



# **Little Patients, Big Voices: Pediatric No-Leak Speaking Valve Assessment and Use**


DfYgYbhYX `]b `&\$&6

© 2026 Passy-Muir, Inc.

These materials are protected by the Copyright laws of the United States and may not be copied, distributed, or republished by the recipient. Recipients are licensed to use the materials for their personal use as an attendee of this seminar.

Passy-Muir®, PMV®, the purple valve®, and the aqua valve™ are trademarks of Passy-Muir, Inc.

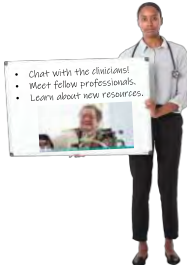
## Little Patients, Big Voices: Pediatric No-Leak Speaking Valve Assessment and Use



1

## Welcome!

- In-Person Considerations
  - Social awareness
  - Networking options
  - Presentations
  - Groups: Purple and Aqua
    - Hands-On
    - Demonstrations
    - Case studies/mock assessments
  - Panel discussions
  - Food and drink




2


### Speaker Disclosures:

Financial: Full-time with Passy-Muir, Inc.  
Non-financial: No relevant non-financial disclosures

**Kristin A. King, PhD, CCC-SLP**  
Vice President of Clinical Education and Research



**Gabriela Ortiz, BSRT, RCP**  
Clinical Specialist



3


### Disclosure

Portions of the information in this seminar relate to products of Passy-Muir, Inc. The content of the seminar is for your general educational information only. Information you learn cannot replace your clinical judgment or the judgment of treating physicians and other healthcare professionals working with patients. The information provided in this seminar should not be considered as medical advice.

4

### Seminar Overview

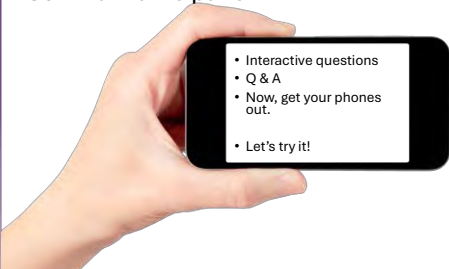
Fundamentals: From Tracheostomy Tubes to  
Mechanical Ventilation Terminology



- 8 hours today
- 1 hour for recorded pre-course

5

### Seminar Participation



- Interactive questions
- Q & A
- Now, get your phones out.
- Let's try it!

6

slide



What is the actual color of the PMV 007?

Start presenting to display the poll results on this slide.

7

### Importance of Effective Communication and Impact on Development



8

### Team Approach



TEAMWORK


9

### Implications of Tracheostomy in NICU & Peds

- Loss of sense of taste and smell
- Reduced airway closure
- Altered subglottic pressure
- Decreased sensation
- Increased accumulation of secretions
- Altered awareness and or management of secretions
- Altered cough


10

### Pre-trach

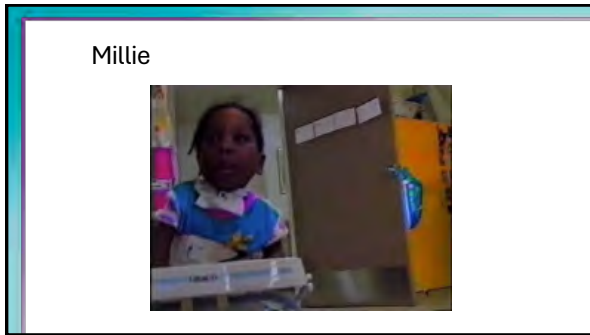


11

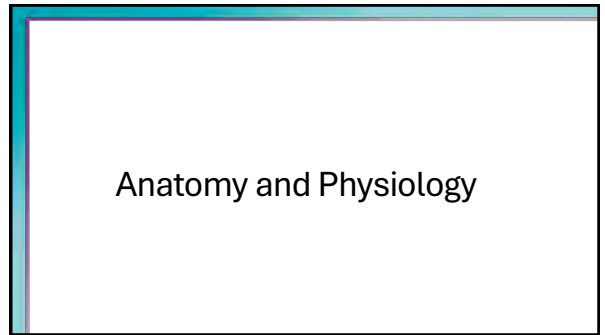
### Post-trach



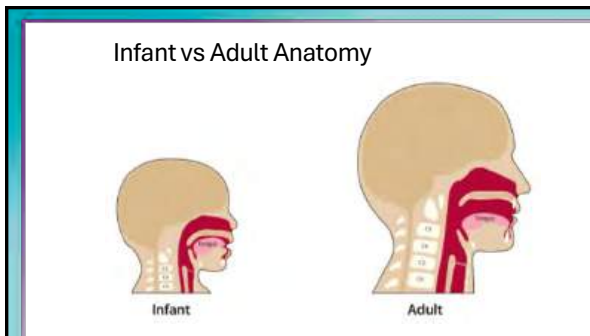
12



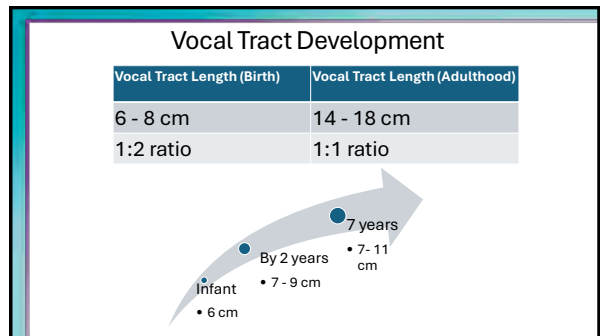
13



14



15



16

### Respiratory System: Secondary Functions

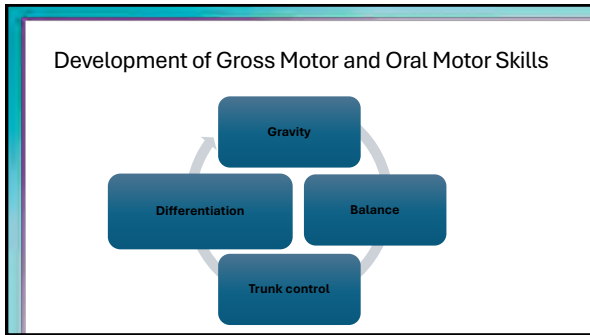
- Subglottic Air Pressure
  - Below the vocal cords
  - Needed for vibration for speech and phonation
  - Assists with swallowing
- To avoid inefficiency
  - Must maintain pressure and slow exhalation

