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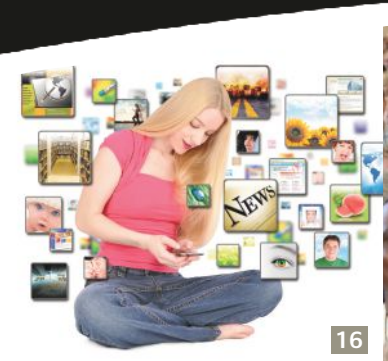
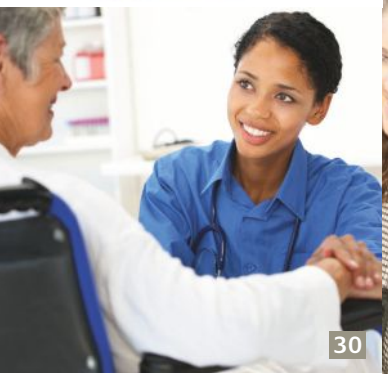
Table of Contents

November 2013
Volume 37, Issue 11



16


30


51


42

Ventilation for Life | 7
Developing competencies for mass casualty ventilators. By Kathy S. Myers Moss, MEd, RRT-ACCS

Chronic Disease Manager | 16
Mobile applications and respiratory care. By Steven B. Nelson, MS, RRT, FAARC

The Expanding Role of Respiratory Therapists in Emergency Departments | 26
At Cleveland Clinic's ED, RTs go beyond their traditional role and assist nurses with total care of the patient through multi-skilled tasks. By Rebecca L. Meredith, BS, RRT

The RT's Role in COPD Disease Management | 30
RTs are positioned to assist in building evidence-based programs that will profoundly impact COPD patients. By Becky Anderson, RRT

DRIVE4COPD Puts Students Behind the Wheel | 34
RTs-in-training further their education at AARP event.

Drum Roll, Please: Introducing the "Respiratory Care Marketplace" | 39
The AARC's new online buyer's guide offers one-stop shopping for the respiratory therapy community.

Respiratory Therapists' Response to a National Clinical Alarm Survey | 42
Improved design and adequate staff training on alarm settings may improve patient outcomes. By Crystal Dunlevy, EdD, RRT, and Shawna Strickland, PhD, RRT-NPS, FAARC

AARC Congress 2013: Sneak Peek III | 51
Here are four more sessions you'll want to attend this month at our annual meeting in Anaheim.

Executive Office Update | 12
Government Advocacy | 14
General Counsel | 22
Industry Update | 58
NBRC Insight | 60
Industry Watch | 62
RC Currents | 64
Classified Advertising | 71
Calendar of Events | 72
Advertiser Index | 72

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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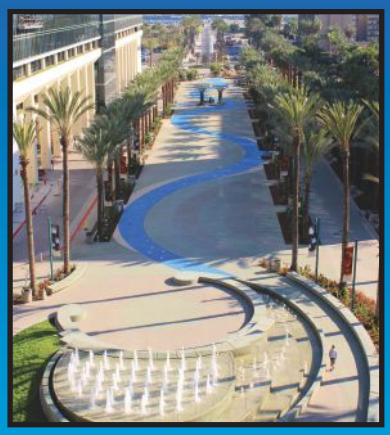

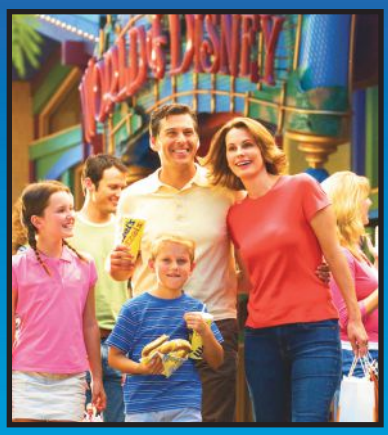

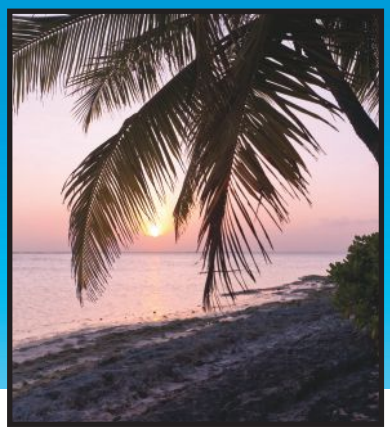

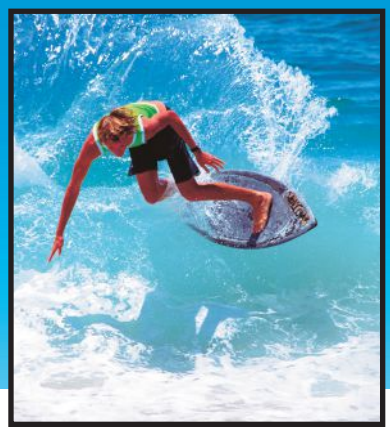

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Utilize additional therapies to maximize oxygen delivery with validated ventilation systems.

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INDICATIONS AND USAGE

Treatment of Hypoxic Respiratory Failure

INOmax® is a vasodilator, which, in conjunction with ventilatory support and other appropriate agents, is indicated for the treatment of term and near-term (>34 weeks) neonates with hypoxic respiratory failure associated with clinical or echocardiographic evidence of pulmonary hypertension, where it improves oxygenation and reduces the need for extracorporeal membrane oxygenation.

Utilize additional therapies to maximize oxygen delivery with validated ventilation systems. In patients with collapsed alveoli, additional therapies might include surfactant and high-frequency oscillatory ventilation.

The safety and effectiveness of INOmax have been established in a population receiving other therapies for hypoxic respiratory failure, including vasodilators, intravenous fluids, bicarbonate therapy, and mechanical ventilation. Different dose regimens for nitric oxide were used in the clinical studies.

Monitor for PaO_2, methemoglobin, and inspired NO_2 during INOmax administration.

CONTRAINDICATIONS

INOmax is contraindicated in the treatment of neonates known to be dependent on right-to-left shunting of blood.

WARNINGS AND PRECAUTIONS

Rebound Pulmonary Hypertension Syndrome following Abrupt Discontinuation

Wean from INOmax. Abrupt discontinuation of INOmax may lead to worsening oxygenation and increasing pulmonary artery pressure, i.e., Rebound Pulmonary Hypertension Syndrome. Signs and symptoms of Rebound Pulmonary Hypertension Syndrome include hypoxemia, systemic hypotension, bradycardia, and decreased cardiac output. If Rebound Pulmonary Hypertension occurs, reinstate INOmax therapy immediately.

Hypoxemia from Methemoglobinemia

Nitric oxide combines with hemoglobin to form methemoglobin, which does not transport oxygen. Methemoglobin levels increase with the dose of INOmax; it can take 8 hours or more before steady-state methemoglobin levels are attained. Monitor methemoglobin and adjust the dose of INOmax to optimize oxygenation.

If methemoglobin levels do not resolve with decrease in dose or discontinuation of INOmax, additional therapy may be warranted to treat methemoglobinemia.

Airway Injury from Nitrogen Dioxide

Nitrogen dioxide (NO_2) forms in gas mixtures containing NO and O_2. Nitrogen dioxide may cause airway inflammation and damage to lung tissues. If the concentration of NO_2 in the breathing circuit exceeds 0.5 ppm, decrease the dose of INOmax.

If there is an unexpected change in NO_2 concentration, when measured in the breathing circuit, then the delivery system should be assessed in accordance with the Nitric Oxide Delivery System O&M Manual troubleshooting section, and the NO_2 analyzer should be recalibrated. The dose of INOmax and/or FiO_2 should be adjusted as appropriate.

Heart Failure

Patients with left ventricular dysfunction treated with INOmax may experience pulmonary edema, increased pulmonary capillary wedge pressure, worsening of left ventricular dysfunction, systemic hypotension, bradycardia and cardiac arrest. Discontinue INOmax while providing symptomatic care.

ADVERSE REACTIONS

Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice. The adverse reaction information from the clinical studies does, however, provide a basis for identifying the adverse events that appear to be related to drug use and for approximating rates.

Controlled studies have included 325 patients on INOmax doses of 5 to 80 ppm and 251 patients on placebo. Total mortality in the pooled trials was 11% on placebo and 9% on INOmax, a result adequate to exclude INOmax mortality being more than 40% worse than placebo.

In both the NINOS and CINRGI studies, the duration of hospitalization was similar in INOmax and placebo-treated groups.

From all controlled studies, at least 6 months of follow-up is available for 278 patients who received INOmax and 212 patients who received placebo. Among these patients, there was no evidence of an adverse effect of treatment on the need for rehospitalization, special medical services, pulmonary disease, or neurological sequelae.

In the NINOS study, treatment groups were similar with respect to the incidence and severity of intracranial hemorrhage, Grade IV hemorrhage, periventricular leukomalacia, cerebral infarction, seizures requiring anticonvulsant therapy, pulmonary hemorrhage, or gastrointestinal hemorrhage.

In CINRGI, the only adverse reaction (>2% higher incidence on INOmax than on placebo) was hypotension (14% vs. 11%).

Based upon post-marketing experience, accidental exposure to nitric oxide for inhalation in hospital staff has been associated with chest discomfort, dizziness, dry throat, dyspnea, and headache.

OVERDOSAGE

Overdosage with INOmax will be manifest by elevations in methemoglobin and pulmonary toxicities associated with inspired NO_2. Elevated NO_2 may cause acute lung injury. Elevations in methemoglobin reduce the oxygen delivery capacity of the circulation. In clinical studies, NO_2 levels >3 ppm or methemoglobin levels >7% were treated by reducing the dose of, or discontinuing, INOmax.

Methemoglobinemia that does not resolve after reduction or discontinuation of therapy can be treated with intravenous vitamin C, intravenous methylene blue, or blood transfusion, based upon the clinical situation.

DRUG INTERACTIONS

No formal drug-interaction studies have been performed, and a clinically significant interaction with other medications used in the treatment of hypoxic respiratory failure cannot be excluded based on the available data. INOmax has been administered with dopamine, dobutamine, steroids, surfactant, and high-frequency ventilation. Although there are no study data to evaluate the possibility, nitric oxide donor compounds, including sodium nitroprusside and nitroglycerin, may have an additive effect with INOmax on the risk of developing methemoglobinemia. An association between prilocaine and an increased risk of methemoglobinemia, particularly in infants, has specifically been described in a literature case report. This risk is present whether the drugs are administered as oral, parenteral, or topical formulations.

 IMK111-01540 April 2013

Developing Competencies for Mass Casualty Ventilators

by Kathy S. Myers Moss, MEd, RRT-ACCS

The American College of Chest Physicians' Critical Care Institute formed the Task Force for Mass Critical Care in 2007 to establish recommendations for emergency mass critical care services.[1] They have suggested that hospitals should plan to provide critical care services, including one mechanical ventilator for each emergency mass critical care patient, for triple their baseline ICU census for up to 10 days without external support.[1,2] Such conditions highlight the key role that may be played by local ventilator resources, in addition to state and federal ventilator stockpiles.[3,4] Effective competency development efforts recognize challenges associated with mass casualty ventilation, integrate training for all potentially available ventilation resources, and accommodate learner diversity with the use of a variety of educational learning theories.[5]

about the author...

Kathy S. Myers Moss, MEd, RRT-ACCS, is a clinical associate professor at the University of Missouri in Columbia, MO.

Challenges to competency development

"The way this is built makes me nervous because it's not like a regular ventilator, so that's weird."

"The pressure valve is fluttering. I don't know if that means I have my flow too high?"

"This little knob thing — the tallest — I don't know what that does."

These responses were collected during a mixed methods research project approved by the Institutional Review Board to examine the ability of second semester respiratory therapy students to apply an automatic resuscitator (Vortran VAR-RT, Vortran Medical Technology 1 Incorporated, Sacramento, CA) that was previously unfamiliar to them (unpublished data). Study participants were RT students who had recently completed an intensive semester of mechanical ventilation lectures, labs, and clinical practice experiences. They accomplished ventilator application tasks with varying degrees of success with and without the aid of the Vortran's package insert (see Table 1). Though the students' reactions may not necessarily represent those of more experienced RTs, they may not be outside the realm of possibility for someone who is asked to apply an unfamiliar mechanical ventilator in a high-stress situation to a critically ill victim of a mass casualty incident. Among other priorities of RC department educators and managers is the need to prepare staff RTs to implement positive-pressure ventilation for critically ill patients in the context of a mass casualty event using less familiar stockpiled mechanical ventilators.

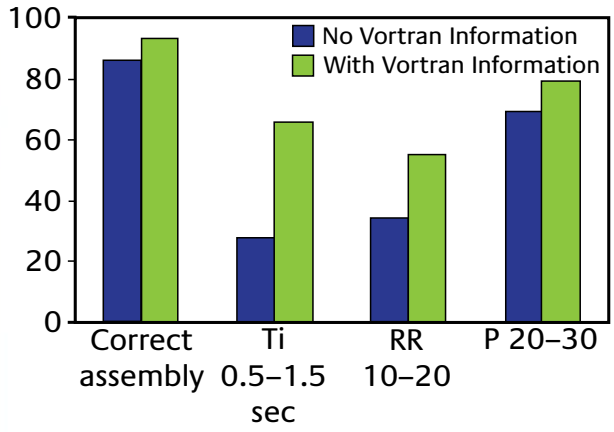
AARC resources

Respiratory therapists are out in front of the planning for mass casualty ventilation scenarios. The AARC website has prepared and organized several relevant website pages, including www.aarc.org/resources/vent_guidelines_08.pdf and www.aarc.org/resources/mass_casualty/index.asp, with links to key resources such as the AARC's guidelines for acquisition of ventilators to meet demand for pandemic flu and mass casualty incidents. The links also provide access to a disaster-response roundtable electronic mailing list, which planners might use to network with other people interested in mass casualty ventilation preparedness, and a list of state-by-state involvement in disaster planning that department educators might use to get ideas about mass casualty ventilator competency development.

Local, state, and federal resources

Effective mass casualty ventilator competency development programs begin with identification of the venti-

Table 1. Percentage of Respiratory Students Accomplishing Ventilator Application Tasks with Vortran VAR-RT



Ti: inspiratory time (seconds)
RR: respiratory rate (breaths/minute)
P: peak inspiratory pressure (cm H_2O)

lator technology available from institutional or other local resources, especially since deployment of state and federal ventilator stockpiles may be delayed for a period of time. Respiratory care department leaders should be informed about the brand of mechanical ventilators or other such devices stockpiled by their own institution. AARC guidelines identify features critical to the performance of ventilators in mass casualty incidents, including the capability to independently control tidal volume, rate, and positive end-expiratory pressure (PEEP), and an adequate alarm system.[6] The Vortran VAR-RT ventilator employed for the research described in the introduction to this article does not include these basic features. Despite this fact, some local health care facilities have stockpiled this equipment, which was FDA approved in 2004 for emergency, short-term, constant flow, pressure-cycled ventilatory support when used by properly trained personnel (www.accessdata.fda.gov/cdrh_docs/pdf4/k041473.pdf). RTs may or may not be enthusiastic about this or other ventilator models that have been stockpiled by their acute care facility, but they should accept that effective preparation includes orientation to any mechanical ventilation resources that may be available in the event of a mass casualty. Staff will activate a plan to deploy ventilator resources that considers the best match of patient needs, ventilator technical features, and the knowledge and skills of available RT and non-RT human resources.[7] Because of their considerable experience with mechanical ventilation and with the management of critical pulmonary dysfunction, the most qualified persons to implement less familiar mass casualty ventilator technology are experienced respiratory therapists with excellent assessment skills.[8]

In addition to institutional and local resources, respiratory care department managers and educators should consult the director of their state-wide ventilator cache program to identify details related to available ventilator model(s) and ancillary equipment. For example, the Missouri Department of Health and Senior Services (MDHSS) coordinates the Missouri Disaster Response System, Incorporated (MoDRS), which maintains a ventilator cache program that included Newport HT50® (Newport Medical Instruments Inc., Costa Mesa, CA) and Impact Eagle II™ (Impact Instrumentation Inc., West Caldwell, NJ) ventilators in 2012. Ventilator cache assets may be requested from the MDHSS by a health care facility through local and state emergency operations centers after all other local resources have been expended. Once deployment has been authorized by MDHSS, MoDRS staff who have completed manufacturer-provided training specific to the MoDRS-stockpiled mechanical ventilator cache, conduct just-in-time training for any Missouri facility or agency requesting deployment of the ventilator cache upon the cache's arrival at the facility but prior to delivery of the cache to facility staff. MoDRS requires documentation of the just-in-time training class for personnel at the requesting hospital or health care facility, including a minimum score of 90% on an eight-question ventilator-specific multiple-choice post-test.

At the federal level, pre-event awareness of emergency preparedness resources may be enhanced by accessing publically available information from the U.S. Department of Health and Human Services (http://archive.ahrq.gov/prep/). More specific mass casualty ventilator competency development requires knowledge of resources from the Centers for Disease Control and Prevention's Strategic National Stockpile (CDC SNS) (www.cdc.gov/phpr/stockpile/stockpile.htm). SNS resources are prepared to arrive from strategically located, secure storage facilities as soon as 24–36 hours from the time of the federal government's decision to deploy.[9] Positive-pressure mechanical ventilators are organized into ventilator kits, including a ventilator, user manual, one adult and one pediatric circuit, heat moisture exchanger, PEEP valve, and other ancillary equipment. In 2012, the SNS managed inventory included fully charged Uni-Vent® Eagle™ 754 (Impact Instrumentation Inc.), CareFusion LTV® 1200 (CareFusion, Yorba Linda, CA), and Covidien LP10 (Covidien, Boulder, CO) ventilators. The CDC sug-

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2. AARC Evidence-based clinical practice guidelines: care of the ventilator circuit and its relation to ventilator-associated pneumonia. Respiratory Care 2003;48(9):869-879.
3. Restrepo RD, Walsh BK. AARC CPG: Humidification during invasive and noninvasive mechanical ventilation. Respiratory Care 2012;57(5): 782-788.

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gests that prior familiarization with stockpiled ventilators, in addition to just-in-time training, may be necessary to develop competency. The CDC has collaborated with the AARC (www.aarc.org/resources/sns_vent_training/) and with the Society of Critical Care Medicine (www.learnicu.org/Instructor-Tools/Pages/FDM.aspx) to create resources and hands-on learning experiences to facilitate competency development with federally stockpiled mass casualty ventilator models.

