

**GAYLORD HOSPITAL**  
**GUIDELINES FOR PASSY MUIR VALVE USE IN THE**  
**VENTILATOR DEPENDENT POPULATION**

Adapted with permission from St. Elizabeth Ann Seton Hospital

**Procedure for performing a bedside airflow assessment:**

A bedside airflow assessment is completed by the RCP as part of the initial admission assessment. The pt should be >48hrs. post surgical tracheostomy. The patient may need to be re-assessed for use after a trach change as well.

A. Suction tracheally and orally

B. Keep patient on ventilator and listen for an air leak or the patient's ability to cough or vocalize with the cuff deflated. Note the amount (in cc's) of air removed from the cuff. The less air required to seal the cuff, the smaller the passageway around the trach tube.

C. Assess the patient for use of accessory muscles or "forced" exhalation; exhalation should appear to be passive, not work.

D. Listen for the patient's ability to create sound. The patient may not be able to vocalize initially; this does not preclude use of the PMV. A weak or whispery voice may be due to a lack of use of the vocal cords or damaged or paralyzed cords. If uncertain, proceed slowly and monitor the patient closely. If the voice does not get stronger within a few days, the patient may need an ENT consult to further assess for airway obstruction or damage.

**Procedure for placing the in-line PMV:**

**Note: Only the RCP can place the valve on a ventilator patient.** (RCP licensure is required to manipulate the ventilator. Exception: Patients going home on the vent)

A. Obtain baseline vital signs, SpO<sub>2</sub>/HR, RR and pattern, breath sounds and work of breathing.

B. Explain the procedure to patient and family.

C. Position the patient comfortably. Make sure the ventilator circuit is not tugging on trach tube.

D. Suction tracheally and orally.

E. Slowly deflate the trach tube cuff completely. Monitor the amount of air removed from the cuff. Some patients, particularly those with a spinal cord injury or neuromuscular disease, are particularly sensitive to cuff deflation and experience an uncomfortable sensation of hypoventilation. These patients may require more time (days, weeks) to get used to having the cuff deflated before they can tolerate a PMV. Spinal cord injury patients are also prone to episodes of autonomic dysreflexia (including blood pressure changes) with sudden changes in sensation.

F. Repeat suction if necessary.

G. Place the PMV in-line with vent circuit (between the HME flex and the suction tee piece) or directly onto the trach tube hub.

H. Adjust vent settings (restricted to licensed RCPs):

Change mode on 840 to NIV

- Turn the PEEP off. This will reduce or eliminate the excessive flow and autocycling created by the vent trying to maintain the PEEP level with the cuff leak. Observe the patient closely for an increased WOB or negative pressure during inspiration. Peak flow may need to be increased in conjunction with tidal volume adjustments.
- May adjust set VT to compensate for volume lost, not to exceed 400cc of additional Vt. Measure the PIP before deflating the cuff. Increase the set VT until the PIP with the cuff deflated is similar to the PIP with the cuff inflated. This step is not necessary with Pressure Control or Pressure Support Ventilation.
- Patients on pressure support may need TiSpont adjusted settings. In Pressure Support, inspiration continues until the flow decreases to 25% of the initial flow or 3 seconds. At higher PS levels, flow may not decrease because of the leak, giving the patient a long inspiration. Some of the newer Tbirds have an adjustment for Terminal Sensitivity: increase the % to allow the inspiratory cycle to end at a higher flow. This is not necessary in Pressure Control because there is a set inspiratory time. Return to 25% after PMV use (earlier breath termination results in shallower spontaneous VTs). Another option is to change to AC mode during PMV use.

I. Adjust alarms:

- If vent has leak compensation, disable and adjust the current low and high pressure alarm settings.
- The low pressure alarm should be set no more than 10 cm below the patient's ventilating pressure and on a setting of no less than 10 cmH<sub>2</sub>O. The high pressure should remain at the normal acceptable limit for that patient, and no more than 60 cm H<sub>2</sub>O.
- An excessively high breath rate can be an indication the patient is not controlling glottic closure (passive respirations) or is tiring out. It can also occur if the PEEP is not turned off and the ventilator is attempting to compensate for the cuff leak. In addition, the trigger sensitivity may need adjusted, and/or V<sub>t</sub> may need to be increased to maintain alveolar minute ventilation with the cuff deflated. The alarm should remain set at the usual setting, and no higher than 40. If the vent settings have been adjusted and the patient continues to have a high rate (>30) the patient cannot be left unattended and PMV use should be limited. The SLP can also help with exercises to help the patient relearn glottic control.
- The low pressure and high breath rate alarms are not to be defeated under any circumstances. These are your only disconnect/patient distress alarms.