17

### Oral- Sensory-Motor Development

- Structures and Surgical Course
  - Jaw distraction
  - Cleft repair
  - GI (transitional oral feeders)
- Sensory processing
  - Secretion management
  - Taste, smell, touch
- Motor development
  - Posture
  - Tone
  - Oral Peripheral Exam

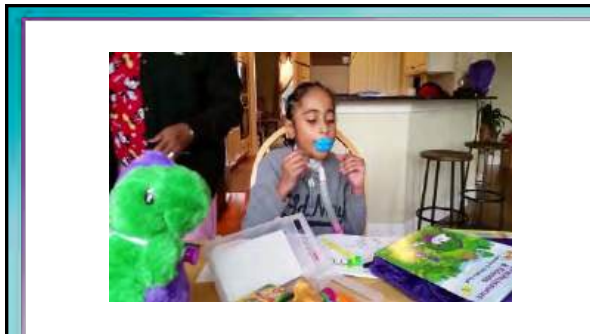
18



19

### Musculoskeletal Development

20



21

### Assessment and Placement: Non-Ventilator

22

### Physiologic Changes after Tracheostomy

**Respiration:** Patient inhales and exhales through open trach tube. No airflow past inflated cuff


23

### Physiologic Changes after Tracheostomy

- Speech
- Smell
- Taste
- Sensation
- Reduced positive airway pressure
  - Poor secretion management
  - Reduced cough

24

### Pediatric Tracheostomy

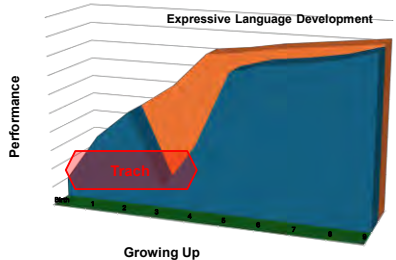


- **Prevalence:**
  - >4,000 per year (birth to 18)
  - 1.4% of all pediatric inpatient procedures
  - Greatest number in infants
- **Common complications**
  - pressure injuries, bleeding, tube occlusion, granulomas, and accidental decannulation

Wills, L. P. (2024). Pediatric tracheostomy year-in-review. *Respiratory Care*, 69(8), 1072 - 1073. <https://doi.org/10.4187/respcare.11932>  
 Varsola, M. & Ferrigno, G. (2024). Tracheostomy in children: A narrative review. *Polmerg Surg*, 11, 1787750. <https://doi.org/10.3390/polmerg110817750>

25

### Growing Into It: Long Term Trach



DeMauro et al. (2014). Developmental Outcomes of Very preterm Infants with Tracheostomies. *Journal of Pediatrics*, 164 (6), 1303- 10.

26

### Effects of Tracheostomy on Communication Development

- **Voice quality**
  - Study: age of decannulation
    - Pre-lingual stage < 12month- appropriate
    - Post-lingual stage 1 to 4 years- delayed<sup>1</sup>
- **Language<sup>2</sup>**
  - Receptive delay of 4.8 months
  - Expressive delay of 9 months
- **Speech<sup>3</sup>**
  - 61% articulation error
  - Consonant and vowel errors
  - Excessive use of phonological processes

1. Sison, B.H., Foster, C.M., Hendler, S.D. (1982) Communication development in young children with long-term tracheostomy. *International Journal of Pediatric Otorhinolaryngology*, 4, 23-30.  
 2. Kamin, Y. M., Wolf-Samuel, R.E. (1985) Clinical predictors: Tracheostomy placement and implications for habilitation of voice, speech and language in long-term tracheostomy. *Journal of Pediatric Otorhinolaryngology*, 9, 244-251.  
 3. Kamin, Y. M., Wolf-Samuel, R.E. (1985) Effects of long-term tracheostomy on speech characteristics of vowel production. *Journal of Speech and Hearing Disorders*, 14, 1557-1562.

27


### Benefits to Application of a No-Leak Speaking Valve



28

### Ability to Vocalize


- To feel and hear his/her own vocalizations is essential speech development
- Children with tracheostomies need opportunities to practice speech production skills



29

### Habilitate!

- Early intervention with Passy Muir® Valve:
  - Returns normal upper airway and physiology as soon as possible
  - Supports:
    - Speech and language development
    - Social interactions
    - Cognitive development




Jackson D and Albanonte S. (1994). Enhancing communication with the Passy-Muir valve. *Pediatric Nursing*, 20(2): 149-53.

30

### Speech and Language Development


- Avoid delays or decrease them with use of PMV®
  - Cooing
  - Babbling



Agostini et al. (2025). Clinical evolution of children who adapted to the speech valve resource: a self-reported study by parents. *Audiology Communication Research*, 36, e3095. <https://doi.org/10.1590/2317-6411-2024-3050a>


31

### Vented & Non-vented Use of Valve



32

### Reminder: Passy-Muir Valve



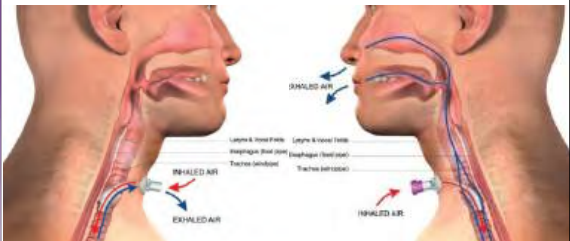
PMV 2001 (Purple color™)

- Bias-closed
- No-leak

What are the benefits of the Valve?

