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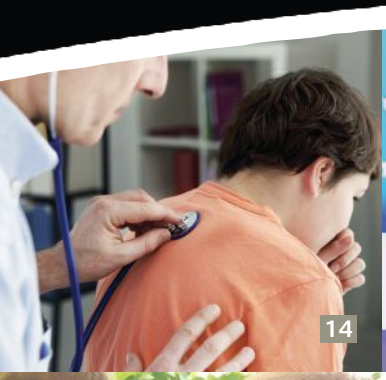

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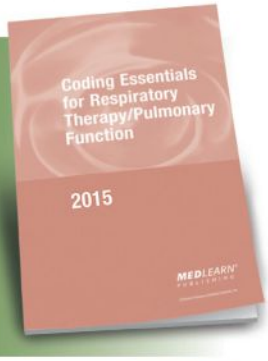

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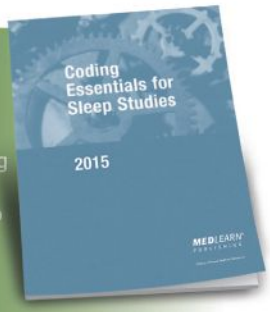

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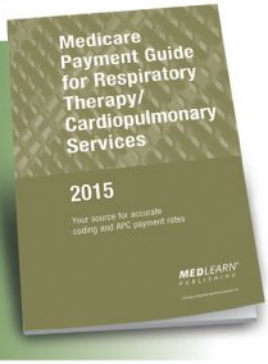

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Ventilation for Life

Aerosol Delivery During Noninvasive Ventilation

by Michael A. Gentile, MS, RRT, FAARC

The use of noninvasive ventilation (NIV) has become widespread in the support of patients with respiratory compromise. While the evidence is strongest for the use of NIV in patients with COPD, it has been described in several other populations.[1] Patients receiving NIV frequently require inhaled medications to treat a variety of clinical conditions. Although much has been published related to NIV, pharmaceutical aerosol delivery during NIV has not experienced the same level of research. Aerosol delivery during NIV can be accomplished using several devices but presents special challenges for clinicians. Optimization of aerosol delivery during NIV may have a direct impact on clinical outcome, thus it is imperative to continuously evaluate the many details associated with these two procedures.[2]

about the author...

Michael A. Gentile, MS, RRT, FAARC, is a research associate at Duke University Medical Center in Durham, NC.

Factors in aerosol deposition

The efficiency of aerosol delivery during NIV is low, resulting in deposition rates of only 1%–10% in adults and children in vitro and 1%–6% in vivo.[2] Numerous but manageable factors influence the effectiveness of aerosol delivery during NIV. The type of interface, location of leak port, device used to generate aerosol, particle size, position of aerosol device, NIV settings, synchrony with NIV, type of device used to supply NIV, mode of ventilation, humidity and density of inspired gas, characteristics of medication, and adequacy of inspiration all must be considered.[2-4] Each of these variables should be examined in order to increase the efficiency of medication delivery.

While aerosol administration during noninvasive ventilation is typically delivered using a vibrating mesh nebulizer, metered-dose inhaler (MDI), or gas-powered small-volume nebulizer, the issues simply do not end with device selection. Each aerosol delivery device has advantages; however, clinicians are sometimes limited by availability of equipment and specific medication to be delivered. Strategies should be employed to match the right device with the clinical situation. In all cases, care must be taken to avoid exposing the eyes of the patient to aerosolized medication as it may cause irritation or worsening of eye conditions.[5] MDIs are convenient but must be able to adapt to the NIV circuit, and actuation must be timed with the patient's inspiratory efforts. The small-volume nebulizer can be utilized to deliver a liquid medication, but caution should be exercised to avoid inadvertent fluctuations in fraction of inspired oxygen (FIO_2) due to the gas being used to power the device. Also, the additional flow from the nebulizer may affect the operation of the NIV device. Vibrating mesh nebulizers have been the focus of recent research in order to improve the amount of aerosol medication delivered without the deleterious effects of additional gas flow that may be associated with traditional gas-powered nebulizers.[6,7]

Mask on vs. mask off

A dilemma for clinicians that exists when providing NIV is whether or not to temporarily remove the patient from NIV in order to deliver aerosol medication to them. While removing the mask and administering may increase aerosol deposition and the amount of drug delivered, the loss of positive pressure may be detrimental to the patient's overall condition, especially in those with dyspnea or hypoxemia. With an increasing number of circuit adapters and devices available for aerosol delivery, the safest option may be to keep the patient on NIV. Care must be taken to provide adequate monitoring if the decision is made to remove NIV to deliver medication via aerosol.[8,9] This is part of the risk-benefit ratio that a respiratory therapist must consider while supporting patients on noninvasive ventilation.

Aerosol delivery device placement in NIV circuit

Aerosol delivery device selection and placement during NIV has been the subject of much research. Several in vitro studies using lung models and filter deposition to evaluate

the various devices and possible configurations have been completed.[3,4,6,7] The evidence shows placing the aerosol device close to the patient increases the delivery as compared to placement back at the ventilator, mainly due to the position of the leak port.

NIV settings and aerosol delivery

Adjustments in NIV settings may be required to enhance aerosol delivery. Increasing inspiratory pressure to raise tidal volume or elevating PEEP (EPAP) levels to enhance functional residual capacity may be effective strategies.[2] However, although these manipulations may seem like simple maneuvers, caution must be exercised. Similar to invasive mechanical ventilation, care must be taken to minimize hemodynamic compromise and avoid alveolar overdistention caused by high pressures and possibly injurious tidal volumes. Also, increased airway pressures may induce gastric insufflation and risk for vomiting and subsequent aspiration.

Optimizing aerosol medication delivery

Aerosol delivery during noninvasive ventilation is multifaceted. The efficiency of aerosol delivery during NIV is inherently decreased due to many mechanical and physiologic factors. Respiratory therapists possess unique knowledge to optimize aerosol medication delivery during NIV. Assessing technical issues such as position and selection of delivery device, interface, and overall patient assessment are common practices for RTs. The refinement of aerosol delivery during NIV continues to evolve and will likely be the subject of future research. ■

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Please, Do No Harm: Medication Management in the Elderly

by Helen M. Sorenson, MA, RRT, FAARC

June 2014: 73-year-old male is admitted to the hospital with extreme weight loss (70 lbs.), a side effect of the new diabetes medication that has been prescribed to control his blood sugar. He is alert but weak and unsteady on his feet. His white blood cell (WBC) count is 32,000/mm^3 (normal being 4,000–11,000/mm^3). He is started on two IV antibiotics.

After six to seven days, antibiotics are discontinued because his WBC is still at 24,000. Being in a strange place at night causes the patient to become disoriented, so he is given lorazepam to help him sleep. Because he had been diagnosed with prostate cancer 10 years earlier and currently has a mass in his abdomen, he is started on chemotherapy. Insulin is given on a regular basis to control his high blood sugar. Pain pills are administered on an as-needed basis, and medication is prescribed to prevent constipation.

If this sounds like fiction, I assure you it is not. Scenarios like this unfold in our health care institutions on a regular basis, all in an effort to do the best for our patients. *Primum non nocere*, first do no harm, is adhered to by our medical professionals… the problem arises when it is the drugs that are harming the patient.

A complicated situation

Medication management in an older adult can be complicated. A variety of factors alter the way drugs are processed in the body. First and foremost is the obvious: advanced age. Older adults have been exposed to many noxious agents, like lead and asbestos, over their lifetimes. Acute diseases contracted by older adults when they were young, like influenza, pneumonia, chicken pox, and even polio, have taken a toll on their already weakened immune systems. Metabolism slows down as we age, and there are changes in the T cells and B cells affecting immunity. Detrimental changes in the liver, kidney, and gastrointestinal system are also a result of aging and will affect drug metabolism.

Adding to the conundrum is the fact that the proportion of older adult patients is constantly increasing in health care institutions across the country. It is estimated that by 2025, 20% of the population will be over age 65.[1] More older adults = more older patients = more medications prescribed.

Polypharmacy, defined as the use of multiple medications and/or the administration of more medications than are clinically indicated,[2] is common among elderly patients. This can represent unnecessary drug use. A literature review of articles from 1986–2007 found that polypharmacy increased over the years and is a known risk factor for morbidity and mortality.[2] Another article concluded that polypharmacy is a significant issue and that little has been done regarding methods to assess the problem.[3]

The diagnosis itself can exacerbate the use of multiple drugs. Two publications in 2014 specifically addressed polypharmacy in older adults with cancer. The conclusions were that the use of multiple medications was associated with impaired physical function[4] and that more than 25% of older adults with cancer were prescribed potentially inappropriate medications (PIMs).[5] In both cases, polypharmacy was associated with increased frailty.

about the author…

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

Dealing with delirium

Polypharmacy has many arms that reach across the spectrum of health care practice. Delirium is an unintended consequence of polypharmacy. Delirium is defined as a neuropsychiatric syndrome with features of inattention and global cognitive dysfunction.[6] While there are many causes, delirium often reflects the consequences of acute medical illness, medical complications, hypoxemia, or drug intoxication.[6]

The important concept to remember is that delirium is a transient, reversible syndrome that can be acute and fluctuating and can occur with medical conditions. If not addressed, delirium can also become permanent. There are three subtypes of delirium: hypoactive, hyperactive, and mixed. In hyperactive delirium, patients may become physically aggressive at any moment. Hypoactive delirium is characterized by sluggishness and lethargy, and mixed delirium is "double-trouble" — patients may change from hyper to hypo at a moment's notice. The hypoactive form is most common.

A study conducted by Spiller revealed that of 100 admissions to a palliative care unit, 29% were found to have delirium, and 86% of those had the hypoactive subtype.[7] Hypoactive delirium is often undiagnosed; patients who exhibit confusion are simply presumed to be depressed or have fatigue. The current standard for diagnosing delirium is found in the "Diagnostic and Statistical Manual of Mental Disorders, 4th Ed."[8] A more recent publication has explored the use of the Mini-Mental State Examination and the Confusion Assessment Method to predict and distinguish between incident (recently developed) and prevalent (already existing) forms of delirium.[8] Disorientation to time and place at admission were risk factors for the development of delirium. Given the fact that delirium is multifactorial, removing one of the causes — polypharmacy — may be preventive.

Reducing potentially inappropriate medications

Interventions to reduce PIMs in health care facilities (acute and long-term care) have included local consensus procedures, educational strategies, and guidelines to reduce overprescribing.[9] The Beers Criteria, updated in 2012, has been used for over a decade to call attention to potentially inappropriate medications for older adults.[10] Another medicine review tool is STOPP (Screening Tool of Older Persons' potentially inappropriate Prescriptions). Recently revised STOPP/START criteria can be accessed in *Age and Ageing* 2014, an online publication by Denis O'Mahony, et al. In studies, the STOPP criteria identified a significantly higher proportion of patients requiring hospital stays as a result of PIMs.[11]

How does this relate to respiratory therapists? Although geriatric pharmacotherapy is emerging as an area of concern, the aging population does now, and will in the future, present challenges. In terms of respiratory care, there are few studies that examine age as a factor influencing the pharmacodynamics and pharmacokinetics of inhaled agents.[12] A 2014 study published in JAMA concluded that in older adults with COPD, a newly prescribed long-acting beta-agonist (LABA) and an inhaled corticosteroid, compared to a newly prescribed LABA alone, was associated with a significantly lower risk of death or COPD hospitalization.[13]

Newer research is also addressing the incidence of neurotoxicity caused by antimicrobials in the elderly. Decreased oxygen in the blood may cause neuronal damage in COPD. The effect of low oxygen levels plus the use of antimicrobials in COPD is an area for further research. While beyond the scope of this article, it would be instructive for therapists to identify specific antimicrobial agents that are associated with a higher risk of neurotoxicity.[14]

Reducing medication errors in health care institutions has been an ongoing initiative for many years and will become even more important in the next decades. As health care providers, we need to see, treat, educate, and also protect our patients. Luckily, older adults are becoming more aware of the dangers posed by medications. Public engagement in medication management has become more important in the geriatric community. At a 2013 workshop entitled "How To Improve Medicines for Older People," the participants reported a number of challenges facing older people and their caregivers[15] (see Table 1).

In his Keynote Address at AARC Congress 2014, Michael AE Ramsay, MD, FRCA, advocated for patient safety. He referred us to the CampaignZero website (www.campaignzero.org/safety-checklists). From there you can select "Prevent Medication Errors." This single-sheet checklist can be duplicated and kept in the respiratory care department as an excellent resource for therapists or family members who are concerned about medication safety for their loved ones.

True story

The patient mentioned at the beginning of this article was not fictionalized; he was my brother. Despite the fact that I spent 10 days in the hospital with him, sleeping in a recliner next to his bed, he developed incident delirium. The diagnosis was unclear from the start, and we understood the need for a variety of medications. There were things, however, we did not understand. The biopsy was done three weeks after admission, no specific bacteria was ever identified, yet he was given multiple medications. His first visit with the palliative care physician was July 4, the day he was discharged from the

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Table 1. Challenges Reported by Older People and Their Caregivers

- Visual problems — not able to read the small print on bottles or inserts
- Dexterity problems — not able to open packets
- Swallowing difficulty
- Tiredness/sleepiness — leading to missed doses
- Confusion, memory problems, no comprehension of what medicines are for
- Stress due to disease symptoms
- Living alone — no one to help
- Medication reviews (usually polypharmacy) and concerns about mixing up the tablets
- Lack of awareness of what they are entitled to from the pharmacist or physician
- Comorbidities — too many different drugs
- Doses in relation to height/weight
- Confusion over names of medicines or generics
- Relationship with and role of the pharmacist
- Admission to hospital — given all medications at once

hospital with a diagnosis of metastatic cancer. He died three days later in hospice.

As therapists, family members, neighbors, parents, and children of patients, awareness is the first step in helping to create a safer environment for all individuals who are hospitalized, regardless of their age. Multiple medications in the aging population, and in any population regardless of the diagnosis, are not safe. We should ask questions, insist on an explanation, and get involved to help protect our patients from harm. Safety always has and always will start with each individual. ■

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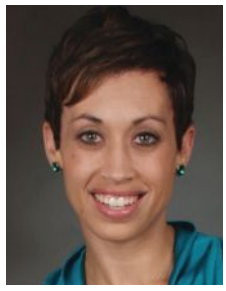
2013 Healthy Aging Report from the CDC

by Arianna Villa, BS, RRT

The Centers for Disease Control and Prevention (CDC) recently released "The State of Aging & Health in America 2013." The report is an update from the last one released in 2007 and is the sixth volume in the series that documents the state of health of adults aged 65 or over in the United States. The update includes an overview of current demographic trends in the aged, including shifts in racial and ethnic diversity and in the nature of health challenges facing older Americans. Also updated is the nation's status regarding 15 indicators of health in the aged, eight of which are targeted for improvement as part of "Healthy People 2020," the national health agenda of the U.S. Department of Health and Human Services (HHS). The report details five "Calls to Action" initiatives to be addressed by the health care community in collaboration with government and community stakeholders to improve the current and future health outlook for the aged in America. The respiratory therapist has an important role to play as a member of the health care community and a key collaborator in the care of the aged.

about the author...



Arianna Villa, BS, RRT, is a case manager and study coordinator in the UCSD pulmonary rehabilitation program at the University of California San Diego Medical Center in San Diego, CA.

