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AARC Strategic Plan

AARC Vision/Mission Statement: The American Association for Respiratory Care (AARC) will continue to be the leading national and international professional association for respiratory care. The AARC will encourage and promote professional excellence, advance the science and practice of respiratory care, and serve as an advocate for patients, their families, the public, the profession, and the respiratory therapist.

AARC Strategic Objectives

- Refine and expand the scope of practice for respiratory therapists in all care settings.
- Advance the knowledge base and educational preparation of respiratory therapists to ensure competent patient care and to foster patient safety initiatives.
- Support research and scientific inquiry to strengthen the scientific foundation and promote best practice for patient care.
- Establish professional standards and outcomes supported by scientific evidence.
- Advocate for federal and state health care policies that enhance patient care, patients' access to care and professional practice.
- Partner with governmental agencies, community organizations, third-party payers, professional societies and the public to promote healthy behaviors and prevent cardiopulmonary disease.
- Broaden consumer and health care providers' knowledge and understanding of the value of respiratory therapists in providing safe, competent and cost-effective care.

The complete version of the Association's Strategic Plan is available to AARC members online at www.aarc.org/members_area/resources/strategic.asp.

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AARC Times and Respiratory Care — official publications of the AARC

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As health care budgets shrink and patient care becomes increasingly complex, our mutual challenges become greater. The synergy of the corporate partner concept is an effective way to address those needs utilizing our combined skills and resources.

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AARC Times **(USPS 491-930)** (ISSN 0893-8520) is a monthly publication of Daedalus Enterprises, Inc., for the American Association for Respiratory Care.

Periodicals Postage: Paid at Irving, TX, and at additional mailing offices. POSTMASTER: Send form 3579 to *AARC Times*, Daedalus Enterprises, Inc., 9425 N. MacArthur Blvd., Suite 100, Irving, TX 75063-4706.

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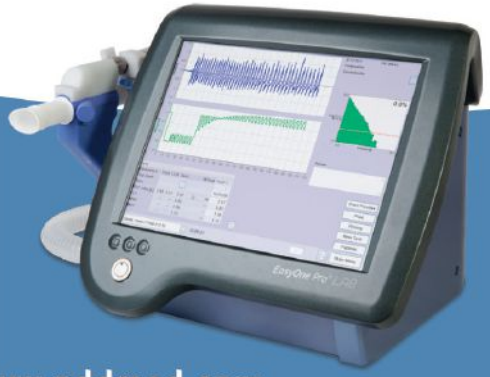

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Diaphragmatic Pacing: Where's the Evidence?

by Amber Galer, BS, RRT; and Timothy R. Myers, MBA, RRT-NPS, FAARC

The diaphragmatic pacing system (DPS) was developed for patients who suffer from insufficient spontaneous respiratory effort due to spinal cord injury, chronic respiratory conditions, and neuromuscular disorders. In the declination of respiratory efforts and degenerating nerves, the respiratory muscles are unable to function independently. Prior to DPS development, mechanical ventilation was the main intervention in the aid of breathing. DPS was developed as a means to decrease the need for mechanical ventilation and potentially wean the patient from the tracheostomy.[1]

Some of the most common challenges with mechanical ventilation include heavy bulky equipment, short battery life, and the patient's fear of power outages. Consequently, potential life-threatening dislodgement and decannulation of the tracheostomy tube, as well as additional health risks like pneumonia and bacterial infections are a potential complication waiting to occur every day. With mechanical ventilation, the patient can lose their sense of smell and experience difficulty with speaking and eating. In addition, the respiratory musculature can be damaged, requiring more positive pressure to maintain proper tidal volume and maintain vital capacity.

Therefore, delivery of an improved way of life for patients through the innovative technology of DPS was created. Diaphragmatic pacing technology is battery powered for over 500 hours of usage and was designed small enough to fit into a purse or pack and, in return, give patients back their freedom. It stimulates the nerve for muscle contraction and facilitates training and strengthening of the respiratory muscles. This allows the patient to generate spontaneous breaths with the assistance of DPS and potentially regain the sense of smell and taste.[2]

about the authors...

Amber Galer, BS, RRT, is a staff therapist at Primary Children's Hospital in Salt Lake City, UT.

Timothy R. Myers, MBA, RRT-NPS, FAARC, is the associate executive director, brands management for the AARC.

Background

According to one of the pioneers of DPS technology, Dr. Raymond Onders (the Margaret and Walter Remen chair of surgical innovation and director of minimally invasive surgery at University Hospitals Case Medical Center in Cleveland, OH): "Over 20 years of research and engineering was performed before it was tested on the first patient. Subjects included animals, normals, spinal cord injuries, and more than 120 amyotrophic lateral sclerosis (ALS) patients following 10 institutional review board protocols and investigational device exemption (IDE) trials at University Hospital Case Medical Center."

Some of the objectives for the DPS consist of utilizing the patient's diaphragm to induce negative pressure and strengthen the muscles, providing portability and accessibility to outpatient services, along with limiting costs and risks for the patient.

In an interview for this article, Dr. Onders described for us what intrigued him to become involved and see this technology through a long U.S. Food and Drug Administration (FDA) process. Dr. Onders stated: "This project began in the 1980s by Dr. Mortimer, and I was recruited by him to join the team when I joined University Hospitals Case Medical Center in 1996 and he became my mentor in this research.

I became the lead researcher when he subsequently retired. Diaphragmatic pacing became my passion over the years. Freeing someone from mechanical ventilation and improving their quality of life is incredibly satisfying. It may not be a cure, and it may be one small thing; but freeing a patient from mechanical ventilation significantly improves their quality of life. With ALS, there is no cure and very limited therapies. Giving a patient additional time to see a birthday, wedding, or a graduation changes that family's life. Working through the FDA has been a tedious process, but there is great reward in helping these patients."

Diaphragmatic pacing surgical procedure

The patient is brought in for a short outpatient surgical procedure that typically is completed within a couple of hours. Four small incisions are made above the abdomen laparoscopically, and the DPS electrodes are inserted and placed near the phrenic nerve — the motor innervation to the diaphragm (see Illustration 1). Mapping of the diaphragm is performed for the optimal location and contractibility (see Illustration 2). Wires are connected to the electrodes and linked to an external, battery-controlled device. Training or "reconditioning" is monitored to evaluate the effectiveness of volume and intensity of the contractions. Settings can be tailored unilaterally or bilaterally in case of single-sided paralysis. Prophylactic antibiotics are given to prevent infection, and the patient is monitored in the ICU for post-surgical observation for a couple of days.

Patient selection

At this current time, the most evidenced-based data and FDA approval exists for patients with two conditions: ALS (also known as Lou Gehrig's disease or motor neuron disease) and spinal cord injuries (SCI). Table 1 provides key statistical data in the United States for these two conditions.

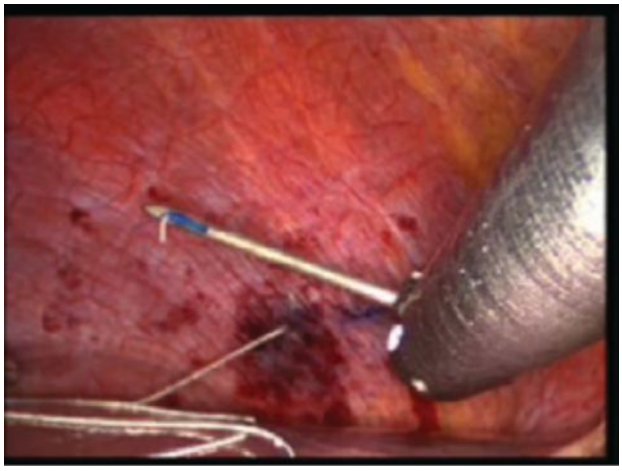

Illustration 1. Laparoscopical Insertion of DPS Electrodes

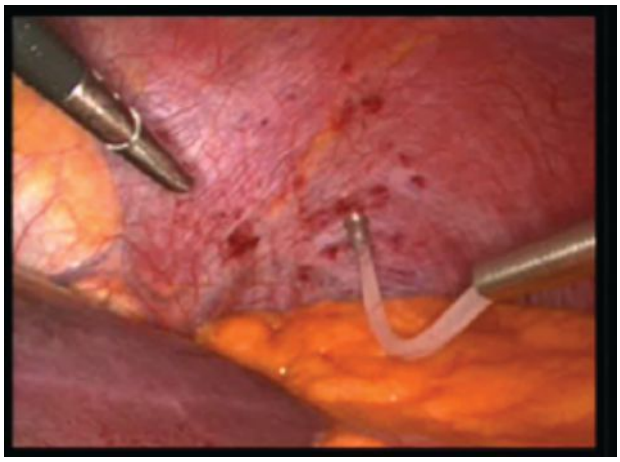

Illustration 2. Mapping of the Diaphragm for Optimal DPS Placement

(Photos courtesy of Dr. Raymond Onders)

Table 1. Key Statistics for ALS and SCI

	Amyotrophic Lateral Sclerosis*	Spinal Cord Injury#
Incidence	30,000	232,000–316,000
New cases per year	5,600	12,000
Gender (male)	60%	Majority
Race (Caucasian)	93%	–
Mortality causation	Pulmonary complications and respiratory failure	Pneumonia, pulmonary emboli, and septicemia

———————

* 2011 ALS CARE Database. Amyotrophic lateral sclerosis fact sheet. www.synapsebiomedical.com *Accessed Jan. 8, 2013*

\# 2011 National Spinal Cord Injury Database. Spinal cord injury fact sheet. www.synapsebiomedical.com *Accessed Jan. 8, 2013*

Table 2. Three Classifications for Spinal Cord Injuries

Classification	Location
High tetraplegia injuries	Cervical spine injuries between vertebra C1–C4
Low tetraplegia injuries	Cervical spine injuries between vertebra C5–C8
Paraplegia	Vertebra injuries of thoracic, lumbar vertebra, or sacrum

ALS is a progressive neurodegenerative disease that affects nerve cells in the brain and the spinal cord. When the motor neurons die, the ability of the brain to initiate and control muscle movement is lost, which often results in total paralysis. One of the most important effects of progressive neuromuscular weakness in ALS patients is the effect of the disease on respiration.

Although ALS has no direct effect on the lungs, it has devastating effects on the mechanical function of the respiratory system. ALS affects all of the major respiratory muscle groups: upper airway muscles, expiratory muscles, and inspiratory muscles. Therefore, all patients with ALS are at significant risk for respiratory complications. Progressive inspiratory muscle weakness in ALS inevitably leads to carbon dioxide retention, inability to clear secretions, and hypercarbic respiratory failure, which is the major cause of death in ALS.

In order to receive the perceived benefits from diaphragmatic pacing (DP), ALS patients must have adequate diaphragm function as well as the phrenic nerves (which stimulate this muscle). If the phrenic nerves or diaphragm have deteriorated too much from the disease, diaphragmatic pacing is unlikely to have any benefit.

Spinal cord injury is typically the result of traumatic damage to the spinal cord that results in the loss of function, such as mobility or feeling. The majority of SCIs involve males under the age of 30. Medical experts currently classify SCI into three distinct groups depending on the location of the injury, while all injuries result in impairment of sensory and motor functions to varying degrees (see Table 2). There is currently no cure for SCI, and each classification comes with a high initial cost and a lifetime economic burden (see Table 3).

The higher the site of injury, the greater the number of nerves affected, which can result in partial or complete paraplegia. Tetraplegia injuries can affect the arms and legs and, in some instances, breathing, resulting in dependence on a mechanical ventilator. Data have shown a distinct difference in SCI injuries that require mechanical ventilation; a 20-year-old tetraplegia patient with ventilator dependency has a life expectancy that is more than 14 years shorter than a tetraplegia patient who does not use a ventilator.

While the FDA approval of DP is currently for adults only, the technique and technology has been utilized in children during the required FDA trials. When Dr. Onders was asked about the future potential utility of diaphragmatic pacing in children, he said:

"Cervical spinal cord injured children as young as two years old have been successfully implanted and weaned from mechanical ventilation. To date, 12 pediatric SCI patients have been implanted, with seven having achieved

Table 3. Economic Impact of Spinal Cord Injuries by Classification

Injury	1st Year Expense	Subsequent Year Expense	Lifetime Cost 25-Year-Old	Lifetime Cost 50-Year-Old
High tetra	$985,000	$171,000	$4,373,000	$2,403,000
Low tetra	$712,000	$105,000	$3,195,000	$1,965,000
Paraplegia	$480,000	$39,000	$1,461,000	$1,032,000

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National Spinal Cord Injury Statistical Center, February 2011. Spinal cord injury fact sheet. www.synapsebiomedical.com *Accessed Jan. 8, 2013*

full-time pacing. One of these patients regained volitional breathing and was weaned off the pacer. Central hypoventilation syndrome is an area where pacing could replace positive pressure ventilation. Pacing may negate ventilator-induced diaphragm dysfunction (VIDD). Pacing has been shown to protect against VIDD; therefore, pacing could be used temporarily in the pediatric ICU to facilitate weaning from mechanical ventilation."

Risk/benefit profile of diaphragmatic pacing

At this time there are no known contraindications for diaphragmatic pacing. Most of the complications are associated with typical risks of any patient who would undergo abdominal surgery or are usually associated with patients who have ALS or SCI.

In 86 clinical trial patients with the NeuRx Diaphragm Pacing System® (Synapse Biomedical Inc., Cleveland, OH), three patients (3.5%) experienced a serious adverse effect that was related or possibly related to the surgical implantation procedure: i.e., capnothorax (in two patients or 2.3%) requiring catheter placement or an extended hospital stay and respiratory failure following complications from surgery (in one patient or 1.2%) after the migration outside of the stomach of a percutaneous endoscopic gastrostomy (PEG) tube placed following electrode implantation. There were no reports of any serious adverse effects related to the patients' use of the device following discharge.[3]

While 21st century medicine has quickly migrated to be founded and supported on evidence-based principles, scientific evidence is extremely difficult for this new innovative technology that has only recently been approved by the FDA under humanitarian-use purposes for patients with ALS and SCI. Currently, most of the available scientific data on the perceived benefits of DP are listed in the FDA approval document or in the document's references from the required clinical trials and case reports contained within the FDA approval.

Perhaps the most unbiased source to review for the perceived benefits would be in the documents submitted to the FDA for review and approval of DPS.[4] Diaphragm pacing has been implanted in over 350 patients to date, with over 150 in controlled clinical trials for spinal cord injury and ALS. Table 4 provides a summary of the benefits of diaphragmatic pacing in patients with ALS and SCI.

Costs of diaphragmatic pacing

It is difficult to place an exact cost of the technology and the necessary surgery because the cost will vary based on the specific benefit plan of the patient. The device is currently being sold to hospitals at the cost of $21,250, which does not cover the cost of surgery, neurologists, and other cognitive specialists at the same rate as for orthopedic surgeons and radiologists.[4] Estimates have placed the hospital charges between $30,000–$60,000 on average. Based on information obtained from the clinical trials, it is estimated that replacement batteries and cables probably will cost less than $100 a month after insertion.

The surgery is accomplished at certified centers by a skilled board-certified laparoscopic surgeon who has received special training in diaphragmatic pacing. As with many new and innovative procedures, candidates for this procedure and technology will need to work with their treatment center to provide them with the best current information on how reimbursement is obtained and to assist them in their insurance pre-approval process. The current bio-medical companies that manufacture the DPS have established Medicare, Medicaid, and private insurance reimbursement information and guidance to support treatment center efforts to obtain pre-approved patients' coverage.

Table 4. Potential Benefits of Diaphragmatic Pacing

- A significant improvement in survival from diagnosis (by 16 months) and from the start of noninvasive ventilation (by nine months) compared to standard-of-care noninvasive ventilation
- A remarkable 100% 30-day survival rate of patients with simultaneous PEG and DPS compared to 30-day mortality expectations of 2%–25% with continued long-term improvement in survival
- A 16-month survival from implant for patients with no other respiratory options who are intolerant or unable to use noninvasive ventilation
- Significant sleep improvement after just four months of DPS conditioning: an increased sleep efficiency (median 9%), with a reduction in arousal index driving a decrease of wake after sleep onset (median 69 minutes), which is also clinically significant given that widely prescribed drugs for the treatment of primary insomnia increase sleep efficiency by 6%–7% and reduce wake after sleep onset by 15–20 minutes.