33


### Airflow After Tracheotomy vs. Airflow with Passy Muir® Valve



34

### Benefits of Closing the System with PMV

- Restores normal physiology
- Reconnects the upper and lower airway
- Providing a closed system
  - Communication
  - Smell and taste
  - Secretion management
  - Sensation
  - Cough
  - Swallowing
  - Positive airway pressure
  - Quality of life



35

### Psychological Benefits

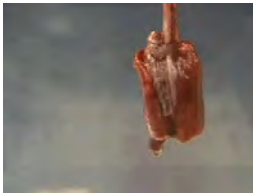
- Communication with family
- Participation in decision making
- Reduced sense of isolation/ anxiety
- Better sense of well-being
- Communication with caregivers

\* Freeman-Sanderson, A. L., Toghiani, L., Elliott, M. R., & Murray, B. (2018). Quality of life outcomes for tracheostomy patients with return of voice: A mixed methods evaluation of the patient experience across the care continuum. *Intensive Critical Care Nursing*, 46, 12-16. doi:10.1016/j.iccn.2018.02.004  
\* Freeman-Sanderson, A. L., Toghiani, L., Elliott, M. R., & Phipps, P. D. (2015). An intervention to allow early speech in ventilated tracheostomy patients in an Australian intensive care unit (2015): A randomized, controlled trial. *Australian Critical Care*, 30(2), 114. doi:10.1016/j.accc.2015.12.012  
\* Freeman-Sanderson, A. L., Toghiani, L., Elliott, M. R., & Phipps, P. D. (2015). Quality of life outcomes with return of voice in tracheostomy patients in intensive care: An observational study. *Journal of Critical Care*, 33, 186-191. doi:10.1016/j.jcc.2015.01.012  
\* Freeman-Sanderson, A. L., Toghiani, L., Elliott, M. R., & Phipps, P. D. (2016). Return of voice for ventilated tracheostomy patients in ICU: A randomized, controlled trial of early-targeted intervention. *Critical Care Medicine*, 44(6), 1075-1081. doi:10.1097/CCM.0000000000001810

36

### Impact on PEEP

- Closed System vs Open
  - Improved gas exchange
  - Improved oxygen saturation levels
  - Decreased risk of atelectasis
- “My patient is not tolerating cuff deflation trials”



37

### Improved Secretion Management




- Research study:
  - 24/49 children wearing PMV® full time
  - Secretion management within normal limits in average of 2 weeks
  - Parent report QOL increases
  - Used valve for occasional sounds and secretion

1. Abraham, 2009

38


### Improved cough



39

### Facilitates Co-Treatment Strategies


- Incorporate several disciplines into valve wearing schedule to optimize rehabilitation
  - Activities of daily living
  - Transfers
  - Exercise
  - Toileting



40

### Expedites Weaning and Decannulation


- Rehabilitation tool
  - For respiratory muscles
  - For upper airway muscles
- Step toward decannulation
  - Less work of breathing vs. capping
  - Develops confidence and motivation



41

### Benefits of a No-Leak Valve

- Improves quality of life



42



43

### Patient Selection Guidelines

- Awake and alert
- Medically stable
- Able to manage cuff deflation
- Manageable secretions
- Low risk for gross aspiration
- Patent upper airway

44

### Pre-Placement: Facilitate Success

- Play-Based
- Educate
- Demonstrate

45

### Assessment

- State regulation
  - Clear sleep state
- Modulation
  - Robust crying
  - Periods of quiet alertness
- Attentional interactive
  - Attends to visual and auditory stimuli

46

### Baseline Measurements

- Oxygenation
- Vital signs
- Breath sounds
- Color
- Work of breathing
- Patient responsiveness

47


### Assessment: Placement of Speaking Valve

- Finger occlusion trials
  - Compliance
  - Tolerance
  - Nasal and mouth airflow with occlusion
  - If airflow, describe breathing
    - Signs of respiratory distress?
    - Work of breathing?

48

### Assessment for Placement


- Transtracheal pressure measurements
  - Back pressure
  - Air trapping
  - Assessing for patent upper airway



49


### Assessment

- What to watch for:
  - Signs of Stability and Stress
    - Autonomic
      - Smooth breathing
      - Stable color
    - Motor
      - Good posture
      - Good tone



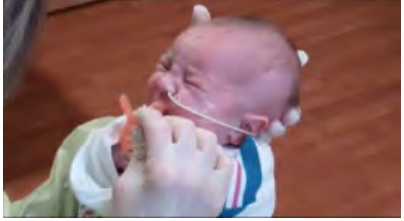
50

### Candidate for Placement? Place PMV




51

### Assessment with Infants




52

### Pediatric Evaluation with TTP



53

### Breakout Sessions: Tracheostomy Tubes and PMVs, Cuff Management, and Mock Assessments



54

### Tracheostomy Tubes and PMVs



55

### Cuff Management



56

### Mock Assessments

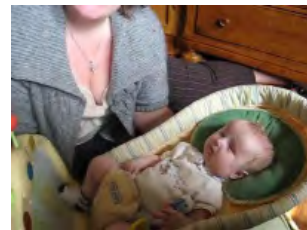


57

### Case Study: Samuel

Home program focused on:

- Cooing
- Babbling
- Extended utterances
- Intelligibility
- Importance of positioning



