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AARC Times

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Ventilation for Life

High-frequency Oscillatory Ventilation and Airway Pressure Release Ventilation — Part 1

by Thomas Lamphere BS, RRT-ACCS, FAARC

EDITOR'S NOTE: This article is the first of two on HFOV and APRV. Part 2 will appear in the Ventilation for Life column of the February issue of *AARC Times*.

Since acute respiratory distress syndrome (ARDS) was first described in 1967, the disease process has provided a significant challenge to clinicians. Since that time, of the many approaches aiming to reduce the high mortality rate for the disease, the only approach shown to have successfully done so has been the use of lower tidal volumes.[1] Despite the implementation of lung-protective ventilation, the mortality rate for ARDS remains higher than 40%.[2]

Two unconventional methods of mechanically ventilating a patient with ARDS include airway pressure release ventilation (APRV) and high-frequency oscillatory ventilation (HFOV). While many clinicians have become familiar with applying these ventilation methods, others remain unfamiliar with their theory and implementation. Part 1 of this two-part article will review the basic theory of both methods.

Research has shown that the cyclic over-stretching and subsequent collapse of alveoli during "traditional" mechanical ventilation leads to changes in surfactant and subsequent lung injury.[3] In an attempt to reduce this injury, clinicians utilize low tidal volumes and an "open-lung" concept of mechanical ventilation in which the lungs are opened and kept from closing.[4] While the low tidal-volume approach addresses the risk of over-stretching the alveoli, it does nothing to prevent atelectrauma that can be caused by the collapse of the alveoli. To prevent this from occurring, the open-lung ventilation strategy utilizes positive end-expiratory pressure (PEEP) to keep the airways open at end expiration. HFOV and APRV are based on the open-lung concept and utilize settings in a very different way from that of conventional ventilation.

Relative contraindications for HFOV include intracranial hypertension and severe air-flow obstruction, while relative contraindications for APRV also include severe airflow obstruction as well as patients with minimal or no spontaneous effort (e.g., deep sedation or neuromuscular disease).[5,6]

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High-frequency oscillatory ventilation

During HFOV, the oscillator utilizes a piston to deliver very small tidal volumes at a very fast rate. This results in very small pressure changes, thereby theoretically reducing the risk of lung injury. In addition to the fraction of inspired oxygen (FiO_2), the bias flow, mean airway pressure (P_{AW}), frequency, inspiratory time, and power are set and adjusted to ventilate and oxygenate the patient.

The bias flow is a continuous flow of gas that travels through the ventilator circuit and passes through a control valve at the end of the expiratory limb. The gas flow is initially set at 30–40 Lpm and is responsible for removing CO_2 from the circuit. Additionally, in combination with the control valve, the flow creates a constant distending pressure in the airways. The P_{AW} setting controls the valve and is initially set to achieve a P_{AW} of 5 cm H_2O above the plateau pressure reading measured during conventional ventilation (up to a maximum of 35 cm H_2O or 20–25 cm H_2O if a plateau pressure cannot be obtained).[7]

The rate of the rapid back and forth movement of the piston is determined by the frequency setting (in Hz).

One Hz is equivalent to 60 bpm, and an initial setting for this control is typically 5 Hz but can range from 4–7 Hz based on the pH of arterial blood prior to initiation of HFOV. The inspiratory time control determines the percent of time that the piston is moving forward and is initially set at 33%. Finally, the power (or amplitude) control determines the oscillation pressure amplitude — or, in simpler terms, how far the piston moves back and forth. An initial setting of 70–90 cm H_2O is suggested; and, in general, the higher the power setting, the greater the tidal volume. Many clinicians adjust the setting based on observing a slight movement from the clavicles to the mid-thigh (known as the chest wiggle factor).[7]

Once initial settings are determined, adjustments to those settings are dependent upon the arterial blood gas results. If the results indicate hypoxemia, the FiO_2 and P_{AW} are the primary controls used to improve oxygenation. Increasing P_{AW} in 2–3 cm H_2O increments typically results in increased lung volume and improvement in both ventilation/perfusion matching and oxygenation. Another approach to improving oxygenation involves the utilization of a recruitment maneuver along with an increase in P_{AW}.[5] Other adjuncts to improve oxygenation such as prone positioning can also be utilized.

If hypercapnia/acidemia is noted, increasing the power setting is typically the first choice to increase the tidal volume delivered. Alternatively, the frequency setting may be decreased, which will also result in an increase in tidal volume delivered as the time of piston movement is increased. Other methods to eliminate CO_2 include introducing a small cuff leak.[7]

There is no clear consensus on weaning patients off HFOV and back to conventional mechanical ventilation. In general, as the patient improves, the FiO_2 is weaned to 50% or less and then the P_{AW} is slowly decreased as tolerated. Once the P_{AW} reaches a greatly reduced value (e.g., 20–25 cm H_2O) while the arterial oxygen saturation (S_{aO2}) remains stable at ≥ 89%, the patient may be transitioned to conventional ventilation.

Airway pressure release ventilation

APRV is a pressure control mode of mechanical ventilation that utilizes the basic principles of inverse-ratio ventilation strategy during which the patient's inspiratory time is greater than the expiratory time. However, unlike early mechanical ventilators, most ventilators utilize an active exhalation valve that allows for spontaneous breathing throughout the entire breathing cycle. Clinicians who have not used this type of ventilation can think of it as two levels of continuous positive airway pressure (CPAP) — one set at a high level (known as P High) and one set at or near zero (known as P Low). Both levels are time-triggered and time-cycled based on two controls known as T High and T Low, which are both set in seconds.

Once the mode is initiated, the ventilator generates pressure up to the P High setting and maintains it at that level for the duration of T High, after which the ventilator allows the pressure to drop to P Low for the duration of the T Low setting. The number of "releases" (the drop from P High to P Low) that occur each minute is determined by (T High + T Low) / 60.

There is no consensus regarding initial settings in APRV, and no single method has proven to be the most effective without drawbacks. In general, P High should be set at 20–35 cm H_2O and P Low set at 0 cm H_2O. T Low should be set at 0.2–0.8 seconds, and the expiratory flow curve should be utilized to adjust this time to allow a drop of 25%–75% of peak expiratory flow rate. This creates intrinsic PEEP and theoretically avoids complete lung emptying and atelectasis. The T Low setting will result in a release rate of approximately 8–12 per minute. Oxygenation is achieved due to the lengthened amount of time for P High and subsequent increases in P_{AW} and alveolar recruitment. Ventilation occurs during the time-cycled releases to P Low allowing for CO_2 to be exhaled. In addition, the patient may spontaneously breathe at any time; and although the tidal volume for these breaths is typically small, they can contribute to the removal of CO_2.[7,8]

Adjustments to the initial settings are dependent upon arterial blood gas results. If the results indicate hypoxemia, in addition to adjustment of FIO_2, there are several options to improve oxygenation. An increase in P_{AW} (with a subsequent increase in oxygenation) can be achieved by increasing the P High setting in 2 cm H_2O increments or by increasing the T High setting while decreasing the T Low setting (if possible). Additionally, maintaining the T Low setting will also increase the PAW but will also result in a reduction of the cycle frequency (or number of "releases"). If an adjustment in P High is utilized, the generally accepted maximum pressure is 35 cm H_2O.[8]

If hypercapnia/acidemia is noted, the patient should be assessed for over sedation and to ensure spontaneous breathing. Additionally, decreasing T High while maintaining T Low will increase the release rate and increase minute ventilation. However, this will result in a lower P_{AW} and the P High may need to be increased simultaneously to maintain the P_{AW}.[3] Finally, increasing the T Low in small increments (0.05–0.1 s) allows more time for exhalation and thereby increased CO_2 clearance. However, care must be taken to ensure de-recruitment does not occur.

There is no clear consensus on weaning patients from APRV. One method of weaning involves a drop-and-stretch protocol. As a patient's oxygenation improves, the P High is systematically reduced (drop) while the T High is increased (stretch). This results in a reduced number of releases and, therefore, amount of minute ventilation provided by the machine. The patient must then increase their spontaneous minute ventilation to maintain their total minute ventilation.[8]

Expert at the bedside

The complex pathophysiology of ARDS combined with the complexities of utilizing HFOV or APRV creates a need for a critical care specialist at the bedside to act as a physician extender. A respiratory therapist who is well versed in both the disease process and different ventilation options is a prime candidate to be that specialist. In fact, the matrix for the Adult Critical Care Specialist (ACCS) exam (www.nbrc.org/accs/Pages/default.aspx) includes both of these types of ventilation as well as other information pertinent to critically ill patients. A respiratory therapist who has earned the ACCS credential has demonstrated a higher level of mastery of this information and can be a very valuable member of the intensive care team. ■

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Clinical Perspectives

Respiratory Care at the Crossroads: Adapting to Newer Care-delivery Paradigms

by Garry W. Kauffman, MPA, RRT, FAARC, FACHE

This article provides an overview of a lecture presented at the 2015 AARC Summer Forum by Patrick Dunne, MEd, RRT, FAARC, and discusses new care delivery models that have been launched as part of the Patient Protection and Affordable Care Act (PPACA).[1] It discusses the emphasis by the PPACA on chronic diseases and disease state management and reinforces the opportunities to align the chronic care model with new and value-added roles for the respiratory therapist.

While there have been several attempts at the federal level, dating back to the Richard Nixon presidency and more recently with proposals advanced by Hillary Clinton during Bill Clinton's presidency, most experts would categorize both proposed and enacted changes as focused solely on reimbursement. What sets the PPACA apart from these earlier attempts is that the PPACA addresses not only how care providers will be *compensated* but also how health care services will be *provided across the care continuum*. As such, the changes brought about by the PPACA are a radical departure from an evolutionary and piecemeal approach and are truly deemed to be revolutionary.

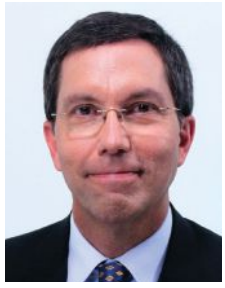
The PPACA is being implemented in several phases with regard to care venue, diagnoses, penalties, bonuses, and reporting requirements. While the rhetoric about repeal of the PPACA has yet to hit its zenith, I believe the PPACA is here to stay because it has forced our nation to look at the performance of our health care system, the cost of this performance, and the opportunity to move from a sickness-reimbursement model to one that truly embraces prevention and reimburses providers on the basis of quality outcomes and patient satisfaction.

The PPACA has adopted a "carrot and stick" approach. Providers that fail to deliver high-quality, cost-effective, and consumer-centric services are penalized. Alternatively (and this is another opportunity for RTs), those providers delivering high-quality, cost-effective, and consumer-centric services receive bonuses. The full explanation of the penalty-bonus formulas is beyond the scope of this article; but it's worth noting that while the penalties of 1%-3% may seem nominal, they are far from insignificant in several ways. Take a minute to calculate the impact on your organization, especially since the penalty is applied not only to the diagnosis-related groups (DRGs) in the current program but to *all* Medicare patients. That takes the "nominal" to "strategic" and provides another opportunity for RTs to support their organization to improve quality and cost-effectiveness of care through the use of protocols across the continuum of care.

The new CMS models address quality of care by examining several aspects of the acute care hospital's performance. Examples of focus areas include unplanned admissions within 30 days, patient satisfaction with care delivery, and timely and effective care compliance. For those wondering if this methodology will be utilized solely by Medicare, we need to remember the implementation of DRGs — a capitated program rolled out for Medicare patients that quickly spread throughout all payers. Thus, as RTs reengineer their services across the health care continuum and focus on demonstrating their value to Medicare patients, they should plan to make this the only way to deliver care to patients of all ages and in all care venues.

To further reinforce that this methodology is here to stay, provider performance is publicized via www.Medicare.gov/HospitalCompare.[2] RTs play an incredibly valuable role in the care of cardiopulmonary patients and are critically important to our health care provider organizations' performance as is being interpreted by all stakeholders. Consumers, employers, and payers are making

about the author...



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decisions based upon this public reporting as they interpret a provider's performance in one domain to indicate overall service quality.

This revolutionary change has prompted many within the industry to compare the "traditional model" to the "new model" of health care. To understand this radical departure from the traditional model, consider several concepts published by Dr. Robert Kacmarek, Dr. Charles Durbin, et al, that emphasize these new roles for RTs align perfectly with the "new model."[3]

Moving from acute care to chronic care

The "traditional model" failed to improve quality or cost-effectiveness because we as providers operated to maximize our silos. There was no imperative to reach beyond the hospital walls because of the traditional reimbursement model. Moving to a chronic care model is the perfect opportunity for RTs to demonstrate their value as they provide pulmonary rehabilitation, act as physician-extenders in urgent care centers, work collaboratively with patients and families in COPD and asthma support groups, manage patients' long-term bronchopulmonary hygiene care in their homes, and move more of their care to post-acute care venues.

Moving from inpatient to outpatient

One of the most disturbing recent trends is the closing of pulmonary rehabilitation (PR) programs across this nation. When queried as to why a PR program was closed, the typical response is: "We didn't make money." Reimbursement for PR isn't what RTs might prefer, but reimbursement is no longer a barrier to this value-added service. PR has been shown in numerous peer-reviewed publications to reduce readmissions. Additionally, for those persons who are eventually admitted, their time in the hospital is significantly reduced. Thus, PR saves money, improves quality, and increases patient/family satisfaction. Few programs can make this statement and back it up with evidence-based practice outcomes.

Moving from treating symptoms to managing the disease

For many RTs, their historical value was predicated on getting the treatments done. Following orders from our physician colleagues is certainly appropriate. However, RTs need to question why protocols aren't implemented when the science of protocols has demonstrated an improvement in both acute and chronic care venues. The peer-reviewed literature is bursting with evidence that demonstrates that longitudinal improvement in quality and cost is achieved secondary to the use of protocols. Protocols allow movement from treatments to disease management — and not just within the acute care hospital but across the care continuum. Protocols also allow better measurement of the impact of RTs' equipment and processes, with the goal of selecting and customizing those services to achieve the highest quality and most cost-effective care.

Moving from volume-driven to value-added

For those RTs who were practicing before the implementation of DRGs in the 1980s, it was typical for an RT leader to utilize treatments done, oxygen hours, ventilated-patient days, and other service accounting as measures of RTs' contribution to the hospital's success. No longer should clinicians and administrators measure their value to the health care system by counting and reporting the number of treatments given but rather by the outcomes resulting from their services. In fact, perhaps the reason more small-volume nebulization treatments or metered-dose inhaler treatments are being administered is that the equipment/supply/medication is not meeting the needs of the patients. This new focus will force respiratory therapists to examine their knowledge of equipment and supplies with regard to efficacy, critical thinking skills, and their ability to discern both process improvements (time on ventilator, ICU days, patient demonstration of correct inhaler/spacer use) as well as longer term outcomes (readmissions, ED visits, length of stay, patient satisfaction with our services).