Table 5. Summary of Transition from Ventilator to Diaphragmatic Pacing

- Increasing diaphragm muscle strength and converting the muscle fibers
- DP turned on and ventilator turned off
- Patients returned to ventilator when O_2 saturation drops or dyspnea develops
- Sessions can be repeated in 45 minutes
- Time for conditioning depends on time from injury and amount of training done per day

The area of cost savings is one that has yet to be fully investigated. The DP candidates, due to the nature and the seriousness of their conditions, incur great costs of care that often is heavily invested with technology. While the diaphragmatic pacing system in ALS is not intended to provide complete ventilatory support as it is in SCI, it is based on the same initial effects. It has been documented that for patients with respiratory compromise who required mechanical ventilation, the cost can average $15,000 a month for rental, backup equipment, maintenance, and nursing care.[5] While the jury is still out on the actual figures of potential direct cost savings, a cost analysis on a Cleveland patient found that the device saved Ohio Medicaid $13,000 a month.[5]

Christopher Reeve's story

Christopher Reeve may have played a well-loved fictional superhero in the 1978 hit movie "Superman," but in 1995 his super-human strength was put to the test. He was thrown from his horse, causing an injury that instantly changed his life. Reeve landed headfirst and fractured his C1–C2 vertebra, leaving him paralyzed from the neck down and incapable of breathing on his own. His inability to sustain adequate respiration led to a tracheostomy and complete dependency on mechanical ventilation. Evident of immobilization, he was bound to a motorized wheelchair that he controlled by blowing into a straw by mouth.[6]

Due to the tragic accident, Reeve was at risk for multiple comorbidities due to immobilization and mechanical ventilation such as: thrombosis, blood pressure disorder, muscle weakness, bacterial infections, atelectasis, aspiration, pneumothorax, and pneumonias. He was also faced with the possibility of tracheostomy tube dislodgement and disconnection from the ventilator, loss of battery, and power outages — which, in turn, could result in his death.

Reeve once said: "never underestimate the difference you can make." He was determined to beat all odds and strived to promote an improved quality of life for all people with similar difficulties. With the help of Dr. Onders in 2003, he was one of the first spinal cord injury patients to receive diaphragmatic pacing during its investigational period. This innovative surgical procedure and technology gave Reeve freedom by decreasing his need for continual mechanical ventilation by retraining his respiratory muscles to trigger with the pacing system. Within hours of the surgery, Reeve was able to breathe spontaneously for up to two hours at a time, compared to 10 minutes before the operation. The operation also returned Reeve's ability to speak and smell. It also significantly reduced his likelihood of pneumonias, bacterial infections, and relieved his constant worries of being disconnected from his ventilator and not being able to sustain adequate respiratory efforts.

Reeve fought a courageous battle and proved his true heroic side by using his injury to spread awareness and raise funds for research.[7] He, like Dr. Onders, paved the way for patients to receive DPS, which has aided in different neuromuscular disorders such as Lou Gehrig's disease and spinal cord injuries like Reeve's own.

The role of the respiratory therapist

Due to the nature of the respiratory etiology of both these patients, the respiratory therapist is a critical component throughout the care transition. According to Dr. Onders, "The respiratory therapist can have a vital role in the care and management of the DP patients. It is imperative that the patient's baseline respiratory status is known and understood, including pulmonary function testing, arterial blood gases, and mechanical ventilator usage and settings. RTs are unique in their ability to integrate the multiple models of invasive and noninvasive ventilation. RTs can provide an going respiratory assessment and implement changes based on clinical findings, and diaphragmatic pacing patients will require this type of specialized care and knowledge. Often times, the SCI patient will require changes to their mechanical ventilator to augment weaning to the pacer. The ALS patient may require changes to the diaphragmatic pacing when they experience a decline in function. The respiratory therapist is the care team member uniquely qualified to assess and implement changes based on patient need."

Invasive or noninvasive ventilation is a key component of pacing candidates with moderate to severe respiratory impairment. Adjunctive and supportive therapies of airway clearance and aerosol therapy are frequently also necessary. The respiratory therapist must

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work with the medical team to develop a plan of care to liberate the patient from ventilation based on the patient's comfort and response to DP. Table 5 provides a summary of a transition process from ventilator to DP. Supportive therapies, if beneficial, will likely continue to be a component of the plan of care and may need to be increased compared to their normal regimen.

The future of DPS

A visionary prospective of where this innovative technology can be expanded to has to be considered. So where is the future of DPS headed in the next 10–15 years? According to Dr. Onders, he believes "diaphragmatic pacing will be used in ICUs to prevent VIDD. So the next set of clinical trials will be focused in the intensive care unit. There have been a few case studies in post-open heart surgery patients with failure to wean and post-operative phrenic nerve dysfunction. These case studies demonstrated in these patients a decreased ICU stay, decreased ventilator days, and overall decreased time with a tracheostomy when compared to similar patients. Pacing would be utilized to maintain diaphragm muscle strength during the acute phase of illness, thus eliminating the subsequent weeks of ventilator weaning."

As with any innovative technology in its early beginnings, diaphragmatic pacing seems to offer not only improved clinical outcomes for its currently intended population but many others with similar diaphragm and phrenic nerve dysfunction. In addition, the improved quality of life for these patients cannot be understated. The future growth of DPS indeed seems to be on the upswing and with great potential. ■

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Stand Up and Be Recognized

by Thomas J. Kallstrom, MBA, RRT, FAARC

Making a difference in the lives of our patients is what we do every day. I think it defines what a respiratory therapist is. When asked why I chose respiratory therapy as my profession, I always respond by explaining that I wanted to help others. While somewhat altruistic, it is a shared perspective of many of my generation of RTs. Over the years, I have asked recently graduating RTs and prospective employees the same question. While I often heard the same answer that I had, I also started to hear (from younger RTs) that the motivation was more personal. They had a child with asthma, a grandparent with COPD, or a medical experience that brought them face to face with a respiratory therapist. Ours is a profession where we enter it based on a clear calling, which ultimately benefits our patients no matter what the reason for starting down this career path. Part and parcel to this is the fact that through the years (66 to be exact) we have not necessarily been as prominent in public perception as some of our other colleagues. I think this is starting to change.

Interestingly, over the past few years I have noticed an increasing wide-ranging recognition of the profession and the AARC. The AARC's Executive Office is frequently contacted by federal, state, and county agencies for the purposes of clarification of respiratory modalities and guidelines, or a request for the AARC to join in a disease-specific collaboration with another agency. Thankfully, we can reach out to our many content experts from our membership to provide that assistance. This recognition goes beyond government contacts. We work with other professional and patient associations that realize the importance of our profession and the critical role that we play in patient care. This acknowledgement of the importance of respiratory therapists will be good for us as we move forward and seek to expand our professional relationships as a profession as well as an association.

Respiratory therapy rated as a "best job"

Speaking of recognition, recently the *U.S. News & World Report* listed respiratory therapy as one of the top 25 (out of 100) best jobs in America. This overview can be accessed at http://money.usnews.com/careers/best-jobs/respiratory-therapist.

Every year *U.S. News and World Report* publishes the most desired jobs for the coming year and beyond. Their information is based on an analysis from the U.S. Department of Labor's predictions of occupations that should have ample openings in the years to come. Some of the indicators used are salary, training, skills, and qualities necessary for the job. This is not a big surprise when you consider the fact that the Bureau of Labor Statistics expects to see a 28% increase in the number of respiratory therapists needed in the next seven years (www.bls.gov/ooh/healthcare/respiratory-therapists.htm). Part of the reason for this need is based on the fact that by 2020 all baby boomers will be 55+ years of age and thus more susceptible to chronic lung conditions.

While we still will need to navigate through the changes in health care, we do have a professional vision that will place the respiratory therapist front and center in areas beyond the hospital walls. Most notably is disease management of patients with chronic lung disease, which is a significant part of our goal as we pursue Medicare Part B reimbursement for respiratory care services.

about the author...

Thomas J. Kallstrom, MBA, RRT, FAARC, is executive director and chief operating officer of the AARC.

RTs receiving "good press"

The AARC also makes it a point to recognize members who excel in a link titled "Good Press: AARC Members in the News," which is found on our landing page (www.AARC.org).

Every few weeks we place updates with examples of actions of respiratory therapists who have been noted in print or broadcast media. Some examples include the CNN interview with AARC member Michael Anderson, MD, after the Sandy Hook tragedy in December 2012 (www.aarc.org/headlines/12/12/anderson.cfm). In his interview, Dr. Anderson explained how hospitals train their staff for disasters and hospital surges such as what happened in this small community in Connecticut.

Jenny Hsieh, BSRT, RRT, is another example of an AARC member who rescued a victim of a hit-and-run accident on the streets of Chicago (www.aarc.org/headlines/12/01/jenny_hsieh). She said that this was second nature for her to jump into action.

Another is AARC member Kristen Scott, BS, CRT, who was part of a group of strangers who rescued a family that was submerged in their car in an icy river in Utah (www.aarc.org/headlines/12/02/kristen_scott/). She selflessly went into action and as a result was invited to "The Ellen DeGeneres Show" to be interviewed about this extraordinary effort.

Recognition starts at home

While these are extreme examples of some remarkable work by our respiratory therapists and physician members of the AARC, they are day-to-day occurrences in our nation's hospitals and beyond. Recognition really starts at home on a one-to-one basis with our patients, patient's families, co-workers, and peers who will assimilate their own opinion of us as health care professionals and human beings based on how we present ourselves and in the way we care for them. Perception is reality and, thus, it is all the more important for us to portray our highest level of professionalism. Stand up and be recognized and make sure your patients know it is a respiratory therapist who is caring for them. ■

The Aging Factor: Staying Healthy on the Job

by Helen M. Sorenson, MA, RRT, FAARC

For those who have elected to become respiratory therapists, regardless of years of service, staying healthy on the job has always been and always will be a challenge. Why is this so? Every day we are exposed to unknown pathogens. We work in an environment where the surfaces we touch, rooms we enter, documents we read, and people we come in contact with are all potential carriers of bacteria, viruses, or fungi. Awareness of our vulnerability prompts us to use good hand-washing techniques and/or alcohol-based hand sanitizers, adhere to "universal precautions," and use common sense when dealing with patients. But is this enough? Another reality that begs consideration is the fact that as we age, our immune systems become less effective. This article will cover some of the ways you can maintain your health and still happily remain on the job.

Aging workforce

In 2005 the average age of respiratory therapists in the United States was 45, up from age 40 in 2000.[1] In 2009, Barnes et al reported that 75% of respiratory therapy faculty from accredited programs planned to retire by 2020,[2] which puts the average age of educators over 50 years now. The 2009 Human Resources Study by the AARC showed the age of working RTs to be between 47 and 49 years of age with few working beyond the age of 62,[3] so yes, we are aging. The explanation for the rising median age of therapists is multifactorial. The "baby boom" obviously put more potential workers into the population between 1946–1964. At the same time, the profession of respiratory therapy was born and growing, needing more employees. A current factor is the economy. Therapists gainfully employed are not as willing to retire until they can receive their maximum benefits. Added to this is the national shortage of respiratory therapists and competition for all advanced skilled workers throughout the United States.[1] We work because we are good at what we do and we are needed.

Keep in mind that one is not classified as "old" until they reach their 65th birthday, as most developed-world countries have accepted the chronological age of 65 as being an older person.[4] It would thus be fair to say that our workforce is not old, but rather aging. With aging comes physiological change in all our organ systems, but this does not necessarily mean that functional change follows any pre-determined pathway. By using common sense and avoiding unhealthy choices, adults can and do have active lifestyles.

about the author...

Helen M. Sorenson, MA, RRT, FAARC, is adjunct faculty and an associate professor (retired) with the department of respiratory care at the University of Texas Health Science Center at San Antonio, TX.

Staying in the profession

Getting up and going to work every day requires energy. Individuals who work off-shifts (such as nights or evenings) need to look for solutions that meet their needs. Energy can be sub-classified as physical energy, metabolic energy, and motivational energy. Levels in all three tend to decline as we age, but this varies greatly between individuals. Finding ways to keep your energy levels up may be the key to job satisfaction and longevity.

Physical energy is often a matter of fitness. Getting adequate sleep, eating a balanced diet, and participating in regular exercise are common sense interventions. For shift workers, sleeping during the day (darkening the room) and adjusting meal times may improve energy levels. A study published in 2006 demonstrated that aerobic exercise training in-

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creased brain volume in both the white and gray matter regions.[5] Cardiovascular exercise has been associated with improved higher-order cognitive processes such as working memory, switching between tasks, and inhibition of irrelevant information.[6] For RTs who work 12-hour shifts, this is extremely important. Other lifestyle choices also contribute to fitness. The facts on nicotine are clear: The more you smoke, the greater the impact on your health. The good news is that there are benefits of quitting at any age. Regular consumption of alcohol, in moderation, may be good for your health.[7] As we age, however, the definition of "moderation" becomes more important, as excess consumption is associated with many diseases including brain damage. The latest dietary guidelines make it clear that no one should begin drinking or drink on the basis of potential health benefits. The MacArthur Foundation Study shows that the choices you make now, more than heredity, determine your health and vitality.[8]

Metabolic energy comes from the different foods we consume, namely carbohydrates, lipids, and proteins. Changes in energy regulation occur with normal aging. Metabolism is decreased, thus caloric intake should be reduced. For adults still in the working world, energy is needed. The recommendation is to eat early in the day. Having a good breakfast will trigger thermogenesis — the body sending a signal to the brain to activate energy production. To keep energy levels up during the day, small meals every three to four hours (with some protein) will keep metabolism going. While there is no convincing evidence that older adults require more protein, women are more vulnerable to any diet marginal in protein.[9] Osteoporosis and sarcopenia, both potential disabling conditions, can be forestalled by adequate intake of protein and the key nutrients needed to maintain muscle and bone strength. Other recommendations for bone strength and the reduction of fractures are vitamin D and calcium supplementation. A study by Di Daniele et al showed that a daily supplement of 500 mg calcium and 200 IU vitamin D in 120 women over 45 years of age for a period of 30 months demonstrated a significant difference in bone density between the control and placebo groups.[10] The potential to reduce the rate of bone loss in the hip, spine, and total body is important. It is never too late to get started on preventive measures.

Motivational energy, while not often listed as a reason to go to work, may be one of the most important factors keeping respiratory therapists at the high end of the age range on the job. Liking what you do, seeing the positive results of your efforts on a daily basis, and knowing you have made a difference can forestall retirement for many years. One surprising result from the "2009 AARC Respiratory Therapist Human Resource Study" was an 80 year-old-plus respondent who is still working. What other than motivational energy would make an 80+ individual keep coming back to work? Regardless of whether you are a therapist, an educator, a supervisor, or an administrator, it is important to remember what led you to the career of respiratory therapy. Whether you became an RT by chance or by intention, if you have been in respiratory therapy for over 20 years, it is a choice. Being a therapist is first and foremost about patient care. Seeing the look on the faces of patients/families when extreme shortness of breath is alleviated, or the relief when a loved one is liberated from the ventilator, is priceless. If you have left patient care (for education or administration) and are considering retirement, put your scrubs on for an hour or so and go talk to a patient. That's where it all started!

We need you

Respiratory therapists are going to become more visible and more important in health care institutions as we encounter the new wave of baby boomers entering old age and becoming patients. Respiratory therapists with 20+ years on the job have the knowledge and experience needed to keep this profession strong. Staying healthy on the job, and happy as well, is going to make a difference for both you and your patients. ■

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Can Dentistry Assist in Managing Your Patients' Airways?

by Jill Wade, DDS, MAGD

Your dental community might be a new source of support in maintaining your patients' breathing and sleeping. As a dentist, I value the prevention of destructive effects that snoring, sleep disorders, and sleep apnea can have on a patient's overall health and well-being. Sleep is essential to maintaining optimal oral health, and lack of sleep can be linked to excessive tiredness, depression, and reduced resistance to infection. Since periodontal disease (an infection of the gum tissue surrounding the teeth) is the world's most prevalent infection, I am concerned about helping my patients get a good night's sleep in order to maintain their oral health. I also realize these sleep conditions can significantly impact their quality of life and place unnecessary strain on relationships between bed partners, family, and the workplace.

What is snoring versus obstructive sleep apnea?

I jokingly say "not much" to the person sleeping next to you. Either sounds loud and disrupts your partner, but technically there is a difference. During sleep, muscles relax — including those that control the tongue and throat. The soft tissue at the back of your throat can sag, narrowing the airway. Incoming air then makes the tissue at the soft palate (uvula) and the throat vibrate; we call this sound snoring. When the airway becomes completely blocked and breathing stops, the brain detects the lack of oxygen and prompts a momentary arousal to draw breath. This loud gasping sound is what most people recognize as a symptom of sleep apnea. Many obstructive sleep apnea (OSA) sufferers may experience hundreds of apnea episodes per night and yet remember none of them. In fact, if the sufferer lives alone or sleeps separately, they may not be aware of their condition at all.

about the author...

