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Times

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AARC Strategic Plan

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

AARC Strategic Objectives

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

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

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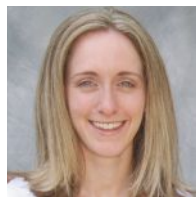

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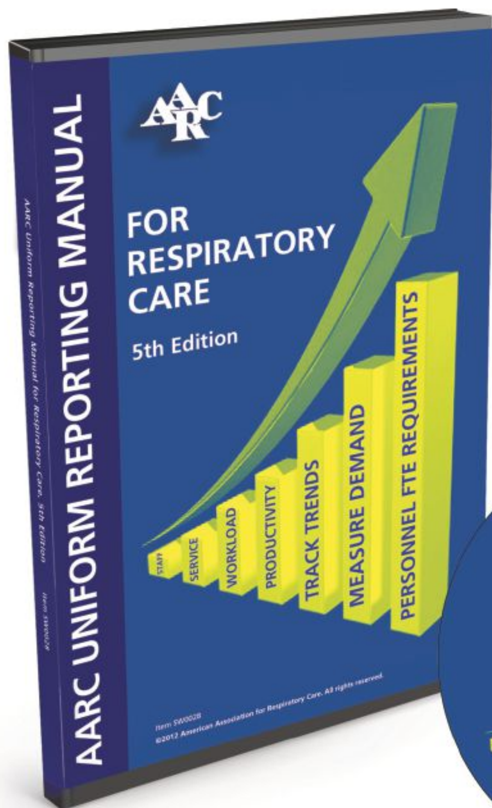

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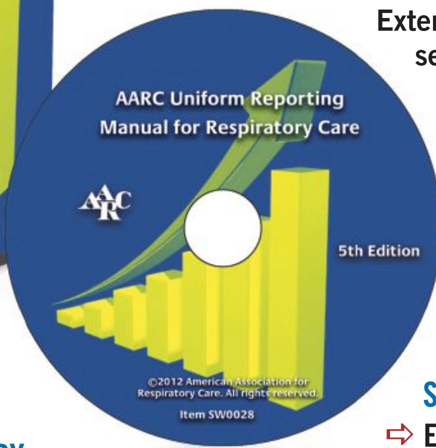

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Advising Older Adults on Effectively Managing Their Respiratory Disease

by Trina Limberg, BS, RRT, FAARC

Patients with chronic lung disease often deal with several persistent health conditions such as bone and joint impairments and chronic pain, hypertension, diabetes, obstructive sleep apnea, congestive heart failure, and gastroesophageal reflux disease to name a few. Multiple comorbid conditions can result in complex medication regimens and a need for several providers. Patients can have burdensome appointment schedules and follow-up for several different medical tests. Managing medical appointments with specialists and taking numerous tests and medications can be overwhelming and frustrating for patients and their families. This column will focus on advice for the respiratory-impaired older adult, with the goal of providing acute and chronic care respiratory professionals a framework to aid patients.

Enhancing communication with providers

Patients should take an active role to support communication between caregivers and health care providers. When patients see providers at more than one health care system, the electronic medical record (EMR) isn't always accessible, thereby leaving the patient to report information obtained from other treating providers. Patients may choose to keep a log of appointments, taking notes and making records with important questions or concerns they feel warrant discussion with their providers. Patients should consider going to the doctor like going to a meeting, thus spending some time preparing for crucial conversations. Computer-savvy patients may choose to include an electronic means to enroll and access Web-based hospital-sponsored programs referred to as patient portals.[1] Patient portals are an option to communicate with health care providers only if EMR integration is available. These programs provide options for patients to send electronic messages to their physicians and pose questions and even receive test results and reminders for immunizations such as flu vaccines. Patient portals protect privacy and provide access to medical record information. Some patients with chronic health issues may choose to use this option to notify their physicians of non-emergent symptom changes. Although 70% of U.S. adults access the Internet and use email, there are significant disparities related to age, education, and socio-economic status, meaning some of the most vulnerable populations may have the least experience with or lack access to an electronic means of communication.[2] For those older adults who do have computers and use the Internet, hospital Web-based portals may offer improved access to physicians.

It may also be helpful for some patients to have their caregivers or a family member attend medical appointments not only for the emotional support but also to have another person there to ask questions and listen to instructions and physician advice.

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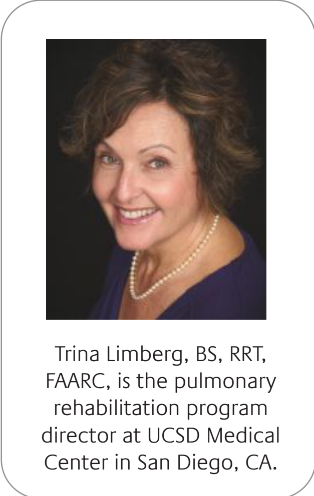

Trina Limberg, BS, RRT, FAARC, is the pulmonary rehabilitation program director at UCSD Medical Center in San Diego, CA.

Organizing appointments

Calendars are the very best way to do this, whether they are electronic or paper and pen. Patients who use acute care or emergency services or undergo testing at multiple health care systems will need to be able to provide that information to bridge communication with providers. Optimal communication can help to avoid repeat testing and give providers important medical chronology so copies of medical records can be obtained. Notes on instructions for testing and appointment preparation such as holding any medications for pulmonary function tests or fasting before procedures should be recorded as well.

Managing medications

Patients should maintain a medication list and keep it updated. Patients with COPD can have upwards of three metered-dose inhalers or dry-powder inhalers, anti-hypertensive medications, beta-blockers, insulin, proton pump inhibitors, and some medications may require multiple dosing throughout the day. Medication lists are required to be reconciled in the electronic medical record at each physician visit. However, patients who travel or those who could be transported to a nearby ER will receive better care when providers know all the medications and drug allergies. It is very important to include all supplements on the medication list; fish oil, for example, can affect clot times and is often held before surgery. Patients should keep a watchful eye on medication supplies and avoid running out of any medication. If mail order is used and a shortage looks imminent, patients should contact their providers for advice. Of course, it is necessary for patients to be knowledgeable about their medications. It is vital for all providers to have an accurate medication list. Patients can and should facilitate communication about medication among providers. Oxygen use with sleep, rest, and exertion should be included in the list as well.

Creating healthy habits

Eating a variety of foods is important — food is fuel and hydration is essential. The energy expenditure needed to breathe as well as shop and prepare food can be a deterrent for many as both require planning and effort. Many respiratory-impaired patients are underweight (possibly under-nourished), and others are significantly overweight. Both pose risks and are challenging to change. In COPD, there is an association between underweight status and mortality, independent of the degree of airflow obstruction.[3] Messages stressing the importance of healthy eating to patients should be consistent across primary providers; most patients will require support to reach weight goals. Keeping a food diary can help provide insight to patients on how much they eat, how often, and the quality of their food choices. Dietary supplements may be needed in patients with low body mass indices.[3] Patients with elevated body mass indices may need counseling to improve choices and achieve weight-loss goals. Respiratory-impaired patients should be encouraged to initiate a discussion with their physician to garner support for achieving body weight goals.

Getting daily activity

This is crucial to ward off muscle deconditioning and depression. Once dyspnea progresses and breathing becomes distressful, patients tend to avoid discomfort and sit more. Remaining independent is generally a goal of most patients. In many instances, sedentary lifestyles can be changed with a referral to pulmonary rehabilitation where after a comprehensive assessment patients can learn to exercise at a level that builds endurance and strength and restores self-confidence.[3] Learning breathing techniques and treating hypoxemia is crucial. Safe ambulation is most important.

Pulmonary rehabilitation is a vital resource for patients diagnosed with chronic lung disease. Baseline physical assessments are done, exercise targets are prescribed, and patients are supervised and encouraged to achieve moderate levels of perceived breathlessness and muscle fatigue while maintaining oxygenation saturations above 90%. Exercise intensity and durations can vary greatly in the respiratory-impaired population. Risks

for falls and balance problems should be assessed. Pulmonary rehabilitation patients receive instructions and encouragement to perform endurance and strength training exercises three to five times weekly at home. Many respiratory-impaired patients have been told by their physicians they need to exercise and believe they should, yet many remain reluctant to begin without help. When advising these patients to start an exercise program, it is important to consider their level of confidence and medical severity. Involving caregivers can, in some instances, provide a safety support and help patients achieve activity goals.

Socializing and social support

Progressive dyspnea and deconditioning, fear, panic, and depression can be strong factors in keeping patients from working and socializing. Many feel isolated, some feel poorly understood by friends and family members, and many lack the energy to venture outside the home or reach out for help. Some studies show patients who have positive social support report feeling less depressed and lonely.[4] Patients need people who can help when they cannot get to the pharmacy or the market, whether that is a neighbor, friend, or family member. Positive people and supportive relationships are very important for respiratory-impaired patients.

Reporting early signs and symptom changes

Many patients wait too long, letting symptoms progress before reporting changes to their physicians. Patients should discuss a plan for handling exacerbations so symptoms can be managed without acute and emergency care intervention when possible. Patients with chronic dyspnea and progressive lung disease should have an exacerbation or "flare-up" plan. They need to be able to assess changes from their normal symptomatology and report those changes in a timely manner, such as within 48 hours. Increased cough, changes in sputum color, volume and consistency, wheezing and shortness of breath are important changes to monitor and report. Onset of a fever, ankle swelling, or pain may need to be reported sooner. Patients should be encouraged to initiate a discussion with their physician to help clarify their unique individual indicators for early symptom recognition and physician contact.

Patients should know how to access urgent care as well. Studies assessing patient perceptions suggest that more emphasis on patient education and empowerment will most likely improve self-management.[5]

In summary, there are many areas where older adults can improve their relationships with providers and feel empowered to self-manage their disease. Respiratory therapists can facilitate patient awareness by providing pulmonary patients with good advice, direction, support, and a referral to pulmonary rehabilitation. ■

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Ventilator Graphics Case Study

by Keith D. Lamb, RRT

Graphical representation of flow, pressure, and volume against time are available on most modern microprocessor-driven mechanical ventilators. Clinicians can glean valuable information from simply observing the interaction between these parameters and correlating them with the clinical scenario at the bedside. Commonly identified abnormalities include flow hunger, difficulty triggering, air trapping, and airflow obstruction.[1-3]

The following are scenarios that demonstrate the value of this correlation in providing direct patient care.

Scenario No. 1

Mr. Noodleman is a 65-year-old patient with a long history of alcohol abuse and now presents with acute pancreatitis. Upon admission, computed tomography revealed the need for an exploratory laparotomy, whereupon he was taken to the operating room. Post-operatively he was transferred to the surgical intensive care unit with an open abdomen due to large-volume resuscitation requirements and subsequent edema. Mr. Noodleman was placed on volume-assist control with a set frequency of 14 bpm, a tidal volume of 500 mL, an FIO_2 of 50%, and PEEP of 5 cm H_2O. The inspiratory flow rate was set at 40 Lpm.

Because of a fairly significant lactic acidemia, it was decided by the ICU team that the patient would be left on volume-assist control until fluid resuscitation was adequate and the acidemia improved.

An hour after Mr. Noodleman arrived in the ICU he began to awaken. He became tachypneic and tachycardic. Due to refractory hypotension and the need for inotropic infusion, increases in sedation and analgesia were not possible.

Figure 1 shows that the inspiratory flow rate that was initially set is no longer adequate. Note the classic "scooping" of the pressure waveform. Mr. Noodleman is essentially "outstripping" the set flow rate. This, in turn, causes asynchrony with the ventilator, dyspnea, and anxiety.[1]

The easy treatment for this issue is to increase the set inspiratory flow rate. In this case the inspiratory flow rate was increased to 75 Lpm.[1] Great care should be taken to closely monitor the patient's inspiratory flow requirements as they are inconsistent, ever-changing, and may need frequent adjustments.

Figure 2 demonstrates marked improvement in ventilator synchrony after the change has been made. Note that the pressure wave form no longer is scooped and represents adequate flow.

Scenario No. 2

Mrs. Jones is a 68-year-old woman with a long and significant history of COPD. She was admitted to the floor with an acute exacerbation of her obstructive disease, most likely due to a community acquired pneumonia. She is placed on noninvasive positive pressure ventilation after blood gas analysis demonstrates significant respiratory acidemia. She was transferred to the ICU and intubated when her acidemia did not improve and she became lethargic.

Due to her severe acidemia she was placed on volume-assist control with a set frequency of 14 bpm, a tidal volume of 550, an FIO_2 of 40%, and PEEP of 5 cm H_2O.

Soon after intubation, Mrs. Jones became increasingly hypotensive. She was given a volume bolus of crystalloid, which improved her hypotension minimally.

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Keith D. Lamb, RRT, is an RT II in surgical critical care at Christiana Care Health System in Newark, DE, and chair of the AARC Adult Acute Care Section.

Figure 3 demonstrates that Mrs. Jones is air trapping.[2] Note that the flow graphic shows that expiratory flow is not reaching baseline before the next breath begins. This allows for incomplete exhalation and resultant trapping of air. This can result in an increased mean airway pressure, which in turn can cause acute hypotension, especially in a patient who is hypovolemic.[2]

Air trapping can be caused by severe airflow obstruction, inadequate expiratory time, or a combination of both. Depending on the clinical presentation, a reduction of air trapping can be approached by increasing the expiratory time, decreasing set respiratory rate, increasing inspiratory flow rate, and/or treating the underlying obstruction if it is present.[1-3]

In Mrs. Jones' case, the inspiratory flow rate was increased, which shortened the inspiratory time. She was also started on bronchodilator therapy. This resulted in an appropriate expiratory time and complete return to baseline of expiratory flow. See Figure 4.

Mrs. Jones' blood pressure soon improved, and she was eventually extubated after being on appropriate antibiotic therapy for a few days.

Now let's assume that Mrs. Jones's air trapping becomes so severe that it prevents her from spontaneously triggering the ventilator. Figure 5 demonstrates this phenomenon. Note the inflections where the patient is attempting to trigger a breath but because of severe air trapping the ventilator does not recognize the patient's effort.[2,3]

After manipulations in trigger settings and reversal of air trapping, Mrs. Jones was now able to trigger the ventilator. Synchrony was improved and her dyspnea and anxiety was alleviated.