Competency development

To facilitate practical familiarity, RC department policy should provide for the routine use of mass casualty ventilator models available in institutional, state, and federal stockpiles.[3] In addition, department managers and educators should provide for ongoing continuing education experiences, with competency evaluation, to facilitate and to document staff readiness to deploy mass casualty ventilator resources.[2,10–12]

Effective continuing education experiences give primary consideration to the perspective of the learners. RTs are likely to approach the educational experience with different preferred learning styles. In addition, the job of becoming proficient with the use of mass casualty ventilators is a complex task, especially given high-stakes applications with critically ill victims in a high-stress environment using resources (such as oxygen and electricity) that may be in limited supply. These learner-related and situation-related contextual considerations require a multifaceted learning experience to address different learning styles and to accommodate multiple, complex learning objectives.[13] As a foundation, the educational experience should accommodate the perspectives of Adult Learning Theory, which was initially described by Malcolm Knowles.[14] Adult Learning Theory postulates that adults are more likely to meaningfully engage with a learning opportunity if it recognizes and builds upon the learner's prior knowledge, is problem-centered, is relevant to work experience, and is offered at a time and place convenient for the learner.

In addition to an experience that recognizes the needs of adult learners, competency development education should consider giving attention to a number of other theoretical perspectives that add value to the educational experience (see Table 2).[15] Integrating behaviorist priorities would require that the educational experience include trial-and-error learning, repetition, and reinforcement, using resources that include the mass casualty ventilator, relevant accessory equipment, and a mannequin. Another approach might integrate the tenets of information processing theory with a presentation that includes mnemonics, memory aids,

Table 2. Learning Theory Perspectives on Ventilator Competency Development

	Behaviorist	Information Processing	Constructivist
Evidence of learning	Observable behaviors	Using strategies to encode & retrieve information	Independently restructuring prior knowledge to assimilate new information
Instructor's role	Organize environment & knowledge	Teach learning strategies	Facilitate independent student exploration of concepts and equipment
Focus of strategy	External conditions & outcome performance	Internal conditions (how the learner processes information)	Individual's mental organization schemata

and discussions to enable the learners to understand how they think about the task of managing a mass casualty ventilator. Related competency development would employ a constructivist perspective if the experience involves active learning activities that engage the learner's previous knowledge and permits active, open-ended exploration of the mass casualty ventilator equipment. A sociocultural perspective would establish the learning activity in the context of the larger mass casualty response to explore the cultural issues relevant to mass casualty scenarios and to consider the interpersonal communications necessary to facilitate care in a mass casualty setting. The integration of educational and social theoretical lenses enables the learner to see the fundamentals of mass casualty ventilation from different perspectives in order to mature and enrich the educational process.

Webster's Dictionary defines competence as "possession of required skill, knowledge, or capacity." Respiratory therapists should become educated about the type of ventilators they are likely to be asked to apply and should engage in related learning activities that have been intentionally planned to facilitate broad understanding of the task. Skillful design of active learning experiences that are enriched by any of a variety of theoretical perspectives may prepare RTs to face the myriad of challenges presented by mass casualty events. ■

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AARC Congress 2013 Just a Few Days Away

by Thomas J. Kallstrom, MBA, RRT, FAARC

November at the AARC is a busy time of year. As you know, we will be making the final touches as we get ready to host AARC Congress 2013 in Anaheim in mid-November. There will be some changes to the Congress this year that we hope will make the experience of attending educationally stimulating and memorable. Attending the Congress is a great way for respiratory therapists and friends from around the globe to re-engage, network, and share our common interests in respiratory care with each other. When I was a practicing respiratory therapist, I used the Congress as a method to learn how I could better provide patient care in my hospital system by implementing changes in my own department — and I was never disappointed.

The planning and development for the 59th International Respiratory Convention & Exhibition took place in Dallas this January. It seems rather early, but it's at this time the Program Committee essentially takes all the recommendations provided from members, sections, and roundtables and forms them into three and a half days of cutting-edge presentations by world-renowned researchers and clinical experts. If you have ideas for next year's Congress, now is the time to let us know. In November there will be an announcement and a place on our website (www.aarc.org) that will direct you through the process.

This year there will be two Keynote presentations. One will be the traditional one that is given following the Awards Ceremony on Saturday, and the other will be a wrap-up Keynote on Tuesday. The opening Keynote this year will be given by Stephen F. Jencks, MD, MPH (former assistant surgeon general of the United States). Dr. Jencks has devoted the past several years to aiding clinicians to better understand hospital readmissions and the impact they have on our health care system. His 2009 *New England Journal of Medicine* paper on the multibillion-dollar cost of hospital readmissions in Medicare is considered the authoritative paper on the subject.[1] As senior clinical advisor and director of the Quality Improvement Organization program in the Office of Clinical Standards and Quality at the Centers for Medicare and Medicaid Services (CMS), Jencks led the transformation of Medicare's Quality Improvement Organization program from focusing on deficient providers to achieving national improvements in health care systems. Reducing unnecessary readmissions is a topic that should be near and dear to all health care providers, and Dr. Jencks will challenge the current way of managing hospitalized patients (specifically those with COPD) with a message that will be tailored to the RT. This is important to the profession because in fiscal year 2015, hospitals will likely be charged with financial penalties should their COPD readmission outcomes exceed regional and/or national benchmarks. This message is not to be missed.

I mentioned a closing ceremony this year as well. We are excited to announce that Bob Eubanks will be hosting the first-ever AARC Closing Ceremony this year. You may remember him as the host of the popular game show called "The Newlywed Game." Eubanks will be presenting a talk focused on how to communicate better with patients. He certainly is an expert in human relations, based on his many years of interviewing contestants and dealing with difficult personalities as a rock concert promoter for Bob Dylan, The Beatles, and The Rolling Stones (just to name a few). An-

about the author...

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

other part of the ceremony will be a game show that he will host called "Workmates." Four teams of two (work colleagues) made up of Congress attendees will be called to the stage to participate. The premise is similar to "The Newlywed Game." Then we will wrap up the meeting with a chance for one attendee, whose name will be picked at random, to play "America's Greatest Gameshow Challenge" and a chance to win $100,000.

Thomas L. Petty Memorial Lecture

Another new addition this year is the Thomas L. Petty Memorial Lecture. Dr. Petty was a leading pulmonary physician who devoted his life to patients. He is well known for his work with patients requiring oxygen therapy following discharge from the hospital. This highly respected physician was a mentor for many RTs and physicians who practice today. Dr. Petty dedicated his life to improving the quality of life for respiratory patients. His own need for supplementary oxygen afforded him a unique insight that has touched the lives of patients throughout the world. David J. Pierson, MD, FAARC (former editor-in-chief of Respiratory Care), will be giving the inaugural presentation. To learn more about Dr. Petty, I encourage you to download an AARC recording of his last book (at no cost), which has been transcribed into an audiobook and read by Patrick Dunne, MEd, RRT, FAARC.[2]

Open Forum presentations

One way of getting more information on the cutting edge of respiratory care is to attend the Open Forums. This year there will be 19 symposia, which usually have between 15–20 research posters presented. Being at the Open Forum provides you a great opportunity to stand with the presenter at their poster and ask questions about the particulars of their research. The poster sessions end with a wrap-up discussion where each researcher gives a brief overview of their poster and why it was important to their practice. Attendees then get one last opportunity to ask any lingering questions that might not have been addressed previously. I can tell you I found these sessions most useful; and on more than one occasion, I used some of these ideas and incorporated them into my own practice. The Open Forum is one of the highlights of the entire meeting and definitely a session you'll not want to miss.

Have you made your plans yet?

As you can see, there are some changes that you should expect to see at the Congress this year, and we think they are going to make it an even more exciting and professionally fulfilling experience.

In 2014, the 60th International Respiratory Convention & Exhibition will be held in Las Vegas, NV, but not in the venue you might think. Next year, we will be hosting AARC Congress 2014 at the Mandalay Bay Hotel and Convention Center, which is located on the Las Vegas Strip. We look forward to seeing you there, too! ■

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The Centers for Disease Control and Prevention

by Cheryl West, MHA

I'll hazard a guess that when many of us hear reference to the actions taken by the Centers for Disease Control and Prevention (CDC), we conjure up a picture of an agency of physicians, epidemiologists, and researchers who, according to many portrayals in the movies, assume the role of worldwide detectives tracking down new outbreaks of deadly diseases and finding ways to stop the spread of these contagions and/or finding an antidote for them. These intrepid government workers (and they are federal employees) leave their offices, board planes, go to the source of the current situation, and report back to their colleagues (working in state-of-the-art labs), who then are tasked to discover a scientific/medical answer/solution/fix to a very bad situation.

Indeed, the CDC does just that; but it also does much, much more. Take a quick look at the main Web page of the CDC (www.cdc.gov) and you will see that the topics run the gamut from a discourse on global malaria, to mold in buildings, to auto safety, and just about everything in between.

About a dozen years ago, the agency inserted the word "prevention" into its title to better reflect the other agenda areas it is also tasked to undertake. After an initial attempt to push the public and media outlets to begin to refer to it as the CD**P**C, wiser heads prevailed, recognizing that the world sees it as the CDC, and let it go at that.

While some might think the CDC is an independent government agency, it's actually one of many agencies under the umbrella of the vast U.S. Department of Health and Human Services (HHS), ultimately answering to the Secretary of HHS. However, unlike most federal agencies, its headquarters is not in the Washington, DC, area but is based out of Atlanta, GA, creating a certain distance between it and the swirl of politics that can be DC. However, that does not mean the CDC personnel work in a vacuum as it develops guidelines and issues research documents. Like any good scientific-based entity, depending on the issue, the CDC seeks input from experts from other government agencies — such as the federal Agency for Healthcare Research and Quality (AHRQ), the Centers for Medicare and Medicaid Services (CMS), the U.S. Public Health Service, as well as the private sector — to refine any set of statements, guidelines, or public information.

about the author...

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

CDC's impact on respiratory therapy

The CDC's influence and impact on the respiratory therapy profession is demonstrated by its collaboration with Medicare. For example, CMS sought input from the CDC when updating its surveyor guidelines on certain Hospital Conditions of Participation that included ventilator and respiratory therapy infection control measures. Because the AARC had significant patient concerns over the guidelines for nebulizer cleaning that recommended use of tap water followed by isopropyl alcohol, CMS and the CDC proactively reached out to the AARC for advice and recommendations to ensure that when the guidelines are finalized they are accurate and consistent with newer technologies.

About a dozen years ago, the CDC began to study and make recommendations on hospital-acquired infections (HAIs), recognizing that many of these infections could be prevented and thereby save the health care system billions of dollars a year and improve a patient's health. One more recent study highlighted the significant cost per patient of ventilator-associated pneumonia (VAP).[1]

Like any good scientific-based entity, the CDC seeks input from experts from other government agencies — such as the federal Agency for Healthcare Research and Quality, the Centers for Medicare and Medicaid Services, the U.S. Public Health Service, as well as the private sector — to refine any set of statements, guidelines, or public information.

Medicare law requires CMS to no longer pay hospitals for the cost of certain conditions acquired during a hospital stay that could have been prevented through use of evidenced-based guidelines. Working with the CDC, CMS proposed to add VAP to the list of preventable conditions. While VAP is serious, the AARC — along with pulmonary physician organizations — argued its diagnosis was imprecise and current evidence and technology wasn't sufficiently developed to ensure it could be reasonably preventable. Based on public input, CMS removed VAP from the list; however, as research becomes more refined, it may be a safe assumption that one day VAP will be back on the "no pay" list.

Bookmark this

The CDC has an entire website for best practices, including performing pulse oximetry for effectively screening newborns: www.cdc.gov/ncbddd/pediatricgenetics/pulse.html. Over the past two years, more than 20 state legislatures have enacted laws to require hospitals in their states to perform newborn testing following the CDC guidelines.

State health programs and many private insurance companies that cover smoking-cessation programs will provide coverage for what is outlined in the CDC guidelines for smoking prevention and cessation at www.cdc.gov/tobacco/stateandcommunity/best_practices/index.htm.

So while many of us may think of the Centers for Disease Control and Prevention as the frontline in responding to dire worldwide health outbreaks, that is only part of their mission. As health care professionals, I recommend that you bookmark their main page. It can be a tremendous resource, professionally and personally. ■

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Chronic Disease Manager

Mobile Applications and Respiratory Care

by Steven B. Nelson, MS, RRT, FAARC

According to a recent survey, more than half of all Americans now own smartphones.[1] Adoption of smartphones is highest among younger users, indicating that the trend toward smartphones will continue to increase. With so many owners, there is an enormous market for mobile applications (apps) to fill every niche imaginable — and in some cases unimaginable. Indeed, it resembles the "Wild West" frontier in many aspects. What does the current market look like for mobile apps related to respiratory care?

The first thing to remember when looking for apps is the meme that "on the Internet, nobody knows you are a dog." As the search for apps in this review started, it became obvious there may be an awful lot of "canine" authors publishing apps. In fact, the U.S. Food and Drug Administration (FDA) only recently stepped in to look at mobile app software.[2] Software can be considered a medical device if it is intended for the diagnosis, mitigation, treatment, or prevention of disease;[3] but the FDA has been slow to react in this space. Indeed, there are a number of apps that could be considered medical devices and will likely fall under FDA scrutiny sooner rather than later.

about the author...

Steven B. Nelson, MS, RRT, FAARC, is an associate executive director for the AARC in Irving, TX.

Medical devices or entertainment?

From a pulmonary diagnostic standpoint, there are three apps purporting to perform spirometry that have been publicized recently. The application SpiroSmart lets you blow at your iPhone and monitor your spirometry values. According to the authors,[4] you just hold your phone at arm's length and blow. It measures the subject's "lip reverberation" to calculate forced vital capacity (FVC), forced expiratory volume in first second (FEV_1), and peak expiratory flow (PEF). The measurement is reported to be accurate within 5.1% on "mostly healthy" subjects. It is not yet available in the app store.

The second is Lung Function Test ($0.99), which advertises it is only for entertainment. That's comforting, since it gives you a random number up to 100% that seems to have no correlation to effort or duration. The last one is Spirometer Pro, also $0.99, and is for entertainment only. While blowing at the microphone, a blue puck moves up to indicate some value up to 2500 mL. The number tends to come out higher if you blow for a long time, as opposed to forcefully blowing out. Since neither of these asks for any demographic data, one wonders how it can guess the predicted outcome. That must be the entertainment part. It was impossible to get reproducible results with either app.

Before looking at more apps, a warning is in order. Not all apps are written for the benefit of the end user. Apps have been known to carry malicious software, send personal data without the user's knowledge, and charge services to the phone owner. Recent furors have arisen over the federal collection of call records. While that has been going on nearly unnoticed since 1978 when the Foreign Intelligence Surveillance Act was approved, the more Orwellian concern should be the number of apps that continually transmit your location and other personal information.

As an example, the app X-Ray Lung Scanner is a game that pretends to take an x-ray of lungs based on the motion of the phone or tablet.[5] It is amusing as it beeps and chirps while displaying a simulated scrolling x-ray when you move your phone over a person. The concern with the application is the permissions required to run on your phone. It tells you that it will record your location, connect to the network to send and receive data, find out whom you called, collect information about other accounts on your phone, and automatically start itself in the background. Samples

of some of the permissions requested and their actions are included in the attached sidebar. A prudent person might be reluctant to share all of that information with unknown parties.

Finding your app

This article was started by performing a generic search for the term "respiratory" in both the Android and Apple app stores. Android yielded over 1,000 results. Unfortunately, the search algorithm is flawed, and about 70% of the so-called matches had nothing to do with the search term. Apple had less than 200 matches, and most of them seemed to be relevant. Narrowing the search to "asthma" showed 329 Android and 131 Apple results. "COPD" had 72 Android and 43 Apple matches. "Tobacco cessation" had a lot of false matches on both platforms with over 1,000 on Android and 549 on Apple. It appeared that there were actually about 50 relevant apps on each platform (see the table "Apps for Study and Review Guides" online at www.aarc.org/members_area/aarc_times/more_of_the_story/index.asp). The apps listed represent those available that generally had better reviews or stood out for a particular trait. It is not an exhaustive list.

Respiratory-related apps can be roughly sorted into three groups: those intended for respiratory students, RTs, and patients. Each segment comes to the market with different needs. What can they expect to find?

By far, the largest group of applications seems to be aimed at students and those trying to brush up for an exam, as they are appropriate as study and review guides. There were countless flashcard applications. Some had as few as 40 items (Respiratory Meds, Jonsap). The RRT Flashcards app by BH offers the ability to enter your own flashcards and then

List of the Permissions That Various Android Apps May Request

This Application Has Access to the Following:

Your Location, Approximate Location (Network-based)
Allows the app to get your approximate location. This location is derived by location services using network location sources such as cell towers and Wi-Fi. These location services must be turned on and available to your device for the app to use them. Apps may use this to determine approximately where you are.

Precise Location (GPS and Network-based)
Allows the app to get your precise location using the Global Positioning System (GPS) or network location sources such as cell towers and Wi-Fi. These location services must be turned on and available to your device for the app to use them. Apps may use this to determine where you are and may consume additional battery power.

Network Communication, Full Network Access
Allows the app to create network sockets and use custom network protocols. The browser and other applications provide means to send data to the Internet, so this permission is not required to send data to the Internet.

Phone Calls, Read Phone Status and Identity
Allows the app to access the phone features of the device. This permission allows the app to determine the phone number and device IDs, whether a call is active, and the remote number connected by a call.

System Tools, Install Shortcuts
Allows an app to add shortcuts without user intervention.

Your Accounts, Find Accounts on the Device
Allows the app to get the list of accounts known by the device. This may include any accounts created by applications you have installed.

Network Communication, View Network Connections
Allows the app to view information about network connections, such as which networks exist and are connected.

View Wi-Fi Connections
Allows the app to view information about Wi-Fi networking, such as whether Wi-Fi is enabled and the name of connected Wi-Fi devices.

Affects Battery, Control Vibration
Allows the app to control the vibrator.

Your Application's Information, Run at Startup
Allows the app to have itself started as soon as the system has finished booting. This can make it take longer to start the device and allow the app to slow down the overall device by always running.

upload them into a shared pool. There was no indication that the shared flashcards were checked for accuracy, however. There were other flashcard sets that had errors in spelling, definitions, and equations. Be sure to read the user comments before using one of these apps.

There are two companies that stand out for opposite reasons. The first, Focus Medica, offers what appear to be free applications in many areas. Once you download the app, you find only a small amount (three or four items) are available unless you buy the full app for $6 or more. The apps are average in content and drawings, but it feels like you are being falsely given something free and then being forced to pay. The other company, WAGmob, is just the opposite. They charge $1.99 up front for their Simple 'n Easy series and deliver the basic information that you need. The Simple 'n Easy moniker is accurate.

Respiratory Refresher from Lone Star College (Kingwood) and The Physiology of the Respiratory System from Taimma Communications Inc. were the two best apps in this category. Respiratory Refresher was a little rough but had a broader range of information available than most of the other review apps. The Physiology app was a sample of the impressive educational tools and graphics that have popularized the A.D.A.M. Project.