Jill Wade, DDS, MAGD, is a dentist at Stonebriar Smile Design in Frisco, TX.

An alternative to CPAP therapy — mandibular advancement splint

Continuous positive airway pressure (CPAP) has been the "gold standard" to treat the effects of OSA for years. However, long-term compliance is not successful for the majority of our patients. My goal is to introduce you briefly to the mandibular advancement splint (MAS), an alternative for patients who are unable or unwilling to tolerate positive airway pressure (PAP) devices. This is a custom-made dental appliance worn during sleep to maintain the patency of the upper airway by increasing its dimensions and reducing collapsibility. An upper and lower dental plate tightly yet comfortably fits around the teeth and positions the lower jaw forward (what dentists call mandibular protrusion). The design allows the mouth to open and close and the lips to seal, yet it does not impact the tongue. The most comfortable devices do not lock or fix the jaws together. The device also needs a way to titrate the position of the jaw forward until signs and symptoms are resolved. Further sleep evaluation is also recommended to confirm effectiveness.

How do you know if MAS is the right treatment option?

If a patient has tried positive airway pressure and cannot tolerate the treatment, they are an ideal candidate. When I consider effectiveness for a patient, I examine three key areas:

- Severity of OSA: The American Academy of Sleep Medicine recommends the use of oral devices for mild-to-moderate OSA (apnea-hypopnea index less than 25) or patients with severe OSA who prefer oral devices to PAP.[1]

- Body mass index: If the body mass index is below 30 (which means a person is not obese), the probability that the device will work is higher.

- Dentition: Minimal dentition of at least six teeth on the lower mandible with no periodontal disease must be present to support the appliance. The device can be made for patients with an existing upper denture.

What features should be considered in an oral device to treat sleep apnea or snoring?

The following features and benefits overcome many of the problems conventionally associated with oral appliances.

- A streamlined design with minimal bulk, which maximizes the size of the lingual space and reduces gagging or impingement of the tongue.
- An excellent fit in both the upper and lower arches.
- The unique design provides anterior and posterior contact, which provides a stable occlusion and prevents tooth movement and minimizes temporomandibular joint discomfort and injury caused by teeth grinding.
- Construction of two individual pieces allows patients to open and close their mouth. This allows clear speech, yawning, and drinking water without requiring the patient to remove the appliance. The ability to communicate clearly while wearing the device is particularly appreciated by patients and their partners.
- The small size and absence of an anterior retaining mechanism helps patients sleep with their mouths closed. This minimizes excessive salivation, dribbling, and dry mouth.
- The high-quality fit provides excellent levels of retention and ensures that there is no damage to the existing teeth, crowns, or bridgework. It is also easy to clean and disinfect.
- The device is titratable and allows for each individual patient's optimal protrusive position to be found, making it both effective and comfortable to the patient.

Research continues to be performed on the success of MAS therapy for sleep apnea compared to PAP. Oral advancement therapy is showing equal health benefits, superior patient compliance and convenience, higher acceptance of treatment, tolerance, and therapy adherence. Chan and Cistulli published a comparison study in *Current Opinion in Pulmonary Medicine* worth reading.[2]

As a dentist, I would rather have my patients trying some type of oral device to help with their sleep disorder than simply being noncompliant with CPAP. In my opinion, every minute of good sleep gets you closer to a better life. I have patients who also proceed with a mandibular advancement splint even if they have an existing CPAP machine. Most of them state that they love the alternative when they travel or need to sleep in the same room with somebody unfamiliar with their sleep habits. I encourage you to seek out a dental professional who provides oral sleep devices to help you help your patients.

Wishing you and your patients sweet dreams. ■

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ADDITIONAL READING

Chan AS, Sutherland K, Schwab RJ, et al. The effect of mandibular advancement on upper airway structure in obstructive sleep apnoea. Thorax 2010; 65(8):726-732.

This is an examble of a custom-made dental appliance worn during sleep to maintain the patency of the upper airway by increasing its dimensions and reducing collapsibility.

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Government Advocacy

Patient Promotes Respiratory Awareness

by Edna Fiore

Note: *This month's column is written by Edna Fiore, a pulmonary patient from Colorado and a tireless advocate for those who suffer from respiratory illnesses. Recognizing the critical, clinical, and quality-of-life importance respiratory therapists provide to those who suffer from pulmonary disease, Fiore has devoted endless hours and expended great energy in not only raising public awareness of COPD and the respiratory therapy profession but has become an active voice to policymakers both in Colorado and in Washington, DC.*

My introduction to the respiratory profession

Thanks to pioneering work in the field of portable oxygen therapy and pulmonary rehabilitation spearheaded by Thomas L. Petty, MD, FAARC, and Louise Nett, RN, RRT, FAARC, Colorado has been a leader and innovator for COPD awareness and advocacy since the 1960s.

In 2003, Dr. Petty brought together patients, professionals, members of the Colorado Society for Respiratory Care (CSRC), and providers including representatives from hospitals, home care suppliers, physicians, educators, and members of the American Lung Association of Colorado in order to organize and present an educational COPD conference. This was the starting point for networking and interaction by both patients and clinical professionals. The focus of this first Moving Mountains Lung Health Conference was awareness and education. Attendees reached a consensus to keep the momentum going by organizing the newly named Colorado COPD Connection. This initiative was spearheaded by Patty Koff, RRT-NPS, from the University of Colorado; Mary Gilmartin, RN, RRT, from National Jewish Health; and Brenda Crowe, CRT, from Exempla Lutheran Health.

about the author…

Edna Fiore has been an FDA Pulmonary-Allergy Drugs Advisory Committee patient representative since 2007 and also serves as a stakeholder representative for the Patient-Centered Research Outcomes Institute.

At a subsequent conference in 2010, we honored Dr. Petty by calling this conference the Thomas L. Petty, MD, Moving Mountains Lung Health Conference. We also renamed our Colorado COPD Connection to the more encompassing Colorado Lung Health Connection (CLHC). Both the CSRC and the CLHC coordinate their work in public outreach, awareness programs, as well as political advocacy efforts.

A number of opportunities to be heard

How did I become involved and active? As a patient I had participated in COPD studies since 1996 and participated in the pulmonary rehabilitation program at Exempla Lutheran Health. I joined the online COPD support group EFFORTS (Emphysema Foundation For Our Right To Survive) in 2001 and became aware of the vital importance of political advocacy.

In 2007 the CSRC sponsored the first Respiratory Society Patient Chapter, which is dedicated to supporting, educating, and sharing information with respiratory patients throughout the state of Colorado. I was privileged to be the first patient AARC member as a member of the CSRC Patient Chapter.

I took my involvement with the CSRC and patient advocacy efforts even further. As many of you know, for the last 14 years the AARC, partnering with the state respiratory societies, has been sending RTs to Washington, DC, every year to advocate to members of Congress the respiratory legislative agenda. I became the first patient to become an active and official PACT (Political Advocacy Contact Team) representative.

On Advocacy Day 2009, veteran CSRC PACT representatives Allen Wentworth, RRT, and Leigh Otto, MEd, RRT,

put me in a wheelchair with my AirSep FreeStyle portable oxygen concentrator and off we flew to DC. We then spent an entire day making the "rounds" of all seven Colorado House members and both of our senators. The three of us were able to impress upon the legislators' staff members the important role of RTs in the management of COPD and other respiratory issues.

Since I first attended the AARC Congressional Hill Day event, patient participation in this important event has increased. In 2011, the COPD Foundation, Alpha-1 Association, and Alpha-1 Foundation sent patient advocates along with RTs to the AARC Hill Day. And in March 2012 we had over 350 congressional appointments — and we were joined by patients from the Pulmonary Hypertension Association. We had a total of 32 patient representatives going to the Hill. The COPD Foundation generously provided funding to help cover the costs of many of the patient advocates.

Participation in the AARC PACT — whether it is the Washington, DC, Hill Day or state- and local-based events — has really afforded me clear insight into and understanding of the legislative process. The opportunity to meet and interact with the legislators' staffs in Washington, DC, to make the case for pulmonary patients and the importance of the respiratory therapy profession has provided me with a solid basis for presenting the pertinent issues to others in the respiratory community, both in Colorado and on the online support groups.

I continue to work closely with both the Colorado Society for Respiratory Care and the Colorado Lung Health Connection. Both organizations coordinate with each other to schedule frequent visits to the local offices of our congressional legislators. We have recruited Rep. Diana DeGette and Sen. Michael Bennet to be members of the Congressional COPD Caucus. Both organizations take an active role in the AARC "Take Action" and Virtual Lobby Week campaigns via email.

Reach out to the patient community

I urge all of the AARC members to reach out to the patient community by speaking about advocacy at Better Breathers Clubs and by participating in online support groups such as EFFORTS and COPD-ALERT. There are many patients who would become involved in advocacy and awareness if they were directly approached by the representatives of the respiratory therapy community. I feel that it is really imperative that the patient voice be heard as the implementation of the Affordable Care Act progresses and the role of respiratory therapists under it becomes more and more important in the efficient and effective delivery of care. ■

The Secret of Respiratory Care

by Anthony L. DeWitt, JD, RRT, FAARC

Death. The word has such a final sound to it. We don't like saying it. We use all kind of colloquialisms to express its meaning. We say loved ones "passed on" or "expired" instead of saying they died. Even when we're dealing with someone else's loved one, or a patient, we find it hard to walk right up to the "D" word and embrace it. We talk about transitions and "better places." We do that because, at our core, every last one of us is scared of the word. We all know we are one day going to have a very personal and intimate understanding of its meaning.

Some of us never grow up. We live our lives as if the day of our departure from this earth will never come. Others, perhaps with a grounding in philosophy or religion, are there to help us when we have to face it and deal with it either personally or with a loved one. This column is about one such person. His name is Desmond Allen, and he is a respiratory therapist at George H. Lanier Medical Center in Valley, AL.

The unexpected

If you ever wonder if you really need all that continuing education, let me assure you that you do. When you don't do things on a routine basis, like care for patients, your clinical skills get rusty. I am a prime example.

I probably should have remembered on Thanksgiving morning this past year that my mother-in-law had recently fallen on her right side. I should have remembered that previously when she was having trouble breathing that she took deep breaths and used her accessory muscles. I knew she had pulmonary hypertension and a long history of low PO_2 values. But when my wife woke me up at 6 a.m. on Thanksgiving Day saying "Mom can't breathe," I didn't remember any of that. I went and turned up the oxygen and called 911. I didn't have a stethoscope, and I knew I couldn't diagnose what was wrong. I watched as it became more difficult for her to breathe, and then I watched her arrest as the firemen came through her bedroom door to help her.

I gathered my wife, called family, and got out of the way. I said some prayers, and then we made the long, slow trip to the hospital. There we learned that breathing and cardiac rate had been restored but that a 70% pneumothorax had deprived her of oxygen for nearly 25 minutes. No one could tell us what to expect.

Even after 13 years of bad experiences in ICUs all over the country, hope dies hard. As my wife wept silently by the bedside, I kept hoping that Miss Mary Jean would wake back up and speak to us.

We have all had that patient in the ICU whom the family hopes and prays will recover, but that we all know will not. I had never thought I would be on that side of the equation, but there I was. I wanted her to wake up. I wanted my wife to have her mother back. It was during this time that we met Desmond Allen.

An ambassador for respiratory care

Desmond distinguished himself, and I would like to think he made the profession proud. When he came in to suction Mary Jean, even though I think he knew she couldn't hear him, he told her what he was doing and why. And when my wife had questions, Desmond had

about the author...

Anthony L. DeWitt, JD, RRT, FAARC, is an attorney and a partner in the firm Bartimus, Frickleton, Robertson & Gorny, PC, and resides in Jefferson City, MO. He has also authored two books and numerous legal journal articles. This article is not a substitute for legal advice.

answers. He managed the ventilator, ensured the tube's cuff was properly inflated, and suctioned Mary Jean frequently.

Desmond was competent — you could tell that by the way he moved and listened to the chest. Watching him work though, I realized that what made Desmond special as a caregiver was that he understood the "secondary victims" theory.

When there is a tragedy like a cardiac arrest, the patient is the first victim, and the family members and loved ones are secondary victims. The thing that distinguished Desmond's care was that he took as much time caring for the non-patients in the room as he did caring for the patient.

Owing to work, I had to leave for two days to go back to my law office. During those two days, my wife asked Desmond questions and relied on his answers to guide her. Being able to trust a brother respiratory therapist with the care of your family is a wonderful thing.

After eight days, it became clear that Mary Jean was not going to wake back up; and after a second negative EEG, my wife made the very difficult but appropriate decision to withdraw life support. My wife wanted to ensure that her mother didn't suffer, and she didn't want just anyone doing the extubation. She asked me, "Do you think we could ask Desmond to do the extubation?" Desmond was on duty and handled this difficult and emotional procedure as well as I have ever seen it handled.

Risk management

In lecture after lecture, all over this country I have told doctors, nurses, therapists, and other health care professionals that people don't sue people they like and that if you want to avoid malpractice, the best way is to get the patients to think of you like family. Over that eight days in ICU, that's what Desmond Allen became to us. He was not just a guy in a lab coat, because we were not "the family in 309" to him. We were "Mary Jean's kids" to him, and he was "our friend Desmond." He won't be remembered so much for his technically competent care as much as for caring for all of us in the room.

There is a great secret in every respiratory therapy program and one that's rarely discussed. You can teach all the skills a clinician needs to be technically competent. You can teach the skills necessary to do a difficult blood gas, a difficult intubation, or to perform complex hemodynamic measurements. You can teach communications theory and problem solving. With experience, a therapist can get better at anticipating problems and preventing them. Between great education and good experience, you can make a seasoned clinician. But that's only half the battle.

Why? Because you can't teach someone how to be a nice person. They either are, or they are not. They either care because it is in their nature, or they're just doing a job. And sometimes, being a nice person, being able to squeeze a grieving family member's shoulder and talk about how you got through this with your own family member, is more important than all the medication you can put into a nebulizer.

So this column is dedicated to the Desmond Allens out there in our profession. The people who go to work every day devoted to the idea that they aren't leaving the building at the end of their shift unless someone is feeling better because they were there. For my late mother-in-law, and for the thousands of patients you help every day, here's a heart-felt salute to all of you. ■

Chronic Disease Manager

Disease Management of Chronic Pulmonary Patients To Decrease Readmissions

by Kimberly S. Wiles, BS, RRT, CPFT

The Affordable Care Act (health care reform) is beginning to unfold and transform into "accountable care." Hospitals are currently faced with penalties for 30-day readmissions for congestive heart failure, pneumonia, and myocardial infarction, with speculation to be followed by chronic obstructive pulmonary disease (COPD) in 2015. Improving the patient's transition of care to their post-acute care setting and reducing 30-day rehospitalizations is today's operating reality for hospitals.

The respiratory therapist's expertise plays a significant role in the ability to affect 30-day readmissions in the cardiopulmonary patient.[1] The RT is a key player in transitioning patients from hospital to home or to their post-acute care setting. As we look to the future of respiratory care, it is time to demonstrate to the health care system how valuable RTs are in minimizing or avoiding costly hospital admissions and readmissions.

The transition of quality care should begin in the hospital and continue into the post-acute care setting. As RTs, we play a major role in this continuum and should be involved from admission to discharge and beyond. Discharge strategies need to be focused on "pulling" the patient into a successful home transition rather than the traditional "push" of the patient out of the hospital. We need to incorporate protocols within the hospital that stratify risk and develop a comprehensive plan to implement an individualized plan of care that will be carried through the discharge and beyond.

about the author...

Kimberly S. Wiles, BS, RRT, CPFT, is vice president of respiratory services at Klingensmith HealthCare in Ford City, PA.

The hospital discharge

For a successful transition to occur, an emphasis must be placed on the discharge from the time of admission. Traditionally, transition of care means that a case manager arranges for equipment and/or services that the patient may need for independent living, and a nurse provides a brief set of instructions for the patient that may include medication dosages and when to schedule a physician's appointment. Nursing articles cite that the current discharge process lasts an average of eight minutes, limiting the effectiveness of a transition effort.[2]

Many institutions are beginning to introduce respiratory therapists as disease management coordinators who begin the discharge process. Early interventions by the RT that include patient assessment to identify barriers to self-care flag higher risk factors for failure in self-management by the patient. Addressing these factors prior to discharge is a vital component of any successful program. When implementing a plan beginning in the hospital, the following items are key:

Risk Identification — Utilizing protocols that assess risk allows the RT's skills to be deployed to the highest risk patient. Some items to consider when evaluating risk include exacerbation history, comorbidities, family/caregiver support, and functional and/or cognitive limitations.

