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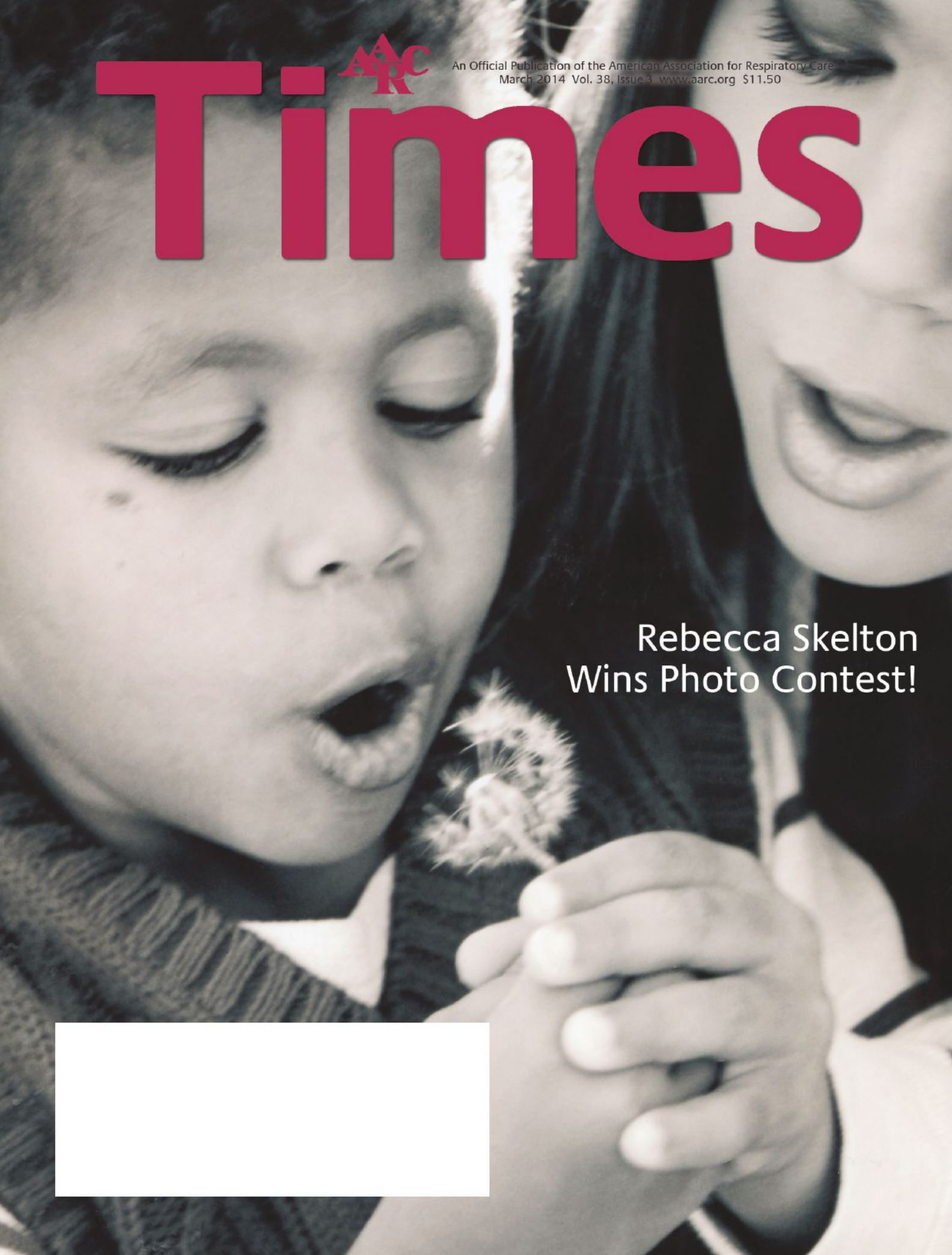

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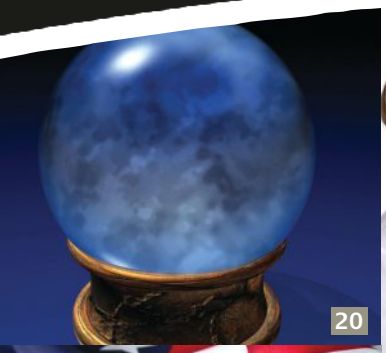

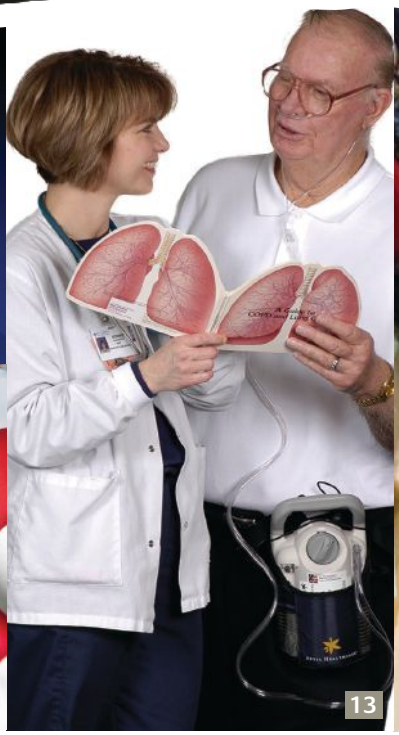

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AARC Vision/Mission Statement: The American Association for Respiratory Care (AARC) will continue to be the leading national and international professional association for respiratory care. The AARC will encourage and promote professional excellence,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

AARC Strategic Objectives

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

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

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Ventilation for Life

How Adjunct Therapies Improve Outcomes for Pediatric ARDS

by Jenna Wheeler, MD, and Michael R. Anderson MD, MBA

Although acute respiratory distress syndrome (ARDS) was first described by Ashbaugh et al in 1967, understanding and management has changed as knowledge has evolved. Core diagnostic criteria identified 46 years ago remain the same: PaO_2/FiO_2 ratio < 300 mmHg for acute lung injury (ALI) and < 200 mmHg for ARDS with diffuse bilateral infiltrates.[1] Since 1967, the criteria have undergone several in-depth reviews, including recognition of pediatric considerations in 1994.[2] In October 2011, an international panel of experts gathered to further evaluate the criteria for ARDS diagnosis. The goal was to streamline the definition and diagnosis to assure feasibility of testing, validity of results, and reliability to assure appropriate diagnosis.[3] The Berlin definition includes four categories: time of onset, chest imaging, origin of edema, and oxygenation. Onset must be within seven days from initial clinical insult or new/worsening respiratory symptoms; imaging must show bilateral diffuse opacities; the origin for edema cannot be exclusively related to cardiac cause or fluid overload; and oxygenation is divided into mild, moderate, or severe based on a PaO_2/FiO_2 ratio less than 300 mmHg, 200 mmHg, and 100 mmHg respectively along with positive end-expiratory pressure (PEEP) ≥ 5 cm H_2O.[4]

Epidemiology

Lower respiratory infection remains the most frequent cause of ARDS in both pediatric and adult populations, although there are many other contributing illnesses including (but not limited to) trauma, sepsis, aspiration, and transfusions. The incidence of ARDS increases with age; and while less commonly seen in the pediatric population, it causes a substantial number of cases requiring treatment in pediatric intensive care units.[5] A large prospective study from Spain published in 2012 found that 1.4% of all children admitted to their hospital and 8.3% of those requiring mechanical ventilation (MV) met the standard criteria for diagnosis with ARDS.[2]

Pathophysiology

ARDS is caused by overwhelming pulmonary inflammation that causes severe hypoxemia and subsequent respiratory failure.[5] It is believed that inflammation, with accumulation of polymorphonuclear cells, along with coagulation pathway activation and platelet involvement, lead to abnormal permeability of both pulmonary endothelial and epithelial membranes causing a disruption in normal function. Proinflammatory molecules are involved including tumor-necrosis factor, interleukins, platelet activating factor, and vascular endothelial growth

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factor and are stimulated by accumulation of leukocytes, erythrocytes, and platelets crossing the altered membranes.[2] When lung histology is available for review, diffuse alveolar damage is consistently observed.[2,5] Another factor in the respiratory sequelae observed with ARDS appears to involve surfactant. While surfactant deficiency has been shown since 1959 to play a large role in the development of infant respiratory distress syndrome,[6] new evidence has emerged to show that changes in surfactant composition early in the respiratory disease course and a deficiency of functioning surfactant may be implicated in ARDS outside of just the neonatal population.[7]

