

BECAUSE YOU NEED TO...

TALK MUIR

Passy-Muir® News, Events and Education

Passy-Muir, Inc. | Winter 2014

PT and Passy-Muir® Valve: Getting Patients Moving!

In this Issue:

Interview with Dr. Mary Massery

Diaphragm Pacing

New Center of Excellence –
Warm Springs Specialty Hospital

FAQ on Pediatric Trach Tubes

2013 Year in Review

Physical therapist, Dr. Mary Massery,
with Nick using the PMV®2001

Passy-Muir Inc.



Introduction:

By Julie Kobak, MA, CCC-SLP, Vice President of Clinical Education, Passy-Muir, Inc.

You may be very familiar with the importance of the Passy-Muir® Valve for communication and swallowing treatments. But did you know that the Passy-Muir Valve has a very important role in physical therapy and rehabilitation? In this issue of Talk Muir, physical therapist, Dr. Mary Massery shares her research and expertise regarding the positive effects of the Passy-Muir Valve on postural stability, movement and increasing patient participation in therapy sessions. Respiratory therapist, Rebecca Wills, explains how diaphragmatic pacing is used to help wean patients with respiratory failure off of mechanical ventilation and how the Passy-Muir Valve is used for the conditioning process. And our newest Passy-Muir Center of Excellence, Warm Springs Specialty Hospital, is in the spotlight for the early intervention they provide to ventilator patients for weaning and rehabilitation.

Did you KNOW?

The vocal folds play an important role in generating the increased thoracic pressures needed for trunk stabilization associated with lifting, pushing, upper extremity and weight bearing activity.



Hayama et al, 2002

Clinical Expert Interview: The Role of the Passy-Muir® Valve in Physical Therapy



**Mary Massery
PT, DPT, DSc**

Dr. Massery received her BS in Physical Therapy from Northwestern University in 1977, her DPT from the University of the Pacific in 2004, and her DSc from Rocky Mountain University in 2011. Mary's publications and interests focus on linking motor behaviors to breathing and/or postural mechanics for both pediatric and adult patient populations.

Dr. Massery has been invited to give over 750 professional presentations in the United States and 13 other countries. Mary has received national awards from the American Physical Therapy Association, including its highest clinical award, The Florence Kendall Practice Award, and the honorary Linda Crane Memorial Lecture. She continues to maintain a private practice in Chicago, specializing in ventilation and postural dysfunction.

Dr. Massery, we often get asked the question, "Should I remove the Passy-Muir® Valve while the patient is in physical therapy?" From your experience, how would you answer this question?

If the tracheostomy tube is sized appropriately and the Passy-Muir® Valve is well tolerated, the patient should do better with their exercises during physical therapy with the valve on. The Passy-Muir Valve restores the pressure support in the trunk, allowing for natural increases in intra-thoracic pressure (ITP) and intra-abdominal pressures (IAP) in response to increased postural demands. Without the valve, thoracic pressures cannot be increased as the air will "fall" out of the trach. For example, if a patient needs to push on a chair armrest to stand up, he would typically engage the glottis (vocal folds) to restrict the expiratory lung volume in order to stabilize the chest. If he has a trach, but no valve, air will fall out of the trach causing lower ITP, presenting as decreased arm strength. It may mean the difference between a successful independent transfer and an assisted transfer.



Physical therapist, Dr. Mary Massery works with Nick to facilitate weight bearing and reaching.



Nick uses the PMV[®] 2001 during his physical therapy sessions.

For example, my young patient, Nick, needed his Passy-Muir[®] Valve to weight bear through his left arm while reaching with his right arm. Without the valve, he would sink down into his trunk which impaired his biomechanical support for reaching.

Bouncing balls and pushing activities were used while the Passy-Muir Valve was on in order to strengthen his vocal folds and trunk muscles as we worked toward decannulation. In addition, the valve provided Nick a stronger voice and improved the spontaneous interaction and play between us, which likely improved his willingness to participate in some harder physical activities.

You have recently published an article in the Journal of Applied Physiology about the effect of airway control by glottal structures on postural stability. Does this research have implications for the patients with tracheostomy?

Yes, our findings indicate that the glottis (vocal folds and surrounding airway constrictors) are involved in dynamic postural stabilization even with a very low level of balance disturbance. In simple terms, it means that people naturally use their airway for balance. This indicated that glottal engagement should be considered for balance training. Although our research was on normal subjects, the extrapolation would be that patients with tracheostomies should consider a Passy-Muir Valve for balance training. A follow up study is needed to confirm our findings in this population.

