Clinical Guidelines for use of Passy Muir speaking valve (PMV) for VENTILATED patients with a tracheostomy: Nepean ICU

Date Created: August 2014
Version: 1.0

Purpose:
- To describe patients that are appropriate for an in-line speaking valve
- To explain how to place the PMV and monitor the patient once speech pathology has determined patient suitable.

Intended Audience:
Nursing, Physiotherapy, Medical staff

Expected outcomes:
- ICU staff can identify patients suitable and refer to speech pathology for a PMV trial.
- Staff know how to safely use and monitor patients with a speaking valve in-line with the ventilator.
- Staff know how to modify the Drager ventilator settings according to Passy Muir to disable apnoea alarm.
- Staff are aware of the benefits and risks of the use of a speaking valve.
- To assist MDT education in Passy Muir speaking valve use.

Procedure
1. Introduction to the Passy Muir aqua speaking valve
A Passy Muir valve aqua is the speaking valve used at Nepean Hospital for tracheostomy patients. It is a one-way valve that redirects air on expiration up through the upper airway and through the mouth.
The Passy Muir valve aqua can be used for some ventilator dependent and non-ventilator dependent tracheostomy patients. This guideline describes its use with ventilators; there is another guideline for use with non-ventilated patients.

In a ventilated patient who has a Passy Muir valve in place when the cuff is deflated, there is an expiratory return of air that is re-directed around the tracheostomy tube, up through the larynx that enables speech.

The medical team must approve the initial trial.

### 2. Benefits and risks

#### Benefits of valve in-situ:

- Speech production - patients can speak
- In some patients, swallowing will improve because of restoration of the normal subglottic pressure
- In some patients, clearance of secretions will improve (cough is typically stronger and more effective with a speaking valve than without)
- Weaning from the ventilator may be faster because a speaking valve makes the patient work harder with respiration

#### Risks:

**WARNING**

A patient will not be able to breathe if the cuff is not completely deflated prior to attachment of the speaking valve. This can lead to death.
Risks: (continued)

- Each patient requires a prior assessment of upper airway patency that is performed by the speech pathologist. *If the upper airway is not patent* (e.g. *swelling about the vocal cords*) or *if the tracheostomy tube is too large for the trachea*, *there will be no space for air to pass around it when the speaking valve is on the patent will have difficulty breathing*—respiratory pressures will rise leaving to breath stacking and barotrauma.

- Secretion viscosity will increase with a Passy Muir speaking valve in-situ, unless there is a warmed humidified circuit.

- When the speaking valve is in-situ and the ventilator apnoea alarm has been silenced, nursing staff will need to manually monitor the patient respiratory status.

3. Patients to be considered for speaking valve

1. Awake and alert tracheostomy patient.
2. Tracheostomy formed for at least 48-72 hours (a fenestrated tube is not required).
3. Medical status: $\text{SpO}_2 > 95$ and haemodynamically stable.
4. Ventilator settings: Those on PSV or ABS with pressures under 20 are ideal candidates. With pressures above 20 patients typically find speaking valve use uncomfortable due to high pressure at the glottis. PEEP value is not a criterion for candidacy. For stable patients on more supportive vent settings (SIMV) speaking valve placement is possible, just more complicated and requires complex ventilator adjustment.

4. Patients not suitable for speaking valve

1. Non-patent upper airway
2. Unconscious or heavily sedated patient
3. Respiratory instability
4. Unstable GI status (vomiting)

5. Insertion of the valve into the ventilator circuit

5.1 Placement of the PMV
Speech Pathology should be present for the first trial of a PMV insertion.

5.2 Equipment needed
- Passy Muir valve 007 (green) AQUA
- Clear 22 mm female Hudson universal connector (available in ICU store #02G1100216)
- 10ml syringe to deflate cuff
- Patient needs to have a wet humidified ventilator circuit