As a result of the pro-inflammatory molecules, altered membrane permeability, vascular dysfunction, and surfactant compromise, patients develop notable compromise in pulmonary compliance and in the ability to appropriately oxygenate.[2] The increase in edema causes an increased work of breathing and resultant hypoxemia, further complicated by surfactant inactivation leading to decreased compliance, which leads to increased atelectasis and intrapulmonary shunting. The hypoxemia is worsened even more so by ventilation/perfusion mismatching causing the hypoxemia that is refractory to many therapies.[2,6]

Current ventilator modalities and their role in treating pediatric ALI

As with adult patients, it is the goal in pediatric ARDS to minimize excessive tidal volume delivery (volutrauma) and ventilation at low end-expiratory lung volumes (atelectrauma). As this has become the focus, clinicians have moved from normalizing pH to using permissive hypercapnic strategies that embrace lower ventilation settings and reduce the risk of ventilator-induced lung injury. While PEEP[8] and tidal volume[9] strategies have been established in adults, questions still remain as to what the optimal PEEP and VT may be.[10,11] Airway pressure release ventilation (APRV) has become more popular in adult ARDS as it has been shown to improve ventilation-perfusion matching, arterial oxygenation, and venous return[12] but maintains a challenge in pediatric patients due to need for higher sedation and less tolerance to cooperate.[10] An adult randomized controlled trial (RCT) comparing APRV to conventional ventilation failed to show benefit in patients with acute respiratory failure.[12] Further studies including permissive hypoxemia and planned recruitment maneuvers are underway.

Adjunct therapies

High-frequency Oscillatory Ventilation: Since the 1970s, high-frequency oscillatory ventilation (HFOV) has been considered as a potentially beneficial ventilator strategy for ARDS. Multiple studies have shown HFOV to significantly improve hypoxemia. Studies, however, have failed to show a benefit for mortality.[11,13,14] In fact, Young et al in 2013 published a multicenter adult RCT study to this effect. As expected, oxygenation was improved but with no significant effect on mortality.[15] Related to pediatric ARDS, in 2000 Fedora et al published a small single center study showing improved survival in patients with early initiation of HFOV compared with late initiation.[16] Since then, further studies have failed to show a consistent survival benefit in using HFOV in the pediatric population. A multicenter RCT is needed to fully assess benefits of this type of ventilation.

Inhaled Nitric Oxide: It is well established that inhaled nitric oxide (iNO) is a potent selective pulmonary vasodilator, causing pulmonary vasodilation in well-ventilated lung regions and consequently has been shown to improve ventilation-perfusion matching, pulmonary hypertension, and oxygenation.[17] iNO therapy can be associated with side effects, including methemoglobinemia, and is associated with high cost. Dobyns et al published a pediatric ARDS trial of iNO in 1999 that demonstrated an acute benefit to oxygenation in patients suffering acute hypoxemic respiratory failure.[18] The same authors subsequently conducted a trial that demonstrated a significant improvement in oxygenation when iNO was used in conjunction with HFOV.[19]

Taylor and colleagues performed a multicenter trial in 2004 that used low-dose iNO at 5 ppm in ARDS patients. The study demonstrated an improvement in oxygenation but no significant change in mortality or ventilator-free days.[20] In 2007, a systematic review and meta-

analysis of adult literature was published demonstrating oxygenation improvement with iNO but no benefit to mortality and a potential for increased renal dysfunction and adverse events.[21] More recently, Dellinger et al published an adult RCT demonstrating that while use of iNO improves oxygenation but not mortality, those patients who had been randomized to the iNO group showed improvement in the pulmonary function testing six months after ARDS treatment.[22] Further testing needs to be conducted to determine if outcomes such as described by Dellinger et al are replicated in the pediatric population that could lead to risk and cost justification if long-term benefits to survivors were demonstrated.

Surfactant Administration: Clinicians are familiar with use of surfactant in premature babies, which has significantly improved morbidity and mortality. It has been demonstrated that surfactant dysfunction plays a role in ALI in not only the neonatal population but in the pediatric and adult populations as well. As a result, surfactant therapy has emerged as a topic of interest in the treatment of ARDS.[6] Three large adult trials conducted between 1996–2004 demonstrated no significant benefit in the therapy. In 2005, however, Wilson et al conducted a multicenter RCT analyzing the effect of exogenous surfactant (calfactant) on pediatric patients with ALI/ARDS. They showed surfactant to be a promising therapy associated with decreased mortality and improvement in oxygenation index. Therapy with surfactant did not, however, decrease days of MV.[23] Thomas et al in 2012 published an infant RCT study examining surfactant use (lucinactant) in ventilated children ≤ 2 years with acute hypoxemic respiratory failure. Some improvement was observed in oxygenation but no difference in mortality or days requiring MV was demonstrated.[24]

More recently, Wilson et al published an additional multicenter randomized controlled trial examining calfactant use in pediatric patients with ARDS secondary to acute lung injury. This study did not reveal any oxygenation benefit nor decrease in mortality. In fact, data showed a possible increase in ICU length of stay and days of mechanical ventilation in the surfactant group. The study was terminated after the second interim analysis for futility.[25] While it would appear surfactant therapy should improve ARDS based on associated surfactant dysfunction, data supporting this treatment approach remains limited.

Prone Positioning: Prone positioning (proning) has been studied in patients with ARDS for some time. Proning is thought to improve V/Q mismatch, promote alveolar recruitment, and decrease lung overdistention.[26] In 2000, Curley et al published a study that showed no significant iatrogenic effects from proning their pediatric patients. These patients showed an improvement in oxygenation,[27] which prompted the 2005 published randomized controlled trial where patients were randomized to the prone position for 20 hours/day during their acute illness or a supine control group. This study demonstrated an improvement in oxygenation, but this did not translate to increased ventilator-free days or decreased mortality.[28]

In 2013, an adult randomized controlled trial of proning patients with severe ARDS showed a significant decrease in both 28-day and 90-day mortality in the proning group. This data is consistent with prior meta-analyses in 2010 by Sud et al and Gattioni et al and an observational study by Charron et al in 2011.[26] Thus, the use of proning remains controversial.

Fluid Management: Appropriate fluid management in patients with ALI has long been a topic of discussion. Patients with ARDS require a delicate balance: keep excess fluid from worsening pulmonary edema while avoiding hypovolemia to ensure organ perfusion.[29,30] In 2006, Weidemann et al published an adult multicenter study randomizing hemodynamically stable ARDS patients to either a "conservative-strategy" group or a "liberal strategy" group. "Conservative-strategy" patients achieved a zero fluid balance through limited fluid administration and diuretics and required fewer days of MV and ICU days. There was no significant difference in 60-day mortality between groups.[30]

Evidence for specific fluid management in pediatric ARDS patients is lacking. Current recommendations are taken from adult literature. As with adults, pediatric patients should undergo appropriate initial fluid resuscitation for hemodynamic stability, and then a conservative fluid approach should be implemented.[5,29]

Extracorporeal Membrane Oxygenation: Since 1972, extracorporeal membrane oxygenation (ECMO) has had a role in managing respiratory failure, especially in the neonatal population.[31] For more than two decades, ECMO has been used to treat pediatric and adult patients with ALI/ARDS with reported survival rates > 50%. Due to the inherent risks, ECMO's use is limited to those children demonstrating hypoxemia refractory to conventional therapy.[5,11] ECMO serves to maintain lung protective strategies while dissociating oxygenation from the ventilation and yielding both improved hypoxemia and hypercapnia.[11] In 2009, an adult multicenter RCT study examined conventional ventilation therapy versus ECMO for severe ARDS. This study demonstrated that patients who were referred to an ECMO center for possible cannulation had an improved survival without disability compared to the group man-

aged on conventional ventilation without referral.[32] Likewise, ECMO proved beneficial when treating patients with ARDS secondary to infection with the H1N1 strain of influenza A during the 2009 outbreak.[31] Most pediatric applications of ECMO for ARDS are extrapolated from adult literature and supported by small retrospective reviews such as by Peng et al published in 2012[33] and a number of individual case studies. Pediatric literature lacks a RCT study examining the use of ECMO in pediatric ARDS/ALI.