A simple way to visualize the role of the vocal folds in postural stability is to think of the trunk of a patient as a soda-pop can. The pressure inside a closed can is greater than the pressure outside, and this pressure “stabilizes” the can. Without pressure, the aluminum can is easily crushed.

The Passy-Muir[®] Valve allows the vocal folds to act as the top pressure valve of the trunk (can) adding to the stabilizing forces of ITP and IAP. Without the valve, the air, and therefore the internal pressures, fall out of the trach tube.



There is a lot of evidence that supports an interdisciplinary approach to the care of the tracheostomized patient. What role does the physical therapist have on the trach team?

This topic is near and dear to my heart. Everyone breathes, so pulmonary issues can not belong to a single discipline. If we all work together, like the Olympic Rings, overlapping rather than gapping, it should improve outcomes: greater physical rehabilitation gains and greater health. Engaging in resistive exercises increases ITP and IAP, which in turn can help to open the distal airways and drive the equal pressure point deeper into the lungs. This may contribute to better airway clearance as well as improved physical health.

Continued next page



The Role of the Passy-Muir® Valve in Physical Therapy *(continued)*

As a clinical researcher and expert on the link between breathing and postural control, what will be the focus of your future work and research?

The logical progression of my research would include patient populations with tracheostomies who are Passy-Muir® Valve candidates. In particular, I would like to look at patients with spinal cord injuries; testing their sitting balance with and without the PMV. My clinical experience as a neuro PT and my recent research on normal populations would suggest that I will find sitting balance is improved with a Passy-Muir Valve compared to an open trach. Similarly, I would like to look at the same patients' limb force production (arm strength) with and without the PMV on their trach tubes. If it is true that we need increased ITP and IAP in order to produce force (strength) through our limbs, then wearing the Passy-Muir Valve should demonstrate increased upper extremity force.

Visit the following website to watch Dr. Massery explain her "soda pop can model" and other concepts from her course "*If You Can't Breathe, You Can't Function.*"

<http://www.masserypt.com/vids.html>

Watch a physical therapist from Madonna Rehabilitation Hospital perform techniques developed by Dr. Massery to facilitate postural support, control of breathing and vocalization with the PMV:

www.passy-muir.com/mobility

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The Passy-Muir Family of Valves



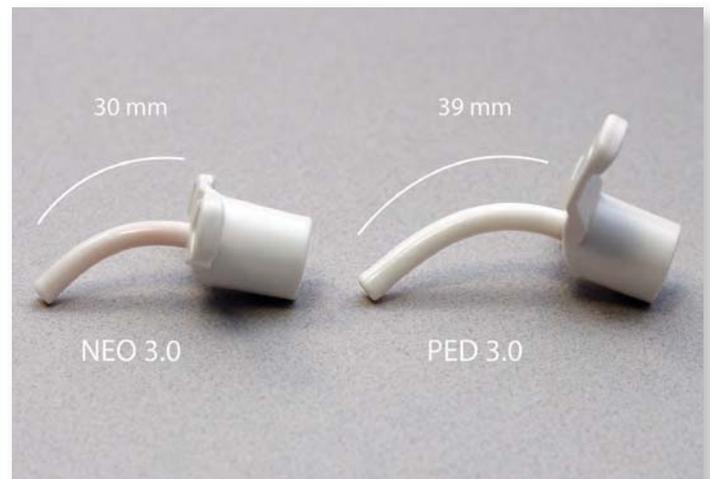
Ask the Passy-Muir Clinical Specialist

Nicole Riley, MS, CCC-SLP, Director of Clinical Education, Passy-Muir, Inc.

Question: *My pediatric patient recently had a tracheostomy tube change. She had a Shiley Neonatal Tracheostomy Tube (NEO) size 3.0 which was changed to a Shiley Pediatric Tracheostomy Tube (PED) size 3.0. She tolerated the Passy-Muir® Valve fine before the tracheostomy change but is now having difficulty. Why is she having difficulty now if both tubes are size 3.0?*

Answer: With the Passy-Muir® Valve in place, the patient inspires through the tube and then 100% of exhalation is redirected around the tracheostomy tube, up through the vocal folds and out the mouth and nose. If the tracheostomy tube is too large in terms of outer diameter or length, and takes up too much space in the trachea, it can interfere with the patient's ability to exhale around the tube.