The aging of the U.S. population

Our nation is currently facing an unprecedented growth in the number of individuals aged 65 and older. By 2030, when the last baby boomer turns 65, one out of every five Americans will be 65 or older. By 2050, the number of Americans aged 65 or older is anticipated to grow to over 89 million, more than double that in 2010.[1]

The aging of the population is due not only to the baby boomers "coming of age" but to an increase in the average lifespan due to great improvements in treating acute illnesses that were once common causes of death. As individuals live longer, there is an increased incidence of chronic health conditions, the impact of which are staggering both for the chronically ill individual and for the U.S. economy as a whole. For the individual, longer lifespans and chronic health challenges increase the prevalence of disability and loss of independence, both of which may necessitate extended care and medical management. The U.S. economy faces a tremendous burden in that the cost of providing health care for one person aged 65 or over is three to five times that of providing care to someone under the age of 65.[2] Considered together, these realities underscore the need to identify the health challenges facing this population and to utilize treatment approaches that emphasize preventive care and self-management. The report suggests that though the risk of chronic disease increases with age, the root causes of many of these diseases begin early in life. Thus, the early promotion of healthy behaviors, preventive care, and increased utilization of disease management programs may prevent or delay disease onset and/or disease progression.

Our report card: health indicators in the aging

The National Report Card on Healthy Aging is organized into 15 indicators of health, chosen because they are modifiable and thought to represent a comprehensive picture of older adult health. They are further broken into four categories: heath status, health behaviors, preventive care and screening, and injuries. They are illustrated in Table 1.

Eight of these indicators were targeted for improvement in Healthy People 2020, the national health agenda of the HHS. The nationwide improvement goals have been met for six of the indicators. It is important to note that the goals have been met as a nationwide average

Table 1. Health Indicators in the Aging

Health Status	Health Behaviors	Preventive Care and Screening	Injuries
Physically unhealthy days (mean per month)	No leisure-time physical activity in past month	Flu vaccine in the past year (%)*	Fall with injury within past year (%)
Frequent mental distress (%)	Eating fruits and vegetables daily	Ever had pneumonia vaccine (%)*	
Oral health: tooth retention (%)	Obesity	Mammogram within past two years	
Disability (%)	Current smoking	Colorectal cancer screening	
	Medication for high blood pressure	Up-to-date on select preventive services	

SOURCE: The State of Aging and Health in America 2013, Centers for Disease Control and Prevention
*Also targeted for improvement for Healthy People 2020. Target met.

and there remains a considerable need for improvement in many areas of the country. The report states that there is wide variation between states with regard to each indicator. No state has met every target, while all have met targets for mammography, medications for high blood pressure, and obesity. Flu and pneumonia vaccination rates are targets that remain unmet by any state. A table illustrating these differences can be found with the online report at www.cdc.gov/features/agingandhealth/state_of_aging_and_health_in_america_2013.pdf.

The report addresses each of the 15 health indicators, with focus on those for which preventive care and self-management are essential to improvement. Among these are: physically unhealthy days (using this information to monitor and guide treatment), frequent mental distress, physical activity, and the use of preventive care services. Some of the strongest suggestions for improvement in these areas are: increased physical activity for the aged to prevent premature disability and to improve overall health outcomes, focus on the mental and cognitive health of older adults, attention to health literacy, and increased awareness of and access to preventive care services.

To encourage community, provider, and individual collaboration and focus on these key areas, the 2013 Healthy Aging Report outlines five calls to action:

1. Using data on physically unhealthy days to guide interventions
2. Addressing mental distress among older adults
3. Monitoring vaccination rates for shingles
4. Developing a new Healthy Brain Initiative Road Map
5. Addressing lesbian, gay, bisexual, and transgender aging and health issues.

The call to action: how can the RT answer?

A constant theme throughout the 2013 report is the utilization of self-management and preventive care to improve health outcomes in the aged. This is a familiar theme as the Affordable Care Act has shifted our focus from treating the individual today to preventing the need to treat tomorrow. Chronic obstructive pulmonary disease (COPD) is a chronic condition with huge impact on the aged population as the third leading cause of death in the United States and one of the diagnoses currently facing 30-day readmission penalties. Respiratory therapists are integral to current efforts nationwide to improve preventive care and self-management in this population with the ultimate goal of better health outcomes. Present across the continuum of patient care, therapists of all specialties have an important role (i.e., metered-dose inhaler education at the bedside, oxygen/nebulizer instruction in the home). However, there is a newly emerging role for RTs as "case managers" for patients with lung disease.

One model is the ROAD (Reversible Obstructive Airway Disease) program at UC Davis Medical Center, which has operated with great success in providing preventive care and self-management education to COPD

patients. The ROAD program consists of a team of Registered Respiratory Therapists that provides individualized treatment planning, one-on-one education, pulmonary rehabilitation, and specialty-care referrals to COPD patients.[3] While there remain challenges to covering the direct costs of providing these preventive services, many hospital systems find sufficient cost savings in reduced hospitalizations and readmission penalties to substantiate the use of RTs in these roles. Pulmonary rehabilitation in and of itself has for decades been provided by RTs and been shown to improve physical activity levels, functional capacity, and quality of life, and does have a national coverage benefit for COPD.[4]

Respiratory therapists have long been vital participants in the care of the aged patient with diagnoses including, but not limited to, COPD. As active providers across the continuum of care, they play an important role in improving the overall health outlook for the aged population in the United States. ■

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Clinical Perspectives

Status Asthmaticus: Fact or Fiction?

by Joel M. Brown II, BSRT, RRT, FAARC

In 2010 the Centers for Disease Control and Prevention (CDC) reported that one in 12 adults and one in seven children had been diagnosed with asthma. They also reported approximately nine people die from asthma each day.[1]

Asthma is characterized by difficulty breathing, which is caused by inflammation and narrowing of the airways and mucus plugging. With the proper clinician guidance, patients are usually able to manage crises and maintain a rather normal quality of life. This is accomplished through patient education on triggers and management of chronic and acute medication use. If symptoms progress and hospitalization is required, a more acute and aggressive approach is used to manage the symptoms. These approaches consist of oral steroid; continuous, or more frequent, inhaled beta-2 agonist; and supplementary oxygen if indicated.

However, there are times when these approaches do not work, and the symptoms of the disease progress. This is usually the first time we hear the words "status asthmaticus" (SA). Some have argued whether this term should ever be used. Is the existence of status asthmaticus "fact" or "fiction"?

about the author...

Joel M. Brown II, BSRT, RRT, FAARC, is the director of respiratory care and sleep medicine services at Nemours – AI duPont Hospital for Children in Wilmington, DE.

Fact: SA is clearly defined in textbooks

First, let us define SA as the term used in a clinical setting. If we take its Latin roots "status" and "ticus," we would find that they are translated into English as "purist state." One would then deduce that status asthmaticus means this is asthma in its purest state, but that is not the case.

According to "Rubin's Pathology," status asthmaticus is "severe bronchoconstriction that does not respond to drugs that usually abort the acute attack."[2] Others have defined it as a "severe asthma exacerbation that does not respond to initial bronchodilation therapy and that may become life threatening."[3] Even though these two definitions sound very similar, there still seems to be some controversy around this disease process and whether it really exists.

Fiction: The treatment of SA is well defined in most major consensus recommendations

Several texts clearly define status asthmaticus.[2,3] In addition, most clinicians have heard of it or maybe even diagnosed a patient or two with it. Where's the controversy? The majority of the mystery around the existence of SA comes from the fact that SA is not clearly defined in most consensus-driven recommendations. The Global Initiative for Asthma (GINA) and the National Asthma Education and Prevention Program (NAEPP) make no mention of the term status asthmaticus in their recommendations on how to manage asthma and educate people with the disease.[4,5]

These two organizations have provided the go-to resources for clinicians who manage asthma for acute and chronic patients. Some of the biggest names in the field have contributed to the recommendations and research in the GINA and NAEPP documents, yet they rarely use the term status asthmaticus in their recommendations. In fact, a review of the NAEPP's most recent Expert Panel Report published in 2007 reveals that the term "status asthmaticus" is not mentioned once in the text of the document. The only place the term is found in this manuscript is in the titles of four of its referenced research articles.

Status asthmaticus is considered a subset of persistent severe asthma, known as "life threatening" or "near-fatal asthma" (NFA). NFA is defined by the following:[4]

- Patient too dyspneic to speak
- Peak expiratory flow of <25% of predicted or personal best
- Typically requires hospitalization or emergency department visit
- Minimal to no relief from standard asthma therapy
- Adjunct therapies often required.

This definition reflects the textbook definition of SA. It also provides a more objective definition of the disease state that can be more readily used to diagnose asthma patients. However, if the experts do not mention status asthmaticus, it must not exist.

Fact: The term SA is found in ICD-10 codes

Based on the expert definitions, why is the term "status asthmaticus" used at all? The simple answer is tradition. In health care we often use terms that may not be accepted by the academic experts in the field but are often used by bedside clinicians. We have seen this epidemic in the respiratory care profession when it comes to defining our modes of ventilation. For example, if someone states that a patient's breath sounds are "coarse," we tend to know exactly what that means even though few of us were taught this term in school.

This trend must have also made its way to the "International Classification of Disease" (ICD), which provides patient diagnosis codes for all clinician interactions. These codes are also used by many insurers to determine payment. If status asthmaticus is not mentioned in our expert-opinion recommendations for diagnosis, treatment, and management, it should not have an ICD code… right?

On Aug. 4, 2014, ICD-10 codes were published as an updated version of the formal coding system, and SA was given a code.[6] The SA diagnosis was listed in the chronic lower respiratory diseases section as code J46. "Asthma" has a separate code (J45), which would make one think that these are two distinctly different diagnoses.

Fiction: There are only a few peer-reviewed published research articles that use the term status asthmaticus.

Ovid Technologies Inc. provides a widely used Web-based search engine that uses multiple scientific databases to search for published research. Type "status asthmaticus" into this search engine, and you will be surprised how many articles you will find. For example, I did a search for articles from 1998 to the present and found over 600 manuscripts. This is considered impressive because SA and near-fatal asthma are rarely seen and very difficult to study due to the small patient population.

Fact: Whether we call it NFA or SA, there are consistent suggestions for how to treat it

Treatment options for near-fatal asthma or status asthmaticus include the following:[7]

- Aggressive use of inhaled beta-2 agonist and IV steroids.
- Consider use of IV beta agonist.
- Consider noninvasive positive pressure ventilation as tolerated.
- If intubation and mechanical ventilation are indicated, consider a larger endotracheal tube to minimize resistance and use ventilation strategies that minimize air trapping.
- Consider use of heliox prior to intubation and after intubation if a U.S. Food and Drug Administration-approved device is available.

- Consider use of magnesium sulfate, which can inhibit calcium channels in smooth muscle and decrease acetylcholine release.
- Consider use of inhaled anesthetic gases like isoflurane and IV anesthetics like ketamine and propofol, which can minimize bronchoconstriction and aid in normalizing gas exchange.
- If none of the above work, consider extracorporeal membrane oxygenation if it is readily available at the facility where mechanical ventilation was initiated.

So does status asthmaticus exist? Is it "fact" or "fiction"? If we were to make a decision based on the evidence presented here, we could find some proof for both arguments. It's a fact that the concept exists, but it has a major identity crisis caused by medical professionals. We need our experts and researchers to come to a consensus and choose one name for this disease state. Until then, we will be forced to use both terms in order to assure the entire multidisciplinary team recognizes the acuity of our severely ill asthma patients. ■

DISCLOSURE
Joel M. Brown II is a member of the Key Opinion Leaders for Aerogen.

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Stepping Up

by Thomas J. Kallstrom, MBA, RRT, FAARC

As I was flying home to Dallas recently and drifting into a sound sleep to the sounds of the engines' drone, I heard over the intercom a call for the assistance of a medical professional. Looking back in the cabin, no one raised his or her hand as I stood to help, so it looked like I was it. Now was time to put on my clinical hat, which I had not worn for awhile. It appeared that there was a lady who did not speak English who was experiencing significant respiratory distress. The flight attendants had already taken out the oxygen and were trying to administer it with the partial rebreathing mask that the airlines use. It was time to step up.

How many times have you had an opportunity to step out of your comfort zone and to give back? Many of you have done so. There are respiratory heroes all over the world, and I have had the privilege of getting to know several of them through the years.

Tom McLeary stepped up

Tom McLeary (a member since 1966) and his colleagues are among them in Cleveland. While Tom is not a respiratory therapist, he has been engaged in the respiratory care community over his entire career and into retirement. He stepped up about 20 years ago and has not stopped. His motivation was that of a respiratory therapist from Cleveland who was murdered on the job. Not surprisingly, it devastated Ohio's respiratory care community. Shortly after Kim Richmond's untimely death, Tom approached Kim's brother Brad (who also was a respiratory therapist) about establishing a Hunger Fund in Kim's name. From there, Tom helped form a committee of members of the Ohio Society for Respiratory Care to work together. Beginning in 1999 and each year since, the fund has provided food for hunger centers and, more recently, for individuals in need.

Throughout his career, Kim Richmond was empathetic for the plight of people less fortunate in society. He quietly spent time and money supporting food banks and housing for the indigent. Kim was especially moved by families with children who were homeless and poor. In addition to providing food for these families, he would often buy a toy for the children to provide a small amount of pleasure in an otherwise dismal situation.

Today, funds for those in need in Cleveland are raised through an annual meeting for respiratory therapists and sleep specialists. Local physicians and therapists generously donate their time and knowledge — without compensation — to present contemporary and cutting-edge respiratory education. In 2014, over 300 turkeys and fresh hams and fruit were provided to local food hunger centers throughout the inner city of Cleveland from money raised at this conference. Additionally, in November 2014, a sizable donation was presented to the Greater Cleveland Food Bank in the name of this fund. That donation provided 10,000 meals to the many families and individuals at risk for hunger during the holiday season. This year the conference will be held May 20–21. If you happen to be in the area, I would encourage you to attend.

Bette Gray stepped up

Bette Grey is another respiratory hero. Bette's journey started when she saw an ABC "20/20" episode where Jon Bon Jovi was dedicating millions of dollars to the Volunteers in Medicine Clinic in New Jersey. It inspired her to start a primary care clinic, which today has treated

about the author...

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

over 2,300 patients. In the past two years, this free clinic annually provided half a million dollars in direct patient care. Through the years, Bette has been able to acquire free medications and inhalers for patients. Her clinic has also worked with the local community in Miffinville, PA, to expand this much-needed service. In fact, in 2008 she established an in-house cupboard that provides food to patients in need. Her inspiration was one of her patients who had diabetes and was living on a diet of dog food.

Bette and her husband knew firsthand what it felt like to not have a fulltime job and to be without health insurance — as she experienced this personally about 10 years ago. This experience was her inspiration to ensure that others in need had access to a medical professional despite their inability to pay for the services.

Bette has even written a book titled: "Death Is Not an Option: A View from a Free Medical Clinic." This book details her experiences and her journey first hand. She told me: *"all of our patients' lives mean something — whether or not they have health insurance."* It does not stop there either. She has set up a rotation for respiratory care students to experience firsthand the challenges that our underserved have as they try to get health care. Getting tomorrow's respiratory therapists involved today while they are students is important.

Step up and make a difference

Getting back to my experience at 30,000 feet… I can tell you that everything turned out fine for the lady in the plane. She had stabilized by the time our flight landed. It felt good to step up and use my skills as a Registered Respiratory Therapist, but it certainly was nothing compared to the humanitarian work of AARC members Tom McLeary and Bette Grey and their respiratory colleagues.

I challenge you to slip out of your comfort zone and be open to making a difference using the skills of clinical care and compassion that you provide daily to your patients. ■

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Will FDA Act Timely To Implement New Tobacco-deeming Regulations?

by Anne Marie Hummel

As respiratory therapists, you know the devastating effects tobacco consumption has on the human body. It leads to COPD and other chronic conditions and is the No. 1 cause of preventable death in the United States. According to information highlighted recently at a meeting of the Tobacco Partners Coalition — headed by the Campaign for Tobacco-Free Kids, the American Lung Association, and the American Cancer Society, and of which AARC is a member — 1 billion people will die from tobacco use during this century.