Professional growth is here and now

In summary, there is no better time to be an RT; and here's just one example to serve as proof. If I had gone to my boss just a few years ago to request hiring four new RTs to serve as cardiopulmonary RT navigators who would generate no new revenue, increase our labor costs, increase our pharmaceutical costs, and reduce our productivity, she would have walked away. The old model rules don't apply; and with the new model, I got approval to hire those four new RT navigators. We have seen reported in AARC publications and heard at the AARC Summer Forum, the annual Congress, and state society meetings numerous stories of success in new models for RTs as case managers, RT navigators, disease state managers, and clinical liaisons facilitating the collaboration between acute care hospitals and post-acute providers. Article after article, lecture after lecture, the common elements for success are confirmed as discussed above. Given that these tumultuous changes will continue to spread and impact care by all providers in all care venues, we have a choice: Keep our heads down and stay the course or step up and demonstrate our value in terms of providing higher quality care, more cost-effective care, and improved patient/family satisfaction across the care continuum. There truly is no better time to be a respiratory therapist. ■

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A Good Time To Let Your Senators and Representative Know You Are Watching

by Cheryl West, MHA

Most state legislatures have either come back or soon will come back into session for 2016 to tackle the perennial issues states have to address every year — issues that range from education funding to Medicaid coverage to the overall and highly important state budgets. Into this mix, which can be highly charged to begin with, add in the fact that 2016 is not only a national election year (for all of the House of Representatives and one-third of the Senate) but a presidential election year as well. Hence, state legislators and governors are highly aware and responsive to what issues are playing out at the national level.

This makes it all the more important that respiratory care society leaderships not only assess the potential 2016 state legislative landscape but also have a sense of what the priorities of the governor and his/her administration will be. As a number of state RT societies can attest, initiatives aimed at health professional licensure (including respiratory therapy) can emerge not just as a bill in the legislature but as a priority agenda item from the state health agencies or even the governor's office. State RT societies are the tip of the spear in your state as your leadership can assess both the potential opportunities and the challenges to the profession.

about the author...

Cheryl West, MHA, serves as director of government affairs for the AARC.

Awareness and response essential

As many of you are aware, there has been a noticeable increase in certain states to question the need for many professions to continue to be licensed and regulated by the state. In some states the respiratory therapy profession has not escaped this scrutiny. So far, these challenges to the RT license have been defeated, but not without intense focus and proactive intervention by your state society leadership. In addition to questioning the validity of RT state licensure, challenges to the integrity of the RT profession can and have in the past come in other forms, such as legislation that encroaches on the RT scope of practice by non-licensed or non-qualified personnel, or diminishing the access of patients to respiratory equipment or clinical services. Awareness by and response from the leadership in the state societies (and in many cases, respiratory therapists) is essential. A policy or bill that might negatively impact the respiratory therapy profession and garners no response is interpreted as support for whatever is being proposed. More often than not, those who are proposing any change are not going to sit up and say, "let's see what the RTs think of this." Being alert and proactive gets the RTs a seat at the table.

Of course, on the flip side there are positive opportunities that can emerge for a state through regulation or legislation. That, too, requires the RT profession to weigh in with support.

Whether the "issue" in your state is positive or negative, legislative or regulatory, initiated by the RT profession or by some outside force, these changes to the legal provisions of the RT licensure law can directly impact how RTs may practice, where RTs may practice the profession, and who can practice it — which then requires true dedication by those RTs in your state who have volunteered their time to preserve and advance your profession.

Don't let a handful of your fellow RT colleagues do all the heavy lifting for the profession in your state. Consider helping out even in small ways, whether it's helping at the annual state meeting or submitting short news updates to the society's newsletter/website. Everything is helpful.

Why me?

In terms of legislative or government activities in your state, ask yourself "who do I know?" At the state level, many of us know someone who works in the legislature or in the state administration. It might be your great aunt Tilly who plays cards every month with the sister of a legislator, or your neighbor is a state employee in an area related to health care. Would you feel comfortable sharing this type of connection with your society? Being able to get an audience with a policy maker to state the position of the profession can be invaluable. These connections don't have to revolve around "access" to these contacts to press an issue, but perhaps they could become a springboard to invite a member of the legislature or administration to the state's annual meeting or other event your profession undertakes. Making a legislator or health decision maker aware of the profession of respiratory therapy is the first step in educating these policy makers on the key role the RT plays in the health care of the citizens of the state. Other health professions simply are better known than is the profession of respiratory therapy, so taking the initiative to educate those who have the power to advance or diminish our profession is *smart*. If those who might draft a bill or write up a state health policy understand the respiratory profession, the issues of importance to the profession, and how the RT and the pulmonary patient are linked, then those policies or legislation can include (or not include as the case may be) provisions that can be positive for the patient and the profession.

Contacts and networking are some of the key components in keeping those state decision makers aware of respiratory therapy and the issues that are important to the profession and the patient. Your state society leadership is committed to the profession. They would not have run for office or accepted committee assignments if they were not. If you can help your fellow RTs — which is helping both the profession and the patients — please consider doing so. Whether it is offering to volunteer some time for a project undertaken by your society, responding to calls for emails to policymakers, or letting your leadership know "who you know," it's all part of advancing the profession and ultimately caring for your patients. ■

Risk Auditing

by Anthony L. DeWitt, JD, RRT, FAARC

Many years ago, I learned an important lesson when a drill sergeant in the U.S. Army told me that to "assume" was the mother of all mistakes. In nearly everything I have done since then, I have learned that assuming things is a deviation that produces disaster. In spite of that, I assume things every day; and every now and then I recognize when an assumption has led me down the wrong path.

We assume things in our daily lives every day, and most of those assumptions are benign. We assume our coworker will do her job. We assume that the physician will listen when we have an issue with a change in the care plan. We assume that we'll be able to leave the hospital at the end of the shift. We assume we are safe — and that our patients are safe — inside the protected walls of a hospital. Most of these assumptions are benign and normal, but what if we looked at our hospital through a different set of eyes? What if we thought like a criminal? What if we thought like a child predator? What if we assumed the worst instead of expecting the best? What changes would we make? These questions are at the heart of performing a risk audit.

Risk auditing is unpopular. It reveals holes in the fabric of security. It reveals policies or procedures that have the potential for exploitation, or worse, negligence. It challenges our "cognitive dissonance" that "it won't happen here; it won't happen to me." Sometimes people *assume* (there's that word again) that these are good reasons not to do a risk audit. In fact, they are the most important reasons to do one.

Risk auditing can be general (a look at the whole hospital), or it can be department specific. As a general rule, it is always a good idea to "put your house in order" before trying to change those around you; so I recommend if you attempt risk auditing that you start in your department.

about the author...

Anthony L. DeWitt, JD, RRT, FAARC, is an attorney and a partner in the firm Bartimus, Frickleton, Robertson & Goza, 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.

Exploiting security flaws

I once worked for a hospital where the pulmonary department was directly below the main lobby. That fact was unknown to 99% of the people who walked through the lobby, but a criminal could easily have discerned this fact simply by walking in the public areas of the hospital. The facility frequently suffered thefts, and the hospital was generally unable to stop them. Everyone knew these thefts occurred.

The bronchoscopy lab was in the pulmonary department, and we kept benzodiazepines and code drugs in a locked box. The box was a repurposed tackle box with a red tag designed to keep the code drugs undisturbed. The room was normally locked; but following a bronchoscopy, it was frequently left unlocked and unattended as the patient was wheeled back to a room. During one of those times, a person dressed in maintenance-type coveralls slipped down the stairs from the main lobby, closed the drug box, picked it up, and went right by the administrator's door looking like he was carrying a tool box. He went up the stairs, stealing $400 in code drugs in order to get three vials of diazepam. Coming in the back way allowed him to bypass the clerical staff in the front office, the technician workroom, the technical director's office, and all the staff who would have been in the front of the department. We later theorized that the thief had been watching the department, learned the protocol, and struck when the time was right.

The vulnerability was created by just two things: (a) an unmonitored stairwell door, and (b) an unlocked

bronchoscopy suite door. The suite door was later fixed with a lock that locked every time the door closed and an automatic closing device. The unmonitored stairwell door was altered with a bell that sounded whenever the door was opened.

As therapists, those who worked there believed they were safe in their own department. But if those therapists had been thinking like street thieves, they would have recognized just how "ripe for the fleecing" the department was. Therapists routinely used the stairs and thought of them as "their turf" and not a public means of travel. But thieves think of them as unseen passageways that they can move through without being detected. And a person with a lab coat or wearing the same color of clothing that maintenance workers wear is unlikely to raise suspicion.

The same kind of thinking can be applied clinically. Instead of thinking like a thief, the clinician must think like the laziest and least competent clinician. Dakin's solution is a mixture that contains chlorine bleach (sodium hypochlorite) and is used for wound irrigation, among other things. It is rarely used; but when it is used, it is often packaged in the same bottles that sterile water comes in, with simply a label affixed. It works well on bacteria but not so well as a solution for refilling ventilator humidifiers. When nurses stored Dakin's solution on the bottom of the ventilator cart, the therapist in the ICU *assumed* (there's that word again) that it was just sterile water. The resulting admixture of Dakin's and existing sterile water did not cause significant injury but did cause significant finger-pointing.

Closing the barn door

A risk audit would have suggested that merely sticking a white label on a bottle of sterile water was insufficient warning of the bottle's contents because clinicians rarely read labels on familiar-looking bottles. Closing the proverbial barn door after the horse was out, therapists began labeling their sterile water with bright purple stickers to prevent a problem in the future. But, like the thefts, the problem could have been prevented had someone simply asked the question "what would happen if this solution were used in the ventilator," and then followed up with "how do we prevent that?"

I recently handled a case where a cardiologist inserting a pacemaker confused the atrial and ventricular leads on a dual chamber pacemaker. The interrogating pacemaker technician failed to notice the transposition on the interrogation (although the tracings were mysteriously lost between the time of the patient's death and the time the lawsuit was filed). The decedent's physician assumed (again, that word!) that the congestive heart failure-induced cough and lack of energy was bronchitis and not cardiac failure. Also, the nurses who recognized the transposition on tracings and called it to the attention of the physician didn't push for immediate correction, resulting in the death of the gentleman before the cardiologist could find time to correct the mistake. Nearly everyone who should have done their job failed to do their job, in large part because they assumed that the person up the line would do it.

An ounce of prevention

Done properly, risk auditing saves lives. It requires a team approach and the ability to think like bestselling authors Dean Koontz or Stephen King. The key question is always: "what awful thing could happen if…?" It is a great team-building exercise for quality improvement teams, and it is a key risk-management tool. It requires multiple people (because none of us are as smart as all of us). It requires the ability to think creatively and imagine the worst. It may not win friends, but it will save lives.

Consider risk auditing as a function of quality improvement. It could prevent patient injury — and the resulting lawsuits. ■

RTs Are Her People

Amy Van Dyken wowed her audience at the Congress Closing Ceremony in Tampa

by Debbie Bunch

Photos by Lennie Sirmopoulos, Convention Photography, Tustin, CA

Respiratory therapists don't always get the recognition they deserve. That wasn't the case as Olympic Gold Medalist Amy Van Dyken shared her journey through severe asthma and a spinal cord injury at AARC Congress 2015.

If six-time Olympic Gold Medal Winner Amy Van Dyken has a repeating refrain running through her life, it is "who are you to tell me what I can and can't do?"

She's been saying that to people who doubted her abilities since she was a child; and she's nearly always proven her point by doing exactly what it was she was told she could not do, whether that be swimming on a competitive level despite severe asthma or, most recently, taking 50 steps on her own after experiencing a near fatal ATV accident in the summer of 2014 that severed her spinal cord and left her paralyzed from the waist down.

But one group of people who haven't heard that refrain are the respiratory therapists who have played such an instrumental role in helping her achieve her dreams, and she made that perfectly clear when she took the podium at the Closing Ceremony for AARC Congress 2015 in Tampa last November. "You guys are so awesome," she told her audience. "You have been my people since I was a little kid."

Her best friends

Asthma first came into Van Dyken's life when she was just a toddler. She was in the backseat of the family car, strapped into a front-facing car seat, when her mom looked back to check on her. It was an alarming moment. Her baby daughter was gasping for breath and turning blue. She rushed her to the doctor to find out what was wrong. "They called it bronchitis," said Van Dyken. "I had it for four months."

At that point, her parents took her to Barnes Jewish Hospital in St. Louis where the true diagnosis was revealed. It was asthma, it was wide ranging, and it was severe. Van Dyken has infection-induced asthma, exercise-induced asthma, and allergy-induced asthma. "I'm pretty much allergic to anything that ever lived or breathed or anything that will ever live or breathe," she quipped to her audience. That includes chlorine, which came up again later in the talk.

She was in and out of the hospital with acute exacerbations on a regular basis; and since she also had a younger brother diagnosed with neuroblastoma (who sadly passed away when she was five), her mom would often have both her children in the same facility on different floors. Without a parent always at hand, she says her RTs stepped up to fill the gap. "You are the ones who sat with me at night and held my hand," she said. "Respiratory therapists were my best friends."

She found her passion

Other kids weren't always so kind. She recalled one incident at school when a little boy (whom she said was, at that time, "the love of my life") came up to her and asked her why she was so weird and why she didn't come out and play with the other kids. She told him she didn't breathe well. Instead of showing sympathy, he simply turned on his heel and went back to his playmates. When she related the story to her mom, she took her to an allergist who suggested she try swimming to exercise her lungs.

She was six years old, and those early days in the pool didn't suggest an Olympic career. "I learned I was not coordinated and was afraid of heights," she told her audience. But something about it made her persevere. "I was decked out for swim practice, and I jumped in the water and found my passion."

It took her another six years to be able to swim the length of the pool; and when she did, her dad told her next year she would win the race. She did, and by the time she got to high school she was ready to try out for the swim team. She may have been the very last person picked, but that didn't deter her. Hard work and determination led to a spot on the relay team, and she recalled the moment when the other three girls on the team realized she was their fourth. They walked by her and one said in that typical 1980s voice of derision, "Oh my god, Amy Van Dyken is totally on our relay team."

Looking to the RT

That 1980s insult just spurred her on to work even harder; and not only did she qualify for the 1992 Olympic trials, she was recruited by both the University of Arizona and University of Colorado. She missed the 1992 team by just a fraction of a second, but kept going, swimming on the college level.