Respiratory therapists have an enormous number of references and calculators available. Again, the quality of the apps varies from incorrect or misleading information to excellent. The Six-Min Walk Test by Stefano Picciolo may be the most useful because it includes everything you need except for a couple of orange cones and a tape measure. Be aware, though, that it is capable of storing patient information on the phone or tablet, which runs afoul of the Health Insurance Portability and Accountability Act (HIPAA). Of the simulation apps, iBronch by Edward Bender is a good example of an app that only does one thing but does it well.

The AARC has three apps available. Meetings information is available from the NimbleUser resource. It features upcoming meetings, agendas, and travel information, and allows the user to create a customized calendar. The AARConnect app provides mobile access to our professional network and all of the discussions and communities found there. Finally, the RC app is available from HighWire, the online publisher of the journal, Respiratory Care.

Patient-support apps

Patient apps are as variable in quality as the other categories. The biggest problem here is that most of the apps do not indicate that anyone with medical knowledge has been involved in the development of the app. In some cases, apps appear to have been copied from the same publicly available resource — right down to their feature lists. Since there is no equivalent to the "Good Housekeeping Seal of Approval," it could be a useful service for an RT department to create a lists of apps they have reviewed and found to be reputable, and then make it available to patients who inquire.

Respiratory-related apps can be roughly sorted into three groups: those intended for respiratory students, respiratory therapists, and patients. Each segment comes to the market with different needs.

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Additional details on this review of available respiratory apps can be downloaded on "More of the Story" at www.aarc.org/members_area/aarc_times/more_of_the_story/index.asp

Patient apps were reviewed for three areas: asthma, COPD, and tobacco cessation. There are numerous studies that show feedback, social interaction, and positive reinforcement are particularly effective in these three areas.[6–14]

The two apps that seemed to stand out for asthma were AsthmaCheck and Asthmapolis. Studies by Lv[12] and Liu[13] both found improvements in asthma control with simple approaches using text messaging. More detailed interventions and community support found in these two apps could lead to even better results. Quit Smoking: Cessation Nation seemed to be the best option for smoking cessation. It is backed up by a very active online support community. As access to technology surpasses simple text messaging, more patients can take advantage of these resources.

Patients with COPD could install the COPD Diary Card from Gavin Donaldson to monitor daily health. Unfortunately, the apps that were described in several papers to provide motivation, feedback and assist with disease managment are not available publically.

One final observation about the differences between the Android and Apple platforms is warranted. The Android platform is much easier for a developer to write a program and publish using a number of tools, whereas the Apple platform has strict rules for development and an opaque approval process. This implies that the barrier to entry for Apple is much higher. Indeed, the Apple apps seem to be more refined in many cases.

The biggest impediment to more widespread use of apps is the lack of high-quality apps produced by experts in the field. Until standards are established and a rigorous review process is in place, mobile respiratory apps will remain a risky frontier. ■

EDITOR'S NOTE

Commentary on smartphone applications discussed in this article are the sole opinion of the author and are not an endorsement from nor representative of the AARC.

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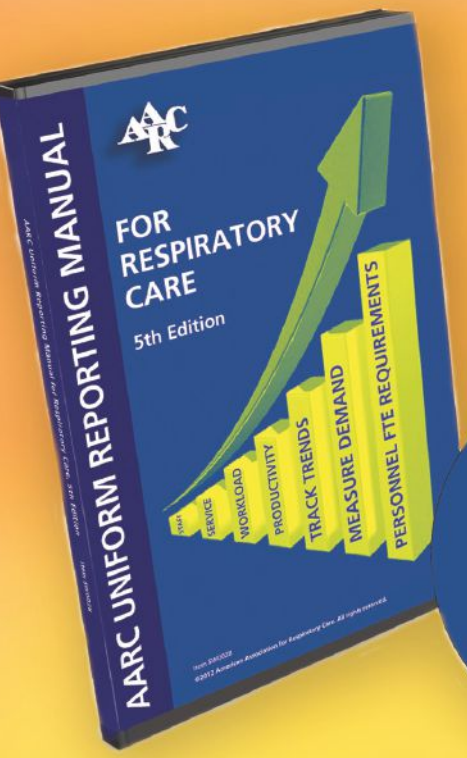

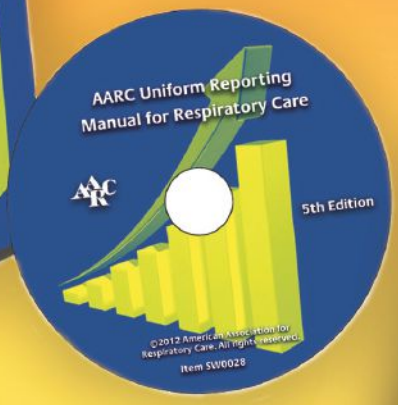

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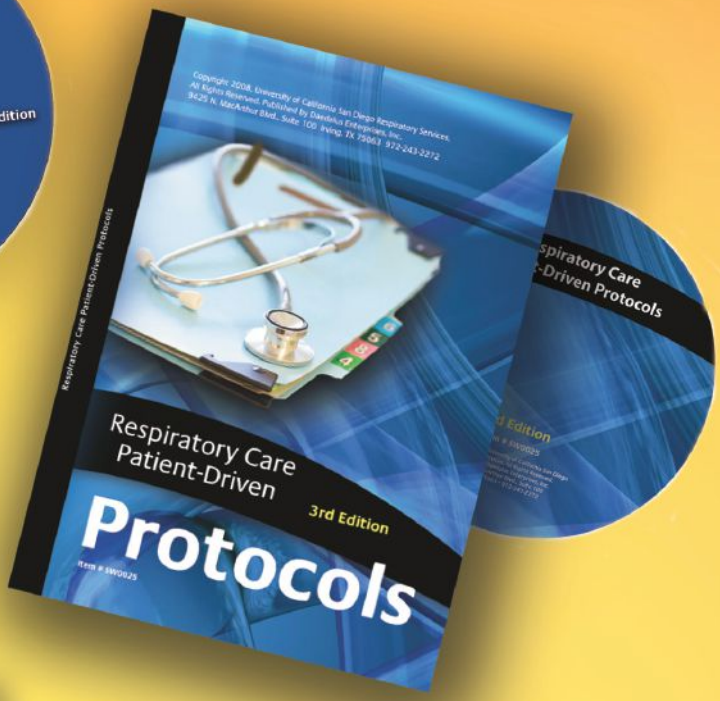

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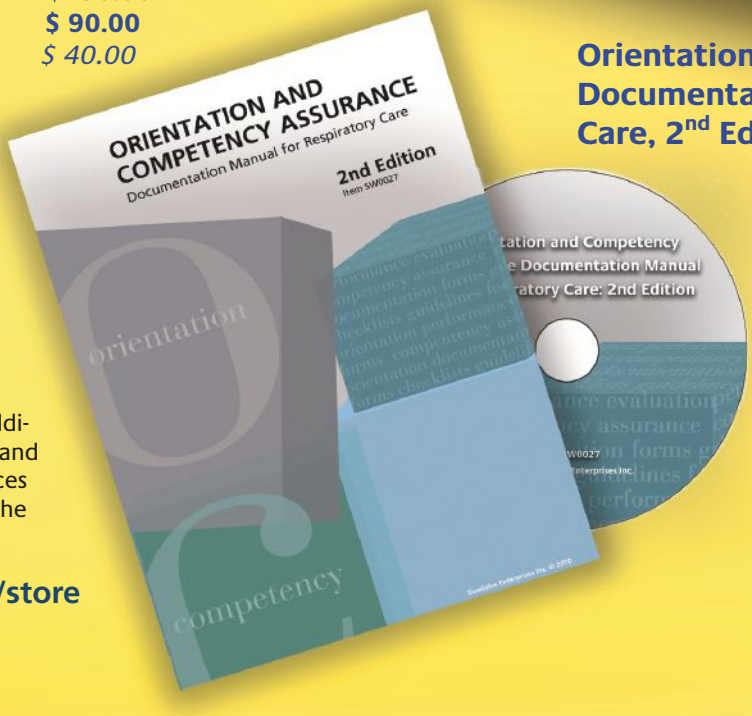

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Penny Wise — Pound Foolish

by Anthony L. DeWitt, JD, RRT, FAARC

If you really want to draw stares from people, ask them what the value of a human life is. Most people will give you something like "you can't put a value on human life"; but of course, juries are asked to do that all the time. They value what a person loses when they lose their husband, father, mother, or wife. While they are not really putting a value on life, they are setting an amount of money to compensate; and at least in some instances, the difference is a semantic one.

If state legislatures are any measure of the value of human life, it is somewhere between $200,000 and $500,000, because this is the amount of the cap on "non-economic" damages — the soft money a jury returns when a person is injured through the negligence of a health care provider. These arbitrary limits are no measure of human life or human suffering; they are just numbers.

But if you drill down to the very core of the issue, no one, whether they are held liable in court or not, wants to be the reason that someone else died. No one who ever manufactured a defective product that maimed or injured someone ever wanted to hurt anyone. Knowing that something you did (or something you should have done but failed to do) resulted in injury to another person is apt to affect your life in negative ways even if a sheriff never shows up at your door with a summons. That is what guilt does to people: It eats at them.

So, I find it interesting that in health care — where much of the equipment is used on critically ill patients and many of the patients balance along a knife's edge between life and death — that hospitals sometimes make decisions that are confounding because they result in short-term savings and long-term risk.

Choice: short-term savings or long-term risk

I once worked at a hospital where nurses, therapists, doctors, and all other staff had to bring their own pens or writing instruments to work. The hospital did not supply pens. There was no place to go inside the hospital to requisition a pen, and no one in any of the supply offices kept them to hand out. When I asked about this, I was told that the hospital had one year totaled up that they had paid out over $700 to buy pens, the majority of which went home with staff and never came back. So in a cost-cutting move, the hospital simply did away with the practice. Every nurse needs to document her care. Every therapist needs to document her care. Every case worker, rad tech, lab tech, and surgical assistant needs to make entries in the patient chart. Doctors need to make entries. The worst offenders about having to borrow pens in my experience were physicians.

It is common knowledge that good documentation prevents lawsuits; but at this hospital, documentation suffered because too often a therapist, nurse, or other caregiver would have to make a mental note to chart something because they couldn't go to a location on the nursing floor and pick up a pen to make a note. At the end of the day, more went undocumented than anyone in the risk management department ever knew; and the result was that the

about the author...

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hospital had significant risk and liability exposure when it could have guarded against it with a $700 investment. Given that the average wrongful death verdict is between $500,000 and $2,000,000 nationwide, that's pretty cheap insurance.

Similarly, when hospitals go to purchase capital equipment, many make the decision based solely on cost (or on what is available from their purchasing group) instead of on the only criterion that really matters: What's best for the patient?

A vendor willing to put cheaper components into critical equipment and sell it for a smaller profit gets their foot in the door of the purchasing group and often forces out better equipment that's better for the patients. Even when groups of employees and managers get together to preview equipment and determine which units to recommend, the decisions tend to reflect only the biases of the group that does the recommending. This, in turn, holds the clinical judgment of other managers — managers who may be more clinically savvy than those in the purchasing group — hostage to the lowest price. It is a foolish way to buy equipment, and it is almost always certain to cost the hospital money in the long run. Equipment that is not modular and that can't be updated with firmware fixes tends to get replaced much more frequently than modular equipment designed around the concept of upgradability.

I find it interesting that in health care — where much of the equipment is used on critically ill patients and many of the patients balance along a knife's edge between life and death — that hospitals sometimes make decisions that are confounding because they result in short-term savings and long-term risk.

Economic good versus the patient's well being

The real problem with the small community hospital buying the cheapest ventilators, oximeters, or monitors is that the experts called to judge whether the hospital personnel were negligent or not will likely have much better equipment and may not understand why certain monitoring wasn't done. They may conclude that the failure to have the right equipment is part of the problem. And if they do, that opens up discovery for how the decision to purchase the Acme model X was made instead of the Brand Name model Y. When price is the first and last factor in the equation, the smart lawyer will say that the hospital put its economic good in front of the patient's well being.

Similarly, some hospitals, during slow periods, cut staffing below the level that is safe without employing a back up, or allowing therapists or other workers to remain on call. Paying a therapist $2 per hour for being on call, as opposed to sending them home with no requirement to come back if there is an emergency, is what sets smart facilities apart from those who think that a plane crash or fertilizer plant explosion won't happen on any particular night. As anyone who has been to Las Vegas knows, it is always better to hedge your bets.

Minimize impact on patient care

When decisions need to be made on a cost basis, someone should put into writing how the decision will affect patient care and why the decision was made. Every effort should be made to minimize the impact on patient care. Doing so, in the end, is what prevents penny-wise decisions from becoming pound foolish in front of a jury. ■

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The Expanding Role of Respiratory Therapists in Emergency Departments

by Rebecca L. Meredith, BS, RRT

Within the current health care system, respiratory therapists routinely provide care in the ICU, emergency department (ED), and the acute care setting. In certain settings, under their licensure, registered nurses (RNs) can provide respiratory care. However, many of the necessary respiratory modalities include more aggressive, life-saving interventions requiring a more experienced health care provider such as the respiratory therapist.[1] As the health care industry changes over the years, institutions are challenged to develop a model of care that brings the most qualified individuals to the team while maintaining costs. Frequently, the bedside nurse serves the role as primary care manager of the patient from admission to discharge — and often, transition to home. In doing so, the nurses find themselves needing the expertise of highly skilled health care professionals like respiratory therapists to ensure quality care is delivered.[2]

Integration of the multi-skilled RT into the ED

In 1994, the newly expanded ED (including a clinical decision unit) at Cleveland Clinic was faced with the challenge of providing respiratory care. In the past, RTs were called to the ED only when their services were needed. However, the new department was remotely located from the main hospital, with response times ranging from 6–12 minutes. It was recognized that the RTs have specialized skills in airway management, mechanical ventilation, and other modalities available to optimize care that the RNs could not easily master through a quick training course. Additionally, RTs are the clinical experts regarding indications, contraindications, and outcome criteria. Therefore, the decision was made to decentralize RTs as part of the ED team. Since the ED had just opened, we had no idea what volume of patients would require respiratory care. As a result, the first challenge we faced was to determine how the RT could assist with the care of patients who did not require their services while still being readily available in the department. For purposes of efficiency and staff utilization, the RTs' role was expanded to include tasks not traditionally associated with the role. These tasks include: peripheral phlebotomy, intravenous (IV) access, electrocardiograms, assisting with orthopedic and suture procedures, assisting with procedural sedation, placing patients on monitors, measuring vital signs, inserting nasogastric tubes, inserting urinary catheters, transporting patients, and assisting with any other personal needs. With this model, the therapist is able to go into the room and place the patient on the monitor, obtain vital signs, place them on oxygen if needed, insert the IV, draw labs, deliver a breathing treatment, obtain blood gases, and transport to radiology.

This multi-skilled role is evolving based on the needs of the health care industry, patient population, patient acuity, and government regulations. Patient acuity in this institution is one of the highest in the nation. Patient populations include a high volume of cardiopulmonary illnesses and pediatric respiratory emergencies. The respiratory therapists, in collaboration with the physicians and nurses, provide the latest technology available in respiratory care including invasive and noninvasive mechanical ventilation, high-flow nasal cannulas, continuously nebulized bronchodilator therapy, etc. A sample of 17 patients presenting with a primary diagnosis of COPD had bi-level

about the author...

Rebecca L. Meredith, BS, RRT, is the supervisor of respiratory therapy in the Emergency Services Institute at the Cleveland Clinic in Cleveland, OH.

PAP initiated immediately. Intubation was not required in any of the patients. Four (24%) were admitted to an ICU, and the remainder were able to be stabilized and admitted to the regular nursing floor. Additionally, 12 patients presenting with heart failure had bi-level positive airway pressure (PAP) initiated immediately. Intubation was required in two (16%) of the patients, while the remainder were successfully managed throughout their hospital stay on bi-level PAP. The availability of the equipment and the therapist right in the department has a positive impact on patient outcomes.

Six years ago the RTs' role again expanded to include staffing a point-of-care (POC) laboratory. The POC tests include: B-type natriuretic peptide, troponin-T, D-dimer, blood gas analyzer (electrolytes, hemoglobin/hematocrit, lactate, creatinine, and co-oximetry), bedside PT/INR (prothrombin time/international normalized ratio) for stroke, urine dip, urine pregnancy, influenza A & B, respiratory syncytial virus, and HIV. The RTs ensure the standards for waived and non-waived (moderately complex) testing meets those established by The Joint Commission and the College of American Pathologists. The RTs take an active role in research, patient education, and orientation. Many RTs serve as instructors for basic life support (BLS), advanced cardiac life support (ACLS), pediatric advanced life support (PALS), and the neonatal resuscitation program (NRP).

The ED respiratory therapists also staff the rapid response team for the hospital. They respond to all codes and visit patients twice a day identified as at risk for decompensation. Over the past 20 years at the main campus, respiratory therapy staffing has increased from five to 22 positions.

Multi-skilled RTs in a free-standing ED

In 2010, our health system began planning the staffing structure for our first free-standing, full-service emergency department. The staff was composed of RNs, paramedics, and clinical technicians. The question was posed as to who would deliver the necessary respiratory care for these patients. It was stated that the nurse could perform basic respiratory modalities; and if there was need for mechanical ventilation, the patient could be placed on the "traditional" tidal volume: 500, respiratory rate: 12, FiO_2: 100% settings and wait for a more qualified individual to arrive (i.e., critical care transport). The respiratory therapy supervisor turned to the chairman for the new facility and said there were two issues with this statement: Ventilator settings are not one-size fits all, and ED patients often need more than basic respiratory modalities. The supervisor suggested using the same model as the main campus and include the multi-skilled respiratory therapist in the staffing structure. Once the chairman and nurse manager learned more about the role, it was agreed to add RTs to the staffing structure.

Six respiratory therapy positions were approved. The candidates had to be registered with at least three years of experience, preferably in the ICU or acute care setting. Several of the applicants were former paramedics, which fit very well into the multi-skilled role. All the RTs have a BLS certification before being hired and then attain ACLS, PALS, and NRP within one year. The RTs oriented at the main campus for four weeks and at the free-standing facility for two weeks. The job responsibilities in the free-standing ED are the same as the main campus. The POC testing is not as extensive but remains part of the RT's role. Additionally, the nurse manager asked if the RT could be responsible for breath-alcohol testing related to workman's injury care and urine drug screening for the Department of Transportation (DOT)/non-DOT. The RTs have been trained and maintain the programs.

Several months after opening, it became increasingly more difficult for the free-standing facility to be managed on a day-to-day basis from the main campus. The nurse manager converted one of the existing positions to that of a clinical specialist, promoting one of the cur-

rent RTs. This individual is a clinical resource to staff at all levels, monitors compliance with the delivery of respiratory care and POC testing, is responsible for competency assessment/education, and ensures the day-to-day operation.