Crucial to spot abnormalities rapidly

The above scenarios are very common and are played out in ICUs across the country every day. Quickly recognizing abnormalities is paramount to appropriate management of these intubated patients, allows for fewer delays in extubation, and reduces harmful sequelae of prolonged mechanical ventilation. ■

EDITOR'S NOTE

All graphics are courtesy of John S. Emberger, BS, RRT, FAARC

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Figure 1. Flow Hunger

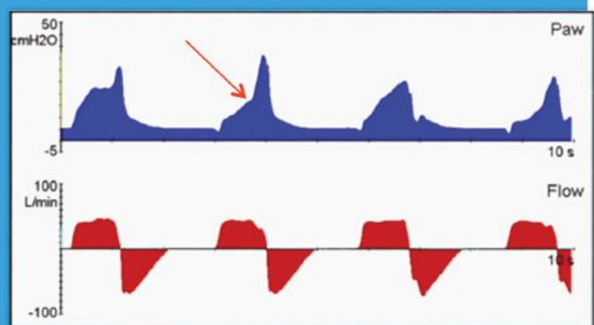


Figure 2. Flow Hunger Treated with Flow

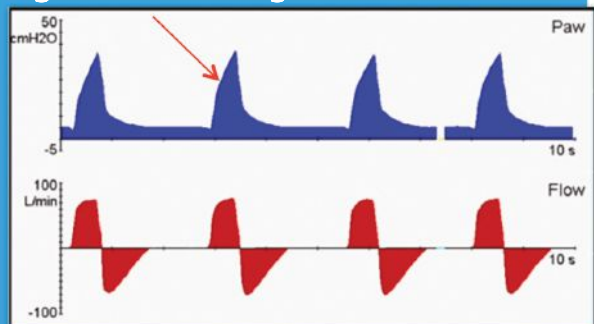


Figure 3. Difficulty Triggering

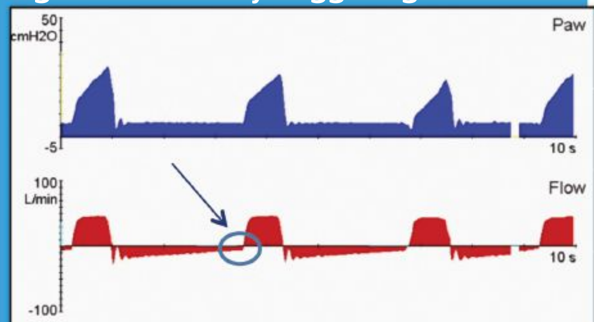


Figure 4. Air Trapping

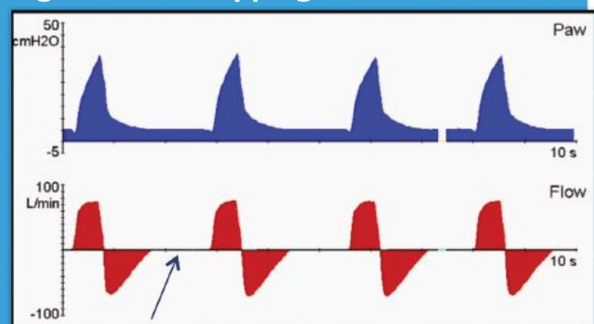
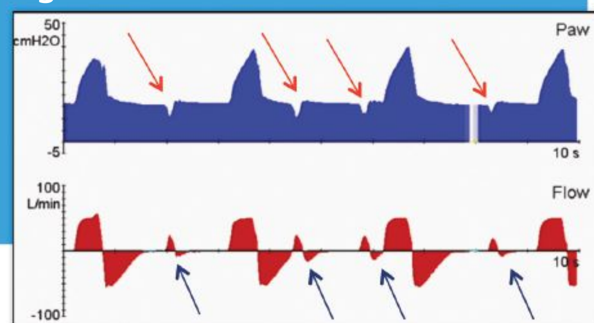


Figure 5. Airflow Obstruction



Black Lung Benefits Program

by Cheryl West, MHA

Most of us are aware of the major state or federal health insurance programs that will provide coverage for people in need of respiratory services. Programs such as Medicare, Medicaid, Veterans Health Care, and the state-based Children's Health Insurance Program (CHIP) are typical examples of well-known programs. But there are other state or federally sponsored health programs that while very important, especially to those patients receiving the benefits, might not be fully on everyone's "radar screen." One such health insurance program is the federally funded Black Lung Benefits Program; and for a specific population of pulmonary patients (coal miners), it can be important indeed.

As is typical with federally funded health services, the Black Lung Benefits Program gets more than a bit complicated. There are actually three federal agencies that have a hand in administering the program:

1. The "lead agency," the U.S. Department of Labor (DOL) under the Workmen's Compensation Division
2. The National Institute for Occupational Safety and Health (NIOSH), which does testing to medically qualify for the benefit
3. The federal Health Resources and Services Administration (HRSA), which provides grants to rural Black Lung Clinics.

But the key take-home point is: For qualified miners, pulmonary rehabilitation (PR) services is one of the services that can be provided as long as there is pre-approval for PR services.

What is the Black Lung Benefits Program?

According to the DOL website www.dol.gov/compliance/topics/benefits-comp-blacklung.htm:

"The Black Lung Benefits Act provides for monthly payments and medical benefits to coal miners totally disabled from pneumoconiosis (black lung disease) arising from their employment in or around the nation's coal mines. The Act also provides for monthly benefits to a miner's dependent survivors...

"The program provides two types of medical services related to black lung disease: (1) diagnostic testing for all miner-claimants to determine the presence or absence of black lung disease and the degree of associated disability, and (2) for miners entitled to monthly benefits, medical coverage for treatment of black lung disease and disability. Diagnostic testing includes a chest x-ray, pulmonary function study, arterial blood gas study, and a physical examination. Medical coverage includes (but is not limited to) costs for prescription drugs, office visits, and hospitalizations. Also provided, with specific approval, are items of durable medical equipment, such as hospital beds, *home oxygen, and nebulizers; outpatient pulmonary rehabilitation therapy;* and home nursing visits." (emphasis added).

about the author...

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

You can find more information on how NIOSH is involved in the black lung testing by linking here: www.cdc.gov/niosh/topics/surveillance/ORDS/CoalWorkersHealthSurvProgram.html.

HRSA also weighs in on the Black Lung Benefits Program in a more peripheral, but important, manner. This agency provides operational grants to rural Black Lung Clinics. And a list of those clinics that receive supporting funding can be found at www.hrsa.gov/ruralhealth/about/community/blacklungrants.html.

While the above provides a list of the rural health clinics receiving HRSA grants, it does not mean those are the only Black Lung Clinics in the United States. The most recent (2010) listing of Black Lung Clinics by the Centers for Disease Control and Prevention can be found at www.cdc.gov/niosh/docs/2002-122/pdfs/2002-122.pdf.

State involvement in black lung benefits

Just to make it interesting, numerous states have their own state black lung programs, usually as a subset of the state Workers' Compensation Program. A list of contacts

for these state programs can be found at www.dol.gov/owcp/dfec/regs/compliance/wc.htm#NM.

There are about two dozen state-based Black Lung Clinics where eligible miners can get services. However, eligible miners do not have to receive their medical care at these state clinics; the federal laws permit them to use the provider of their choice.

Pulmonary rehabilitation benefits

A logical question to ask is whether the coverage of the Black Lung Programs' pulmonary rehabilitation (PR) benefit is the same as the coverage requirements under the Medicare PR program? Keep in mind that the Black Lung Benefits Program has covered PR for decades prior to the implementation in 2010 of the Medicare PR benefit. The Medicare PR benefit has very specific regulations including who can qualify for the benefit (i.e., only those who are Medicare beneficiaries and who have only been diagnosed with range of COPD severity). Also, the Medicare PR benefit is limited to a specific number of lifetime PR sessions.

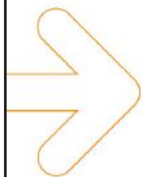
The Black Lung Benefits Program has no defined set of regulations outlining the specifics of what pulmonary rehabilitation under this program would entail — only general requirements. These requirements include:

- Testing positive for the disease
- Having been pre-approved by a physician for PR
- The services are medically necessary.

Being diagnosed with black lung disease can affect any miner of most any age, so certainly there is no age threshold to qualify as there is for Medicare.

RTs and the Black Lung Benefits Program

Certainly the Black Lung Benefits Program does not span the far-reaching scope of Medicare and Medicaid, programs that reach tens of millions of Americans. However, this program does specifically address a small population who have a specific lung disease and who can receive RT-related services, including pulmonary rehabilitation. While you probably are not going to find an authorized Black Lung Clinic in downtown Chicago, for example, there are pockets of the country that have more than their fair share of these clinics. Given the continued tough economy and the concern by the profession over employment in the traditional settings, this health care program and venue that is keyed to the skills of respiratory therapists might be worth your effort investigating. ■



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Inventors Beware

by Anthony L. DeWitt, JD, RRT, FAARC

Nearly every therapist has had an idea at some point in their career that if marketed could have made them some money. And, of course, every therapist has looked at an idea (like multiple-use suction catheters) and slapped their forehead and said, "Why didn't I think of that!"

In the United States, ideas are protected in two forms. Expression — like poems, books, and photographs — is protected by copyright. Ideas for products and design plans are protected by patents. Not every lawyer can help with a patent, however. To help advance a patent, an attorney must be a member of the Patent Bar and on the rolls of the U.S. Patent and Trademark Office. In the United States, fewer than 2% of the more than 1.25 million lawyers are active patent practitioners.

The fact that there are so few attorneys who practice in this area means that patent lawyers generally can demand very high fees for their services, and that often makes it difficult for an entrepreneur to get his idea protected by a patent for a reasonable fee. Even an uncomplicated patent application can cost upwards of $8,000 in legal fees and application costs, with complex patents requiring an inventor to shell out $15,000 to ensure their idea is patented. To be sure, the cost of protecting what you invent can be high, but the cost of not patenting the device can be even higher.

Should you market your idea to a manufacturer?

Some inventors assume that the cost of patenting their device can be bypassed if they take what is a good idea to a product manufacturer and get them to buy the idea and market it. Indeed, some joint ventures of this nature work out well, but the process is fraught with peril on both sides.

Jane develops a small clip-on suction catheter that can be affixed to the end of a laryngoscope, along with a trigger mechanism that fits on the handle. To suction the airway, all the person needs to do is put their little finger over the trigger and suction is instantly applied. After learning a patent might cost her $15,000, she goes to Acme Medical Products — a company that makes catheters — and pitches the idea to them.

Unbeknownst to Jane, Acme has had the "cone of suction" idea for some time and has been working on perfecting the idea. Several prototypes have been tried, but no one at Acme has figured out a trigger mechanism. When Jane comes to them with her Jane-O-Matic, it would seem to be a match made in heaven. Acme patents a design that uses elements of Jane's invention but is primarily based on its own design. Because they did not have a written non-disclosure agreement prior to evaluating the product, Acme agrees to pay her 10% of the profits from the device. Jane is outraged because in her view Acme only added a few bells and whistles to what was her well-designed device. Acme is similarly annoyed because they invested a lot of time and effort developing their product. They could not have disclosed the state of their art to her without tipping their hand to their competitors. Acme never thought it needed an agreement with Jane before it sat down to evaluate her product, but Acme was dead wrong.

about the author...

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

As a result, all the money Jane and Acme could have made from the invention goes instead to lawyers on both sides who spend years arguing over whose idea the ultimate product was. In the end, no one wins. By trying to save a little money, Jane cost herself a lot of money.

Should you take your idea to an invention service?

One solution may be to use a fee-based invention service. Many of these companies advertise on radio and late-night television with the promise that they will patent your idea and submit the idea to industry for marketing and production. But, as with most things that sound too good to be true, the track record of such companies is not always as rosy as they suggest in their advertising; and it is wise to ask for client references and review any agreement with such a service very carefully (and preferably with a lawyer) before signing. You may wind up giving such a fee-based service either a large check up front or a large piece of the profits of your devices down the road. The devil is often in the details of their agreement.

The best idea

To further complicate things, patent law is changing in March 2013 when a *new statute* takes effect. The patent system is changing from a first-to-invent rule to a first-to-file rule. This means that even if a device is not perfected, the person who files the first patent application is the one who wins the battle for royalties later.

The best thing an inventor can do is find a good patent attorney who will explain the patent process, charge a reasonable fee, and offer good advice on the patentability of an invention. The best approach to protect your rights as the inventor is to get the patent first and then market the product to industry.

If an inventor thinks he has the perfect idea to change a product that is already in production (like a suction catheter or laryngoscope) and he knows the company that produces the device, the temptation to deal with the company may be very great. However, under no circumstances should inventors talk to a company or provide any details about their invention until they have a non-disclosure agreement executed by the company. This agreement (which you can get almost any attorney to draft for you) protects as much as possible from the company taking your idea and using it as their own. Paying a few hundred dollars up front for legal advice may save you thousands (or even millions) down the road.

Finally, one word about do-it-yourself patent applications. You can certainly try to patent your device yourself. You can pay the patent office fees and submit the drawings, and there is even a chance that the patent office will grant you a patent. But having a patent is different from defending a patent; and if someone later challenges your patent on technical grounds, you might prove the adage that a lawyer who represents himself has a fool for a client.

There are a hundred ways to screw up a patentable idea, and only a few ways to get a good and solid patent. If your idea is worthwhile, seek out a good lawyer and get started. ■

Future Medication Innovations for Managing Asthma

by Timothy R. Myers, MBA, RRT-NPS, FAARC

Asthma is a chronic inflammatory disease of the airways that has three distinct but interrelated components: chronic inflammation processes, hyperreactivity, and bronchoconstriction. This provides the rationale in the approach from a pharmacologic management standpoint to have two distinct classes of medications: controllers (chronic) and relievers (symptomatic, exacerbations).

The global market for asthma and COPD prescription drugs was valued at $34.9 billion in 2011.[1] This figure is projected to reach $38 billion in 2012 and $47.1 billion in 2017, increasing at a five-year compound annual growth rate (CAGR) of 4.4%. The segment made up of asthma drugs is projected to increase from $15.3 billion in 2012 to $20.2 billion in 2017, a CAGR of 5.7%. The largest increase may not be seen with new therapeutic agents but rather by use of generic labeling as many patents are expiring and there is a move toward combination therapy.

Over the last 20 years, pharmacologic advances have been significant. New iterations of inhaled corticosteroids with greater potency as monotherapy or combined with long-acting beta agonists (LABAs) have become a first-line approach to the management of persistent classes of asthma. More recently, medications that alter the leukotriene inflammatory pathways (leukotriene modifiers) or imunomodulators that prevent binding of IgE to high-affinity receptors on basophils and mast cells (omalizumab) have provided additional tools for controlling asthma symptoms.

Despite billions of dollars invested over the last several decades in drug research and development, asthma patients continue to experience persistent symptoms that result in functional morbidity. The pathogenic complexity and individual genetic component of asthma makes its pharmacologic control a multifactorial process. The goal of chronic asthma management is intended to reduce symptoms, minimize acute flare-ups, encourage appropriate utilization of health care services, and implement individualized care for the patients.[2]

With the forthcoming introduction of once-daily combination products, the late-stage pipeline for asthma medications addresses the need for simplified treatment. The potential to improve patient compliance and, therefore, efficacy is highly expected and anticipated. Most new medications in the near future are minimally differentiated from current options, offering simplified treatment through improved dosing or combined therapies.

about the author...

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

Asthma drug pipeline

Novel compounds or concepts are typically guarded closely within the pharmaceutical industry. In the foreseeable future, combination products will underline asthma therapeutics, especially the LABA/long-acting muscarinic antagonist (LAMA or anticholinergic) combinations. To demonstrate the industry's focus on these medication categories, it is estimated that combination asthma/COPD drugs are expected to be worth $17.4 billion in 2012 and should reach $21.3 billion in 2017, a CAGR of 4.1%.[1]

Expert pipeline analysts predict a split across different phases, mechanisms of action being developed, and emerging pharmacologic trends.[1] The key classes of mechanism of action include: combination therapies (LABA/ICS and LABA/LAMA), phosphodiesterase 4 (PDE4) inhibitors, immunotherapy, interleukin inhibitors, TNF-a inhibitors, $CRTh_2$ antagonists, and prostaglandin D_2 (PGD_2) receptor antagonists. Table 1 provides a prospective summary of future asthma medications based on the companies' websites.

Novel drug classes

Phosphodiesterase inhibitors — Phosphodiesterases (PDEs) inhibition will increase the amount of intracellular cyclic adenosine monophosphate (cAMP); increased cAMP results in inhibition of eosinophils from the bone marrow. PDE4 inhibitors also decrease the transmission of circulatory eosinophils to the lung, along with decreasing secretion of inflammatory mediators from immune cells. It is speculated that PDEs might also decrease inflammatory mediators release from neutrophils, T lymphocytes, airway epithelial cells, basophils, monocytes, and macrophages.