She did so well in the 1996 trials that she was given the opportunity to go to the Olympic Training Center in Colorado. The indoor facility, however, wasn't conducive to asthma control. "You opened the door and chlorine was right in your face," she recalled. "There was a four-inch layer of chlorine above the water." She began having asthma attacks on a daily basis. Eventually she came up out of the water one day and couldn't breathe at all. The paramedics were called and rushed her to the hospital, where RTs once again were there for her.

"They were about to give me something I couldn't take," she said, referring to the steroid drug called for to treat the severe attack. She refused to take it and the

physician said: OK, but if you don't, you will be dead. Van Dyken said she looked over at her RT and the therapist looked back at her and shook her head yes in agreement with the physician.

That was the confirmation she was looking for. She said to the assembled group of health care providers, "OK, drug me up."

Record-breaking performance

Van Dyken made it to the 1996 Olympics with an exemption to the no steroids rule (it was deemed "vital for life"). "There I was, Amy, the asthmatic weakling no one wanted to play Red Rover with," she said of the moment when she was getting ready for her first event. "I pulled up my suit and there was the American flag."

She went on to win four Gold Medals in Atlanta — the first American woman to accomplish that goal in a single Olympic Games. She didn't even know she had done it until she climbed out of the pool, saw her coach in tears, and was asked by a reporter how she felt just breaking an Olympic record. "I thought he was talking about the time; but he said, 'No, you're the first American woman to win four Olympic medals in a single Olympic Games,'" she recalled. Van Dyken said she was so shocked she just looked in the camera and said (in typical 1990s fashion), "Shut up!"

When it was time for the 2000 Games, Van Dyken again made it to the trials but suffered a shoulder injury her doctors called "career ending." Once again she simply uttered that repeating refrain ("who are you to tell me what I can and can't do?") and ended up winning another two Gold Medals in Sydney, Australia.

She remembers going to the mall shortly thereafter and running into one of the girls who doubted her abilities on the relay team in high school. She asked the woman what she was doing now, and the woman said she was a realtor. Van Dyken took extreme pleasure in noting she had just won Gold Medals for swimming in the Olympic Games.

Life-changing day

Over the next 14 years, Van Dyken took her inspiring message of Olympic Gold to groups and organizations around the country and also worked as a sports broadcaster on FOX Sports Radio, where she was the only female co-anchor at the time. Then in June of 2014 she and her husband, Denver Broncos punter Tom Rouen, went on vacation in Arizona. She had just gotten her first hole-in-one on the golf course and life was great.

On June 6 she went to CrossFit and then came home and her husband snapped a picture of her lying on the driveway with their dog Kuma. It was time for dinner and they decided to try a restaurant about a quarter mile away. Rouen asked her if they should take the truck. He could, she said, but she would take the ATV. She wanted to feel the wind in her hair.

After dinner she recalls getting up from the table and pushing in her chair. The next thing she remembers is waking up in the hospital the next day. Her husband filled her in on what happened. As he followed her home, he watched in horror as she careened off a six-foot embankment. He rushed to her side and could see she had broken her back. Flight for Life came and airlifted her to a hospital in Scottsdale. She was breathing on her

AARC President Frank Salvatore talked with Amy.

After her presentation, Amy posed for pictures with attendees and autographed Congress programs.

own, but doctors were worried about her head injury. Turns out, she had a concussion, four broken ribs, and four broken vertebrae. Two, (T11 and T12) were smashed. When the physician showed her the x-ray, she was alarmed. Her vertebrae were perpendicular to one another, and one was touching her aorta.

She would need surgery to fuse her spine. Her doctor looked at her and told her he would be working in nanometers and she should say goodbye to her husband. Her husband told her, "Babe, if this is ever too much for you, you can give up."

In true Amy Van Dyken form, she just looked at him and once again said the words she'd been saying to people her whole life. "I said, hon, who are you to tell me what I can do?"

Seven hours later she was fused and paralyzed and alive. "I said, can I have a wheelchair that's purple with skulls on it?" Van Dyken told the audience at the Congress. Then she wheeled her chair around to show she had gotten all she had asked for.

50 steps

Van Dyken almost died several times when she was in the ICU. While she continued to breathe on her own, RTs were always there when things got especially tough and she was always reassured to see them on hand.

In the year and a half since the accident, she has taken the resolve she's always applied to beating her asthma and put it to work beating her paralysis. While she knows she has a long way to go, early results are promising. Using an exoskeleton developed by the military and leg braces, she's been able to get back

up on her feet. She can move her hip flexors and has movement in her abdominal muscles as well. The official diagnosis now is that she's an incomplete paraplegic.

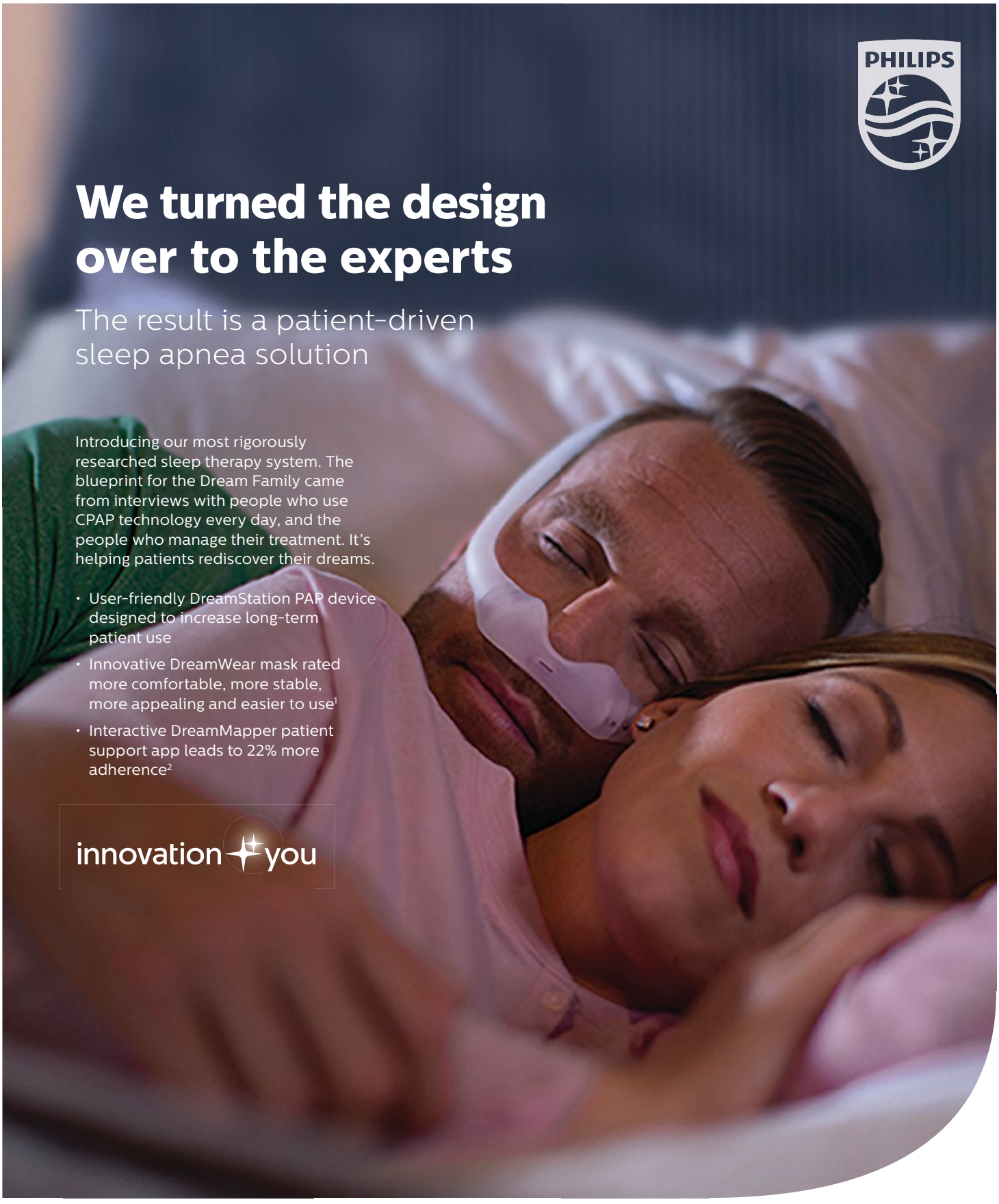
At the AARC's closing ceremony at Congress, she was proud to tell her audience that she had just taken 50 steps on her own a few days before. "There was more sweating and cussing than I had ever done in the games," she said. "But 50 steps was a big deal and meant more to me than anything I had ever done in the pool."

"Thank you"

Amy Van Dyken closed her presentation at the ceremony by thanking all the RTs in the audience for the amazing work they do every day on the job. "You guys have been an amazing part of my life… I don't get to meet all my RTs, so I want to say thank you to you and maybe it will trickle down to the people who saved my life." ■

Congress attendees gave Amy a standing ovation.

Bill Seitz of Monaghan Medical met with Amy. Monaghan sponsored her presentation.



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1 Than their prescribed mask; survey of U.S. patients
2 In a retrospective review conducted by Philips Respironics of approximately 15,000 patients using System One, those patients who used DreamMapper demonstrated 22% greater adherence to the therapy than patients who did not use DreamMapper. To see a list of compatible DreamMapper devices, go to www.sleepmapper.com/compatible.

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AARC Congress 2015: Capitalizing on the Moment

by Debbie Bunch

Respiratory care professionals from here in the United States and around the world gathered for AARC Congress 2015 in Tampa, FL, last November — and the time could not have been better for a meeting of the minds on the key issues facing respiratory care and the patients they serve.

With new and improved technologies aimed at treating lung disease either already here or on the horizon and a plethora of reform initiatives poised to change the health care landscape forever, the meeting "doubled down" on the must-have information clinicians, educators, and managers will need to move their organizations forward in 2016 and beyond.

"AARC Congress 2015 covered all the cutting-edge topics in the profession, and attendees went home with new ideas to put to work in their departments and other facilities," says AARC President Frank Salvatore, Jr., MBA, RRT, FAARC. "It truly was an opportunity to gather with the thought leaders in the profession to find out where we're headed, why that's the destination, and how we can best get there."

In this issue you will find a detailed account of the Congress and why it continues to be the premier educational event in the respiratory care profession. ■

Photos by Lennie Sirmopoulos, Convention Photography, Tustin, CA

In the Limelight

by Debbie Bunch

Attendees took time out from the lectures and presentations to honor standout performers in the profession.

Photos by Lennie Sirmopoulos, Convention Photography, Tustin, CA

Congratulations, 2015 Award Recipients!

The following top performers in the AARC, National Board for Respiratory Care (NBRC), and Commission on Accreditation for Respiratory Care (CoARC) received awards during the Congress Opening Ceremonies.

- Jimmy A. Young Medal: Bill Galvin, MSEd, RRT, FAARC
- NBRC/AMP William W. Burgin Jr. MD and Robert M. Lawrence MD Education Recognition Award: Karissa L. Kuneli
- William F. Miller MD Postgraduate Education Recognition Award: Kelly L. Colwell, MRC, RRT-NPS, CPFT
- NBRC/AMP Gareth B. Gish MS RRT Memorial Postgraduate Education Recognition Award: Kevin Collins, MS, RRT, RPFT
- Morton B. Duggan Jr. Memorial Education Recognition Award: Haley Cheshier
- Jimmy A. Young Memorial Education Recognition Award: Hannah R. Tkach
- Charles W. Serby COPD Research Fellowship: Richard D. Rice, MEd, RRT
- Monaghan/Trudell Fellowship for Aerosol Technique Development: Allison C. Anderson, MSc, RRT
- Philips Respironics Fellowship in Mechanical Ventilation: Dina Gomaa, BS, RRT
- Philips Respironics Fellowship in Non-Invasive Respiratory Care: Mark Siobal, BS, RRT-ACCS, FAARC
- CareFusion Fellowship for Neonatal and Pediatric Therapists: Craig Smallwood, BS, RRT
- Forrest M. Bird Lifetime Scientific Achievement Award: John B. Downs, MD
- Dr. Charles H. Hudson Award for Cardiopulmonary Public Health: William N. Rom, MD, MPH
- Thomas L. Petty MD Invacare Award for Excellence in Home Respiratory Care: Kent L. Christopher, MD, RRT, FAARC
- Mike West MBA RRT Patient Education Achievement Award: Trina M. Limberg, BS, RRT, FAARC
- Jeri Eiserman RRT Professional Education Research Fellowship: Robert Bayer, RRT
- NBRC/AMP H. Frederick Helmholz, Jr. MD Educational Research Grant: Monica L. Schibig, MA, RRT-NPS, CPFT
- Mallinckrodt Best Paper Award by Best First Author: Nicholas D. Werre, MSRT, RRT

The Jimmy A. Young Medal was awarded to Bill Galvin, MSEd, RRT, FAARC (right).

The Education Recognition Award recipients were Hannah Tkach, Karissa Kuneli, and Haley Cheshier.

The Forrest M. Bird Lifetime Scientific Achievement Award went to John B. Downs, MD.

The Thomas L. Petty MD Invacare Award went to Kent L. Christopher, MD, RRT, FAARC.

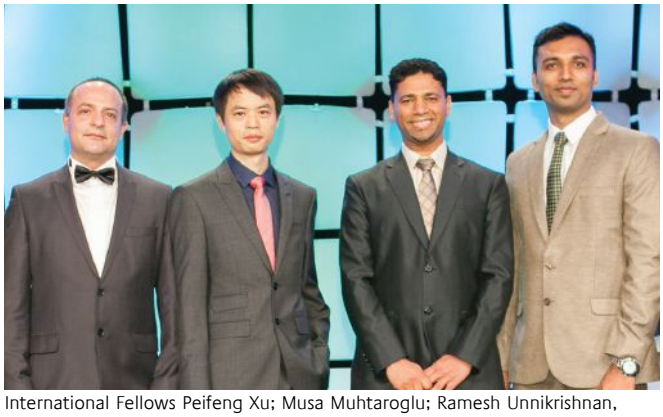
The Mike West MBA RRT Patient Education Achievement Award went to Trina M. Limberg, BS, RRT, FAARC.