Important role of respiratory care professionals

Since the organization of the ARDS Network in 1994, the respiratory therapy profession, originally established in the 1940s,[34] has seen an increase in both research and clinical responsibilities and has been looked to as a group of professionals central to ALI/ARDS treatment. There has been considerable sophistication in available therapies and device development requiring an advancement in education. Respiratory therapists have stepped forward to implement evidence-based treatment protocols and to ensure consistent, quality respiratory care be delivered to all patients.[34,35] In the pediatric community, we have also seen a significant increase in the formation of physician and respiratory therapist collaborations committed to advancement of pulmonary health.[36]

In the past decade, pediatric ALI/ARDS has emerged as a significant area of interest and importance to the pediatric critical care community. While this disease is more prevalent in the adult population, pediatric clinicians have not only refined their ventilator strategies for acute lung injury patients, they have also explored potential adjunct therapies. Although much of the data in pediatric critical care come from adult ICU studies, pediatric researchers have now begun to study the pediatric nuances of specific therapies. It is hoped that further research will aid clinicians in caring for critically ill children with acute lung injury/ARDS. ■

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Community Needs of the Aging Patient

by Karen Lane, RRT, AE-C

We all remember an elderly end-stage COPD patient with frequent readmissions. Now new penalties for readmission within 30 days have changed our view of readmission. If reviewed by the readmission team, the medical record from prior admissions may reveal that appropriate and optimal plans were developed for the patient but the patient failed at home. The failure may be due to non-medical conditions such as lack of transportation for follow-up care, lack of motivation to maintain optimal health, poor understanding of treatment plan, or lack of social support. Respiratory therapists typically know their "frequent flyers" well and have an opportunity to change this readmission dynamic.

Challenges faced by chronic disease patients

Patients with chronic diseases face many challenges — such as financial or physical access to medications, mobility issues, depression, and loss of independence. Socially isolated individuals are more likely to engage in poor health behaviors. Without a social support network, the failure rate increases for elderly patients with chronic disease.[1] According to Dr. William Hettler, cofounder of the National Wellness Institute, the basic dimensions of wellness include occupational, social, intellectual, physical, emotional, and spiritual wellness (see Table 1).

Lack of social interaction in the elderly population has been shown to decrease quality of life and reduce life expectancy. Regular social contact provides a sense of caring and the anticipation of future events:

- A person who has contact with a friend or relative at least three times a week is less likely to be depressed and more likely to adhere to medication and treatment plans. A simple phone call from a friend, family member, or caregiver may be considered social contact because the simple act of engaging in conversation stimulates memory and provides a sense that someone cares.[2]

- Attending church, volunteering, or joining a special interest group are common social activities for retired seniors. However, chronic disease patients (especially those who are oxygen dependent) may be reluctant to engage in regularly scheduled activities for fear of having a bad day or running out of oxygen. Even if they have financial resources to attend social functions, chronic disease patients face barriers of physical endurance and limitations of supplemental oxygen equipment. They may not be able to participate in a favorite activity, such as playing golf or bridge. They would subsequently lose the social contacts these activities provided. Some are no longer driving or limit their driving to daylight hours to avoid "rush hour" traffic. An aging patient who lives alone with no relatives nearby faces many barriers to social interaction, especially when they are no longer driving.[3]

- Personal pride and dignity could prevent patients from accepting help when it is offered. Reluctance to burden busy family members or friends could limit the number of times a patient will interact socially.

about the author...

Karen Lane, RRT, AE-C, is the pulmonary rehabilitation coordinator at St. Luke's Hospital in Chesterfield, MO.

Table 1. Basic Dimensions of Wellness

Occupational Wellness	Ability to contribute unique skills to personally meaningful and rewarding paid or unpaid work
Social Wellness	Ability to form and maintain positive personal and community relationships
Intellectual Wellness	Commitment to lifelong learning through continual acquisition of skills and knowledge
Physical Wellness	Commitment to self-care through regular participation in physical activity, healthy eating, and appropriate health care utilization
Emotional Wellness	Ability to acknowledge personal responsibility for life decisions and their outcomes with emotional stability and positivity
Spiritual Wellness	Acquiring purpose in life and a value system

SOURCE: Adapted from The Six Dimensions of Wellness Model, by W. Hettler (1976). Copyright 2004 by the National Wellness Institute.

RTs can help patients overcome challenges

As respiratory therapists become more involved in disease management and discharge planning, it is important to know what type of social support a patient will have when they return home.[4] There are many predictors of social engagement, but most are common sense. Some simple social situations to consider:

- Does the patient have help at home?
- Is family or friend support available and nearby?
- Does the patient have the capability to fix meals?
- Is the patient able to shop for groceries, get their medications, or drive to physician appointments?

If the answer to these questions is no, the patient will require a strong social network to avoid readmission. Patients who have an established social network usually have someone available to provide assistance. For more information, see the Lubben Social Network Scale, available online at www.bc.edu/content/bc/schools/gssw/lubben/downloads.html.

For those without adequate social support, however, a transition to an assisted living facility or skilled nursing facility may be necessary. Most seniors are reluctant to leave their homes and move to a retirement community or assisted living facility. Loss of independence is a difficult concept to accept; but after the transition adjustment period is complete, the most common statement I've heard from patients is: "I wish I had made the move sooner because there is always something to do and help is always available." Transitioning to a more supportive environment provides valuable social interaction that reduces the likelihood of a hospital admission.

Respiratory therapists often have valuable input regarding changes in a patient's mental or physical status from their previous admissions. No matter where a chronic lung patient is admitted within a facility, the respiratory staff probably will have interaction with them. Routine respiratory assessments should include the patient's current understanding of their disease. Also ask about any home therapies they currently use such as nebulizers, metered-dose inhaler spacers, airway clearance devices, oxygen, continuous positive airway pressure or bi-level positive airway pressure devices. In-patient nebulizer treatments provide RTs an opportunity to inquire about physical or social barriers the patient encounters at home. Questions in the Lubben Social Network Scale are simple and easy to ask during patient encounters. It is the RT's responsibility to communicate potential problems to the attending physician, registered nurse, case management, or social services. When patients notice a decline in their ability to perform activities of daily living, referrals to outpatient pulmonary rehabilitation and the pulmonary support group can be suggested to the patient and family members. Referral may not require stuffing yet one more thing into a lab coat

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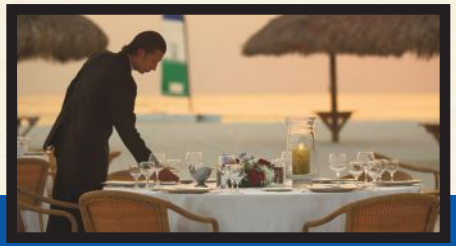

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pocket. Contact the pulmonary rehab staff to develop a HIPAA-compliant method for delivering pulmonary rehab brochures, newsletters, and support group information.

Role of support groups

Twenty-six years ago our pulmonary physicians wanted a support group for their patients. I volunteered because of an interest in pulmonary rehab as an opportunity to make a difference in patient outcomes. I was given the task of support group start-up because there was no competition. This lack of co-worker interest was cause for doubting my acceptance of the support group challenge. Today I can proudly state my involvement with support groups has been the most rewarding choice in my career. Everyone involved with the group has a vested interest in chronic pulmonary disease. The interactions between members and the friendships formed over the years have provided this therapist with a deep understanding, compassion, and respect for the obstacles these patients overcome. I leave every meeting with a renewed purpose and sense of appreciation for my patients and my job.

Respiratory therapists often have valuable input regarding changes in a patient's mental or physical status from their previous admissions.

Pulmonary support groups provide disease-specific education and social support. These support groups focus on positive outcomes. When a new attendee presents negativity, the seasoned members are quick to deliver positive feedback and coping strategies. Hosting a support group is an incredible way to gain understanding of the struggles chronic lung disease patients and their caregivers must cope with on a daily basis. Sample topics for a support group meeting are:

- Pharmacist discussing medications
- Physician discussing research for new medications
- Exercise physiologist demonstrating stretch-band exercises performed in a chair
- Dietician offering tips to control steroid weight gain and supplemental options for cachexia patients
- Durable medical equipment representative talking about the impact of Medicare competitive bidding
- Social worker discussing options for assistance at home
- Psychologist talking about depression
- Pastoral care discussing end-of-life issues
- Local department of tourism presenting interesting day trips.

Celebration of Pulmonary Rehabilitation Week at our facility began 19 years ago with a light snack and three pulmonary physicians talking to the support group (the event is scheduled for March 9–15 this year). Feedback from the support group was overwhelming, with requests for more educational topics. A few years later, the annual program evolved into a full lunch, vendor hall, and three professional speakers providing CRCE for res-

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piratory therapists. It is a unique venue where RTs mingle with patients who aren't wearing a hospital gown.