FDA has authority to regulate all tobacco products

The U.S. Food and Drug Administration (FDA) has the authority to control tobacco use and to prevent young adults from getting hooked at an early age. Given authority under the Family Smoking Prevention and Tobacco Control Act of 2009, the FDA has already issued strict regulations and oversight of the sale and distribution of cigarettes, cigarette tobacco, smokeless tobacco, and roll-your-own tobacco. The law also gives them authority to deem "all tobacco products" under their authority; and it is this deeming authority that would allow the FDA to regulate additional products such as cigars, e-cigarettes, pipes, hookahs, dissolvable tobacco products, gels, and future products containing or derived from tobacco.

After three years, the FDA finally issued proposed rules on April 25, 2014, to regulate the products identified above. However, that's just the beginning. Nothing can happen until the FDA issues final regulations after taking into account public comments on its proposal.

The longer the FDA delays in publishing a final rule, the more time the tobacco industry has to continue targeting young adults with a new generation of products. In that regard, the AARC and others have called for the FDA to issue a final rule no later than one year from the date of the proposed rule, or April 25, 2015.

Key provisions aimed at young adults

It is important for our members to keep abreast of the issues involving the FDA's authority to regulate tobacco products and encourage a dialogue to prevent young adults from starting down a path that can lead them to addiction.

The proposed deeming rule would apply to many, but not all, of the restrictions imposed on the sale and distribution of cigarettes to the deemed products. These safeguards for products other than cigarettes are especially important as more and more youth are taking to smoking small cigars and e-cigarettes.

In addition to certain provisions that impact the manufacturing of tobacco products, the "deeming"regulation proposes the following restrictions:

- Prohibits retailers from selling any of the deemed products to persons younger than 18; age verification would be required.
- Prohibits the sale of deemed products through vending machines except in facilities restricted to persons 18 or older.
- Prohibits distribution of free samples of deemed products.
- Requires newly deemed products other than cigars to carry a specific warning label covering at least 30% of the principal packaging panel.
- Requires packages and ads for deemed cigars to bear one of five specific warnings.
- For cigars sold individually, the warning must be posted at the retailer's point of sale.

about the author...

Anne Marie Hummel is the AARC's director of regulatory affairs in Washington, DC.

While this is an important beginning, the rules do not go far enough to protect our nation's youth.

FDA's actions need to go further to protect young adults

A new survey released in December 2014 and conducted by researchers at the University of Michigan with funding from the National Institute on Drug Abuse provides new evidence that use of e-cigarettes has increased among 8th and 10th graders, with more than twice as many using e-cigarettes compared to regular cigarettes (see www.drugabuse.gov/related-topics/trends-statistics/infographics/monitoring-future-2014-survey-results). Increase in cigar use has also risen due to an increase in the use of small, flavored cigars, with flavors like grape, watermelon, and chocolate.

Although the FDA has authority to propose other restrictions on deemed products than those listed above, it chose **not to** develop proposed policies as part of the "deeming" rule that would strengthen its regulatory authority over other aspects of sales and advertising that could go a long way to protecting our nation's young adults. Examples include the following:

- It does not propose restrictions on the sale of flavored cigars or e-cigarettes at a time when there is mounting evidence of increased usage of these products by middle school and high school youth.
- It does not bar self-service displays in retail stores. For example, cigars and e-cigarettes with candy and fruit flavors could be placed next to the candy aisle.
- It does not impose minimum pack size. Inexpensive single cigars or other products could appeal to price-sensitive youth.
- It does not address childproof packaging for liquid nicotine. As of Nov. 30, 2014, the American Association of Poison Control Centers reported 3,638 calls to poison control centers involving exposures to e-cigarette devices and nicotine liquids. This number is more than double the 1,543 calls in all of 2013 and more than 13 times the 271 calls in 2011. Legislation requiring childproof packaging of liquid nicotine is expected to be reintroduced in the new Congress.
- It does not explicitly prohibit Internet sales of deemed products nor impose any age verification requirements on Internet purchases. Given easy access by underage youth to purchase products over the Internet, the easiest solution would be for the FDA to simply prohibit Internet sales of deemed products altogether as a step toward prohibiting Internet sales of all tobacco products.
- It does not address advertising of newly deemed products in ways or venues that attract youth. For example, promoting products using celebrities, cartoon characters, or brand sponsorship of athletic or musical events that may have significant youth attendance.

It is believed that the FDA has held back on further proposals in its desire to firmly establish its authority to regulate all tobacco products it deems subject to its control. However, the AARC and other organizations have encouraged the FDA to issue separate proposed rules to address some of these critical issues so that a final rule can be issued immediately following publication of a final deeming rule.

"Big tobacco" wants certain cigars exempt from FDA's authority

Bowing to pressure from the tobacco industry, the FDA's proposed deeming rule asked for public comments on whether to regulate all cigars or exempt certain "premium" cigars from their authority. Premium cigars are defined in part as those wrapped in tobacco leaf containing 100% leaf tobacco with no filter, top, or non-tobacco mouthpiece, and no flavor other than tobacco.

The resounding answer from public health organizations, including the AARC, is that there is no justification to exempt "premium cigars." The FDA even observes in its proposed rule that "all cigars are harmful and potentially addictive" and "a large cigar may contain as much tobacco as a whole pack of cigarettes." Lobbying on Capitol Hill by the tobacco industry to exempt premium cigars is expected to continue; thus, it is important for the FDA to act timely in publishing its final rule.

RTs can help educate patients and youth

Respiratory therapists have the chance to make a difference. Preventing tobacco use, offering smoking-cessation counseling, and (most importantly) talking to young adults about the harm of using any tobacco product and the long-term effects it can have on their health can go a long way to help the fight in making the next generation tobacco free. ■

Trade Secrets

by Anthony L. DeWitt, JD, RRT, FAARC

John has worked at Our Lady of Perpetual Billing for 12 years. He has risen from staff therapist to assistant manager, but now a local for-profit hospital wants to hire him to be their new department manager.

John helped develop and write the respiratory care protocols and has been in charge of the department's unique modular scheduling system that permits therapists to work either 10 four-hour blocks or four 10-hour blocks a week. He even helped write the spreadsheet macros that make the system work. John is afraid he will be denied permission to take the processes and protocols he helped develop during his tenure to his new employer, so he embarks on a self-help remedy. John quietly goes into the department director's office, photocopies the protocols, and takes a copy of the modular scheduling template on a USB thumb drive. He then turns in his resignation, receives the good wishes of his staff, and heads over to Treatem-Streetem Hospital to take his new job. In his first 60 days, he implements many changes, including protocols and modular scheduling. Several staff from his old employer defect and join John at his new employer. Things are going great!

Then a funny thing happens. He gets a summons from a sheriff to appear in the local district court. The complaint names him and alleges that he has stolen trade secrets from Our Lady of Perpetual Billing and seeks damages as well as an injunction against both John and his employer. Soon his administrator is suggesting that John retain a good lawyer; and while he's at it, see if anyone is hiring. The two hospitals work out a deal, and John is left unemployed and looking for a way to pay his lawyer.

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How did this happen?

Nearly every state[1] has passed a "Trade Secrets Act" that defines what a trade secret is as well as what remedies exist if secrets are taken for commercial gain. The most commonly recognized example of a trade secret is the recipe for Coca-Cola®. It meets the three tests for a trade secret:

> *(1) …it is "information, including a formula, pattern, compilation, program, device, method, technique, or process; (2) that derives independent economic value, actual or potential, from not being generally known to or readily ascertainable through appropriate means by other persons who might obtain economic value from its disclosure or use; and (3) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy."*[2]

In John's case, the department protocols, which allow care to be delivered in an efficient manner that makes the best use of hospital resources, clearly has economic value and is "not generally known" except to hospital employees. However, since every member of the hospital's RC staff knows and uses the protocols, and since they had to receive approval by the medical staff before they could be used, it is unlikely that they were not "readily ascertainable through appropriate means." Still, John appropriated them in what might be seen as a midnight raid, and that may well weigh against his defense.

Another problem for John's former employer is the degree to which the hospital attempted to maintain its secrecy. If the department director uses the protocols to recruit, or if they are disclosed to students during their

rotations, or if they are the subject of a journal article in a trade publication, then there is no real attempt to keep them secret. Even more importantly, if employees are not told that the information is proprietary and considered by the hospital to be confidential, there is little likelihood that a court would deem them to be protected trade secrets.

The scheduling program, however, might be a different matter. John will no doubt claim that since he wrote the macros, they are his. Sadly, under U.S. copyright law, if he wrote them on duty and in the course and scope of his employment, those protocols are in fact the intellectual property of his employer under the "work for hire" doctrine. The modular scheduling system, an innovation of the department manager not generally used in any other hospital in the state, is also a core idea that is worthy of protection. John's macros only express the process by which that modular scheduling system is implemented. Thus, John does not have an ownership interest in the system nor in the macros themselves. Since the document was stored in a hospital computer, which had to be accessed to retrieve it, John may also have run afoul of the Computer Fraud and Abuse Act, which makes it unlawful to exceed the scope of permission when using an employer's computer system. Since the one copy was in a computer maintained by the director of the department, certainly there were reasonable steps taken to ensure the security of the program. John has a real problem here.

Had John simply recreated the macros from memory and made a few additions to the macros and software to make it less like his former employer's, he might have had a better argument that these are not a trade secret. Even then, however, the intellectual property might well be subject to a claim of trade secret protection because John only developed the macros, not the idea behind the macros.

What should John have done?

Simply put, it is always better, if leaving employment, to ask specifically what you can and cannot take with you. If you are permitted to take something and do so, there is little recourse for the former employer. However, if you "assume" and take materials that were developed by you or others, you run the risk of being sued for disclosing proprietary information to your new employer in addition to damaging your reputation in the community. Not only can this get you sued, it can get your new employer sued — and nothing says "termination" quite like causing a summons to be served on the hospital CEO.

It is also important to note the difference between hospital technical processes like respiratory care protocols and hospital strategic planning. When a hospital shares information regarding its strategic planning and operations with managers, even in the absence of a written statement of confidentiality or a non-disclosure agreement, managers should understand that they are receiving information that, were it leaked, could cause the organization grave harm or give competitors a road map to its strategic thinking.

It is also worth noting that hospitals can take a dim view of managerial or supervisory staff taking per diem or relief positions at competitor facilities. That is especially true if the supervisors or managers have access to management briefings and strategic planning information. Even if the extra work is only for the purpose of making some extra money for the holidays, it can get that manager fired. Plus, if strategic information is passed on to the competitor, it can get that manager sued.

Thankfully, most hospitals share information regarding processes (and indeed, entire policy and procedure manuals) with other hospitals and other departments. In the real world there is very little information that a hospital might deem proprietary, except as noted above. If a hospital wishes to protect its proprietary processes, it must do several things:

1. Have a policy restricting access to the protocols or processes (and abide by it) and limit access to only those with a need to know.
2. Impose a confidentiality agreement on anyone whose job requires them to use the process or information in their normal work day.
3. Take steps to protect the information by storing it securely.
4. Retrieve proprietary information (notebooks, protocols, training materials, etc.) from employees upon departure from the organization.

In some states, additional protections and procedures may be needed to protect the proprietary information and gain trade secret protections. These are matters about which an intellectual property attorney can provide guidance. ■

FOOTNOTES

1. At present 40 states and the District of Columbia have enacted some version of the Uniform Trade Secrets Act.
2. Uniform Trade Secrets Act.

Sleep Medications and Lung Diseases: Side Effects and Complications

by Lutana Haan, MHS, RRT, RPSGT, and T.J. Wing, MHS, RRT

Adequate sleep is fundamental to health, with lack of sleep linked to poor daily functioning, heart disease, high blood pressure, stroke, weight gain, and diabetes. Insomnia is a common condition that affects 30%–35% of the U.S. population and increases in likelihood with age.[1] Insomnia refers to difficulty falling asleep, staying asleep, or early-morning awakenings; and it also causes daytime impairment.[2] It can occur as a transient, short-term, or chronic disturbance. Insomnia is not defined as "short" sleep since people vary in their requirements, nor does it mean people are just "poor" sleepers. Notably, insomnia is not an explicit illness or disease but rather a symptom of a more specific disorder.[3] People have multiple causes of their insomnia; therefore, their treatments should involve a combination of cognitive, behavioral, and pharmacological therapies.

Insomnia and treatment

The U.S. Food and Drug Administration (FDA) has approved medications used to treat insomnia, including benzodiazepines, non-benzodiazepine receptor agonists, and ramelteon. An example of a benzodiazepine is flurazepam (Dalmane®) or triazolam (Halcion®) (see Table 1).[2] Benzodiazepines affect the gamma-aminobutyric acid (GABA) neurotransmitter to reduce nerve activity and promote sleep. Non-benzodiazepines such as zolpidem (Ambien®), zaleplon (Sonata®), or eszopiclone (Lunesta®) also target GABA but have a shorter half-life with fewer side effects.[2] Ramelteon is a melatonin receptor agonist that has a short half-life in comparison to the above mentioned medications.[3] Melatonin is produced naturally by the pineal gland during the night, which affects receptors in the suprachiasmatic nucleus, regulating periods of sleep and wakefulness.[2]

Although not approved by the FDA for the treatment of insomnia, antidepressants are often used. The tricyclic antidepressants (amitriptyline, trimipramine) reduce the time it takes to fall asleep and help keep a person asleep; however, they have side effects such as hypotension, changes in heart rate, confusion, and poor memory.[2] Trazodone facilitates sleep through sedation; however, no large studies have been done that provide the information required to generalize the use for insomnia. These medications also have the risk of overdose. The selective serotonin reuptake inhibitors (SSRIs) such as paroxetine or sertraline replace these agents for depression but do not help with sleep.

Over-the-counter (OTC) sleep aids such as melatonin, valerian root, chamomile, and lavender have been utilized for the treatment of insomnia with varying success; but many of these agents are not regulated by the FDA.[2] When taken several hours before bedtime, melatonin has been shown to decrease the amount of time it takes to fall asleep and works for some individuals. Antihistamines purchased OTC are also used for mild insomnia but often leave the user with sedation effects that carry over to the next day.