- Drager Literary Award: Donald A. Johnston, PhD, RRT, RN
- Albert H. Andrews Jr. MD Memorial Award: Paul A. Selecky, MD, FCCP, FAARC
- Dr. Ralph L. Kendall Outstanding Site Visitor Award: Ian Gilmour, MD; Kelli Chronister, MS, RRT-NPS, CPFT
- Héctor León Garza MD Achievement Award for Excellence in International Respiratory Care: Jerome M. Sullivan, PhD, RRT, FAARC
- International Fellows: Peifeng Xu; Musa Muhtaroglu; Ramesh Unnikrishnan, MSc, RRT; Hussain Jassim Khatam, MHS, RRT, FAARC
- Specialty Practitioners of the Year: Adult Acute Care, Maria Madden, BS, RRT-ACCS; Continuing Care/Rehabilitation, Russel Sison-Tojino, RRT-NPS; Diagnostics, Matthew O'Brien, MS, RRT, RPFT; Education, Will Beachey, PhD, RRT, FAARC; Long-Term Care, Karen Hamilton, CRT; Management, Garry Kauffman, MPA, RRT, FAARC; Neonatal-Pediatrics, Shari Toomey, MBA, RRT-NPS; Surface & Air Transport, Joseph Hylton, BSRT, RRT-NPS, FCCM
- Zenith Awards: CareFusion, Philips Healthcare, Fisher & Paykel Healthcare, Monaghan Medical, Drager Medical, Aerogen
- Honorary Membership: Kris Kuykendall
- Life Membership: Fred Hill, MA, RRT-NPS
- AARC Fellows: Jeanette M. Asselin, MS, RRT-NPS, FAARC; Joseph G. Sorbello, MEd, RRT, FAARC; Kenneth Miller, MEd, RRT-NPS, FAARC; Thomas F. Paolillo, RRT-NPS, FAARC; Diana Merendino, DHSc, RRT-NPS, FAARC; Richard Wettstein, MSEd, RRT, FAARC; Jeffrey M. Haynes, RRT, RPFT, FAARC; John T. Gallagher, MPH, RRT-NPS, FAARC; Carolyn A. Williams, BS, RRT, FAARC; Connie Paladenech, RRT, FAARC; John R. Goodman, BS, RRT, FAARC; Sarah Varekojis, PhD, RRT, FAARC; Gary C. White, MEd, RRT, FAARC

These awards were bestowed during the AARC's Annual Business Meeting on Sunday, Nov. 8.

- Outstanding Affiliate Contributor: Teresa Lesser, RRT
- Jerry Bridgers Delegate of the Year: Chuck Menders, BA, RRT-ACCS, AE-C
- Summit Award: South Carolina Society for Respiratory Care

The Héctor León Garza MD Achievement Award went to Jerome M. Sullivan, PhD, RRT, FAARC.



International Fellows Peifeng Xu; Musa Muhtaroglu; Ramesh Unnikrishnan, MSc, RRT; Hussain Jassim Khatam, MHS, RRT, FAARC

Honorary Membership was awarded to Kris Kuykendall.

Fellows of the AARC (FAARC)

Life Membership was awarded to Fred Hill, MA, RRT-NPS.

Outstanding Affiliate Contributor Teresa Lesser, RRT

Jerry Bridgers Delegate of the Year: Chuck Menders, BA, RRT-ACCS, AE-C

Summit Award: South Carolina Society for Respiratory Care

These companies were awarded the AARC Zenith Award: Drager, Aerogen, Phillips Healthcare, Carefusion, Fischer & Paykel, and Monaghan.

Specialty Practitioners of the Year were Maria Madden, Russel Sison-Tojino, Matthew O'Brien, Will Beachey, Karen Hamilton, Garry Kauffman, Shari Toomey, and Joseph Hylton.

2016 AARC Officials Installed

The Association installed its 2016 officials during the AARC Annual Business Meeting that took place on the second day of the meeting. Brian Walsh, MBA, RRT-NPS, FAARC, was installed as president-elect; and other officers include Lynda Goodfellow, EdD, RRT, FAARC, vice president for internal affairs; Cynthia White, MSc, RRT-NPS, FAARC, vice president for external affairs; and Karen Schell, DHSc, RRT-NPS, RPFT, secretary-treasurer.

The 2016 Board of Directors includes: Cheryl Hoerr, MBA, RRT, FAARC (Management Section); Ellen Becker, PhD, RRT-NPS, FAARC (Education Section); Keith Lamb, BS, RRT-ACCS (Adult Acute Care Section); Natalie Napolitano, MPH, RRT-NPS, FAARC (Neonatal-Pediatrics Section); Kimberly Wiles, BS, RRT, CPFT (Home Care Section), and at-large directors, Bill Lamb, BS, RRT, FAARC; Timothy Op't Holt, EdD, RRT, FAARC, and Lisa Trujillo, DHSc, RRT.

Three Specialty Sections also held elections this year, and these individuals were elected: Zach Gantt, RRT (Home Care); Marilyn Barclay, BS, RRT, CPFT (Sleep), and Steve Sittig, RRT-NPS, C-NPT, FAARC (Neonatal-Pediatrics).

New House of Delegates officers include: speaker, Jacklyn Grimball, MA, RRT, AE-C; speaker-elect, Keith Siegel, BS, RRT, CPFT; secretary, Kerry McNiven, MS, RRT; and treasurer, Curt Merriman, BA, RRT, CPFT. John Wilgis, MBA, RRT, is now the past speaker. ■

The Jeri Eiserman RRT Professional Education Research Fellowship went to: Robert Bayer, RRT (right).

The Dr. Ralph L. Kendall Outstanding Site Visitor Award recipients were Kelli Chronister, MS, RRT-NPS, CPFT and Ian Gilmour, MD.

Hamilton Medical won "Best of Show" among the Exhibit Hall booths.

Welcome 2016 Corporate Partners

Our 2016 Corporate Partners were announced at the meeting. Supporting the AARC and the profession this year are: CareFusion, Masimo, Medtronic, Monaghan, Philips Respironics, Drager, Maquet, Teleflex, Boehringer Ingelheim Pharmaceuticals, Actavis, Mallinckrodt Pharmaceuticals, and Fisher & Paykel. All of these companies comprise best-in-class organizations interested in supporting the goals and work of the Association. The program provides respiratory care providers with information, insights, and innovative approaches to improve performance and advance the health of their patients. ■

Zenith Awards Recognize Top Companies

The AARC was pleased to bestow its annual Zenith Awards on the following companies: CareFusion, Philips Healthcare, Fisher & Paykel, Monaghan, Drager, and Aerogen. AARC members selected these companies based on the quality of their products, accessibility of their sales staff, responsiveness, service record, truth in advertising, and support of the respiratory care profession. ■

Drager Literary Award: Donald A. Johnston, PhD, RRT, RN (right).

Best of Show Second Place went to Teleflex.

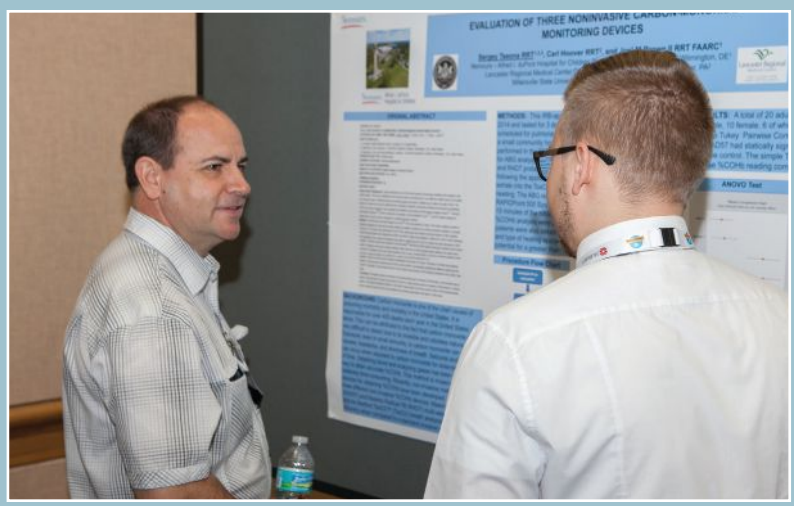
Best of Show Third Place went to Tri-anim.

2015 Congress Content Zeroes In on What Matters Most

by Debbie Bunch

Hot topics in all areas of the profession were covered during the daily sessions.

Photos by Lennie Sirmopoulos, Convention Photography, Tustin, CA


EVALUATION OF THREE NONINVASIVE
MONITORING DEVICES

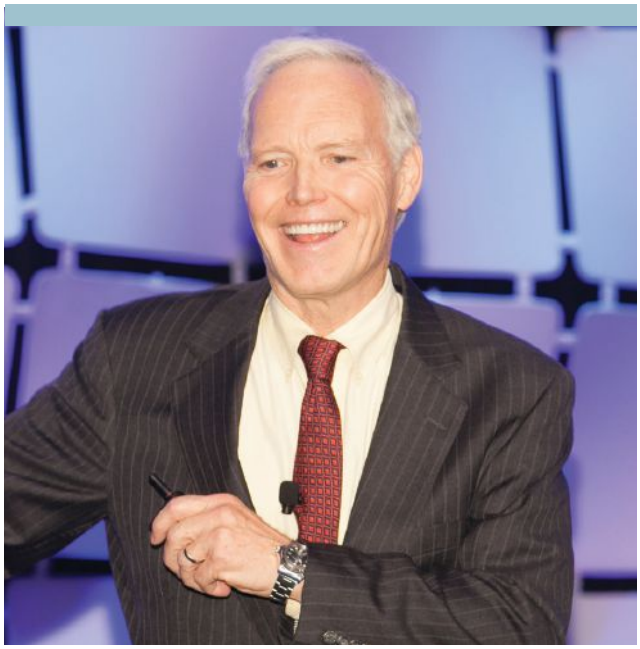
From Tobacco Company Heir to Anti-tobacco Activist

Over the past 30 years, Patrick Reynolds has worked tirelessly to help reduce smoking throughout the country, educating children on the dangers of tobacco and urging them never to begin smoking. As our Keynote Speaker at the 2015 Congress, he offered attendees his unique inside perspective on the tobacco industry, tobacco use, and the devastating effects it has had on this country and throughout the world.

When his grandfather founded R.J. Reynolds in 1875, "he didn't know how dangerous tobacco would be and didn't know it would kill hundreds of millions of people." One hundred million deaths were caused by smoking in the 20th century. If smoking continues on its current path this century, one billion lives will be lost to tobacco addiction. "Big tobacco spends $9.6 billion a year on tobacco lobbying," he emphasized. In fact, the tobacco industry has spent more on lobbying than any other business.

Today, it's not only tobacco that's the problem. From 2013 to 2014 alone, e-cigarette usage tripled and threatens to cause more illness among the population. Reynolds urged respiratory therapists to contact their congressmen to help defeat legislation in Congress that currently contains language to help the e-cigarette industry avoid regulation.

Reynolds encouraged RTs to keep educating everyone, especially children, on the dangers of smoking and the resources available to those trying to break the addiction.



Keynote Speaker Patrick Reynolds

He noted that counseling, when combined with other methods to counter nicotine's effects, have been proven to work well in quit attempts.

"We need to use tobacco taxes to prevent smoking and to help people quit. We need to have campaign reform (in lobbying). We need to make a surgical strike on smoking! I have a vision one day we will have a tobacco-free society… (it) is coming because of you and the work you do. As respiratory therapists, you can save lives when you intervene."

The AARC Keynote Address was sponsored by Boehringer Ingelheim. ■

Spotlight Symposia Provide Key Information

With more than 250 lectures to choose from, nobody could attend all the sessions in Tampa. AARC Program Committee members made it a little easier by highlighting those they deemed too good to miss.

COPD Management: Taking Care of the Entire Patient: Brian Carlin, MD, FAARC, Deb McGowan, RN, BSN, ACM, and Claudia Vukovich, RRT, AE-C, TTS, covered diagnosis, drugs, and devices; the need for collaboration with other disciplines; and the emerging roles for respiratory therapists in chronic pulmonary disease management.

Employee Engagement: The Key to Your Success as a Leader: Diane Oldfather, MHEd, RRT, Garry Kauffman, MPA, RRT, FAARC, Cheryl Hoerr, MBA, RRT, FAARC, and Karen Schell, DHSc, RRT-NPS, RRT-SDS, took a closer look at fostering engagement in students, staff, and managers themselves.

How Do I? Evidenced-based Practice: Brian Walsh, MBA, RRT-NPS, FAARC, Ira Cheifetz, MD, FCCM, FAARC, Heidi Dalton, MD, and Alex Rotta, MD, FAACP, FCCM, examined the latest thinking on NIV versus intubation, setting the ventilator, deciding when to move beyond conventional ventilation and how to best sedate the mechanically ventilated patient.

Dyspnea and the Evaluation for Upper Airway Disorders: Michael Morris, MD, MACP, FCCP, Steven Boas, MD, and Kent Christopher, MD, RRT, FAARC, provided an interesting overview of this topic in sessions addressing concerns in adults and children and the role played by vocal cord dysfunction.

Reducing Risk and Improving Patient Safety During Transport: Robert Aranson, MD, FCCP, Jennifer Watts, RRT-NPS, C-NPT, and Alex Brendel, MBA, RRT-NPS, covered the medical and legal pitfalls of interfacility transports, patient safety on transport, and the special needs of infants and children in this setting.

Pulmonary Rehab: Charley Starnes, RRT, Trina Limberg, RRT, FAARC, FAACVPR, and Deborah Bennett, RRT, shared

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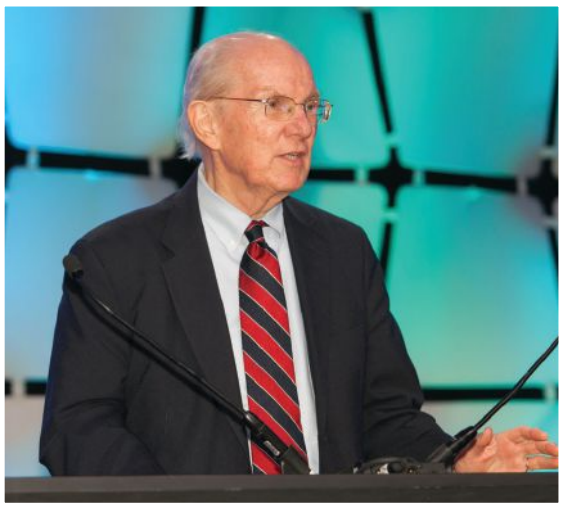


their expertise on everything from the basics of pulmonary rehabilitation (PR) to expanding the services of PR staff to other areas of the hospital, to the role of PR staff in helping patients face the end of life.

The RT and Physician Partnership in Patient-centric Care Across the Continuum: Acute Care to Home: Dr. Christopher, Russell Acevedo, MD, FAARC, Eric Yaeger, MD, and Sam Collins, CRT, explained ways therapists and physicians can work more closely together to benefit patients in the hospital, long-term care and post-acute transitional facilities, and home.

Noninvasive Support for Acute Respiratory Failure: Julie Jackson, BAS, RRT-ACCS, Brady Scott, MS, RRT-ACCS, and PJ Papadakos, MD, FCCM, FAARC, looked at humidified high-flow nasal cannulas, noninvasive positive pressure ventilation, and the role of noninvasive mechanical ventilation in patients with high-risk pulmonary infections.