58

### Transtracheal Pressure Diagnostics and Behavioral Considerations



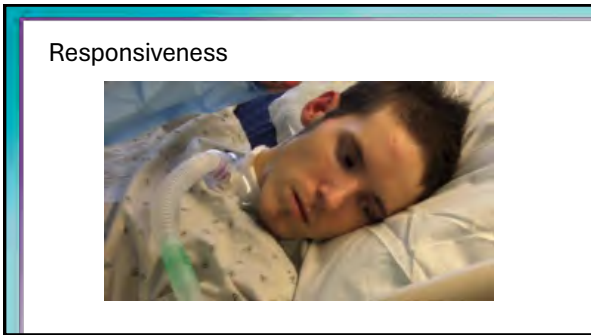
59

### Case Studies: Low Level TBI

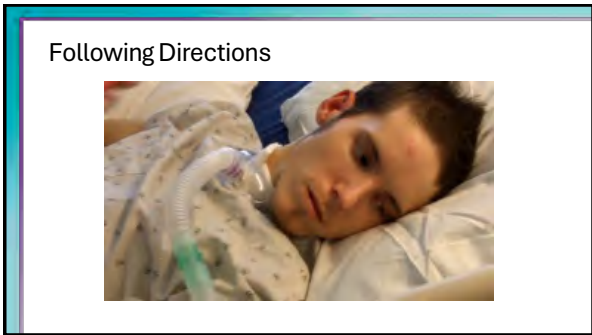
- Rehabilitation: Ranchos II-III
- Localized to generalized responses
- Stimulation



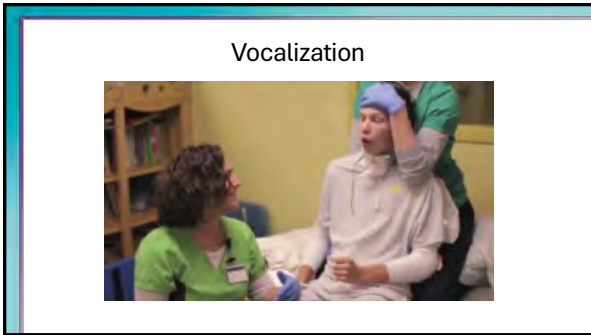
60



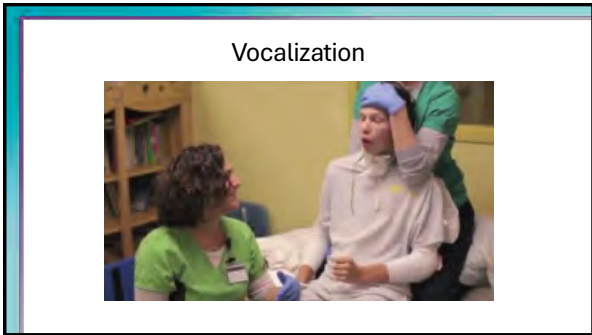
61



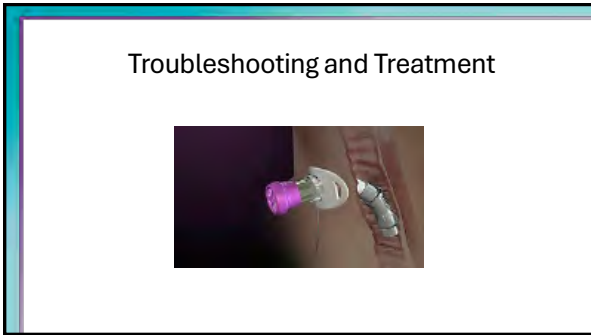
62



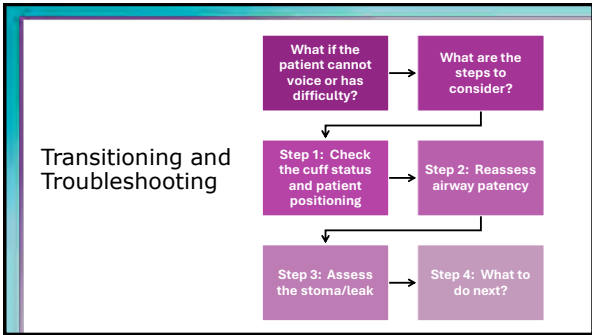
63



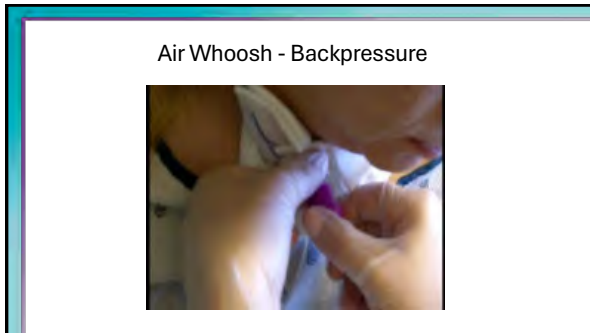
64



65



66

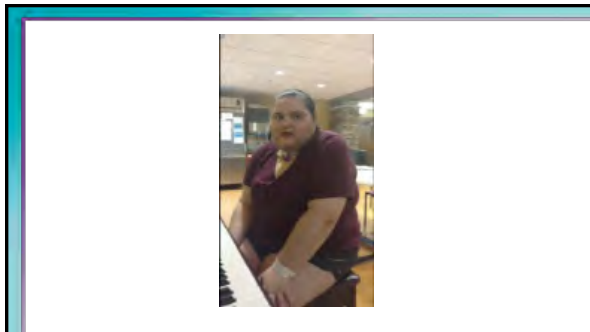


67

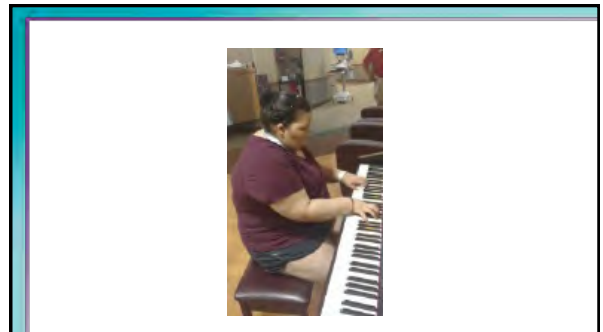
### Factors Affecting Expiratory Air Flow