Studies have shown that people frequently use alcohol as a sleep aid. Alcohol is sedating and helps one fall asleep; however, as it is metabolized during sleep, it causes awakenings. Reports have shown 21% of insomniacs have mixed medications — the most common being alcohol and benzodiazepines.[4] Alcohol, along with benzodiazepines in high doses, can become extremely toxic. Study results

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from the combination have mixed results, depending on dosage and the individual; therefore, use should be cautioned.[4]

Although not specifically insomnia, people with chronic pain often report difficulty sleeping. Opiates are used frequently to treat chronic pain; however, during sleep they are known to reduce control of respiratory rhythm and tidal volume, leading to decreased oxygen saturation and increased likelihood of apneas.[5] Hospitals are treating pain more aggressively and have experienced complications in patients' breathing during sleep with opiate use. Opiates reduce REM sleep and have been shown to contribute to Cheyne-Stokes respirations.[5]

Long-term studies have not been published that demonstrate the effectiveness of medications in the treatment of persistent insomnia. Commonly, medications are studied for less than six months; although they frequently are prescribed for longer periods of time, and some patients remain on them for years.[1] The efficiency of many medications may be reduced over time. Therefore, it is important to determine the root cause of insomnia and treat the underlying condition.[1]

Insomnia and the COPD patient

Patients with chronic obstructive pulmonary disease (COPD) have more difficulty falling and staying asleep and experience increased daytime sleepiness as compared to the general population. This leads to the use of pharmacologic sleep aids. During sleep, all individuals have a change in their response to carbon dioxide (CO_2): blood levels of CO_2 increase and blood oxygen levels decrease slightly as ventilation decreases. These changes can be heightened in those with COPD as they have a blunted response to CO_2.[3] Compounding the potential problem is a reduction in upper airway muscle activity during sleep. For these reasons, obstructive sleep apnea (OSA) occurs in about 10%–15% of COPD patients, a condition referred to as "overlap syndrome."[6] The nighttime hypoxia and hypercarbia increases the number of awakenings in the COPD patient and can lead to insomnia. COPD patients also report dyspnea, cough, and wheezing during sleep.[5] Thirty-three percent of COPD patients state that it takes longer to fall asleep, and their complaints increase as COPD progresses.[6]

Benzodiazepines have been reported to cause changes in pulmonary function in COPD patients. These changes include a decrease in tidal volume, a decrease in oxygen saturation, and decreasing ventilatory drive that can lead to changes in blood gas values during sleep.[4] Heightened snoring has been demonstrated with the use of benzodiazepines, and they have been linked to airway obstruction, which increases the risk of "overlap syndrome." Benzodiazepines may also alter cognitive function; and in the older COPD patient, they may increase the risk for falls and fractures. A recent study quoted in *Sleep Review* found a 45% increased risk of respiratory symptom exacerbation following recently prescribed benzodiazepines.[7] Non-benzodiazepine medications have not been found to affect ventilatory drive. However, they can cause cognitive impairment and may also lead to an increase in the risk of falls.[4] Ramelteon has been used in small trials, appearing safe for those with mild-to-moderate COPD and OSA. It has not been found to have any adverse cognitive effects.[4]

No studies have been done specifically in COPD patients and the use of trazodone. Nevertheless, trazodone has been associated with cardiac arrhythmias, cognitive impairment, dizziness, and psychomotor difficulties, which could potentially be dangerous for a COPD patient.[4] The half-life of trazodone is 16 hours, and the residual daytime "hangover" effect can be noticeable.

Individuals over 65 years of age, including those in nursing homes, receive hypnotics at a higher level when compared to younger persons. Sleep disturbances are one of the reasons families seek institutionalization of older relatives. Individuals over 60 years were 2.5 times more likely to experience an adverse drug reaction in the hospital.[3] The half-life of the medication may increase due to reduced hepatic clearance leading to a higher potential risk to the elderly. All these factors lead to the possibility of increased risk for the COPD population.

Non-pharmacologic therapies for sleep proven beneficial to COPD patients include guided imagery and progressive muscle relaxation. Guided imagery is a mind-body connection practice to reduce stress and calm the

Table 1.
FDA-approved Medications for Insomnia

Benzodiazepines	
Flurazepam	Dalmane®
Quazepam	Doral®
Estazolam	ProSom®
Temazepam	Restoril®
Triazolam	Halcion®
Non-benzodiazepines	
Zolpidem	Ambien®
Zaleplon	Sonata®
Eszopiclone	Lunesta®
Doxepin	Silenor®
Ramelteon	Rozerem®

mind with a beginning focus on breathing.[8] Progressive muscle relaxation is a technique of tightening and relaxing muscles in the body in order to reduce stress and help promote sleep.[9] These practices should be encouraged in the COPD patient.

Special concern for a respiratory therapist

Respiratory rate is the vital sign that can be a key to determining critical changes occurring with sleep medications in those with pulmonary disease. Respiratory rate, however simple, is often bypassed. On assessment, if clinical changes appear, such as an unexplained hypoxia, hypercarbia, or changes in respiration, investigation and discussion related to sleep medications can be beneficial. Added education regarding sleep medications for COPD patients, especially those with OSA, would be beneficial. The patients and family need to be aware of changes in level of consciousness, pulse oximetry, or ABG chemistry that may be attributed to prescribed medications. ■

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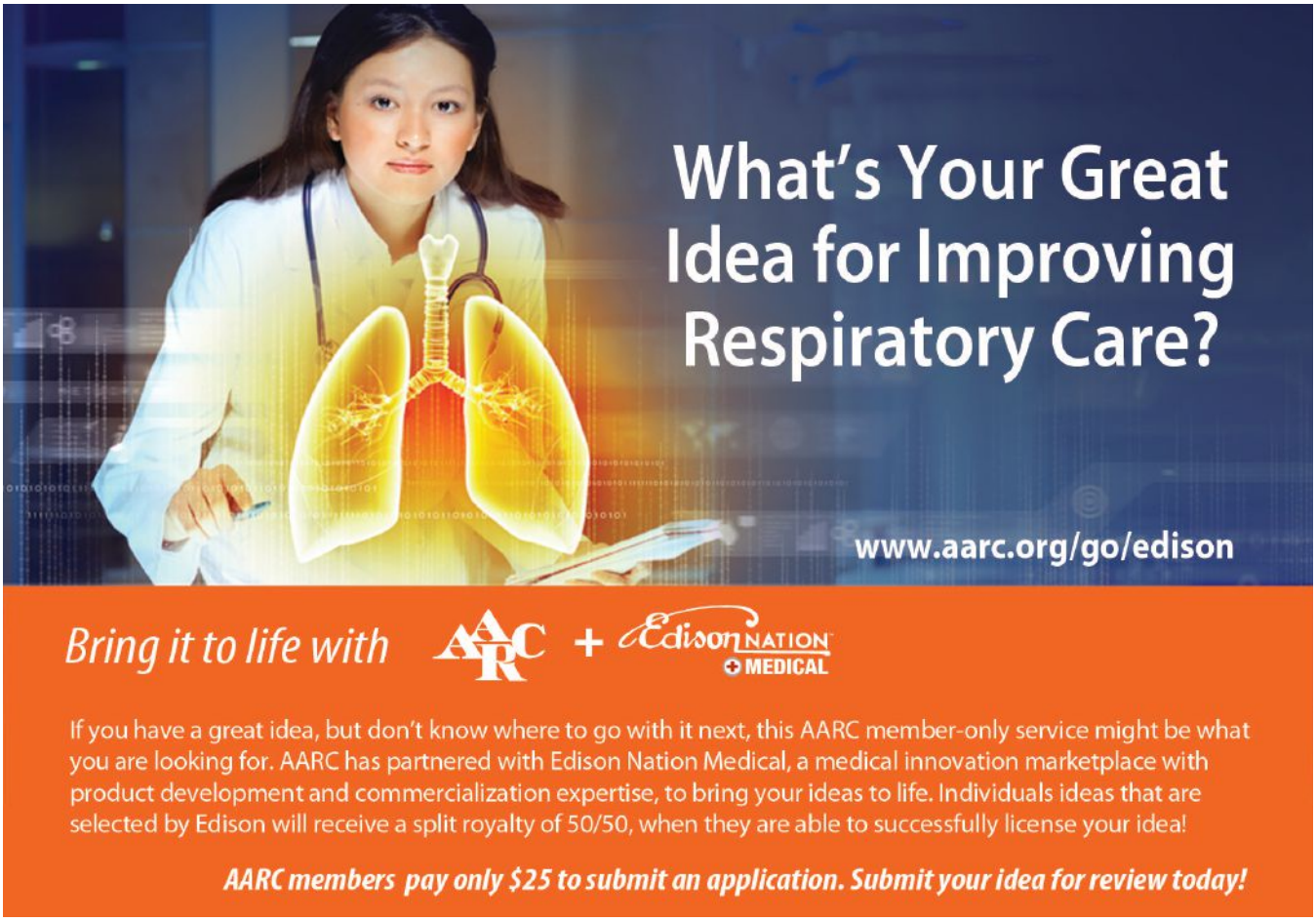

Chronic Disease Manager

Caring for the Chronically Critically Ill Patient: Future Challenges for Health Care

by Mark Siobal, BS, RRT-ACCS, FAARC

Continuously evolving advancements in medical care driven by research, innovation, and technology are allowing health care providers to extend the lives of patients with severe critical illness. However, a growing number of these patients survive their acute illness only to become chronically critically ill, resulting in immense societal, ethical, and financial burdens to the provision of health care.

Chronic critical illness (CCI) can be attributed to the use of extensive, increasingly aggressive, high-cost intensive care treatments. The added combination of an aging population and rising comorbidities such as obesity, heart disease, and diabetes has resulted in the survival of an increasing number of CCI patients with profound disabilities. Care of the chronically critically ill is extremely challenging and resource intensive, requiring the multidisciplinary expertise of compassionate and committed caregivers capable of providing high levels of specialized care for prolonged periods.[1–3]

Respiratory therapists are at the forefront of care for the chronically critically ill, as prolonged mechanical ventilation (PMV) and tracheostomy are defining characteristics in the vast majority of adult and pediatric patients with CCI. The increasing population of CCI patients gives rise to new and continuing challenges for the RT and the health care system in general.

about the author...

Mark Siobal, BS, RRT-ACCS, FAARC, recently retired from his position as a clinical specialist and technology manager in the respiratory care services department at San Francisco General Hospital in San Francisco, CA.

Defining chronic critical illness

There is no single accepted definition of CCI, but several have been based on the need for PMV and tracheostomy. In general, the CCI patient partially recovers from the acute phase of critical illness but remains functionally debilitated and dependent upon continued high levels of care during the chronic phase. This care is often, but not always, associated with PMV.[1–3]

Chronic critical illness is further described as a syndrome comprising numerous characteristics, including abnormal physiologic, metabolic, immunologic, and endocrine conditions. These protracted derangements may be initiated by an episode of sepsis or injury and accompanied by immune system exhaustion, susceptibility to infection, and dysfunction of multiple organ systems from a wide range of critical illnesses.[1–3]

Evolving efforts to define the CCI patient population are important for epidemiologic study, demographic quantification, outcomes research, and the determination of financial impact. This information is essential for the development of strategies to prevent CCI, as well as to improve outcomes, reduce costs, and impact future planning of health care policy. The study of CCI is important not only for clinicians in regard to identifying evidence-based best practices to prevent CCI, but it is also important for health care payers and policymakers.[1–3]

A recent multi-stakeholder definition that reflects current consensus about both the underlying clinical conditions and the duration of the qualifying episode has been used to estimate the population prevalence, cost, and mortality associated with CCI in the United States.[1] CCI was defined in patients who required eight days of intensive care and had one of the following clinical conditions: PMV of at least

four days, tracheostomy, sepsis, severe wounds, stroke (ischemic or hemorrhagic), traumatic brain injury,[1] and multiple organ failure.[2]

Population prevalence, mortality, and cost

Extrapolated epidemiologic study data for the United States between 2004–2009 estimated over 380,000 CCI cases in 2009, an average of 105,000 in-hospital deaths per year, and a $10.4 billion increase in hospital-related costs over six years to $26 billion. These data also show that as the number of cases and costs increased, the rates of in-hospital mortality declined by an average of 1% per year, from 33.3% in 2004 to 28.3% in 2009. These trends suggest that CCI patients may be surviving longer and transitioning to other levels of care, which further escalates costs over time.[1]

Age-specific population differences show that the prevalence of CCI increases with age — peaking, then declining precipitously after 80 years of age. This trend may be due to the combination of early mortality from age-related severity of illness and expanding preferences toward end-of-life decisions for early withdrawal or withholding of life support.[1] The number of infants and children with CCI is also expected to increase as medical treatment and technology improve.[3] Changes in these trends over time will indicate whether the growth of CCI is being limited by improved cost-effective interventions and health care policy or promoted by continued aggressive and sometimes excessive intensive care and long-term treatment.

Comorbid conditions that are common in critically ill patients include COPD, cancer, end-stage renal and liver disease, and HIV infection.[2] The impact of these conditions combined with the aging population, the current obesity epidemic, and the increasing rates of heart disease and diabetes can only contribute to the poor outcomes and the consumption of health care resources related to CCI.

Role of the respiratory therapist

The RT is in position to play a pivotal role in contributing to the prevention and treatment of CCI. Respiratory therapists can:

- Promote evidence-based practices and protocols to reduce the incidence of iatrogenic complications that prolong critical illness, such as ventilator-associated pneumonia and ventilator-induced lung injury.
- Target early weaning from mechanical ventilation and use of noninvasive ventilation to prevent intubations.
- Prevent disuse muscle atrophy by assisting with early mobilization of patients.
- Reduce the development of delirium and acute brain dysfunction by promoting the limitation of sedation (especially benzodiazepines) and encouraging sedation interruptions, and taking steps to maintain the patient's normal sleep-wake cycle.
- Aid the nutritional support process by providing metabolic testing for patients receiving mechanical ventilation.
- Adhere to strict infection-control measures such as hand hygiene, personal protective equipment, and equipment decontamination procedures to prevent the spread of hospital-acquired drug-resistant infections.
- Provide proper care and correct sizing, positioning, and patency of artificial airways to prevent complications.
- Screen patients for sleep disorders and identify patients at risk for complications in the acute care setting.
- Provide patient monitoring, respiratory care, and mechanical ventilation in the non-ICU setting.

- Participate in the multidisciplinary care process with professional dedication and mutual respect for other health care providers.
- Stay current with evidence-based care, new technology, and innovation while considering their impact on health care costs.
- Participate in research and development to advance the practice of respiratory care.
- Target professional development toward the future advanced practice respiratory therapist and respiratory care case manager credentials/certifications.
- Maintain the ethical treatment and compassionate care of patients and their families.

Future challenges for health care

Fiscally and socially responsible health care policy reform and practices aimed at reducing unnecessary health care spending are essential to optimizing care delivery while controlling costs from CCI. Efforts to achieve these goals should include continued funding and implementation of evidence-based research and practice, along with the development of integrated information, data collection, and analysis tools that promote coordination and longitudinal collaboration within the health care system at all levels of care.[4] Continued development and integration of multidisciplinary palliative care practices to better align the advances in health care with the relief of suffering and quality-of-life preferences for both the patient and family coping with CCI are needed as well.[3,5] ■

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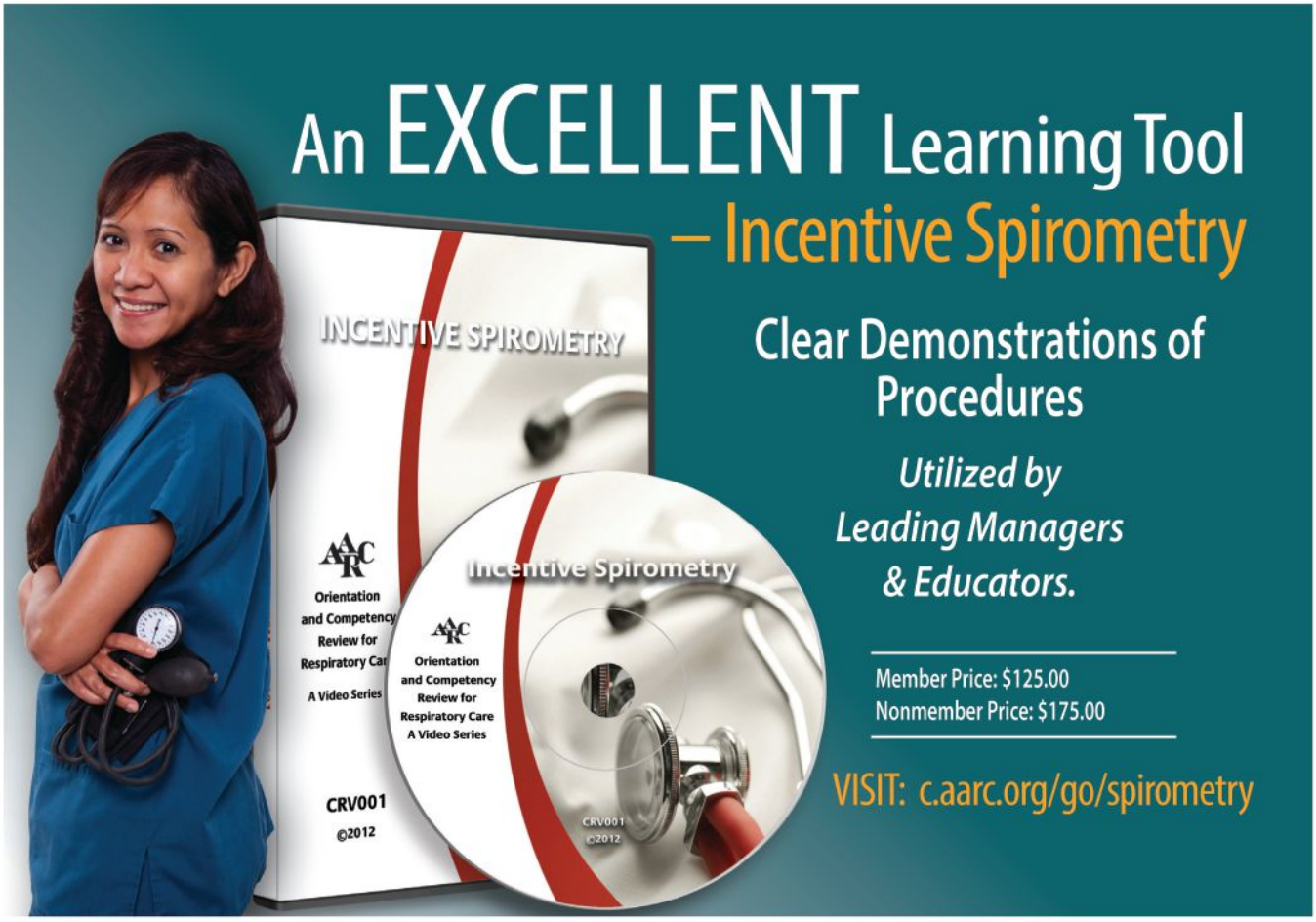


Giving Flight

Monarch Butterflies Symbolize Transplant Patients' Emergence from Lung Disease

by Debbie Bunch

Our 2014 Photo of the Year symbolizes the soaring progress that can be made with transplants and pulmonary rehabilitation

The monarch butterfly is a lot like the patients Diane DeClerck, RRT, sees in her pulmonary rehabilitation (PR) program every day: a bit in trouble and in need of help. Thanks to environmental factors like the loss of winter habitat in Mexico and the loss of nectaring and host plants due to genetically modified seeds, monarch numbers are dwindling.