Connecting the Dots from Inpatient to Outpatient Chronic Disease Management: Starnes joined Zack Gantt, RRT, in a session that covered preparing RT staff to teach, creating an effective discharge program from acute care to long-term care to home, and clinical and financial outcomes of an RT-driven COPD management program.

Sleep Waves: What Is the Future? Chad Ruoff, MD, Brad Eli, MD, Anthony Daclan, MBA, RRT, and Peter Gay, MD, MS, FCCP, explored everything from the new certification in clinical sleep health to dental devices and other alternatives to CPAP, the bi-directional relationship between sleep and obesity, and other kinds of ventilation for complex sleep apnea.

COPD Readmissions: Robin Kidder, BA, RRT, AE-C, and Arianna Villa, RRT, shared their perspectives on the multidisciplinary approach to tracking readmissions and the range of skills needed to get the job done.

Patient Education: Are You Ready for It? Robin Kidder, BA, RRT, AE-C, and Deborah Bennett, RRT, covered new inhalers and what RTs need to know about them, along with the COPD Foundation's Pulmonary Education Program and how it can figure into a hospital's program to educate COPD patients about their condition.

Learning Starts Early

Three pre-courses gave Congress attendees a chance to learn even more during their time in Tampa:

With the barriers between health care settings quickly disappearing, **"Management of Chronic Hypoxemia Across the Continuum of Care"** offered a great overview of oxygen delivery systems and how they can be provided in a more patient-centric, collaborative care model that will enhance the management and monitoring of patients who require home oxygen.

Mechanical ventilation is a core competency for RTs, but adult therapists and pediatric therapists often have different perspectives on the modality. **"Adult and Pediatric Mechanical Ventilation"** brought these two groups of clinicians together during a morning session to learn from one another about what works and what doesn't before dividing up into separate tracks in the afternoon.

Adding value to the RT department via the adoption of non-traditional skills is vital in this era of health care reform. Attendees at **"Vascular Access: Developing an Arterial Catheter Insertion Program"** heard from the experts about what it takes to bring this service under the respiratory care umbrella and train respiratory therapists in these skills.

All of the Congress pre-courses were approved for CRCE. ■

Donald F. Egan Scientific Memorial Lecture

Monitors: Improving Safety or Increasing Risk?

It's great to have so many monitors out there today to tell us when our patients may be in distress. But the alarm fatigue created by this plethora of devices has led some to wonder if they may be doing more harm than good.

Charles G. Durbin, Jr., MD, FAARC, reviewed the good, the bad, and the ugly in the monitoring arena in the Donald F. Egan Scientific Memorial Lecture.

He began by using his own long history in the field of anesthesia to illustrate how monitoring has developed over the years, noting when he first got into the field anesthesiologists were using the "finger on the pulse" method to ensure their patients in the operating room were still alive.

The problem with that method was, the finger was placed on the pulse only about 5% of the time.

As a young physician, he helped to promote the use of continuous monitoring with a precordial stethoscope in the operating room after taking care of a patient whose heart stopped during surgery. He was alerted to that fact by the stethoscope and told the surgeon. The patient was promptly revived and survived, and his hospital adopted the use of the monitoring device.

Much of his talk, however, focused on the use of pulse oximetry as a continuous monitoring device for surgical and other patients and the research that has been conducted in the area.

According to the professor of anesthesiology and surgery at the University of Virginia Health System in Charlottesville, many papers have compared the accuracy of different pulse oximeters and then classified them on this basis. But few have actually addressed the positive or negative impact a pulse oximeter may have on patient care, and the majority of those who did only identified near misses in diagnosing and preventing hypoxic injuries and did not include a control group cared for without the use of a pulse oximeter for comparison purposes.

The one controlled quality evaluation of pulse oximetry that did compare outcomes on anesthesia and surgery patients cared for with and without the use of the device found no benefit in clinical outcomes. In fact, patients in the monitored group were actually more likely to be diagnosed with hypoxemia, received more supplemental oxygen, spent more time in the recovery room, and suffered more pulmonary dysfunction, possibly as a result of the greater use of oxygen therapy.

"They actually found good reasons not to use pulse oximeters," said Dr. Durbin. But that wasn't enough for physicians surveyed about the use of the device to consider giving it up, with about 90% reporting one or more reasons to continue using it.

Dr. Durbin emphasized that it is not the information gleaned from the monitor that makes a difference, but how the clinician acts on that information. He believes this paradigm should be used to test the value of the care plan that is initiated and supported by the presence of any monitor and went on to cite a study he conducted after a read-through motion pulse oximeter was introduced to the market.

In his study, patients were monitored with both the new pulse oximeter and a standard pulse oximeter applied to fingers on each of their hands. Caregivers were assigned to be shown the results from only one of the devices. Results showed clinicians managing patients with the newer pulse oximeter weaned patients faster to an FIO_2 of 0.40, obtained fewer arterial blood gas measurements, and made the same number of ventilator changes during the weaning process. "When caregivers are given a better monitor, they will deliver better care," said Dr. Durbin.

A 2014 study out of Canada, however, shows how clinicians may over-depend on these devices. In this study, otherwise healthy infants with mild to moderate bronchiolitis and true oxygen saturations of 88% or higher were assigned to either a pulse oximeter that gave the true results or one that gave readings that were 3% higher. The researchers found infants with the altered readings were less likely to be hospitalized within 72 hours or to receive active hospital care for more than six hours than those with unaltered oximetry readings. "Everything favored the inaccurate monitor," said Dr. Durbin. "They were changing the monitor into a diagnostic tool."

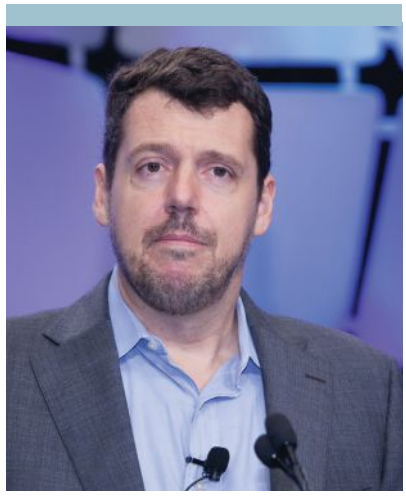
Today the Patient Safety Foundation is advocating the use of continuous pulse oximetry on many more patients; and while the physician applauds efforts to improve patient safety, he strongly believes monitoring alone won't solve the problem. "You can't not see the human part of this," he emphasized. "A continuous monitor and a person watching is my take-home message."

To drive home his point, Dr. Durbin offered a quote attributed to Dr. Donald F. Egan that said, "The best monitor for quality and safe patient care are the senses and observations of a knowledgeable and alert health care provider."

"Monitoring at a distance only gets the process started," said the physician. "You need a knowledgeable health care provider — and that's all of you out there." ■

Phil Kittredge Memorial Lecture

E-Cigarettes: The Science Behind the Smoke and Mirrors



Respiratory therapists and other clinicians are getting more and more questions from patients who smoke about the advisability of using the e-cigarette as a stop-smoking aid. Many therapists would say "no way" — but it's more complicated than that, said Nathan Cobb, MD, during the Phil Kittredge Memorial Lecture at AARC Congress 2015.

Dr. Cobb said he first became involved in the e-cigarette debate when an intern walked into his office with one of the devices and asked him what he knew about it. Turns out the answer was "not much." So they took the device apart and sent it to a lab to be tested. His interest in the area grew, and he began looking at a variety of factors involved with these products.

He shared much of what he has learned with his audience, noting e-cigarettes started out looking like combustible cigarettes; but many of the newer devices coming on the market today barely show a resemblance. Safety concerns range from the use of lithium ion batteries to drive the products to the addition of propylene glycol to produce the vapor. Fears that the batteries could explode have led to new rules banning the devices from being packed in baggage on airplanes; and while propylene glycol is generally accepted as safe, it's use in a vaporized form has not been well studied.

Supply chain issues come into play as well, with some small manufacturers outside of the United States substituting the much more dangerous dynalene glycol for the less dangerous propylene glycol in these devices. Dynalene glycol, noted the physician, is highly toxic and can lead to renal failure.

Despite the negatives, however, the assistant professor at Georgetown University Medical School and physician at Medstar Georgetown Hospital suggested to his audience that e-cigarettes may still have a place in the tobacco-cessation world. Number one, they are not really cigarettes because they don't contain tobacco. Number two, current nicotine replacement therapies (NRTs), although safe and effective, have fallen short of expecations. "That is what gets people excited," he said. "If they really are like nicotine replacement, they could change the end game of tobacco." Dr. Cobb said he is not aware of any failed trials on NRT but that getting patients to stick with these products has proven to be an uphill battle — and thus they have not really resulted in widespread quitting.

He went on to cite several studies that have been conducted in e-cigarettes, including one trial that compared a placebo e-cigarette to the nicotine patch. The patch didn't outperform the e-cigarette, suggesting there may be something about these devices that make them appealing to the user.

Another study found people who use e-cigarettes puff harder on them than they do on combustible cigarettes, which indicates people don't use these devices the same way they use traditional cigarettes.

So, maybe the answer is to harness the appeal of e-cigarettes to help people quit and maybe even drive combustible cigarettes off the market for good, suggested the physician. Science has been conducted in that direction too, including a recent study out of Duke that found bonding the nicotine to pyruvate boosted the nicotine dose delivered by the e-cigarette.

The troubling thing about that study, however, is the fact that the intellectual property was promptly sold to Phillip Morris. And that leads to the question, if and/or when the U.S. Food and Drug Administration decides to regulate e-cigarettes, thus making them safer for the consumer, who will make them?

According to Dr. Cobb, the pharmaceutical companies have shown no interest; and that leaves the tobacco companies. Tobacco companies are already investing in the e-cigarette market in droves, and he believes that's a real concern because clearly their mission will not be to help people quit all forms of nicotine for good.

What does he tell his patients about e-cigarettes, and what should respiratory therapists tell theirs?

First and foremost, Dr. Cobb advocates for the use of traditional NRT products to people who ask him for advice on quitting. But if a smoker says he is having some success getting off combustable cigarettes with the use of an e-cigarette, his advice is "don't rock the boat." He does, however, recommend that they purchase the product only from one of the larger independent manufacturers rather than from a tobacco company or one of the smaller, random sellers out there today.

The goal, he said, is to help people get off combustible tobacco. "Anything that helps you do that is worth doing." ■

Thomas L. Petty Memorial Lecture

Surviving the ICU: Taking a Step Back into the Future

Back in the day, hospitals got their patients up and about as soon as possible. But with the advent of sophisticated critical care modalities capable of saving even severely ill or injured patients, that's no longer the norm in the ICU.

Dale Needham, PhD, MD, believes it's time to go back to the future — even if that means getting a mechanically ventilated patient in the ICU on his feet and moving with the help of a team of health care professionals, including RTs. The professor of pulmonary and critical care medicine and medical director of the critical care physical medicine and rehabilitation program at Johns Hopkins explained how ICU-acquired weakness (ICUAW) can devastate a patient both in the short and long term.

According to the physician, the problem lies in the usual trajectory followed in modern ICUs. Clinicians focus on the patient's immediate problems and put the brain, the nerves, and the muscles on the backburner. Patients are left under heavy sedation, and it is not until the patient's primary problems resolve that rehabilitation comes into the picture. By then the patient is so weak he is typically discharged to a rehab center.

Studies suggest that's too late. Nearly half of patients in one trial had neuromuscular abnormalities a year later and another found only half of those of working age had been able to return to work. One trial that used a variety of methods to measure muscle loss found significant loss occurs in mechanical ventilator patients within just days of being intubated, and these losses occurred independent of nutrition. "So just feeding them better is not going to work," said Dr. Needham.

What does work, he continued, is to implement an early mobility program similar to the one he and his colleagues have put into place at Johns Hopkins. In a study they conducted to gauge long-term outcomes among their patients, they found only two factors were associated with long-term muscle weakness — age and bedrest. For each additional day of bedrest, there was an 8%–11% decrease in muscle strength that persisted over two years.

You can't do anything about age, said Dr. Needham, but bedrest is a modifiable risk factor. "We need an ICU where patients are animated and motivated," emphasized the physician. He and his colleagues embarked on a quality improvement project aimed at implementing early mobilization in ICU patients, with results showing the concept was both safe and effective. The program involves a multidisciplinary team including physical therapists, occupational therapists, and RTs who work with physicians, nurses, and others to get the patient out of bed and moving.

Another study that looked at their outcomes over 2.5 years found use of narcotics was cut by two-thirds without an increase in patient pain, the number of ICU days without delirium doubled, and ICU mortality dropped by 10%. ICU length of stay declined by 30% and hospital length of stay by 18%.

Dr. Needham illustrated the human side of these gains by sharing the case of one patient who had been deemed ventilator dependent for life by another physician. He and his team got the man up and walking; and within two weeks he was able to walk 240 feet while still on the ventilator. A photo showing the man finally getting to go outside brought applause from the audience, as did the news that he was eventually weaned from the ventilator.

Dr. Needham said the patient came back to visit the ICU staff trailing his oxygen — and then proceeded to tell them that he felt so good he didn't even have it turned on.

A short film of another patient talking about his experiences with the early mobility program at Johns Hopkins left the audience inspired as well. Said this gentleman, "I thought it was wonderful … anything to get me up on my feet. This is what I wanted to do." ■

Open Forum Delivers on Research

Research conducted by and for respiratory therapists took center stage during the Open Forum. Over the four days of the meeting, attendees learned the latest developments in the profession in 12 Poster and Discussion sessions divided into topic areas, along with two Posters Only sessions.