- Size or type of tracheostomy tube
- Presence and degree of obstruction
- Edema
- Secretions
- Incomplete cuff deflation
- Foam-filled cuff
- Tube position

68



69



70

### Facilitate Success

- Distract with toys
- Increase child's comfort with exhalation and encourage vocalization with activities such as:
  - Microphone (echoes)
  - Bubbles
  - Horns/Whistles
  - Talking Tom App (sample)


71

### Therapy Goal Areas

- Valve use - waking hours with SpO<sub>2</sub> > 90%
- Swallowing & secretion management
- Re-establish intra-oral airflow management
- Speech and language development or rehabilitation
- Voicing
- Decannulation

72


**Therapy Techniques:  
Oral Motor and Sensory**



**Structures and Function**


- Strength, ROM, and coordination
- Tone

**Sensory Processing**




73

**Sensory Stimulation**



74

**Increase Oral Exhalation:  
Retrain Upper Airway**

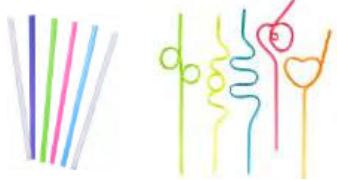


**Techniques:**

- Imitation
- Blowing
- Bubbles
- Whistles
- Horns, kazoos
- Pinwheels
- Straws
- Cotton balls


75

**Respiratory Activities:  
Straw Hierarchy**



76

**Not Just for Respiratory:  
Feeding (Intraoral Pressure)**



77


**Respiratory Activities:  
Whistle/Horn Hierarchy**



78

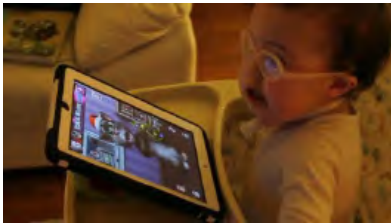
### Respiratory Muscle Strength Training (RMST)

- Inspiratory Training Improves:
  - Lung volumes
  - Vocal fold opening
- Expiratory Training Improves:
  - Cough strength
  - Suprahyoid complex activation
  - Vocal fold closure
  - Breath support




79

### Speech and Language



80

### Max and Pete, the Repeat Parrot




81

### Humidification

- Humidification is recommended
- Use with heat-moisture exchanger (HME) is ineffective
- Consider using with heated humidification
- Remove valve for medicated aerosol treatments

82


### Oxygen adapter



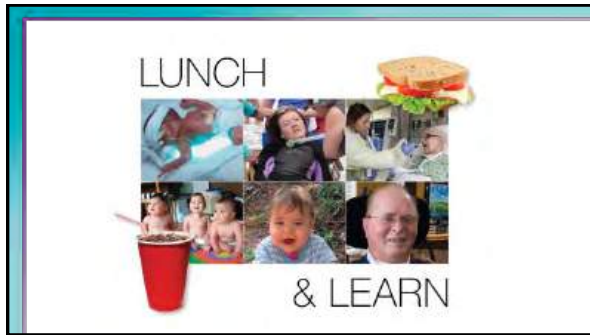
83

### Care and Cleaning

- Average lifetime of 2 months




84



85

### PMV Assessment and In-Line Placement


Set yourself and your patient up for success!



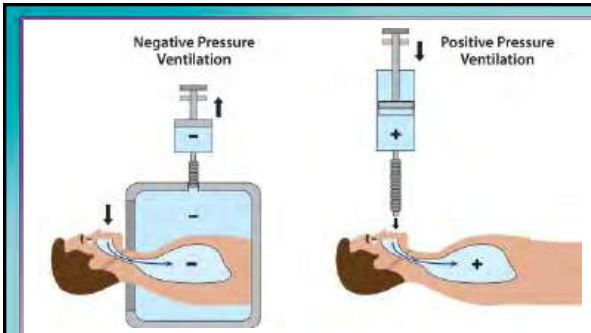
1

### Indications for Invasive Mechanical Ventilation

- Can no longer support with NIV
- Airway protection
- Apnea
- Hypercapnic respiratory failure
- Hypoxemic respiratory failure
- Cardiovascular distress
- Specific neonatal conditions




2



3


### Non-Invasive Ventilation



4

### Invasive Ventilation


- Endotracheal Tube
- Tracheostomy Tube



5

### Lung Mechanics

<h4>Lung Compliance</h4> <ul style="list-style-type: none"> <li>• Factors affecting <math>C_{LUNG}</math> <ul style="list-style-type: none"> <li>• Pulmonary disease</li> <li>• Tube position</li> <li>• Abdominal distension</li> </ul> </li> </ul>	<h4>Airway Resistance</h4> <ul style="list-style-type: none"> <li>• Factors affecting <math>R_{aw}</math> <ul style="list-style-type: none"> <li>• Trach tube size                             <ul style="list-style-type: none"> <li>• Turbulent flow</li> </ul> </li> <li>• BPD (&lt;2 y/o)</li> <li>• Bronchospasm</li> </ul> </li> </ul>
--	--



6

### Peak Inspiratory Pressure (PIP)

Highest pressure the ventilator uses to deliver a breath

- Pressure needed to overcome:
  - ✓ Lung stiffness
  - ✓ Any obstructions in the circuit or airway
- On the ventilator screen, it is often shown as PIP, Ppeak, or PAP.