Future expansion

When the nurse manager at the first free-standing facility was originally asked her opinion about adding RTs to the staffing structure, her response was, "Why? The nurses can do it." Since that time she has come to appreciate the expertise and value of a respiratory therapist. It gives the nurse peace of mind to know that they are readily available. As a result, the model was replicated at a second free-standing ED in 2012, and there are plans for two additional facilities. The future for the respiratory therapist in our emergency department looks very promising. By 2015 we will have 46 multi-skilled RTs delivering care to our patients over five facilities.

As the health care industry changes over the years, institutions are challenged to develop a model of care that brings the most qualified individuals to the team while maintaining costs.

Why so successful?

The RT supervisor communicates with nursing and physician leadership to increase their awareness regarding the versatility of a respiratory therapist. This communication breaks down the walls that divided the professions, which creates a mutual respect for the expertise each caregiver brings to the bedside of the patient. The model also provides immediate availability of the clinical expert at the bedside of patients, thus eliminating any delays to treatment and improving outcomes. It also requires that RTs go beyond the traditional role and assist the nurse with total care of the patient through the multi-skilled tasks. We are able to take the two separate experts and make them into an expert team, thus positioning the respiratory therapist as an indispensable member.[3] ■

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The RT's Role in COPD Disease Management

by Becky Anderson, RRT

While there is no consensus across the medical community on a definition for the term "disease management," it is generally held that disease management programs should include strategies to improve overall quality, cost-effectiveness, and health-related patient outcomes.[1] A review of definitions in medical publications found these additional characteristics:

- Intervention for a target group of persons to manage or prevent one or more chronic conditions
- Utilization of a systematic, multidisciplinary approach
- Promotion of patient self-management.[2]

Disease management is not a new term in the vocabulary of respiratory therapists. Numerous articles have been written describing the role of RTs in chronic disease management and behavior modification.[3,4] For nearly two decades, RTs have been involved in developing innovative disease management practices across the health care spectrum. Influenced by the oncoming tide of the baby boomer generation rushing toward Medicare eligibility, there has been a perceptible shift in the health care system to focus on disease prevention and chronic disease management as opposed to reacting to acute illness.

A leading cause of morbidity and mortality with high rates of recidivism, the incidence of COPD continues to rise.[5–7] As the delivery of acute care shifts from the hospital to the patient's home, respiratory care must also make that shift.[7] Respiratory therapists are trained in providing respiratory care for patients with chronic conditions and, as such, are poised to impact future care for COPD patients.

about the author...

Becky Anderson, RRT, is manager of disease management for respiratory care services at Sanford Medical Center in Fargo, ND.

The role of the respiratory therapist

In 2008, the AARC convened a task force to envision the RT of the future. Their body of work included identifying elements of education, training, and competency needed to effectively transition respiratory therapists into the changing landscape of health care.[7] The competencies on which general agreement was reached all have recognizable impact on COPD care and include a competency area specific to disease management. Key points of competency include:

Disease state — As the experts in respiratory care, it is essential that RTs have an in-depth understanding of COPD disease state including diagnosis and treatment of cardiopulmonary diseases. Because of the complexity of coordinating care due to comorbid conditions, the respiratory therapist must display a broad understanding of the pharmacology of all organ systems.[8] Clinical management of COPD requires coordination of care for the whole patient, not simply the pulmonary system.

Communication — Patient adherence to a prescribed self-management plan is essential in optimizing disease management. One frequently voiced frustration of caring for patients who live with COPD is the perception of non-adherence, which can result in increased rates of morbidity, health care expenditures, hospitalizations, and possibly mortality.[9] A major consideration in non-adherence is lack of communication between health care providers and patients. More precisely, it is the lack of *effective* communication that frequently causes misunderstandings leading to patient decisions that affect adherence. However, there are evidence-based

In the dynamic and rapidly changing world of health care, respiratory therapists are positioned to assist in building evidence-based health care programs that will have a profound impact on quality of life for COPD patients.

communication styles that have been shown to facilitate behavioral change and improved adherence, one of which is motivational interviewing (MI).[10] Not to be confused with persuasion or confrontation, MI is an interpersonal style of communication that meets the patient where they are in readiness to change and then partners the RT and patient in exploring conflict between two courses of action (e.g., to quit tobacco or not). Affirmation of a patient's freedom of choice and self-direction are hallmarks of this respectful communication style.[11] RTs must communicate with and provide education for patients in a manner that engages them in self-care and empowers them to make choices which will positively impact their health.

Care planning — The role of RTs in developing, administering, and re-evaluating the patient care plan for COPD patients is at the heart of disease management. The ability to assimilate published research into evidence-based practice is essential to building effective disease management programs. The RT's critical thinking skills and keen eye for detail are an advantage in evaluating care across many settings and in developing action plans to improve health-related outcomes for COPD patients.

Outcomes — Successful disease management programs are the result of continuous improvement. Outcomes must be identified, documented, and monitored to provide objective data for use in program development. Common health care outcomes that are relevant to COPD care include economic, quality, safety, and patient satisfaction.[5]

Leadership — Multidisciplinary care teams will become the standard for care delivery.[7] The ability of RTs to collaborate across the health care spectrum and assume leadership roles to facilitate the work of the care team will be essential in building strong COPD care programs.

Building a COPD disease management program

At AARC Congress 2012 in New Orleans, keynote speaker John J. Nance talked about the use of checklists to assist hospitals in the pursuit of patient safety and quality care. The development of a COPD disease management program, whether in the inpatient or ambulatory setting, is essentially a checklist that facilitates identification of goals and objectives. While the basic list can be used across the health care continuum, the detail will differ based on locale and resources.

Align with strategic goals — When approaching health care executives to secure organizational support for a COPD care delivery redesign, it is vitally important to understand the organization's strategic initiatives. COPD will be added to Medicare's Hospital Readmissions Reduction Program in FY15 (beginning October of 2014), so reducing all-cause readmissions should be a priority for hospitals. Organizations may also identify initiatives to

reduce cost, improve the patient experience, provide population health management, or improve efficiency. Understanding those goals will help in drafting a proposal to improve COPD care, which will add value for an organization.

Assess current application of evidence-based care — Comparing current care to recommended care will provide guidance in building evidence-based clinical pathways, order sets, and protocols. Respiratory therapy protocols based on best practice have been shown to improve quality of care and decrease cost and should be incorporated into COPD care in both hospital and ambulatory settings.[7] Clinical practice guidelines for COPD care are available from a variety of experts, including the American Thoracic Society, Global Initiative for Chronic Obstructive Lung Disease, Institute for Clinical Systems Improvement, American College of Physicians, and American College of Chest Physicians. The AARC website is a valuable source of information on clinical practice guidelines as well as educational opportunities focused on COPD, including the self-study COPD Educator Course (www.aarc.org/education/copd_course/index.cfm). The COPD Best Practices Community at AARConnect (http://connect.aarc.org/aarc/home/) provides access to information and documents pertaining to COPD care and shared by a variety of health care organizations.

Review current outcomes — In the hospital setting, financial reports for MS-DRGs 190, 191, and 192 can supply information on the number of COPD discharges, length of stay, charges, estimated reimbursement, direct and indirect costs, total cost, estimated net margin, and payer mix. Direct cost analysis can be further drilled down by department to target specific areas for improvement. Medications cost can be identified by pharmacy, and the costing department can supply information on respiratory therapy labor costs. Quality departments can help in determining all-cause readmission rates.

The future is now

In the dynamic and rapidly changing world of health care, respiratory therapists are positioned to assist in building evidence-based health care programs that will have a profound impact on quality of life for COPD patients. The future of respiratory therapists as disease managers is a unique opportunity to advance our skill set and expand our scope of practice… and that future is now. ■

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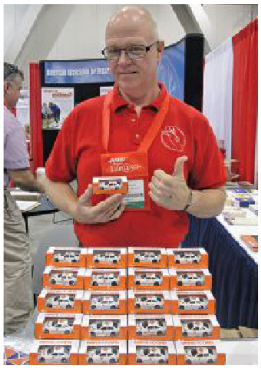


Above: Front row (from left): Danielle Curry, Andrea Lopez, Gerino Dragon (center), Tiffany Law, Christina Antolin, Maria Abalos (scrubs). Back row (from left): Todd Young, MA, RRT (director of clinical education), Anthony Everidge, BA, RRT-NPS (program director), Joel Wood, RRT (instructor), Craig Dykstra, Richard Rehm, Kelly Ashley, Aimee Barnes, RRT (clinical instructor).

AARP Event in Las Vegas

Students Behind the Wheel

further their education at AARP event

Patient education is an increasingly important part of the RT's job. Students at the Life@50+ event in Las Vegas honed their skills by visiting with more than a thousand patients and potential patients last spring.

AARP members who attended the organization's Life@50+ expo in Las Vegas, NV, had the chance to do everything from attending a film festival featuring Hollywood stars like Billy Bob Thornton and Jerry Lewis (who were on hand to answer questions after their screenings) to participating in a "Community Day of Service" aimed at helping neighborhoods in need. In the midst of all this excitement, however, were an array of exhibits designed to educate seniors on important health care issues, and the AARC's DRIVE4COPD booth was part of it all.

"The AARP's Life@50+ event gives us the opportunity to connect with thousands of people who may either have COPD or be at risk for the condition," explains AARC COPD Coordinator Jason Moury, BS, RRT. "We always have a great turnout, and this year was no different as AARP members lined up to take advantage of our screening and patient education." Much of the screening and education was provided by local RT students from the respiratory therapy program at Pima Medical Institute, where program director Anthony Everidge, BA, RRT-NPS, says the event helped his senior students fulfill their program's community service requirement.

Students rise to the occasion

"The opportunity to have our students experience this type of event was amazing," says Everidge. "Interacting with the attendees — a.k.a. patients — was a superb opportunity for them to practice their patient interview skills as well as their assessment skills." The students also got the chance to perform simple spirometry and gather peak flow rates from attendees. Altogether, the group screened 1,700 attendees and completed spirometry and peak flow tests on more than 500.

Life@50+: *Student Recollections from the Event*

One man I met was around 61 years old and was healthy as can be. I gave him the test, and I knew he would pass. Before he left he stopped and said, "You know, I really wanted to talk to you." With a confused look on my face, I said to him, "But why, I'm just a volunteer." The next thing he said left me speechless. The man said I reminded him of his son, whom he misses so much. It warmed his heart that I was a nice young man. I thanked him for all the kind words and then asked him if he visits his son. He then said his son passed away a couple of years ago. My heart just sank. I told the man I was sorry for his loss, and he looked at me and said, "You know, I miss my son so much, but talking to you made me feel so much better." It felt nice to know I made someone feel warm inside because I reminded him of his son.

— Gerino Dragon,
Pima Medical Institute

Bristol, Tennessee Event

Life@50+: *Student Recollections from the Event*

A gentleman approached me asking questions about COPD and the symptoms to look for. He proceeded to tell me that his wife was concerned about the disease because her mother passed away due to complications from COPD and her sister is currently being treated for COPD. He said she was 58 years old and has refused to be tested but wanted some information. I asked to speak with her directly to better answer her questions. When I met with her, I explained how we conduct the tests and the wealth of knowledge they will provide. She then chose to entrust us to conduct the assessment. After completing her spirometry test, she and her husband enthusiastically came over to show me her results. Not only did she score at very low risk for COPD, but also her spirometry results were extremely encouraging. She told me she was excited to visit her doctor when they returned home.

— Richard Rehm,
Pima Medical Institute

Everidge and his colleagues believe the community service activity helped prepare their students to move into a new world of clinical practice that is increasingly relying on the respiratory therapist to provide patient education. "We realize the role of the RT is expanding and evolving into not only a highly trained clinician but also an active patient educator," says the program director. "Opportunities such as the AARP convention allow our students to practice their clinical skills and experience their role as an educator, both of which are crucial to the student and future practitioner."

The students also say they enjoyed the one-on-one time they got to spend with the seniors in attendance and were able to hone some skills they had studied but not often been able to put into practice. Gerino Dragon says he learned how to instruct someone on the use of respiratory medication delivery devices, and he also polished his spirometry skills. For him, coming face-to-face with patients was also a plus. "It sharpened my communication skills because I'm usually a shy person," says the student. "But these people brought the talkative guy out of me."

Columbus, Ohio Event

Fellow student Richard Rehm called the event a "fantastic addition to my respiratory therapy education," noting that he had the chance to talk with people who were already diagnosed with COPD as well as those who might be at risk for the disease. He also enjoyed the opportunity to meet and work directly with leaders in the AARC and the COPD Foundation who attended. "They were very encouraging and helpful, in my experience."

Maria Abalos enjoyed meeting leaders in her new profession, too. "I was truly inspired by their kindness, compassion for the attendees, and overall enthusiasm for everything they do," she says. Getting to interact with so many patients and potential patients in just three days was great as well. "It allowed me to personally utilize the education I have gained thus far and share it with a variety of different people who were all eager to gain personal knowledge about the COPD process."

Kelly Ashley says the convention gave him a better idea of what it will be like when he graduates and begins practicing in the profession. "I felt like it put me on a different playing field," he says. "I felt like I went from a student of respiratory therapy to an actual respiratory therapist, with mutual respect from the other professional RTs."

For Christina Antolin, the event provided a way to help people understand that there are many things they can do to minimize the effects of COPD — or even help prevent it in the first place. "I informed them about how COPD can affect your lung functions and your everyday basic life activities," she says. "By becoming aware of COPD, early detection and treatment can make a difference in your healthy living."

Life@50+: *Student Recollections from the Event*

My clinical instructor came over accompanied by a kind woman approximately 65 years old who exhibited several signs and symptoms of COPD. She was not fully educated about the disease process and its effects, but it was clear she was ready to take an active role in educating herself about COPD. It was amazing to be able to sit with her because she was eager to learn all she possibly could in that brief amount of time. She was truly engaged every step of the way through testing and explanations. After we completed her spirometry, I could see the relief in her eyes and the gratitude on her face that this small service was provided to her. She was relieved to be able to bring tangible results to her doctor. I knew right then that being able to make such a huge difference to just one person is exactly why I decided to pursue a career in respiratory therapy.

— Maria Abalos,
Pima Medical Institute

Spreading their wings

Jason Moury says the AARC's participation in the May event is just one of several the Association has gotten involved in this year. Since the AARP event, the AARC has also hosted DRIVE4COPD booths at health fairs and expos in Boston, MA; Louisville, KY; Columbus, OH; and Bristol, TN. Two more are planned in Miami, FL, this fall; and Moury hopes to continue the effort into 2014 with a similar lineup of events across the country. "By creating a presence at these large-scale health expos — which draw in thousands of attendees — we not only spread the word about early screening for COPD, we also help educate the public about respiratory therapists and the role we play in patient care and education," says the therapist.

Anthony Everidge believes events like the AARP's Life@50+ offer a big opportunity to his fellow RC educators as well. "Every respiratory therapy program should participate in events like this," he says, citing their great potential to expose students to hundreds of patient education encounters in a short period of time. "The booth was active and crowded from the opening day until virtually the last minute of the convention. At times the line to do testing was quite long — we may have been one of the most popular booths on the convention floor." He was particularly proud to observe the professional demeanor and increased confidence his students developed as they asked the attendees the questions on the COPD questionnaire and performed peak flows. "The students were involved, caring, and acted as if they had been doing this for a long time," he says.

He and his fellow educators went home with more than they came with, too. "It was a pleasure to watch students we have spent the last two years actively educating now spread their 'RT wings' and take their knowledge and apply it to patients," says Everidge. ■

Life@50+: *Student Recollections from the Event*

I met one very nice lady about 75 years old who had never had a peak flow done before. She was a nonsmoker and looked very healthy for her age. She could not thank me enough for being at the AARP event and helping with the DRIVE4COPD campaign. Her evaluation came out very good and she thanked me again. She then invited me to attend a local event called The Greek Festival and to ask for her and she would give me and my family a tour around her facility. She told me she had been organizing this event for the last 41 years. I decided I would take her up on her invitation!

— Kelly Ashley,
Pima Medical Institute

Life@50+: *Student Recollections from the Event*

The person I remember best was about 62 years of age and informed me that her parents were both smokers. Growing up, they smoked around the children and inside the house. Her parents died of COPD, and she knew the symptoms because she experienced and lived them. She was never a smoker; but as she grew older, she felt something was out of the ordinary and knew right from the start that she may have developed COPD. She was right. She was diagnosed with COPD due to secondhand smoke at an early stage. She informed me that early detection, treatment, and pulmonary rehabilitation really made a difference because she is now able to manage her COPD exacerbations.

— Christina Antolin,
Pima Medical Institute

Drum Roll, Please:

Introducing the Respiratory Care Marketplace

THE AARC'S NEW ONLINE GUIDE TO PRODUCTS AND SERVICES OFFERS ONE-STOP SHOPPING FOR THE RESPIRATORY THERAPY COMMUNITY

For years, AARC members flipped through the pages of this magazine to find the products and services they needed to run their departments. Then we introduced our online Buyer's Guide to complement the printed edition.

Now we're going online only, and the result is a virtual "Marketplace" — http://respiratorycaremarketplace.com — where everything and anything related to respiratory care is just a click away.

Late last summer the AARC debuted a brand new buyer's guide on www.aarc.org called the "Respiratory Care Marketplace" that's been designed especially with the end user in mind. In the following interview, AARC Associate Executive Director, Brands Management Timothy R. Myers, MBA, RRT-NPS, FAARC, explains the thinking behind the new website and what users will find when they visit.

AARC Times:

Why did the AARC decide to revamp its online Buyer's Guide and why the name change to "Marketplace"?

Myers:

The AARC decided to revamp its online Buyer's Guide to make it more consumer friendly and easier for users to navigate and search for the desired products. In addition, the original system was many years old and consumed a considerable amount of human resources in its maintenance.

The decision to change the name was a shift in traditional thinking. This guide is constructed for patients and clinicians alike. The desire was to provide more access to, and information about, the companies and their products — and not just for purchasing decisions but for comparing product categories, too. "Marketplace" just seemed to fit that paradigm.

AARC Times:

You're working with a company called MultiView, Inc., to manage this new site. What is MultiView bringing to the table, and how is it improving the functionality of the site for users?

Myers:

MultiView provides the information technology (IT) platform that the AARC Respiratory Care Marketplace operates from. They provide all the resources and maintenance of the system and its software, while serving as our partner to offer companies a variety of digital advertising opportunities on the site itself.

AARC Times:

What are some of the new features on the site, and how can users best take advantage of them?