Identify opportunities to engage patients via support groups

Patients do not have to wait until they begin pulmonary rehabilitation to attend a support group. Most support groups are free and open to everyone. Spouses and supportive individuals are encouraged to attend with chronic pulmonary disease patients. There are many opportunities for RTs to refer patients to a support group. The pulmonary function lab is an excellent opportunity to introduce obstructive or restrictive lung disease patients to the support group by providing a flyer, newsletter, or website information. Metered-dose inhaler instruction, nebulizer treatments, or home respiratory equipment set-ups are also good times to mention support groups. Patients who ask questions about their disease or seek advice for coping strategies are great candidates for the support group. Discharge planning sessions are also ideal for identifying social deficits and referral to support groups.

RTs key to reducing readmissions

Health care reimbursement changes mandate penalties for pneumonia readmissions within 30 days. COPD exacerbation will be the next readmission penalty, beginning Oct. 1, 2014. Respiratory therapists are routinely involved with both types of admissions. This is an opportunity to increase the value of respiratory care professionals as key health care providers for reducing readmissions. It may be challenging to add yet another patient interaction into a work day filled with time constraints and increased workloads. However, if RTs want to improve patient outcomes and reduce readmissions, it is essential to think about how the patient will function at home and what type of social support they have. A referral to a pulmonary support group and/or outpatient pulmonary rehab group provides social support and disease management education in a positive, safe, and secure environment. A facility that does not have a pulmonary support group or provide outpatient pulmonary rehab should refer to the nearest available program. RTs could also take the initiative to start a support group or a pulmonary rehab program. The challenge will elevate your professional career and positively impact many patients. ■

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Aerosol Therapy: What Does the Future Hold?

by Sarah M. Bass, RRT; and Timothy R. Myers, MBA, RRT-NPS, FAARC

Aerosol therapy has been in existence since 460 BC and has enhanced the medical world by reducing morbidity and mortality associated with chronic respiratory disease. This therapy is something respiratory therapists learn about early in their careers and is considered as perhaps one of the cornerstones of our profession. RTs are educated about the different types of delivery devices: metered-dose inhalers (MDIs), dry-powder inhalers (DPIs), and nebulizers. Let us revisit, rediscover, and see what is to come from our old friend.

Perspective: past and present

Aerosol therapy was used by many different cultures dating back to the ancient Egyptians, Greeks, and Native Americans. Aerosols were used for smoking tobacco, inhaling herbs, and breathing in different vapors; but it was 4,000 years ago when aerosol therapy was first used for medical purposes. This was done in India around 2000 BC, when they began using inhalation therapy for asthma and other lung diseases. Throughout the centuries there were remarkable advances in technology. In the late 18th and early 19th centuries, designs for inhalers were first made. The 1800s brought the first atomizers, and the steam spray inhaler followed shortly in the 1860s. In the 1930s–1940s, the early electric and compressor nebulizers were developed. In 1935, the nebulization of a 1:100 epinephrine solution was introduced for the relief of bronchial asthma. Later attempts were made to nebulize penicillin and eventually streptomycin. These drugs were used for treating asthma, pneumonia, bronchiectasis, lung abscess, chronic bronchitis, and sinusitis. The 1940s–1950s brought the early version of the MDIs and DPIs. In 1974, the "Sugarloaf Conference" (Scientific Basis of Respiratory Therapy Conference) brought together the skilled professionals of pulmonary medicine and respiratory care to address respiratory modalities in ambulatory patients.

The era of advanced technology has respiratory therapists and medical personnel relying on aerosols in their everyday practice. Aerosol therapy now has a wide range of demographics, giving us the opportunity to treat premature infants, children, adults, plus handicapped and mechanically supported patients. The cystic fibrosis population has also been positively impacted with the advances in aerosol therapy, which has given them an extended life expectancy. Aerosol therapy offers both a medical and practical solution for patients with respiratory diseases. Inhalation of aerosolized particles allows for direct deposition of the medication to the area of need without complete reliance on the circulatory system. From a practical standpoint, the drugs are relatively easy to administer and have proven to be largely safe and effective for most patients with chronic respiratory diseases.

With that being said, there are also disadvantages frequently associated with aerosol therapy. One obstacle for aerosol therapy is determining the correct or true dose. With factors such as particle size, flow pattern, inspiratory flow rate, I:E ratio, respiratory rate, inhaled volume, and breath holding, it makes exact dosing largely unscientific. Aerosol therapy also loses its effectiveness when proper education has not been provided. Patients are often pre-

about the authors...

Sarah M. Bass, RRT, is a staff therapist at Rainbow Babies & Children's Hospital in Cleveland, OH.

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

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Figure 1. Common Inhalers Available in the United States.[1]

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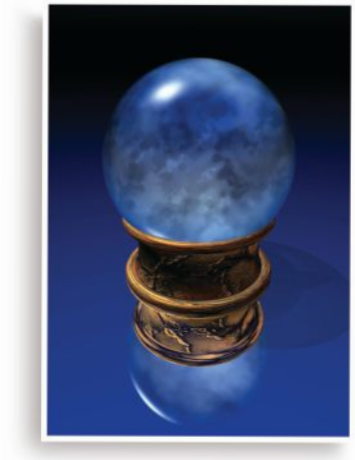
What does the future of aerosol therapy hold? If anyone held a crystal ball and could predict that future, it would quite possibly lead to both fame and fortune.

scribed numerous drugs that frequently entails many different aerosol devices. This creates confusion with patients and their caregivers, causing them to experience a greater chance of error. This makes it vital for health care professionals to have the correct knowledge about the variety of delivery devices and their mechanism of action and nuances.

Future

What does the future of aerosol therapy hold? If anyone held a crystal ball and could predict that future, it would quite possibly lead to both fame and fortune. What we do know is that the prevalence of chronic respiratory disease continues to grow on an annual basis. While the current technologies and medications are quite effective, patients with chronic respiratory disorders continue to suffer with symptoms and exacerbations that lead to daily morbidity, and even mortality, in some patients with severe disease.

While inhaled medications for respiratory diseases still largely rest in three main categories — bronchodilators, glucocorticoids, and antibiotics — the proliferation of delivery technologies continues to grow exponentially for these medications. One only needs to quickly glance at Figure 1 to develop a clear understanding of how patients get confused on the correct use of their delivery device, which too frequently leads to undertreatment and/or issues with compliance and adherence to prescribed therapies.[1]



Delivery errors frequently transpire with various aerosol devices, as each device requires precise instructions and specific patient efforts to obtain correct and maximal drug delivery.[1] As management of chronic airway disease is 10% medication and 90% education, the proliferation of inhaler types may be disadvantageous to the quality of care.[2] As time moves forward, there is always a scientific curiosity about whether many drugs could be safely delivered via inhalation to treat and manage a variety of diseases, not just those of a respiratory nature.

Let's not attempt to arbitrarily predict what the future technology of aerosol therapy should look like, but what it should strive to provide. It must provide accuracy and dosing as precisely as the respiratory pathophysiology will allow an inhaled medication to provide. A relatively user-friendly, low-maintenance device that is easy to operate, simple for patients to learn, and inexpensive is an absolute must to promote correct utilization and adherence. To further promote adherence and compliance to the prescribed regimen, a device that can be used effectively on the most infrequent basis makes life more simplistic.

Perhaps the best review of current asthma pharmacology and the future of asthma pharmacology is by Barnes,[3] who stressed the need and future of single inhaler maintenance and reliever therapy. This approach attempts to reduce the likelihood of confusion and misaligned therapies and approaches — and potentially decreases adherence issues in the patients being prescribed asthma medications. The rationale by Barnes is to provide all controller medications in a single, once-per-day inhaler.

RTs key to tailoring delivery systems to each patient

Until the day that aerosol therapy nirvana arrives, the respiratory therapist must play a key and vital role in promoting effective education, adherence, and reinforcement of good technique to patients prescribed aerosolized medications for chronic respiratory diseases.