7

### Drive through settings & modes of ventilation

8

### Mode = who's driving?

- How is the breath controlled:
  - Full control
  - Assist control
  - Support only

9

### Mandatory vs. Spontaneous Breathing

- Mandatory breaths:
  - Given by the vent at a set rate
- Spontaneous breath:
  - Started by the patient

10

### Settings = How the drive feels

- **Rate** (RR)-breaths per minute (like cruise control speed)
- **Tidal Volume** (VT)-size of each breath
- **Pressure**-force pushing air in
- **PEEP**- small amount of pressure left in the lungs at the end of exhalation
- **FiO<sub>2</sub>** - percent of oxygen in the air given (room air is ~21%)


11

12

### Conventional vs. Non-Conventional Ventilation

Conventional Ventilation	Non-Conventional Ventilation
<ul style="list-style-type: none"> <li>Follows a normal inhalation exhalation (normal breathing)</li> <li>Closely mirrors how one breathes without support</li> </ul>	<ul style="list-style-type: none"> <li>Does not follow normal breathing patterns</li> <li>Used when lungs are damaged – air is changed to protect them</li> </ul>

13




### Modes of Ventilation

**Compatible with PMV Use:**

- A/C, VC, & PC
- SIMV
- CPAP/PS
- NIV

14



### Modes of Ventilation


**Not recommended with PMV:**

- PRVC
- AVAPS
- Other "auto" adjusted modes


15

### Ventilator Terms - Settings

- Mode of ventilation
- Tidal Volume
- Pressure
- Respiratory Rate
- Inspiratory Time
- Trigger sensitivity
- FiO<sub>2</sub>
- PEEP/CPAP



16




### Measured Ventilator Parameters

- PEEP
- Exhaled Tidal Volume (Vte)
- Peak Inspiratory Pressure (PIP, Ppeak, PAP)
- Total Respiratory Rate (RR/f)
- Mean Airway Pressure (MAP)

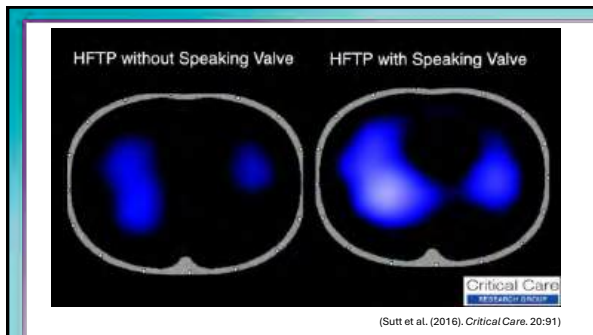
17

### Why use a Passy-Muir Valve with patients who are mechanically ventilated?

- Verbal communication
- More rapid weaning from the venti
  - Rehabilitation tool
- Improved secretion management
  - More effective cough
  - Reduces need for suctioning
- Improves quality of life
- Improved lung recruitment and diaphragm involvement



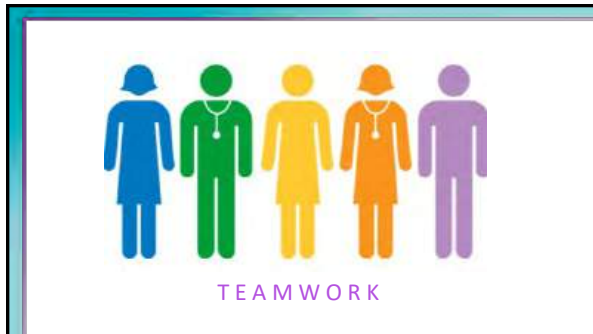
18



19

Step 1: Prepare for Assessment


20



21

General Observations


- Time of day
- Age-appropriate education
- Family education and participation
- Body position
- Address behavioral issues



22

Why Is Body Position Important?


- Tasks requiring trunk control:
  - Breathing
  - Coughing
  - Eating
  - Talking
  - Moving
  - Reaching
  - Bowel and bladder emptying



23

Facilitate Success


- Environment of trust
  - Familiar voices
- Use distractions to your advantage
  - Soft toy
  - Pacifier
- Positive feedback
  - Time & trial



24

### Patient Selection Guidelines


- Awake and alert
- Medically stable
- Able to manage cuff deflation, if present
- Manageable secretions
- Patent upper airway



25

### Baseline Vital Signs

- Oxygenation
- Vital Signs
- Breath sounds
- Color
- Work of breathing
- Patient responsiveness




26

### Assess Ventilator Parameters

Three parameters that give you the general state of your patient's respiratory status:


1.  $FiO_2$
2. PEEP
3. PIP



27

### Cuff Deflation and Mechanical Ventilation


1. Set parameters do not change when cuff is deflated.
2. Cuff deflation generates less resistance to flow.
3. Ventilatory system is no longer sealed, there is a leak.



28

### "Must Know" for PMV Use

- $FiO_2 \leq .50$
- $PEEP \leq 10 \text{ cmH}_2O$
- $PIP \leq 40 \text{ cmH}_2O$
- $VT_i$  &  $VT_e$



29

### Step 2: Assess For Airway Patency

30

### Assessing Airflow Into the Upper Airway



31

### Upper Airway Assessment

- Transtracheal pressure (TTP) measurement



32

### TTP Measurement



33

### TTP Measurement



34

### TTP Measurement

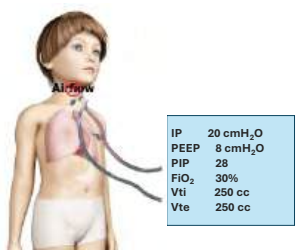


35

### Step 3: Ventilator Assessment

36

### PC: Patient Assessment




IP	20 cmH <sub>2</sub> O
PEEP	8 cmH <sub>2</sub> O
PIP	28
FiO <sub>2</sub>	30%
Vti	250 cc
Vte	250 cc

37

### Ventilator Assessment


- Note Vent Settings:
  - Set IP
  - PEEP
  - RR/f
  - FiO<sub>2</sub>
- Note Vent Measurements
  - PIP
  - Exhaled Vt (Vte)
  - Total RR
  - MV