So when DeClerck was first introduced to the monarch a few years ago during a presentation by Monarch Watch Conservation Specialist Debbie Jackson at a church luncheon, the AARC member and winner of our 2014 Photo of the Year Contest decided she could help them, too, and began raising them in her home. Watching them go from caterpillars to beautiful butterflies reminded her of her transplant patients and the new life they receive with their new set of lungs. What better way to mark the occasion than by releasing a newly emerged monarch to the winds?

What worked with the transplant patients spilled over to COPD patients like Christine Bergeron as well, who is pictured on our cover and is now awaiting a lung transplant of her own at Henry Ford Health Sytem in Detroit, MI. Pulmonary rehab patients, too, get the chance to release monarchs to commemorate the progress they've made in the PR program.

Symbol of life

"I brought in the butterflies for the lung transplant recipients to release as a symbol of their new life with new lungs," says DeClerck. "Then something beautiful happened when I decided to let a COPD patient release a butterfly." When the patient returned to the program the next day, she told DeClerck what the experience had meant to her and how good it made her feel for the rest of the day. That patient, Patsy Neumaier, even went on to raise a monarch of her own.

DeClerck raises the caterpillars at home, then brings them in chrysalis form in containers to the PR gym. "I feed them common milkweed leaves, which are picked from the roadside and then washed, dried, and refrigerated," explains the RT at Henry Ford Macomb Hospital in Clinton Township, MI. "It takes one month for a monarch to go from egg to caterpillar to chrysalis to butterfly.

Diane DeClerck (second from right) joins pulmonary rehab patients Christine Bergeron, Lauri Kazyak, and Frances Brown during one of the butterfly releases.

Patsy Neumaier was the first COPD patient to give a monarch the freedom to fly.

Poetry in Motion

One of Diane DeClerck's patients was so moved by the butterfly release she participated in that she commemorated the experience in this poem. She had written the first part of the poem before coming to rehab and the rest after the monarch release.

Hanging by a Thread by Karen Chism

Sometimes I feel like I'm hanging on by a thread; but that is wrong
If only by a thin thread; I would have been gone
To give any credit to that proverbial thread isn't fair
For really, that kind of thinking is an evil snare.

I do know where the thanks should be placed
I pray I won't ever forget; no matter what I face
This morning at my rehab session, a therapist named Diane
Explained to me the monarch butterfly's game plan.

She brought to work, a container of four butterflies ready to hatch
I was amazed as they broke through the covering,
and by a silk thread they were attached
I was honored to let one of the four fly free
A truly amazing sight to see.

She explained it was a female and showed me how to tell
Her soft gentle narration put me in a spell
The delicate creature needed to fly from Michigan to Mexico
However it could manage that, only God can know.

I wondered about the thread I feel like I'm hanging from
I envisioned my flight further than Mexico; when the Lord Jesus says,
"come"
— And some say, "There is no God"
The strength of that thread; I'm awed!

During this process, the caterpillar grows from the size of an eyelash to the size of a 1-1/2 to 2-inch pencil."

The green and gold chrysalis the caterpillar transforms into before it emerges as a butterfly is similar to the cocoons made by moths. Just before the monarch is ready to emerge, the chrysalis darkens and the wings can be seen inside. "Monarchs raised in the spring and summer months live to breed and then die," says DeClerck. "The ones that emerge in the fall, however, must fly to Mexico for the winter." Throughout many generations, they then migrate back in the spring to do it all over again.

A magical experience

DeClerck places the monarch containers on a counter in the gym where patients and staff alike can mark their progress. "When one emerges, everyone is ecstatic," she says. "They are very small after emerging and must hang to blow their wings out to twice the size, which takes about 20 minutes."

Releasing the monarchs is a major event in this tight-knit group of patients and clinicians. "People who have come through our program have made lasting friendships and are concerned about each other, especially if they haven't seen someone in a while," emphasizes DeClerck. "We are like a family here. We give hugs and we listen."

When it's time to select someone to release one of the butterflies, she says sometimes she will pick a patient and sometimes other patients will tell her who really "needs it." Then everyone gathers outside to watch. "Sometimes the butterfly will linger on their hand and not fly right away," she says. "It is magical." ■

Photography 101

As a respiratory therapist, you see things that touch your heart every day. Our 2015 Photo of the Year Contest is your chance to make sure your colleagues see them, too. As the photo on the cover of this month's issue of *AARC Times* illustrates, RTs just like you can take good pictures. However, turning the desire to capture a fabulous shot into reality does require some thought and careful execution.

Here are some tricks of the trade (with a focus on digital photography) that might help you become the winner of our 2015 Photo of the Year Contest.

Technical details first: Don't use your iPhone or smartphone! You can't take a professional-quality photo for the cover of a magazine without using the right camera and appropriate settings, so be sure to start off right with your "real" camera. In addition, make sure your camera is set to take RAW, TIFF or JPEG photos and that your resolution and/or image size is set for the highest quality available for your camera.

Keep it vertical: Since the winning photo in our contest will appear on our magazine cover, all photos must be ***vertical*** (not horizontal).

Think before you click: A great photo begins with some serious consideration of what you want your finished product to look like. So before you peer into the viewfinder, take stock of your setting and the people in it. What do you really want your photo to convey to people? Imagine the image in your head and then decide how you can best position yourself to record it. Also, think about how you would describe the back-story to readers if your photo is the winner.

Don't put your main subject in the center: One of the most common mistakes made by the average person with a camera is placing the main subject in the center of the viewfinder or screen. That usually makes for a very boring photo. Professional photographers use the "rule of thirds" to determine where to put what. Imagine two lines crossing the frame horizontally and two crossing it vertically to divide your frame into thirds, then make sure key elements of your photo are positioned along these lines — or better yet, at the points where they intersect.

Draw the eye across the frame: If your main subject is turned even slightly to one direction or the other, make sure he, she, or it is facing into the rest of the frame rather than facing out of it. You want to draw the eye across the entire frame, and a subject that is looking or traveling out of the frame will ensure your viewer misses everything else that's going on in the picture.

Flash or no flash? Most digital cameras will tell you when you need to use the flash — even when you are outdoors. The best advice is to follow that advice. While a flash can cast harsh shadows on your image, not using the flash when it is needed will likely result in a photo that's too dark or, even worse, out of focus because there wasn't enough light for the camera to select the faster shutter speed you need for a sharp photo. You can bump up the ISO setting on your camera to allow for better photos in lower light, but that's a slippery slope because if you bump it up too high, you'll end up with a grainy or "noisy" photo. A better idea for shooting low-light conditions where you don't want to use the flash would be to put your camera on a tripod.

See it all: Before you snap the shutter, take a moment to see ***everything*** that's in the frame. Sometimes photographers get so caught up in their main subject that they lose sight of the other elements in their photo. The rude awakening comes after they see the photo and realize there was too much distracting clutter in the background, or a bright red cup in the foreground that overwhelms everything else, or a big ugly stain on the shirt of the person they were trying to capture.

Check every shot: With digital cameras, it is easy to take a look at what you've just shot, so make sure you do just that before you pack up your camera and call it a day. Zoom in to ensure everything is in perfect focus and scroll around the frame to make sure there isn't anything in there that you'll wish wasn't later when you view the photo on a bigger screen. If the focus isn't perfect, or you see something you don't like, start over.

Edit your photos: Photo-editing software makes it easy to take care of minor glitches in your photos like "red eye" or a lack of color saturation. So load your photos up on your computer and use the software to touch up things before you enter the photo in the contest. One caveat: Photo editing software is ***not*** that good at sharpening up the focus in photos that are out of focus. So it would be best to set less-than-sharp photos aside and concentrate instead on "fixing" those that are already in sharp focus.

Our 2015 Photo of the Year Contest is underway now, so start snapping some great shots and enter them by this year's deadline, Nov. 14. We're planning to feature the grand prize winner on the cover of our April 2016 issue of *AARC Times*. You can find the complete list of contest rules at www.aarc.org/resources/publications/aarc-times/photo-year-contest/ ■

2014 AARC Human

by Shawna Strickland, PhD, RRT-NPS, FAARC

Every few years the AARC commissions a survey of the profession. How many respiratory therapists are out there? Where are we practicing? How much do we earn? The "AARC Respiratory Therapist Human Resource Study 2014" was completed last year, and the information is invaluable. When taken into context with past surveys, results of the 2014 study provide historic trends about the profession as well as our current status.

Differences in 2014

Respiratory therapists responded to the survey during June and July of 2014. The sampling technique for the 2014 survey was a bit different than the method used in the past. In 2009, 7,000 postcards were mailed to respiratory therapists, which invited those RTs to participate in the study. In addition, the postcards encouraged a snowball sampling technique; that is, the person who received the postcard was encouraged to share the information with others who might be interested in participating in the study. This technique resulted in 3,942 participants in 2009.

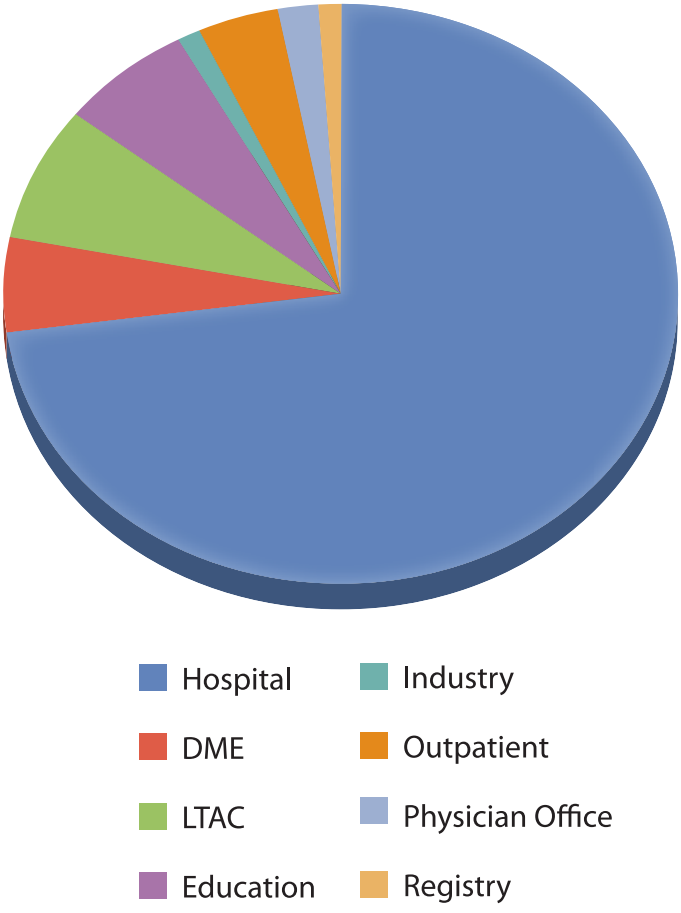
Shawna Strickland, PhD, RRT-NPS, FAARC, is the AARC's associate executive director of education.

In 2014, 15,234 RTs submitted survey responses, which was substantially more than in the past. Researchers contacted each credentialed therapist from the National Board for Respiratory Care's database who had a valid email address. The email invited the recipient to participate in the study and encouraged the participant to share the information with others who might be interested. By sending the survey invitation to a much larger group, it was less likely than in past years that a study participant was an AARC member. In addition, notices were posted on AARConnect and sent to AARC members.

The snowball sampling technique allowed us to reach RTs who met the study criteria but for whom the researchers did not have contact information. This led to accessing a broader population for the 2009 survey and helped reduce the influence of sample bias. Because the 2014 sample was larger and broader than past study samples, the results should be more generalizable to the population. It was important to keep this in mind when comparing results from 2009 to results from 2014. What may appear as change may actually be the result of better representation of the profession.

Resources Survey

Where We Work



Demographics

Before we jump into the main findings of the 2014 survey, it is important to know who responded to the survey and how the sample demographics differed from 2009. Researchers estimated the number of respiratory therapists in the United States based on the reporting by states about persons who were licensed. Alaska is the only state without licensure, so an AARC representative in that state estimated the population of Alaskan RTs. The projected population was 172,921 respiratory therapists, up from 145,117 in 2009. However, there are some limitations to this projection. For example, some respiratory therapists may hold a license in more than one state, which means that they would be counted twice by this method. RTs who had retired but kept an active license were also included in the count. The upward trend remains an important finding in spite of the limitations on accuracy, especially in light of the challenges some therapists have faced in securing a job in some regions of the United States.

The geographical distribution of the survey sample mirrored the distribution of licenses in each state. The South Atlantic region demonstrated the highest concentration of respiratory therapists, while the New England region was noted to have the lowest. The areas with the highest growth were the West South Central region, the East South Central region, and, to a lesser extent, the Pacific region as depicted in this U.S. census map (https://www.census.gov/geo/maps-data/maps/pdfs/reference/us_regdiv.pdf).

AARC human resource studies have reported an increasing average age with each passing survey. As the profession ages, so have the survey participants. The 2014 survey participants were, on average, slightly younger and less experienced than those who participated in 2009. The average age of the 2014 participant was two years younger, and they had approximately seven years less experience than the 2009 participants. Added to the already noted larger sample size, the added factors of a slightly younger and less experienced population may explain some of the more interesting findings of this survey.

Salaries/factors impacting compensation

A question asked of studies like this in which people have a lot of interest is, "How does my salary compare?" The median base wage was $28.00 per hour in 2014, compared to $28.85 per hour in 2009. At first glance, this is concerning. However, this is the point where we take into account the different demographics, which could explain the lower median salary. The largest cohort to participate in the 2014 survey was a group of staff therapists, who had an average salary of $52,758. The department/program director cohort demonstrated the highest salary at $70,373, significantly higher than any other cohort.