Aerosol therapy is integral to the RT's scope of practice; and because we are considered the experts in this area, we have a professional obligation to our patients to continue our learning and competencies in the delivery of aerosolized medicines. Respiratory therapists must take advantage of this opportunity to reinforce their value by updating their knowledge of aerosol delivery systems and combining that knowledge with effective assessment of patients requiring this therapy. Recommending an appropriate delivery system tailored specifically to the patient's abilities is part of that assessment and need as we continue into the future of aerosolized medications. ■

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Preventable Patient Safety Errors

by Thomas J. Kallstrom, MBA, RRT, FAARC

We are all painfully aware of the problem of patient safety in health care. More specifically is the growing number of preventable deaths that occur in our nation's hospitals at an alarming rate. Some estimate there are over 200,000 preventable deaths. This may be a conservative guess as other studies have put preventable deaths at over 400,000 annually according to James et al.[1] This is a 100,000 increase over the past decade. The problem is getting worse, not better.

These preventable incidents occur, according to James, in five categories: errors of commission, omission, communication, context, and diagnostic. When looking at this even more closely, however, the causes seem better aligned to:

- Failure to diagnose and treat a complication in a timely manner
- Medication errors
- Overuse of blood transfusions
- Infections related to IVs
- Overuse of supplemental oxygen to infants
- Late or missed diagnosis of congenital heart disease in infants
- Hospital-acquired infections
- Lack of communication between care providers
- Need for a better reporting mechanism for errors and unsafe conditions.[2]

about the author...

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

The Patient Safety Movement is in its second year of existence and has taken this problem head on. Founded by Masimo CEO Joe Kiani, this movement has gathered significant attention and support by the government, The Joint Commission, clinicians, hospital administrators, payers, manufacturers, and most importantly, patients. By getting all interested parties to work together to reduce and eliminate these deaths, the movement is getting credible commitments, and changes are starting to be noticed. Their stated goal is to bring to zero the number of preventable deaths by 2020.

Patient safety checklists

In January of 2014, a Patient Safety Movement Summit was held. Over 400 invited guests were present to hear some of the best minds in health care talk about how we can help bring these numbers down. One of the presenters was Patrick Dunne, MEd, RRT, FAARC, who shared the two safety initiatives that the AARC developed. They come in the form of checklists and are available for anyone to use and to customize in their own institution.[3]

There are three checklists. One is an adult risk assessment for patients being discharged from the ICU, and the other two are for patients who are transported within the hospital. The transport checklists were developed after a systematic review of the literature with the intention of finding the most common safety error that related to oxygenation in the hospital. It was patient transports that emerged as the common thread. There may be many reasons for this, but chief among them is that RTs are frequently not present during house transports. RTs prepare the patient for the transport but are not always with them during the transport — instead leaving this role to transporters and nurses.

The main components of the transport checklists are categorized into:

- Patient readiness for transport
- Monitoring equipment: device readiness
- Oxygen supply.

While these precautions may seem rudimentary to a respiratory therapist, it is essential that all components be assessed and functional by anyone who has anything to do with the transport. These checklists can and should be modified for your own institution as no two hospitals and procedures are ever alike.

The other checklist was developed for patients about to be discharged from the intensive care unit. It was developed with a team of physicians, nurses, and respiratory therapists. It allows the RT to use an objective tool that will classify risk pre-discharge. As a long-practicing respiratory therapist and department director myself, I often observed that there were some patients who, due to the need for bed space, were released from the ICU (perhaps prematurely) and were not adequately followed on the floors post discharge. In fact, once my medical director insisted that because we were seeing an increase in readmissions for respiratory-related problems that it was a problem that the respiratory care department needed to address and solve. This checklist can do this as it takes into consideration the key components of patients' readiness. Included is:

- Level of consciousness
- Gag reflex
- Ventilator status
- Vital signs
- Gas exchange.

There is also an assessment of known risks that are considered. They include:

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Based on these assessments, the patient's risk classification is determined and scored. From this the clinician can make a reasonable recommendation of egress from the ICU. Additionally, we recommend the use of protocols that the RT can use post discharge. In doing so, the patient will still have a periodic assessment from the respiratory therapist.

Get on the team!

ICU readmissions are associated with dramatically higher hospital mortality rates, and the best predictor of ICU readmission is the patient's vital signs.[4] I would also add that because respiratory and cardiac conditions are the most common reason for readmission, that it is incumbent on the respiratory therapy team to be part of the solution to this problem.

We will be hearing more about the Patient Safety Movement in the years to come. While this is one of many initiatives that have been put in place, I do urge you to learn more about it. Become a front-and-center knowledgeable clinician in your hospital who will be sought after for your expertise in respiratory management and who — with the rest of the team — will help us bring down preventable patient deaths to zero by the year 2020. ■

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Inhalation Injury: Three Types, Three Treatments

by Tina L. Palmieri, MD, FACS, FCCM

Inhalation injury occurs in 10–20% of admitted burns, with age and the total body surface area (TBSA) of the burn influencing mortality.[1,2] Inhalation injury includes three different types of airway pathology: the effects of inhaled gases, upper airway injury, and lower airway injury.[3] Each type has a different cause, pathophysiology, and treatment. The purpose of this article is to describe the diagnosis and treatment of each type of inhalation injury.

Inhaled gases

Flames consume oxygen and decrease the fraction of inspired oxygen in the room to <10%. Hence, the leading cause of death at the scene is hypoxia. Toxic byproducts of combustion, including ammonia, cyanide, and carbon monoxide (CO), are also released.[4] CO, accounting for 15,000 emergency room visits and 500 unintentional deaths per year, has an affinity for hemoglobin 200–250 times that of oxygen and decreases the oxygen-carrying capacity.[5,6]

Acute CO toxicity results in neurologic deficits proportionate to the carboxyhemoglobin (COHb) level.[7] Deficits caused by CO toxicity range from headache (10–20% COHb) to disorientation (30–40% COHb), combativeness and coma (41–60% COHb), and seizure and mortality (>60% COHb). Any confused or combative patient with suspected inhalation injury should be suspected of having CO toxicity until proven otherwise.

Pulse oximetry does not accurately reflect systemic oxygenation in CO exposure and should *not* be used to assess oxygenation in inhalation injury. CO toxicity is diagnosed via COHb using co-oximetry. If the diagnosis of CO toxicity is being considered, patients should be given supplemental oxygen. Increased inspired oxygen will displace CO from the hemoglobin molecule.

COHb >10% is treated with oxygen, with the COHb levels repeated hourly until COHb is <10%. If patients are awake and alert with COHb >10%, they should be treated with 100% FIO_2 via face mask. Combative, obtunded, or hypoxic patients should be intubated and placed on mechanical ventilation on 100% FIO_2. The half-life of COHb on 100% FIO_2 is 40–60 minutes; hyperbaric oxygen decreases half-life to 30 minutes.[8] Hyperbaric oxygen may be indicated if COHb is >25% despite 100% oxygen. However, hyperbaric oxygen does not improve neurologic outcomes.[9,10]

Upper airway injury

The second type of inhalation injury is upper airway thermal injury. The temperature of inspired air in a flame-filled room approaches 150°C. Thermal upper airway burns cause tissue edema and airway obstruction. The timing of acute airway obstruction depends on injury depth, fluid resuscitation, and patient anatomy, but generally peaks at 24 hours post-injury.[11] Timely intubation in symptomatic patients is recommended.[12] However, endotracheal intubation has risks, including aspiration, airway injury, airway loss, and ventilator-associated pneumonia.[13]

Identification of patients needing intubation requires the integration of history, physical findings, and laboratory studies. A history of prolonged exposure (unconscious in a flame-engulfed room) increases risk. Patients with a brief exposure (such as a "flash" burn from a barbeque) are at lower risk. Patients with evidence of stridor,

about the author...