38

### Upper Airway Patency Assessment

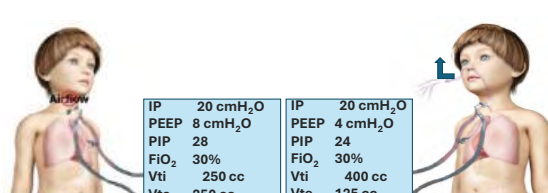
- Turn Down PEEP
  - PEEP down by half
- Then,
  - Slow cuff deflation



39

### Upper Airway Patency

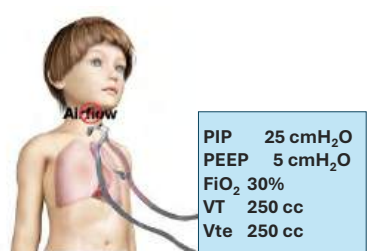
Cuff Inflated-Closed Circuit      Cuff Deflated-Open Circuit



IP	20 cmH <sub>2</sub> O	IP	20 cmH <sub>2</sub> O
PEEP	8 cmH <sub>2</sub> O	PEEP	4 cmH <sub>2</sub> O
PIP	28	PIP	24
FiO <sub>2</sub>	30%	FiO <sub>2</sub>	30%
Vti	250 cc	Vti	400 cc
Vte	250 cc	Vte	125 cc

40

### VC: Patient Assessment

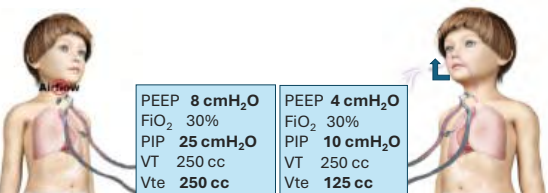


PIP	25 cmH <sub>2</sub> O
PEEP	5 cmH <sub>2</sub> O
FiO <sub>2</sub>	30%
VT	250 cc
Vte	250 cc

41

### Upper Airway Patency

Cuff Inflated-Closed Circuit      Cuff Deflated-Open Circuit




PEEP	8 cmH <sub>2</sub> O	PEEP	4 cmH <sub>2</sub> O
FiO <sub>2</sub>	30%	FiO <sub>2</sub>	30%
PIP	25 cmH <sub>2</sub> O	PIP	10 cmH <sub>2</sub> O
VT	250 cc	VT	250 cc
Vte	250 cc	Vte	125 cc

42

### Assessment Criteria

- Note PIP
- Observe inhaled and exhaled VT
- Achieve cuff deflation slowly, if present
- Assess volume changes (measure Vte)
- Listen for tracheal BS and assess leak through the upper airway



43

### Step 4: Assemble the Necessary Parts & Pieces


44

-  
 -

### Which Valves can be used for in-line placement?


45

### Ventilator Connections




46

### In-line Placement of the PMV® 2001 (Purple color™)



47

### In-line Placement of the PMV® 007 (Aqua color™)




48

**Step 5: Place the Valve In-line and Assess the Patient**

49

**Amelia**


- 8-month-old BPD
- Cuffless 3.5mm
- Awake and alert
- Hemodynamically stable



50

**Vent Settings**

- SIMV 12
- PC 18 cmH<sub>2</sub>O
- PEEP 8 cmH<sub>2</sub>O
- PIP 26 cmH<sub>2</sub>O
- FiO<sub>2</sub> .24




51

**Valve Placement**

- PEEP 4 cmH<sub>2</sub>O
- Place PMV
- PIP 22 cmH<sub>2</sub>O
- Good cough and begins to make sounds

Successful?



52



53

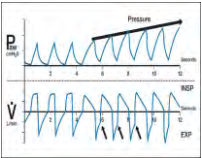
**Troubleshooting**

- PIP increases 2-4 cmH<sub>2</sub>O at a time
- Increased abdominal WOB noted

*What is wrong?*


- Remove the Valve and hear a "rush" of air coming from the trach

*What is this telling you?*




54

### Listen for Back Pressure



55




### What are some factors leading to back pressure?

56


### Factors Affecting Upper Airway Patency

- Tube size and type
- Stenosis, edema, tumors, tracheomalacia
- Anatomical differences
- Foam cuff is an absolute contraindication.




57

### Tube Position is Important



58

### Tracheostomy Tubes and Impact on Airflow




59

### Ventilator Adjustments

Pressure Ventilation

- If necessary, increase PC in small increments to achieve audible voice and adequate ventilation
- Adjust I-Time




60

### Ventilator Adjustments

Volume ventilation


- Increase VT in small increments to achieve pre-cuff deflation pressures (PIP)
- Compensate for leak



61

### Ventilator Adjustments


- Pressure Support
  - Exp % sensitivity
  - Inspiratory cycle off
  - Set I-time
- Pressure Control
  - Set I-time
- Adaptive modes-AVAPS
- Other modes
- Vent circuit



62

### Alarm Settings – Safe Practice


- Low exhaled Vt and Ve alarms
- Low pressure alarm
  - Set 5 to 10 below PIP
- High pressure alarm
  - Set 5 to 10 above PIP
- High respiratory rate
  - 10 to 15 above baseline



63

### James


- Older child
- Trach 5.0, cuffed
- Awake and alert
- Hemodynamically stable



64

### Vent Settings


- SIMV 10
- VT 250 cc
- PIP 28 cmH<sub>2</sub>O
- PEEP 8 cmH<sub>2</sub>O
- FIO<sub>2</sub> 24%
- PS 10 cmH<sub>2</sub>O




65

### Valve is NOT Placed In-Line

Why not?  
What are your recommendations?



66



**What are the steps in removing the Valve?**


67

**Re-assessment**

Trach tube to size 4.5

- Exhaled VT 100 cc
- PIP 12 cmH<sub>2</sub>O

Would you place the Valve?




68

**Ventilator Adjustments**

- Patient is coughing
- Patient is verbalizing but doing so on inhalation and exhalation
- Prolonged I-time


What would you adjust to help your patient?



