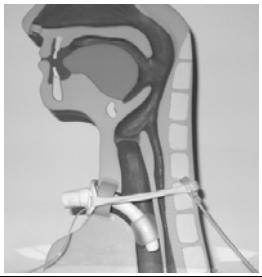
THE PASSY-MUIR TRACHEOSTOMY & VENTILATOR SWALLOWING & SPEAKING VALVES

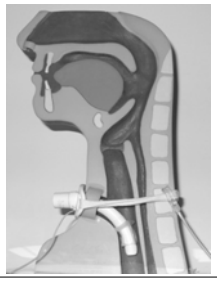
Tracheotomy

- **Indications for tracheotomy**
  - **Prolonged intubation**
  - **Need for long term mechanical ventilation**
  - **Need for permanent tracheostomy tube**

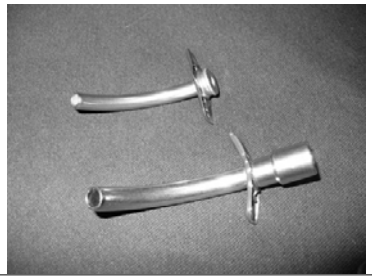
Tracheostomy Cuffs



Tracheostomy Cuffs



Tracheostomy Tubes



Tracheostomy Tubes

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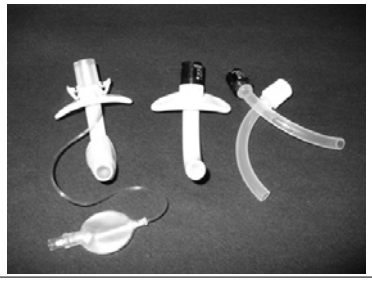
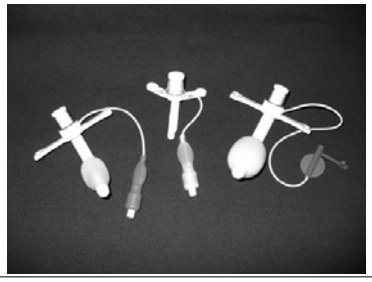


Tracheostomy Tubes



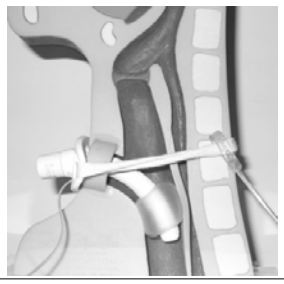
Open Tracheostomy Tube

- **Inflated Cuff**
  - **Breathing in and out through the tube only**
  - **No airflow through the upper airway**
  - **Lack of vocal production**

Open Tracheostomy Tube

- **Inflated Cuff**
  - **Decreased sense of smell/taste**
  - **Risk of tissue necrosis**
  - **Cuff impingement on esophagus can cause reflux**

Tracheostomy Cuffs



Definition of Aspiration

- **Any material that has penetrated beneath the level of the vocal cords**

Increased Risk of Aspiration

- The cuff of the trach tube can tether the larynx
  - The larynx does not elevate
  - The epiglottis does not flap down to protect the airway

Increased Risk of Aspiration

- Lack of airflow through the upper airway
  - Lack of sensation in the oropharynx
  - Patient cannot feel pooled secretions or material

Increased Risk of Aspiration

- Lack of airflow through the upper airway
  - Vocal cords remain in an open position because there is no airflow past the baroreceptors (pressure receptors) beneath vocal cords.

Increased Risk of Aspiration

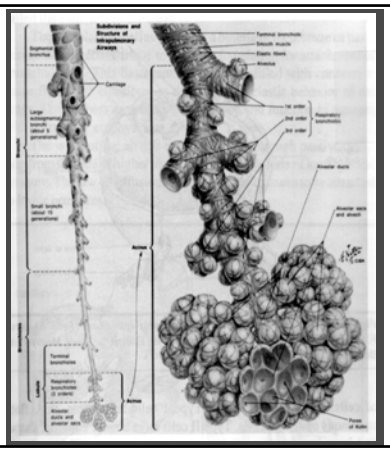
- Lack of subglottic pressure
  - Decreased swallowing efficiency
  - Increased risk of aspiration
  - Can lead to feeding tube placement

Lack of Airway Pressure

- Decreases effectiveness of cough
  - Patient is unable to mobilize secretions effectively
  - Patient is suctioned more frequently

Lack of Airway Pressure

- Decreased physiologic PEEP
  - Decreased gas exchange due to reduced surface area of alveoli
  - Decreased oxygenation
  - Possible atelectasis



Open Position Valves

- **All other valves are open position valves**
- **Patient must exhale to close the diaphragm of the valve**

Open Position Valves

- Secretions travel up the tube and occlude the valve
- For communication only

Passy-Muir Valves

- Closed Position “no leak” design

Positive Closure Video

Physiologic Benefits of the Passy-Muir Valves

- **Improved voice production**

Physiologic Benefits of the Passy-Muir Valves

- **Improved sense of smell/taste**

Physiologic Benefits of the Passy-Muir Valves

- **Restoration of normal physiology prevents aspiration**
  - **Deflated cuff allows for increased laryngeal elevation**