Interleukin inhibitors — Increases in T helper (Th_2) cytokine concentrations have been seen in atopic asthma, with interleukin 4 and interleukin 13 thought to have a role in the physiological response to allergen challenge.[3] Cytokines are inflammatory mediators that intensify airway inflammation and fluid accumulation (edema), resulting in bronchoconstriction. By inhibiting cytokines, the airway inflammation and narrowing can be controlled.[4]

TNF-a inhibitors — TNF-a inhibitors (cytokine tumor necrosis factor) are being studied for their role in augmenting the inflammatory response in patients with asthma. TNF-a exerts a direct bronchoconstriction effect on smooth muscle, adding to the inflammatory process.

$CRTh_2$ antagonists and prostaglandin D_2 receptor antagonists — Mast cell-derived prostaglandin D_2 (PGD_2) is the major prostanoid discovered inside asthmatic airways immediately after allergen challenge testing. PGD_2 has demonstrated chemokinetic effects on eosinophils and T-helper type 2 (Th_2) cells *in vitro*. Mast cell-derived PGD_2 may contribute to eosinophilic inflammation and mucus production in allergic asthma. Chemoattractant receptor homologous molecule expressed on TH_2 cells ($CRTH_2$), a high affinity receptor for prostaglandin D_2, mediates trafficking of TH_2-cells, mast cells, and eosinophils to inflammatory sites and has recently attracted interest as a target for treatment of allergic airway diseases.[5]

Delivery devices

Current delivery mechanisms for asthma medications typically fall into two categories: inhaled or systemic medications. Inhaled medications are largely delivered by one of three types of delivery devices — small volume nebulization (SVN), metered-dose inhalers (MDI), and dry-powder inhalers (DPI) — while systemic drugs are administered orally, intramuscularly, or intravascularly.

Table 1. Overview of Potential Future Asthma Medications

Pharmaceutical Company	Drug Class
Aerovance	15 kDa recombinant human protein
Amgen	Human monoclonal antibody Antagonist of CRTH2 and Prostaglandin D2 receptors Human monoclonal antibody to IL pathways
Asmacure Ltée	Nicotinic receptor agonist
AstraZeneca	Anti-IL-5R, 9 and 13 MAb CRTh2 receptor antagonist iLABA Toll-like receptor 7 agonist
Boehringer Ingelheim	Antimuscarinic
Dey Labs (Mylan Labs)	Short-acting bronchodilator
Forest Laboratories	Anticholinergic LABA
Genentech	Humanized monoclonal antibody
GlaxoSmithKline	5-lipoxygenase-activating protein (FLAP) inhibitor Glucocorticoid agonist Human monoclonal antibody to IL pathways ICS/LABA Novel glucocorticoid agonist (inhaled) PDE4 inhibitor (inhaled)
Merck	ICS/LABA
Novartis	ICS/LABA
Nycomed	PDE4 Inhibitor
SkyePharma	ICS/LABA

Table 2. Key Focal Points of Future Drug-delivery Devices for Asthma

- Decreased treatment times and device complexity
- Increased adherence and compliance
- Smaller, more economical aerosol compressors
- Optimized aerosol delivery in invasive and noninvasive ventilator modalities
- Highly efficient targeted drug delivery to patients' lungs
- Drugs originally approved for different delivery routes being reformulated and tested for safe and targeted delivery to the lungs

Delivery devices are as variable as the manufacturer or pharmaceutical companies that bring them to market. With aerosol therapy being a cornerstone of the respiratory therapy profession, the ability of the respiratory therapist to stay knowledgeable and current with the technologies and technology/drug combinations is paramount to the patients they care for and educate.[6] The ability to make devices more efficient, more portable, and user friendly is critical to encourage correct patient technique and adherence. Table 2 lists key focal points of future drug delivery devices.

Most of the current inhaler devices on the market fall into the three delivery-device categories listed; and while they each have their own unique characteristics based on proprietary development, each device basically works on similar underlying characteristics and properties as the others in that particular category. Much of the innovation of new drug delivery devices is not centered or focused within the asthma domain but on more exotic or expensive medications for other disease etiologies.[7]

In fact, the most recent delivery device technology innovation to receive U.S. Food and Drug Administration (FDA) approval lies within the COPD population and currently is only under investigation for use in asthma. The Combivent® Respimat® (Boehringer Ingelheim, Ridgefield, CT) delivery device has a delivery mechanism that relies on a spring, rather than propellants, to generate a slow-moving mist from a medication solution contained within a cartridge.

Unique challanges

Despite a greater understanding of the pathophysiology and epidemiology of asthma over the last two to three decades, patients with severe asthma and chronic underlying inflammation continually present unique challenges and opportunities from a medical management standpoint. Different phenotypes of asthma are being discovered on a regular basis. This diversity presents unique challenges to traditional therapies. Pharmacologic advances will be developed to specifically target phenotypes and hopefully produce the best patient outcomes. This is the area of greatest future drug research and development.

In fact, Polosa and Casale when talking about a specific inflammatory pathway state that, "Owing to the complex nature of asthma, with various phenotypes and pathological mechanisms, and the fact that monoclonal antibodies blocking the action of individual biological pathways might not be enough to suppress inflammation and control remodeling efficiently, it is not surprising that the development of new treatments is fraught with difficulties."[8] ■

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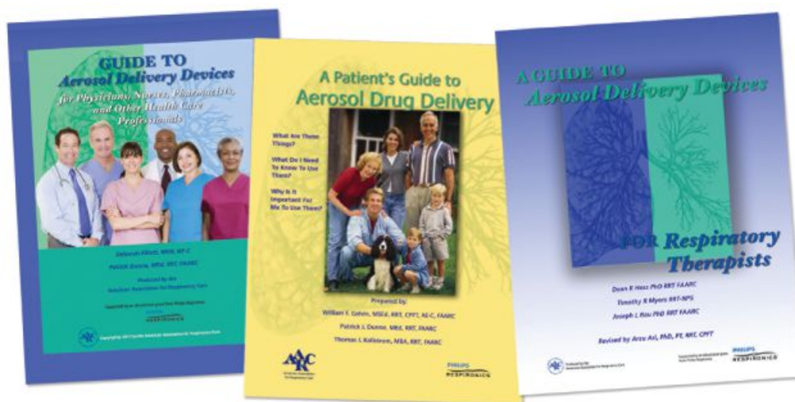

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Advocacy for Our Patients

by Thomas J. Kallstrom, MBA, RRT, FAARC

Patients who may have thought that they have nothing to worry about as they attempt to navigate through today's health care system can often find themselves frustrated with unanswered questions about self-management of their chronic lung disease. These questions include:

- Which medication is covered under their health care plan?
- Which is the correct aerosol or oxygen delivery device for them?
- Are they using these devices correctly?

It is almost as if our patients need their own personal chronic lung disease concierge to lead them though some of the twists and turns in understanding and managing their health.

In fact, it is likely that you have faced similar issues yourself in your own health care management. Couple this with a busy primary care physician (PCP) with limited time to spend during an office visit. The average time allotted for a visit with a PCP is approximately 15 minutes — with about five minutes spent on the longest topic and then any remaining topics getting about one minute of attention.[1] There are more recent studies that have noted that time with the PCP is actually closer to 10 minutes.[2]

This limited time prevents the physician from completing a comprehensive physical examination as well as diagnosis, treatment, determination of compliance, development of a care plan, providing feedback on test results, and spending time with the patient in focused education and/or teaching device or self-management techniques. Couple this with the strong evidence that there will be a significant increase of patients with chronic lung disease in the years to come as well as an expected decrease in PCPs and specialists. We know there will be a need for creative approaches to care that provide a more meaningful visit to the out-patient clinic. The answer is finding the right health care practitioners to better teach patients to self manage their disease and to engage them in the process. The respiratory therapist is one such professional who can step in… but more on that later.

about the author…

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

PACT Capitol Hill Lobby Day right around the corner

In mid March the AARC and its dedicated Political Advocacy Contact Team (PACT) members and friends will descend on Washington, DC, for the 14th consecutive year to be part of our Capitol Hill Lobby Day. This year's visit (as in past years) is jointly sponsored by our state societies and the AARC. Last year there were 135 respiratory therapists from 46 states who were accompanied by 32 patients who joined us as we walked the halls of Congress. We hope to increase the number this year as we continue to gain more momentum. While most of the respiratory therapists are seasoned veterans, some newer ones are learning how to be an effective PACT member as part of an ongoing mentorship.

We are fortunate to have two PACT representatives from each state society as part of the team. This team — made up of RTs, patients, partnering professional and patient associations, and AARC staff and others will be working together again this year in a concerted effort to assure that the lawmakers of the 113th Congress are made aware of the issues that affect our patients and the respiratory care profession.

By the time you read this there will have been many communications with our members though www.AARC.org, YourLungHealth.org and *News Now* (our weekly email

update). There will also be a request for you to reach out to your Congress representative and senator as part of a virtual letter-writing campaign. We want you to be aware of how you can help make this a success.

It is important that you know what issues we will be advocating this year on Capitol Hill. We will continue to pursue Medicare Part B, which when passed will increase access for respiratory therapists and allow reimbursement for chronic disease management services in the physician's office. It was the decision of the leadership of the AARC to introduce a revised bill that was more focused on the expanded disease management role that the registered respiratory therapist can provide to patients with chronic lung diseases such as asthma, COPD, and pulmonary hypertension. This reasoning is in line with our vision for the future of the profession. In fact, our first conference on 2015 designated disease management as a primary role for the respiratory therapist of the future.[3]

This Medicare RT Access Act, once passed, will amend Medicare Part B to provide coverage of chronic disease management services furnished by a qualified respiratory therapist in the physician practice setting. As part of this arrangement, the physician would bill Medicare at a reduced fee, thus providing a savings to Medicare. Chronic lung disease management will provide Medicare beneficiaries who are suffering from chronic obstructive lung disease greater access to RTs. As with any education directed at self-management, it is essential that it be provided at the patient's level of health literacy and cooperation. Through smoking-cessation counseling, aerosol and oxygen delivery device education, and teaching of essential self-management techniques, steps can be taken by the patient to prevent or reverse an exacerbation or (at the very least) help them determine when to seek additional medical intervention should it become necessary.

Your emails, phone calls, or letters will reinforce the message that your PACT representatives will be delivering face to face with your senators and the members of the House of Representatives.

Besides hearing from respiratory therapists, it's very important that our members of Congress hear from physicians, patients, family, friends, and caregivers. Senators and representatives listen intently to voters from home and especially from those of you whose health can be improved when RTs directly assist you.

While all of us cannot be physically "walking the halls of Congress," your message of support for the profession of respiratory therapy and the patients you serve surely will make a huge impact as we reach out to our nation's lawmakers. ■

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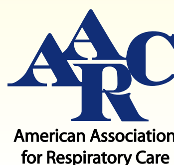

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Clinical Perspectives

Unusual Cases in Blood Gas Analysis

by Franklyn Sandusky, MBA, RRT

Over the last 30 years, blood gas analyzers have expanded their diagnostic parameters from the simple pH, PCO_2, and PO_2 measurements. The current blood gas analyzers have added capabilities of CO-oximetry, electrolytes, and metabolites. The analysis of these values in a relatively short time provides a unique insight into diagnosis and patient treatment. In the following case studies, the respiratory therapist used these added capabilities of the blood gas analysis as an essential tool in patient care.

Franklyn Sandusky, MBA, RRT, is the AARC's representative on The Joint Commission's Laboratory Professional and Technical Advisory Committee. He serves as manager of respiratory care services at Fairview Hospital in Cleveland, OH.

One autumn day the respiratory therapists responded to the ER when a trauma code was initiated. The trauma team was presented with a 64-year-old white female found unconscious at the bottom of her basement stairs. She arrived in our ER by emergency medical squad intubated, hypotensive, hypothermic, and comatose. Initial core temperature was 29°C. To increase the patient's core temperature, ultrafiltration and external warming were initiated. The RT verified endotracheal tube placement, and the patient was placed on mechanical ventilation. Initial arterial blood gases were drawn and analyzed in the respiratory blood gas lab. Initial laboratory values (listed in Table 1) included a pH of 6.48, $PaCO_2$ 10 mmHg, sodium 126 mmol/L, potassium 7.1 mmol/L, calcium 1.3 mmol/L, lactate 6.5 mmol/L, and glucose of 1400 mg/dL. The RT reported the abnormal ABG results to the trauma physician and the patient received multiple ampules of bicarbonate. She was then given dopamine, norepinephrine, and insulin drip was started. The trauma workup revealed no broken bones, internal bleeding, or head injury. The patient was placed on medical service and transferred to the ICU. For reference, serial arterial blood gas values are also shown in Table 1.

When a medical history was obtained, it indicated that the patient had Type 1 diabetes mellitus. She was not compliant with following the regimen of drug therapy prescribed by her physician or in monitoring her glucose levels. This lack of medication compliance resulted in hyper-lactatemia. Hyperkalemia results from excessive ketones in the body and dehydration during diabetic ketoacidosis. Within 24 hours, electrolyte and glucose values were within normal limits and the patient was extubated. The patient was discharged with supportive care in an attempt to gain compliance with the regimen of medication needed in the home environment. It should be noted that the patient is an eccentric who lives in the basement of her house and keeps the temperature in the 10–16°C range throughout the year.[1]

Hypothermia is defined as body temperature below 35°C, and a core temperature of below 28°C results in a medically life-threatening emergency.[2] There is a high rate of mortality with diabetic ketoacidosis and hypothermia, between 30%–60%. Diabetes can impair peripheral vascular function in the regulation of body temperature. Contributing factors of hypothermia in patients in severe diabetic coma include insulin deficit, water depletion, and low environmental temperatures. Hypothermia may also exacerbate the treatment of uncontrolled diabetes mellitus. At low body temperatures, insulin production is

Table 1. Serial Blood Gases

Values	pH	PCO_2	PO_2	Base E/D	HCO_3	% O_2 Sat.	Glucose
Normal	7.35–7.45	35–45 mmHg	80–110 mmHg	±2	22–25 mmol/L	90–100%	65–100 mmol/L
9:10 am	6.84	10	686	-29.4	0	99.9	1400
10:45 am	6.86	15	228	-28	0	99.3	1045
11:35 am	7.08	23	205	-21.6	8.6	99.8	777
12:40 pm	7.33	21	178	-14.1	13.9	100	511
1:37 pm	7.35	23	164	-12	15.4	100	398
3:00 pm	7.38	21	155	-11.6	15.8	100	340
4:02 pm	7.45	20	164	-9.4	17.6	100	296
11:00 pm	7.59	22	122	-1.1	24.4	100	147
5:15 am	7.57	21	133	-2.4	23.4	99.5	83

NOTE: Blood gas values are not patient temperature corrected.

impaired and exogenous administration is less effective.[3] The full use of the blood gas analyzer parameters and the rapid reporting of the ABG results by the RT provided timely treatment of this patient. As a final note, this patient was readmitted to the hospital in the same condition several months later. The interesting thing is the patient had the same outcome.

Case 2: Drug-induced methemoglobinemia

A 56-year-old white female had a transesophageal echocardiogram as part of a cardiac workup prior to surgery. At one hour post-procedure, the patient developed shortness of breath and cyanosis. A rapid response team code was initiated. The RT responding noted the pulse oximetry (SPO_2) was 87% on room air and placed the patient on a non-rebreathing mask at 10 L/min. The SPO_2 went up to 98%. The patient was still cyanotic and short of breath. Additionally, the patient had no recorded history of drug allergies. The RT obtained the arterial blood gas sample and noted the color of the blood was a chocolate brown. The cardiologist was informed of the color of the blood and that a reaction to the hurricane spray used to anesthetize the throat should be considered. Methylene blue was administered at 4 mg/kg via IV. At this time, the patient was responsive, still had shortness of breath, and remained cyanotic. The diagnosis of methemoglobinemia was confirmed when the main laboratory transmitted results. Additional methylene blue was given, and the patient was monitored overnight. Serial ABG results are listed in Table 2. In the patient's electronic medical record a benzocaine reaction was noted.