Education — Simple but detailed education must be initiated. The acute care setting may not be the ideal setting to educate the cardiopulmonary patient due to the circumstances, but it needs to begin in the hospital. The education should be individualized based on the patient's literacy and learning capabilities.

Medication management — The respiratory therapist must ensure patient understanding of medication utilization and proper technique. Providing patients with sample medications would help to eliminate the po-

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Once the patient is discharged to the home, the expertise of the home care RT is critical in the evaluation of the patient and their home environment.

tential for missed doses in the immediate period after discharge.

Physician appointment — According to the Jencks study, 50% of the patients who were hospitalized within 30 days after discharge did not see a physician within the 30 days.[3] It is essential for the patient to have a physician appointment scheduled prior to leaving the hospital.

Skilled care — Many patients would benefit from skilled care beyond the hospital. A referral to a home health agency (HHA), skilled care facility, or long-term acute care facility that has specialized programs for cardiopulmonary patients should be considered. Many of these patients are faced with new treatments and/or medications — and potentially new barriers to independence that their home may now present.

The development and communication of a detailed individualized plan of care for each patient is crucial in the transition. Currently, very little communication exists between the hospital and outside entities involved in the care (i.e., durable medical equipment, home health agency, etc.). A complete handoff, as well as the patient's level of risk, should be reported to all agencies involved in the care. In order to have a successful transition program, the patient MUST be followed into the post-acute care setting by a respiratory therapist who has a complete understanding of the patient's care plan and history.

Home care

Once the patient is discharged to the home, the expertise of the home care RT is critical in the evaluation of the patient and their home environment. The respiratory therapist responsible for the care becomes the "eyes and ears" of the physician, which makes respiratory care competencies for the home care therapist unique. Providing care in an uncontrolled environment poses one of the greatest risks of readmission.

Home visits allow for the identification of potential barriers to self management. Problems can be identified in the home that would not be apparent to the hospital professionals. If the health care team is unaware of problems identified and they go unaddressed, there may be an increased risk for readmission. There are many areas that the respiratory therapist must address with the patient/caregiver during the home visit. Some of these include:

Home safety — A detailed assessment of the patient's home environment is the most significant tool that contributes to the plan of care development. It allows the RT to identify potential risk of falls, infection control issues, etc. Problems identified can be addressed, and measures can be taken to minimize or eliminate the risk.

Clinical assessment — In addition to the standard clinical assessment, baseline spirometry should be performed as well as a thorough oxygen titration while performing activities of daily living (ADLs). In the hospital, a patient's oxygen needs are often determined by a six-minute walk test on continuous flow oxygen. Once the patient is at home, the patient is usually put on pulse dose oxygen. In determining the setting, pulse oximetry must be completed while the patient performs ADLs. This gives the RT the opportunity to observe the patient, assess dyspnea, and monitor heart rate and saturations, as well as incorporating proper breathing skill sets while targeting oxygen levels as the activities are performed.

Education — Instruction on managing their disease is vital to all patients with chronic conditions. This includes following up with scheduled physician appointments, anxiety control, nutrition, smoking cessation, and the importance of participating in a pulmonary rehabilitation program when applicable.

Medication management — The patient must have a clear understanding of when and how to take their medications. The RT needs to be knowledgeable of medication best practices based on the GOLD guidelines or best evidence and guidelines for other chronic respiratory conditions so that recommendations can be made if warranted.[4]

Equipment management — Ongoing reinforcement of proper use and maintenance procedures is crucial to strong compliance with prescribed and necessary therapy.

Recognizing the need for additional care — The RT must recognize situations where other health care disciplines may need to be consulted (i.e., HHA, Area Agency on Aging) and communicate these needs to the physician.

RTs needed for seamless transition

The increasing burden of chronic cardiopulmonary conditions must be accompanied by the development of

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programs to improve care. Programs specific to respiratory diseases lead to better survival and functional status than conventional care by reducing exacerbations, ICU admissions, emergency department visits, and hospital admissions.[5] Developing programs utilizing RTs from hospital to home allows for a seamless transition. It is imperative that the hospital RT and the post-acute care RT work together in order to achieve a smooth transition, thus decreasing 30-day readmissions. To impact chronic disease management as respiratory therapists we need to adopt and develop tools utilized in the transition of patients from hospital to the home as well as incorporate best practices within all institutions of care. ■

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Clinical Perspectives

Bronchoscope Cleaning and Reprocessing

by Steven W. Hoffman, RRT, and Thomas R. Gildea, MD, MS

Managing the care and maintenance of a flexible bronchoscope is a critical process in the daily work of some respiratory therapy practices. These instruments commonly pass through body orifices known to harbor virulent organisms and are used to diagnose severe infections, often in patients with significantly compromised immune systems. In this era of ever-increasing resistant organisms and patients with severely weakened immune systems, being certain that the instrument is not transmitting infection from patient to patient is essential. We will describe some of the key concepts behind the process.

First, it is important to recognize that flexible bronchoscopy, because of its route of entry, is considered non-critical according to the Spaulding classification (contact with mucous membranes) versus instruments that perforate the membranes (critical) — thus, scopes require high-level disinfection.[1] Critical instruments like forceps or other biopsy tools require sterilization. When a bronchoscope is cleaned, there are three steps:

- External washing and ascertainment of scope integrity
- High-level disinfection, and
- Quality control and documentation.

It is important to understand and refer to the specific process for each manufacturer and individual scope type.

about the authors...

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External washing/precleaning

Personnel should wear appropriate protective gown, eye protection, and gloves. Personnel should always refer to a checklist and procedure cleaning guidelines as well as other local recommendations, including being aware of hazardous material handling policies and procedures.

Immediately after removing the bronchoscope from the patient, wipe down the bronchoscope and thoroughly wash the working channel to remove any body fluid or tissue from the various parts of the instrument. If the pre-cleaning is not performed immediately after removing the scope from the patient, then it is necessary to perform a presoak process after leak testing to loosen any dried materials. Just this step alone has been shown to reduce the bacterial load on the specimen.[2]

Leak test

The purpose of this step is to assess the integrity of the bronchoscope's interface with the patients and the electronics. Any breakdown in the barrier is detected by pressurizing the electrical component's side and assessing for leaks by fully submerging the scope under water. If a bronchoscope has a leak, the cleaning process may damage the electronics and may lead to body fluid contamination of the electronics. Document the location of the leak and *do not* place the scope in the machine (refer to manufacturer guidelines for damaged scope processing).

Manual wash

Wash all debris from the exterior of the bronchoscope using gauze and a low-sudsing enzymatic detergent and water, diluted according to the manufacturer's recommendations. It is essential to use a fresh detergent solu-

tion each time in order to prevent cross-contamination. Using the small channel opening brush (single-patient use), clean inside the suction valve and biopsy port openings. Brush the entire system (body, insertion tube, and umbilicus) with the channel cleaning brush. After each pass, rinse the brush before retracting it and reinserting. Continue brushing until there is no debris visible on the brush. Other steps include rinsing and flushing with the cleaning solution. Finally, rinse all ports thoroughly with clean water.

High-level disinfection vs. sterilization

High-level disinfection (HLD) is the process of using a high-level disinfectant (a chemical germicide) to destroy all microorganisms, with the exception of high levels of bacterial spores. The U.S. Food and Drug Administration has cleared HLD for all bronchoscopes as it is capable of destroying all viruses, vegetative bacteria, fungi, mycobacterium, and some, but not all, bacterial spores. Conversely, sterilization is the process that completely eliminates or destroys all forms of microbial life. Sterilization is the standard for medical devices that enter the vascular system or sterile tissue; but since the bronchoscope gets contaminated going through the nose or mouth and is only in contact with mucous membranes, it does not require sterilization. Most bronchoscopes are heat sensitive and cannot be put through a thermal sterilization process, leaving HLD as the best viable approved option for cleaning. There are several methods and types of chemical disinfectants available that are used in different cleaning systems. A few examples are listed below.

Glutaraldehyde has been used for over 30 years. Glutaraldehyde products are marketed under a variety of brand names and are available in a variety of concentrations. It has excellent biocidal activity, is active in the presence of organic matter, and is non-corrosive to metals, rubbers, and plastics. However, it does not eliminate all atypical mycobacteria using standard contact times (20 minutes of complete soaking at 20° C) that may create cross-infection risk. It also can fix proteins and allow for biofilm formation. Adequate ventilation must be available in areas where glutaraldehyde is being used since it can be a respiratory irritant to those in close proximity to the solutions. After using this sort of cleaning, rinse with sterile water or 70% alcohol instead of tap water. There have been documented failures of this technique with regard to mycobacterial infection.[3]

Ortho-phthalaldehyde has demonstrated excellent microbiocidal activity and has shown superior mycobactericidal activity compared with glutaraldehyde. Studies have shown that ortho-phthalaldehyde (OPA) proved effective in eradicating vegetative bacteria, fungi, parasites, and glutaraldehyde-resistant mycobacteria from bronchoscopes.[4,5] One disadvantage of OPA is that it is a potential eye, skin, and nose irritant. Similar to glutaraldehyde, prolonged or repeated contact may cause dermatitis and may aggravate pre-existing bronchitis or asthma.

0.2% peracetic acid has been developed for use in liquid chemical sterilant processing systems. It is rapidly active against all microorganisms, including bacterial spores, and is effective in the presence of organic matter. Peracetic acid has a similar or better biocidal efficacy compared to glutaraldehyde, and it has not caused the development of resistant organisms.[6] There have been new solutions and formulations approved in line with the changes in the more modern versions of the automated machines.

Aldahol® (Alden Medical LLC, West Springfield, MA) is the chemical HLD and is a combination of glutaraldehyde, isopropanol, and potassium acetate. It has been shown to have better results against mycobacteria and spore-forming bacteria as well as a reduction in biofilm in less time than glutaraldehyde or OPA alone.[7,8]

According to manufacturers Olympus, Pentax, and Fujinon, glutaraldehyde and OPA are compatible with all endoscopes.[9-11] While 0.2% peracetic acid is compatible with some scopes, it is not compatible with others. However, these recommendations may change frequently. Thus, it is important to check frequently with each manufacturer's published guidelines. These are based on manufacturer recommendations and not on external bodies like the U.S. Food and Drug Administration or The Joint Commission.

Automated bronchoscope cleaning machines

Prior to placing the bronchoscope into the washer, a clear plan of quality control and instrument tracking must be in place. Some of the newer machines have automatic tracking and logging.

Machines typically have a chemical test strip to prove that there was an adequate chemical concentration/exposure to assure a complete degree of high-level disinfection. This step is also documented in the event of some possible exposure. There are several connections and positioning steps to assure a complete flush of all internal

Figure 1. Note secure connections for the disinfectant rinse through the scope channels.

components (see Figure 1). The scopes need to be positioned correctly to avoid damage. Once a scope is clean, it can be taken to its storage location. All scopes should be placed in an appropriate, well-ventilated, locked cabinet for storage after cleaning (see Figure 2). Failures leading to contamination have been linked to several critical steps associated with endoscope connections in the machines, water temperature, and even water treatment/filtration systems.[12-14] It is important to be able to assess the various components of these automated machines and have a comprehensive approach to their use. Key points include:[15]

- Comply strictly with bronchoscope manufacturer's instructions for disinfection.
- Intensively educate staff in proper disinfection techniques and the potential danger in deviating from guidelines.
- Check compatibility of bronchoscopes with automated endoscope reprocessors (AERs) and determine if specific steps are required prior to reprocessing.
- Compare reprocessing instructions by the bronchoscope and AER manufacturers and resolve conflicting recommendations.
- Initiate a comprehensive quality control program.

There is an autoclavable bronchoscope currently on the market. It is designed with materials able to survive the high temperatures of steam autoclaving, which can destroy all microorganisms, including spores. The idea of sterilizing bronchoscopes is intriguing for the patient with bone marrow transplants or other high-level immunosuppression, but the turn-around time and already extremely low risk of infection make them unlikely to replace the current fleet of bronchoscopes and specialty scopes.

Quality control and documentation

The various aspects of quality control involve the uses of chem-strip testing, leak testing, gross assessment of scope function, post processing scope assessment, and a clear documentation of each step in the process so that any and all problems may be tracked to primary documentation.

A veteran employee/work leader who is skilled in cleaning and handling scopes should train all new employees. At our institution this is a core competency of all personnel in the assigned duties in the bronchoscopy suites. There are new recommendations that reducing the variability of the number of personnel doing the scope cleaning does result in less damage and better quality control.

All scope usage is documented with date, patient, physicians, type of procedure performed, as well as cleaned by whom. This allows for follow-up if/when an issue arises, such as tracing an unexplained infection, damaged scope, billing, or lack of procedure documentation in the patient's chart. In rare cases where the infection control surveillance system in our institution finds suspicious organisms in the lab or a clinical outbreak, we can very easily review the possible links. High-profile cases of failure of infection control and its root cause

Figure 2. Cabinet storage allows the scope to hang freely (avoiding kinks), dry thoroughly, and minimize possible damage and cross contamination.

analysis highlights the importance of this seemingly simple process.[16]

In summary, bronchoscope cleaning and reprocessing is a semi-critical process of high-level disinfection with multiple steps to assure patient safety. Respiratory therapists have a clear role that may be a part — or encompass all parts — of this process from ascertainment of bronchoscope integrity and asset protection, through cleaning, running a new automated machine, and a quality control and regulatory documentation. Because there are several kinds of endoscopes, cleaning techniques, and local regulatory and tracking structures, respiratory therapists should be familiar with their local policies and procedures. ■

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Timothy R. Myers
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AARC Associate
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Focus on Sleep

The Role of the Respiratory Therapist in Sleep-disordered Breathing

Sleep-disordered breathing is a major medical problem affecting millions of Americans, many of whom remain undiagnosed and untreated.

Respiratory therapists have long been involved in sleep medicine, but the extent of their involvement has varied widely from facility to facility. Last fall at AARC Congress 2012 in New Orleans, LA, AARC Associate Executive Director, Brands Management, Timothy R. Myers, MBA, RRT-NPS, FAARC, gathered a diverse group of clinicians together in an effort to get a better handle on the role RTs play in sleep diagnostics, testing, education, and treatment. Here are some key excerpts from that discussion.

Focus Group Participants at a Glance

Suzanne Bollig
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James O'Brien, MD
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Medias Inc. Sleep Medicine Services
Blacksburg, VA

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Primary Children's Hospital
Salt Lake City, UT

Kathleen Deakins
MHA, RRT-NPS, FAARC
Rainbow Babies & Children's Hospital
Cleveland, OH

Timothy Myers: Let's get started by having everyone explain how they are involved in sleep.

The physicians do a pretty good job of educating them on the risk factors of untreated sleep apnea and why they were sent to the clinic. We also let our patients know that they can call in or stop by any time they have a question or an issue and one of us will help troubleshoot.

Jessica Schweller

Kathleen Deakins: I'm the manager of respiratory care at Rainbow Babies and Children's Hospital in Cleveland, OH. We're somewhat novices in this arena because, as an inpatient service, we just started helping the sleep lab over the past year. With our sleep lab being rather small, they needed our help. So the pediatric respiratory care department got involved, and our RTs assist the sleep lab during the night. We've delegated an RT who goes to the lab to make changes on the noninvasive and invasive settings as needed.

Amber Galer: I am the lead respiratory therapist in the pediatric sleep lab at Primary Children's Hospital in Salt Lake City, UT. I specialize in vent and trach patients but also do the CPAP, bi-level PAP, and cross-train in EEG. I work mainly in the outpatient department and have three techs who work with me. We have three beds that we can run per night, and I have the capability of running one inpatient Embletta study. We have one scorer who can score the studies almost immediately.

Camden McLaughlin: I'm president and owner of Medias Inc. Sleep Medicine Services in Blacksburg, VA. We specialize in management and ownership of sleep facilities. We have 10 facilities, primarily in Virginia, and also in West Virginia and Tennessee. We have six technologists in the Virginia area and four technologists in Tennessee. All the staff in Virginia travel from hospital to hospital or physician clinic depending on what's going on with the patients for that particular night.