The highlight of the Open Forum came with the presentation of the Editor's Choice abstracts. Each of these top 11 abstracts was presented during an eight-minute slide show followed by a five-minute period of audience questions and discussion. Sessions and presenters included:

High Priority Ventilator Alarms That Received No Intervention: An Analysis of Ventilator Alarm Informativeness in Intensive Care Units, Jefferson H. Mixell, BS, RRT, Newark, DE

Does the Selection of Endotracheal Securing Devices Impact the Number of Unplanned Extubations in a Neonatal Population? Lindsey Borock, AAS, Ann Arbor, MI

Screening of Exercised Induced Bronchoconstriction in College Student-Athletes, Dave Burnett, PhD, RRT, AE-C, Kansas City, KS

Impact of an Intervention to Reduce Therapy Delays from Emergency Department to Medical Surgical Units, Jennifer Cockerham, MBA, Little Rock, AR

Assessing the Prevalence of Sleep Apnea Among Collegiate Football Players, Tamara Douglass-Burton, MS, RRT, Towson, MD

Impact of Electronic Medical Record Screening Tool and Therapist-driven Protocol on Length of Stay and Hospital Re-admission for COPD, Karen D. LaRoché, RRT, Seattle, WA

Accidental Extubation in the NICU, Kevin Crezee, RRT-NPS, Salt Lake City, UT

Respiratory Procedures Done Prior to Onset of Ventilator-associated Events, Carl F. Haas, MLS, RRT-ACCS, FAARC, Ann Arbor, MI

Utilization of an Interface and Skin Assessment Tool by the Respiratory Care Practitioner To Reduce and Prevent Hospital-acquired Pressure Ulcers Associated with Non-Invasive Ventilation, Linda McKnight, RRT, Little Rock, AR

Characterization of Ribavirin with Small Particle Aerosol Generator and Micropump Aerosol Technologies, Brian K. Walsh, MBA, RRT-NPS, FAARC, Boston, MA

Evaluation of Positive Pressure Delivered from a Non-prescription Nasal Patch (Theravent™), Nancy Johnson, RRT-NPS, Cleveland, OH

The Open Forum was supported by an unrestricted educational grant from Monaghan.

Reaching Across Borders

Speakers, exhibitors, and attendees from abroad gathered with their U.S. colleagues all week long in Tampa, and the result was an unprecedented sharing of information across borders that can only bode well for the future of respiratory care and the patients it serves.

The 2015 Open Forum served as a great example of the broad horizons now enjoyed by the profession. These international colleagues presented their work:

- Ivan Lee, BSRT, Singapore
- Hao-Yan, Wang, Beijing, China
- Andrew West, MAPPSC, RRT, FCSRT, Winnipeg MB, Canada
- Eun Young Kim, Seoul, Korea
- Chin-Jung Liu, MSc, Taichung, Taiwan
- Muhammad Abdullah, CPFT, Lahore, Pakistan
- Takamitsu Kubo, Sunto-Gun Nagaizumi-Cho, Japan
- Nishigami Masami, Kishiwada, Japan
- Leonardo De Souza, PhD, São Gonçalo, Brazil
- Shu Wah Ng, Hong Kong
- Pui Fan Chan, MSN, Hong Kong
- Qi Guo, MD, PhD, Shenzhen Guangdong, China
- Riccardo Guarise, Milan, Italy
- Udupi Karnataka, India
- Hana Alsomali, Khoba, Saudi Arabia
- Ya Wang, Hsinchu, Taiwan
- Adil Alotaibi, Nottingham, United Kingdom
- Fatimah Al Alshaikh, PhD, Southampton Hants, United Kingdom
- Adil Alotaibi, Riyadh, Saudi Arabia
- Yi-Hao Peng, Taichung, Taiwan
- Sunitha Palanidurai, BSRT, RRT-ACCS, Singapore
- Chia-Chen Chu, MSc, Taichung, Taiwan
- Hsiumei Lee, Kaohsiung, Taiwan
- Man Chi Lu, Kaohsiung, Taiwan
- Malte Hanelt, Tuebingen, Germany
- Masahiko Kimura, Sagamihara-Si, Japan
- Abdulaziz Alshammary, Dhahran, Saudi Arabia
- Jui Liu, Kaohsiung City, Taiwan
- Lien Shi Sheng, Kaohsiung, Taiwan
- Edward Banguera, Cali Valle, Colombia
- Angela Arevalo CRT, Cali Valle Colombia
- Diana Serrato, MSc, RRT, Cali Valle, Colombia
- Jiahui Ma, Changchun, China
- Stefan Ponto, ING, MBA, Würzburg, Germany
- Taha Ismaeil, Beeston Nottingham, United Kingdom
- Yusuke Chikata, PhD, Tokushima, Japan

Our international fellows added another component to the mix, as they sat in on sessions to learn the latest from clinicians here in this country and shared their own practices with U.S. colleagues in informal networking sessions. The AARC was pleased to welcome them to the meeting — Peifeng Xu, China; Musa Muhtaroglu, Cyprus; Ramesh Unnikrishnan, MSc, RRT, India; and Hussain Jassim Khatam, MHS, RRT, FAARC, Bahrain.

Recognition also went to the sponsors of the International Fellowship Program: AARC, AARC House of Delegates, Draeger Medical, Inc., Medtronic, Philips Respironics, and Teleflex. ■

2015 International Fellows

Attendees Rush In!

The AARC Exhibit Hall opened up right after the Opening Ceremonies, and attendees lost no time getting into the hall to see the latest and greatest in respiratory care. With all the vendors in the industry on hand, it proved to be the perfect place to see the technology that will define the profession in 2016 and beyond.

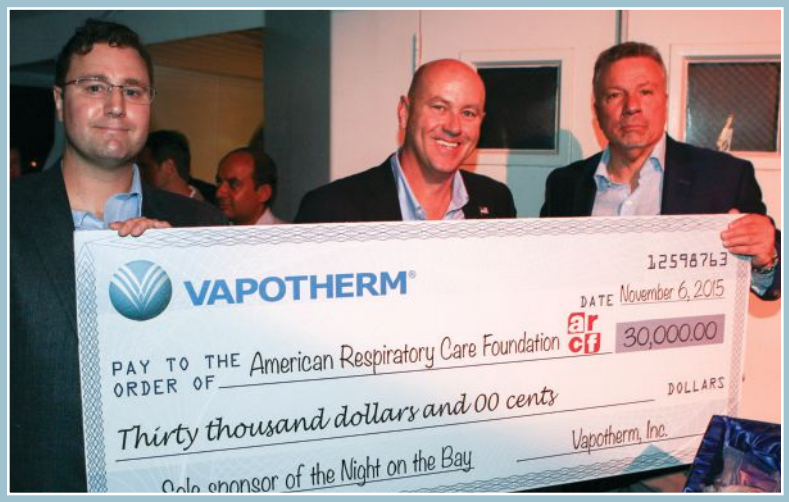
It was a "buying show" as well, which meant some attendees were able to cover some or all of the cost of their trip to Tampa with the savings they realized by taking advantage of meeting discounts and making purchases right on the Exhibit Hall floor. ■

Beyond Education—RTs Enjoyed a Lively Congress Full of Special Events

by Debbie Bunch

Respiratory therapists and their colleagues in pulmonary medicine came to the AARC Congress for the continuing education they knew they would find there. But the meeting was about way more than just earning CRCEs.

Photos by Lennie Sirmopoulos, Convention Photography, Tustin, CA



CONGRESS 2015

Cruising for a Cause

The Yacht Starship pulled away from the Sail Pavilion on the south side of the Tampa convention center on the Friday evening before the Congress with a capacity crowd of AARC members and other dignitaries who all came on board to support the American Respiratory Care Foundation (ARCF) and its quest to continue funding respiratory care research. The sold-out dinner cruise featured a fabulous multi-course meal, along with a short program highlighting the ARCF's past, present, and future. The event paid special recognition to generous Foundation donors.

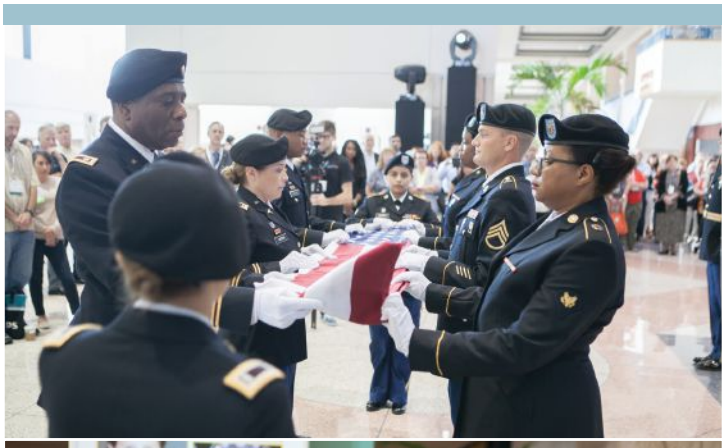
The highlight of the evening came with the drawing for two great travel prizes. Timothy Myers presented the grand prize to Karen McDonald of Maine: a seven-night Caribbean Luxury Cruise. Kathy Sullivan of Ohio won a three-day Getaway to Las Vegas. The Night on the Bay was sponsored in part by an unrestricted grant from Vapotherm, Inc. ■

Attendees Honor the Troops at Veterans Day Salute

With Veterans Day occurring so close to our Congress, attendees gathered for a flag-folding ceremony honoring those among us who are serving in our armed forces today and those who have so willingly given of their service in the past.

Respiratory therapists in uniform performed a special roll call for Thomas Wallsmith, the only respiratory therapist member of the military known to have been killed in the line of duty, and Dr. Forrest Bird, who served in World War II and was the AARC's oldest member until his death earlier this year.

AARC offers special thanks to these AARC members and veterans of service for taking part in the ceremony: Steven Sittig, RRT-NPS, FAARC; James Wood, RRT; Douglas Masini, RRT-NPS, FCCP, FAARC; John Hiser, MEd, RRT, FAARC; Chelby Mathison, RRT-NPS, CPFT; Harry Roman, MA, RRT, 1SG Retired; MAJ Wadie Williams, Jr., MS, RRT; LT Joseph Buhain, EdD, RRT, FAARC; SGT Myra Roman, RRT; SSG Crispin St. John, RRT; SGT Michael Romero, CRT; SPC Monica Campbell, CRT; SPC Aaron Meehan, CRT; SPC Billy Pierce, RRT; SGT Edward Wadey, CRT; SPC Sherita Lee, CRT; SPC William Mason, CRT; 2LT Kayla Bunn, RN; 1LT Minerva Arzon, RN; 1LT Daisy Mailhot, RN. Thanks also go to Jim Doepke for serving as the bugler for this event. ■



North Carolina won the National Sputum Bowl!

Video Visuals Add to Sputum Bowl Excitement

As they have for the last few years, event organizers worked hard to ramp up the excitement for Sputum Bowl 2015 through popular features like "ask the expert," "risk/reward," and "ask the posse." The event streamed on Twitter as well, giving everyone a chance to keep up with the competition even if they couldn't be in the room when the questions were asked.

But it was a brand new feature that really got the adrenaline pumping; video visuals were added to deliver questions up on the big screens. "With everyone so accustomed to learning visually these days, we thought adding videos to the mix would be a great way to drive home key questions for both the teams and the audience members," said Sputum Bowl Committee Chair Sherry Whiteman, BHS, RRT.

On Finals night, the winning teams from the preliminary competition battled it out for the top prizes.

National Sputum Bowl
First place: North Carolina
Second place: Missouri
Third and Fourth place: Ohio Renegade and Minnesota

Student Sputum Bowl
First place: Nevada
Second place: Florida
Third and Fourth place: Iowa and Minnesota

The 2015 Sputum Bowl was supported by an unrestricted educational grant from Medtronic. ■

Nevada won the Student Sputum Bowl!

Information Meets Fun Meets Twitter Feed Meets Prizes

The AARC Information Center in the heart of the Exhibit Hall proved to be a very busy place during AARC Congress 2015, as attendees came by to take part in some iPad quizzes, snap some cool "selfies," and network with Executive Office staff who were there to answer any questions.

The biggest highlight of the booth, however, had to be the giant screen where a Twitter feed scrolled by showing the tweets of everyone hash-tagging their posts with #aarc15.

On Nov. 9, several attendees went home with some great prizes, too, as the Exhibit Hall drawing for prizes like AARC Congress 2016 free airfare took place. ■

- Attendee Daniel Ayers was the grand prize winner: a free airline ticket to AARC Congress 2016 in San Antonio, TX!
- Shirley Long won complimentary registration to AARC Congress 2016.
- Valerie Chang won roundtrip ground transportation from the San Antonio International Airport to her convention hotel for Congress 2016.
- Merlyn Mathews won a one-night hotel stay for AARC Congress 2016.
- Amanda Roby won a free one-year AARC digital membership.
- Patricia Hurley won a $100 Visa pre-paid gift card.


Daniel Ayers

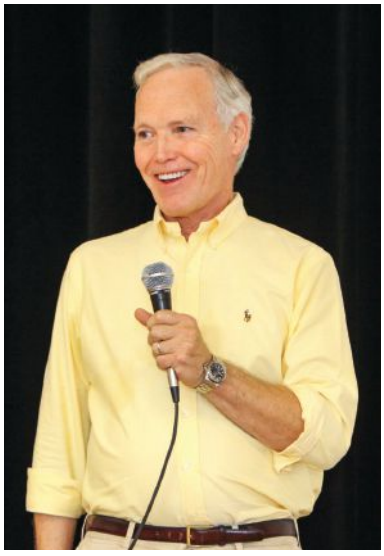

Shirley Long


Valerie Chang


Merlyn Mathews


Amanda Roby


Patricia Hurley



Keynote Speaker Patrick Reynolds Educates Kids at Nearby School

Patrick Reynolds came to Tampa to deliver the AARC Keynote Address, but he also took time to go to the Sam Rampello Downtown Partnership K-8 Magnet School in Tampa with AARC leaders to talk with a group of local schoolchildren about the dangers of smoking. It's something the grandson of RJ Reynolds, an anti-tobacco activist, does whenever he goes to speak; and he believes it's a vital part of his mission to ensure more kids never take that first puff — or, if they already have, that they quit before the habit is so ingrained in their behavior that they can't let it go.

With the rise of e-cigarettes and "vaping" these days, he is especially interested in making sure kids have the straight story about this latest threat as well, and he made that clear during his presentation at the school. "We have no idea how safe vaping really is, and it will be decades before we get long-term reliable data. It may be safer than smoking cigarettes, but that doesn't mean it's safe. What I tell people in my talks is, vaping may be like jumping off the fifth story instead of the tenth story." ■

Inspiring Closing Ceremony Featured Amy Van Dyken

Olympic Gold Medalist Amy Van Dyken amazed attendees of the Congress Closing Ceremony with her stories of overcoming childhood asthma, her appreciation of respiratory therapists, and her recovery from injuries incurred during a near-fatal ATV accident that severed her spinal cord in the summer of 2014. After the ceremony, she talked with hundreds of RTs, posed for pictures with them, and even autographed their Congress programs, graciously giving of her time until every person in the long line of admirers had met with her. You can read more about her presentation detailing her journey in this issue's cover story. ■

Putting Patients in the Driver's Seat

The days when patients stood back and let their health care providers make all the decisions about the treatments they received are long gone, and many believe it's about time. After all, who better than the patients themselves to be involved in the health care decisions that will affect their future — particularly when it comes to chronic respiratory conditions requiring lifestyle changes to maximize quality of life.

That was the premise behind the AARC Respiratory Patient Advocacy Summit that took place the day before the Congress. The summit brought patients, caregivers, respiratory therapists, and others together for a unique view on the challenges and needs of patients. The Summit also addressed how patients can gain better access to clinical resources and the role of patient advocacy groups in making that happen.