Myers:

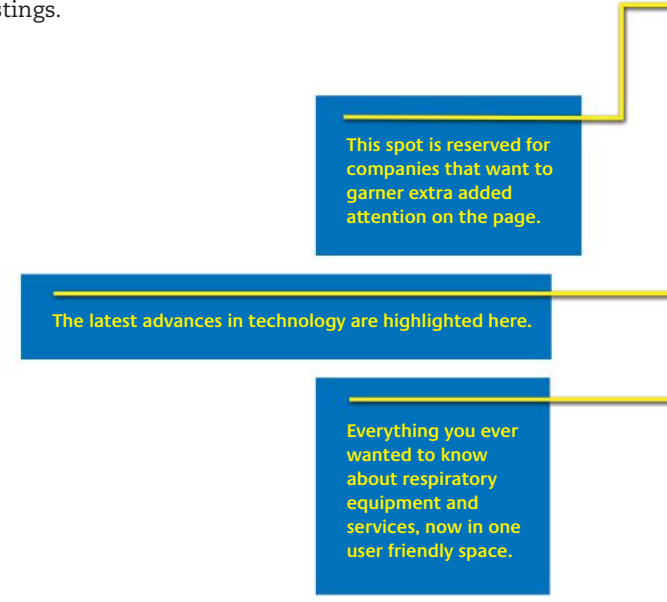
The new features include a decrease in the number of product categories and a more clinical approach to the nomenclature used for the various product categories contained within the Marketplace. There are a number of new features available with the new platform, such as additional opportunities to showcase specific companies and products in the "Featured Companies" and "Product Showcase" areas of the Marketplace. The opportunity for companies to showcase new products and platforms through digital advertising is also new. In addition to those exciting features, the product listings have the ability to link to company sites, AARC Corporate Partners, and AARC Congress Exhibitors.

AARC Times:

The Marketplace website debuted in late summer. What kind of feedback have you gotten on it so far?

Myers:

As with any conversion to a new product or platform, our strategy was to provide a soft launch at the end of the summer to allow us to address and correct any glitches and problems. The accuracy of the Marketplace and its products relies heavily on the companies and the manufacturers that provide input and updates to their products and assign appropriate keywords to enhance the search engine's capabilities to provide reliable and accurate information. While the system works very quickly and smoothly, we are still working with MultiView and the respiratory care industry to fine tune the platform and its listings.



AARC Times:

Are there any plans in the works to further enhance the functionality of the new site? If so, what's being planned and why?

Myers:

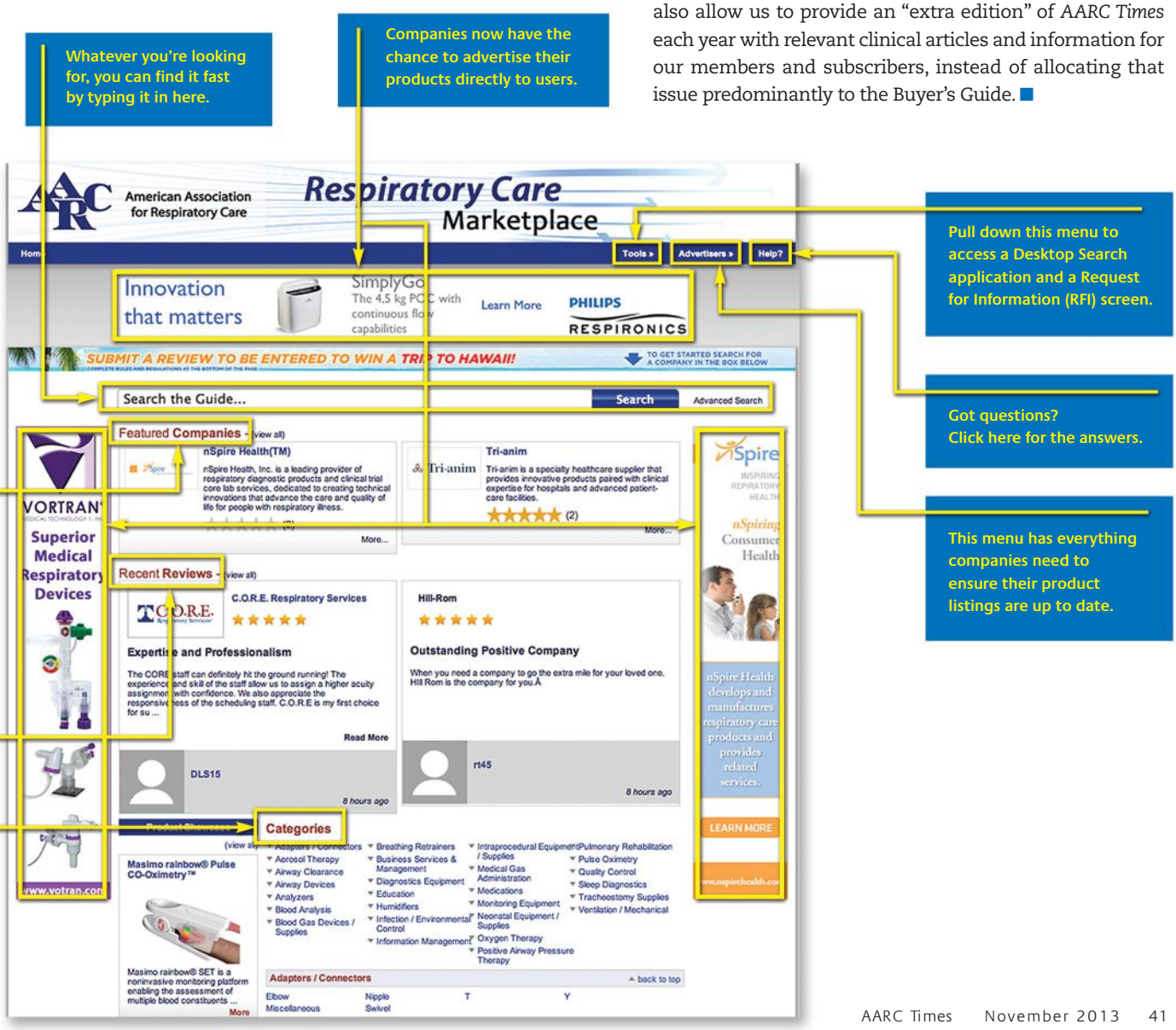
We will continue to fine tune the platform and its listings as we move forward in the fourth quarter of 2013. A new feature to be released this fall is "Ratings and Reviews" functionality. MultiView recently partnered with BazaarVoice (www.bazaarvoice.com/) to integrate ratings and reviews into our marketplace platforms. It is believed that tools such as these will increase member engagement, drive usage, and modernize our existing product offering with the latest technologies available.

AARC Times:

We understand that this new Marketplace site will become the sole buyer's guide for the AARC, replacing the printed guide that typically appears in the July issue of *AARC Times*. What was the thinking behind this move, and how do you believe members will ultimately benefit from the change?

Myers:

The advantages to an online Marketplace are that it allows for real-time access to current and new products in the respiratory care community. The traditional Buyer's Guide that was printed in the July issue of *AARC Times* was always a respected and critical resource for our membership; but it was available only to those who subscribed to the publication, decreasing its reach and relevance compared to the global community in need of the resource. This change will also allow us to provide an "extra edition" of *AARC Times* each year with relevant clinical articles and information for our members and subscribers, instead of allocating that issue predominantly to the Buyer's Guide. ■



Respiratory National Clinical

Respiratory therapists adjust and respond to alarms multiple times during the course of a shift. Alarms originate from many medical devices, such as mechanical ventilators, pulse oximeters, cardiac monitors, infusion pumps, bed alarms, and intermittent compression devices.

RTs overwhelmingly support the implementation of smart alarms, which may at least partially solve the problem of inadequate staff that is available to respond to alarm events.

Therapists' Response to a Alarm Survey

About the Authors
Crystal Dunlevy, EdD, RRT, is a clinical associate professor at The Ohio State University in Columbus, OH.

Shawna Strickland, PhD, RRT-NPS, FAARC, is the AARC's associate executive director of education.

Each alarm has its own characteristics. To complicate matters further, there is no standardization of alarm sounds as to priority or parameter/device in alarms among manufacturers: RTs must triage among multiple alarms that demand their attention, responding according to the perceived importance of the alarm.

The Joint Commission (TJC) reviewed 23 reports of death or injury related to mechanical ventilation in 2002. Of these, 65% were related to alarms.[1] In January 2014, TJC will incorporate alarm management into its National Patient Safety Goals (NPSG) in an effort "to improve the safety of clinical alarm systems" in TJC environment of care standards.[2] The major patient safety issue identified by TJC involves the desensitization of staff to audible alarms and the difficulty in prioritizing the many devices emitting audible alarms. In addition, the FDA Manufacturer and User Facility Device Experience Database (MAUDE) and the ECRI Institute Problem Reporting System were reviewed, and "alarm hazards" was identified as the number one device-related risk on ECRI Institute's 2013 list of top 10 health technology hazards.[3]

Alarm events

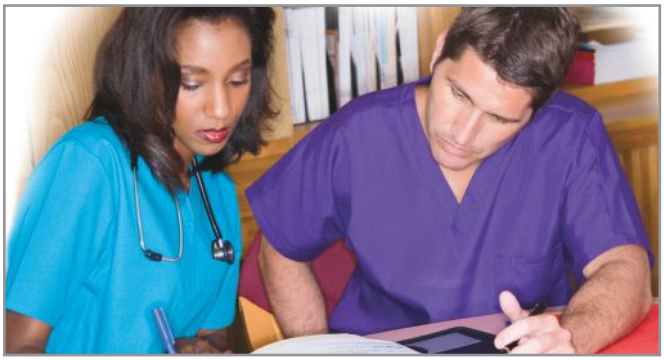
In an effort to determine the causes of alarm events, the Shepherd System's Risk Model was applied to the 237 adverse event reports from the MAUDE database. Forty-one percent of these event reports could not be analyzed due to the lack of information provided; but of the remaining 59%, 53% of the alarms resulting in patient deaths were related to operator error.[4] Nuisance (false positive) alarms can also compromise patient safety. When alarms are deemed irrelevant by clinicians, they are ignored or not responded to immediately. Review of the medical literature reveals an abundance of studies on nuisance alarms over the last 15 years.[5–9] Subjects were monitored between 300 and 2,000 hours and included mechanically ventilated patients, pediatric ICU patients, stable emergency department patients with chest pain, and adult ICU patients. The highest percentage of clinically significant alarm events was 8%, and the lowest was 0.2%. To summarize, medical devices alarm frequently, the cause of the alarm is not often clinically significant, and clinicians become desensitized to alarms. Desensitization potentially results in poorer patient outcomes. This data suggested the need to query caregivers about their experiences with clinical alarms in order to decrease the occurrence of alarm-related adverse events.

Clinical alarms survey

In 2008, the results of a national online survey on the effectiveness of clinical alarms that had been distributed to health care providers was published in the *American Journal of Critical Care*.[10] The survey was developed by a 16-member task force made up primarily of clinical engineers and made possible through the American College of Clinical Engineering's Healthcare Technology Foundation (HTF). The same Clinical Alarms Survey with additional valuable questions was made available to RTs in 2011.

The survey consisted of four sections:

- a section on demographic data
- a section asking RTs to rate their opinions and experiences surrounding clinical alarms using a five-point scale ranging from strongly agree to strongly disagree
- a section where RTs were asked to rank nine issues that they believed to be barriers to effective alarm management, and
- a section that contained open-ended questions about how to improve recognition of and response to clinical alarms.



There were 2,071 RTs who responded to the survey. The questions and responses from the RTs are shown in Table 1 on page 46. Ninety-eight percent of respondents worked in an acute care facility, 63% worked in an ICU, and 80% reported more than 11 years of health care experience. Ninety-five percent of RTs agreed or strongly agreed that alarm sounds and visual displays should differentiate the priority of the alarm; 91% thought the alarm sounds and/or visual displays should be distinct either based on the parameter (respiratory rate, heart rate, etc.) or source (type of device).

Regarding nuisance alarms, 72% of RT respondents agreed or strongly agreed that they occur too frequently. Interestingly, 84% of nurses who responded to this question agreed or strongly agreed that nuisance alarms occur too frequently.

In regard to the effect of nuisance alarms on alarm trust, 76% of RTs and 82% of clinical managers agreed that nuisance alarms reduce trust in alarms, causing caregivers to inappropriately turn off alarms at these times. In addition, 66% of the RT respondents believed that nuisance alarms disrupt patient care.

When RTs were asked to consider their personal experience with clinical alarms, only 16% reported that they found setting alarm parameters to be overly complex, and 65% did not believe that newer monitoring systems (defined as less than three years old) have solved clinical alarm problems. Sixty percent of RTs who responded did not believe that integrating clinical alarms into TJC patient safety measures has resulted in fewer adverse events.

While 75% of respondents believed that alarms in use at their facility were adequate to alert staff to adverse events, nearly 30% reported that there were frequent instances when alarms were missed because they could not be heard. Sixty-seven percent of RTs who responded to the survey believed their peers to be sensitive to alarms, responding quickly to an alarm event. Half of all respondents agreed or strongly agreed that, when numerous devices are used with a patient, it can be confusing to determine the cause of an alarm, with 39% reporting that background noise further interferes with alarm recognition.

Central alarm management staff devoted to receiving, prioritizing, and alerting staff to an alarm condition was seen as helpful by 53% of respondents, and 62% agreed that alarm integration and communication systems such as pagers, cell phones, and wireless devices are useful for improving alarm management and responses. With regard to smart alarms (e.g., where multiple parameters, rate of change of parameters, and signal quality are automatically assessed in their entirety), 77% agreed that they would decrease the incidence of false alarms and 79% believed that they would improve clinical response. Although 81% of RT respondents reported that their facility required them to document that alarms are appropriately set, only 59% thought that clinical policies and procedures about alarm management were effectively used.

Interestingly, nearly half of the respondents were unsure of the following:

- whether an adverse patient event related to clinical alarms had occurred at their institution in the last two years
- whether their institution had developed clinical alarm improvement initiatives over the past two years, and
- whether their employer instituted new technology designed to improve clinical alarm safety.

How RTs rank alarms:
What is needed for improvement

Table 2 on page 48 displays how RTs ranked alarm issues in order of most-to-least important.

Although only 11% of RTs responded, when asked specifically what is needed to improve clinical alarm recognition, RTs suggested the following: improved training on alarm systems; different alarms for different problems (e.g., louder, longer, or different sounding alarms for more severe/life-threatening clinical problems); priority alarms; and greater supervision/accountability for setting alarm parameters and responding to and resolving alarm events.

The responses of RTs were similar to the majority of those reported in the 2008 article where the majority of respondents were nurses. Nuisance alarms were ranked as the most important clinical alarm issue. The majority of RTs believed that newer monitoring systems did not impact the number of adverse alarm events, which may support comments like this one: "It doesn't matter how sophisticated the alarm system is — it still takes a therapist who is properly trained and conscientious/vigilant about responding."

RTs overwhelmingly support the implementation of smart alarms, which may at least partially solve the problem of inadequate staff that is available to respond to alarm events (ranked second in Table 2) by improving alarm efficiency. Finally, over 40% of RTs responded that policies and procedures regarding alarm management at their institution were not used effectively — this may point to the need for greater accountability and/or supervision.

Table 1

Summary of Healthcare Technology Foundation 2011 Survey: Respiratory Therapy Responses

Survey Question	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Alarm sounds and/or visual displays should differentiate the priority of the alarm.	69.5%	25.6%	2.4%	1.7%	0.8%
Alarm sounds and/or visual displays should be distinct based on the parameter (e.g., heart rate) or source (device type).	55.9%	35.3%	6.1%	2.0%	0.6%
Nuisance alarms occur frequently.	23.3%	48.2%	18.1%	0.2%	0.8%
Nuisance alarms disrupt patient care.	22.2%	44.2%	19.0%	13.6%	1.0%
Nuisance alarms reduce trust in alarms and cause caregivers to inappropriately turn alarms off at times other than setup or procedural events.	33.9%	41.6%	10.4%	12.0%	2.1%
Properly setting alarm parameters and alerts is overly complex in existing devices.	3.2%	12.9%	21.9%	52.8%	9.3%
Newer monitoring systems (e.g., less than three years old) have solved most of the previous problems we experienced with clinical alarms.	3.8%	31.2%	42.9%	19.8%	2.3%
The integration of clinical alarms into The Joint Commission patient safety measures have reduced patient adverse events.	5.9%	34.0%	46.6%	11.5%	2.0%
The alarms used on my floor/area of the hospital are adequate to alert staff of potential or actual changes in a patient's condition.	17.3%	57.4%	13.6%	10.3%	1.4%
There have been frequent instances where alarms could not be heard and were missed.	4.9%	23.8%	17.3%	45.2%	8.8%
Clinical staff is sensitive to alarms and responds quickly.	11.7%	55.0%	19.3%	12.2%	1.8%
The medical devices used on my unit/floor all have distinct outputs (i.e., sounds, repetition rates, visual displays, etc.) that allow users to identify the source of the alarm.	16.8%	55.1%	13.3%	13.4%	1.5%
When a number of devices are used with a patient, it can be confusing to determine which device is in an alarm condition.	9.3%	40.9%	13.5%	33.2%	3.1%

The Joint Commission and alarm safety

The 2014 TJC NPSG includes several performance elements with a target completion date of Jan. 1, 2016. The first goal, set for July 1, 2014, is that the health care facility form committees to promote and recognize that alarm system safety is a significant patient safety issue. As this patient safety goal is focused on "managing clinical alarm systems that have the most direct relationship to patient safety,"[2] it is vital to patient safety that respiratory therapists are included in these committees or task forces. The input from the respiratory therapist can significantly impact the way in which the health care facility prioritizes and manages clinical alarms. Indeed, the majority of the focus is on physiological alarms due to the alarm fatigue factor. It is critical that ventilator alarm improvements be included in the process. The Joint Commission expects that the committee work completed in 2014 will result in established policies and procedures for clinical alarm management and facility-wide education by Jan. 1, 2016.

RTs impact clinical outcomes

Clinical alarms are only one tool, albeit an important one, in patient management. Manufacturers should design alarms that are effective, easy to use, with standardized sounds according to priority level. Improved design (e.g., smart alarms), coupled with adequate staff training on setting appropriate alarm parameters, may help to reduce the incidence of nuisance alarms, which may lead to more efficient use of therapists' time and improved patient outcomes.