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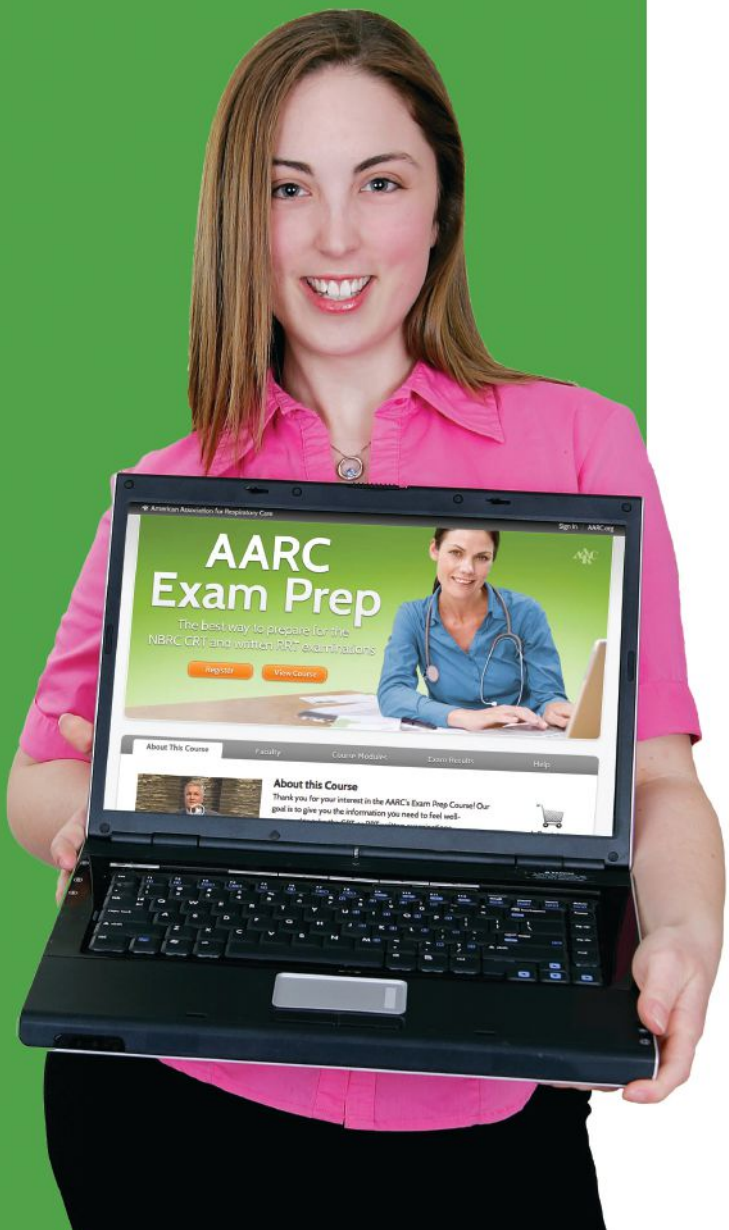

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Appropriate respiratory therapy treatment remains the key to improving outcomes in patients with inhalation injury.

severe (third-degree) facial burns, hypoxia, and burns >50% TBSA are candidates for immediate endotracheal intubation.[14] In patients lacking these signs, oral examination for evidence of soot or edema of the oropharynx should occur and changes in the voice should be assessed. Laryngoscopy may be advisable. The clinician should be prepared to intubate during laryngoscopy, as the procedure may trigger acute obstruction.

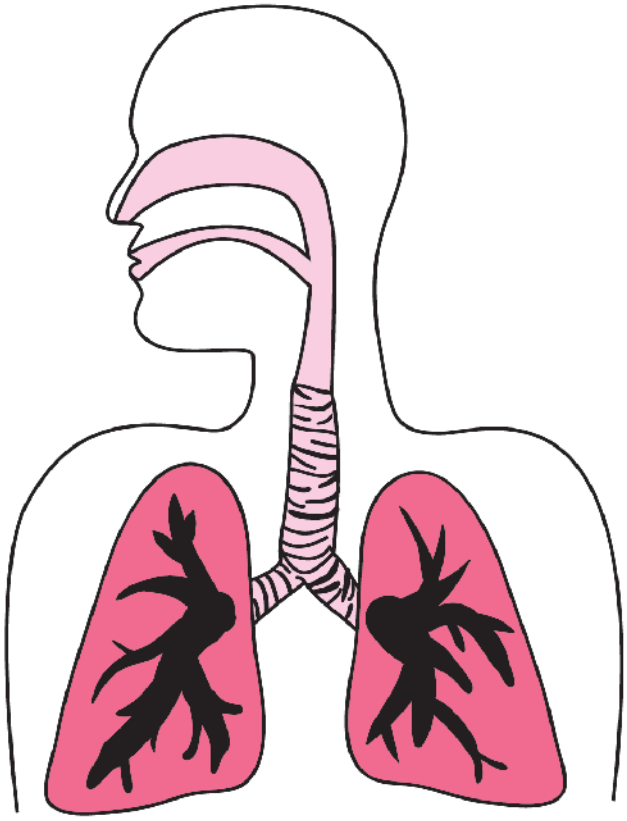
Endotracheal intubation after upper airway injury can be challenging. The most experienced airway provider should intubate the burn patient using the proper size of endotracheal tube.[14] Changing an obstructed or improperly sized endotracheal tube in an edematous patient is problematic. In adults, endotracheal tubes should be ≥7.0 mm (preferably larger). In children the appropriate tube size is estimated by this equation: (16+ age in years)/4.

Endotracheal tube fixation is extremely important. The method should immobilize the tube yet allow for the development of facial edema and the subsequent decrease in edema several days later. Tape should *not* be used to secure the endotracheal tube in facial burns as it will not adhere to moist surfaces. Endotracheal tubes should be fixed in two planes. The ties should be monitored and adjusted as edema develops. The location of the endotracheal tube at the teeth should be documented since the facial structures change with edema. The head of the bed should be elevated 30° to minimize facial edema and decrease ventilator-associated pneumonia.[15]

Lower airway injury

Lower airway inhalation injury is defined as a chemical injury. Casts accumulate, causing bronchoconstriction and airway hyperreactivity. Inhalation injury causes acute lung injury, which may progress to the acute respiratory distress syndrome. Inhalation injury with associated cutaneous burn injury increases mortality compared to isolated burn injury.[16]

Diagnosing lower airway inhalation injury involves a history and physical examination similar to that conducted for upper airway injury.[14] Arterial blood gases, blood counts, COHb levels, and a chest x-ray should be



obtained. Bronchoscopy is often used to visualize injury of the lower airway and may be required frequently in the first week to remove debris.

While lower airway inhalation injury treatment is supportive, the optimal mode of mechanical ventilation is unclear. The volumetric diffusive respirator (VDR) decreases the incidence of pneumonia and mortality after inhalation injury.[17] However, the VDR has not been compared to low tidal volume ventilation strategies or newer forms of mechanical ventilation. Aerosolized heparin, nitric oxide, and beta-2 agonists have been proposed but require prospective trials to confirm their effectiveness in these patients.[18,19]

Pneumonia occurs in 30% of inhalation injury patients due to impaired airway clearance of debris, loss of ciliary function, mucous plugging, and increased secretions.[20] Meticulous pulmonary hygiene, percussive ventilation, and bronchoscopy may prevent pneumonia. Pulmonary hygiene, maintenance of humidified oxygen, and increased mobility are essential. Steroids and prophylactic antibiotics are not recommended because they impair immunity and increase the incidence of virulent infection.

Appropriate treatment is key

The three types of inhalation injury differ in pathophysiology and treatment. Inhaled gas exposure requires attention to oxygenation, upper airway injury requires intubation for airway edema, and lower airway injury requires mechanical ventilation for respiratory failure. Prognosis varies based on the extent and type of inhalation injury as well as burn size and patient physiology. Appropriate respiratory therapy treatment remains the key to improving outcomes in patients with inhalation injury. ■

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Government Advocacy

State vs. National Political Action: Is There a Difference? How Do You Navigate Each?

by Joe Dwan, MSEd, RRT-SDS, RRT-ACCS

My journey began in 1998 as a naive respiratory therapist when, as the Oregon Society for Respiratory Care (OSRC) representative, I attended the State Societies Leadership Workshop organized by the AARC for new affiliate presidents. Sam Giordano, MBA, RRT, FAARC (AARC's previous executive director), stated that his vision was to develop a "grass roots" infrastructure for the profession to influence the congressmen/women in Washington, DC, who developed health care policies that affect the whole country. Thus, I was an original Political Advocacy Contact Team (PACT) member. More recently, I also was involved with the OSRC in helping guide the final provisions that created state licensure requirements for sleep technologists. Here is what I've learned advocating at both the state and congressional levels.

People Business: In Washington, DC, senators and representatives are in a people business — just like RTs are in a people business. As RTs, we talk to all kinds of patients, and congressional members talk to all kinds of people; so we should be good at talking to them about issues impacting respiratory patients. This is also true when working with state legislators.

Access: It is much easier to access your state legislator than your national congressmen and women. The bigger your state, however, the less access you have to your state legislators. I'm from a smaller state and found all of my state senators on one floor at the state capitol. It is always best to have firm office appointments when you set out to meet face to face with the legislators or their health staff; but in my experience, I have been able to drop in at my state offices and accomplish my mission.

about the author...

