromise.
2. Patient able to verbalize thoughts and participate in social situations and care giving decisions.

References:

Application of the Passy Muir Speaking Valves with Tracheostomized and Ventilator Dependent Patients.  
August 1995 Passy Muir, Inc.