Therefore, it is important to identify and understand all of the dimensions of the tracheostomy tube, including diameters and lengths. The inner and outer diameters of neonatal and pediatric tracheostomy tubes are the same when made by the same manufacturer. In this case, both are made by Shiley so the NEO 3.0 and the PED 3.0 tracheostomy tubes have the same inner diameter (3.0mm) and outer diameter (4.5mm). However, the **length of the tube** is different. Pediatric tubes are much longer compared to neonatal tubes. In this case, the length of the PED 3.0 is 39mm and the NEO 3.0 is 30mm. The longer pediatric tube occupies more space in the airway which, as in this particular case, can be significant enough to create greater resistance to exhalation around the tube and difficulty tolerating the valve.

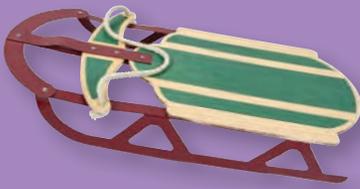


A comparison of the lengths of Shiley neonatal and pediatric tracheostomy tubes.

The clinician may recommend to the physician that the outer diameter of the tracheostomy tube be downsized in order to increase airflow through the upper airway. If downsizing is not possible, frequent reassessment is recommended as the child grows to determine when the tracheal lumen has increased in an adequate diameter for Passy-Muir Valve use.

To compare sizes of other neonatal and pediatric tracheostomy tubes, visit the tracheostomy tube manufacturer websites.

Passy-Muir Inc.



Clinical Expert Interview: The Passy-Muir Valve and Diaphragm Pacing: Changing Lives



Rebecca Wills BA, CRT, CRT-NPS, Pulmonary Program Manager

at Madonna Rehabilitation Hospital has been a respiratory therapist since 1993 and received her Bachelor of Arts degree in Allied Health cum laude in 2004 and her specialty designation in Neonatal/Pediatric Respiratory Care in 2009. On staff at Madonna Rehabilitation Hospital in Lincoln, Nebraska since 1996, Rebecca is the Pulmonary Program Manager and is responsible for the development, growth, quality and marketing of programs for adult and pediatric tracheostomy and ventilator patients.

What types of patients benefit from a diaphragm pacing system?

Candidates for a diaphragm pacing system are patients with respiratory insufficiency, a condition where the lungs are unable to function properly and maintain the normal processes of oxygen uptake and carbon dioxide removal. *There are many causes of respiratory insufficiency, but until recently treatment options were limited.*

Now, patients with chronic respiratory insufficiency may benefit from a diaphragm pacing system as an alternative to mechanical ventilation.

Individuals with a functional diaphragm and an intact phrenic nerve can achieve a normal negative pressure breathing pattern through rhythmic electrical stimulation by the pacer which eliminates the need for positive pressure mechanical ventilation and its associated risks.

Persons with a cervical spinal cord injury (SCI) or Amyotrophic Lateral Sclerosis (ALS) are among those that have benefitted from a diaphragm pacing system. Patients with congenital central hypoventilation syndrome (CCHS) have also had success with diaphragm pacing.

How new is this technology and how exactly does it work?

The first breathing pacemaker was available for commercial use in the early 1970's and was developed by Dr. William Glenn in collaboration with *Avery Laboratories*. This breathing pacemaker system, also known as "the Avery Device" requires cervical or thoracic surgery and consists of implanted receivers and electrodes that wrap around the phrenic nerves. An external transmitter with antennas worn directly over the implanted receivers completes the system.