> The average RT reports being assigned six mechanically ventilated patients at a time

— 2015 —

Since 1947, the AARC has been leading the effort to advance the respiratory care profession and promote quality respiratory care. Collaborating with our 50 state organizations and other organizations, we have successfully advocated at the federal, state and local level for patients, their families, the community, the profession and the respiratory therapist.

The AARC'S CORPORATE PARTNERS

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

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

AARC CORPORATE PARTNERS

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SUNOVION Healthy bodies, healthy lives

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More interesting than the dollar amount were factors that impacted compensation. A very long list of potential predictors was narrowed to a list of 10 factors by a multiple regression procedure. Table 1 itemizes the factors that were noted to have a significant impact on compensation in 2009 and 2014. Unless otherwise noted, the impact of each factor on compensation was positive — meaning that compensation tended to increase as the factor (years of experience, hours worked per week) increased or the factor (AARC membership, RRT credential) was present.

One factor exerted a significant negative influence on compensation: concurrent therapy. Those respondents who identified that their employers expected them to provide care to more than one patient at a time were noted to have been compensated less than those employers that did not require concurrent therapy. Caution must be used when interpreting this information; there may be other factors at those facilities that could have negatively impacted compensation in addition to the presence of concurrent therapy.

Acute care hospital employers

In addition to the survey of respiratory therapists, the AARC also surveyed acute care hospital employers. The survey had 558 valid responses from directors of respiratory therapy departments. The majority of the respondents were in rural facilities, and 18.5% were critical access hospitals.

The 2009 acute care hospital employers study revealed that workforce shortages had decreased for respiratory therapists. In 2014, directors reported even fewer vacant positions. At the same time, the trend between 2009 and 2014 indicated that there were more full-time equivalents (FTEs) in hospitals for respiratory therapists. The 2014 results indicate that open positions for RTs have become more of a regional than a general occurrence. Hence, respiratory therapists looking for a position should be prepared to move to where the open positions can be found.

When asked about staff RT requirements, almost 38% of respondents identified that their staff is comprised solely of persons with the RRT credential, and 58% indicated that their staff are given a time limit to achieve the RRT credential. Of those departments that did not require the RRT, 7.3% of respondents indicated that the work assignments were different for therapists with the CRT credential versus the RRT credential. Approximately one-third of respondents who indicated that their respiratory therapists had earned Advanced Cardiovascular Life Support (ACLS) certification also indicated that those therapists were given additional clinical responsibilities. However, less than 20% indicated that those therapists would receive more compensation.

Table 1. Compensation Factors

2009	2014
Hours worked each week at primary job	Total years experience as RT since training
Experience with current primary employer	Hours worked each week at primary job
General experience as an RT	Satisfaction with primary job
Earned RRT credential achieved	Highest academic degree
Satisfaction with primary job	Earned CRT-NPS or RRT-NPS credential
Whether care is delivered by protocol	Earned RRT credential
	AARC member
	Whether the employer requires simultaneous patient care (negative impact)
	Experience with current primary employer
	Earned RRT-ACCS credential

Education programs

Education program directors were also surveyed. Of the 254 respondents, 49% indicated that the program director and 28% indicated that the directors of clinical education intend to leave respiratory education within the next 10 years. The largest positive effect on compensation for educators was achieving tenure followed by job title (program director, director of clinical education, instructor) and the highest academic degree achieved.

> The number of respiratory therapy school graduates continues to trend up
>
> Females 67%, Males 33%

With regards to students, there continued to be an increase in the number of non-traditional students enrolling in education programs. The use of distance learning continued to grow as compared to what had been observed in 2009. In addition, the mean number of programs and number of graduates continued to increase. This statistic is also noted in the "CoARC Report on Accreditation in Respiratory Care Education," published each spring.

Summary

The respiratory care profession continues to evolve; hence it is important to periodically evaluate its status. "The AARC Respiratory Therapist Human Resource Study 2014" provides valuable insight into the profession and how the RT is interacting in the health care environment. ■

New AARC Respiratory Therapist Human Resource Study 2014 Released

Using formal surveys, the American Association for Respiratory Care conducted a study of three groups within the respiratory care profession in the spring of 2014. AARC's Respiratory Therapist Human Resource Study 2014 provides comprehensive data that ranges from demographics, wages, procedures, hours, trends in patient care and more.

This study is available in 4 formats:

AARC Respiratory Therapist Human Resource Study 2014 Full Package
(includes all portions of the study: therapist, educational and hospital acute care studies)
$120 member price
$160 non-member price

Therapist Data Package
$50 member price
$65 non-member price

Educational Programs Package
$50 member price
$65 non-member price

Acute Care Hospital Employers Package
$50 member price
$65 non-member price

Some of the survey responses revealed results such as:

- Mean annual salary for respiratory therapists was $59,927
- The number of RTs grew almost 19% since the last survey, from 146,117 in 2009 to 172,921 in 2014
- On average, each respiratory therapist reported caring for about 6 patients receiving mechanical ventilation.
- It takes an average of between 4-5 weeks to orient a new employee in an acute care hospital
- Turnover rate in acute care hospitals for both full and part-time therapists has not changed since 2009
- Acute care hospitals remain the major employer of respiratory therapists; however, this survey identified that more therapists are transitioning to long term acute care, from 4.4% in 2009 to 7.6% in 2014
- Educational Program directors' mean salary has increased 8.7% since 2009

BONUS! Compensation Calculator
This Excel spreadsheet lets you plug in your own demographics for earnings comparison.

Visit: http://www.aarc.org/resources/tools-software/aarc-respiratory-therapist-human-resource-study-2014/

COPD Patient-Powered Research Network

A Registry of the COPD Patient Community

RTs can help enroll COPD patients in a program to drive research for solutions to the disease

by Vernon Pertelle, MBA, RRT, CCM

Chronic obstructive pulmonary disease (COPD) typically affects individuals over 65 years old, although it also affects younger adults. COPD is the third-leading cause of death and fifth most-expensive disease in the United States.[1,2] Currently, there is no cure for COPD, although symptoms can be managed effectively through the use of pharmaceuticals, proper nutrition, physical activity, and long-term oxygen therapy for patients with hypoxemia, requiring supplemental oxygen.

The treatment goals are geared toward reducing symptoms that lead to exacerbations, emergency room encounters, or hospitalizations. Patient education about self-managing symptoms can ensure the most optimal quality of life. Treatment and adherence to individualized care plans help to slow the progression of COPD; nonetheless, it is a chronic and debilitating disease. The Centers for Disease Control and Prevention (CDC) estimates that in 2011 there were 14.8 million patients diagnosed with COPD.[3] However, approximately 12 million more adults have COPD but don't know it.[4]

COPD on the increase

The Centers for Medicare & Medicaid Services (CMS) estimated that in 2012 there were 4.1 million Medicare beneficiaries with COPD, which represented a 3.9% increase from 2008.[5] Costs are projected to be approximately $49 billion by the year 2020.[4] Patients with COPD experience significant morbidity, which results in significant health care utilization.[6]

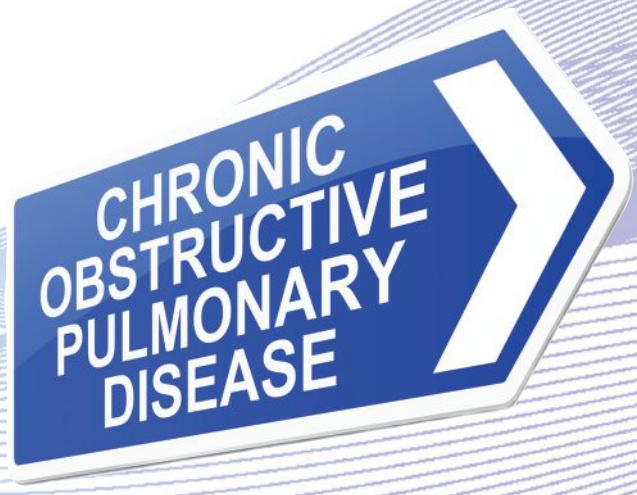
CMS added COPD to the Hospital Readmission Reduction Program last year because the disease is the third most common cause of 30-day readmissions.[7] Therefore, many efforts are underway to improve treatment and management of COPD patients and thus improve their quality of life, reduce the incidence of morbidity, and reduce emergency room encounters, hospital admissions, and readmissions. All approaches must include placing patients at the center and empowering them with education on self-management of their disease.

The COPD Patient-Powered Research Network

Participating in the COPD Patient-Powered Research Network (PPRN) Registry will change the future of the treatment and management of COPD patients. Patients are at the center of the project, and the COPD Foundation's goal is to enroll over 75,000 individuals living with COPD who have agreed to share their health information regarding the impact of the disease on their lives. The PRRN is unique from other patient registries in that it will be operated and governed by groups of patients in conjunction with dedicated researchers.

"We are excited to launch this network and encourage individuals with COPD to sign up to participate," says Deborah McGowan, RN, senior director of health outcomes at the COPD Foundation.

The Patient-Centered Outcomes Research Institute (PCORI) funds the COPD PPRN project. The project is one of 29 approved by PCORI. The information gathered from participants will allow the COPD Foundation to join with other networks to advance research in the United States. COPD is the focus, although there are numerous other chronic diseases included in an initiative led by the National Patient-Centered Clinical Research Network (PCORnet).



According to John W. Walsh, president and co-founder of the COPD Foundation: "This is a unique and perfect opportunity for our patients to make a difference and come together with others living with COPD."

A perfect opportunity

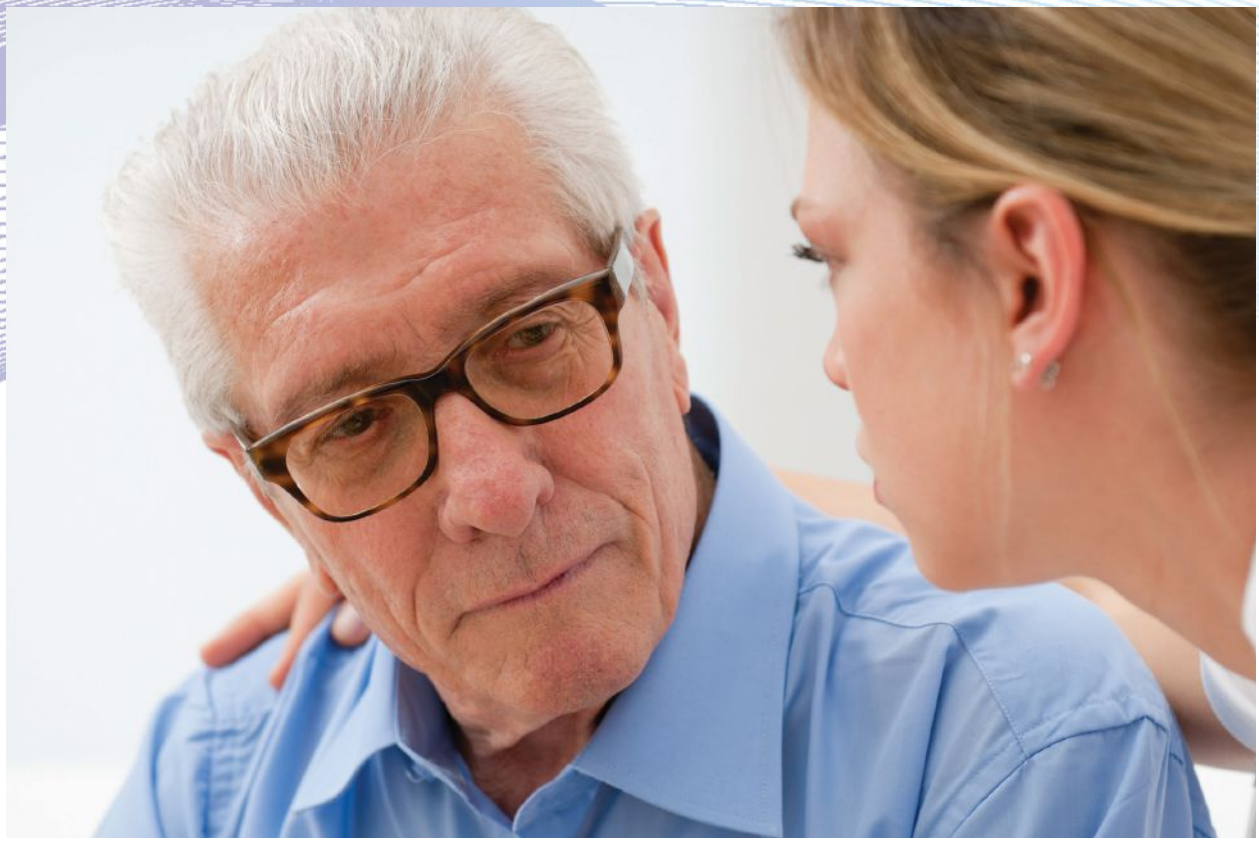
According to John W. Walsh, president and co-founder of the COPD Foundation: "This is a unique and perfect opportunity for our patients to make a difference and come together with others living with COPD." Walsh, one of the principal investigators of the COPD PPRN research team, would like respiratory therapists to support efforts to enroll COPD patients by encouraging them to participate.

"I think every patient with COPD, regardless of where they live, has hopes for a cure; and we all know this means research," says Jean Rommes, PhD, a COPD patient. She notes that while patients wait for a cure, they are also hoping better medications will come along. "We will keep learning more about how this disease affects us differently, to develop patient-specific combinations of meds to treat individuals better," notes Dr. Rommes, who desires better, more efficient, longer lasting, and lighter oxygen delivery systems and believes that registering for the PPRN is one way to help contribute to this long-term goal. "I feel like I'm doing my part in an effort that may not benefit me as much as I'd like but will benefit COPD patients down the road," she says.

COPD is one of the most complex diseases to treat and manage. It challenges patients, their physicians, nurses, and respiratory therapists with developing more effective approaches to control and reduce the frequency of exacerbations. Better management of COPD increases both quality and health outcomes while reducing costs, which is a major focus of all health care organizations.

For a better quality of life

Many providers and organizations have begun to develop innovative educational programs that include cross-continuum teams and services to help support patients, their caregivers, and health care workers in



better self-managing COPD. The PPRN will support additional research leading to better solutions that positively impact treatment and management, resulting in an overall better quality of life for patients diagnosed with COPD.

For more information about the COPD Patient-Powered Research Network and to learn how to help get more patients enrolled, visit the COPD Foundation website at: www.copdfoundation.org/Research/COPD-Patient-Powered-Research-Network/COPD-PPRN-Why-you-should-enroll.aspx ■

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About the Author

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RC Currents

IN THE NEWS

Transitions:

James Whitacre, MA, RRT, First Editor of Respiratory Care

The respiratory care community lost a pioneering member late last month with the passing of James Whitacre, MA, RRT, at the age of 93.

One of the earliest members of the AARC, Whitacre served the Association as secretary in 1962. However, his biggest contribution to the profession came even earlier, when he took over the helm of what was then a fledgling publication — the journal we all know today as Respiratory Care.

"He was the first editor of Respiratory Care, 1956–1967, and is pretty much credited by some of us as the one who 'created' the Journal," said Respiratory Care Managing Editor Ray Masferrer, RRT, FAARC. "He, more than anyone else, had the vision that a professional medical society must have a science journal as part of its existence."

Whitacre also was among the first RTs to recognize the need for a higher level of education for respiratory therapists and founded one of the nation's first bachelor's degree RT programs at the University of Missouri (MU) in Columbia in the 1960s.

Former AARC Executive Director Sam Giordano, MBA, RRT, FAARC, recalls Whitacre from his own early days in the profession back in Kansas City and St. Louis, MO. "He was secretary of the 'ARIT' and signed my registry certificate with Albert Andrews," said Giordano.