The most frequent manifestation of methemoglobinemia is acquired methemoglobinemia. This occurs as a result of exposure to certain chemicals, drugs, antibiotics, or nitrates. The drugs include anesthetics such as

Table 2. Serial Blood Gases

	Modality	FiO_2	pH	$PaCO_2$	PaO_2	SO_2	O_2Hb	MetHb
Normal			7.35–7.45	35–45 mmHg	80–100 mmHg	90–100%	90–100%	0–1.5%
1:45 pm	NRB mask	1.00	7.46	35	181	98	62	37.7
3:30 pm	Nasal cannula	.36	7.44	37	94	97	73	25.0
6:50 pm	Room air	.21	7.48	34	90	98	93	3.3

NOTE: Blood gas values are not temperature corrected.

benzocaine and benzene. Nitrates, used as additives to prevent meat from spoiling, have also resulted in elevated methemoglobin (MetHb) levels. Patients receiving antibiotics such as dapsone and chloroquine should be monitored with MetHb levels. Dapsone is a sulfone antimicrobial used to treat *Pneumocystis jiroveci pneumonia* (PCP) prophylaxis and immunocompromised patients.[4] Over-dosing of the drug has resulted in elevated MetHb levels.

The signs and symptoms of methemoglobinemia include: arterial blood is a chocolate color; MetHb concentrations above 1.5% lead to the development of cyanosis with a low oxygen hemoglobin saturation (O_2Hb), a normal PaO_2, and no significant cardiopulmonary dysfunction; cyanosis is unresponsive to oxygen therapy. Other symptoms include headache, fatigue, shortness of breath, and lack of energy. Also, pulse oximetry is a poor indicator of the patient's oxygenation and should be used with caution. SpO_2 values reach a plateau of 84%–86% and do not decrease further when MetHb levels exceed 35%.[5]

The treatment for methemoglobinemia is methylene blue and aggressive oxygen therapy. The "gold standard" for monitoring MetHb is CO-oximetry. However, monitoring with special pulse oximeters with MetHb and COHb displays can be used. These instruments should still be correlated with the blood gas analyzer.

Respiratory therapists' unique understanding of blood gas results and ability to assess patients make them valuable members of trauma and rapid response teams. The increased capability of blood gas analyzers and rapid analysis provide the RT with a powerful tool. The RT's identification and reporting of abnormal results can be lifesaving for our patients. ■

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Clinical Perspectives

Evaluation of Post-Deployment Respiratory Symptoms in Military Personnel

by Michael J. Morris, MD, FACP, FCCP

Numerous concerns have been raised about the health effects due to deployment of military personnel to Southwest Asia (SWA) in support of Operations Enduring Freedom/Iraqi Freedom (OEF/OIF) over the past 10 years. Commonly encountered post-deployment health issues have included post-traumatic stress disorder, traumatic brain injury, and various other long-term effects of traumatic injuries. The effect of deployment on respiratory health of military personnel is an ongoing issue reviewed and discussed extensively over the past several years.[1] The ongoing military conflicts are unique due to environmental exposures from suspended geologic dusts, extensive use of burn pits for waste disposal, and several localized exposures such as the 2003 sulfur mine fire in Mishraq, Iraq. Numerous agencies within the Department of Defense (DOD) have been actively studying the epidemiological and clinical implications of these respiratory exposures.

Ongoing exposure to particulate matter

Military personnel in SWA have been exposed to high levels of airborne particulate matter (PM) since early in OEF/OIF as described by ongoing environmental sampling by the U.S. Army Public Health Command. High levels of ambient PM are ubiquitous and generally exceed environmental, occupational, and military exposure guidelines.[2] The Assistant Secretary of Defense for Health Affairs chartered the Joint Particulate Matter Working Group in 2005 to investigate potential health issues related to this ongoing PM exposure. Augmented ambient PM was collected from 15 locations throughout the Central Command and extensively characterized the physical, chemical, and mineralogical properties.[3] The 2010 Armed Forces Health Surveillance Center report concluded that there was no evidence of increased risk for respiratory diseases associated with exposure to burn pit emissions.[4] The 2011 Institute of Medicine report likewise utilized the available data and concluded there was insufficient evidence of an association between exposure to burn pit combustion products and chronic disease outcomes in the populations studied.[5] One confounding factor in evaluating respiratory symptoms in deployed military is the overall higher rate of tobacco use and increased use during deployment. A survey of deployed soldiers found 58.3% of males and 52.1% of females were using tobacco during deployment while 25.4% of males and 48% of females increased tobacco use during deployment.[6]

There are documented increases in non-specific respiratory symptoms such as cough and dyspnea during SWA deployments based primarily on survey data. Survey research five years after the conclusion of the First Persian Gulf War noted a modest correlation in self-reported symptoms of asthma and bronchitis in a cohort of 1,560 veterans, but the findings did not correlate with modeled exposures.[7] Initial results from the Millennium Cohort Study conducted by the U.S. Naval Medical Research Center in a survey of 15,000 redeploying military personnel from Iraq and Afghanistan estimated that 69% of deployed personnel reported experiencing respiratory illnesses, of which 17% required medical care.[8] Further data from this study on respiratory health found that deployed personnel had a higher

about the author...

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rate of newly reported respiratory symptoms than non-deployed personnel (14% vs. 10%), with similar rates of chronic bronchitis/emphysema (1% vs. 1%) and asthma (1% vs. 1%) observed.[9]

Strategies outlined

In February 2010, a roundtable meeting of DOD, Veterans' Administration (VA), and academic researchers and physicians was convened at the National Jewish Center to discuss deployment-related respiratory health and to outline general strategies forward. A DOD pulmonary working group was established at the U.S. Army Center for Environmental Health Research (USACEHR) at Fort Detrick, MD, and met initially in June 2010 and again in December 2011. Numerous clinical, epidemiological, and interesting studies were developed within the DOD to address issues surrounding respiratory symptoms and lung disease related to deployment.

In addition, with increased environmental surveillance in theater, the DOD pulmonary working group recommended the pathogenicity and toxicity of SWA dusts be further evaluated. Laboratory work conducted with PM dust from Camp Buehring by the Navy Environmental Health Effects Laboratory showed no long-term toxicity in exposed rats, and two-week inhalational exposures of rats to filtered Camp Victory surface soil by the Navy Environmental Health Effects Laboratory did not induce notable adverse responses.[10] These studies are also consistent with independent rat studies using intra-tracheally instilled PM_{10} from Camp Victory by the USACEHR and National Institute for Occupational Safety and Health. There was evidence of acute inflammation shortly after instillation, but limited effects in the lung parenchyma were observed 150 days after exposure.

Published data on deployment-related acute and chronic respiratory disease are limited.

> Investigating deployment-related respiratory symptoms and providing comprehensive state-of-the-art treatment for all redeploying personnel continues to be a priority.

Studies limited but ongoing

Despite accession restrictions for asthma, it remains a significant problem in military personnel that is similar to the general population. The extreme climate conditions and high PM levels in SWA could potentially contribute to poor asthma control and increased exacerbations. A survey of redeploying military demonstrated that 5% of troops deployed to SWA reported a previous diagnosis of asthma. Notably, both asthmatics and non-asthmatics reported significantly increased respiratory symptoms during deployment compared to pre-deployment.[11] Data from a VA review based on ICD-9 diagnostic codes for asthma in deployed military suggested a higher prevalence of new-onset asthma in deployed personnel (6.6% vs. 4.3%), but the study did not report pulmonary function testing or adjust for smoking rates.[12] However, an ongoing DOD review of medical records for active-duty personnel undergoing physical evaluation boards for asthma found that 54% never deployed, 22% deployed with an existing diagnosis, and 24% were diagnosed post-deployment.[13] Similar findings have been documented for active military with COPD/emphysema.

A case series published in 2011 reported unusual findings among deployed soldiers from Fort Campbell, KY, who had pathologic evidence of constrictive bronchiolitis on surgical lung biopsy.[14] Most of the soldiers had symptoms with high levels of exertion, had normal pulmonary function tests (PFTs) and high-resolution CTs, did not undergo a comprehensive pulmonary evaluation, and nearly 60% underwent surgical lung biopsy. The patients comprising the case series had varied deployment exposures, and less than half reported sulfur fire exposure. An epidemiologic comparison demonstrated no increase in post-deployment medical encounters among personnel exposed to the 2003 Mishraq sulfur fire.[15] Performing a surgical lung biopsy in the absence of supporting clinical data is controversial, as is the clinical diagnosis of constrictive bronchiolitis. DOD pulmonologists do not concur with this aggressive approach due to lack of definitive clinical data and the incomplete patient evaluations. Blinded review of the biopsy samples from the Vanderbilt study is currently being undertaken to validate the pathologic findings with support by DOD funding.

Numerous clinical studies on post-deployment respiratory symptoms are actively being conducted at San Antonio Military Medical Center. A retrospective review of all pulmonary cases in active duty military at DOD facilities is specifically evaluating the relationship of deployment on common pulmonary conditions such as

asthma, COPD, interstitial lung disease, and sarcoidosis. The Army also maintains a registry for military personnel with pulmonary conditions potentially related to deployment. The prospective "Study of Active Duty Military for Pulmonary Disease Related to Environmental Dust Exposure (STAMPEDE)" has been evaluating redeploying soldiers with new respiratory complaints and found minimal evidence for chronic lung disease based on imaging, PFTs, and bronchoalveolar lavage.[16] Additional studies to include pre- and post-deployment spirometry in soldiers from Fort Hood, the utility of screening spirometry in new military recruits, and a comprehensive evaluation of post-deployment dyspnea have recently been initiated. This active clinical research program is being jointly conducted with the VA to evaluate pulmonary disease in the DOD population and further evaluate links to deployment-related exposures.

The health of all military personnel is an important mission for all DOD and VA medical treatment facilities. Investigating deployment-related respiratory symptoms and providing comprehensive state-of-the-art treatment for all redeploying personnel continues to be a priority. ■

DISCLOSURE

Dr. Michael J. Morris serves on the speakers' bureau for Spiriva, with Pfizer Inc and Boehringer Ingelheim Pharmaceuticals Inc.

DISCLAIMER

The opinions in this manuscript do not constitute endorsement by Brooke Army Medical Center, the U.S. Army Medical Department, the U.S. Army Office of the Surgeon General, the Department of the Army, Department of Defense, or the U.S. Government of the information contained therein.

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AARC President George Gaebler Outlines His Vision for the Future

2013–2014 president sees great things ahead for the profession

by Debbie Bunch

9 Goals of

1. Evaluate the transitional needs to meet the competencies necessary to develop the "Respiratory Therapist for 2015 and Beyond" based on the expected needs of respiratory care patients, the profession, and the evolving health care system.

When George Gaebler, MSEd, RRT, FAARC, first entered the "inhalation therapy" program at Upstate Medical Center in Syracuse, NY, back in 1972, the profession was still in its formative years. Like many of his peers, he started out as an inhalation therapy tech, but thanks to a thirst for knowledge that led him to further his education, he quickly moved up the ranks. Now, after earning a master's degree in education and serving for many years as director of respiratory care at Upstate Medical University and Golisano Children's Hospital in Syracuse, our 2013–2014 president sits at the pinnacle of his career, ready to lead his professional organization as the nation continues to grapple with the realities of health care reform. He outlined his vision for the future during his inaugural address at AARC Congress 2012 last November.

Seizing the opportunities

"We can expect many changes over the next three to five years due to the Patient Protection and Affordable Care Act," said Gaebler. "In many cases, respiratory therapists will be at the forefront of disease management as long as we can seize the opportunities as they become available in hospitals and other care sites."

He plans to help RTs achieve that goal throughout his presidency, particularly by furthering the work already done by the "Respiratory Therapist for 2015 and Beyond" conferences convened several years ago to identify the knowledge, skills, and attributes RTs will need to succeed in the 21st century.

"We have been here before when the profession moved to associate's degree entry level in the mid-1990s," he reminded his audience. Upgrading the entry level helped to raise the stature of RTs in the nation's hospitals and other care settings then, and he believes a similar transition may be necessary today to position RTs for the coming explosion in disease management roles. Indeed, statistics suggest many respiratory therapists have already seen the "handwriting on the wall" and furthered their own education. "Some survey and legwork thus far has shown that about 46% of therapists currently possess a bachelor's degree or higher," said Gaebler.

the New AARC President

2. Continue to develop and execute strategies that will increase membership and participation in the AARC both nationally and internationally.

3. Promote patient access to RTs as medically necessary in all care settings through appropriate vehicles at local, regional, and national venues.

4. Continue to promote the patient and his/her family's needs by being the advocate for those patients with respiratory disorders.

5. Continue to advance our presence in the international respiratory community through activities designed to address issues affecting educational, medical, and professional trends in the global respiratory care community and to advance advocacy for the patient.

6. Promote the access of high-quality continuing education to develop and enhance the skill base of current practitioners to meet the future needs of our profession.

(*continued on next page*)

Maximizing potential

In order to maximize the potential of the RT workforce, Gaebler says the Association will redouble its efforts to ensure patients have access to respiratory therapists in all care settings, an endeavor that has already seen much progress thanks to the stronger ties the AARC has fostered with health officials. "The payers and regulators have become much more connected to the AARC in the last couple of years," he told his audience, noting the AARC is increasingly at the table when regulations are written, and we are getting guidance for new bills in Congress from Medicare.

Research groups are increasingly looking to the AARC, as well, to take part in work groups and other entities aimed at fleshing out best practices in respiratory care; and a major overhaul of the Association's Clinical Practice Guidelines is demonstrating our commitment to evidence-based care. To ensure RTs are prepared for the changes coming their way, Gaebler says the Association will maintain a strong emphasis on providing high-quality continuing education for its members and will continue with its mission to encourage RTs to advocate for their patients at every level of the system and raise awareness of RTs among the general public.

Gaebler notes a growing international presence for the profession being spearheaded in large part by our science journal is adding to the cumulative effect of these efforts. "International activities are expanding all over the world, with the recognition that Respiratory Care is the face of the respiratory therapist and the state of the art in respiratory care around the globe," he said.

Back to the future

All of this led Gaebler back to what he believes will be the driving force behind change in the profession during his presidency: 2015 and Beyond. The AARC Board of Directors is deliberating the conference recommendations, so the key question is how to transition the profession from where it is today to where we need to be in the future. While that question has yet to be fully answered, he believes with the right knowledge, skills, and attributes,

"We can expect many changes over the next three to five years due to the Patient Protection and Affordable Care Act."

— George Gaebler, MSEd, RRT, FAARC

RTs will be a "slam dunk" when it comes to providing hospitals with the respiratory disease management services they are going to need to reduce hospital readmissions and keep a closer eye on the bottom line. Opportunities abound as hospitals move to decrease the cost of the provision of care through reimbursement changes that make outcomes the measuring stick for the quality of the respiratory care service they provide.

Indeed, he envisions a future in which RTs will lead the way not only in disease management but also in respiratory protocols and in case management for ventilator-associated pneumonia, ventilator care, length of stay, and discharge planning. "Expect to see respiratory therapists in the home, being paid for by hospitals working to shorten length of stay and assure that readmissions do not occur in 30 days for the targeted diagnoses we treat," he said. "Indirect or 'soft' reimbursement will be the norm in many cases."

Gaebler closed out his inaugural address by emphasizing that the Affordable Care Act is going to foster large changes in the nation's health care system at a much faster rate than many people expect. Hospitals will be at risk — which will put all other providers at risk — and that risk will translate to a new willingness to adopt cost-saving and quality-enhancing practices that previously were a hard sell. "I believe the sky's the limit for respiratory therapists," said our newly installed president. "Protocols will be passed when they couldn't be passed before. We will finally move to doing only value-added respiratory care for our patients. And we will most certainly see a major move to respiratory disease management." ■

7. Maintain and expand relevant communication and alliances with key allies and organizations within our communities of interest.