Dr. James O'Brien: I am board certified in critical care medicine and pulmonary medicine as well as sleep medicine. My practice is predominately contracting with different hospitals in the Denver area as well as a five-state region in the West. I have experience over the last 10 years helping to develop a sleep lab in Bellevue, WA, and working at a large trauma center in Denver where there's a very active sleep program. In neither case did the sleep department have significant involvement with in-hospital care of patients; and I found that to be a deficiency in our practice, although St. Anthony's Hospital in Denver was initiating a perioperative screening program. I, and others, would really like to see more involvement of sleep labs within the hospital, be it with screening, with diagnosing in the hospital, or with treating in the hospital.

Jessica Schweller: I'm from The Ohio State University in Columbus. I am one of the sleep nurse practitioners in our outpatient clinic. I'm also a respiratory therapist, so I'm sort of the CPAP expert in our clinic. I see most of the patients after their sleep study. We also have a full-time RT who runs a portable sleep program from our outpatient clinic. Her job includes calling patients back after their sleep studies, going over their results, and explaining everything to them so they understand. We do inpatient portables as well, mostly with the heart failure patients. About a year and a half ago we started a program with our outpatient assessment center screening patients before surgery. If they have a positive STOP BANG test, they are sent straight to our clinic for a portable that day. After their portable, they take an auto-titration unit home, it's assessed within 48 hours, they're seeing the physician within 48 hours, and they're

set up with a CPAP unit within 48 hours.

Karen Schell: I'm director of cardiopulmonary services at Newman Regional Health in Emporia, KS. I have 1.9 FTEs in a two-bed sleep lab, but all of our therapists are involved with sleep screening at the hospital. My floor respiratory therapists participate by screening all inpatients who come in for OSA with the STOP BANG questionnaire, and then we follow up with auto-titration if needed in the hospital. That's been a real success for us in helping those patients get screened in the hospital so that we can get them properly treated. We work closely with local DMEs to ensure our patients are set up and followed up correctly.

Suzanne Bollig: I am manager of the Sleep and Neurodiagnostic Institute at Hays Medical Center in Hays, KS. We are an offsite facility located in a community health and wellness center. Our location allows us the opportunity to focus on community education and provide care in relation to sleep, health, and wellness. We do diagnostic sleep testing as well, which provides the revenue stream to allow us to offer the various educational programs at minimal or no charge to our community. I have five full-time staff members who work exclusively in sleep and neurodiagnostics. All staff are dual credentialed in that we all carry combinations of respiratory, nursing, sleep, or electroneurodiagnostic credentials. This allows us to be very versatile with the patient care provided.

Myers: So, quite a bit of diversity here. About how many sleep studies do you run through your facility in a week?

In my experience, all COPD patients have sleep-disordered breathing but not all of them have sleep apnea. So that's another real challenge for the acute care therapist that sometimes we follow up with in the sleep testing facility, sometimes not.

Suzanne Bollig

Bollig: We have a four-bed facility and average 16–18 studies a week. We're not open seven nights a week; but when we're open, we're full. We are also available for daytime studies throughout the week and limit pediatric sleep studies to age 13 and older.

Schell: We're in a rural community, and I have about nine staff for all five of my departments. So our sleep lab is open two nights a week and typically does four sleep tests a week. We are also in charge of scheduling and scoring. At this time I don't have enough staff to be open more nights a week, although the business is there. We're also looking in our community to see where home sleep testing is going. We're trying to figure out how we can fit in to be a better service for the community. That's why I think it's important for us to have the cross training that respiratory therapists offer, because they can do a lot of the support service once the diagnostic part is done.

Schweller: We have a 10-bed, hospital-based facility that is open seven nights a week and is primarily full all seven nights. During the day we have the ability to run at least four-to-six multiple sleep latency tests, maintenance of wakefulness tests, and daytime sleep studies. We also have four portable sleep study units, but we only do two or three a night so that if an emergency patient comes in we will have a unit available. Most of our patients are adults. However, we do go as young as 14.

Dr. O'Brien: I'm a little uncomfortable speaking about outpatient sleep since it's been a few years since I've practiced primarily outpatient sleep. I can tell you historically at Overlake Hospital in Bellevue, WA, we did six sleep studies six nights a week. At St. Anthony's in Denver I believe they did at least four studies every night. With that said, experience has been that there's a separation of outpatient sleep departments and inpatient need for sleep evaluation.

McLaughlin: We have 26 beds we could potentially fill every night, with a staff of seven. In a month's time we could probably do 150 studies. Our challenge is getting patients in the bed every night. Cancelations are a huge thing to deal with. With United and Cigna pretty much dictating home sleep studies (at least in our area), we're happy to move toward that. A major hospital system recently contracted us to do home sleep in their facilities, and we're just now trying to get that off the ground. Our main center, which is in southwest Virginia, is where all the scoring is sent.

Galer: We're open four to six days a week. We do quite a few of the more challenging studies; and I have had patients travel from Idaho, Montana, Nevada, Wyoming, Arizona, and some from New Mexico. We get a lot of vent and trach patients, so we're either doing capped trachs or open trachs, ventilator titrations, and then, of course, the CPAP and the bi-level PAP for these patients along with high flow. My patients range in age from 28 weeks gestation all the way up to adults. We have even had a 50-year-old. I have also worked in the CPAP clinic during the day and perform mask fittings for patients and provide education. Then I follow patients through the sleep study.

Deakins: I don't have the exact stats on our sleep lab. At Rainbow we are somewhat new on the scene as consultants for the RRTs who actually work in the hospital and are getting involved in some of the inpatient sleep studies. Some of it is because of reimbursement issues, obviously. We are involved during the night probably three or four times a month.

AARC Times

Photo Contest

Call for Entries

Go to
http://tinyurl.com/72qfqt5

- Take the photo at your highest quality setting
- Email your photo to knauf@aarc.org or send a CD to:
  Photo Contest, *AARC Times*, 9425 N. MacArthur Blvd., Irving, TX 75063

- You must be an AARC member.
- Contest finalists will receive one year *FREE DUES* on membership renewal.
- Finalists will be in the Nov. 2012 issue for members to vote on.
- The winning photo will be on the Feb 2013 cover.
- All photos become the property of the AARC.
- You must provide a signed release form for everyone in the photo.
- Go to www.aarc.org and type *photo release* in the search box or have Karen fax you one. Call (972) 406-4661.
- If you have a story for the photo, please send that, too.

Myers: These days it seems like there's two types of sleep patients — the traditional OSA patient and then the more complex patient with comorbidities. Do you see a difference in your patients, and is there a difference in the type of equipment that you use for them?

When it comes to education, our CPAP clinics are run by a respiratory therapist and a physician. Since we work with children, we have to find different techniques to educate them. We have to use teddy bears and storybooks.

Amber Galer

Deakins: Obviously, we have the pediatric sleep apnea, but we're seeing more and more childhood obesity, too. Some patients can be up to 200–300 pounds at age nine or ten. We're also seeing some airway abnormalities, and we have the whole neuromuscular disease side of things as well. We have a lot of developmentally delayed patients who are also being titrated on CPAP, along with Down syndrome patients into their adulthood.

Galer: We also have the basic OSA along with a few children who are coming in age nine, 300 pounds, with diabetes. It seems to be growing out of control. We also work closely with the neurology department, so we get many muscular dystrophy and spinal muscular atrophy children. But we don't usually use different equipment for these patients who have a lot of neurological disorders or other abnormalities in the airway; we will use more equipment, just not necessarily different equipment from that used in the regular sleep study.

McLaughlin: In rural southwest Virginia and West Virginia most of our patients are adults. It really seems like we see more complex apnea patients in Tennessee than we do in Virginia and West Virginia. I'm not sure why that's the case. Equipment wise, I would say almost universally right now we're doing in-lab studies for titrations. If you are putting patients on auto-titrating CPAP, you are pretty much relying on the home care companies to do good work; and not all of the home care companies in our areas have respiratory therapists on staff. Those patients with complex apneas need to be kept in the sleep center where we have the assurance of accurate titration. I think the insurance companies are going to drive us to change that model, but right now our medical director and sleep physicians are really trying to keep the patients within the facility.

Dr. O'Brien: My greatest experience has been in Bellevue, WA, at Overlake Hospital. We had a very active sleep lab; but it was in the shadow of the University of Washington and other large centers in Seattle, so we didn't see pediatric patients. But we did see an array of complicated adults with multiple comorbidities, organic heart disease, underlying lung disease, stroke, etc. It was a traditional practice, and as I understand remains a traditional practice of attempting to bring the patient into the sleep lab for a diagnostic study and doing a split-night and/or a second night CPAP titration study. I've actually spoken in the past about the benefit of home sleep studies because I think they would allow for a greater capture of sleep apnea within the community. But when it comes to CPAP titration, that's where I think the interventions that can be made in one night probably do affect compliance. The financial pressure to do auto-titrating studies may be penny wise, pound foolish.

Schweller: With our heart failure program we often see patients with Cheyne-Stokes respiration who also have central sleep apnea and end up on the auto bi-level PAP SVs and things like that. We also have a comprehensive neuromuscular program at Ohio State. They generally don't come through our clinic other than for an initial screening, but we do have a respiratory

therapist who bills for his time and does all of the management of these patients with their machines. He sees a lot of patients on the AVAPS® or the iVAPS. We also have a pretty extensive bariatric program; and when many of those patients go through the diagnostic study, they will go through a titration as well. We have a DME company that we have a very good relationship with where all of our patients, whether they're on set CPAP or auto CPAP, leave with an auto-titrating CPAP so that if you want the ability of putting them into the auto mode, you can.

When it comes to the bariatric population with obesity hypoventilation, we make sure we're monitoring blood gases, PFTs, and things like that on a regular basis. The same is true for the opiate-induced central sleep apnea. We've also found that for a lot of our patients who do go through the traditional diagnostic study, we are able to see if the severity is more severe during REM, non-REM, or positional; and we have found that a lot of our positional patients and those who have more severity during REM do much better on the auto. So we see a wide variety of patients in our clinic and have them on everything from the most basic of CPAP all the way up to the highest of the Servos.

Schell: For home sleep testing, we're looking at Level 3 equipment, and we're going to be leasing that because we don't want to purchase a lot of things up front as we roll out this program. Our medical director oversees every referral before the test to determine whether it's going to be in lab or out of lab. For the set up, we use auto-titrate at home after a positive test. If the patient fails the auto-titrate, he comes into the lab for a PSG. We're just kind of feeling out the insurance companies to see what's going to be covered. Of course, when it comes to home titration, we know that it's not very successful if you're not there teaching them about it and fitting them properly. We haven't worked that part out yet with the DME. We're meeting with them and trying to say, "You know we really need a therapist here to do this."

Schweller: Karen, in Ohio we've actually been able to do that, where we've done the portable, set them up on auto, and then sent them back for the titration and gotten everything covered. It was kind of our protocol when we implemented the portable program with the outpatient center that the patients were aware that we're just giving them a CPAP so that we can get treatment started, but eventually they're going to come back in for a titration.

Bollig: What most people would consider the typical sleep apnea patient is not the norm in our facility. We see patients with sleep apnea complicated with multiple comorbidities such as heart or respiratory failure. However, traditional OSA patients are frequently seen by the therapists and the clinicians in the acute care hospital. There are some issues with reimbursement for the sophisticated equipment prescribed for people — such as the auto-SVs, the bi-level autos, and the noninvasive ventilators. There are some DME companies that dispense the more sophisticated machines in the home — the ones that are able to go from CPAP to auto-PAP to bi-level or auto-SV — and then just charge the one price. According to these companies (and I think this is a great way of looking at it), if they start with the simple machine and then have to change to the more sophisticated ones as the patient's treatment plan or the complexity of their situation becomes more apparent, they're actually having more money involved. The reimbursement to them is the same from the insurance companies, so they think it's better to go ahead and put in the more sophisticated equipment.

In my experience, all COPD patients have sleep-disordered breathing but not all of them have sleep apnea. So that's another real challenge for the acute care therapist that sometimes we follow up with in the sleep testing facility, sometimes not. The complicated sleep apneas are often seen in the acute care side; but that doesn't necessarily translate into them having the tools to take care of these people because these individuals may need the most sophisticated equipment, which is not always readily available in acute care unless they're in a large tertiary care facility and have access to all the different kinds of ventilators.

Myers: I have two final questions for you. First, how are equipment purchasing decisions made in your facility; and second, what kind of patient education is being done by your RTs?

If I were designing a program within the hospital setting with unlimited resources, I would first concentrate on increased screening for sleep apnea, especially in the perioperative period.

Dr. O'Brien

Bollig: We are able to purchase most types of equipment. The vendors frequently show us new technology and will let us field test it. Our diagnostic testing personnel provide education for the patients and families about the disease process and the therapeutic process, and demonstrate and fit masks and those types of things. Additional education is provided by the physicians and clinicians who see these people during their clinical evaluation and follow-up. Follow-up is key, whether by phone or in person. In fact, there have been some great studies showing that portable monitoring has as good of adherence results as in-lab testing and titration as long as the clinical follow-up and education remain the same. Whether that's from the respiratory therapist or the nurse practitioner, or the physician, it really doesn't matter. We all need to contribute because if we do not provide education from the first exposure until the last exposure we're going to lose the patient from a compliance standpoint. Education. Education is the key.

Schell: Our sleep physician knows we're limited as far as financing, but we do bring in equipment, and we test it, and we have real good vendor relationships. We just have to be very cost effective and make sure it's something our hospital can afford. In terms of education, we start from the moment they come in the door with our sleep screening. If they're identified as high risk, our therapists go to the room and talk to them about sleep testing. Most of them don't even realize what it is. Then as they're coming in diagnostically, we spend a lot of time up front educating because we really want them to sleep and be comfortable and understand what's going on. Where we're lacking is where the DMEs come in, because we have several DMEs that provide service and there are no therapists at any of them. A lot of them don't understand the importance of compliance and mask fit and how to get that patient to wear that mask. So it is really important that we do a really good job up front because we don't know what's going to happen after they get home.

Schweller: The director of our sleep facility and our sleep lab manager are responsible for purchasing equipment. With regards to the education piece, when our patients come in for their new patient appointment, many of our physicians actually have the respiratory therapist come in and try them on CPAP so they can see what it's going to feel like, especially if they're going to have a split-night study. We give them a little card that has the mask and size that they tried so that when they go into the lab they're not overwhelmed and they're more ready to go. The physicians do a pretty good job of educating them on the risk factors of untreated sleep apnea and why they were sent to the clinic. We also let our patients know that they can call in or stop by any time they have a question or an issue and one of us will help troubleshoot. During our visits, we reiterate things like traveling with your CPAP and cleaning your machine, and go over any questions or issues.

McLaughlin: Our technologists let the patients know that there's a possibility they could be split tonight, and they show them a mask and talk about it prior to the study. We find that when a lot of our patients come back for their titration studies, they'll walk in and ask, why am I here tonight? The PCPs are not necessarily giving them a lot of good education, so it's primarily the responsibility of our therapists/sleep technologists to do the education. From the equipment standpoint, I'm

the primary person who purchases the equipment. But most of what I purchase comes from recommendations made by my staff. We have a potpourri of masks and supplies that the technologists carry with them.

Galer: We don't use a lot of auto-PAP because it doesn't work as well on our very small patients. We do use every size of mask. We do not use too many disposables, although some of them do work just fine, especially on some of my difficult patients, such as those with a cleft lip or oronasal problems. We've used pH probes and performed some studies with pH and acid reflux for our sleep apnea patients. When it comes to education, our CPAP clinics are run by a respiratory therapist and a physician. Since we work with children, we have to find different techniques to educate them. We have to use teddy bears and storybooks. We also need the parents to be more compliant. If the child wants that mask off, they'll get it off. But if the parents are onboard with us, the child is usually right there with them. It takes a lot of time; but by the time they get to the sleep lab, we're usually set.

Deakins: We do the same thing with the teddy bear and storybook. I think some of the materials they've come out with now for pediatric patients have been helpful for the family also. If there's a sibling, they sometimes can help, too. We're very limited on the inpatient side when it comes to equipment, and auto-titration is usually not available for under 40 kilos. So that is a huge problem for us. We use it on selected types more toward the adult or adolescent.

Dr. O'Brien: I think there should be more diagnosis and treatment of sleep apnea in the hospital, and these comments are primarily to spark some discussion within our field. In my experience, many respiratory therapy departments seem deficient in the initial treatment of sleep apnea largely due to the lack of equipment and staff in the hospital setting. Typically, they have a limited set of masks to provide to patients or the personnel to titrate CPAP for patients within the hospital. Understandably, hospitals do not have ready access to auto-titrating equipment; and as a result, we send patients to DME companies for this. It is this extra step where treatment often falls short as more than half of all sleep apnea patients, suspected or diagnosed in the hospital, do not follow up for outpatient care.