69

**Troubleshooting**


- Time or Flow Limit PS breath



70

**Humidification**

- Heat-Moisture Exchanger (HME) is ineffective
- Can use with heated systems
- Remove Valve for medicated aerosol treatments



71

**VITO Demonstration**




72

# Mock Assessments and Decision Making


73

## #1-Noah

- Spinal Cord Stroke due to Chiari Malformation
  - Respiratory failure
  - Quad
- Hx: recurrent headaches, asthma, anxiety
- Intubated 5/31
- Trached 6/06



74




"Stability" depends not just on vitals and vent settings, but also on...

75

## Noah

- Trilogy vent: SIMV/PC
- PC 22| RR 16| PEEP 8| PS 8
- FiO<sub>2</sub> 28%
- Shiley #4 cuffed




76

## Noah

What if...

- his vent settings are not appropriate?  
PC 22| RR 16| PEEP 8| PS 8| FiO<sub>2</sub> 28%
- I don't adjust PEEP?
- he becomes anxious?
- he doesn't tolerate cuff deflation?




77

## Trach mask trial


What if...

- he desats?
- he becomes short of breath?
- he trials with a Valve on?



78

### #2: Grady




- Born at 23 weeks
- Intraventricular Hemorrhage (IVH)
- BPD
- Bowel perforation

Vent settings: Pressure

- PEEP 12
- FiO<sub>2</sub> 40%
- IP 45 cmH<sub>2</sub>O
- TTP >20

79

### What else do we want to know?




- Comments on secretion management: Was there increased secretion or need for suctioning?
- Upper airway patency: Was it visually assessed, or TTP only?
- Vent settings within stable state?
- Any changes in behavior?
- Co-morbidities that may be affected with restoration of PAP?

80

### Trial 1 – 15 minutes

- No vocalizations observed
- Patient calm, appeared happy and content
- Breathing unlabored with stable respiratory rate, no signs of distress
- Color pink, SpO<sub>2</sub> maintained within normal range
- Tolerance: good




81



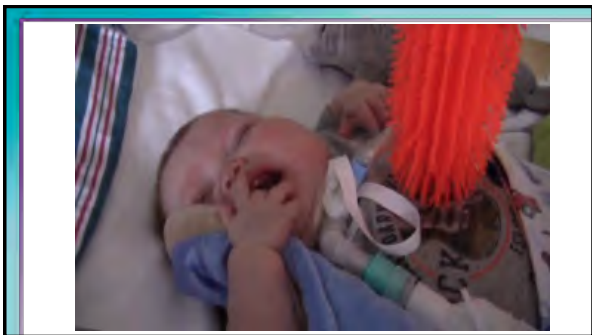
82

### Trial 2 – 20 minutes

- Occasional cooing noted
- Patient alert, interacting with environment
- No signs of increased work of breathing
- Respiratory rate stable
- SpO<sub>2</sub> stable
- Tolerance: good




83



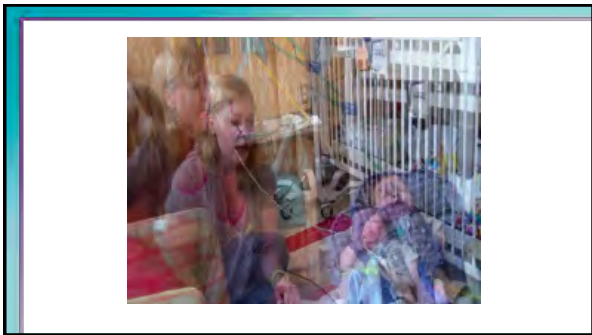
84

### Trial 3 – 15 minutes

- Increased vocalizations (cooing)
- Patient visually engaged and responsive
- Airflow through upper airway adequate
- RR unlabored
- V/S Stable
- Tolerance: good




85



86

### #3-Adam

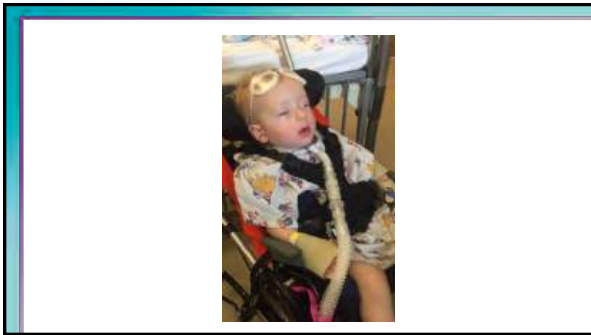
- 16 m/o
- Acquired Brain Injury about 6 weeks ago
- Trach tube
  - Size 3.5 cuffless
- Awake but seems drowsy



87

Therapy Goals for Adam?


88



89

### Vent Settings

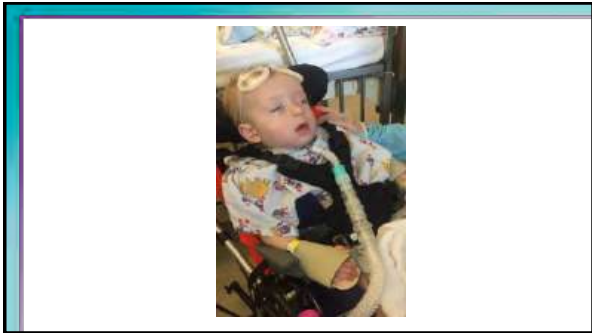
- Bi-PAP 10 cmH<sub>2</sub>O
- PEEP 5 cmH<sub>2</sub>O
- FiO<sub>2</sub> 28% bleed-in
- Total RR 17 bpm
- Vte 130-140 ml
- I:time 1:2.3
- Passive circuit



90

What is the next step?


91



92


**Low Level**

- Monitor closely
  - V/S
- Sign of distress
  - Facial expressions
  - Body movement
  - Head bobbing
- Wear time



93

Baby begins to interact when the Valve is placed!



94