8. Expand efforts to obtain research funding.

9. Increase and enhance activities to increase public awareness of RTs and their role in the treatment of respiratory disorders. ■

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Adult Critical Care Credential

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NBRC exam documents advanced skill set

by Keith D. Lamb, RRT

Our colleagues in the ICU have specialty credentials demonstrating their expertise in adult critical care. Now we do, too.

Respiratory therapists who deliver care in ICUs or other critical care settings work as part of a multidisciplinary team. Until last summer, however, we were at somewhat of a disadvantage when it came to documenting our expertise in the adult critical care arena. While the physicians and nurses we work with every day had their specialty credentials, we were limited to our generalist credential, the Registered Respiratory Therapist, or RRT.

All that changed for the better last summer when the National Board for Respiratory Care (NBRC) began offering the Adult Critical Care Specialist (ACCS) Examination for members of our profession. The new exam went live

on July 17 as the initial exam takers sat for the test at NBRC testing centers across the country. Respiratory therapists who passed the test are now displaying the "RRT-ACCS" credential behind their name. More importantly, they are demonstrating to their colleagues in the ICU and patients that they have the specialized skills and knowledge necessary to deliver the highest quality of care to the most critically ill patients.

Long time in the making

The RRT-ACCS credential was a long time in the making. The idea for the exam dates back to around 2004–2005 when RRTs working in the ICU first raised the issue of a credential that would roughly correspond to specialty certification for nurses offered by the American Association of Critical-Care Nurses. Noting that neonatal-pediatric RTs had already bolstered their position on the NICU team through specialty credentialing, these therapists felt strongly that their position on the adult ICU team would be similarly strengthened by the opportunity to earn a specialty credential of their own. They took their thoughts to leaders at the AARC, who brought the idea to the NBRC. The NBRC agreed to investigate the possibility of an exam leading to an adult critical care credential for therapists. The results of their research indicated that there was a definite need for the specialty credential.

In order to garner support from the larger respiratory care community, the NBRC sought input from the AARC, American College of Chest Physicians, the American Society of Anesthesiologists, and the American Thoracic Society throughout the development of the exam. This input ensured that the exam would reflect the needs of both therapists and the physicians they work

with, and would also be a valuable credential recognized and respected by employers, colleagues, and patients.

Reaching past the RRT

Since everyone who sits for the ACCS exam has already earned the RRT credential, the exam reaches past the standard skills and knowledge measured by the RRT exams to cover topics specific to the care of patients dealing with life-threatening conditions. Not surprisingly, you can expect to see questions related to respiratory critical care, such as managing airways, administering specialty gases, managing ventilation, and delivering pharmacologic agents. But the exam goes farther, too, addressing general critical care areas ranging from assessing patient status and changes in status, to recognizing and managing patients with infections and sepsis, to managing end-of-life care, and much more.

The NBRC also wanted to ensure RRTs who take the exam have a good understanding of specific respiratory conditions that land a patient in critical care as well, and thus a secondary set of test specifications covers all of the key conditions seen in the typical ICU. Acute lung injury/acute respiratory distress syndrome, asthma, cystic fibrosis, COPD, and other respiratory patients are covered in detail, but so are those whose primary condition is non-respiratory in nature, such as patients recovering from bariatric surgery and those being treated for psychiatric concerns.

A second set of secondary test specifications addresses another common theme in critical care settings — the question of ethical care. The rationale behind the inclusion of these types of questions goes back to the fact that the exam is designed to elicit a specialist credential. Specialists can and should be aware of ethical issues involved in the care they deliver, and a specialty exam can and should test practitioners on their ability to recognize and deal with those issues.

Test-taking essentials

So, what does it take to sit for the new exam? According to the NBRC, respiratory therapists who have earned the RRT credential and have one year of full-time clinical experience working in a critical care setting are eligible. The NBRC defines a "critical care setting" as an ICU, emergency room, post-anesthesia recovery unit, long-term care setting, or other site involving the care of critically ill patients. "Full time experience" is defined as 21 hours per week, per calen-

Exam Takers Speak

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Who: Deborah Hendrickson, BS, RRT-ACCS

What: Respiratory Therapist

Where: Trauma Life Support Center, University of Wisconsin Hospitals and Clinics, Madison, WI

Why she took the exam: I fully believe that therapists who continue to challenge themselves with higher degrees and advanced credentials will provide better outcomes for our patients and will advance our profession.

How she prepared: I took the free practice exam on the NBRC website until I got every question right and then took the 150-question practice exam that can be purchased from the NBRC.

What she thought of the test: The exam asks you to step up as a clinician — you must think as an adult critical care specialist, not just as a respiratory therapist.

How it will help her career: Passing this exam validates you as an advanced clinician. I shared it both in the RT department and in the trauma/critical care ICU I work in. Reaction was super positive, and now many of my RT colleagues are interested in taking the exam, too.

Who: Julie Jackson, BAS, RRT-ACCS

What: Respiratory Care Manager

Where: Iowa Health Des Moines, Des Moines, IA

Why she took the exam: I felt that since I was the adult critical care supervisor for RT at our facility, it would only make sense to take an exam that would demonstrate my abilities and knowledge to care for patients in the adult ICU.

How she prepared: I prepared by reviewing the course outline to see what was going to be tested. For the areas that I knew I was weak in, like nutrition, I spent time "rounding" and speaking with colleagues to gain more knowledge.

What she thought of the test: The exam was exactly what I expected it to be: challenging.

How it will help her career: In our facility, I think having this exam will put the RTs on the same level playing field as the nurses who have the CCRN. When I told our lead pulmonologist that I was going to be taking the exam, he told me that he thought it was great that we were going to have an exam for RTs who specifically work in adult intensive care because the people who do that require a different skill set than others.

dar year working under medical supervision in one of those settings.

Preparing for any credentialing exam is a daunting proposition, but the NBRC has resources you can use as you get ready for test day. Web-based self-evaluation examinations that simulate the ACCS exam experience are available and are highly recommended for anyone about to embark on the real thing. The self-evaluation is a great way to begin your preparation for the exam, as it will show you your existing strengths and point out any weaknesses that you should address before heading out to the testing center.

The ACCS exam can be taken at one of more than 180 Assessment Centers located throughout the United States and is administered by computer Monday–Saturday. All of the exam information, including instructions for applying online, can be found on the NRBC website at www.nbrc.org/pages/ACCS.aspx.

Career booster

As a respiratory therapist who works primarily with critically ill and injured patients, the ACCS exam is definitely on my radar screen. There is a lengthy application process with the NBRC, so I am preparing for it now and expect to sit for the exam in the near future. To me, the exam represents another opportunity to document my adult critical care skills to my colleagues in the ICUs at my hospital, and I believe it will help to further my career by showing both my department leadership and my hospital administration that I am ensuring that I have all the skills I need to deliver safe and effective care to our patients.

I am hoping that many of my colleagues in adult critical care feel the same. Like many of you, I am looking forward to the day when the "RRT-ACCS" becomes as ubiquitous in respiratory care as the "RRT-NPS" is today. ■

about the author…

Keith D. Lamb, RRT, is an RT II in surgical critical care at Christiana Care Health System in Newark, DE, and chair of the AARC Adult Acute Care Specialty Section.

the Story" at **www.aarc.org/members_area/aarc_times**

Who: J. Brady Scott, BSRT, RRT-ACCS

What: Clinical Education Coordinator

Where: Rush University Medical Center, Chicago, IL

Why he took the exam: Two reasons: For the personal satisfaction of passing an advanced level exam and because this advanced credential is required of our supervisory-level staff.

How he prepared: I had taken a critical care class a few months prior to the exam. Immediately prior to the exam, I prepared by taking the self-assessment exam.

What he thought of the test: I thought the exam was very challenging. It covered way more than mechanical ventilation.

How it will help his career: The credential is being recognized in our institution and is a condition that one must meet to be considered for an advanced-level position.

Who: Carl Hinkson, MS, RRT-NPS-ACCS, FAARC

What: Assistant Manager, Respiratory Care

Where: Harborview Medical Center, Seattle, WA

Why he took the exam: I chose to take the exam to demonstrate my competency in adult critical care.

How he prepared: I took the free practice test available at the NBRC website as well as the self-assessment examination. For the areas I needed to strengthen, I looked up review articles.

How it will help his career: The ACCS credential demonstrates the learning and experience that I've been able to achieve beyond the classroom environment. I also believe that earning the ACCS credential shows a commitment as a professional.

Who: Edita Meksraityte, MS, RRT-ACCS

What: Level 3 Therapist

Where: Rush University Medical Center, Chicago, IL

Why she took the exam: I am a recent Master's respiratory program graduate from Rush University in Chicago. Our respiratory department went through restructuring, and I was promoted to a level 3 therapist. ACCS is in my job description now as a requirement.

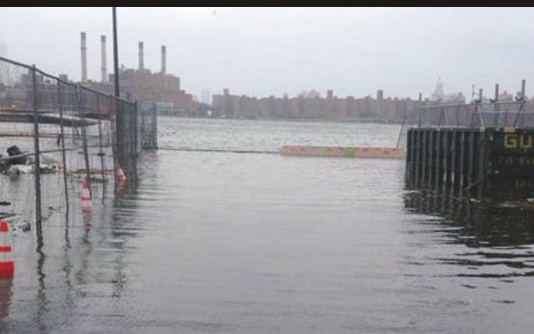
How she prepared: I used the practice exam that was offered for free. That gave me a good idea of what to expect on the real exam.

How it will help her career: As noted earlier, the ACCS is now required for my job description. I am proud of my profession and my new credentials.

Respiratory therapists throughout New York City made sure their patients were well cared for during the historic storm.

Freeze Frame: One Month

NYC THERAPISTS WEIGH IN ON



Later
SUPERSTORM SANDY

By Thomas J. Johnson, MS, RRT, and Camille Chin, MPH, RRT

Aftermath (Dec. 2, 2012)

A month after Superstorm Sandy made landfall near Atlantic City, NJ, the impact of this 1,000 mile-wide storm is still being felt by millions in the region. In New York City, five major hospitals are still closed. Two trauma centers (Bellevue and Coney Island Hospital Centers) are dark. The city's financial area and Chinatown lost the medical services of New York Downtown Hospital. For the city's veterans, getting health care from the U.S. Department of Veterans Affairs (VA) means a trip to the Bronx or Fort Hamilton Brooklyn, since the VA's Manhattan Harborview Hospital is undergoing extensive repairs. New York University Langone Medical Center's Tisch Hospital is boarded up, with only HAZMAT, FEMA, and clean-up crews allowed on the premises.

Before the storm

Like hospitals anywhere in the nation, our hospitals complied with city, state, and federal regulations regarding generators. The NYU Medical Center, Bellevue, Harborview VA, NY Downtown, and Coney Island are located in flood zones. All had backup generators, and all had a second generator located on a higher floor. At Bellevue, the backup generators were located on the 13th floor. However, fuel and fuel pumps for generators were placed in basements rather than with the backup systems.

In anticipation of the storm, Harborview VA and New York Downtown evacuated. Located in lower Manhattan, New York Downtown anticipated the loss of the power grid and was concerned about its ability to continue to operate solely on backup power. Respiratory Care Department Director Eugene Benjamin, RRT, shared the rationale. "We managed 9/11 well enough. This time we knew it was different — we knew our generator's fuel would last at least 42 hours, but it was a real possibility that we would not be resupplied that necessitated evacuations."

Still, the hospitals kept caring for patients up until the last minute. "As we were evacuating, a woman in labor came in," recalls Benjamin. She had nowhere else to go and time was of the essence. "We're the only hospital south of 14th Street," explained Benjamin.

Bellevue Hospital remained open but made preparations in anticipation of the storm. The respiratory department made sure enough oxygen tanks were ordered and placed in patient areas. A census was taken of all ventilator and trach-

GOING THE DISTANCE

by Debbie Bunch

An avid cyclist, Deborah Paris, RRT, CPFT, bikes to her job as a staff therapist at Coler-Goldwater Specialty Hospital and Nursing Facility on Roosevelt Island in New York City most days of the week. Doing so, she covers the 15-mile distance in a little under an hour. That training was put to the test after Superstorm Sandy devastated the area.

Sandy Paris took advantage of her cycling skills to get back and forth to the hospital after Sandy struck.

Not once, but twice during the aftermath of the largest storm to ever form in the Atlantic basin, Paris hopped on her bike and headed through the rain-soaked and storm-damaged streets to make sure her chronic care ventilator patients would receive the care they needed.

Powerful and scary

"Sunday, Oct. 28, 24 hours before the strength of the storm hit, my husband dropped me off at work at 4 p.m.," recalls the AARC member. "All public transportation was suspended and did not resume until a week later." Along with other RTs on staff, Paris remained at the facility for the next three days, ensuring continuity of care for patients. "The storm was very powerful and scary. We could see the river rising and flooding over the wall," she says. "We were constantly worried. Mother Nature had her own agenda, yet I believe we prepared for the unexpected." Thankfully, the hospital's backup generators performed flawlessly during and after the storm, and the facility never lost power.

collar patients throughout the hospital, which for them was on the low end. There were a total of six ventilators in all four of the ICUs, three in the neonatal ICU, and one in the pediatric ICU. They checked the ventilators to be sure they were plugged into red outlets in the event of a power failure. In terms of staffing, RTs who were scheduled to come in on Sunday night and Monday morning were told to prepare to stay over their normal shift.

The Bellevue siege

Sandy struck on Mon., Oct. 29, yet Bellevue did not evacuate its last two patients until the following Saturday. The RTs at Bellevue performed under the most exhausting, difficult, and austere conditions you could imagine.

Located on First Avenue and East 26th Street within 200 meters of the East River, Bellevue serves NYC as a major trauma center. At approximately 7:45 p.m., Bellevue's neighbor hospital, NYUMC-Tisch on East 33rd Street, experienced a first power failure. Shortly thereafter, at 8:30 p.m., a large transformer explosion at the Con Edison plant on 14th Street effectively blacked out Bellevue and a major portion of Manhattan.[1] With the Bellevue basement flooding, RTs began cohorting ventilator patients to areas still with electricity and coordinating the evacuation of pediatric newborn patients to Metropolitan Hospital on First Avenue and East 97th Street.

When the main power went out, the hospital switched to generators, which are kept on the 13th floor. However, the fuel pumps used to supply the generators were located in the basement, which by this time was under 2.5 feet of water. National Guard troops arrived to help in a five-gallon fuel bucket brigade up 14 floors.

At approximately 10 p.m. Monday night, at the height of the storm, Bellevue officials made the decision to evacuate their first ventilator patient from the PICU. All of the remaining ventilated patients were moved to the southwest wing of the hospital where most of the power was generated.

At 9 a.m. Tuesday morning, the NICU and the remaining ICUs began to evacuate their ventilated patients to other New York hospitals. At 1 p.m., Bellevue made the decision to evacuate all of the remaining patients. Due to the shutdown of the elevators, patients were transported down the stairwell with the help of the National Guard soldiers. By the end of the day, only two patients remained: a heart patient on BiVad, NO, and mechanical ventilation, and a 550-pound mechanically ventilated patient. Both were successfully evacuated on Nov. 3.

When the worst was over, Paris hitched a ride back home with her husband, who had enough gas left to pick her up. By then, however, the couple was out of fuel and gas lines were a mile long. Public transportation had been suspended, so after getting a night of rest in her own bed, Paris hopped on her bike and rode back to work. "The streets on the way were dark, empty, and littered with debris of all kinds — live wires, trees down, cars pointed in all directions, boats where they shouldn't be," says Paris. "It took me at least an hour and a half through the damp and rain-filled streets."