Many thanks to the Alpha One/COPD Foundation, COPD Coalition, and Allergy & Asthma Network for facilitating this important program. ■

See You in San Antonio!

The AARC will head to San Antonio, TX, for AARC Congress 2016, and the city promises to welcome us with open arms. We'll be headquartered right on the world-famous River Walk, with all of its spectacular restaurants, great shops, and fun spots to enjoy a little nightlife. Of course, the historic Alamo is just a few steps away, too.

So pencil in the dates on your calendar now — Saturday through Tuesday, Oct. 15–18. Then plan to join us for the biggest and most influential respiratory care meeting in the world! ■

See You Next Year!


Medtronic

— 2016 —

Since 1947, the AARC has been leading the effort to advance the science and practices of the respiratory care profession while promoting the highest quality of care for our patients. Collaborating with the respiratory communities at-large, we have successfully advocated at the federal, state and local level for patients, their families, the community, the profession and the respiratory therapist.

The AARC'S CORPORATE PARTNERS

The collaborative efforts between the respiratory care profession and manufacturers in pursuing unique and innovative ways to improve both the quality and outcomes of our patients makes us natural partners in today's ever changing healthcare continuum.

As health care finances become more strained and patient care becomes increasingly more complex, the mutual challenges become greater for the profession and its industry partners. The inherent synergies of the corporate partner concept are to provide an effective and efficient way to address those needs utilizing our combined skills and resources.

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RC Currents

AARC Student Spotlight

Seattle RT Student Juliet Quarcoo Attends AARC Congress 2015

Few respiratory therapy students have the opportunity to attend an AARC annual meeting while going to school, but member Juliet Quarcoo, a student in a bachelor of applied science program at Seattle Central College in Washington State, made it a priority. She traveled across the country last fall to attend AARC Congress 2015 in Tampa, FL.

Although she has lived in Seattle 20 years, she is originally from Argentina and lived in the West African country of Ghana for several years before coming to the United States. When asked what brought her to the AARC Congress, she answered, "Motivation! I want to know everything I can about the profession. I want to be part of it as much as I can."

She said she wanted to become a respiratory therapist because she was curious about all the kinds of patient care RTs can provide. "I had worked as an ER tech and got to know a couple of RTs. I love the way RTs are able to work on a ventilator. I have been looking at all the varieties of respiratory care, and I am currently interested in the neonatal area," she said. She continues to work as an ER tech in parallel to her RT studies.

Quarcoo attended the Annual Business Meeting of AARC members at the Congress, led by President Frank Salvatore, Jr., MBA, RRT, FAARC. Afterwards, she was able to meet him and get a picture together.

"In school, you realize the things you can do," she said. "I am so excited to become an RT. My dream is to volunteer. I can do so many things. I can make a difference." ■

▶ STUDENT CORNER

Overcoming Clinical Challenges and Difficult Situations

by Lisa Trujillo, DHSc, RRT

Editor's Note: In this issue, we're introducing a column in which educators will offer wisdom and valuable tips for respiratory care students to help set a path for becoming a top-performing, professional respiratory therapist.

Throughout your clinical experience as students, you strive to increase your knowledge and expertise, refine your effectiveness and efficiency, expand critical thinking skills, and become increasingly independent in your ability to manage a respiratory therapist's workload. In addition to these expectations, you have to learn to navigate challenging and sometimes difficult situations.

As health care providers, we are expected to approach each patient in a professional, non-judgmental manner and provide appropriate and equal care for all patients regardless of circumstance. This isn't always easy. Treating the patient as an individual can help shift your attention from their circumstances toward their individual needs as a patient.

Stress and anxiety are often a challenge for students, especially when first starting clinical rotations. Know yourself and how you react in difficult or high-stress situations. Identify and develop coping strategies that help you deal with these feelings. This will allow you to perform better clinically, knowing you will have an opportunity to process the experience at a later time.

Debriefing is very effective and provides students an opportunity to discuss a variety of situations in a safe, supportive environment and to learn how to process emotions associated with challenging patient situations, including death. Identify whom you can turn to for support. Select someone who can relate to your experience such as a faculty member, your preceptor, or a department supervisor.

Recognize that not all situations are ideal. Despite our desire for every clinical day to be stimulating and sprinkled with exceptional mentoring, this isn't always the case. However, even a bad day has its lessons to be learned. Search for them.

Translating didactic learning and laboratory experiences into real-world clinical practice can be a challenge. Although every effort is made to connect curriculum with clinical application, you will notice slight differences. This may be simply due to variance in protocols or available equipment. Allow yourself to learn from these differences rather than be frustrated by them.

Don't show your lack of confidence. No one expects you to be perfect. We know you are learning. Stay calm. Watch once or twice then don't be afraid to jump in and do it yourself. However, if you don't know how to do something, then say you don't and share your desire to learn. Offer to help as often as possible and ask for honest feedback from your preceptor.

Finally, always behave professionally and remember you are a guest in the facility.

Dr. Lisa Trujillo is associate professor/director of clinical education at the Weber State University Respiratory Therapy Department in Ogden, UT.

Study: Unnecessary Surgery Concerns Unfounded

With the advent of coverage for lung cancer screening programs, concerns have been raised that more patients will undergo unnecessary surgeries for benign disease. Researchers from the Lahey Hospital & Medical Center in Boston, MA, who reviewed surgical outcomes in 1,654 patients who underwent LDCT lung cancer screening between January 2012 and June 2014 believe those fears are largely unfounded.

Of the 1,654 patients screened in their study, 25, or 1.5%, underwent surgery. Twenty patients were diagnosed with lung cancer, 18 of them in an early stage of the disease with a high probability of being cured. Five out of 1,654 patients, or 0.30%, had a surgical intervention for a non-lung cancer diagnosis, considered comparable to the 0.62% rate found in the National Lung Screening Trial that helped secure screening coverage in the U.S. The study appeared in a recent edition of the *Annals of Thoracic Surgery*.

As Seen on *AARConnect*

Have you looked at what your colleagues are talking about on the *AARConnect* discussion lists? You might find an interesting tidbit you can use in your area of respiratory care or maybe answer a question someone has asked. Here is an example of a dialogue we found on *AARConnect* while preparing this edition of the magazine.

AARConnect...

Is there anyone working in an inpatient pulmonary rehabilitation program? How does it work?

Is there anyone referring patients directly from an inpatient stay to outpatient pulmonary rehab? How does it work?

Diane Pullins, RRT, AE-C
Piedmont Atlanta Hospital
Atlanta, GA

We have in-patient pulmonary rehab, mainly for educational purposes. We have standing discharge orders asking for PFTs six weeks post discharge and an order for outpatient pulmonary rehab. We are still trying to determine the best way to have doctors follow through on this. We still live in a somewhat "silo" system. We are finding we need better communication between hospital services and primary care, as well as educating providers on the COPD guidelines. Our department has also been contracted by a local health insurance company to provide COPD management for their members. The participant meets with a respiratory therapist for a two-hour assessment. Recommendations are given to the primary care provider (i.e., PFTs, medications according to GOLD, pulmonary rehab, etc.). It provides a segue to a formal pulmonary rehab program.

Harriette Janssen, RRT
St. Elizabeth Hospital
Appleton, WI

We do not have an inpatient PR program but we have started an outpatient PR referral process for inpatients. Each morning we screen all inpatients by diagnosis that may be PR candidates. For those who are good candidates, we communicate to discharge coordination and they obtain the PR order (includes full PFT if needed). Once the order is faxed to PR, we meet with the patient in the hospital and schedule the full PFT if needed, or the PR intake appointment.

If they need the PFT, we wait to schedule the PR intake session until it is completed.

Timothy Near, BS, RRT, CTTS
Indiana University Health Goshen Hospital
Goshen, IN

A Good Night's Sleep Works Wonders

New research out of Australia suggests some people diagnosed with depression may really just need a good night's sleep.

Investigators from Sir Charles Gairdner Hospital in Perth looked at 293 men and women who were newly diagnosed with obstructive sleep apnea (OSA). Nearly 73% reported depression and 41 patients also reported suicidal ideation.

After three months of treatment with CPAP, only 4% of the 228 patients who adhered to CPAP for an average of at least five hours a night still had clinically significant signs of depression and none were plagued with persistent thoughts of suicide. The study was published in the September edition of the *Journal of Clinical Sleep Medicine*. ■

Helping Kids Who Are Waiting to Hear

Respiratory therapists are known for helping people breathe. They're also known for helping their colleagues when they need it, and in Tennessee that's meant helping children to hear as well.

It all started when two RTs from Fall Branch learned that their two-year-old daughter Sarah had lost her hearing. "A few months after being diagnosed, Sarah received two cochlear implants and began a journey back to the hearing world," says her father, Shannon Ball, RRT-NPS, RPFT, AE-C. But he and his wife Sherry, also an RRT, quickly learned that Sarah was an exception to the rule. In reality, fewer than 5% of children with hearing loss receive a cochlear implant to help them hear again. Most of their parents are never even told it is an option, says Ball.

The Balls decided to found an organization to raise awareness of the issue in their area of the country, and Waiting to Hear was born. Their fellow RTs quickly rallied to the cause. The board of directors includes three therapists, including AARC member Sherry Bailey, RRT, and Shannon Ball counts members Missy Webb, RRT, Tammy Willis, RRT, Greg Cornett, MA, RRT, Vanessa King RRT, Kayla Bates RRT, Justin Bishop RRT, and Heather Long RRT, among his most active volunteers. All told, more than 40 RTs and RNs turned out at a recent fundraising event for the organization.

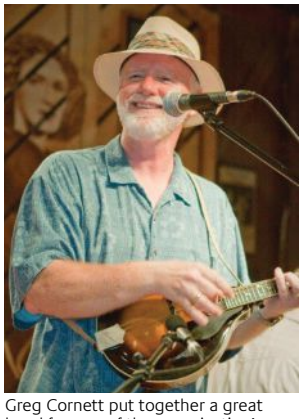
"The live events have really given the area RTs and RNs a chance to get to know each other's non-medical talents and brought us all closer as a community," says Shannon. "In many ways, they have acted as de facto team building exercises that have inadvertently improved working relationships — and should anyone ever stop breathing at an event, we have that well covered!"

Since its inception in 2014, Waiting to Hear has sponsored cochlear implant awareness programs throughout the area, a language enrichment summer camp for deaf and hard of hearing children that is offered at no cost to the families, and regular outings where deaf and hard of hearing children and their families can meet each other and share their experiences. Even bigger things are in the works for this year: hosting a cochlear implant conference for medical professionals, establishing a hearing aid loaner bank for children awaiting implant surgery, and publishing a free guidebook and reference materials for newly diagnosed families.

Having RT colleagues like Sherry Bailey, Missy Webb, Tammy Willis, Greg Cornett, Vanessa King, Kayla Bates, Justin Bishop, Heather Long, and many others help out with fundraising has made it all possible. "These guys are just amazing. We've had volunteers that have done everything from opening for an Elvis tribute artist, to wearing an Olaf costume, to wading a freezing river in the middle of October for our Bionic Duck Derby," says Ball.

You can learn more about the organization online at www.waitingtohear.org and on social media. ■

Shannon and Sherry Ball are working hard to ensure more children like their daughter Sarah have the chance to receive cochlear implants.



Greg Cornett put together a great band for one of the organization's Music to Our Ears concerts.

Elvis gathers with some of the Waiting to Hear volunteers at the Hearing from the King concert.

The Hear Me Roar fundraiser took place at a local zoo.

Kayla Bates had fun playing 'Anna' from the movie 'Frozen' at a recent event.

Triathlons Keep This AARC Member Young at Heart

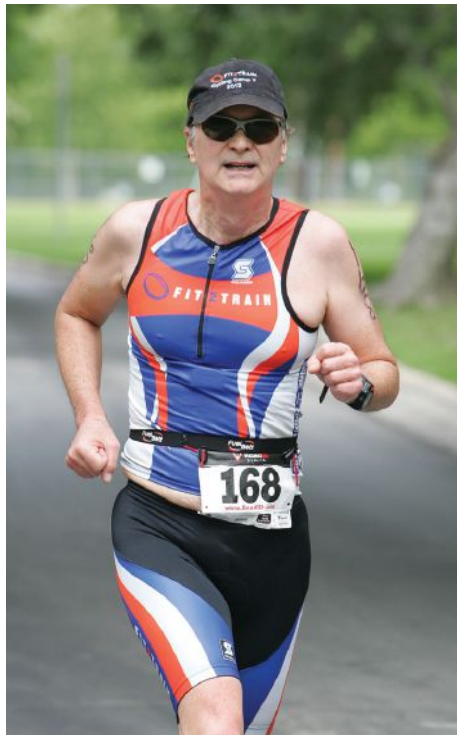
Mark Millard, MD, FCCP, was on a swim team as a teenager, but like most of us, he let exercise go by the wayside as he built his career. Shortly after turning 40, he decided it was time to do something about it.

"Just looking in the mirror told me that I needed to start exercising again," says the medical director of the Martha Foster Lung Care Center at Baylor University Medical Center in Dallas, TX. "My mentor in college had run five miles on his 50th birthday, and I decided to emulate his goal when I turned 50."

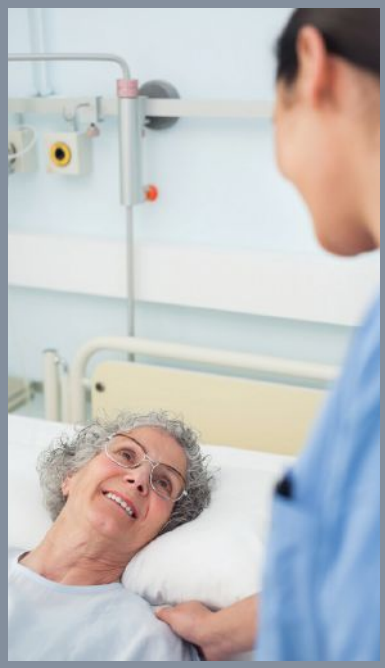
A few years later, he added bicycling to his routine — mainly to help preserve his knees — and by the time he was getting ready to turn 60 he was in good enough shape to consider something most 60-somethings would just laugh at. "When I was 59 years old, I woke up one day and thought that a great way to celebrate turning 60 would be to go ride a bike in France and also do an Olympic distance triathlon, specifically, the NY Nautica Tri."

A broken foot kept him from making it to the New York event that year but he was there when he turned 61. By then, he was definitely bitten by the "triathlon bug." Since then, he's participated in three 70.3 half-Ironman events, which consist of 1.2 miles of swimming, 56 miles on the bike, and 13.1 miles of running.