If I were designing a program within the hospital setting with unlimited resources, I would first concentrate on increased screening for sleep apnea, especially in the perioperative period. I would then work to establish mutually beneficial working relationships between hospitals and DME companies where equipment could be readily available to patients within the hospital setting. This step is critical as it creates a smooth transition from the hospital to the outpatient setting and may increase the likelihood that a patient will participate in outpatient diagnosis and treatment. Moreover, as one dovetails inpatient and outpatient sleep apnea programs, better educational opportunities are naturally created, thus increasing a patient's understanding of their diagnosis and treatment of sleep apnea. Additionally, once a CPAP machine is established in a patient's home, when it comes to adherence with CPAP, I think there's just no better intervention than a nurse practitioner or a respiratory therapist helping the patient gain competency with that CPAP machine. Those first few weeks after hospitalization or a CPAP titration night are key when it comes to sealing adherence with CPAP.

Myers: I want to thank everyone for their time here today. As your experiences have shown, respiratory therapists are key players in sleep and will no doubt remain key players despite reimbursement and other challenges facing the field. ■

"Dancing with Dad"

Photo Wins the 2012 AARC Photo Contest

by Debbie Bunch

2012 photo of the year catches an RT's special moment with her father

Stephanie and Justin Nelson, both RRTs in Great Falls, MT, were just two and a half weeks away from their wedding last July when Stephanie got the kind of phone call no child ever wants to receive. Her mother was on the phone from Nebraska, saying she'd just had to call an ambulance to take Stephanie's 58-year-old father to the hospital. The ambulance crew had to intubate him on the scene, and he was now awaiting a CT scan to try and determine where he would be flown for more definitive care.

"We decided to send my dad to the closest hospital we could that would provide the care he needed," says Stephanie, a flight therapist at Benefis Health Systems in Great Falls. "Once at the hospital, my dad remained intubated for four days, and it was determined that he had a cerebellum stroke and also a dissecting vertebral artery." Steve Darr was extubated on day five and placed on a 15-liter high-flow nasal cannula. He remained hospitalized over the next week while respiratory therapists worked diligently to try to wean him from the oxygen in time for the wedding, but ultimately he had to go home on three liters of oxygen.

"It was a week before our wedding, and we had decided to still get married but now had to figure out how to get him and his oxygen cylinders to Montana," recalls his daughter. Working with respiratory therapists and staff at the home oxygen company, they figured out a plan, and Steve and Stephanie's mom Toni were able to make the 12-hour drive.

It's a winner

The wedding took place as planned, and many of the guests were Stephanie and Justin's fellow RTs. AARC members Crystal and Brian Cayko were among the group; and when it came time for the father-daughter dance at the reception, Crystal, an RRT who serves on the flight team with Stephanie at Benefis Health, snapped the winning photo for the 2012 AARC Photo-of-the-Year Contest. "The decision to enter the photo was an easy one," explains Brian Cayko, MBA, RRT, director of clinical education for the respiratory therapy program at Great Falls College Montana State University (GFC MSU), who sent in the photo for consideration. "One of

Members: Send us your photos of what makes respiratory care so great!

Log on to **www.AARC.org/members_area/aarc_times/index.asp and get your photo release form today.**

Stephanie Nelson is grateful to all the health care professionals who made her father-daughter dance possible.

the many interests Crystal and I share is photography. That, along with delivering respiratory care, made it obvious that the mediums had converged."

Crystal notes that the moment captured the essence of the profession. "Knowing the bride and what her father had gone through to be at his daughter's wedding, and adding that his daughter was managing his oxygen cylinder during the dance, made for a very special moment in the eyes of any RT," she says. "That sentiment by the bride is what it means to be an RT."

Full recovery

Steve Darr remained on oxygen for about a month after the wedding but was eventually able to be weaned and has now made a full recovery. He's back at work at his job in the railroad industry and is enjoying life with his family and, most especially, his grandchildren. His daughter is grateful to all of the respiratory therapists and other caregivers who participated in her father's care. "We had multiple physicians, nurses, respiratory therapists, and others to help my dad recover while in and out of the hospital," says Stephanie. "Without any one of these people, my dad would not be here today and doing as well as he is."

As for our contest winners, who met when Brian was assigned to shadow Crystal during his first year in the respiratory therapy program at GFC MSU and wed in 2006, they are just happy to have had the opportunity to share this special moment in Stephanie and her dad's lives with their fellow RTs. ■

Steve Darr had the chance to celebrate his daughter's big day, thanks to the good care he received after his stroke.

More on Our Contest Winners

Husband–wife RTs Give Back to the AARC

Brian Cayko found the respiratory care profession back in 2002 when he was getting ready to graduate with a bachelor's degree in biological sciences from Montana State University in Bozeman. "Like many four-year grads, I didn't have much direction as to what to do with my degree," he recalls.

Brian and Crystal Cayko are proud to be RTs.

When he had to have a pulmonary function test at Bozeman Deaconess Hospital to qualify for a HazMat job during his senior year, however, he met some RTs who suggested he take a closer look at respiratory therapy. He contacted AARC member Gregory Paulauskis, PhD, RRT, FAARC, who was then director of the program at Great Falls College Montana State University (GFC MSU), and was soon packing his bags and heading upstate to begin the program. After graduation he worked for awhile in an ICU and then started on his master's degree, which ultimately led to his current position as director of clinical education for the GFC MSU program.

Crystal Cayko was first introduced to the profession back in the sixth grade, when she and her family suffered carbon monoxide poisoning from a leaky furnace in the house they were living in at the time. Since she also has asthma, the recovery was especially tricky for Crystal, and the care she received from a respiratory therapist sparked her interest in the profession. She graduated from respiratory therapy school in 1999, went to work at Benefis Health Systems in Great Falls, and has been there ever since, joining the flight team in November of 2011. "I absolutely love what I do and wouldn't change it for anything," says the RRT.

Both Brian and Crystal believe strongly in giving back to their profession, and they've done that over the years through their active involvement in the Montana Society for Respiratory Care, where Brian is currently director of technology and Crystal has served as president and is now secretary/treasurer. Brian is also actively involved in the AARC's Political Advocacy Contact Team (PACT), and as of this writing in January, was getting ready to head to Washington, DC, with the PACT this month. Every single therapist can make an impact on the profession by contributing to our growth as professionals, he says. "Given that, I am a strong proponent of supporting our profession." ■

2013 Photo Contest:

Our 2013 Photo-of-the-Year Contest is underway now, and finalists in the competition will receive a free one-year membership renewal and have their photo entered into our Photo-of-the-Year Contest, with the chance of it being chosen to appear on the March 2014 cover. Not sure how to get that winning photo? Here are nine tips that can help you come out on top in our 2013 contest.

9 Tips for Capturing a Winning Shot

1. **Read** the contest directions before you get started.
2. **Photo must be** vertical and not horizontal.
3. **Set your camera** to take the highest pixel photo.
4. **Look** at the background before you take the shot. Is there a tree limb coming out of someone's head or will the lighting block part of the shot? Consider every element of the photo before clicking the shutter.
5. **Put yourself in the best position** to get the shot, even if that means getting down on the floor or up on a chair.
6. **Make the picture tell a story** about the respiratory care profession. A picture that conveys some emotion about your patients is always preferable to one that does not.
7. **More is not always better**. Don't clutter your photo with unnecessary components.
8. **Take lots and lots of shots**. The time-consuming part is looking through all your photos on your computer. Trash the ones that are not flattering and choose your entry from the three-to-five best shots.
9. **Cropping** can sometimes be a miracle worker when it comes to taking an average photo and making it special.

For complete instructions and guidelines, click on the *AARC Times* icon on the Resources menu on **www.AARC.org** and then click on the "Photo-of-the-Year Contest" link. The deadline to submit photos is Oct. 15, 2013. ■

Marketplace

Featuring information on products and equipment from manufacturers

CPAP Mask Improvements

DeVilbiss Healthcare's Serenity Nasal CPAP mask features new, ultra-soft ComfortTouch cushions, more modern mask frame, and improved headgear and forehead pads. The ComfortTouch mask cushion finish offers a non-stick, satin texture for optimal comfort, while the ComfortTouch cushions are exclusive to DeVilbiss interfaces and available on both the silicone and gel mask cushions. www.DeVilbissHealthcare.com

Multi-functional Circuit Board

Covidien has launched the Nellcor™ Multi-Functional Respiratory Printed Circuit Board Assembly (MFR PCBA) for integration with leading patient monitor platforms, enabling Covidien OEM partners to incorporate the complete Nellcor suite of pulse oximetry-based SpO_2, pulse rate, and respiration rate technologies into their existing patient monitoring systems. Through these integrations, hospitals can upgrade from their existing monitors to MFR PCBA-supported monitors that measure through a single sensor SpO_2, pulse rate, and respiration rate. Clinicians also have expanded access to SatSeconds™ SpO_2 alarm management and the Saturation Pattern Detection feature, which alerts clinicians to possible significant repetitive reductions in airflow. www.Covidien.com

Mask Abrasion Solution

According to Strapparatus Inc., the simple solution to mask abrasion is their hypo-allergenic tested adhesive tape with a polyethylene foam cushion. Their Nozguard® is positioned over the nasal bridge, whereas their Faceguard™ is applied over the buccal and facial areas. Simply remove the liner and apply to patient prior to oro-nasal mask treatment. The Nozguard is available in tan or ivory in small and medium-large sizes. One size fits all for the adult Faceguard. Faceguard is for the edentulous patient and may improve both comfort and sealing. Disposable, single-patient use. www.strapparatus.com

Press releases and photos on new products are welcome. Send to Marsha Cathcart, *AARC Times* editor, at cathcart@aarc.org.

RC Currents

IN THE NEWS

Members, Send Us Your Human Interest Stories

Have you been active in a ventilator-dependent kids' summer camp? Have you helped an elderly patient in need? Have you saved a life outside of a health care facility? *AARC Times* is always searching for stories from AARC members that relate special experiences.

If you have a human interest story to share with our readers, please contact *AARC Times* Editor Marsha Cathcart at cathcart@aarc.org. ■

Educators: Help Recognize Outstanding Students

The American Respiratory Care Foundation (ARCF) is accepting applications for its undergraduate and postgraduate Education Recognition Awards now through June 15 and is asking RC educators to help get the word out to their students. So check out the list of available awards and then encourage your best and brightest students to apply.

The ARCF offers awards to students who are currently enrolled in accredited respiratory care educational programs and to respiratory therapists who are pursuing an advanced degree. Awards include registration and airfare to attend AARC Congress 2013, to be held Nov. 16–19 in Anaheim, CA.

To see all of the awards bestowed by the ARCF every year, go to the Foundation's Grants, Awards, and Fellowships page at www.arcfoundation.org/awards/. For more information, contact April Lynch at lynch@aarc.org. ■

AARC Launches Membership Campaign

AARC membership numbers have grown continuously over the years, but 2013 is pegged as a year when we want to grow faster and higher than ever before.

Why is a strong membership so important? "People pay attention when you represent a majority of your profession," says George Gaebler, MSEd, RRT, FAARC, AARC president. "Advocacy work is easier, representing the organization is more powerful, and our resources to help you are multiplied."

Frank Salvatore, BS, RRT, FAARC, co-chair of the Membership Committee, will be spearheading the campaign and says that this is a campaign for everyone. Any active member joining or renewing during the defined campaign periods will be eligible for an iPad or Kindle Fire.

Gary Wickman, BA, RRT, FAARC, co-chair of the committee, stresses that more members mean more opportunities for the AARC to deliver better education, better management tools, and better communication and information resources for everyone. "More members allow us to lead change on a national and state level for better patient care through advocacy and education," he says. Students will be included in a campaign that will launch in the first quarter, and they will have the opportunity to win prizes of their own. In addition, a friendly competition among the state societies will make the campaign even more fun as we see who can grow by the largest number and the highest percentage over this next year.

Active members who renew their membership could win an iPad; and new active members are eligible to win a Kindle Fire. See the membership campaign details at www.aarc.org/campaign/. ■

AARC Now Accepting Applications for the 2013 International Fellowship Program

If you provide respiratory care outside of the United States and would like to share and expand your knowledge, please consider applying for our International Fellowship Program.

The International Fellowship Program is a sponsored activity of the AARC. Since 1990, health professionals from more than 50 countries have shared experiences, knowledge, and lasting friendships through this exceptional program.

The three-week program takes each participant to two host cities in the United States and concludes with attendance and acknowledgement at AARC Congress 2013 to be held Nov. 16–19 in Anaheim, CA.

Learn more and apply at www.aarc.org/resources/international_fellows/. For more information, contact April Lunch at lynch@aarc.org. ■

International Fellowship Program Looking for City Hosts

Every year the AARC sponsors an International Fellowship Program that brings physicians, therapists, and nurses from other countries to our shores to learn more about American-style respiratory care in two cities.

It can't happen without city hosts in each of the localities, and now is the time to step up and volunteer. The AARC is currently accepting applications from AARC members in metropolitan areas who would be willing to:

- Communicate with fellows prior to their visit to ensure a smooth trip
- Develop an itinerary for the city activities and coordinate all activities among the various sites, including transportation between sites
- Provide an overview of the health care system in the United States
- Ensure that objectives of the Fellowship visit are met
- Communicate with the AARC International Committee.

If this sounds like something you'd enjoy being involved in, learn more about the program and apply by the June 1 deadline. The fellowships take place in the fall just prior to AARC Congress 2013, scheduled this year for Nov. 16–19 in Anaheim, CA.

Learn more and apply at www.aarc.org/resources/international_fellows/. For more information, contact April Lynch at lynch@aarc.org. ■

Request for Open Forum Abstracts for AARC Congress 2013

The AARC invites you to submit abstracts for the Open Forum at AARC Congress 2013. Considered by many to be the premier event at the AARC Congress, the Open Forum is your opportunity to gain national and international recognition for your research in cardiorespiratory care by submitting an original abstract for presentation at the Congress and having it published in Respiratory Care. The deadline to submit abstracts for the Open Forum is June 1 at http://aarc2013.abstractcentral.com/. ■

AARC Leaders Attend Meetings

Throughout the year, AARC leaders and members of the Executive Office staff attend meetings of the Association's state societies as well as other special meetings. In addition to making AARC representatives available for speaking engagements at meetings, the Association funds a special program to help some state societies partially pay for the travel costs of the speakers. Below are some activities AARC representatives are involved in:

Thomas J. Kallstrom, AARC Executive Director/CEO
- Presenting the keynote address at the South Coast Regional CSRC meeting in Los Angeles, CA

Timothy R. Myers, AARC Associate Executive Director
- Presenting the AARC Asthma and COPD Educator Course in Riyadh, Saudi Arabia

Dr. Bruce K. Rubin
- Presenting the AARC Asthma and COPD Educator Course in Riyadh, Saudi Arabia

Medical Mission to Las Pintas, Mexico

by Connie Freund, BSRT, RRT,
and Reesa Allee, BS, RRT

Johnson County Community College in Overland Park, KS, has partnered with Centro Integral Communitario in Las Pintas, Mexico, where they have formed a rich learning community in the midst of extreme poverty. Las Pintas is located on the outskirts of Guadalajara, Mexico, and has a population of about 16,500.

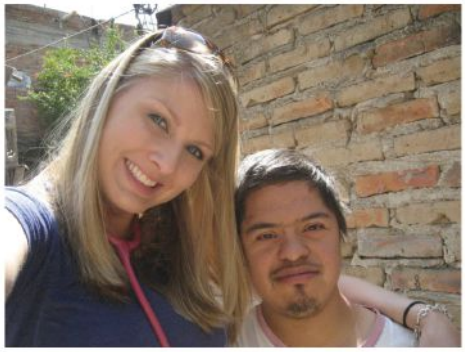
Respiratory therapy faculty and students have teamed with students and faculty from the nursing program to travel to Las Pintas annually since 2006. The team, also known as the "health brigade," is made up of alumni, interpreters, health care students, physicians and/or family nurse practitioners, and more recently, social workers. Once in Las Pintas, we work closely with community volunteers called "health promoters," traveling in groups to neighborhoods to perform basic health screenings. Over the past few years there has been an effort to provide more education for the community through health fairs and in home teaching as well.

Respiratory therapy student Reesa Allee helped these girls make paper flowers during a day of fun activities with the health promoters and their families.