The full survey can be accessed at the Healthcare Technology Foundation website: www.thehtf.org/documents/2011_HTFAlarmsSurveyOverallResults.pdf. ■

Survey Question	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
■ Environmental background noise has interfered with alarm recognition.	5.7%	33.0%	16.5%	40.8%	4.0%
■ Central alarm management staff responsible for receiving alarm messages and alerting appropriate staff is helpful.	12.5%	39.7%	37.8%	8.4%	1.6%
■ Alarm integration and communication systems via pagers, cell phones, and other wireless devices are useful for improving alarms management and response.	17.5%	43.5%	27.9%	9.6%	1.5%
■ Smart alarms (e.g., where multiple parameters, rate of change of parameters, and signal quality are automatically assessed in their entirety) would be effective to use for reducing false alarms.	20.5%	56.6%	19.9%	2.7%	0.3%
■ Smart alarms (e.g., where multiple parameters, rate of change of parameters, and signal quality are automatically assessed in their entirety) would be effective to use for improving clinical response to important patient alarms.	20.9%	57.6%	18.6%	2.6%	0.3%
■ Clinical policies and procedures regarding alarm management are effectively used in my facility.	11.3%	47.4%	26.0%	13.9%	1.5%
■ There is a requirement in your institution to document that the alarms are set and appropriate for each patient.	35.5%	45.8%	11.1%	6.9%	0.7%

Survey Question	Yes	No	Not sure
■ Has your institution experienced adverse patient events in the last two years related to clinical alarm problems?	16.5%	39.6%	44.0%
■ Does your institution utilize "monitor watchers" in central viewing area to observe and communicate alarm conditions to caregivers?	49.3%	42.6%	8.1%
■ Has your institution developed clinical alarm improvement initiatives over the past two years?	20.1%	40.5%	49.4%
■ Has your healthcare institution instituted new technological solutions to improve clinical alarm safety?	19.9%	33.5%	46.6%

Table 2
Ranking of Alarm Issues by RTs

Issue	Ranking
Frequent false alarms, which lead to reduced attention or response to alarms when they occur	1
Inadequate staff to respond to alarms when they occur	2
Difficulty in identifying the source of an alarm	3
Difficulty in understanding the priority of an alarm	4
Difficulty in hearing alarms when they occur	5
Over-reliance on alarms to call attention to patient problems	6
Difficulty in setting alarms properly	7
Lack of training on alarm systems	8
Noise competition from non-clinical alarms and pages	9

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FOR ALL INFORMATION!

AARC Congress 2013:

Sneak Peek III

4 Four more sessions you'll want to attend this November

AARC Congress 2013 is just around the corner — Nov. 16–19 — but if you're still trying to decide whether to attend, read our final preview to get an idea of the type of content you'll find at this year's Congress. We think you'll agree: This is the best meeting of the year to learn more about the topics that will make a difference in your organization and career in 2014 and beyond.

1 Getting the Job: From Resume to Interview

WHO: Douglas S. Laher, MBA, RRT, FAARC

WHAT: Associate Executive Director

WHERE: AARC, Irving, TX

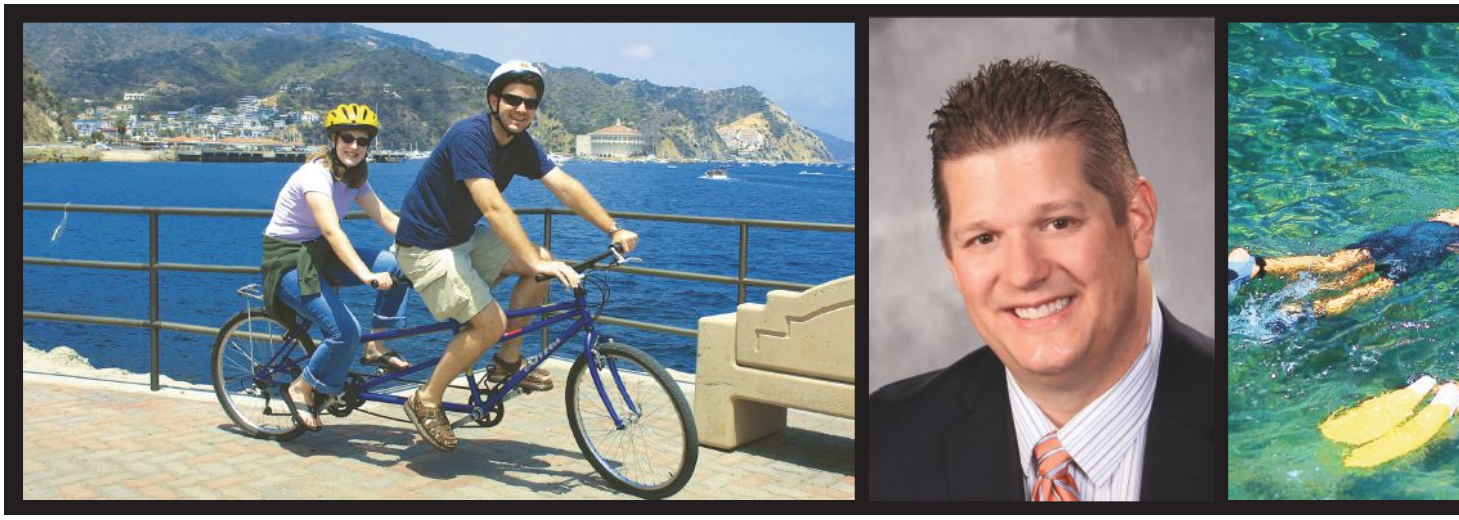
While the overall job market for RTs is bright, as we look to the next 10 years it's apparent that employment opportunities may continue to be scarce in selected areas and that the market could be over-saturated in some places around the country. Couple this with lingering effects from the economic recession in 2008 and the rollout of the Affordable Care Act in 2012, and finding a job could be a tough proposition.

That's why the AARC Program Committee felt strongly about having a symposium at this year's AARC Congress to provide people with the tools to better secure the job of their dreams. It will be delivered by a "Who's Who" in respiratory care, including the likes of Shawna Strickland, PhD, RRT-NPS, FAARC; Garry Kauffman, MPA, RRT, FAARC; Cheryl Hoerr, MBA, RRT, FAARC; and Bill Galvin, MSEd, RRT, FAARC. The symposium will touch on a number of important topics, starting with resume writing and then moving on to finding the right job and where to look, writing a cover letter, interview skills, and job relocation.

This "soup to nuts" approach to securing the right job will be hosted at the Anaheim Marriott Hotel just prior to the NBRC Student Survivor Hour. While the symposium was originally developed with the respiratory student in mind, the Program Committee understands that a competitive job market impacts everyone — students and experienced therapists alike. Hence, every AARC Congress attendee is invited to attend; and as an added BONUS, any AARC member (Congress attendee or not) is welcome to sit in on the session at NO COST!

"California has a highly competitive job market," says Program Committee Chair Cheryl Hoerr. "Allowing AARC members to attend 'Getting the Job: From Resume to Interview' at no cost is the least we can do for therapists looking for a job."

This symposium is NOT approved for Continuing Respiratory Care Education (CRCE) contact hours. See the *Advance Program* for a complete agenda. ■



Douglas Laher

2 Preparing for a Pandemic: The Strategic National Stockpile Mechanical Ventilators

WHO: Shawna Strickland, PhD, RRT-NPS, FAARC

WHAT: Associate Executive Director-Education

WHERE: AARC, Irving, TX

In health care, the respiratory therapist must be prepared for anything. In the event of a pandemic or widespread outbreak of disease, RTs will be challenged with a surge of critically ill patients, many of whom may require mechanical ventilation.

When the hospital's supply of mechanical ventilators is exhausted, how will we provide mechanical ventilation? Utilizing mechanical ventilators in the Strategic National Stockpile (SNS) may allow us to provide mechanical ventilation to those in need and improve outcomes of a pandemic event.

The SNS ventilators are available upon request, but the just-in-time learning that occurs at the point of delivery can be confusing and decrease effectiveness. Training the respiratory therapist on the intricacies of requesting the SNS ventilators and the nuances of the various ventilators in the stockpile before a pandemic hits may increase efficiency and delivery of care at the time of need. In the face of a pandemic event in the United States, likely from a flu strain, the respiratory therapist must be prepared to handle the surge of critically ill patients.

This Congress pre-course, which will be presented twice on Friday, Nov. 15 (morning and afternoon sessions), will provide us with the tools we need to efficiently use the SNS ventilators when we need them and potentially improve health outcomes. The session will include hands-on training with all three SNS mechanical ventilators — training that will allow our organizations to rely on the RT's skill set rather than on quick, just-in-time training in the event of a pandemic. I hope attendees will take information back to their facilities about the logistics of requesting the SNS ventilators, the allocation process, and how their facility can best handle a pandemic event. ■

Shawna Strickland

3 Aim Before You Act

WHO: Robert L. Chatburn, MHS, RRT-NPS, FAARC
WHAT: Clinical Research Manager
WHERE: Cleveland Clinic, Cleveland, OH

We have all heard the familiar phrase, "Ready, Aim, Fire." But how often are we guilty of the mindset, "Ready, FIRE, Aim," where we consider the consequences of our actions only *after* things have gone wrong? In our world of increasing complexity and increasing pressure to act, this is all too common; and it's particularly prevalent in medicine where medical errors are a leading cause of death. Adverse events happen despite the commitment of the medical community to put patients first. What is going wrong?

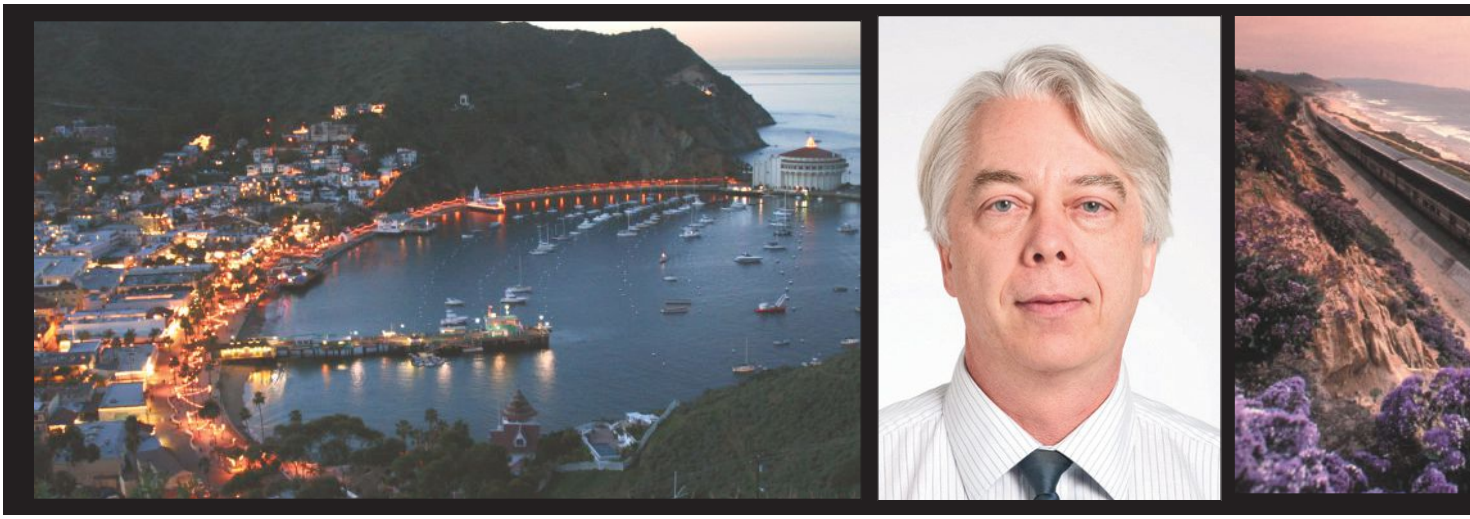
Patients exist between two important socio-economic forces. One is medical research, which produces an endless stream of data (most of which we cannot access or interpret). The second is medical industry, which produces an endless variety of treatment options. These forces leave us with a gap between patient needs and appropriate treatment, especially in the area of mechanical ventilation, where technological evolution has outpaced our educational resource development.

Patient needs related to mechanical ventilation can be simplified into three basic goals of ventilator management: safety, comfort, and liberation. Before we can select the appropriate treatment, we must first identify the available options. To do this, we must be able to identify, classify, compare, and evaluate the technical capabilities of the modes of ventilation on our inventory of mechanical ventilators. Finally, we need to match the available technology to the immediate needs of the patient.

The conceptual model for this process may be remembered with this acronym: **A**ssess patient needs (safety, comfort, liberation), **I**dentify available treatments (modes and their technical capabilities), and **M**atch technology to patient needs (select most appropriate mode) before you **A**pply **C**onsidered **T**echnology. This seminar applies the AIM-ACT rubric to mechanical ventilation.

Robert M. Kacmarek, PhD, RRT, FAARC, recently voiced the urgency of this topic in a Respiratory Care article entitled "Mechanical Ventilation Competencies of the Respiratory Therapist in 2015 and Beyond." According to the author, RTs must "…be able to discuss in detail the mechanism of action of all of the modes and adjuncts that exist on the mechanical ventilator." The problem is, there are nearly 300 unique names of modes that represent about 50 unique mode classifications.

Attendees at this seminar will receive the tools they need to identify, classify, compare, and contrast all modes of ventilation. These tools represent the foundation of a new educational system for mechanical ventilation. ■



Robert Chatburn

4 Critical Care Transport: Evolution of a Profession

WHO: Steven Sittig, RRT-NPS, C-NPT, FAARC

WHAT: Neonatal/Pediatric Transport Clinical Specialist

WHERE: Mayo Clinic, Rochester, MN

Since the early 1970s, respiratory therapists have been providing ventilatory support and respiratory care on medical transport. This is especially true for the neonatal and pediatric population. A lot has changed over these 40+ years as technology and medical knowledge have improved. Yet some facets, and even some equipment, have remained virtually unchanged. For example, the importance of specialty teams for neonatal and pediatric patients has been well documented in the literature, showing a decrease in morbidity and mortality when pediatric specialty teams are utilized in the transport of these critically ill patients versus a standard adult-focused team.

Have you ever wondered what is needed to be a transport RT? This symposium will contain two lectures. The first will focus on critical care transport from the perspective of a transport RT. In this lecture we will discuss the history of medical transport and why it is so important to have RTs involved in transport, especially for neonates and pediatric patients.

The second lecture will look at how the Affordable Care Act may impact the use of transport RTs, and even specialty teams, in medical transport. As economic pressures will likely influence care, our profession must advocate for our patients in this specialty area of respiratory therapy. We'll cover topics such as: Does having Pediatric Advanced Life Support certification and limited clinical experience truly qualify a standard adult transport team to complete pediatric transports? The goal will be to provide department managers, medical directors, and transport RTs with valid arguments to keep respiratory therapists on transport teams. ■

Steven Sittig

Anaheim Insider

In this final edition of our inside look at Anaheim and the surrounding area, California Society for Respiratory Care members Patrick Moore, RRT, and Marianne Shaw, RRT, provide a few more recommendations for attendees at AARC Congress 2013 who want to experience some of what Southern California has to offer while they're in town.

Patrick Moore's Picks

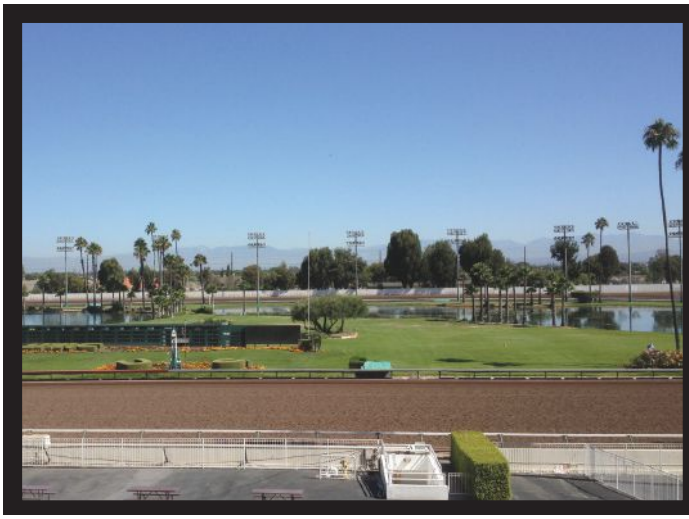
Patrick Moore

Hidden gem . . . There is a hidden gem in Anaheim called Mama Cozza's. This establishment has been in Anaheim for almost 50 years. In fact, it was recently featured on "Diners, Drive-ins and Dives" with Guy Fieri on the Cooking Channel. This establishment reminds me of my Aunt Josephine's house when I was a child. Black-and-white photos of relatives from back in Italy adorn the walls along with Chianti bottles with candles.

But let's get to the food. Everything on the menu is delicious. You're able to select any ingredients for your pasta sauce that you wish, or you can go with some of the specials. The Domery clam sauce is incredible — a delicious red sauce with homemade Italian sausage and clams. You can have it with any type of noodle you wish. If you enjoy pizza, their Mama Special is the bomb! Loaded with everything — including a homemade sausage — it's a culinary delight.