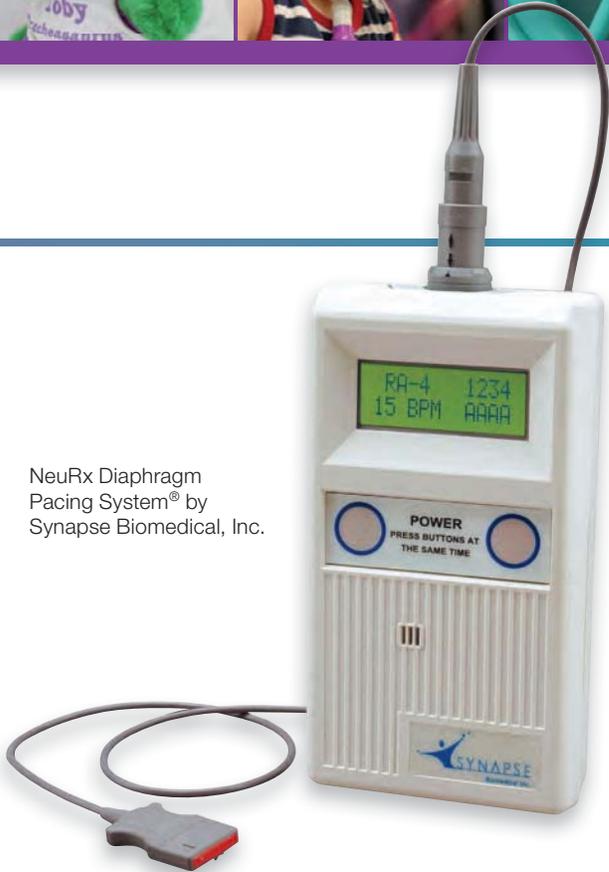
The external transmitter and antennas send radio-frequency energy to the implanted receivers just under the skin. The receivers then convert the radio waves into stimulating pulses.

These pulses are then sent down the electrodes to the phrenic nerves, causing the diaphragm to contract. This contraction causes inhalation of air. When the pulses stop, the diaphragm relaxes and exhalation occurs.

The system used by our patients, the **NeuRX DPS®** by **Synapse Biomedical, Inc.**, was FDA approved for persons with spinal cord injuries in 2008; the FDA approved its use for treating respiratory insufficiency in patients with ALS in 2011. The device uses electrodes implanted directly to the diaphragm in a minimally invasive procedure. The laparoscopic surgery takes approximately 90 minutes and is performed by a general surgeon. Assessing the diaphragm for ideal placement of the electrodes is the first step of the procedure. The diaphragm must respond to stimulation with a strong enough contraction to provide the desired breath, or tidal volume.

The NeuRX DPS® has an external pulse generator (EPG) that connects to the patient with a lightweight cable and is programmed with a breathing rate and characteristics that determine the delivered pulse strength.

Patients typically discharge the day after the procedure and we begin the diaphragm conditioning program. The diaphragm pacing care plan will vary based on diagnosis and individual goals, but includes interdisciplinary strategies to isolate and strengthen the diaphragm.

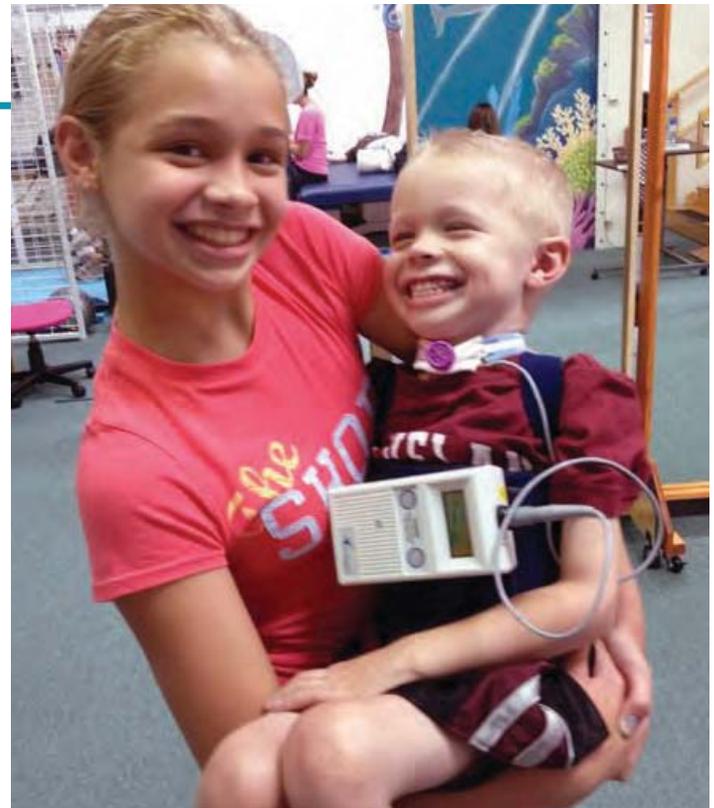


NeuRx Diaphragm Pacing System® by Synapse Biomedical, Inc.

What role does the Passy-Muir® Valve have during rehabilitation or conditioning with the diaphragm pacing system?