Getting back to her patients, however, was the top priority; and she says the same was true for her fellow therapists. "During this period, there were 10 RTs, which is the same complement of therapists on a normal day." Of course, nothing was normal after the storm. "Everyone pitched in and served food, delivered laundry, and manned the phones as needed," she says. "We slept in shifts."

Deborah Paris' hospital fared well during the storm.

Teamwork pays off

Paris says Goldwater typically has about 85–100 chronic care ventilator patients, and when Hurricane Sandy struck there were about 90 in the facility. While care was able to proceed unimpeded, Paris and everyone else on staff scrambled to deliver the extra attention their patients needed to cope with the crisis. "Most residents were watching events unfold with great interest," she says. "We did a lot of listening and comforting during the days following the storm." Ventilator patients kept up with the news when the televisions were working, and staff used their own cell phones to call patients' families when the phones were out to make sure they were kept up to date on their loved ones.

Paris credits the hospital's spirit of teamwork for keeping everyone calm during the ordeal. "The respiratory staff worked very closely with the nursing staff in an incredible synchrony," she says. "Our administrators were working right alongside clinicians. Our managers really led by example." Auxiliary staff — housekeepers, laundry, food service, and engineers — also stepped up to keep everything running as smoothly as possible. "The storm brought out the best in everyone." Her last bike ride in the storm came a couple of days later when she rode back home to pick up some personal supplies, then headed back to the facility. "Our patients are long term, and we know them and their families on a first-name basis. What kept me going was not only the resilience of our staff, but the dignity and resilience of our patients." ■

What went right, what went wrong

The RTs at Bellevue became extremely overwhelmed and physically drained during the evacuation process. AARC member Emmanuela Romain, BS, RRT-NPS (lead therapist at Bellevue), and her RT colleagues made over 40 patient transports. Often, National Guard soldiers carried patients or transport ventilators, assisting the RTs. But even though the evacuation presented a significant challenge to everyone involved, health care professionals still managed to work together. Patients were successfully evacuated without any casualties. Romain says, "Even during the chaos, RTs managed to collaborate and work together. It brought everyone together and also mended us as a department."

On the downside, Bellevue was not expecting many of the events that occurred within the hospital. They did not expect to have a power failure that, in turn, would cause a failure of the pumps used to power the backup generators on the 13th floor. Vacuum systems also failed. No manual suction units were available, which meant RTs were not able to suction patients if needed.

After returning from transporting the first patient from the PICU, Romain was assigned to set up two ventilators for a set of adult female twins who came into the emergency department. But since the power outlets in the ED were not receiving power by the generators, she was not able to place these patients on the ventilators. "I have never felt so useless to a patient until that moment," she says. Immediately she informed the ED director it was necessary to transport the patients out of the hospital.

The good news is, cohorting patients worked. Placing all ventilator and critically ill patients in the same hospital area made a difference. Teamwork between RTs, nurses, and the National Guard facilitated care, as well.

Lessons learned

There are many lessons to be learned as a result of Superstorm Sandy that would help hospitals make better preparations in the event that history repeats itself. Storm disaster plans considered that it would be a Category 4 or 5 hurricane with a storm surge and wind to seriously damage the city. However, computer modeling and tabletop exercises did not take into account the synergism of tide and phase of the moon that, combined with a slow-moving, large Category 1, would produce a 13.88 foot surge along with winds of 74–95 mph. Our experience, therefore, suggests that:

- Generator checks should be performed regularly according to specific guidelines for the hospital. Generators require fuel, and the fuel and its pumps must be placed at or near the backup generators.

- Non-electrical suction and aluminum oxygen cylinders with 50 psi power take-off are essential.

- Storm warnings are usually issued 72 hours in advance. Last-minute preparations must begin at that point. Staffing should be increased to ensure enough manpower to handle all of the patients in the event of evacuation.

- Staff hygiene, food, and water needs have to be figured into the plan.

- Alternative transportation for staff who may be called in to support facility evacuation or recovery must be considered. NYC public transportation was closed for seven days; and even as we write this article in early December 2012, several subway lines and stations are not operating.

Aftermath in the city

Despite the best efforts to mitigate the storm's effects, NYC subways are struggling to provide public transportation for millions. Some flooded stations and tunnels are not restored. The current cost estimate to repair subway trains, stations, and tunnels is $4.75 billion, even with $950 million in FEMA dollars.[2]

Respiratory care departments in other NYC hospitals are reeling with displaced patients from those hospitals. Skilled nursing facilities also evacuated during the storm. At Brooklyn's Lutheran Hospital, the ICU and sub-critical care units are 100% occupied. In Brooklyn, Maimonides, Downstate, and Methodist Hospitals are asking for RT overtime and hiring per diem staff.

In Manhattan, Mt. Sinai's neonatal department has all the evacuated babies from NYUMC-Tisch Hospital. Ambulances initially took these patients to St. Luke's Hospital, New York Presbyterian/Weill Cornell Medical Center, and even Long Island Jewish Hospital in Manhasset. Of NYU's 215 adult patients, 26 were evacuated to Memorial Sloan Kettering Cancer Center further uptown.[3]

Emergency care is now at a premium. On the east side of Manhattan, south of 60th Street, only Beth Israel Medical Center can provide services. Lenox Hill Hospital on the east side of Manhattan hired NYU nurses and RTs, plus they gave physicians "privileges" to handle the increased number of patients. On the west side of Manhattan at 59th near Central Park, the ED of St. Luke's-Roosevelt is managing a significantly higher volume of patients because Bellevue's ED is not expected to re-open until mid-December. At Lenox Hill Hospital, the bed occupancy was 50% prior to Sandy. With evacuated patients and displaced new patients, the occupancy is over 66%. ■

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3. Evans H, Burke K, Cunningham JH, Connor T. Bellevue Hospital evacuating patients after power outage. New York Daily News; Oct. 31, 2012

about the authors...

Thomas J. Johnson, MS, RRT, is assistant professor and program director of the respiratory care division at Long Island University in Brooklyn, NY.

Camille Chin is a respiratory therapy supervisor at Forest Hills Hospital-North Shore Long Island Jewish Health System, in Forest Hills, NY.

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RC Currents

IN THE NEWS

AARC Now Accepting Applications for the 2013 International Fellowship Program

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

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

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

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

AARC Pushes for COPD Awareness as CDC Releases Report

The AARC called for respiratory therapists to get more involved in COPD awareness programs after the release of a Centers for Disease Control and Prevention (CDC) report that shows COPD is a health crisis that deserves more focus and attention (www.cdc.gov/mmwr/preview/mmwrhtml/mm6146a2.htm?s_cid=mm6146a2_w).

The CDC's Behavioral Risk Factor Surveillance System included COPD in its 2011 survey for the first time ever, in an attempt to establish its U.S. prevalence. The data demonstrate COPD's nationwide impact is severe but not consistent from state to state.

Nearly 500,000 individuals were surveyed in 2011. In addition to the prevalence question, 21 additional states included another five-question module that described diagnostic testing, impact on quality of life, and utilization of health care services as a result of COPD.

"The ability to quantitate the prevalence and impact of COPD is an important first step in raising public awareness of the third-leading cause of death in the United States," says George Gaebler MSEd, RRT, FAARC, president of the AARC.

"We applaud the CDC and the National Heart, Lung, and Blood Institute for initiating this survey to increase focus on COPD and provide this valuable data in hopes that it will create greater awareness and involvement in community advocacy and a broader attention from policymakers in the battle against this debilitating disease," concludes President Gaebler.

Thomas Kallstrom MBA, RRT, FAARC, executive director of the AARC, states "The ability to share this data upon its release with our 52,000+ members is significant to the respiratory care profession so that they can better serve as an advocate for their patients and families to receive the necessary screening, diagnosis, and care for COPD to minimize its negative impact."

Kallstrom concludes, "The CDC report highlights the need to rally the respiratory community to continue its mission as it relates to COPD diagnosis, management, and care. AARC has been conducting COPD screening events nationwide for years with its partners at the COPD Foundation to bring greater awareness and advocacy to this disease. This data provides solid proof to what AARC and its partners have been advocating for years — better focus, the need to screen individuals at risk, appropriate diagnosis by spirometry, and hopefully improved management and care of individuals with COPD that lead to improved outcomes and a better quality of life."

As part of its mission, the AARC has pursued the ability "to serve as an advocate for patients, their families, and the public" for more than six decades. One such recent effort of public outreach over the past several years is its involvement from the beginning in the DRIVE4COPD campaign (www.DRIVE4COPD.org), an effort to raise public awareness, and an education campaign for COPD with our partners at the COPD Foundation (www.COPDFoundation.org). ■

International Fellowship Program Looking for City Hosts

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

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

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

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

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

Educators: Help Recognize Outstanding Students!

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

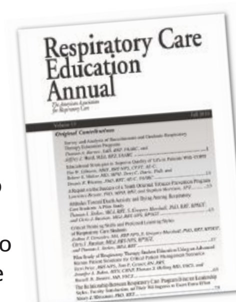
The ARCF offers awards to students who are currently enrolled in accredited respiratory care educational programs and to respiratory therapists who are pursuing an advanced degree. Awards include registration and airfare to attend AARC Congress 2013, to be held Nov. 16–19 in Anaheim, CA.

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

Request for Open Forum Abstracts for AARC Congress 2013

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

Respiratory Care Education Annual Call for Papers



The AARC will publish Volume 22 of the "Respiratory Care Education Annual" in the fall of 2013. This refereed journal is committed to providing a forum for research and theory in respiratory care education and is listed in the "Cumulative Index to Nursing and Allied Health Literature."

The AARC Education Section invites educators to submit papers for consideration. Preference will be given to papers that emphasize original research, applied research, or evaluation of an educational method. Other topics that may be considered include interpretive reviews of literature, educational case studies, and point-of-view essays. Submissions will be reviewed based on originality, significance and contribution, soundness of scholarship (design, instrumentation, data analysis), generalizability to the education community, and overall quality of the paper. Papers should be approximately 6–10 pages in length and **must** follow the guidelines in the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals," 5th edition (1997). These may be found at www.rcjournal.com/guidelines_for_authors/preparing_the_manuscript.cfm. Abstracts should not exceed 250 words. For more information, contact Dennis Wissing, PhD, RRT, FAARC, editor, at dwissi@lsuhsc.edu or (318) 573-9788. Electronic copies of completed manuscripts should be sent to Shawna Strickland at edu@aarc.org. Deadline is Feb. 28, 2013. ■

Project India

by Jenni Raake, MBA, RRT-NPS

Long lines of people wait for medical care.

In February 2011, I received a letter from my church announcing that they were looking for medical professionals to travel to North India. I had been on a mission trip to Haiti before. But with the exception of treating one of our injured workers there, this was my first chance to go on a mission trip where I would be using my medical skills. The trip, organized by a local mission and its doctors, was designed to run medical camps for the poor. Three nurses joined me on the team.

In September 2011, we flew 14 hours to Delhi, and then drove another four hours north to Chandigarh. We ran medical camps in small villages nearby. With the aid of an interpreter, we would do a history and physical on the patients. Most of the pediatric and/or respiratory patients were sent my way. If the patients required the services of a physician, we would send them on to the physician in charge.

With donated medical equipment and supplies, we were prepared for a variety of medical needs. We were well equipped with wound dressings, antibacterial ointments, surgical implements, pulse oximeters, laryngeal mask airways, resuscitation bags, and resuscitation masks. A visit to the local hospital confirmed that we were better prepared for patients than they were. Their antiquated ICU was a six-bed ward with no piped-in oxygen or air, and no mechanical ventilators. They had heart rate monitors but little else. The IV bottles were primarily glass, with some plastic. The beds were out of the 1940s and '50s. The floors were dirty, and the walls were filthy with peeling paint.

That was the only hospital where the poor could receive free care. Another hospital was under construction nearby. Designed for patients who can afford to pay for their health care, it will have modern equipment and the best of everything when completed.

At our medical camps we treated patients with a variety of illnesses, injuries, and complaints. One of the saddest experiences involved a toddler who was lethargic and had no muscle tone. The family said the child did not cry at birth and the umbilical cord had been wrapped around his neck. While the toddler would drink breast milk, he would do little else. They said they were going to see about eye surgery so their child would be able to see them and interact with them.

At another camp, a toddler was sent my way with a history of irritability. The child, at 22 months, was still breastfed and was looking malnourished. The mother was very thin as well. When we asked about other nutrition, we learned that the child drank only buffalo milk that was wa-

People live with poor sanitation and water resources.

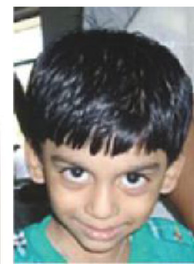
tered down to make it last. I asked about mashing bananas or introducing beans or rice into the diet. The family had not considered that their child could simply be hungry.

One of the camps we held was in the colonies. The colonies are huge camps where the people live in huts, tents, and shacks. The conditions are appalling, with little fresh water and poor sanitation. The lines for our clinic were long, and we saw as many as we could. While many of the families were living in squalor, surprisingly, some of them had some modern conveniences such as TVs. These families would throw an electric line up to the utility wire and "hijack" into the electrical system.

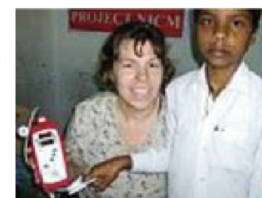
The last camp was held at a local school. This was probably the only opportunity for children there to have any type of medical care. Many were afraid of what these strangers were going to do. After they saw that we were safe, they calmed down and let us perform our care.

An impromptu medical encounter brought me back to my days of adult care. A man approached our group at a local gathering. He complained about shortness of breath, especially when walking. He also had prolonged exhalation. I asked about his occupation, tobacco exposure, and nutrition.

He had worked in the sugar cane factory where a lot of dust was generated. The factory did not provide masks for the workers, and he eventually had to quit his job because he couldn't breathe well. He was a former smoker with a 14-pack-year history but had been tobacco free for five years. A huge part of the nutrition in India consists of beans, rice, and bread. Because of his lack of income, this man ate what was readily available to him, which was rice, fruit, and some bread. This probably did not help his breathing. While he likely had emphysema, I am not a doctor and could only guess based on his signs and symptoms.



While most of our time was spent in caring for the poor, our group also had a chance to do a little sightseeing while we were in the country. A few highlights of the trip included a camel ride, watching a snake charmer make cobras dance, a trip to see the Golden Temple in Amritsar, a train ride from Amritsar (near the Pakistani border) to Delhi, and a trip to the Taj Mahal. We appreciated the opportunity to see the beauty of India.



Although these were enjoyable experiences, there were also reminders everywhere that India is a place in need. We came with the objective of providing care to the people that we encountered. We felt overwhelmed at times that we didn't have the time to do enough. But in the end, we did meet the needs of as many as we could. ■

Jenni Raake (pictured above) is a respiratory therapist at Cincinnati Children's Hospital Medical Center in Cincinnati, OH.

National Health Observances

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

Enter the 2013 AARC Photo Contest

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

Holding a 3-Day Clinic in Kui, Kenya

by Christy Goodwin, BHS, RRT-ACCS

I recently returned from my first medical mission trip, which took me to Kui, Kenya. It was an experience I will never forget and always treasure.

Medical mission trips present a unique opportunity to step out of your comfort zone and help others in a way that may change and enrich your life. There were many parts of my trip that will stay with me, like seeing how people live without technology or even basic necessities such as clean running water. However, the best part of my mission trip was the wonderful people I was fortunate enough to meet. I don't mean just the people we treated but also my group members. It was all of these people who made my trip a wonderful experience.

Among the amazing people I met were the outstanding Kenyan nurses who were active members of our group. They were instrumental in making our trip a success. The other members of our group included two doctors, an advanced registered nurse practitioner, two RRTs, an emergency medical technician, four nurses, and four others who were invaluable non-medical team members. We had a great group of people, and I truly believe we would not have accomplished all that we did without each member.