Please save room for dessert. You have to try their tiramisu — incredibly light, flavorful, and delicious! After your meal, they bring you an aperitif and some orange wedges. Most likely, you'll get a bag to take back to your room for a midnight snack. Bon appétit! www.mamacozzas.com/

Horseracing at its finest . . . If you have time to fit it into your Congress schedule, I recommend you go to the Los Alamitos Race Course. It's horseracing at its finest and located just a few miles away from the convention center on Katella Avenue. Along with para-mutual wagering, they have a delightful restaurant called The Vessels Club. It's fine dining at its best. The entire menu is great, but ask for the special of the day. If you're lucky enough to have prime rib for the special, I hope you're hungry, as the portions are very generous. See you at the conference! www.losalamitos.com/ ■



Marianne Shaw's Picks


Marianne Shaw

Visit an island paradise . . . Twenty-two miles off the coast of Southern California lies the beautiful island paradise of Santa Catalina. Take an island tour and see the buffalo and soaring eagles. Catalina also offers many other activities fun for the whole family: parasailing, scuba diving or snorkeling, kayaking, zip lining, biking, and golf are only a few. Ferry boats are available in Newport Beach, Long Beach, Dana Beach, and San Pedro. You may even see a whale, dolphin, or seal on your ride over. Stay for the day or spend the night; there are hotels, bed and breakfasts, and campgrounds available. Tour the historic casino or see a movie in the restored Avalon Theatre. **www.catalinachamber.com/island/activities/**

Witness the magic of science . . . Discovery Science Center will spark your children's natural curiosity. Offering 120 interactive activities, this unique facility is located in Santa Ana just south of Disneyland. **http://www.discoverycube.org/**

Take a shopping break . . . The Outlets at Orange, Orange County's only outlet shopping mall, is home to more than 120 outlet and value stores. Minutes from Disneyland, there are also 25 restaurants to choose from and an AMC 30 movie theatre with IMAX. **http://www.simon.com/mall/the-outlets-at-orange**

A pirate's life for me . . . Enjoy a rousing dinner at Pirate's Dinner Adventure to experience life on the high seas *and* a four-course feast. Cheer on your pirate mascot while the adventure unfolds, with a bounty of action-packed exploits accompanied by cannon blasts, pyrotechnics, and plenty of laughs. See you there!
http://www.piratesdinneradventureca.com/ ■

Industry Update

Featuring information on products and equipment from manufacturers

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

Oxygen Cylinder Toggle

Lee Medical Supply has developed a new toggle for oxygen cylinders that is longer than standard toggles and gives patients the ability to easily open and close their cylinders. "On" and "off" labels with directional arrows instruct patients in the proper use of the oxygen cylinders, and a roll pin is included to enable the patient to attach the toggle to the valve of the cylinder. www.eztoggle.com

Flowmeter

Ohio Medical's new Integrated Flowmeter combines a flowmeter and medical gas outlet into one simple and compact design that helps to improve patient safety and reduce replacement and repair costs. With dual ports, it offers more options in less space and assures clinicians will always have a flowmeter at hand when they need one. As an added bonus, the outlet also comes equipped with an auxiliary port, offering flexibility to deliver the solutions RTs and patients need. www.wefoundyourflowmeter.com

Noninvasive Ventilator

The Hayek RTX noninvasive ventilator from United Hayek Medical actively controls the inspiratory and expiratory phases of respiration using biphasic cuirass ventilation (BCV). Compact and lightweight, BCV is extremely effective in ventilating a large variety of patients. The ventilator also includes secretion clearance and cough-assist modes that improve comfort and increase patient compliance with prescribed therapies. Treatment can be administered either in a hospital or the home. According to the company, it offers significant cost savings by reducing hospitalization rates, time in the ICU, and dependency on highly specialized staff. www.unitedhayek.com

Updated OSA Solution

Philips Respironics has made significant changes to its medSage OSA patient management and resupply solution, a Web-based voice and email software that has helped OSA patients achieve compliance with their sleep therapies while helping home care providers efficiently manage and grow their mask resupply businesses. The new version 3.0 enhancements reduce by half the number of steps and time needed to perform functions such as adding and viewing comments, patient searching, finding and editing reorders, and resolving patient notifications. www.healthcare.philips.com

Airway Clearance System

The G5® Freedom Airway Clearance System from General Physiotherapy is a portable, self-contained, easy-to-use device for children and adults consisting of a synthetic vest with eight Directional-Stroking® Percussion Pods™ that are positioned over major lung segments and generate high-frequency chest wall percussion. A user-friendly control module enables the user to set the treatment time, choose a treatment program, and vary the cycle-per-second range for each Pod. It will also allow the user to start, pause, and stop the treatment. www.g5.com

2013 Jimmy A. Young Memorial Lecture Unveils the New Therapist Multiple-Choice Examination

The NBRC has presented the Jimmy A. Young Memorial Lecture each year since 1978 to honor the memory of a remarkable contributor to the respiratory care profession. Within the short span of 15 years, he had progressed from on-the-job trainee to achieving the RRT credential (#263), directing an education program in Boston, and directing an RT department in one of Boston's leading hospitals. He became the 22nd president of the AARC and was a trustee of the NBRC at the time of his unexpected death. Current NBRC President Kerry George, MEd , RRT, FAARC, and two staff members of the NBRC, Associate Executive Director Lori M. Tinkler, MBA, and Assistant Executive Director Robert C. Shaw, Jr., PhD, RRT, FAARC, presented the 2013 lecture in Orlando, FL, on July 17, 2013. In the lecture, they informed RTs about the NBRC's new Therapist Multiple Choice Examination and held discussions.

Significant recent decisions

Lori Tinkler began the lecture by describing significant decisions the NBRC trustees had made during their meeting in April 2013. Oct. 31, 2014, is the final date by which a candidate must submit applications to take the Certified Respiratory Therapist, Written Registry, or Clinical Simulation Examinations under the current CRT and RRT credentialing systems. December 2014 graduates can make a special request to test before Dec. 31, 2014, but Tinkler noted there could be limited capacities to accommodate such candidates because of competition for available seats. Those candidates could save themselves $190 by waiting just a few weeks to take examinations in the new two-examination RRT system.

Tinkler confirmed that NBRC examination fees will be the same as they have been for the last 13 years. The NBRC Board of Trustees decided to immediately open a pathway to the new Therapist-Multiple Choice (TMC) Examination for persons who hold the RRT credential from the Canadian Society of Respiratory Therapy. A therapist from Canada may choose to (1) attempt the TMC examination only to satisfy the licensing requirement of the state in which he or she will live, or (2) pursue the NBRC RRT or other credentials. Otherwise, the policies for admitting candidates remain unchanged.

Following each TMC Examination administration, candidates will receive their official score report containing the pass or fail result. Tinkler announced that scaled scores will phase out across all NBRC programs starting with the TMC Examination in January 2015. Hence, candidates will see raw (number of correct responses) scores on their score reports along with the low threshold for achieving the CRT credential and the high threshold for becoming eligible to take the Clinical Simulation Examination (CSE). Eligibility for the CSE must be documented by a result from the TMC Examination before a candidate can apply for the CSE.

The NBRC will combine information-gathering (IG) and decision-making (DM) subscores into a total score for comparison to one passing score. However, candidates will still see their IG and DM subscores on their score reports. Subscores will be reported by type of problem (for example, adult COPD, adult trauma) as well.

In the next "NBRC Insight" column, we will continue this summary of the NBRC's 2013 Jimmy A. Young Lecture to inform you of what you need to know relating to the NBRC exam content validation and job analysis. However, if you would like to learn more about this now, log on to www.nbrc.org.

Contact us

The NBRC Board of Trustees and its committees are interested in your questions, comments, and concerns. You may contact the NBRC by email at nbrc-info@nbrc.org, by phone at (888) 341-4811, or visit the NBRC website at www.nbrc.org. ■

NEW! DVD Library Bundle

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Professor: Niall D. Ferguson, MD FRCPC MSc Moderator: Dean Hess, PhD RRT FAARC

2009: Delirium and Sedation in the ICU Patient
Professor: E. Wesley Ely, MD MPH Moderator: Dean Hess, PhD RRT FAARC

2010: Computer Control of Mechanical Ventilation
Professor: Robert L. Chatburn, MGGS RRT-NPS FAARC Moderator: Dean Hess, PhD RRT FAARC

2011: NIV of Neonatal-Pediatric Patients
Professors Rob DiBlasi, RRT-NPS FAARC and Ira M. Cheifetz, MD FAARC FCCM
Moderator: Tom Kallstrom, MBA RRT FAARC

2011: Four Evidence-Based Practices for Mechanical Ventilation
Professor: Dean Hess, PhD RRT FAARC Moderator: Richard Branson, MS RRT FAARC FCCM

2011: The Many Faces of PEEP
Professor: Richard Branson, MS RRT FAARC FCCM Moderator: Dean Hess, PhD RRT FAARC

DISEASE MANAGEMENT BUNDLE: $99 Bundle/Item #PRK002

2009: Critical Care of the Brain-Injured Patient
Professor: Steven Deem, MD Moderator: Dean Hess, PhD RRT FAARC

2009: Respiratory Management of the Premature Infant
Professor: Sherry E. Courtney, MD MS Moderator: Tom Kallstrom, MBA RRT FAARC

2009: Improving PAP Compliance in Patients with OSA
Professor: Paul A. Selecky, MD FAARC Moderator: Suzanne Bollig, BHS RRT RPSGT R. EEG T

2010: Management of the Difficult Airway
Professor: William E. Hurford, MD Moderator: Dean Hess, PhD RRT FAARC

2011: Management of the COPD Patient with Comorbidities
Professor: Robert A. Sandhaus, MD PhD FCCP Moderator: Tom Kallstrom, MBA RRT FAARC

2011: Sleep and Sleep-Disordered Breathing in the Hospitalized Patient
Professor: Peter C. Gay, MD Moderator: Suzanne Bollig, BHS RRT RPSGT R. EEG T

AARC Professor's Rounds delivers lectures on current trends and practices presented by recognized leaders and specialists in respiratory care.

* 2009-2011 Professor's Rounds DVD Bundles do not qualify for earning CRCE credit. To purchase Professor's Rounds DVDs that qualify to earn CRCE credit, visit the AARC store.

Purchase online from the AARC store:

https://store.aarc.org/

or call AARC customer service @ 972-243-2272

Industry Watch

Quidel awarded FDA clearance for RSV test

Quidel Corporation has received 510(k) clearance from the FDA for its Sofia RSV FIA test for use with the Sofia Analyzer for the rapid, objective detection of respiratory syncytial virus infections. The Sofia Analyzer and Sofia RSV FIA employ unique immunofluorescence chemistry, advanced lateral flow technology, and failure alert and fail-safe systems designed to ensure a highly accurate diagnostic result within 15 minutes of application of the patient's specimen.

VIBATIV® pneumonia treatment back on the market

Theravance Inc. has commenced shipments of VIBATIV (telavancin) into the U.S. wholesaler channel. The drug is approved in the U.S. for the treatment of adult patients with hospital-acquired and ventilator-associated bacterial pneumonia caused by susceptible isolates of *Staphylococcus aureus* when alternative treatments are not suitable. It will also be used in the treatment of complicated skin and skin structure infections. "VIBATIV is an important treatment option for physicians and patients dealing with serious MRSA infections," says CEO Rick E. Winningham.

iSonea receives innovation award for asthma device

iSonea Ltd. has received the 2013 North American Frost & Sullivan Award for New Product Innovation Leadership for its AsthmaSense® Cloud. The mobile app turns a smartphone into a personal monitoring device for people with asthma.

Covidien announces campaign on sedation

Covidien has launched a new campaign to help medical professionals become more aware of over-sedation and its effect on patient outcomes in the ICU. As part of the effort, the company is providing clinicians access to tools such as clinical education, research, and advanced technology to help them manage sedation more effectively in their patients. "We work with hospitals day in and day out to improve the effectiveness of ventilator equipment," says Jim Willett, vice president and general manager of respiratory solutions. "If we can reduce unnecessary sedation in the ICU, we may help clinicians dramatically improve patient outcomes in the long run."

Sarepta Therapeutics seeks FDA approval for DMD drug

Sarepta Therapeutics Inc. has announced plans to submit a New Drug Application (NDA) to the FDA for the approval of eteplirsen for the treatment of Duchenne muscular dystrophy, a condition leading to the loss of respiratory muscle strength along with chest wall deformities such as scoliosis that can cause restrictive lung function. Eteplirsen is Sarepta's lead exon-skipping compound in development for the treatment of patients with DMD who have a genotype amenable to skipping of exon 51. The FDA has requested additional information before the NDA can be filed, but Sarepta representatives say they believe the request can be addressed and incorporated into an NDA submission in the first half of 2014.

MolecularMD to study lung cancer

MolecularMD Corp. has entered into a license agreement granting the company exclusive patent rights to commercialize patent-pending intellectual property pertaining to DDR2 mutations for diagnostic, prognostic, and predictive uses for humans in the area of lung cancer. "DDR2 is potentially the first actionable biomarker available for squamous cell carcinoma patients, whose treatment options are currently limited to chemotherapy," Dr. Greg Cox, MolecularMD's director of licensing, was quoted as saying.

NHLBI issues grant for adenosine study for lung disease

The National Heart, Lung, and Blood Institute issued a five-year grant to investigators at the University of Texas Health Science Center at Houston and University of Colorado Denver Anschutz Medical Campus. The grant will be used to advance the development of therapies based

on the molecule adenosine, which normally helps in the healing process but can result in excessive inflammation and fibrosis in people with chronic conditions. "By combining our expertise and efforts, we hope to develop adenosine-based therapies for lung disease, sickle cell disease, and acute kidney injury," principle investigator Michael Blackburn, PhD, was quoted as saying.

Adamis Pharmaceuticals acquires DPI technology

Adamis Pharmaceuticals Corporation has entered into an agreement to exclusively license and fully acquire 3M Company's Taper Dry Powder Inhaler (DPI) technology under development for the treatment of asthma and COPD. Adamis would obtain worldwide rights to use this platform technology in all indications in the dry-powder inhalation field. The unique design uses proprietary 3M technology to store an active pharmaceutical ingredient on a microstructured carrier tape. 3M will supply the drug delivery tape for the platform to Adamis.

Technion-Israel Institute develops infant inhalation mask

Researchers at the Technion-Israel Institute of Technology have made a breakthrough that they believe could lead to radical changes in the design and effectiveness of inhalation masks for infants. Through the use of computational metric geometry for facial analysis, they have created an infant-specific inhalation mask that even contains a small valve chamber that allows the child to suck on a pacifier while wearing the mask. Sucking the pacifier not only soothes the child but also provides atmospheric pressure on the mask to provide better adhesion. Health care providers can then infuse the treatment through another valve. Technion representatives say the FDA has already approved the new mask, and a company is currently in the process of producing it for commercial use.

UAB researchers launch sleep-pain study

Researchers at the University of Alabama at Birmingham are launching a new study aimed at clarifying the relationship between sleep and pain. The investigation will be conducted among patients with osteoarthritis who are already participating in the Understanding Pain and Limitations of Osteoarthritic Disease (UPLOAD) trial. Participants from the UPLOAD study who qualify for the sleep study will undergo sleep testing on two nights in the UAB Sleep Wake Disorders Center. "Sleep is a modifiable phenomenon," study investigator Megan Ruiter, PhD, was quoted as saying. "Treating sleep to modify pain may allow more options than simply treating pain at the source, which is often extremely difficult."

RC Currents

IN THE NEWS

Call for Open Forum Abstracts for AARC Congress 2014

The AARC invites you to submit abstracts for the Open Forum at AARC Congress 2014. Considered by many to be the premier event at the AARC Congress, the Open Forum is your opportunity to gain recognition for your research in cardiorespiratory care by submitting an abstract for presentation at the Congress and having it published in Respiratory Care. New in 2014: three different ways you can present your poster at AARC. For more details, see http://rc.rcjournal.com/site/open_forum/2014_call_for_abstracts.xhtml/. The deadline to submit abstracts for the Open Forum is **June 1**. ■

Correction

In the October issue of *AARC Times*, we incorrectly printed the title of Rolf D. Hubmayr, MD, in an article about his upcoming Egan Scientific Lecture at AARC Congress 2013. Dr. Hubmayr is professor of medicine and physiology and a member of the Pulmonary and Critical Care Medicine Division at the Mayo Clinic. ■

AARC Activates Disaster Relief Fund for Victims of Colorado Flooding

The AARC has activated its Disaster Relief Fund for AARC members who sustained property loss or damage as a result of recent massive flooding in Colorado that destroyed 19,000 homes and killed eight people.

Members who have suffered such a loss may apply for a grant of up to $500, either online (https://secure.aarc.org/disaster_fund/application.html) or by mail using our downloadable application form (www.aarc.org/headlines/11/04/application.pdf). Applications will be reviewed at the AARC executive office and will then be sent on to the president of the state society for verification and a recommendation of action.

The AARC Disaster Relief Fund was established in 1992 and may be activated at the time of any federally declared disaster. It has been used following hurricanes in Florida and Hawaii, earthquakes and fires in California, flooding in the Midwestern states, tornadoes in numerous areas of the country, and during the Katrina disaster. The Disaster Fund is open for six months from the date of the disaster.

The fund is all about AARC members helping members. If you would like to contribute to the AARC's Disaster Relief Fund, you can donate by sending a check made payable to the AARC at 9425 N. MacArthur Blvd., Suite 100, Irving, TX 75063. Put "Disaster Fund" in the memo section of the check. You can also call the AARC's Customer Service Department at (972) 243-2272 and tell them you want to make a donation with a credit card. ■

Respiratory Care Education Annual Call for Papers

The AARC will publish Volume 23 of the "Respiratory Care Education Annual" in the fall of 2014. 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. The deadline is February 15. ■

"New Members" Column Now Online

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

Format Changes for the AARC Education Annual

The "Respiratory Care Education Annual" has recently been posted online, and members of the AARC Education Section have already been notified of its availability.

In addition to the new electronic-only delivery, this year section members can opt for two different reading formats. The traditional PDF format (www.aarc.org/resources/rcea/rcea13.pdf) lets readers peruse the annual in much the same way they would read the publication on paper — or even print it out, if that's what they prefer.

Our brand new ePub version is a free download for Education Section members who would rather read the papers on their electronic devices — including iPads, Kindles, iPhones, Androids, etc.

So if you're a member of the Education Section, click over now to read outstanding papers from your peers. Topics this year run the gamut from inter-rater reliability of a respiratory therapy preceptor training program, to service learning and community engagement, to teaching students to apply principles of evidence-based protocol-guided clinical practice, and much, much more.

If you aren't a member of the Education Section, visit our section sign-up page to join (https://secure.aarc.org/sections/). Your membership will become active immediately, and you can begin enjoying these informative papers today. ■

AARC Member Cuts Hair for a Good Cause

Dianne Pearce, before and after she cut her hair and donated all 27 inches of it to Locks of Love.

For many would-be therapists, respiratory care looks like a great profession to get into because you can finish school in just a couple of years and begin making a great living while helping people with lung disease.

For Dianne Pearce, CRT, however, the race to become a respiratory therapist was more of a marathon than a sprint. Due to several life events that got in the way of her completion of the program at the County College of Morris in Randolph, NJ — including the deaths of both of her parents and her fiancé — it took her eight years to reach the finish line. She credits lots of people for keeping her motivated, including family, friends, and her professors and fellow students in the program. But one other factor came into play as well — her hair. She vowed she wouldn't give it anything but a slight trim until she graduated.

"Growing my hair started out as a financial decision," she says. "The office I had been with for 15 years split up, and I had to take another position with a huge pay cut. The monthly haircuts didn't fit into the budget." When she enrolled in the RC program, which came about after she went to work as a medical assistant in the Respiratory Center for Children at Morristown Medical Center's Goryeb Children's Hospital, she found an even better reason to let her locks continue to grow.

"At Goryeb Children's Hospital, I worked directly across from the Valerie Center, which is the pediatric oncology group," she explains. "My daughter donated her hair to Locks of Love some years back, and as I saw those beautiful children, some so changed by their disease process, I decided this was a simple way to help."

Two days after her final exams last summer, when she knew she would graduate, Pearce headed to her local hair salon and got the haircut you see in the photo here. "If putting my hair into a wig on some little girl's head helps her feel better, wonderful," says the AARC member. "It doesn't always have to be a big thing to help someone else." ■

Members, Send Us Your Human Interest Stories

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

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

Send Us Photos of Your RC Week Events

We want to hear about what you did to celebrate National Respiratory Care Week this year. Send us your photos to milligan@aarc.org with a brief description before Nov. 9 — and be sure to include your name and email, event description, organization hosting the event, and city/state. You just might find your story on the AARC website or in an upcoming issue in "RC Currents."

For more information and to see a slide show of how other RTs celebrated this year, check out www.aarc.org/rcweek/photos. ■

Cerebral Microbleeds Linked to COPD

A new study out of The Netherlands finds an increased risk of cerebral microbleeds among patients with COPD.