The use of the Passy-Muir® Valve is an integral component of the diaphragm pacer patient's care plan. The valve plays a critical role for the tracheostomy tube/diaphragm pacer patient in reducing the risks of aspiration and airway obstruction, and facilitating ventilator and tracheostomy tube weaning.

With a cervical spinal cord injury, the coordination of breathing and swallowing may be lost, putting the patient at an increased risk of aspiration. The restoration of negative pressure breathing increases this risk as well as the risk for potential upper airway collapse. The use of the Passy-Muir Valve mitigates these risks because of its closed-system design, and is recommended to be utilized by the Synapse Clinical Specialists and in the NeuRX DPS Patient Caregiver Manual. Synapse specialists also recommend the use of the Passy-Muir Valve at night for this population as opposed to capping the tracheostomy tube or an open tracheostomy tube for these same reasons.



It is imperative that the entire treatment team understand how the change from positive pressure breathing to negative pressure breathing impacts their patient's care plan. For example, the Speech Language Pathologist (SLP) working with a ventilator patient on timing their phonation and swallow with a machine delivered breath while using the Passy-Muir Valve, must now educate and coach the patient on a completely different way of speaking and eating safely and efficiently with the pacer and negative pressure ventilation.

For more information on this topic, view Rebecca Will's webinar: "The Speaking Valve and Diaphragm Pacing: Changing Lives" at www.passy-muir.com/ceu

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Featured Passy-Muir Center of Excellence: Warm Springs Specialty Hospital of Victoria

By Gail M. Sudderth, RRT, Clinical Specialist, Passy-Muir, Inc.



Warm Springs Specialty Hospital

of Victoria (WSSH) is a 26 bed long-term acute care hospital in Victoria, Texas, specializing in medically complex patients, weaning from mechanical ventilation, rehabilitation and wound management. WSSH receives patients from the immediate area acute care hospitals, as well as from large metropolitan areas in southeast Texas.

The team at WSSH wanted to offer a different approach to critically ill patients, one that provided hope for patients recovering from traumatic accidents, injury and illness.

Tracheostomized patients, who were unable to communicate, seemed to present with feelings of isolation, fear and hopelessness. It became apparent to Allie Atkinson, MA, CCC-SLP, that hope played a critical role in the patients' healing process. When tracheostomized patients were offered a Passy-Muir® Valve, they were able to express themselves for the first time in weeks or even months. They were able to verbalize their needs, participate in medical decisions, and begin eating orally. Restoring these basic human needs provided hope for these patients, and with hope, momentum occurred in their healing and rehabilitation.



Gail Sudderth, RRT, Clinical Specialist, Passy-Muir, Inc. uses a ventilator demonstration model during an educational inservice with the staff of Warm Springs Specialty Hospital.

Although Allie was passionate about providing a voice for all of the tracheostomized patients with the Passy-Muir Valve, she recalls a time in 2008, when she was met with some resistance from her colleagues. The Respiratory Care manager, Sonya Johnston, RRT, expressed concern that the staff did not have the confidence or experience to place the Passy-Muir Valve on patients still on mechanical ventilation. At that time, the standard at WSSH was to wean the patient from the ventilator before valve trials were initiated. Allie provided clinical research to Sonya regarding the

benefits of early intervention using the valve. She also contacted the Passy-Muir clinical team for assistance with education regarding application of the valve in-line with the ventilator. The first on-site inservice at WSSH was conducted in 2008 by Gail M. Sudderth, RRT, Passy-Muir Clinical Specialist. Following the in-service, Sonya reported that the education had an obvious impact on the physicians in attendance because one of them wrote orders the following day for all of his patients to receive an evaluation for the Passy-Muir Valve.

After this initial education, Allie and Sonya continued to collaborate in order to develop a standardized process for ongoing education of all staff, including documented competencies and a facility-wide policy and procedure for Passy-Muir Valve assessment and application. Once the competencies and policies were established, the staff had both the skill and confidence to implement the valve in-line routinely with their patients and approach physicians with this treatment option.



The Warm Springs Specialty Hospital respiratory team (L to R): Tracey Kreifels, Courtney Walker, Sonya Johnston, Martin Tames, Lydia Gutierrez, Mary Sullivan, Kristen Snow, and Rick Stahle.



Clinicians from Warm Springs Specialty Hospital, Karesa Keesee, SPT, and Mark Andrean, MSPT, assist a patient using the PMV®007 with ambulation during physical therapy.