Joe Dwan, MSEd, RRT-SDS, RRT-ACCS, is a faculty member at Kettering National Seminars and an adjunct professor at Oregon Institute of Technology. He also serves as a member of the AARC House of Delegates.

In Washington DC, it is rare to meet with your actual senator or representative. Having a pulmonary patient with you may not only get their attention but is also a rewarding experience. Plus, a pulmonary patient committed to our advocacy issues can be the best voice and supporter for our issues. If you actually meet with a member of Congress, that is great; but expect to meet with one of their congressional staff, hopefully the one who's accountable for health care issues. These staff members are often brilliant "kids" in their 20s who have excellent communication skills and are capable of showing empathy without committing to your cause. In fact, the first couple of times, I naively thought they were agreeing to support our legislation when, in fact, they were just good listeners.

"All politics is local" is a great take-home message. So contacting your congressional representative or senator by calling their local district office in your state will make a difference — but the real work for respiratory therapy takes place in Washington, DC. You don't need an earth-shattering topic to call them about, just call to chat about respiratory therapy patients and issues important to you and the patient. The objective is to educate the office staff about your patients and profession, which they will then pass on to the senator or representative. Developing relationships is key to making progress and building relationships year after year. Don't forget to follow up with anyone whom you've contacted within about a week after your office visit and every several weeks to ensure that your message reached your senator or representative. That's the key to making progress: keep the issue in front of them.

Enlist other RTs to contact the congressional member or staff because that makes a difference. Squeaky wheels

get attention in Congress, as do the "big bucks" (which frankly is not "us"). There are only ~130,000 RTs nationwide, so those few of us who participate and are involved with state or national policy have to be the squeaky wheel. Enlisting patients, families, nurses, physicians, and anyone else really does make a difference.

Speeches: Always have two "speeches" or comprehensive messages ready to give at a moment's notice; and make sure you practice those speeches so they flow well, you get your points across, and you stay within your time limit. The "elevator" speech: have a five-minute speech ready to describe your issues. The "office" speech: have a 10-minute speech ready to discuss the issues (the problem and what you believe is the solution).

Ask for what you want. Remember to always be specific about what you want the senator or representative to do. This applies both to Washington, DC, and your state capitol. If you are not specific, progress will not be made.

Newsletters: Everyone in Washington, DC, and your state capitol has an email newsletter. Subscribe to your legislators and congressmen and women plus any key members who sit on health-related committees. This will give you a feel for what is important to them and allows you to connect to them in a personal way.

Handouts: These will reinforce your issues, especially if the information is from other organizations, journals, or people who are not part of your association or organization. Your objective is not to appear to be self-interested, but rather to be patient-focused.

Follow Up: Within the week be sure to follow up with them to determine how the legislator responded to the information and your specific request. Press gently for commitment. Identify what their concerns might be, if they have any questions, or if they need clarification on any particular point. And if you don't know the answer to their question, say you don't know but will get back to them (and do!).

Developing Relationships: Getting to know the legislative staff is part of relationship building. Ask if they know anyone with COPD, asthma, heart disease, or other diseases we treat. Remember this more personal information and always "circle back" to it on your next office visit as that can provide you a real-world connection with them on the issue.

There are differences between state and national politics, but the essentials are the same. Getting legislation passed with such a small organization as the AARC or your state affiliate is a long, difficult road. But be an optimist because it will happen eventually as respiratory therapy builds relationships, establishes trust and credibility, and persists in our goals of improving patient care through our profession. ■

There are differences between state and national politics, but the essentials are the same.

Make a Wish

by Debbie Bunch

Our 2014 Photo-of-the-Year Contest winner says her children have made her wishes come true

Earlier this year a message showed up in Rebecca Skelton's email box announcing the 2014 *AARC Times* Photo Contest, and like a lot of members across the country she started thinking about pictures she might have on hand that would be worthy of entry.

The shot you see on this month's cover immediately came to mind. "To me, it was so precious because Daniel had struggled a lot with his asthma and it was a sweet picture showing that he was able to do this — he was able to blow the dandelion," says the RRT at Baylor Medical Center at Waxahachie in Waxahachie, TX.

Parental moment

Daniel is her adopted son, and like his older brother Harvey (also adopted) has required special attention over the years due to asthma. When the photo was taken back in 2004, he was about two or three years old; and the family was out in a field near their home getting ready for mom to snap her annual Christmas card photos. The girl you see pictured with Daniel is Madison, Skelton's oldest biological daughter. When she spotted the dandelion in the field, she asked Daniel if he knew what you could do with one.

"He didn't, and so she taught him how to blow the dandelion and make a wish," says Skelton. It was one of those moments parents love to capture on film; and she obviously did a great job of it, given the fact that she ended up winning our 2013 AARC Photo Contest. The picture was taken with a 35 mm Olympus camera and developed the old-fashioned way, in a dark room. While Skelton says she has now adopted digital like everyone else ("I was heartbroken, but finally converted over"), she still uses the photography skills she's been honing for years.

"I take pictures for friends, such as if they want a family picture done or pictures at a wedding, but I never have done it professionally," she says. "I do love it though."

A passion for her kids

Skelton's real passion is her kids. The two older girls (Madison's younger sister Alexandra is 20) are both in college. Madison is getting ready to graduate in the spring with a degree in biology and plans to go on to medical school. Alex is majoring in math and has plans to earn her master's degree.

Rebecca Skelton loves being surrounded by her children: (from left) Alexandra, Daniel, Harvey, and Madison.

The two boys — neither of whom Skelton or her husband Ben, a local chiropractor, knew had asthma when they were adopted — are 16 and 11. While Harvey has outgrown his asthma, Daniel still struggles with the condition; but with a mom who's also an RT, he is in good hands. "He's not severe, but he does have problems a few times a year," says the AARC member.

She emphasizes Daniel has always been great at recognizing when trouble is at hand; and over the years she and Ben, as well as the other kids, have also learned to anticipate his symptoms so treatment is speedily initiated whenever a flare-up appears to be imminent. Thanks to this level of care, he is able to engage in whatever childhood pursuits he would like without being fearful that his asthma will get in the way. "He takes bronchodilators and steroids throughout the year," says his mom. "When we notice symptoms, we start treatments, and he is fine."

Skelton says her own experiences as a mom of children with asthma regularly comes into play on the job at Baylor as well. "I tell these moms at the hospital, 'you can get a handle on it and recognize the triggers.'" ■

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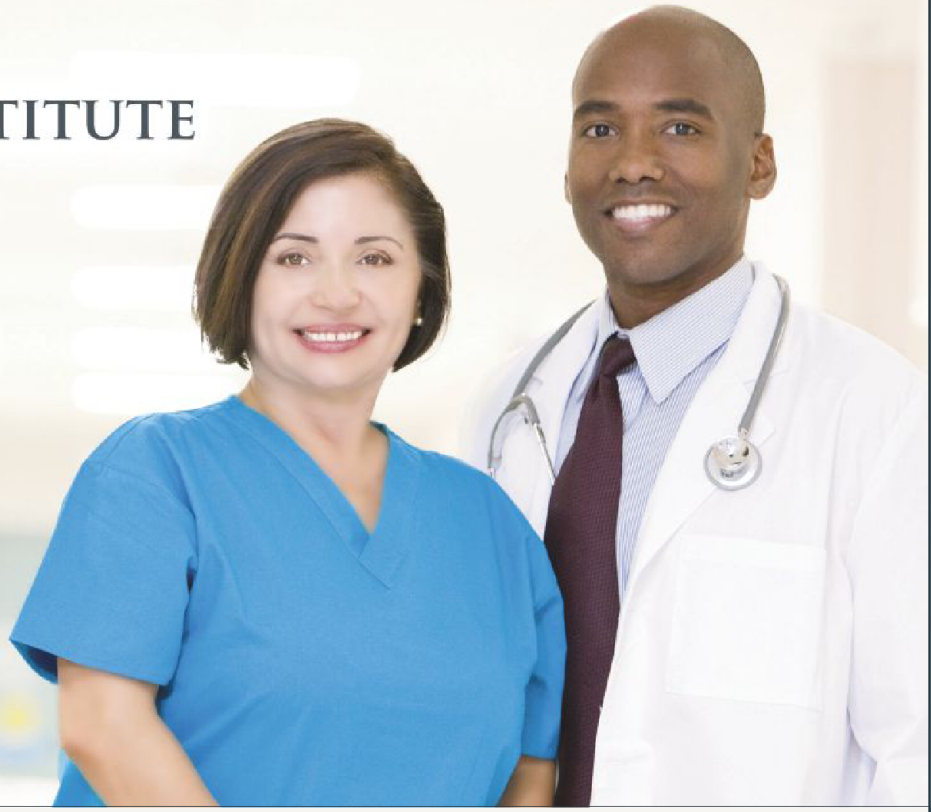