During Whitacre's visit to the MU program last year, his former student Jeff Ward, MEd, RRT, FAARC, sat down with the man he considers his lifelong mentor to talk about the founding of the MU program and profession then and now. "I think the thing I learned by watching Jim was that the real pleasures in this profession come both at the bedside and then in the professional contribution you do," said Ward.

Whitacre spoke to the power of the personal touch and his own gratitude to a profession that served him well. "You do as much therapy with your presence as you do with your equipment," said the AARC Life Member and Jimmy A. Young Medalist. "I've certainly been lucky. I could hardly have gotten myself into a field that I would enjoy more."

You can watch their entire conversation at https://www.youtube.com/watch?v=QSGVlYwT1m8&feature=youtu.be. ■

Thomas Kallstrom Honored at 3rd Annual Patient Safety Summit

Industry leaders recently gathered for the third annual Patient Safety, Science & Technology Summit in Irvine, CA, to address issues surrounding patient safety and brainstorm ways to minimize patient safety-related deaths in this country and around the world. Former President Bill Clinton and current Vice President Joe Biden delivered keynote addresses at the event, emphasizing the need for technology companies to work with health care providers and one another to reduce these deaths.

To companies that resist the technical interoperability needed to make that happen, President Clinton said, "It's just a mistake. It's the difference between life and death for people. You can't have a position where you know what you're doing is costing lives."

AARC leadership was there too and our CEO and executive director, Thomas J. Kallstrom, MBA, RRT, FAARC, received a Humanitarian Award at which time he acknowledged the critical role of the members of the AARC whose efforts have helped reduce preventable deaths in our nation's hospitals.

During his tenure at the Executive Office, Kallstrom has spearheaded efforts to develop Patient Safety Checklists and new evidence-based Clinical Practice Guidelines that reflect best practices in the profession that have been utilized by AARC members across the country. Read the entire story online at www.aarc.org/putting-patients-first/. ■

"Current Topics" Debuts

For the past 25 years, the AARC's Professor's Rounds series has been educating respiratory therapists about key topics in the profession. As RTs came together in department meeting rooms and other venues, they learned how to bring cutting-edge therapies to their patients from some of the leading names in the profession via the magic of first video tapes and, later, DVDs — all while earning CRCEs to maintain their state license to practice.

However, even the best programs eventually run their course, and this year the Association is retiring Professor's Rounds in favor of a new DVD series called Current Topics that just launched with a presentation on Ebola featuring Lewis Rubinson, MD, who shares the knowledge he gained by caring for Ebola patients in Sierra Leone.

Thanks to a streamlined production process, the new series is offered at a considerable cost savings as well.

"Professor's Rounds has supplied respiratory therapists with the information they need to remain on the cutting edge for a quarter century now, but we felt that the formatting for the presentations — in other words, the professor/moderator interchange — might be a bit dated," says AARC Associate Executive Director-Education Shawna Strickland, PhD, RRT-NPS, FAARC. "The new Current Topics series follows the more dynamic lecture format, which we believe will prove more engaging for today's RTs."

Like its predecessor, Current Topics (see www.aarc.org/education/group-courses/current-topics-respiratory-care-2015-2/) will release one DVD per month between now and September, making it easy for RT managers to schedule continuing education for their staffs. ■

ARCF Now Accepting Applications for the 2015 International Fellowship Program

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

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

The three-week program takes each participant to two host cities in the United States and concludes with attendance and acknowledgement at AARC Congress 2015 to be held Nov. 7–10 in Tampa, FL.

Learn more and apply by **June 1** at www.arcfoundation.org/international/fellows/. For more information, contact April Lynch at lynch@aarc.org. ■

International Fellowship Program Looking for City Hosts

Every year the ARCF sponsors an International Fellowship Program that brings physicians, therapists, and nurses from other countries to our shores to learn more about American-style respiratory care in two cities. It can't happen without city hosts in each of the localities, and now is the time to step up and volunteer.

Learn more about the program and apply by the **June 1** deadline at www.arcfoundation.org/international/fellows/city_host.cfm. The fellowships take place in the fall just prior to AARC Congress 2015, scheduled this year for Nov. 7–10 in Tampa, FL.

For more information, contact April Lynch at lynch@aarc.org. ■

Enter for a Chance To Win a Free Membership Renewal

AARC Times is looking for creative AARC members to enter our annual AARC Photo Contest. Finalists will receive a **free** one-year membership renewal and have their photo entered into our Photo of the Year Contest with the chance of it being chosen and featured on the cover of the April 2016 *AARC Times*. For information on how to enter, go to www.AARC.org/resources/publications/aarc-times and click on the "Photo of the Year Contest" link. Deadline to submit photos is **Nov. 10, 2015**. ■

Genetic Mutation May Be Linked to Emphysema in Women Smokers

Using genetic data gathered in COPD studies funded by the National Institutes of Health, Johns Hopkins researchers have found that mutations in a gene involved in the production of telomerase (an enzyme responsible for maintaining and repairing the caps that protect the ends of chromosomes from degradation during cell division) may be linked to emphysema in female smokers. They first found the mutation in three of 292 smokers with emphysema, then looked at a sample of 50 patients with syndromes linked to telomere shortening. Among 39 nonsmokers, there were no cases of emphysema. Among smokers, seven of 11 patients, including all six female smokers, had emphysema.

The authors believe these findings suggest women smokers with telomerase-related mutations may be more susceptible to emphysema. The research was published in a recent issue of *The Journal of Clinical Investigation*. ■

Submit Your Open Forum Abstract for AARC Congress 2015 by May 1

The AARC invites you to submit abstracts for the Open Forum at AARC Congress 2015. 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. We now have three different ways you can present your poster at AARC. See https://aarc2015.abstractcentral.com for more details. The deadline to submit abstracts for the Open Forum is **May 1, 2015**. ■

National Health Observances

- **World Health Day**; April 7; World Health Organization; www.who.int/world-health-day/en/
- **National Asthma and Allergy Awareness Month**; May; Asthma and Allergy Foundation of America; (800) 727-8462; info@aafa.org
- **Air Quality Awareness Week**; April 27–May 1; National Oceanic and Atmospheric Administration; (301) 713-1867; www.airquality.noaa.gov
- **World No Tobacco Day**; May 31; WHO Prevention for Noncommunicable Diseases; www.who.int/tobacco/wntd/en

Educators:
Help Recognize Outstanding Students

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

The ARCF offers awards to students who are currently enrolled in accredited respiratory care educational programs and to respiratory therapists who are pursuing an advanced degree. Awards include registration and airfare to attend AARC Congress 2015, to be held Nov. 7–10 in Tampa, FL.

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

Contribute to Our "Transitions" Column

The AARC "Transitions" column is now devoted to sharing news about the passing of AARC members.

You can submit news about your colleague's recent passing by going to http:c.AARC.org/transitions. Please provide any information about the member's recent obituary so that we can share it with the membership and pay tribute. ■

Strange But True...

Smart outfit: Researchers are one step closer to 24-7 heart disease monitoring. They've developed an "ECG shirt" that keeps track of heart activity on an ongoing basis, then alerts the wearer to any abnormalities via his smartphone.

Too much of a good thing? It sounds wrong, but could too much oxygen cause lung cancer? Maybe, report University of Pennsylvania researchers who studied lung cancer rates in regions with different elevations. They found the lowest rates in mountainous areas of the country where the atmosphere is at its thinnest. The finding held true in smokers and nonsmokers alike.

Free labor: A new research technique called "crowd science" is harnessing the power of the masses to perform research tasks ranging from counting sea stars to examining cancer cell images. A recent report on seven such projects found this unpaid labor accounted for more than $1.5 million when assessed at the rate normally paid to graduate students to do it. ■

More Asthma and Allergy Education Needed

New research confirms what most RTs already know — people with asthma and allergies often do not use their prescribed medical devices correctly. The study was conducted among people who were prescribed epinephrine for severe allergic reactions and metered-dose inhalers for asthma.

Overall, epinephrine was used correctly by only 16% of respondents and inhalers by only 7%. The most common error for epinephrine users was not holding the unit in place for at least 10 seconds after triggering. Other common errors included failure to place the needle end of the device on the thigh and failure to push down forcefully enough to activate the injection.

The most common mistake among inhaler users was not exhaling prior to delivering the puff of medication. Another common mistake was not shaking the inhaler before administering the second medication puff.

"Our study suggests that either people weren't properly trained in how to use these devices, didn't completely understand the instructions even after training, or forgot the instructions over time," lead author Rana Bonds, MD, was quoted as saying. "Younger patients and those with prior medical education were more likely to use the auto-injector correctly."

The study appeared in the *Annals of Allergy, Asthma and Immunology* earlier this year. ■

AARC Times is always looking for good stories from AARC student members that relate special experiences and give the RT student perspective on the respiratory care profession they have chosen as a career.

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

Many Factors Explain Epidemic of Asthma

Inner-city living has shouldered the lion's share of the blame for the epidemic of asthma in children, but a new study from Johns Hopkins investigators questions that conventional wisdom. In a survey of the parents and caregivers of 23,065 children between the ages of six and 17, they found 13% of inner-city kids had asthma, compared with 11% of children living outside of inner cities. However, even that small difference disappeared when factors such as race, ethnicity, family income, and geographic region were included in the analysis. Here are some of the findings:

Children of families with incomes below the national poverty threshold were more likely to be diagnosed with asthma and have an asthma attack that required emergency treatment, with the risk of having an emergency asthma episode or a diagnosis of asthma creeping up as income went down; family poverty had a stronger influence on asthma risk than neighborhood poverty.

Asthma rates were 17% in African-American children and 20% in children of Puerto Rican descent versus 10% in white children, 9% in other Hispanic children, and 8% in Asian children. The higher rates persisted even when poverty and other factors were taken into account.

Urban areas in the Northeast had the highest prevalence of childhood asthma at 17%, while urban areas in the West had the lowest rates at 8%.

Some poor suburban and rural areas had asthma rates higher than those of inner-city zones in the same region. For example, the asthma prevalence in low-income suburban areas of the Northeast was 21% compared with 17% in the corresponding urban area of that same geographic region. Low-income areas in medium metro areas in the Midwest had 26% asthma prevalence, compared with 15% in urban areas of the Midwest.

"Our findings suggest that focusing on inner cities as the epicenters of asthma may lead physicians and public health experts to overlook newly emerging 'hot zones' with high asthma rates," senior author Elizabeth Matsui, MD, MHS, was quoted as saying. The study was published in a recent issue of the *Journal of Allergy and Clinical Immunology*. ■

Heritability of Asthma Called into Question

Asthma tends to run in families, but is the condition really inherited or is something else coming into play? University of Chicago Medical Center investigators who combed through more than 33,000 different genetic mutations in over 11,000 people believe it is something else in most cases. Their research unveiled only three genetic markers for asthma risk, and those mutations were present in less than 5% of the population.

"Previous studies have likely overestimated the heritability of asthma," notes senior study author Carole Ober, PhD. "This could be because those estimates are based on correlations between family members that share environment as well as genes, which could inflate the heritability. Gene-environment interactions are not considered in these large-scale association studies, and we know that these are particularly important in establishing individual risks for asthma."

Among the three genetic mutations identified in the study, one was primarily found in people of African ancestry while the other two were primarily seen in Latinos. The study appeared in a recent issue of *Nature Communications*. ■

A Better Way To Vaccinate for the Flu

The flu vaccine fell short in protecting people against the main strain of the virus circulating during this flu season; but if researchers from McMaster University and the Icahn School of Medicine at Mount Sinai are correct, a better option may be available in five to seven years — and people would only have to get the shot once.

They have discovered a new class of antibodies that are capable of neutralizing a wide range of influenza A viruses. While these antibodies had much weaker neutralization activity than today's strain-specific antibodies when evaluated in the laboratory setting, when they were isolated in their natural (polyclonal) setting from human blood, their potencies were comparable. The subtype of antibodies found in the lungs and upper respiratory system were particularly potent in neutralizing the flu.

The investigators believe these results add to the growing evidence that a universal flu vaccine may be just around the corner. The study was published in a recent issue of the *Journal of Virology*. ■

Metabolism Makes a Difference for Smokers Trying To Quit

The way a smoker metabolizes nicotine may point to the right treatment strategy to help him quit, say U.S. and Canadian investigators. They recently studied 1,246 smokers who were categorized as either slow or normal metabolizers and then randomly assigned them to 11 weeks of either the nicotine patch plus a placebo pill, varenicline plus placebo patch, or a placebo pill and patch.

Nearly 40% of normal metabolizers on varenicline were still abstaining from smoking at the end of their treatment compared to 22% of those on the patch. The efficacy of varenicline and the patch was equivalent for slow metabolizers; but since they reported more side effects on varenicline, the authors suggest slow metabolizers would be better off using the patch to quit.

The trial was conducted at the Perelman School of Medicine at the University of Pennsylvania, the Centre for Addiction and Health at the University of Toronto, the State University of New York at Buffalo, and MD Anderson Cancer Center, and funded by the National Institutes of Health. It was published in a recent issue of *Lancet Respiratory Medicine*. ■

Bundle Up!

A new study out of Yale University suggests old wives' tales sometimes do prove true. When they looked at the speed at which rhinoviruses multiply in mice, they found even a slight chill increased the rate — suggesting cold weather really can lead to colds. The new research, which was published in the *Proceedings of the National Academy of Sciences*, actually just confirms a previous study conducted in 1960 that showed rhinoviruses multiply more quickly at 33° C than they do at body temperature.

The Yale investigators took that finding one step further by explaining why this may be happening. They found genes in the cells lining the mice's nasal passages are less capable of producing the virus-fighting protein interferon at 33° C than 37° C and that molecules that detect viruses inside cells and then order the production of interferon are less sensitive at the lower temperature. That lower sensitivity also reduces the production of other proteins that normally work to rid the virus from the body. ■

X-ray Crystallography Helping Search for a Treatment for EV-D68 Virus

Purdue University researchers are using a technique called x-ray crystallography to learn more about enterovirus D68, which affected thousands of children last summer and fall. The investigators are specifically looking at the precise structure of the original EV-D68 strain identified in 1962 and the structure as it exists when the strain is bound to an anti-viral compound known as pleconaril.

They expect the research may help lead to the development of drugs capable of inhibiting more recent strains of the virus, including the one that caused the outbreak last year. The study was published in a recent issue of *Science*. ■

RC Currents

"Campus Cash" Debit Cards Can Buy Tobacco at Some Schools

Believe it or not, some colleges and universities are now allowing students to use their "campus cash" debit cards — usually funded by their parents — to purchase tobacco products and e-cigarettes. According to researchers from the University of Colorado Cancer Center who looked at the top 100 universities as ranked by *U.S. News and World Report*, 11 schools allow tobacco products and 13 allow e-cigarettes to be purchased with these cards. Previous research has shown that 42% of students who smoke use their campus debit cards to buy cigarettes. The study was published in *Tobacco Control*. ■

Asthma Increases OSA Risk

People with asthma may be at increased risk of developing obstructive sleep apnea (OSA), report Wisconsin researchers publishing in a recent issue of *JAMA*. In a study involving participants in the Wisconsin Sleep Cohort Study who were free of OSA at study entry, they found 22 of 81 of those with asthma (or 27%) experienced incident OSA over their first four-year follow-up intervals versus 75 of 466 of those without asthma (or 16%). Over the entire study period, 27% of participants with asthma experienced OSA versus 17% of those without asthma.