J. Continue to monitor the patient's parameters (VS, WOB, HR, RR, SpO<sub>2</sub>, et al.) for undesirable changes.

K. Assess the patient's ability to cough and clear secretions. Most patients will cough spontaneously when the valve is first placed.

L. Once the patient's breathing is relaxed, and the PMV is in place, establish speech and assess vocal quality, etc. Encourage ventilator patients to speak during the expiratory cycle only.

M. Ventilator patients must have someone at the bedside when using the PMV. The patient cannot be left without a professional caregiver in the room.

N. When finished, remove the PMV, reset all ventilator setting and alarms, and reinflate the trach tube cuff.

O. RCPs: Document use, airflow, ability to cough and clear secretions, time worn, etc. in the EMR. Document changes in vent settings made in PMV trials. Other caregivers document on the appropriate form with other care being performed.

P. Some patients may only tolerate short periods of time initially and tolerance may vary from one day to the next. Increase use as tolerated until weaned.

## What if the patient says “I don’t like it”?

- A. If the patient complains he/she can’t breathe, their chest is tight, they’re unable to cough or coughs continuously, has no voice, and/or no breath sounds are heard, REMOVE VALVE IMMEDIATELY, then look for evidence of an airway obstruction or air trapping:
- Auscultate over the trachea to assess for airway stridor. (Possible causes include edema, secretions, vocal cord damage, stenosis, et al.)
  - The PMV opens with minimal effort and does not cause a significantly measurable increase in inspiratory resistance however, since the patient now senses airflow through the nose and mouth, they may subjectively interpret this as difficulty breathing. Some patients may experience a sense of dryness as well.
  - If the patient is unable to exhale adequately (air trapping), they will not be able to take a breath in and will complain they cannot catch their breath. Be particularly alert to this possibility with COPD patients.
  - If a “whoosh” is heard upon removing the valve and/or pressure is sensed behind the valve (pushing it off), the patient does not have adequate airflow and should not be using the PMV until the tube size is assessed or airway obstruction has been resolved.
  - Corrective measures:
    1. Recheck cuff deflation. Consider a smaller size or uncuffed trach tube. For vent patients, measure the patient’s airway resistance (peakflow/PIP minus plateau) prior to changing the trach. If airway resistance is high, you may need to decrease inspiratory flow rates when downsizing trach.
    2. Reassess secretions; treat with humidity or mucolytics if necessary. If secretion consistency is OK, reassess the patient’s ability (cough strength) to clear. Since the in-line suction is not removed, it is possible to suction vent patients while the PMV is on.
    3. If the patient coughs hard enough to “pop” a corner of the diaphragm through the valve body, reassess for adequate airflow around the tube. Recheck cuff deflation, secretion quantity/consistency. The patient normally will not exhale through the tube, but if they do not have adequate flow and cough hard enough, they may be able to cough through the tube and pop

the diaphragm. When using the new PMV 007 that has the 6 spokes, the instance of valves inverting is virtually eliminated. This may indicate patient is ready for a smaller trach or decanulation.

4. If the patient has severe COPD, the problem may be physiological (air trapping). To decrease auto - PEEP, attempt to retrain the patient to use pursed lip breathing.
  5. The patient may not be able to use the PMV or may need to limit use of communicating needs only.
  6. If all causes are eliminated, and airflow is not improved with a smaller trach, it may be necessary to request an ENT consult to scope the airway above the trach.
- B. If a ventilator patient complains of “burning” or their throat hurting, being dry, it is most likely due to the sensation of excess airflow from the ventilator. Recheck the PEEP, peak flow and pressure support settings.
- C. Some patients will complain that the speaking valve has a bad taste. The valve has no taste. What the patient is experiencing is his or her own bad breath. This is NOT due to poor oral care but rather the lack of airflow through the oral cavity and the pooling of oral secretions in the oropharyngeal area. Usually as the patient uses the valve more and keeps the airway clear, the problem clears up.
- D. 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