Christy Goodwin helped to bring much-needed medical care and services to school children and others in a small community in Kenya.

Our main goal was to set up and run a three-day clinic. As part of this endeavor, I helped out in the makeshift pharmacy. The large majority of my time was spent counting and, with the help of a translator, dispensing medications. This may not sound like an overly exciting task, but the camaraderie was rewarding, and our team was able to see over 500 people in three days.

Before my trip, I wondered what a respiratory therapist (particularly one accustomed to working critical care in an ER) would do in a village that had no power source. I found that not only did I have a place but opportunities arose for me to actually use my particular skill set. I was able to teach children and adults how and when to use an inhaler. I also participated in home visits. During one visit, I was able to instruct a mother on the use of chest physiotherapy for her young son who suffered from cerebral palsy.

I feel very fortunate to have gone on this trip and hopefully improve the lives of others. I try to apply the lessons I learned in Kenya to my everyday life by being kind to others and remembering that everyone has issues they struggle with and it pays to be understanding of others. You never know what you may learn or the opportunities you may be given.

I would recommend medical mission trips to anyone who thinks they would enjoy helping others in an environment that is far from what they are accustomed to. Kui, Kenya, may have been a remote village in Africa, but its people and the people I met on my trip will always stay close to my heart. ■

Christy Goodwin is a clinical specialist at Bay Medical Sacred Heart in Panama City, FL, and an adjunct instructor for the respiratory care program at Gulf Coast State College.

Christy Goodwin had a successful medical mission in Kenya.

RT Student Members: Send Us Your Stories and Editorials

AARC Times is always looking for good stories from AARC student members that relate special experiences and give the RT student perspective on the respiratory care profession they have chosen as a career. We have published the stories of several student members in *AARC Times* this past year, and we continue to encourage you to share your experiences.

Have you volunteered at a summer asthma camp or helped organize the DRIVE4COPD program in your state? Have you advocated for respiratory therapy in your state capitol or on Capitol Hill? Maybe you and your RC student friends have collaborated to build a house with Habitat for Humanity. Perhaps you witnessed a lifesaving event outside the hospital setting or experienced something that took your breath away. Whatever the story, we are interested in seeing it.

If you have a story to tell, please contact *AARC Times* Editor Marsha Cathcart at cathcart@aarc.org and include in the subject line, "Student Member Story." Be sure to give us your full name, AARC member number, a brief description of the story subject, and why you would like to have it published. Then attach a Word document of the story. We hope to hear from you soon! ■

South Carolina Members Honor Wounded Warriors

SSgt. Matthew Rodriguez and his wife Christina were special guests at the SCSRC conference last fall.

Soldiers wounded while serving in Iraq and Afghanistan have touched the hearts of respiratory therapists everywhere, but AARC member Randy Lydick, RRT, has taken his admiration for these wounded warriors one step further. For the past few years, he's been leading an effort at the South Carolina Society for Respiratory Care (SCSRC) to sponsor one of these veterans of service to attend the state society's annual respiratory care conference, a four-day event held every September in the resort community of Myrtle Beach.

The service man or woman need not be a respiratory therapist — the idea is simply to provide the chosen individual with the opportunity for some much-needed R&R while introducing them to the respiratory care community.

Lydick, who currently serves as SCSRC vice president, says funds to support the wounded warrior's attendance at the annual meeting are raised through generous donations from the membership along with vendor support and support from the Hilton Myrtle Beach Resort, where the meeting takes place. While the wounded warrior is free to spend his time in Myrtle Beach any way he would like, the SCSRC welcomes him and his family to all of their activities. "Our conference format provides multiple activities, including educational sessions, "meet and greets," a banquet with DJ and dancing, our vending hall, and multiple meals," he says. They encourage the wounded warrior and family to come to all of these events.

The SCSRC takes a few moments at each event to recognize the wounded warrior and his family. "They are definitely treated like stars and made to feel very special," says Lydick.

The SCSRC works with Operation Homefront, an organization that supports all branches of the service and their families, to identify soldiers who might like to participate. Lydick and his colleagues take it from there, contacting the selected warrior and inviting him and his family to attend. "I have been very surprised at how emotional this part of the process is for the soldiers," says the therapist. "Two of the three we have sponsored have cried when we made the offer."

This year the SCSRC sponsored U.S. Marine Staff Sergeant Matthew Rodriguez and his wife Christina. SSgt. Rodriguez, who suffers from a post-traumatic brain injury and post-traumatic stress disorder, completed six combat tours of duty in Iraq and Afghanistan and helped capture Saddam Hussein's palace in Baghdad.

"This year SSgt. Rodriguez and his wife came to almost all of our events, including two lecture sessions," says Lydick. He addressed the audience at one of the sessions, talking about some of his experiences in the war. At the end of the presentation, he related the soldier's mission to the mission respiratory therapists carry out every day — to help people who need it. "I had goose bumps," says Lydick.

When it came time to ask for donations to support next year's wounded warrior, SSgt. Rodriguez was the first person to contribute. "When we told him that he absolutely didn't need to do that, he said, 'This has meant so much to us. We want to make sure someone else gets to come next year,' says Lydick." ■

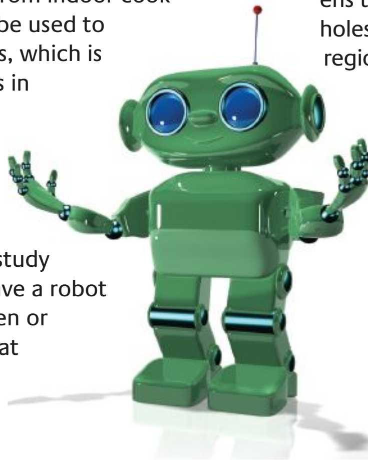
▶ Strange But True…

A more PC Santa: Parents who read their children a newly edited edition of Clement Clarke Moore's classic "'T'was the Night Before Christmas" last Christmas didn't have to worry about exposing them to a tobacco-smoking role model. Thanks to a crusade by author and former smoker Pamela McColl, the line citing Santa's proclivity for a "stump of a pipe" eliciting smoke that "encircled his head like a wreath" was nowhere to be found.

Smart insoles: Shoe insoles have been around for decades, but a University of Utah researcher is taking the concept to new heights. She's working on a high-tech version with force sensors, accelerometers, and gyroscopes to detect a person's gait and then provide feedback with every step via a smartphone app. The goal is to help people with gait problems, such as amputees, learn how to reduce their limp.

Clearing the air: Thanks to funding from the Bill & Melinda Gates Foundation, young children and toddlers in some parts of the developing world may soon be running around with what looks like a cell phone. In reality, they'll be carrying specially designed monitors to measure their exposure to smoke from indoor cooking fires. Investigators hope the data can be used to reduce exposure to smoke from these fires, which is suspected of causing respiratory problems in kids.

Do this, not that: Will older adults really accept help from a robot? Yes, report Georgia Institute of Technology researchers, but only up to a point. Their study found older people would be willing to have a robot help with tasks such as cleaning the kitchen or doing the laundry, but they drew the line at assistance with more intimate tasks such as dressing, eating, or bathing. ■



Foam Sealant Tested as Option to LVRS

A former smoker with emphysema became the first patient in the United States to receive an experimental therapy for the condition last October. Researchers from the University of Alabama at Birmingham (UAB) injected the man's lungs with a foam sealant designed to reduce lung volume. The investigators hope the treatment may achieve the same results as lung volume reduction surgery (LVRS) without the complications often seen with the more invasive procedure.

A proprietary polymer, the foam comes in two liquid parts that are mixed together moments before injection into the lung during a standard bronchoscopy. (Watch a video link at www.newswise.com/articles/view/595675/?sc=mwhr&xy=5013137.) The addition of air to the mixture produces the foam. Within about 30 minutes of injection, the foam hardens to a rubbery consistency, blocking off the holes in the alveoli and sealing the damaged regions of lung. Over the course of several weeks, the alveoli deflate and the lung shrinks in size, clearing the way for the diaphragm to return to normal function.

Lead researcher Mark Dransfield, MD, says previous studies and experience overseas suggest the system is nearly as effective as LVRS without the more significant risks associated with surgery. The main side effect is an immune system inflammatory response with flu-like symptoms that resolves over the course of two or three days. UAB is part of an international phase III trial of the treatment being conducted in Europe, Israel, and the United States. ■

Norway Study: Respiratory Symptoms Tied to Menstrual Cycle

A woman's menstrual cycle can have a significant effect on her respiratory symptoms, report researchers from Norway. They looked at 3,926 women with regular cycles who were not taking exogenous sex hormones. Menstrual cycles, respiratory symptoms, body mass index (BMI), asthma, and smoking status were determined by postal questionnaire.

Researchers found significant variations over the menstrual cycle for each symptom assessed in all subjects and subgroups. Reported wheezing was higher on cycle days 10–22, with a mid-cycle dip near the putative time of ovulation in most subgroups. Shortness of breath was highest on days 7–21, with a dip just prior to mid-cycle in a number of subgroups. The incidence of cough was higher just after putative ovulation for asthmatics, subjects with a BMI of 23 or higher, and smokers, as well as just prior to ovulation and the onset of menses in subgroups with a low incidence of symptoms. The study was published in an online ahead-of-print edition of the *American Journal of Respiratory and Critical Care Medicine* in November. ■

Study: Smoke-free Laws Work

Smoke-free laws significantly reduce the health risks associated with smoking, according to University of California, San Francisco researchers who reviewed 45 studies on smoke-free laws in the United States and other countries around the world. The results of this study were published in a recent issue of *Circulation*, showing that:

- Comprehensive smoke-free laws were associated with a 15% decrease in heart attack hospitalizations, 16% decrease in stroke hospitalizations, and 24% decrease in hospitalizations for respiratory diseases, including asthma and COPD.
- The most comprehensive laws — those covering workplaces, restaurants, and bars — resulted in the highest health benefits. ■

Thumbs up! SciClone Pharmaceuticals Wins Award for Safety

SciClone Pharmaceuticals Inc. recently received the "Innovator Award" in the annual Tag and Label Manufacturers Institute competition for its anti-counterfeiting Pharma-Comb Void label for Zadaxin®. The Zadaxin label, which was created for SciClone by Germany-based Schreiner MediPharm, is based on an innovative multi-part concept to ensure product safety and security and to counteract the illegal practice of refilling previously used medicine vials.

Basically, when the label's tear strip is removed, the inscriptions "Opened" and "Used" appear in the film's two indicator fields, effectively making the undetected reuse of a glass container with an original label virtually impossible. ■

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

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

COPD Patients at Risk for Carotid Artery Plaque

Dutch researchers publishing in an online ahead of print edition of the *American Journal of Respiratory and Critical Care Medicine* in October find COPD patients are at increased risk for carotid artery plaque formation, including the presence of vulnerable plaques with a lipid core.

Their study was conducted among 253 COPD patients and 920 controls who underwent ultrasonography to determine carotid wall thickening. Those identified with thickening then had high-resolution MRIs to characterized carotid plaques. COPD patients had a two-fold increased risk of carotid wall thickening on ultra-sonography compared to the controls, and this risk increased significantly with the severity of airflow limitation. On MRI, vulnerable lipid core plaques were significantly more frequent in subjects with COPD. ■

Hand Off Higher Acuity Patients First To Save Lives

Patient handoffs might benefit from a policy that says, "discuss the most critical patients first." That's the take-home message from a University of Michigan researcher and his colleagues who analyzed videos of patient discussions between highly experienced intensive care physicians at Kingston General Hospital in Ontario. Physicians turned over between six and 23 patients in each of nearly two dozen sessions, spending an average of 2.5 minutes per patient. However, the actual time devoted to each patient varied widely, with physicians who were handing off median-sized groups of 11 patients spending at least 50% longer discussing the first case on the list than the last. Since the lists were ordered by patient room number rather than patient acuity, the researchers believe higher-acuity patients could be shortchanged.

Hundreds of millions of handoffs happen in U.S. hospitals every year, lead author Michael D. Cohen noted. "Just an increase of one-tenth of 1% in their effectiveness could translate into a large number of prevented injuries and lives saved." The study was published online ahead of print by the *Archives of Internal Medicine* on Nov. 12. ■

American Respiratory Care Foundation

Every year the American Respiratory Care Foundation (ARCF) joins with sponsors from the health industry to award up to $29,008 to respiratory therapists and physicians through its education recognition, fellowships, grants and awards programs.

Award Programs

For more information, or to apply for one of these awards, contact the ARCF Executive Office, 9425 N. MacArthur Blvd., Suite 100, Irving, TX 75063-4706, (972) 243-2272, fax (972) 484-2720, email arcf@aarc.org.

ACCESS ARCF ONLINE AT WWW.ARCFOUNDATION.ORG

Grants, Awards, and Fellowships

Community Grants
Community grants are made from funds raised through the annual Ventilator 5K events. These support a wide variety of community events to raise awareness of lung diseases, educate the public and assist patients.

Undergraduate Student Awards
The ARCF has several award programs available to students currently enrolled in accredited respiratory care education programs.

Postgraduate Student Awards
Two award programs are available to respiratory therapists who hold a Baccalaureate degree and seek an advanced degree.

Research Fellowships/Abstract Awards
Fellowships are awarded to researchers having quality abstracts accepted for presentation at the AARC International Respiratory Convention & Exhibition.

Achievement Awards
The ARCF presents these prestigious awards to professionals in recognition of their dedication and commitment to respiratory care.

Literary Awards
All papers submitted in the science journal RESPIRATORY CARE are automatically considered for these awards.

Research Grants
Research funds are available to qualified investigators in the field of respiratory care.

Other Funding Sources
These are sources that we are aware of that also offer funds and grants to researchers and students.