In early 2013, Allie and Sonya contacted Gail from Passy-Muir, Inc. with their desire for WSSH to become the first facility in their parent group, Post Acute Medical, LLC, to be designated as a Passy-Muir Center of Excellence. As part of the Center of Excellence requirements, Gail completed additional web-based and on-site education for the WSSH team to ensure that all ventilator application education was up to date. She also met with the Allie and Sonya to review and fine-tune their policy and procedure for Passy-Muir® Valves. Currently, the policy and procedure requires the development of a collaborative and individualized treatment plan for every tracheostomized patient including the assessment and placement of the Passy-Muir Valve. The immediate patient goals focus on restoring communication,

improving secretion management and improving swallow function. These skills are the foundation for rehabilitation, and with them bring a new hope that the patient can accomplish anything.

When asked why she wanted her facility to be recognized as Passy-Muir Center of Excellence, Allie explained, “We felt it was important to apply for the designation in order to be recognized for the process we fought for and worked on for so many years. The excitement of national recognition has provided motivation for all involved. The process of the consultative relationship with Passy-Muir, Inc. also facilitated the finalization of our current program to offer the benefits of the Passy-Muir Valve to all of our patients.”

Warm Springs



The Warm Springs Specialty Hospital team. *Back row (L to R):* Becky Jessup, Tara Smith, Diane Pletcher, Mark Adrean, David Petty; Roger Lawrence, Gene Lopez. *Middle row:* Gina Irby, Bianca Horton, Kalleen Zamxow, Carissa Perry, Mary Beth Fuller, Tommy Beyer, Darlene Degrand. *Front row:* Angela Banduch, and Allison Atkinson.

Gail remembers the first contact she had with Allie and Sonya five years ago, and she has been continually impressed by their team spirit and drive to keep moving forward. According to Gail, “I don’t expect for the drive to stop just because they have received the designation of a Passy-Muir Center of Excellence. I hope to see both Sonya and Allie working towards helping the other facilities in their parent group to also attain this recognition.”

Visit www.passy-muir.com/coe to learn more about Warm Springs Specialty Hospital and the other Passy-Muir Centers of Excellence.

For the 5 important steps to becoming a Passy-Muir Center of Excellence visit www.passy-muir.com/keys.

Post Acute Medical, LLC is based in Camp Hill PA with facilities in Texas and Louisiana. Allie would like to acknowledge the following for their assistance during the COE process: Candi Ward, Director of Quality and Standards; and, Debbie Bornmann, CEO Warm Springs Thousand Oaks Rehab Hospital (formerly Director of Rehab WSSH).



2013 Year in Review



New Passy-Muir Team Members

New Clinical Consultants:



Nicole Riley, MS, CCC-SLP

the new Director of Clinical Education for Passy-Muir, Inc. provides a clinical inservice at Ambassador HealthCare in Lincoln, NE.



Lyndsi Yarkosky, BS, RRT

from Children's Institute of Pittsburgh shares her expertise working with pediatric patients with tracheostomy at the 2013 ASHA convention.



Leigh Ann Baker, MS, CCC-SLP, BCS-S

from Promise Hospital, Baton Rouge, LA provides education on Passy-Muir® Valves with the assistance of VITO at the 2013 ASHA Convention.



Cheryl Wagoner, MS, CCC-SLP

from Madonna Rehabilitation Hospital, Lincoln, NE presents a poster on the importance of early SLP intervention for patients with tracheostomy at the 2013 ASHA Convention.



Rebecca Wills, MA, BA, CRT-NPS

from Madonna Rehabilitation Hospital, Lincoln, NE uses Pocket TOM™ to teach a mother of a young child with a tracheostomy about the benefits of the Passy-Muir Valve.





2013 David A. Muir Graduate Student Award Recipient: Melanie Reynolds

Congratulations to Melanie Reynolds from Miami University in Oxford, OH for her excellent Case Study Presentation on the Clinical Application of a Passy-Muir® Valve. Gail Sudderth, RRT, Passy-Muir Clinical Specialist presented the award to Melanie at the NSSLHA Honors Luncheon at the ASHA Convention in Chicago. Melanie received an award package that included travel assistance and registration to the ASHA Convention, \$1500, a Pocket TOM™ educational model, and the tracheostomy textbook *Communication and Swallowing Management of the Tracheostomized and Ventilator Dependent Adult*, by Karen J. Dikeman and Marta S. Kazandjian. We would like to thank Melanie's supervisors Donna Scarborough, PhD, CCC-SLP, BRS-S, Academic Supervisor and Desiree C. Hockenberry, MA, CCC-SLP, Clinical Supervisor for supporting Melanie with her submission.