Prior to traveling to Las Pintas, students and faculty attend an overnight retreat and meet regularly over a three-month period to become a cohesive group and learn about the culture they will be serving and the health care that they will deliver. They work to obtain needed supplies and money for the project. This time of preparation is essential to the success of the program and develops the concept of teamwork prior to departure.

Developing cultural awareness and sensitivity is enhanced in this service learning program as students live in the community that they are serving. Volunteers from the community participate in the daily work with the students, providing each group with the opportunity to gain insight from the other about who they are and what is important to them. Students are faced with ethical and justice issues throughout this experience as they witness the faces of poverty.

Lasting friendships were made during the trip.



The faces of poverty were everywhere in Las Pintas.

Educating the health promoters so they, in turn, can educate people in their community is an important part of the process. During our most recent trip, the focus was on hand washing, proper nutrition, and sustainability projects such as composting. For the hand-washing activity we used an organic powder that was sprinkled into the health promoters' hands for them to rub in. After washing their hands they would place them under a black light to assess the quality of their hand-washing skills.

We also used play food and had the health promoters "feed" us a nutritious lunch. We would try to bribe them into giving us cookies, potato chips, and other unhealthy foods; but they were quick to recognize that these items were not the best choices for a healthy diet. We would then have a discussion about the importance of a well-balanced diet of vegetables, fruit, dairy, and protein.

For sustainability, one of our faculty demonstrated composting and the richness of the soil after the decomposition of organic matter. The health promoters were given a tree to plant in this compost. Students also led daily group reflection sessions designed to help participants process their experiences and observations.

With the exception of a few pulse oximeters and blood glucose monitors, there were no high-tech pieces of equipment available in Las Pintas, so the students had to rely on the raw skills they had recently learned — such as observation, auscultation, skin color, and communication — when seeing patients. They walked away with a new appreciation for the value of their clinical assessments.

One particularly fulfilling experience was when a young boy came into the clinic barely able to talk from shortness of breath. He was in obvious respiratory distress, with a respiratory rate of about 20, and was diaphoretic. We took off his shirt and you could see the retractions of his ribs. One of the nursing students listened to his breath sounds and stated that she didn't hear any wheezing. We auscultated his breath sounds, and they were silent. Immediately we started him on albuterol treatments. It took three treatments before his breath sounds were almost normal, with just a slight expiratory wheeze. Within 40 minutes this boy went from being unable to talk or do anything to talking, smiling, and playing.

This incident made a huge impression on the nursing student. During our evening debriefing of the day, she told the story to our group, relating how fulfilling it was to see this young boy go from being unable to breathe to leaving the clinic as if nothing had ever been wrong. Quite a satisfactory and rewarding day! ■

Connie Freund assesses a little girl who came to the clinic.

Connie Freund is a professor of respiratory care at Johnson County Community College in Overland Park, KS. Reesa Allee has graduated from the program and is now a staff therapist at Children's Mercy Hospital in Kansas City, MO.

Have Suitcase, Will Travel

What's the No. 1 thing keeping many respiratory therapists from engaging in health promotion activities out in their communities? Time! Time to devote to the endeavor is, of course, a big consideration. But so is time to prepare the presentation and gather all of the materials necessary for a successful event.

AARC member Stacie Fox, RRT, who often accompanies Charity Clark on her school visits, gets ready to set up the lung display at the school of Clark's daughter.

Packing everything into a suitcase makes it easy to host a program at a moment's notice.

The Kansas Respiratory Care Society (KRCS) solved the latter problem about a decade ago when it came up with a unique way to get presentation materials out to its members: suitcases packed with everything anyone would need to carry out a community event. "I think it was 10–12 years ago that we came up with the suitcases, four at that time, and they were distributed to the directors," says AARC member Karen Schell, MHSc, RRT-NPS, AE-C, a core strategy leader in the "promote" category for the society. "Now they are in key locations with board members for members to access. It was a major public relations project, and it really took off."

This year the suitcase project was expanded to include six suitcases; and AARC member Charity Clark, BS, RRT, who currently serves as KRCS public relations chair, says the traveling presentation kits are on the road most of the time, helping members deliver lung health information. "We never want someone to not promote the profession because a promotional suitcase is busy," she says. "Therefore, we expanded to six kits and have strategically placed them across the state — two on the east side, two centrally located, and two out west."

The kits are set up to accommodate all age groups and have been used for everything from health fairs to career days to elementary school education. Each suitcase contains a set of healthy and smokers' pig lungs, plus a wide variety of AARC educational handouts covering various respiratory conditions. A spirometer, smoking-cessation materials, and the DRIVE4COPD tools are in the case as well, as is the AARC's "Life & Breath" DVD and information on respiratory therapy educational programs in Kansas. A flash drive holds multiple PowerPoint presentations, and notes on presenting to different age groups are included, too.

"The main reason for these items is to allow any member to be well equipped and promote respiratory care across the communities in

The children enjoy touching the lungs.

and taking care of your lungs. It is amazing to see what they retained from the previous year."

Her daughter's class heard the presentation when they were in kindergarten and first grade, and Clark says some of her daughter's classmates have referred to her as the "lung lady" ever since. She recently reconnected with those kids — now in third grade — and the pictures you see here are from that event. "This is a wonderful way to empower and equip society members to promote our profession and make a difference in the lives of their communities," she says. ■

Kansas," says Clark. "Ideally, this takes away the extra time used for prep work and organization, which sometimes deters individuals from participating in fairs, classroom opportunities, and other community outreach programs."

Clark says she isn't sure how many times the suitcases have been used over the years; but thanks to the AARC's social networking site, AARConnect (AC), that will soon be changing. The state society is setting up a special AC group just for the suitcases and will now be able to more easily track their location around the state, get them to members who are planning an event, and receive reports on when, where, and how they are being used to educate the public about lung health and inform interested groups about the career opportunities in respiratory care.

As for herself, Clark has a standing date to bring one of the suitcases into her daughter's school every year, where she uses it to educate kindergarteners and first graders about the respiratory system. "It is always a joy to teach the kindergarteners, and they even sing us a song about the respiratory system to go along with it to the tune of 'When the Saints Go Marching In,'" she says. "Then in first grade we discuss more about lung health

Fox waits for the children to arrive.

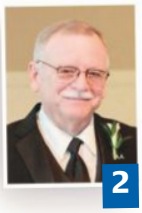
Enter the 2013 AARC Photo Contest

AARC Times is looking for creative members to enter our AARC Photo Contest. Finalists will receive a free one-year membership renewal and have their photo entered into our Photo-of-the-Year Contest with the chance of it being chosen to appear on the March 2014 cover. For instructions and guidelines, select the *AARC Times* icon on www.AARC.org and click on the "Photo-of-the-Year Contest" link. Deadline to submit photos is Oct. 15, 2013. ■

Transitions

Carl Mottram, RRT, RPFT, FAARC, has been elected to serve as secretary of the executive committee of the board of directors of the Clinical and Laboratory Standards Institute. CLSI writes the standards and guidelines for laboratory medicine and pathology. He is director of the pulmonary function laboratories and pulmonary rehabilitation at the Mayo Clinic in Rochester, MN. (Photo 1)

Charles Friderici, BS, RRT, has been appointed as emergency preparedness specialist for St. Peter's Health Partners in Albany, NY. He will coordinate disaster preparedness and response activities for a system with four acute care hospitals and numerous subacute care locations.



Kenneth Wayne Stegall, MEd, RRT, passed away on Nov. 28 after a long illness. He had received a Purple Heart in the Vietnam War, then returned home to East Texas where he taught respiratory therapy at Tyler Junior College for the next 32 years. His colleagues have established a scholarship in his memory. (Photo 2)

Annette Horton, RRT, clinical manager of respiratory care at St. Christopher's Hospital in Philadelphia, PA, passed away suddenly in November. She was an active volunteer with the Pennsylvania Society for Respiratory Care, where she helped to plan a seminar just last year.

Jack McGee, RRT, passed away on Jan. 3 after a long battle with cancer. McGee last worked at Stanford Hospital & Clinic in San Jose, CA, and was a long-time member of the AARC's Political Advocacy Contact Team, making many trips to Washington, DC, to advocate for respiratory therapy issues. He was also the long-time chair of the California Society for Respiratory Care's government affairs committee.

You can submit news about AARC members by going to www.AARC.org/transitions. ■

Honoring Military RTs

If you are a respiratory therapist currently serving your country in the military, *AARC Times* would like to publish a story and photo about your service or deployment.

Please go online at www.AARC.org/go/mm where you will find an online form you can fill out to provide information about your deployment. You can also download your photo there.

Once we receive your information, we may use it to prepare an "RC Currents" story about your service in the military. The AARC honors those who serve, and we would like to share your story with your respiratory care colleagues here and abroad. ■

Read the Rest of the Story at www.AARC.org

- AARC Congress 2012 videos available — www.aarc.org/headlines/13/01/congress_videos.cfm
- Safety expert John J. Nance delivers Congress keynote address — www.youtube.com/watch?v=Vy5MjWSPQ20
- Best practices in respiratory care productivity and staffing — www.aarc.org/resources/productivity_and_staffing/index.cfm
- Final rule paves way for exemption of home respiratory technologies — www.aarc.org/headlines/12/12/taxes.cfm?utm_source=newsnow&utm_medium=enews&utm_campaign=newsnow

Nominate an AARC Member for "Success Stories" or "Interesting People"

Do you know an AARC member who would be good for one of our "people" features in "RC Currents"? If so, provide this information to the editor at the address below: the member's name, job title, place of work, city, and state; why you think they should be featured; and their contact information. Send to: Editor Marsha Cathcart, cathcart@aarc.org with "Success Stories" in the subject line. ■

Smoking Tied to Sudden Cardiac Death in Women

Canadian researchers who examined data from the long-running Nurses' Health Study found even light-to-moderate cigarette smoking places women at higher risk for sudden cardiac death. The study was published in a recent issue of *Circulation*. Among the findings:

- Light-to-moderate smokers, defined in this study as those who smoked one to 14 cigarettes daily, had nearly two times the risk of sudden cardiac death as their nonsmoking counterparts.
- Women with no history of heart disease, cancer, or stroke who smoked had over two times the risk of sudden cardiac death compared with healthy women who never smoked.
- For every five years of continued smoking, the risk climbed by 8%.
- Among women with heart disease, the risk of sudden cardiac death dropped to that of a nonsmoker within 15–20 years after smoking cessation. In the absence of heart disease, there was an immediate reduction in sudden cardiac death risk, occurring in fewer than five years. ■

Stopping Mucus in Its Tracks

Researchers from Washington University School of Medicine in St. Louis have discovered a molecular pathway that leads to excess mucus in airway cells and are now working on new drugs aimed at inhibiting that pathway. If successful, these drugs could have major implications for people living with respiratory conditions like asthma and COPD.

Scientists discovered that a critical signaling molecule, CLCA1, allows a protein known as IL-13 to turn on the major mucous gene in airway cells. The researchers also showed that CLCA1 needs help from an enzyme called MAPK13. From there, they took drugs already known to inhibit a similar enzyme, MAPK14, and adapted them to target MAPK13. Results show that some of their newly designed MAPK13 inhibitors reduced mucus production in cultures of human airway cells by 100-fold.

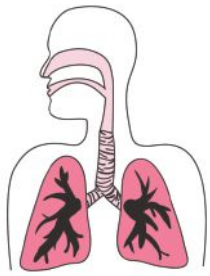
Beyond asthma and COPD, the investigators believe these drugs may have a role to play in treating other conditions that result in excess mucus production as well, such as cystic fibrosis and even the common cold. They published their findings in the Nov. 26 edition of the *Journal of Clinical Investigation*. ■

Pre-op Coughing and Breathing Exercises Reduce Post-Surgery Complications

Pre-operative coughing and breathing exercises, along with muscle training and general exercise, help to reduce pulmonary complications following cardiac surgery. That's the take-home message from Dutch researchers who analyzed data on 856 subjects taking part in eight randomized trials. Patients who received preoperative exercise interventions were less likely to experience partial lung collapse and pneumonia after heart surgery.

Study author Erik Hulzebos, PhD, notes that such therapy is especially important for higher-risk patients. "It is important to stratify high- and low-risk pulmonary patients before surgery so the high-risk patients can be given tailored care to prevent pulmonary complications post surgery," he was quoted as saying. The findings were published in a recent issue of *The Cochrane Library*. ■

▶ Strange But True...



Lung on a chip: Harvard researchers who developed a microchip that uses human lung cells to mimic the function of alveoli have now offered proof-of-concept for their device. When they treated the chip with interleukin-2, which leads to pulmonary edema, the drug caused fluid to start leaking across the blood channel of the device to the alveoli, where it started to clot.

Flucasting: Researchers from Columbia University and the National Center for Atmospheric Research have developed a prediction system that may one day forecast influenza outbreaks seven weeks in advance. Based on weather prediction models, the system accurately predicted the influenza outbreaks in New York City in 2003–2004 and 2008–2009, which were tied to extended periods of very dry weather. The investigators foresee the day when the flu forecast will be reported on the evening news much like the weather forecast is today.

Friendly competition: Need some motivation to get moving? Kansas State University researchers suggest finding an exercise partner whom you feel is in a little better shape than you are. The study found people increased their workout time and intensity by as much as 200% when exercising with a teammate who made them feel slightly inferior. ■

First "Breathing Lung" Transplant Takes Place at UCLA

A 57-year-old pulmonary fibrosis patient recently became the first person in the United States to receive a "breathing lung" transplant. The groundbreaking transplant took place at the Ronald Reagan UCLA Medical Center and involved an experimental organ-preservation device known as the Organ Care System (OCS).

With the OCS, the lungs are removed from a donor's body and are placed in a high-tech OCS box, where they are immediately revived to a warm, breathing state and perfused with oxygen and a special solution supplemented with packed red blood cells. The device also features monitors that display how the lungs are functioning during transport.

"Organs were never meant to be frozen on ice," Dr. Abbas Ardehali, director of the heart and lung transplantation program, was quoted as saying. "The cold storage method does not allow for reconditioning of the lungs before transplantation, but this promising 'breathing lung' technology enables us to potentially improve the function of the donor lungs before they are placed in the recipient." Watch a video at www.newswise.com/articles/view/596473/?sc=mwhr&xy=5013137. ■

The "New Members" Column Is Going Online

Beginning on March 1, the "New Members" column can be accessed at www.AARC.org/new_members. Current AARC members are encouraged to check this site on the first of each month to view the names of individuals who have been approved as "Active Members" in the Association. Any current member may object to a new membership by filing a written objection with the Executive Office at info@aarc.org within 30 days. ■

National Health Observances

- **National Sleep Awareness Week;** March 3–10; National Sleep Foundation; (703) 243-1697; www.sleepfoundation.org
- **World Tuberculosis Day;** March 24; World Health Organization; www.stoptb.org/events/world_tb_day

Study: Compression-only CPR Beats Conventional CPR

Chest compression-only CPR outperformed conventional CPR in a new study published in *Circulation*. Japanese investigators compared one-month outcomes for 1,376 people who had sudden cardiac arrests between 2005 and 2009 and received CPR and AED shocks from bystanders. Among these individuals, 36.8% received compression-only CPR and 63.2% received conventional CPR with chest compressions and breaths. At the one-month followup, 46.4% of the compression-only CPR patients were still alive versus 39.9% of the conventional CPR patients, with favorable brain function seen in 40.7% and 32.9%, respectively. ■

Air Quality on Your Smartphone?

The Environmental Protection Agency (EPA) places air monitoring sensors in communities across the nation, but these sensors are generally few and far between. For example, in San Diego County, which covers an area of 4,000 square miles, only 10 stations monitor air quality.

Computer science researchers from the University of California, San Diego, are working to improve that situation. They have developed a small fleet of portable pollution sensors that allow users to monitor air quality in real time on their smartphones. Data from the sensors can also be used to estimate air quality throughout the area where the devices are deployed, providing information to everyone, not just those carrying sensors. The sensors detect ozone, nitrogen dioxide, and carbon monoxide, and the user interface displays the sensor's readings on a smartphone using the EPA's color-coded scale for air quality.

The investigators tested the devices in 30 users over a four-week period, finding that air quality varied widely, with pollution concentrating in hot spots along main roads and at intersections and other areas. They also found time of the day matters — for example, mid-morning levels were low while evening rush-hour levels were much higher.

The researchers envision a day when the sensors could be built into every smartphone, thus allowing virtually everyone to keep track of the air pollution they encounter every day. They believe that if air pollution could be made more evident to people, support for air pollution control would rise.