Physiologic Benefits of the Passy-Muir Valves

- Restoration of normal physiology prevents aspiration
  - Airflow over the baroreceptors allows the vocal cords to move into a closed position
  - Improved sensation in the orophaynx allows the patient to sense pooled secretions

Physiologic Benefits of the Passy-Muir Valves

- Restoration of subglottic pressure facilitates a better swallow and decreases the risk of aspiration
  - Swallow is not only mechanical, but a pneumatic system as well.
  - The patient has a more efficient and effective cough

Physiologic Benefits of the Passy-Muir Valves

- Improved Swallowing

1. Deflated cuff = elevated larynx
2. Closed vocal cords
3. Restored airflow = improved sensation
4. Restored subglottic pressure

MBS
Split Screen
Video

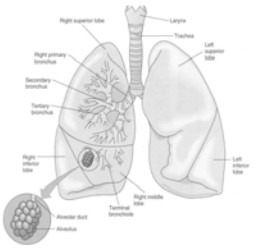
Physiologic Benefits of the Passy-Muir Valves

- **Improved Secretion Management**
  - **Improved cough**
  - **Decreased suctioning needs**
  - **Decreased risk of tracheal damage**

Physiologic Benefits of the Passy-Muir Valves

- **Restored physiological PEEP**
  - **Improved oxygen saturation levels due to improved gas exchange**
  - **Decreased risk of atelectasis**

- **Gas exchange occurs across alveolar membrane**



Physiologic Benefits of the Passy-Muir Valves

- **Improves decannulation**
  - **Utilization of expiratory muscles**
  - **Restoration of normal physiology**

Physiologic Benefits of the Passy-Muir Valves

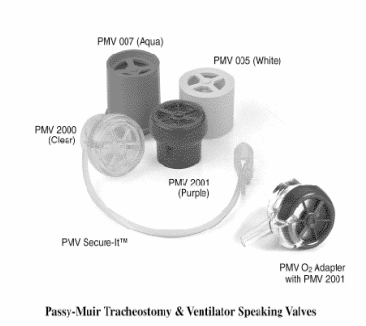
- **Expedites Weaning**
  - **Utilization of expiratory muscles**
  - **Restoration of normal physiology**

Physiologic Benefits of the Passy-Muir Valves

- **Psychological enhancement**
- **Improved Quality of Life**

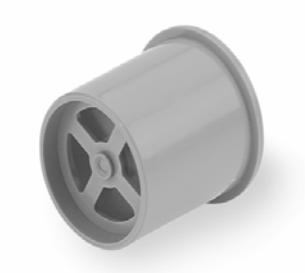
Cost Effectiveness of PMV Use

- **Facilitates Staff/Patient Communication**
- **Decreased Risk of Infection**
- **Reduced Suctioning Needs**
- **Improves Swallow, May Reduce Aspiration**
- **Decreases Weaning/Decannulation Time**



Passy-Muir Tracheostomy & Ventilator Speaking Valves

PMV 005 (White)
Original PMV Design



PMV 007 (Aqua)
Designed Specifically for In-Line Ventilator Use

PMV 2000 (Clear) & PMV 2001 (Purple)
Improved, Lower Resistance, Lower Profile PMVs

PMA 2000 Oxygen Adapter
Works with PMV 2000 (Clear)
and PMV 2001 (Purple)

PMV 2000 (Clear) with the PMV Secure-It™

Assessment and Placement

Patient Selection

- **Cognitive Status-Awake, Responsive, Attempting to Communicate**
- **Medically Stable**
- **Able to Tolerate Cuff Deflation**
- **Able to Manage Secretions**
- **Swallow Status/Risk for Aspiration**

Patient Assessment

- **Upper Airway Patency**
  - **Patient must be able to exhale sufficiently past the tracheostomy tube**
  - **Patent upper airway**

Patient Assessment

- **Upper Airway Patency**
  - **Sizing of Tracheostomy Tube**
  - **Presence and Degree of Stenosis and/or Granulation Tissue (Inhalation vs. Exhalation Considerations)**
  - **Foam-Filled Cuff**
  - **Edema**
  - **Secretions**

To Assess for Upper Airway Patency

- **Deflate Cuff**
- **Vocalize on Exhalation**
- **Cough**

To Assess for Upper Airway Patency

With the Pediatric or Very Anxious Adult, Use Mirrors, Cotton, Feathers, Whistles or Bubbles to Assist with the Oral Exhalation Process.

PASSY-MUIR VALVE PLACEMENT

“Set your patient up for Success!”