Passy-Muir Clinical Specialist Gail Sudderth, RRT presents the 2013 David A. Muir Graduate Student Award to Melanie Reynolds of Miami University at the 2013 ASHA Convention.



New CEU Opportunities

Our continuing education course offerings continued to expand this year with new additions to our live and self-study webinars, including: *Overcoming Barriers to Speaking Valve Use: Success through Teamwork*; *End-of-Life Care and Patient Communication in Critical Care Settings*; *Speaking Valve and Diaphragm Pacing: Changing Lives*; *Communication and Swallowing Management for ALS Patients with Tracheostomy*; *Home Care Tracheostomy Team: Navigating and Networking*; and *Pediatric Candidacy for Speaking Valve Use: Journeys to Success*.

In 2013, clinicians from all over the world logged in and completed 51,919 webinars about the Passy-Muir Valve. Here are a few of the wonderful reviews from our most recent live webinar by Katy Peck on pediatric application of the valve.

"To see real pediatric patients being taken care of really touched me. This event will go a long way to help me deal with trach care more comfortably."

- Robert Quist, RRT
Haywood Hospital, MA

"Enjoyed the convenience and affordability of this course. Have appreciated PMSV company for providing continuing education opportunities free of charge. You have a wonderful company that continues to change lives. We are grateful for you."

- Karli Negrin, MS CCC-SLP,
Alfred I DuPont Hospital for Children, DE

"I work in a children's hospital in New Zealand. We are very isolated when it comes to professional development in this area and your webinars are fabulous. They are much appreciated and I look forward to more in the future!"

- Melissa Keesing,
Paediatric Speech-language Therapist,
Starship Children's Health



NEW Passy-Muir Centers of Excellence



The Ambassador Health System, Lincoln, NE

 **Gaylord Specialty Healthcare**
 Care beyond the ordinary.

Gaylord Specialty Healthcare, Wallingford, CT

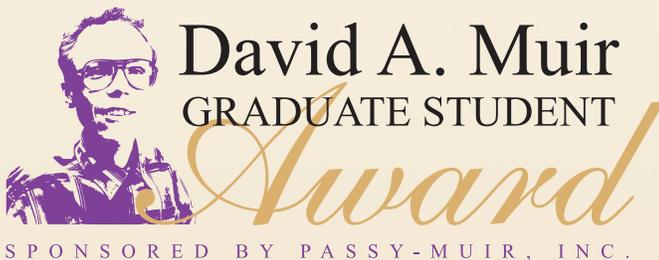


Warm Springs Specialty Hospital, Victoria, TX



Pediatric Home Service, Roseville, MN

Visit our **Centers of Excellence** website to learn about the facilities that we have honored this year for outstanding teamwork, education, and utilization of the Passy-Muir® Valve in providing tracheostomized and mechanically ventilated patients a step towards independence and enhanced quality of life.



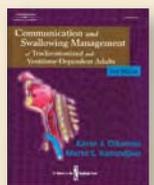
2014 David A. Muir Graduate Student Award

A Case Study Presentation related to the utilization of the Passy-Muir® Valve in the assessment and treatment of dysphagia and/or communication.

The recipient will be announced and recognized at the November 2014 American Speech-Language-Hearing Association (ASHA) Convention in Orlando, FL.

Award includes the following:

- ★ **Travel assistance** to the 2014 ASHA Convention in Orlando, Florida to receive David A. Muir award
- ★ **\$200 donation** to the NSSLHA scholarship fund in honor of the award recipient
- ★ **\$1500.00**
- ★ **Text book:** *Communication and Swallowing Management of the Tracheostomized and Ventilator Dependent Adult*, Karen J. Dikeman and Marta S. Kazandjian
- ★ **Pocket T.O.M.™** Tracheostomy Anatomical Model used for bedside education



Details and application can be found at: www.passy-muir.com/david_award



David A. Muir
 Inventor

Talk-Muir is published by Passy-Muir, Inc. for clinicians and for tracheostomy and ventilator-dependent patients, their caregivers and medical professionals in an effort to educate and to support research, and to provide: • Interesting news and stories • Resources and clinical guidelines • Information about new educational opportunities • Upcoming events

Contributions and comments are welcome.

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