The research involved 165 subjects with COPD and 645 subjects with normal lung function who were taking part in the Rotterdam study, a prospective population-based cohort study in subjects age 55 and older. The significantly higher prevalence of cerebral microbleeds seen in the COPD patients was independent of age, sex, smoking status, atherosclerotic large vessel disease, antithrombotic use, total cholesterol, triglycerides, and serum creatinin levels.

The prevalence of microbleeds in deep or infratentorial locations was also significantly increased in COPD patients, and the prevalence of these microbleeds increased with increasing severity of airflow limitation. In a longitudinal analysis restricted to subjects without microbleed at baseline, COPD independently predicted incident cerebral microbleeds in deep or infratentorial locations.

The study was published online ahead of print by the *American Journal of Respiratory and Critical Care Medicine* in July. ■

▶Transitions

Patricia Blakely, RRT, FAARC, passed away unexpectedly in September. An AARC member since 1984, she was serving as chair of the Judicial Committee at the time of her death and was also a member of the Political Action Committee. She was a member of the AARC Board of Directors from 2000–2003 and received the Outstanding Affiliate Contributor Award in 1998 for her work at the South Carolina Society for Respiratory Care. This year she was awarded the Thomas L. Petty MD Invacare Award for Excellence in Home Respiratory Care, which was to be presented to her at the awards ceremony in Anaheim, CA, during AARC Congress 2013. Blakely was the division clinical manager at Apria Healthcare in West Columbia, SC.

Andrew C. "Chase" Getz, CRT, RPFT, passed away in July. A 35-year veteran at Fairview Hospital in Cleveland, OH, he was serving as director of cardiac services when he died.

Rich Weiler, RRT, has received the Bernard E. Lorimer Award from MidMichigan Medical Center in Midland, MI. The award has been presented annually since 1978 to one employee at the hospital who possesses the characteristics that Lorimer exemplified during his career as president of the medical center. Weiler has served as manager of the RT department at MidMichigan since 1996.

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

National Health Observances

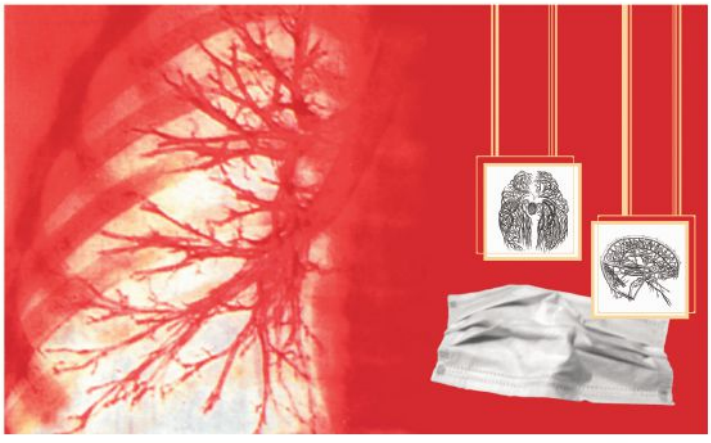
- COPD Awareness Month; November; American Lung Association, (800) 548-8252; www.lung.org
- Lung Cancer Awareness Month; November; American Lung Association; (800) 548-8252; www.lung.org
- World COPD Day; Nov. 20; Global Initiative for Chronic Obstructive Lung Disease (GOLD); www.goldcopd.org
- Great American Smokeout; Nov. 21; American Cancer Society, (800) 227-2345; www.cancer.org

When It Comes to Donor Lungs, Bigger Is Better

Earlier this year a 10-year-old girl made headlines when her parents petitioned the courts to allow her to receive a new set of lungs from an adult donor. The decision flew in the face of conventional medical wisdom, which holds that donor lungs should match the size of the recipient for the best outcomes.

New research is now questioning the wisdom of that idea. A group led by a physician from Johns Hopkins analyzed data from 4,520 double-lung transplants and 2,477 single-lung transplants performed in the U.S. between May 2005 and April 2010. Overall, patients who received oversized lungs were about 30% more likely to still be alive one year following the transplant. The findings were stronger for those receiving double-lung transplants than single-lung transplants, but oversized lungs conveyed benefits across the board.

"Despite what we thought, bigger lungs turn out to be better," senior study author Christian A. Merlo, MD, MPH, was quoted as saying. "Our study tells us that if we were to routinely transplant larger lungs into patients, we could potentially make a real impact on survival." The study was published in the August issue of *The Annals of Thoracic Surgery*. ■



PAH Treatment on the Horizon

Is there a better treatment on the horizon for pulmonary arterial hypertension (PAH)? According to researchers led by a team from the Icahn School of Medicine at Mount Sinai, the answer may be yes. Working in a rat model of the disease, they completely reversed the condition using gene therapy administered through a nebulizer-like inhalation device. The gene therapy restores function of SERCA2a, an enzyme critical for proper pumping of calcium in calcium compartments within the cells. Expression of SERCA2a is reduced in patients with PAH.

"The gene therapy could be delivered very easily to patients through simple inhalation — just like the way nebulizers work to treat asthma," notes study co-senior investigator Roger J. Hajjar, MD. "We are excited about testing this therapy in PAH patients who are in critical need of intervention." Studies are underway in larger animals now, and the gene therapy has already been approved by the National Institutes of Health for human study. The current research was published in the July 30 edition of *Circulation*. ■

There's an App for That…

Researchers from The University of Texas MD Anderson Cancer Center have developed an app aimed at encouraging teens to refrain from smoking or to quit if they have already started.

Based on MD Anderson's ASPIRE (A Smoking Prevention Interactive Experience) program for middle and high school students, the Tobacco-Free Teens app features colorful animated teen characters, cool tunes, and gaming activities that reinforce smoking-cessation tips. In one game, for example, the user's task is to tap away various temptations to smoke, depicted as objects that rapidly move around the smartphone screen. Another challenges teens to match two pairs of cards that contain memorable images of smoking consequences, such as yellow teeth, bad breath, and stained fingers. The app is available for free in the Apple iTunes Store. ■

Asthma, Allergies Linked to ADHD in Boys

U.S. and European investigators publishing in the August issue of the *Annals of Allergy, Asthma & Immunology* report a link between asthma and allergies and attention-deficit/hyperactivity disorder (ADHD) in males.

The study was conducted among 884 boys with ADHD and 3,536 boys without the disorder. Of the children with ADHD, 34% had asthma and 35% had an allergic disorder. The increased risk for ADHD in boys with asthma was strongest in those who also had an allergy to milk.

The study suggests medications used to treat these conditions may be associated with an increased ADHD risk as well. However, the editor in chief of the journal cautioned against reducing the use of asthma medications based on that finding.

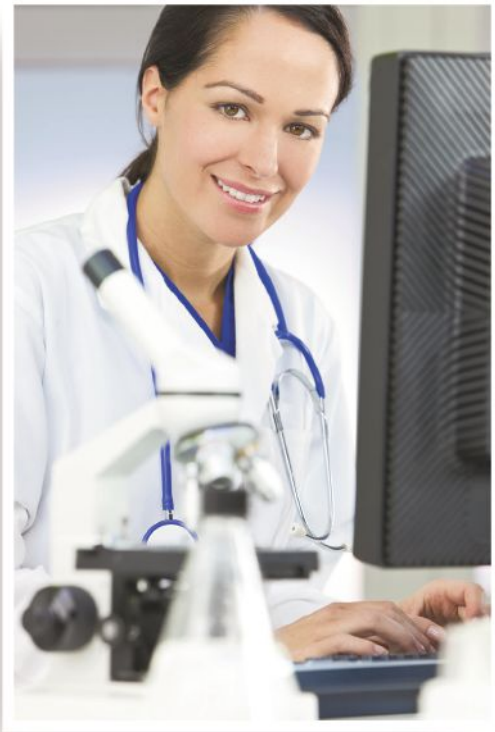
"Further research is needed to understand why there appears to be an increased risk of developing ADHD in children with allergy and asthma," Gailen Marshall, MD, was quoted as saying. "Medications for these conditions far outweigh the risks and can be life-saving in some conditions. Treatment should not be stopped unless advised by a board-certified allergist." ■

▶ Strange But True…

What's in that cookie? These days, smartphones can do remarkable things, but could they identify allergens lurking in food? Researchers from the University of Illinois, Urbana-Champaign say they have come up with a smartphone cradle and app that can do that. Just aim the device at the suspicious item, and it will tell you if it contains peanuts or other allergy-causing ingredients.

Full moon affects sleep: The full moon has been blamed for many things in popular culture. Now Swiss investigators reporting in *Current Biology* are saying it disrupts sleep. In tests conducted on 33 individuals, they took five minutes longer to fall asleep and slept 20 minutes less on nights when there was a full moon.

Clearing the air: A key ingredient in sunscreen is turning a new medical building in Mexico City into a smog eater. It turns out that coating coral-like tiles with Prosolve370e causes the sun to react with air pollutants, breaking them down into less harmful substances such as calcium nitrate, carbon dioxide, and water. ■



A New Drug Target for Asthma

Researchers from the University of Iowa have linked an enzyme called CaMKII to harmful effects of oxidation in the respiratory tract that can trigger asthmatic symptoms. They believe the finding could lead to the development of a drug that would target the CaMKII enzyme.

The investigators knew from previous work that CaMKII plays a role in the oxidation of heart muscle cells, which can lead to heart disease and heart attacks. The scientists surmised the same enzyme may affect oxidation in the respiratory system as well. After blocking the enzyme in the epithelial cells of mice, they found less oxidized CaMKII, no airway muscle constriction, and no asthma symptoms. Conversely, mice without the blocked enzyme showed high oxidative stress, defined as oxidized enzymes in the epithelial cells, a constricted airway, and asthma symptoms.

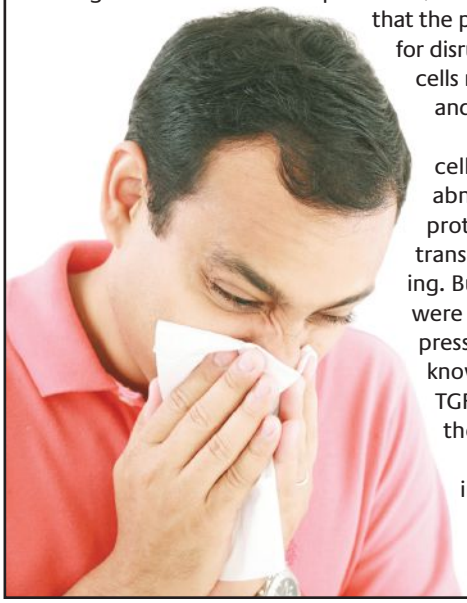
From there, the researchers took tissue samples from the airways of patients with asthma, finding more oxidized enzymes in those patients than in healthy individuals. They also found that mild asthma patients who inhaled an allergen had a spike in oxidized CaMKII in the epithelial cells just a day later.

The investigators now plan to study inhaled drugs that could block the oxidation of the CaMKII enzyme. The research was published in the July 24 edition of *Science Translational Medicine*. ■

Getting to the Root of Allergies

For the first time, researchers have implicated a single genetic pathway in an array of allergic disorders and found that treatment with a common blood pressure medication may help.

The discovery was uncovered during a study of a protein called transforming growth factor-beta (TGF-beta) in children with Loeys-Dietz syndrome (LDS). These children are known to have higher than normal rates of allergies. After a series of experiments, the researchers concluded that the protein may be responsible for disrupting the way immune cells respond to common foods and environmental allergens.



Specifically, the immune cells of children with LDS had abnormally high levels of a protein called SMAD, a known transmitter of TGF-beta signaling. But when those patients were treated with the blood-pressure medication losartan, known for its ability to tame TGF-beta signaling, levels of the protein were reduced.

The study was published in the July 24 edition of *Science Translational Medicine*. ■

Simple Index Predicts Readmissions

Yale University investigators have found that a score called the Rothman Index may be useful in predicting hospital readmissions. The score is calculated automatically using routine data on vital signs, routine nursing assessments, skin condition, heart rhythms, and laboratory tests. Lower Rothman Index scores indicate a higher risk of readmission.

The researchers evaluated the ability of the Rothman Index to predict hospital readmission using data from more than 2,700 patients hospitalized during 2011. Sixteen percent of the patients had an unplanned readmission within 30 days after hospital discharge. For patients in the highest risk Rothman Index category, readmission risk was more than one in five. By comparison, for those in the lowest risk category, the risk was about one in 10.

After adjustment for other factors, patients in the highest versus lowest risk category were more than two and a half times as likely to be readmitted within 30 days of discharge. The Rothman Index also predicted readmission across various diagnoses and medical specialties. The study was published in the September edition of *Medical Care*. ■

Another Link in the Chain Connects Acute Viral Infections to COPD

Investigators at the Washington University School of Medicine in St. Louis are adding another link in the chain of events connecting acute viral infections to the development of COPD.

After first finding that interleukin-13 (IL-13) was the key driver of excess production of chronic airway mucus after viral infection five years ago, they decided to look for events upstream from IL-13 production that could be involved in keeping the immune response active. They focused the hunt on molecules associated with controlling the immune response; and one of those molecules, IL-33, was strongly linked to the production of IL-13 in their mouse model of COPD that developed following viral infection.

IL-33 was then traced to a specialized set of cells within the epithelial layer that lines the airways of the lung. These IL-33-producing epithelial cells were found to possess the characteristics of progenitor cells — meaning that these cells, like stem cells, had the ability to self-renew and to execute a program that gave rise to a complete airway.

Further study in lungs taken from people with advanced COPD who were undergoing lung transplants also pointed to epithelial cells with progenitor properties as the source of IL-33.

"This work suggests that previous viral infections of the lung may worsen COPD by stimulating a particular type of lung cell that over activates the immune system," noted James P. Kiley, PhD, director of the Division of Lung Diseases at the National Heart, Lung, and Blood Institute. "Additional research on these cells and their products may lead to new ways to diagnose and treat COPD."

The study was published in the September edition of the *Journal of Clinical Investigation*. ■

Classifieds

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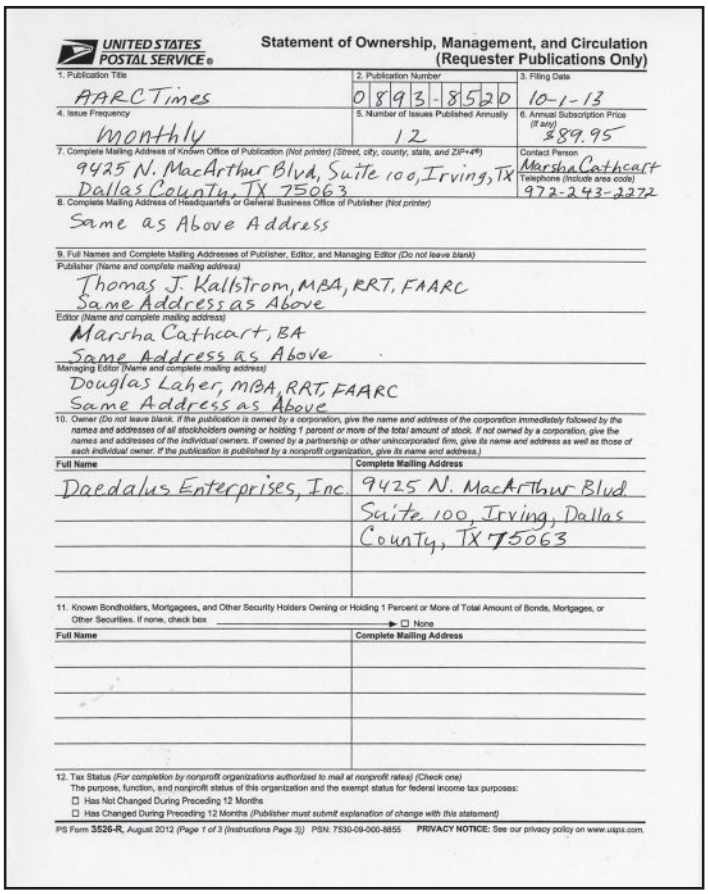

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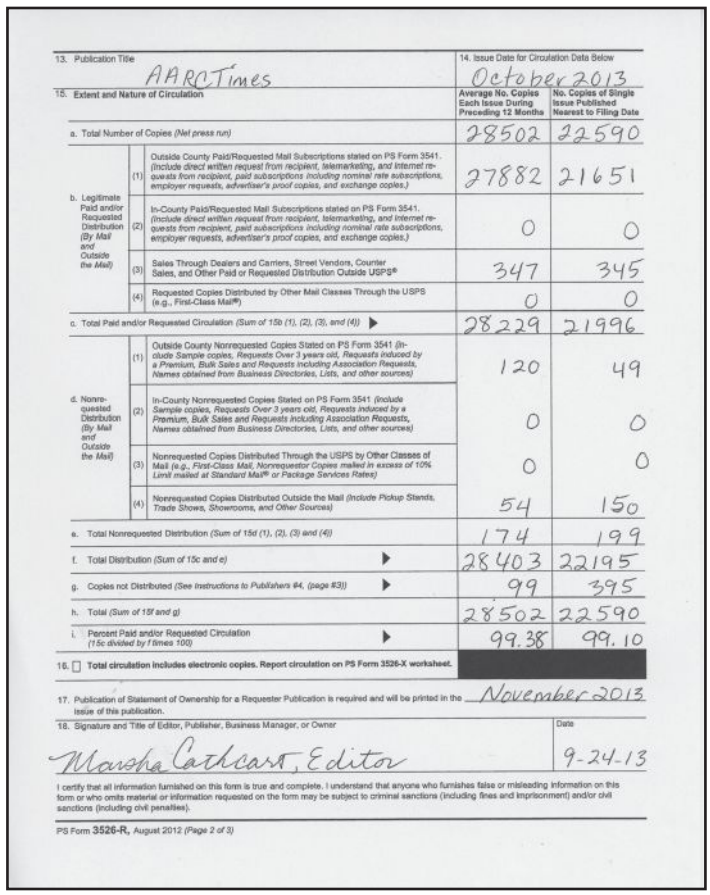

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Respiratory Care Week
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October 23
Lung Health Day
Contact: AARC, (972) 243-2272, www.aarc.org

October 24
Newark, DE
Delaware Society for Respiratory Care's 2013 Annual Trends in Respiratory Care Conference
Contact: www.delawarelung.org

November 1
Urbandale, IA
Iowa Society for Respiratory Care's Annual Meeting
Contact: Amy Weiford, (319) 296-2329

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

December 5–6
Springfield, MO
MSRC's 9th Annual Fall Specialty Conference
Contact: Christopher Cox, (417) 659-6590

Submissions for the next available issue are due Nov. 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 E-mail binkley@aarc.org

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