It's all keeping him young at heart, says the long-time AARC member. "The last five years of my life have brought some of the greatest 'highs'! I train with a bunch of kids who are young enough to be my children or even grandchildren, and we've endured hailstorms, near gale-force winds, sub-freezing temps, and of course, the Texas sun," says Dr. Millard. "When you get to the finish line of an event, that's really just the icing on the cake. It's the journey with your friends that makes doing triathlons special."■



Dr. Mark Millard



Err on the Side of Caution

Elderly pneumonia patients whose conditions put them on the cusp of requiring care in a general hospital ward or an ICU fare better if their physician opts for the ICU. University of Michigan researchers arrived at that conclusion after studying pneumonia outcomes and costs among 1.1 million hospital stays at 2,988 hospitals across the country between 2010 and 2012.

Initial findings revealed that patients with an ICU stay were more likely to die, and their costs of care were higher than those seen for patients treated in a general hospital ward, even after differences between patients' backgrounds and underlying conditions were taken into account. But when the investigators used statistical techniques to focus in on pneumonia hospital stays where the choice of bed type appeared to be truly "discretionary" — on the borderline of needing intensive care, and up to a doctor's judgment — they found that 14.8% of patients placed in the ICU died within 30 days vs. 20.5% of those admitted to a general hospital ward.

The overall cost of care for these patients was about the same regardless of care setting, about $14,100 for ICU patients and $11,300 for non-ICU patients. The study was published in a recent edition of *JAMA*. ■

Lower Nicotine Equals Less Smoking

In the first large-scale clinical trial to examine the effects of reduced-nicotine cigarettes on smoking behavior, researchers from the Vanderbilt Center for Tobacco, Addiction and Lifestyle found lowering the nicotine levels in cigarettes does indeed reduce nicotine exposure and dependence.

Participants in the clinical trial were randomly assigned to smoke either their usual brand of cigarettes or one of six types of investigational cigarettes with nicotine content ranging from 15.8 mg per gram of tobacco to 0.4 mg per gram. A total of 840 participants underwent randomization, and 780 completed the six-week study. Participants who smoked their usual brand of cigarettes averaged 22.2 cigarettes per day vs. 14.9 cigarettes per day for those who smoked cigarettes containing 0.4 mg of nicotine per gram of tobacco. The average number of cigarettes smoked per day dropped off only at nicotine levels lower than 5.2 mg per gram of tobacco.

While the authors emphasize there is no "safe cigarette," they believe these results suggest there's a benefit to reducing the nicotine content in cigarettes across the board. Under the 2009 Family Smoking Prevention and Tobacco Control Act, the FDA has the authority to reduce nicotine in cigarettes if it benefits the public health.

This study appeared in a recent edition of the *New England Journal of Medicine*. ■

E-cigarette Makers Market To Kids

According to data from the 2014 National Youth Tobacco Survey, e-cigarette use tripled among middle and high school students from 2013 to 2014. Researchers from the University of California, San Diego believe aggressive online marketing techniques are part of the reason why.

Seventy percent of the 57 online vendors they studied used more than one of the three most commonly used social media platforms (Facebook, Twitter, and Instagram) to promote their products and these vendors also appeared to be making it fairly easy for kids to purchase e-cigarettes. While 68% did display one or more health warnings about the devices on their website, the notices were often depicted in smaller fonts or placed discretely in the "terms and conditions" section.

One third of the vendors had no detectable age verification process for buyers, and of those that did, most required only a simple click to say the buyer was within the legal age limit. The study was published in a recent edition of *Drug and Alcohol Dependence*. ■

Strange But True...

One and done: Researchers from Washington University in St. Louis have developed a test that can detect virtually any virus capable of infecting humans or animals. They believe the test will be especially useful in situations where standard testing has failed to result in a diagnosis or in outbreaks where the culprit remains unknown despite typical testing.

3D printing: University of Michigan physicians became the first to use 3D printing of a fetal head to assess a facial mass with the potential to impede a baby's airway upon birth. Thanks to the technology, they were able to avoid a complicated procedure requiring partial delivery of the infant while he remained attached by his umbilical cord to the placenta so that a surgeon could establish an airway to allow him to breathe. ■

Industry Update

Featuring information on products and equipment from manufacturers

Ventilation System

The Breathe Technologies Life2000™ Ventilation System has received clearance from the U.S. Food and Drug Administration. It is indicated for adult patients who require positive pressure ventilation delivered invasively or noninvasively. The ventilator is suitable for use in home and institutional settings and is intended to be administered by qualified, trained personnel under the direction of a physician. www.breathetechnologies.com

COPD Medication

Stiolto™ Respimat® Inhalation Spray from Boehringer Ingelheim is a long-term prescription medicine used to control symptoms in adults with COPD. Stiolto, which contains the anticholinergic, tiotropium, and the long-acting beta-2 adrenergic agonist, olodaterol, works by helping the muscles around the airways stay relaxed, thereby preventing symptoms such as wheezing, cough, chest tightness, and shortness of breath. It is not intended for the treatment of sudden symptoms. www.us.boehringer-ingelheim.com

Sleep Monitor

The S+ by ResMed monitors sleeping patterns from the users' bedside table, sending real-time sleep information to the S+ by ResMed app, available on iOS- or Android-enabled devices. The data is then laid out on easy-to-read charts and graphs that help set users on a path toward better sleep. The app also includes several additional features that help users fall asleep with greater ease. Thanks to ResMed's proprietary touchless monitoring technology, users simply turn on the device at bedtime — with no need to wear a watch, wristband, or other sensor. www.resmed.com

Audiometer/Spirometer Integration

Integration of the Benson Medical Instruments CCA-200*mini* Plus audiometer and the CCS-200 Plus spirometer gives occupational health program managers the ability to run database software on the same PC, run the devices separately or integrated, or run both separately on different PCs. Changes made to an employee record in the audiometer database will also appear updated in the spirometer database, eliminating the need to enter and modify the data twice and reducing the potential for errors. www.bensonmedical.com

Oxygen Concentrator for Active Users

The LifeChoice ActiVox Portable Oxygen Concentrator (POC) from PRO2 Medical Supplies comes complete with AC/DC power supplies, carrying bag, and cannula. Designed to accommodate active oxygen users, the LifeChoice ActiVox makes it easier to travel without worrying about refilling or changing tanks. Featuring a battery level indicator, push button oxygen flow release, and an alarm LED to let users know when oxygen levels are low, these three-liter and four-liter POCs are the lightest available on the market today. www.pro2medical.com

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

Calendar of Events

AARC & State Society Programs

February 4–5

Davis, West Virginia

WVSRC Fall Health Care Conference at Canaan Valley Resort & Conference Center

Contact: Cynthia.keely@gmail.com, www.wvsrc.org

Submissions for the next available issue are due December 22.

For information on submitting calendar events, contact: Beth Binkley, AARC Times 9425 N. MacArthur Blvd, Suite 100, Irving, TX 75063-4706 (972) 243-2272 Fax (972) 484-2720 E-mail binkley@aarc.org

Advertiser Index

To advertise, contact: Phil Ganz, 48 Abbey Woods Ln., Ste.100, Dallas, TX 75248, Voice (972) 991-4994, Fax (888) 206-9006, phil.ganz@aarc.org. Or contact Beth Binkley, Advertising Assistant, Daedalus Enterprises, Inc., 9425 N. MacArthur Blvd., Ste. 100, Irving, TX 75063-4706, (972) 243-2272, Fax (972) 484-2720, binkley@aarc.org.

AARC Times Classified Advertising Information & Requirements:

Classified Word Advertisements

AARC Members: $50 for 50 words or less; each additional word, $1. Free Internet placement. Nonmembers: $60 for 50 words or less; each additional word, $1.20. Listings are categorized by state. Following the state listings are United States/International, For Sale/For Rent, Miscellaneous, and Situations Wanted. All copy should be typed double-spaced. All ads will be set in 8-point type. To calculate the cost per advertisement, a "word" is considered to be one or more letters, numbers, or special characters with a space before and after.

Ads are featured on the AARC website for one month after publication. Ad may only be placed on the website with an insertion order for placement in an AARC publication. Ad is noncancelable after placement on the website. NOTE: _AARC Times_ reserves the right to refuse any advertisement not directly relevant to respiratory care. _AARC Times_ does not endorse any advertiser, its positions, practices, services, or products.

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.

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Deadline for ad placement and written cancellations for the next available issue is Dec. 22. Blind ads available. **For Recruitment Advertising Information, Contact AARC Respiratory Jobs** • Respiratory.Jobs@aarc.org (972) 243-2272 • Fax (972) 484-2720 4925 N. MacArthur Blvd., Ste. 100, Irving, TX 75063

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Déjà Vu All Over Again

by Linda Van Scoder, EdD, RRT, FAARC

EDITOR'S NOTE: In this issue of *AARC Times*, we introduce a column that lets retired respiratory therapists look back and reflect on their profession, their career, and their lives. We hope to keep the column going by collecting stories from AARC members to place in "Reflections." Submissions may be emailed to Cathcart@aarc.org with "Reflections" in the subject line.

After graduating with a BS degree in respiratory therapy in 1975, I spent the first few years of my career as a supervisor. During that time many (if not most) of the respiratory therapy staff I supervised were on-the-job trained. That situation was common during those years before licensure. The remainder of my career was spent in respiratory therapy education, and the changes over that time period have been tremendous. I retired from my job in July 2015 after 40 years of working in respiratory therapy.

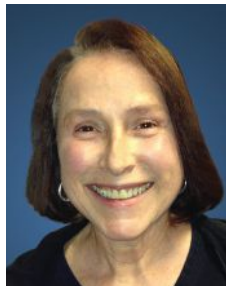
Here we go again

When I began teaching in 1978, hospital-based technician programs were not uncommon, and BS programs were rare. Very early in my teaching career, the accrediting agency decided that programs needed to award college credit for their courses; and my program was required to make that change. We accomplished that by forming a consortium with a local university and actually decided to become an associate degree therapist program even though that wasn't required. Many programs chose to remain at the technician level.

I eventually became the program director; and in the early 1990s, I was honored to be appointed as a member of the steering committee for the AARC Education Consensus Conferences. The main outcome of the conferences was the recommendation that the minimum entry-level education for respiratory therapists should be the associate degree. Now as I listen to the angst engendered by the AARC 2015 and Beyond Conference recommendation that the entry level should be the baccalaureate degree, all I can say is (in the words of the late Yogi Berra), it's "déjà vu all over again."

When we proposed the ASRT-minimum, we were told that it wasn't needed for the job, that we wouldn't be able to produce the manpower to maintain the profession, that the program-accrediting agency would be sued, etc. None of that came to pass then, and I seriously doubt that a move to a BSRT-minimum will result in the end of the world as we know it. If nothing else, age and experience give you perspective.

about the author...

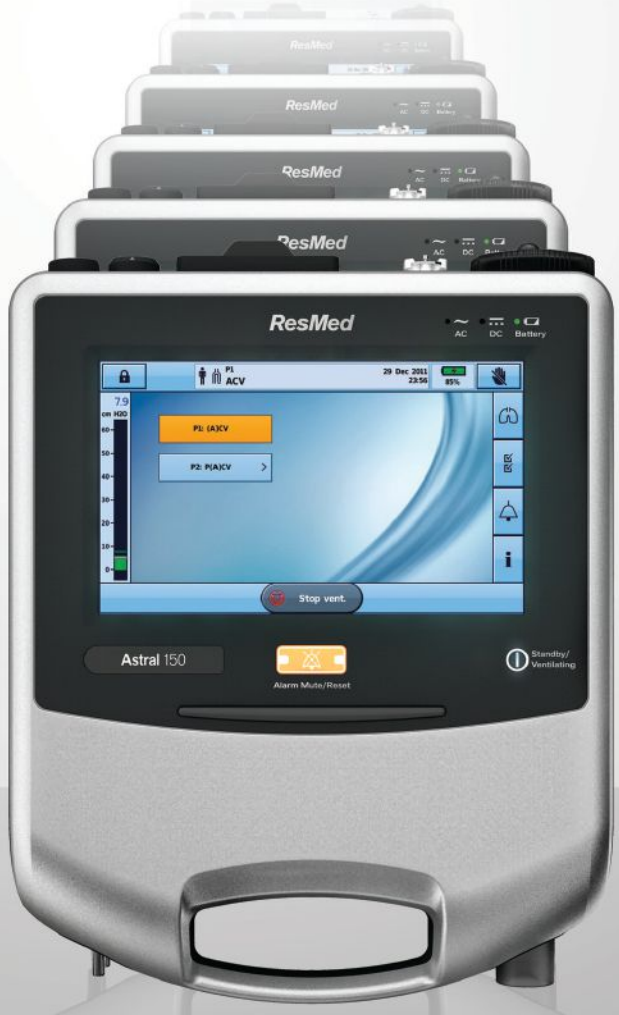


Before her retirement last summer, Linda Van Scoder, EdD, RRT, FAARC, was the program director for the Indiana Respiratory Therapy Education Consortium in Indianapolis, IN.

Better times ahead

When I retired, my program had been awarding a baccalaureate degree for a number of years. Lengthening the program allowed us to increase the number of prerequisite credits in anatomy and physiology, math, physics, psychology, and chemistry. Plus, we were able to add courses in statistics and ethics. Our students must complete the general education core for their university, which leads to a more well-rounded graduate. It's something I had to do when I was completing my own BS in the 1970s. And although I don't know that I appreciated my courses in economics, logic, and art history at the time, I'm now glad that I had that broad foundation.

Even though I have retired from my job, I haven't retired from the AARC. I was honored to be named a Life Member a couple of years ago, and I am still a member of the Position Statement Committee. It is the position of the AARC that the minimum entry-level needs to move to the baccalaureate degree. If I can pass something on to you from my years of experience it would be, "Don't worry. It will work out, and we will be a better profession for it." ■



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Untethered Continuous Patient Monitor

Radius-7 for the Root® Patient Monitoring and Connectivity Platform allows for patient mobility while enabling continuous monitoring.

Each Radius-7 comes with two rechargeable, "hot-swappable" modules with short-range communication to Root.

> Breakthrough Measurements

- Masimo SET® Measure-through Motion and Low Perfusion™ pulse oximetry
- rainbow Acoustic Monitoring™ with Acoustic Respiration Rate (RRa®)

> Small, lightweight, and wearable for untethered monitoring and ambulation

> Integration with Patient SafetyNet* for surveillance monitoring

www.masimo.com

Caution: Federal (USA) law restricts this device to sale by or on the order of a physician. See instructions for use for full prescribing information, including indications, contraindications, warnings, and precautions.

* The use of the trademark PATIENT SAFETYNET is under license from University Health System Consortium.

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