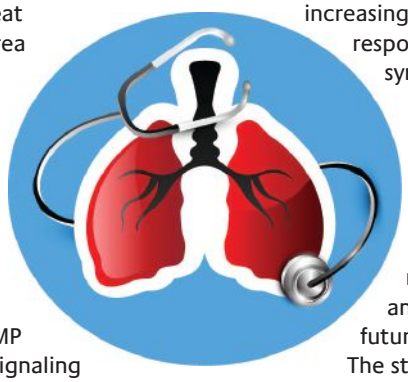
Participants with preexisting asthma had a nearly 40% increased risk for new OSA compared with those without asthma, and asthma duration was related to both new OSA and new OSA with habitual sleepiness as well. ■

Check Out the AARC New Members List Online

The "New Members" column can be accessed at http://c.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. ■

Discovery May Lead to New Therapies for Asthma

A discovery made by researchers from the University of California, San Diego School of Medicine may be paving the way for new therapies to treat asthma. Working with colleagues in Korea and Scotland, they have identified a novel signaling pathway critical to the immune response of cells associated with the initiation of allergic asthma.



Specifically, the scientists demonstrated that T helper 2 (Th2) type inflammation in allergic asthma involves a type of white blood cells called dendritic cells (DC) that trigger a reduction in the production of cyclic AMP (cAMP), a key messenger molecule for signaling inside cells. In mouse models, deletion of the gene that codes for a protein that promotes the production of cAMP resulted in spontaneous bronchial asthma, which shares many similarities with human asthma. Conversely, increasing cAMP levels inhibited the inflammatory response that results in asthma's characteristic symptoms.

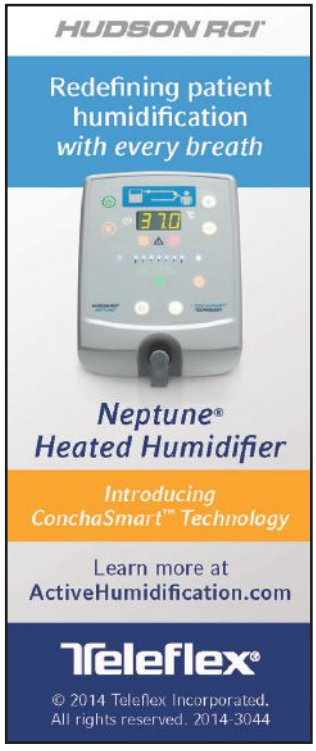
"This research will open a new field of exploration of DC-related molecules as mediators that influence Th2 induction and Th2 'bias,'" according to study author Jihyung Lee, PhD. "We have already identified some of these molecules. Others are under investigation, and we hope to identify them in the near future."

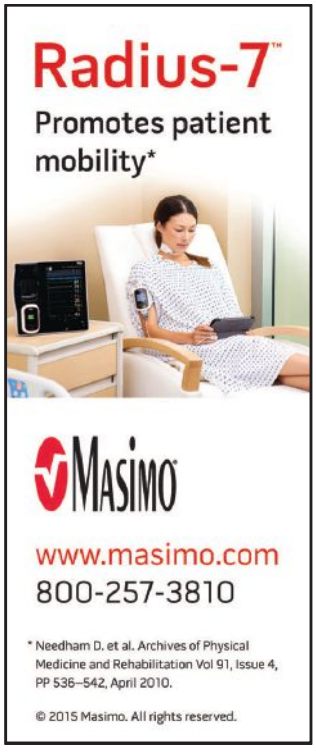
The study results were published ahead of print in the *Proceedings of the National Academy of Sciences* earlier this year. ■

Special Advertising Section

Industry Update

Featuring information on products and equipment from manufacturers





Specialized Support for Challenging Sleep Apnea

ResMed's new AirCurve™ 10 series includes three bi-level devices for specialized support of challenging sleep apnea cases, along with an adaptive servo-ventilation device for patients with central sleep apnea or Cheyne-Stokes respiration. Every AirCurve 10 device features built-in wireless connectivity and works seamlessly with ResMed's AirView™ patient monitoring software. AirCurve 10 devices also support ResMed's U-Sleep premium patient management platform and the myAir™ patient engagement tool.
www.resmed.com

Smart Case for EpiPens

The Veta smart case from Aterica replaces the stock case of an EpiPen and introduces digital support features to users, such as location tracking via an app so they can always find their devices. The case, which will be available in the fall, comes in two colors to match a user's dosage. The Veta app will run on iOS and Android devices and connects to the case via Bluetooth.
www.aterica.com

DRV Safety Speaking Valve

If a tracheal tube cuff was left inflated and a standard speaking valve is placed on the tube, then the user cannot exhale. The DRV is designed to deploy a safety button with an increase of tracheal pressure that allows for full exhalation and normal respiration. Also, the DRV can be opened for direct access to the lungs. Its design allows for suctioning, med-neb/humidified air treatments, and sleeping.
dhroot59@gmail.com

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

Classifieds

ADVERTISING SECTION

United States

Sales Rep Opportunities

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Due to our continued success, we are expanding our service areas to new markets. B.E.S.T is looking for s*elf-motivated independent sales reps* throughout the United States. Previous sales experience is preferred. If interested, please email your resume to George Kacmarek at info@ebestonline.com.

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

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Industry Watch

Novartis seeks FDA approval for COPD drugs

Novartis has submitted regulatory applications to the U.S. Food & Drug Administration for two new treatments for COPD. The two bronchodilators, QVA149 and NVA237, are already being marketed in other countries. Both have met primary and secondary endpoints in a phase III clinical trial.

Pfizer, GSU team up to combat smoking in China

Pfizer Inc. has granted nearly $850,000 to Georgia State University's School of Public Health to partner with Chinese health officials to expand tobacco control efforts to major cities in China. The grant will support the development of policies and programs to protect nonsmokers from secondhand smoke, encourage smokers to quit, and prevent women, children, and young adults from starting smoking. The grant builds on tobacco control work conducted in China by a team of researchers from GSU and Emory University that was previously funded by the Bill & Melinda Gates Foundation.

Draeger extends agreement with ICON

Draeger Medical Inc. has extended its exclusive agreement with the Intensive Care On-line Network (ICON) to provide clinical and educational support to users of Draeger neonatal care equipment, including incubators, neonatal transport systems, infant warming systems, and handheld jaundice meters. ICON has supported Draeger's respiratory care customers in the United States, Canada, and the United Kingdom since September 2001.

Good results for audio-visual reminder technology

A new study out of New Zealand found children who had audio reminders in the SmartTrack inhaler when turned on were 180% more likely to take prescribed medications than those in the control arm and had a 45% reduction in rescue medication use, reports Nexus6, maker of the device. The trial was conducted among 220 children between the ages of six and 15 and is likely the largest global study of medication adherence using audio-visual reminder technology. Children using the audio-visual reminders had an overall medication adherence of 84% compared to just 30% in those who did not have this additional reminder. Only 9.5% of children using the audio-visual reminder required rescue medication to alleviate symptoms, compared to 17.4% in the control group.

Boehringer Ingelheim COPD drug now in U.S.

According to Boehringer Ingelheim Pharmaceuticals Inc., Spiriva® Respimat® (tiotropium bromide) Inhalation Spray is now available by prescription through retail pharmacies across the United States. It was recently approved by the FDA for the long-term, once-daily maintenance treatment of bronchospasm associated with COPD, including chronic bronchitis and emphysema, and to reduce exacerbations in COPD patients.

BTG buys PneumRx

Specialist health care company BTG plc has acquired PneumRx Inc, a growing interventional pulmonology business. The acquisition was completed on January 7.

Roche receives emergency use designation for Ebola test

According to Roche Holding AG, the FDA has issued emergency use designation for its LightMix Ebola Zaire rRT-PCR Test for use with patients suspected of having Ebola. The test can generate results in just a little over three hours, allowing for early treatment of the disease. Emergency use designation means the test is authorized for use for a limited period of time by selected laboratories in the U.S. and other countries. The test has not been approved for general use.

Kansas State receives patent

A Kansas State University research team has received a patent for the use of a peptide that has been shown to prevent or reduce damage to intestinal

tissue. However, the team's ongoing work may have far-reaching implications, including new ways to treat tissue damaged during a heart attack or stroke. Researchers are also continuing trials that are showing additional promise for heart, lung, and kidney health.

Philips Foundation partners with UNICEF, Red Cross

The Philips Foundation has formed global innovation partnerships with UNICEF and the Red Cross to address health care and highlight challenges in disadvantaged communities or those affected by disasters. "In 2015, as the world prepares to define the post-2015 development agenda, it's clear that the only way to overcome many of the global challenges is through cross-sector collaboration," says Ronald de Jong, chief market leader at Royal Philips and chair of the Philips Foundation. "Consolidating these efforts into these global partnerships under the Philips Foundation is a logical and exciting step in contributing to our company's mission to improve the lives of 3 billion people by 2025."

Invion announces phase II results

Invion Limited has announced positive interim data from its phase II double-blind placebo-controlled randomized clinical trial in patients with chronic cough or established COPD who are trying to quit smoking but have failed multiple times. The data are based on assessments of sputum samples collected from patients upon reaching a maximum tolerated dose of drug and four weeks of maximum tolerated dose treatment. The blind-broken analysis shows clinically relevant changes in four biomarkers of inflammation in INV102-treated patients compared to placebo.

Disappointing results on CF drug

KaloBios Pharmaceuticals Inc. has announced top-line data from the randomized, double-blind, placebo-controlled phase II study of KB001-A, an anti-PcrV monoclonal antibody fragment to treat *Pseudomonas aeruginosa* lung infections in subjects with cystic fibrosis. While the data showed KB001-A was generally safe and well-tolerated, the primary endpoint of increased time to the need for antibiotics for worsening respiratory tract signs and symptoms was not met. In addition, secondary endpoints such as improvements in FEV_1 and subject-reported outcomes as measured by CF respiratory symptom diary did not show an advantage with KB001-A treatment. "Based on these top-line data, we intend to discontinue our development of KB001-A in cystic fibrosis," David W. Pritchard, KaloBios president and CEO, was quoted as saying.

Arena begins dosing in phase II trial

Arena Pharmaceuticals Inc. has announced the initiation of patient dosing in a phase II clinical trial of ralinepag, an oral, non-prostanoid prostacyclin (IP) receptor agonist intended for the treatment of pulmonary arterial hypertension (PAH). The 22-week, randomized, double-blind, placebo-controlled trial will evaluate the hemodynamic and exercise capacity effects, and safety and tolerability, of ralinepag in up to 60 patients with PAH. "We believe ralinepag offers promise in the IP receptor class of molecules given its oral availability, long plasma half-life, and high selectivity and potency in vitro," noted Jack Lief, Arena president and CEO.

DeVilbiss wins BBB award

The Better Business Bureau of Western Pennsylvania presented its 2014 Torch Award for Marketplace Ethics for mid-size companies to DeVilbiss Healthcare during an awards ceremony held last December at the company's global headquarters in Somerset, PA. Ed Murphy, president and CEO of DeVilbiss Healthcare, accepted the honor on behalf of the company.

University of Wisconsin receives grant to study new asthma treatments

The National Institute of Allergy and Infectious Diseases has awarded the University of Wisconsin School of Medicine and Public Health (UW SMPH) a seven-year, $70 million grant to continue its work with the Inner-City Asthma Consortium (ICAC), a nationwide clinical research network aimed at evaluating and developing promising new immune-based treatments. Their goal is to reduce the severity of asthma in inner-city children and foster new research efforts for preventing the disease. The grant is the largest ever received by the UW SMPH, bringing the total amount of government funding for the ICAC to just over $190 million since 2002.

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

Calendar of Events

AARC & State Society Programs

April 9–10

Ogden, Utah

Utah Society for Respiratory Care Annual Conference at Weber State University

Contact: Kim Bennion, (801) 347-1269, Kim.Bennion@imail.org

April 15

Missoula, Montana

41st annual MSRC Convention of Respiratory Care

Contact: Pattie Stefans, (406) 563-8680, pstefans@chofa.net

Other Meetings

May 15–20

Denver, Colorado

ATS 2015: Pulmonary, Critical Care, and Sleep Medicine

Contact: http://conference.thoracic.org/2015/

Submissions for the next available issue are due March 20.

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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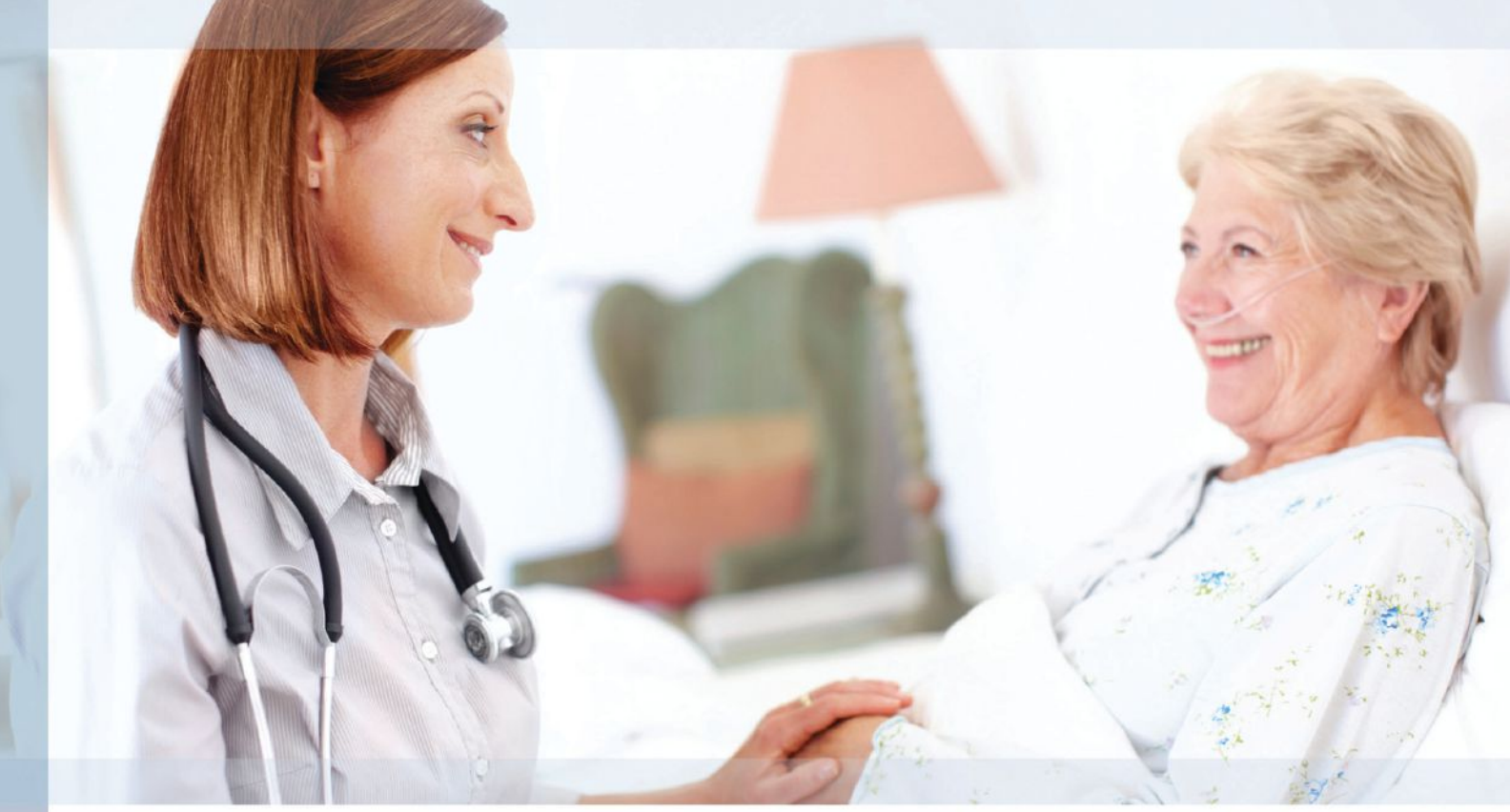

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1 Needham D et al. *Archives of Physical Medicine and Rehabilitation* Vol 91, Issue 4, PP 536–542, April 2010.

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