5.3 Placement of PMV procedure – 2 people required
- Connect the clear female connector to the Passy Muir valve, ready to place in the ventilator circuit
- Sit patient up and explain the procedure
- Suction the oropharynx and the Subglottic port if available
- Suction the tracheostomy tube while slowly deflating the tracheostomy cuff with 10ml syringe
- Remove ALL the air from the cuff
- Remove the flexi-tubing from the circuit and place the valve onto the side arm of the in-line suction catheter and the clear connector to the ventilator tubing (figure 2)
- Monitor patient vital signs
- Remove the valve according to the ‘when to cease’ guidelines, or if requested by medical staff.
- The apnoea alarm will sound when the patients breathe out through their upper airway, therefore the apnoea alarm needs to be silenced

6.0 Ventilator Alarms
It is important to monitor the ventilated patient closely during valve placement as some ventilation settings may be inaccurate. When the patient exhales through the mouth, there is no air return through the expiratory limb of the ventilator. Therefore expiratory tidal and minute volumes will read zero causing an apnoea alarm.
The apnoea alarm has to be removed because with a circulatory leak, the ventilator responds by trying to offer breath support.

6.1 How to remove the apnoea alarm:

6.1.1 Drager Specific Instructions:

a. Reduce PEEP by 5 as a general rule unless documented otherwise. Passy Muir suggest that a speaking valve restores ‘physiological PEEP of the upper airway’ (equals 5).

b. Adjust trigger sensitivity to prevent auto-cycling (turn down to 0.3).

c. Turn off Flow Monitoring – NOTE: this eliminates all low exhaled volume alarms so the clinician must remain at the bedside during all valve use time. It must be turned back on when the valve is removed.

d. Turn off Leak Compensation and/or Tube Compensation.

e. Set alarms for safety

   a. Flow monitoring “off” disables volume alarms, and PEEP of zero eliminates a reliable disconnect alarm. For long-term use of the valve in-line, a clinician must remain at the bedside, or a low pressure alarm should be built into the circuit.

      i. The low pressure alarm should be set at 10 cmH2O below the PIP, but never below 10 cmH2O.

      ii. The high pressure alarm should be set at 10 cm H2O above the PIP.

7.0 When to cease or remove the PMV and how to monitor tolerance

The PMV should be removed if the patient is displaying signs of respiratory distress or has a significant and sustained decrease in SpO2

Cease placement if patient has a significant or sustained increase in anxiety, heart rate or tracheal/oral secretions or if medical team has ordered removal.

Monitor heart rate, SpO2 and respiratory rate, rather than focusing on the ventilator screen as ventilator values may be incorrect due to no return flow from the patient.
8.0 Contacts/Feedback
If you have any enquiries about ventilator use of speaking valves please contact:

- Klint Goers  #17139 from Speech Pathology
- Hailey Carpen ICU liaison # 17565
- Anwar Hassan ICU Physiotherapist #26018

9.0 Resources/Further Reading


- Passy Muir Tracheostomy and Ventilator Speaking Valves Instruction Booklet (available in each valve package and via website [www.passy-muir.com](http://www.passy-muir.com))

- Agency for Clinical innervation Tracheostomy Clinical Practice Guideline 2014, NSW Department of Health. Available via NSW ACI website

Risk Rating
HIGH

Risks of Non-Compliance
Asphyxia that could lead to death

Implementation Plan
Speech pathology and ICU CNE’s to discuss guideline during tracheostomy education. To be at patient’s bedside.
Staff access via ICU intranet policies and procedures

Version History

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<td>May 2015</td>
<td>1</td>
<td>New Document</td>
<td>Klint Goers Speech Pathology Reviewed by tracheostomy MDT</td>
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<tr>
<td>August 2015</td>
<td>2</td>
<td>Changes to PEEP setting</td>
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APPENDIX (Patient Bed sign)

PLEASE ENSURE CUFF IS DELFATED AT ALL TIMES WHEN WEARING PASSY MUIR SPEAKING VALVE

IF THE CUFF IS UP WITH THE VALVE IS INSITU THE PATIENT WILL BE UNABLE TO BREATHE

Please refer to Speech Pathology Intensys entry date ___________ for further recommendations about use and the clinical guideline for ventilated tracheostomised patients available on the ICU intranet.