New Members

Welcome to the AARC

U.S. Members

A

Blackwell, John, Wilmer, Al*
Covington, Mamie, Citronelle, Al*
Dedman, Deanna, Enterprise, Al*
Livings, Jenni, Enterprise, Al*

Wright, Jeffrey, Star City, Ar*

Acedo, Anna, Tucson, Az
Alvarez, Julie, Tucson, Az
Avina, Gabriella, Tucson, Az
Barba, Rapture, Phoenix, Az*
Carney, Julie, Tucson, Az
Castillo, Shaila, Tucson, Az
Ford, Retricia, Tucson, Az
Lamb, Thomas, Tucson, Az
Navarro, Oscar, Tucson, Az
Niggl, John, Vail, Az
Poulter, Tamra, Mohave Valley, Az
Silvain, Lupita, Tucson, Az

C

Akib, Olasheni, Canoga Park, Ca*
Baltazar, Johnny, North Hollywood, Ca*
Bangthamai, Tara, Winnetka, Ca*
Basbas, Manny, Pleasanton, Ca*
Betuel, Bambi, Fremont, Ca
Cabuco, Thomas Oliver, Anaheim, Ca*
Castillon, Pablo, Granada Hills, Ca*
Cavagnaro, Timothy, Clovis, Ca*
Farrer, Arlene, Santa Rosa, Ca*
Hart, David, Red Bluff, Ca*
Howell, Norman, Chico, Ca*
Isip, David, Glendale, Ca*
Jama, Hassan, San Diego, Ca*
Johnson, Wayne, La Mesa, Ca*
Karim, Shafiqul, Studio City, Ca*
Leong, Lacyanna, Elk Grove, Ca
Marron, James, San Fernando, Ca*
Ov, Chheng Stacy, Diamond Bar, Ca*
Qurioz, Joe, Rancho Cucamonga, Ca*
Ramdass, Karee, Carmichael, Ca*
Reeves, Sharon, Elk Grove, Ca
Saldana, Priscilla, Exeter, Ca*

Sloan, Tim, Arvada, Co*

Dorazio, Vincent, Stamford, Ct*
Greenwood, Jonathan, Collinsville, Ct
Gross, Patricia, Enfield, Ct
Lima, Bambi, Colchester, Ct
Loum, Aji, West Hartford, Ct
Lynch, Megan, Baltic, Ct
Malan, Casey, Manchester, Ct
Marino, Samantha, Wolcott, Ct*
Martin, Ketanya, Hartford, Ct
McKenzie, Patrice, Hartford, Ct
Merced, Tomas, New Britain, Ct
Parsons, Edward, Bolton, Ct
Patel, Anjana, East Hartford, Ct
Rodriguez, Isabel, Rocky Hill, Ct
Rosner, Ashley, Enfield, Ct

D

Cobb, Nathan, Washington, DC
Ntamak Ngouwa, Jeanne-Nancy, Washington, DC*

Poore, Nicholas, Newark, De*
Whitehead, Joseph, Newark, De*

F

Butler, Joyce, Tallahassee, Fl*
Caste, Kathi, Largo, Fl*
Esposito, Tammy, Jacksonville, Fl*
Griffin, Baden, Port Saint Lucie, Fl*
Hayes, Benita, Dade City, Fl*
Heller, Theresa, Jacksonville, Fl*
Manzali, Safi, Miami, Fl*
Rengifo, Sara, Miami, Fl*
Sipe, Tracey, North Port, Fl*
Williams, Shirley, Pensacola, Fl*

G

Bayless, Norman, Conyers, Ga
Hill, Ingrid A., Guyton, Ga*
Kotowski, Angela, Rome, Ga*
Lewis, Hawana, Columbus, Ga*
Price, Susan, Conyers, Ga*

I

Bell, Emily, Central City, Ia*
Nabors, Susan, Solon, Ia*
Sunner, Becky, Cedar Falls, Ia*

Bingham, Sherry, Marion, Il*
Davis, Samantha, Chicago, Il*
Lambert, Megan, Carterville, Il*
Larocca, Joel, Lombard, Il*
Lewis, Thomas, Roscoe, Il*
Rutt, Jeff, Lombard, Il*
Turner, Rhonda, Saint Anne, Il*

Cable, Ronald, Elkhart, In*
Hackleman, Heather, Bloomington, In*
Jackson, Errol, Anderson, In*
Patel, Mita, Carmel, In*

K

Downing, Jayme, Lawrence, Ks
MacDonald, Brienna, Medicine Lodge, Ks
Mullin, Renee, Wichita, Ks
Silba, Claudia, Wichita, Ks
Spencer, Michelle, Shawnee, Ks
Wilson, Melissa, Wichita, Ks

Allen, David, Louisville, Ky*
Bogenschutz, Andrew, Hebron, Ky
Clark, Tim, Leitchfield, Ky
Drysdale, Angela, Nicholasville, Ky*
Huntsberger, Jeanene, Lawrenceburg, Ky*
Satterly, Robert, Springfield, Ky*
Sorrells, Annetta, Vine Grove, Ky*

L

Baudoin, Carl, Houma, La*
Cannon, Sean, Alexandria, La*
King, Dora, Leesville, La*

M

Benvie, Charles, Salem, Ma*
Walsh, Meaghan, Bridgewater, Ma*

England, Nathan, Boonsboro, Md*
Ghajari, Simin, Frederick, Md*
Lacuesta, Romeo, Severn, Md*

Conway, Darrell, Richmond, Mi*
Niemer, Laurie, Harrison Twp, Mi*
Smigiel, Marci, Wyoming, Mi
Wells, Carlos, Detroit, Mi*

Entinger, Jamie, Montrose, Mn*
Johnson, Nancy, Fergus Falls, Mn*
Lusty, Brenda, Moorhead, Mn*

Bower, Kelly, Kansas City, Mo*
Lam, Doc, Blue Springs, Mo*

Hamilton, Nicholas, Ridgeland, Ms
Rapp, Veronica, Olive Branch, Ms

N

Evans, Lisa, Elm City, NC
Harwood, Shanda, Mount Pleasant, NC*
Smathers, Shannon, Waynesville, NC*

Michel, Wilna, Minot, ND*
Nelson, Michelle, Grand Forks, ND*
Rene, Jhon, Minot, ND*

Porter, Sally, Bellevue, Ne*

Elsayyid, Waleed, Dover, NJ
Fofah, Adenike, Manalapan, NJ*

These individuals have been approved for membership in the AARC. Any member may object to a new membership by filing a written objection with the Executive Office within 30 days. *Active Members

McGettigan, Sheila, Somerdale, NJ*

Agbang, Jane, Las Vegas, Nv
Aspiras, Michael, Las Vegas, Nv
Avery, Katarina, Las Vegas, Nv
Bernal, Jose, North Las Vegas, Nv
Brown, Anthony, Henderson, Nv
Duarte, Richard, Las Vegas, Nv
Ellis, John, Las Vegas, Nv
Gill, Tanya, Las Vegas, Nv*
Gutierrez, Nora, Las Vegas, Nv
Jennings, Leah, North Las Vegas, Nv
Lutz, Jourdain, Las Vegas, Nv
Martinez, Mark, Las Vegas, Nv
Mathew, Vishal, Las Vegas, Nv
Mirsoltani, Parisa, Las Vegas, Nv
Mower, Vanessa, Las Vegas, Nv
Mozzoni, Edward, Las Vegas, Nv
Nwapa, Chinwe, Las Vegas, Nv
Pelaez, Marie, Las Vegas, Nv
Williams, Tamara, Las Vegas, Nv
Wondafrash, Ermiyas, Las Vegas, Nv

Kingsley, Maretta, Fairport, NY*
Lissfelt, Chirstopher, Ontario, NY*
O'Connor, Patricia, Rochester, NY*
Oas, Rusell, Wayland, NY*
Philantrope, Magalie, Brooklyn, NY*

O

Allen, Crystal, Batavia, Oh
Austin, Roy, Youngstown, Oh
Baugh, Alexandria K, Vienna, Oh
Bowling, Allison, New Richmond, Oh
Carter, Laina, Loveland, Oh
Davis, Andrea, Hamilton, Oh
Dick, Danielle, Loveland, Oh
Endress, Katheryn, Milford, Oh*
Gebreberhane, Mesmer, Cincinnati, Oh
Gildenblatt, Phillip, Maineville, Oh
Heywood, Bill, Cincinnati, Oh
Hoff, Lynn, Steubenville, Oh*
Hoffman, Alecia, Austintown, Oh*
House, Elisabeth, Milford, Oh
Johnston, Shannon, Batavia, Oh
Linnstaedter, Travis, Cincinnati, Oh
Mueller, Tim, West Chester, Oh
Musselman, Thomas, Blanchester, Oh
Osborne, Kayla, Milford, Oh
Palmisano, Jennifer, Cincinnati, Oh
Patel, Ankita, Cincinnati, Oh
Simpson, Steven, Cincinnati, Oh
Swinford, Don, Mount Orab, Oh
Thomas, Dave, Cincinnati, Oh
Williams, Ashley, Cincinnati, Oh
Yakimow, Robert, Fairfield, Oh

Bolden, Lacy, Lawton, Ok
Hanza, Barry, Lawton, Ok
Hennessee, Rachel, Lawton, Ok
Ivacic, Patricia, Elgin, Ok
Langoc, Geri, Oklahoma City, Ok
Magers, Jessica, Lawton, Ok
Pichardo, Elizabeth, Temple, Ok
Ritchey, Heather, Lawton, Ok
Schmidt, Simon, Lawton, Ok
Singh, Bhupinder, Lawton, Ok
Wilkerson, Michael, Lawton, Ok
Zarraga, Amber, Lawton, Ok

Johnson, Krista, Harrisburg, Or
McDonough, John, Tenmile, Or*
Merrill, Mary, Portland, Or*
Morford, James, West Linn, Or
Ridgeway, Kasey, Silverton, Or

P

Allen, Kimberly, Yatesboro, Pa*
Atkins, Erica, York, Pa
Bomboy, Judy, Slatington, Pa*
Cady, Melanie, Export, Pa*
Cindric, Mario, Harrisburg, Pa
Conway, Morgan, Ellwood City, Pa*
Cook, Cecil, Irwin, Pa*
Cristiano, Joseph, Allison Park, Pa*
Dowling, Jason, Leechburg, Pa*
Dudek, Nicole, Boiling Springs, Pa*
Dunmeyer, Nicole, Allenport, Pa*
Endlich, Nicole, Murrysville, Pa*
Evanek, Michael, Pittsburgh, Pa*
Evans, Jacqueline, Distant, Pa*
Fouch, Shalon, Smock, Pa*
Giaramita, John, Trafford, Pa*
Harbaugh, Kari, Chambersburg, Pa*
Hines, Joanne, Philadelphia, Pa*
Holsing, Linda, Greenock, Pa*
Kauffman, Amanda, Brogue, Pa
Kelley, Stephanie, Trafford, Pa*
Kingman, Kristen, Wampum, Pa*
Klunk, Kaitlin, McSherrystown, Pa
Kramer, Jason, Belle Vernon, Pa*
Lane, Lisa, Pittsburgh, Pa*
Leibowitz, Murray, Arnold, Pa*
Lloyd, Barbara, North Versailles, Pa
Loar, Ernest, Carmichaels, Pa*
Lyons, Dana, St Marys, Pa
Manchini, Holly, Lower Burrell, Pa*
Massa, Kelly, Drexel Hill, Pa*
McCabe, Todd, Philadelphia, Pa*
McCutcheon, Rebecca, New Kensington, Pa*
McDowell, Cathy, Uniontown, Pa*
McLaughlin, Rebecca, Kersey, Pa*
Miller, Patricia, Mount Pleasant, Pa*
Murray, Emily, Reading, Pa
Nuzzo, Donald, New Castle, Pa*
Park, Ronald, Greenville, Pa*
Peters, Ashley, New Freedom, Pa
Poppelreiter, Catherine, Carnegie, Pa*
Quigley, Michael, Wexford, Pa*
Reamer, Brent, Irwin, Pa*
Reynolds, Katie, York, Pa
Rick, Roxanne, Monongahela, Pa
Rishel, Amber, Mifflinburg, Pa
Robbins, Esther, Leola, Pa*
Roher, Tyishia, Latrobe, Pa
Schwarm, Paul, Pittsburgh, Pa*
Scott, Robert, Hermitage, Pa*
Shean, Laura, Greensburg, Pa*
Sheridan, Andrew, Spring Grove, Pa
Shutts, James, Waterford, Pa*
Smith, Shawn, Crescent, Pa*
Snook, Jordan, Stewartstown, Pa
Sossong, Michael, Johnstown, Pa*
Suarez, Caridad, Chambersburg, Pa
Swanger, Steven, Arnold, Pa*
Sweeney, Stacy, Ebensburg, Pa*
Thomas, Russell, Wampum, Pa*
Trottier, Cynthia, Murrysville, Pa*
Tutich, Douglas, Dillsburg, Pa*
Uvodich, Darin, Baden, Pa*
Van Scoyoc, Troy, Johnstown, Pa*
Varvaro, Philip, Coroapolis, Pa*
Weisz, Joshua, Ellwood City, Pa*
White, Stacey, Philadelphia, Pa*
Wise, Roseanne, Natrona Heights, Pa*

R

Barnes, Patricia, Providence, RI*
Goodwin, Robert, Providence, RI*

S

Merritt, April, Ridgeville, SC*

Kennerly, Lindsee, Sioux Falls, SD*

T

Cotner, Tamara, Greenbrier, Tn
Downs, Michael, Franklin, Tn*
Gerard, Harvey, Nashville, Tn
Goltry, Cynthia, Knoxville, Tn*
Kirby, Bianca, Nashville, Tn*
Schultz, Maryann, Bristol, Tn*
Smith, Jessica, Collinwood, Tn*

Arvizu, Marisol, Wichita Falls, Tx
Callahan, Alyssa, The Colony, Tx
Courtney, Rebecca, Kingwood, Tx
Lindstrum, Maria, El Paso, Tx*
Monis, Shakiba, San Antonio, Tx*
Pegel, Bob, Converse, Tx*
Stephens, Tawanna, Houston, Tx*
Tavakoli, Anahita, Houston, Tx*
Vidal, Christiana, Houston, Tx*

U

Arellano, Melissa, Syracuse, Ut
Keller, Kristina, Ogden, Ut
Lebaron, Emily, Centerville, Ut
Lougy, Scott, Magna, Ut
Park, Lynae, West Jordan, Ut
Powell, Erica, Lehi, Ut
Russell, Andrea, Farr West, Ut

W

Alcaraz, Angelica, Bremerton, Wa
Goldsby, Shari, Shelton, Wa
Houlihan, Teresa, Kennewick, Wa*
Makalena, Sheila, Tacoma, Wa
Stephens, Cynthia, Gig Harbor, Wa

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Hansen, Monica, Altoona, Wi
Marcone, Jean, Burlington, Wi*
Radke, Kelsey, Eleva, Wi
Warren, Sarah, Bloomer, Wi

Graff, Terri, Weirton, WV*
Hall, Michael, Fairview, WV*
Johnson, Wendy, Triadelphia, WV*

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Felder, Sabrina, APO, AE*

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D'Intino, Domenico, Cepagatti (Pe), Italy
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Marketplace

Featuring information on products and equipment from manufacturers

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BIAMP

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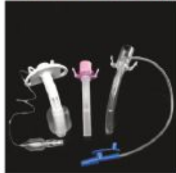

Blom Tracheostomy Tube System is an innovative solution for the tracheostomized patient. Our Standard, Subglottic Suctioning, Speech and LPV Inner Cannulas are used with our Blom Tracheostomy Tube to provide better patient care.

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SpO_2 Single Parameter Module

Covidien has announced the launch of its Nellcor SpO_2 single parameter module for use with the Philips IntelliVue patient monitoring platform. The Nellcor SpO_2 module incorporates Nellcor OxiMax pulse oximetry technology and is compatible with the full line of Covidien Nellcor sensors, including the forehead sensor, non-adhesive sensors, and single-patient-use oximetry sensors. The device is compatible with the Philips IntelliVue MP40 through MP90 and MX 600 through MX 800 monitors. The single parameter module is available in North America, the European Economic Area, and other select international markets. www.covidien.com

Miniature Proportional Valve

A small footprint, low energy consumption, long life, and high accuracy make the new Flatprop EQP miniature proportional valve from Norgren a problem-solver for OEMs of any portable ventilators and anesthesia equipment. The new valve matches the footprint of Norgren's proven Flatprop EQI valve but delivers >40% more flow, and with low power consumption of just 2.5W, delivers 186 liters per minute of oxygen at an inlet pressure of 2.0 bar (30 psig). www.norgren.com/us/lifesciences

Clinician-Centric Monitoring

Masimo's 2012 Radical-7 monitor has an upgradeable rainbow® SET platform featuring noninvasive and continuous monitoring of: blood constituents that previously required invasive or complicated procedures; Masimo SET measure-through motion and low perfusion pulse oximetry for oxygen saturation, pulse rate, and perfusion index; and respiration rate through a novel acoustic sensor clinically shown to be as accurate if not more accurate than capnography for respiration rate. With its intuitive, gesture-control touch screen, the 2012 Radical-7 offers exceptionally easy operation and instant adaptability to change displays and settings on the fly. www.masimo.com

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

Classifieds

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

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February 28 – March 1
Daytona Beach, FL
Florida Society for Respiratory Care Sunshine Seminar
Contact FSRC at (866) 534-6172 or www.fsrc.org "Live Events"

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

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

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

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

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

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

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Submissions for the next available issue are due February 19.

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 Email binkley@aarc.org

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[1] EMMA Users Manual.