The investigators presented their findings at the Wireless Health 2012 conference. ■

Vein Graft Failure Linked to Past Smoking

Quitting smoking even a year prior to coronary artery bypass grafting (CABG) surgery does not fully normalize smoking-related changes to the leg veins used for the surgery and may lead to later graft failure, report researchers publishing in the January issue of *The Annals of Thoracic Surgery*.

The study involved 208 patients undergoing elective CABG surgery who were divided into six groups based on current and previous smoking status. Results showed heavy smoking noticeably increased matrix metalloproteinase enzyme levels in the saphenous vein. These enzymes have been linked to vein graft failure.

While the study identifies smoking as a significant risk factor for vein graft failure, the exact mechanisms of this relationship are not entirely understood. Still, the authors believe their findings suggest it may be better to use more arterial grafts than saphenous vein grafts in smokers who undergo CABG. They also believe the study points to the importance of smoking cessation for people who are to receive CABG. "Although recovery after smoking cessation appears somewhat disappointing, it illustrates exactly the importance of prompt smoking cessation for patients who will receive CABG," they write. ■

Industry Watch

Medicago announces positive results for flu vaccine

According to Medicago Inc., researchers have found that a single dose of its influenza vaccine could protect against not only the H5N1 avian influenza strain it was designed for, but also another H5N1 strain and a strain of a different flu subtype, called H2N2. Known as "cross-protection," this phenomenon is highly desirable in an influenza vaccine because influenza strains often mutate, rendering stockpiled vaccines ineffective.

Researchers gave mice a single dose of Medicago's H5N1 VLP vaccine formulated for the Indonesia H5N1 influenza virus. After 28 days, the mice were given a lethal dose of either the Vietnam H5N1 strain or an H2N2 influenza virus strain that caused a pandemic in humans in the late 1950s. The study found Medicago's vaccine protected 100% of the mice from the Vietnam strain and 70% from the H2N2 strain.

Covidien integrates Nellcor technology

Covidien recently announced the integration of its Nellcor™ pulse oximetry with OxiMax™ technology into GE Healthcare Giraffe® and Panda® infant warmers. According to the company, integrating Nellcor SpO_2 monitoring along with the SatSeconds alarm management system enhances the respiratory support and resuscitation capabilities of GE Giraffe and Panda warmers and helps clinicians safely monitor and screen infants for life-threatening cardiac and respiratory complications, as well as standardize resuscitation protocols across the perinatal care area.

GSK, Theravance submit application for COPD drug

GlaxoSmithKline and Theravance Inc. have submitted a new drug application to the FDA for the investigational once-daily LAMA/LABA combination medicine UMEC/VI for patients with COPD. UMEC/VI is a combination of two investigational bronchodilator molecules, GSK573719 or umeclidinium bromide (UMEC), a long-acting muscarinic antagonist, and vilanterol (VI), a long-acting beta-2 agonist that is administered using the Ellipta™ inhaler. Anoro Ellipta is the proposed proprietary name for the medication.

Mauna Kea Technologies enters research agreement

Mauna Kea Technologies has entered into a research agreement through a collaboration negotiated by Edinburgh BioQuarter and the University of Edinburgh to develop a novel molecular imaging device to use with its optical biopsy product Cellvizio®. If successful, the combined technology could dramatically change the way physicians diagnose and monitor patients with lung disease, according to the company. The collaboration will help develop the device to be used with clinical-grade novel molecular imaging Smartprobes developed by the Queen's Medical Research Institute. The Smartprobes selectively generate fluorescent signals that can then be imaged with Cellvizio.

Ikaria announces FDA clearances

According to Ikaria, the FDA has granted 510(k) clearance for a software upgrade to enable connectivity of the INOmax® DSIR drug delivery system with hospital health information systems. This connectivity allows data regarding INOmax usage to be transmitted directly to electronic medical records, where it can easily be viewed at computer stations to reduce charting time, avoid transcription errors, improve billing efficiency, and facilitate reimbursement for INOmax usage.

The FDA has also cleared three new noninvasive respiratory care devices for use with the INOmax DS and DSIR drug-delivery systems: the Fisher & Paykel Healthcare Infant Circuit Nasal Cannula and Optiflow™ Breathing Circuit and the A-Plus Medical Babi Plus™ Bubble CPAP.

Drive Medical broadens its scope

Drive Medical is now manufacturing and distributing the Evo/Global Medical respiratory and SmartDose® product lines, including suction

canisters, nebulizers, 50 PSI compressors, and aerosol products, along with its SmartDose line of oxygen conserving devices. "We are pleased to broaden our capabilities and product line in the respiratory product category," Drive Medical Chairman and CEO Harvey Diamond was quoted as saying, "By manufacturing these products, we continue our aggressive respiratory growth strategy, which we began last year with the acquisition of Inovo/CHAD Therapeutics."

Teleflex gets FDA clearance for vascular access catheter

Teleflex Incorporated has announced that its Semprus BioSciences subsidiary has been granted 510(k) clearance for its innovative vascular access catheter, the Nylus™ Peripherally Inserted Central Catheter with Semprus Sustain™ Technology. The Nylus PICC is indicated to provide peripheral access to the central venous system for infusion, intravenous therapy, blood sampling, central venous pressure monitoring, and power injection of contrast media. The FDA clearance follows the product's European market clearance in July 2012.

Johns Hopkins establishes sleep center

The Johns Hopkins Center for Sleep-Related Symptom Science is being established to help define and break the cycle of sleeplessness. The brainchild of Johns Hopkins University School of Nursing researcher Gayle Page, DNSc, RN, FAAN, and Michael Smith, PhD, of the Hopkins School of Medicine, the center is the result of a $1.9 million National Institutes of Health "center of excellence" grant. Its mission includes expanding the scope of sleep-measurement research already underway.

Respicardia announces new VP

Respicardia®, which successfully completed enrollment in the first global chronic pilot study to treat central sleep apnea with an implantable system last fall, has appointed Jay Millerhagen as vice president of clinical affairs and market development. Respicardia CEO Bonnie Labosky was quoted as saying, "His 23 years of cardiology-centric medical device experience, which includes conducting several major clinical trials, make him an ideal fit for our company at this exciting and important juncture."

FDA approves first flu vaccine made from cultured animal cells

The FDA has approved Flucelvax, the first seasonal influenza vaccine licensed in the United States that is produced using cultured animal cells instead of fertilized chicken eggs. Flucelvax is approved to prevent seasonal influenza in people ages 18 years and older. "Today's approval represents the culmination of efforts to develop a seasonal influenza vaccine using cell culture as an alternative to the egg-based process," says Karen Midthun, MD, director of the FDA's Center for Biologics Evaluation and Research.

Brief submissions and photos for this column may be sent to Marsha Cathcart, *AARC Times* editor, at cathcart@aarc.org. ■

Classifieds

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We reserve the right to make editorial changes for reasons of clarity and consistency. Every effort is taken to avoid mistakes, but *AARC Times* cannot be responsible for clerical or printing errors. **Deadline for Ad Placement/Cancellation** Deadline for ad placement and written cancellations for the next available issue is March 17. Blind ads available. **For Recruitment Advertising Information, Contact Classified Advertisement** Andrea Conté • Alhambra Plaza • 725 N. Highway A1A, Suite C-106 • Jupiter, FL 33477 • (561) 745-6793 • Fax (561) 745-6795 • AARCAD@aol.com

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Required qualifications

- Must be a graduate of an approved AMA School for Respiratory Care.
- Current State Licensed required. Credentialed by the NBRC.
- Current BLS Certification
- Proof of negative TB testing (either skin or negative Chest X-Ray)
- 2 years experience in ventilator management (either Acute or Home Care) preferred but not required

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Two positions are currently available. Hours vary, with one position focused more on days and the other more on nights. Qualified applicants will have an active NJ registered respiratory therapist licensure and a minimum of one year of relevant experience in an acute care setting.

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Calendar of Events

AARC & State Society Programs

March 26–27
Newport, RI
29th Annual Rhode Island Society for Respiratory Care's Conference & Exhibition for Healthcare Professionals
Contact: Dorothy Lunnin, (401) 595-7059

April 3–5
Baton Rouge, LA
LSRC's 43rd Annual Education Meeting and Exhibits
Contact: Raymond Pisani, (985) 518-3346

April 6–9
SeaTac, WA
40th Annual Pacific Northwest Regional Respiratory Care Conference and Scientific Assembly
Contact Bob Bonner at bbonner@highline.edu

April 8–10
Kalamazoo, MI
Michigan Society for Respiratory Care's 2013 Spring Conference
Contact: (866) 989-6772

April 11–12
Ogden, UT
USRC's Annual Respiratory Conference and Exhibition
Contact: Laurie Myers, (801) 652-7126

April 11–12
Wichita, KS
36th Annual KRCS Spring Educational Seminar
Contact: Melanie Asmussen, (316) 268-5812

April 15–16
Fargo, ND
NDSRC's Annual Spring Convention
Contact: Angela MacAdams, (701) 234-6777

April 18–19
King of Prussia, PA
PSRC's Eastern Regional Conference
Contact: Thomas Lamphere, (215) 687-2904, www.psrc.net

April 18–19
Cocoa Beach, FL
Florida Society for Respiratory Care Space Coast Cardiopulmonary Conference
Contact FSRC at (866) 534-6172 or www.fsrc.org "Live Events"

April 23–24
Las Vegas, NV
Nevada Society for Respiratory Care's 2013 Annual Conference Spring into Action
Contact Connie Small at (702) 807-9311 or conkerdoodle@hotmail.com

April 24–26
Kalispell, MT
39th Annual MSRC Convention
Contact: Bill Carmichael, (406) 455-5242

April 30–May 1
Plantsville, CT
CTSRC Symposium XXXI
Contact: Susan Albino, (203) 739-7878

May 1–3
Lake Ozark, MO
MSRC's 42nd Annual Conference and Business Meeting
Contact: Aaron Light, (417) 447-8824

May 1-3
Vail, CO
CSRC State Conference: Rockin' Rollin' Respiratory
Contact: Kari Woodruff, (720) 235-4986

May 15–17
Kearney, NE
Great Plains Conference on Respiratory Care
Contact: Joe Rush, (402) 413-3275

July 15–17
Orlando, FL
AARC Summer Forum
Contact AARC, (972) 243-2272, www.aarc.org/education/meetings

July 29–30
Columbus, OH
Ohio Society for Respiratory Care's 35th Annual State Meeting
Contact: Joe Huff, www.osrc.org

October 20–26
Respiratory Care Week
Contact AARC, (972) 243-2272, www.aarc.org/rcweek

October 23
Lung Health Day
Contact AARC, (972) 243-2272, www.aarc.org

November 16–19 (Saturday–Tuesday)
Anaheim, CA
AARC Congress 2013
Contact AARC, (972) 243-2272, www.aarc.org/education/meetings

Other Meetings

March 7–8
San Antonio, TX
UT Health Science Center San Antonio's 18th Annual Respiratory Care Symposium
Contact Leo Wittnebel at wittnebel@uthscsa.edu or Kenzie Arnold at arnoldk2@uthscsa.edu, (210) 567-7960, www.uthscsa.edu/shp/rc

Submissions for the next available issue are due March 19.

For information on submitting calendar events, contact: Beth Binkley, AARC Times
9425 N. MacArthur Blvd, Suite 100, Irving, TX 75063-4706
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- **VAP to VAE: Implication for the Respiratory Therapist - Ventilator Associated Events**
  By Dean Hess, PhD RRT FAARC and Kathleen Deakins, MHA RRT-NPS FAARC
- **Oxygen Therapy in the Hospital**
  By Keith Lamb, RRT and Dean Hess, PhD RRT FAARC
- **Caring for Patients with Chronic Critical Illness**
  By Shannon Carson, MD and Neil MacIntyre, MD FAARC
- **Cystic Fibrosis - A 21st Century Perspective**
  By Elliot Dasenbrook, MD, MHS and Timothy R. Myers, MBA RRT-NPS FAARC
- **Medicated Aerosol Therapy – New Drugs and Devices**
  By Douglas S. Gardenhire, EdD RRT-NPS and Tom Kallstrom, MBA RRT FAARC
- **Airway Clearance**
  By Timothy R. Myers, MBA RRT-NPS FAARC and Richard Branson, MSc RRT FAARC
- **Optimizing Patient-Ventilator Synchrony**
  By Robert Kacmarek, PhD RRT FAARC and Tom Kallstrom, MBA RRT FAARC
- **Humidification During Mechanical Ventilation – A Review of the Literature**
  By Richard D. Branson, MSc RRT FAARC and Doug Laher, MBA RRT FAARC

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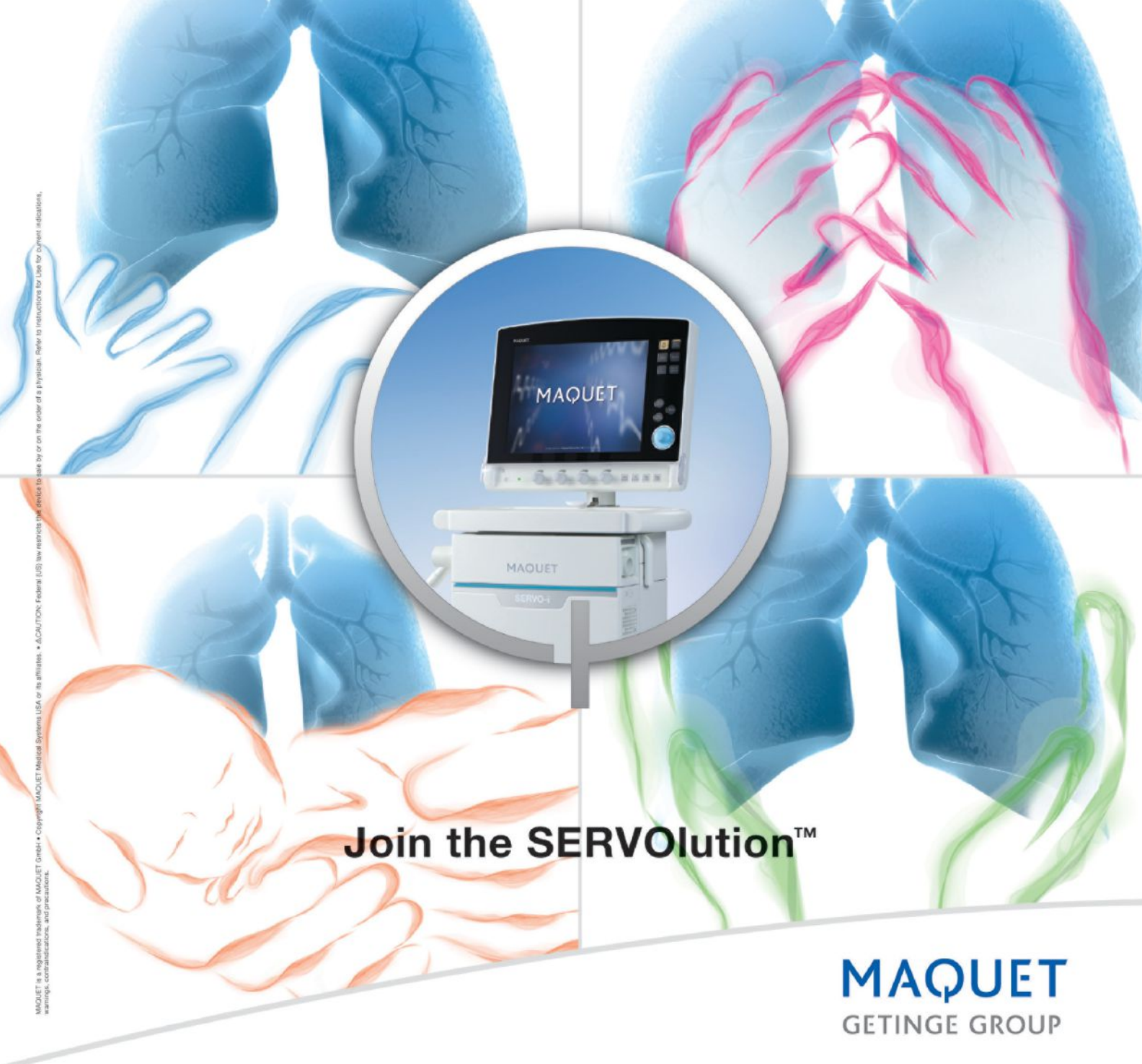

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[1] EMMA Users Manual.