Placement Guidelines

- **Patient Education**
- **Peer Education**
- **Suctioning**
- **Patient Position**
- **Achieve Cuff Deflation**
- **Place Valve**

Educate Staff

- **When using the Passy-Muir Valve the cuff must be *completely* deflated**
- **Use the warning label provided with packaging**

Patient Care Kit

Patient Education

Placement Guidelines

- **Obtain Baseline Measurements:**
  - **Oxygenation**
  - **Vital Signs**
  - **Breath Sounds**

Placement Guidelines

- **Obtain Baseline Measurements:**
  - **Color**
  - **Work of Breathing**
  - **Patient Responsiveness**

Ventilator
Application

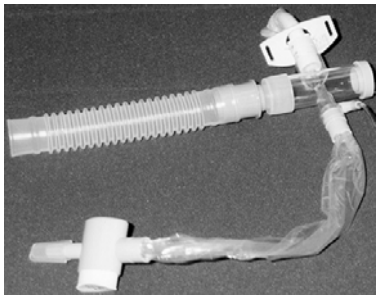
Ventilator Placement

- **Record Ventilator Settings**
  - **Mode**
  - **Rate**
  - **V_T**
  - **F_IO_2**
  - **PEEP**
  - **PIP**
  - **Alarms**

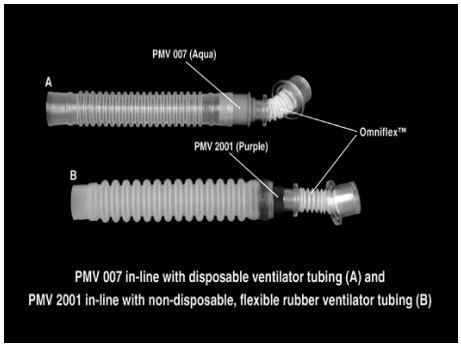
Ventilator Placement

- **Deflate Cuff Gradually**
- **Monitor PIP for Possible Changes to V_T**

IN-LINE SUCTION CATHETER



Ventilator Connections



PMV 007 in-line with disposable ventilator tubing (A) and
PMV 2001 in-line with non-disposable, flexible rubber ventilator tubing (B)

Ventilator Assessment & Adjustments

- **Volume Compensation During Cuff Deflation**
- **Low High Pressure Alarms**
- **PEEP On/Off**
- **Pressure vs. Flow Trigger**
- **Pressure Support/Pressure Control**

Mechanical Ventilation

Humidification

- **Use with Heat/Moisture Exchanger (HME)**
- **Use with Heated Water Pot Systems**

Acute Care Patient

Homecare Patient

Removal of the PMV

- **Replace Original Circuit Set-Up**
- **Return Ventilator Settings and Alarms to Pre-PMV Parameters**
- **Re-Inflate Cuff, as Indicated**

Transitioning and Troubleshooting

- **Anxiety**
- **Depression**
- **Airway Patency**
- **Breathing Pattern Changes**

Speech and Language Goals

- **Respiration: improve strength and coordination of respiration with phonation**
- **Example: diaphragmatic breathing, positioning timing voice with exhalation**

Speech and Language Goals

- **Phonation: improve strength through laryngeal exercises**
- **Example: glottal attacks, resistance exercises for closure falsetto, velar sound production for elevation**

Speech and Language Goals

- **Articulation: increased intelligibility with restored oral air pressure**
- **Language/Cognition: assess and treat, "functional" therapy**

Swallow Evaluation

- **Bedside Swallow Evaluation**
- **Blue-dye assessment**
- **FEES**
- **MBS**
- **Scintigraphy**

Silent Aspiration

- **What effect will this have on bedside evaluation**

Dysphagia Treatment: Benefit of PMV on Swallow

- **Reduce or eliminate negative impacts of tracheostomy tube/vent**
- **Restore a more normal swallow physiology**

Dysphagia Treatment

- **Retraining**
  - **Example: thermal/gustatory stimulation, Mendelsohn maneuver**
- **Compensatory**
  - **Example: supraglottic, double swallow**

Co-Treatment Strategies

- **Bed to Chair Transfers**
- **PT and OT Exercises**
- **Toileting**

Patient Example History:

- **56 yr. old male, s/p aneurysm, respiratory failure, aspiration pneumonia, tracheotomy**

Patient Example History:

- **Transferred to rehab and weaned from ventilator**
- **Shiley # 8 cuffed tracheostomy tube**
- **Trach mask with supplemental oxygen**
- **Moderate thick, white secretions**
- **NPO, G-tube**
- **Alert, confused, attempting to communicate**
- **Aphonic**
- **Family involved**

Patient Example History:

- **MBS results: Silent aspiration of thin liquids, penetration of pureed, decreased laryngeal elevation and vocal cord closure, marked retention of bolus in valeculae and pyriform sinuses, no effort to clear**

Patient Example: Rehab Goals

- **PMV placement**
- **Voice**
- **Swallow**
- **Language/Cognition**

Care, Cleaning and Lifetime of the Passy-Muir Speaking Valves

5 FREE CEUs

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Passy-Muir, Inc

- PMB 273
  4521 Campus Dr
  Irvine, CA 92612
  ph: 949-833-8255
  fax: 949-833-8299
  info@passy-muir.com
  www.passy-muir.com
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