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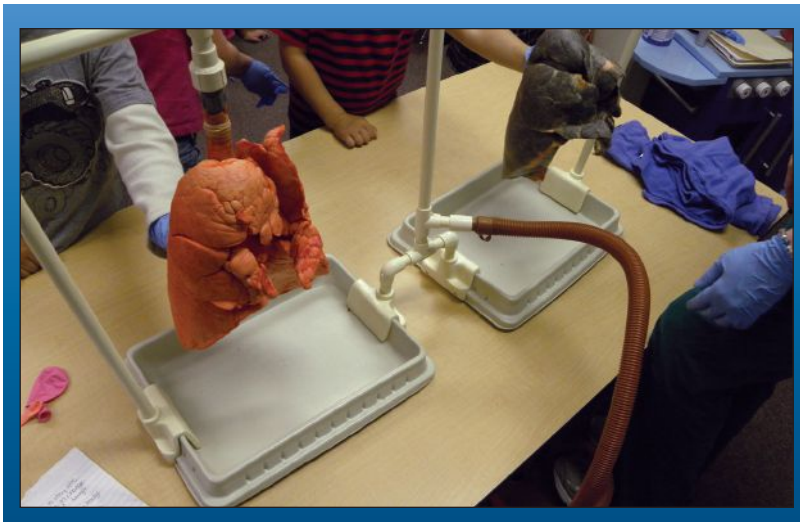
Respiratory Care: The Next Generation

Future therapists are already out there... we just need to let them know it!

by Debbie Bunch

"Respiratory therapist" ranked among the top 12 jobs in health care on a recent list compiled by the employment website CareerCast.com. Getting the word out to kids about the profession, however, is really a job for respiratory therapists themselves.



Ask kids what they want to be when they grow up and you're likely to get a range of answers — depending on the child, of course, but also on the age. Back in 2009, the authors of an article in *Forbes Magazine* found the single most popular career choice for kindergarteners was "superhero." Among jobs with any basis in reality, "firefighter" came out on top. To their credit, though, younger kids were at least able to articulate a choice, regardless of how bizarre that choice was. Another article in the *Daily Mail* out of the United Kingdom, for example, even cited the case of one five-year-old who was adamant about growing up to be a dog.

Authors of an article in *Forbes Magazine* found the single most popular career choice for kindergarteners was "superhero." And *Daily Mail* out of the United Kingdom even cited the case of one five-year-old who was adamant about growing up to be a dog.

The older kids get, however, the less likely they are to have a clue — outlandish or otherwise. An informal Internet survey recently found most kids simply replied that they didn't know when asked to cite their career plans. Clearly, somewhere between kindergarten (when "superhero" or even "dog" sounds totally doable) and high school, children begin to struggle when it comes to choosing a career path.

For professions like respiratory care, that struggle blows the door wide open to the possibility of a future caring for people with respiratory conditions. The problem is making sure kids know it exists.

"Be an RT" and more

The AARC works to educate young people about the potential that respiratory care has to offer through a number of means:

Be an RT: This dedicated website on www.AARC.org has a wealth of information for young career seekers, including a great explanation of what RTs do on the job, where they work, the high-tech equipment they use to care for their patients, opportunities for advancement, and the employment and financial outlook for the career. Kids also find practical advice on how to get started down the path to becoming a respiratory therapist, including how to choose an educational program that will best meet their needs.

"Life and Breath" Video: Divided into 10 segments, this video is also housed on the AARC website (www.AARC.org/career/be_an_rt/life_and_breath.cfm) and shows RTs in action in sites ranging from critical care to pulmonary rehabilitation and research. After watching a fast-paced overview featuring real RTs and physicians talking about the profession, career seekers can dig into specialty areas, getting a great idea of where they might like to go should they decide on respiratory care as a career choice.

Future RTs?

Only time will tell — but as these letters show, kids clearly enjoy the chance to learn about the profession from a real respiratory therapist.

Yesterday was career day at our school, and I thought that you were the best! I think you gave a good explanation of your job and what you do. — *Thanks, Danny*

Thanks for giving us a magnet, keychain, and pen… I am even writing with your pen now. — *Sincerely, Tyler*

It was very interesting meeting a respiratory therapist. I only knew a physical therapist.... I never knew that much about asthma but, now thanks to you, I know a lot more! *I thought your job was very interesting!*

— Sincerely, Ashlee

High School Career Project: Developed several years ago to assist RTs everywhere in bringing word about the profession to their local schools, this ready-made resource includes a step-by-step guide for planning a visit, including a slide presentation you can customize for your own purposes. A model video showing a therapist delivering the program to a real group of high school students is included as well. It's all available on the AARC website (www.AARC.org/education/high_school_project).

Connecting with kids through HOSA

The AARC also reaches out to kids every year through its regular presence at the Health Occupations Students of America (HOSA) conferences. With the help of local Association members in the conference city, organizers set up a booth where they get the chance to network one-on-one with high school students interested in pursuing careers in a health care profession as well as the high school counselors who guide them down that path.

Jamy Chulak, MS, RRT, and his students from Valencia College in Florida were on hand at the 2012 HOSA event in Orlando. "Many of the attendees were very impressed with the scope of practice described by our students," recalls Chulak. "Intrigue grew as we explained how we work directly with physicians in surgical, medical, and emergency settings while caring for patients when they need us most. We talked about how patients with COPD, along with the aging baby boomers, will impact the future demand for health care in general and specifically our profession, raising a curious eye among many of these high school students."

The conference was Chulak's third, and he says he was particularly gratified to see some kids he had seen in previous years. "It was especially exciting to get return visitors who wanted to challenge themselves at intubating — or gross out a friend by holding the pig lung," he says. Knowing that those kids were telling their friends about respiratory therapy was nice as well. "Comments like, 'I heard about this booth!' were all too common. It was fun."

Last year's conference in Nashville was equally rewarding for R. David Johnson, MEd, RRT, and his students at Columbia State Community College. "We gave the attendees the opportunity to intubate, connect themselves up to a heart monitor, measure their peak flow, and wear 'the vest'." Those experiences helped to draw out the students about what they wanted from a health care career. "Putting on the vest, intubating the manikin, etc., was an effective springboard to talk about the profession," says the educator. "Many students also talked about health issues of friends or family or wanting a career in health care."

I thought it was cool how you brought some stuff from your job and used people in my class to show what they did and how they worked. I hope you had a really fun time because I know I did.
— Sincerely, Jessie

I thought it was very interesting because **I learned lots of things about your lungs and asthma**.
— Sincerely, Jill

Cory Martin, EdS, RRT-ACCS, CPFT, program director at Volunteer State Community College, and Christine Hamilton, DHSc, RRT, from Tennessee State University, were also at the Nashville session; and both noted the great opportunity the conference gave them to also connect with the parents and teachers in attendance. "It's natural for both parents and teachers to assist in career planning and goal setting for those who are approaching college entrance, so HOSA is an excellent occasion to speak to those who are very focused on what respiratory care has to offer as a profession," says Martin.

"My favorite experience was meeting two respiratory therapists who are now health education teachers/HOSA advisors, one from Texas and one from Georgia," says Dr. Hamilton. "They were thrilled to see respiratory therapy being promoted and gladly took the recruiting brochures with them to take back to their high schools."

Celebrating STEM education

Next month the AARC will expand on the success it has seen with HOSA by taking part in the third annual USA Science and Engineering Festival (USA SEF) in Washington, DC. A national grassroots effort with a who's who list of partners and sponsors (everyone from Microsoft to the U.S. Air Force), the festival is designed to advance STEM education (science, technology, engineering, and mathematics). Thousands of children will spend three days touring an exhibit hall offering hands-on experiences with a range of exciting careers — including the respiratory care profession.

"Our main purpose for being at the USA SEF is to promote the profession to school-age children," says AARC Associate Executive Director-Education Shawna Strickland, PhD, RRT-NPS, FAARC. "We would love for more people to simply be aware of the profession but also encourage students with strong science preferences to explore respiratory therapy."

Dr. Strickland is working closely with AARC member Carolyn Williams, BS, RRT, to coordinate volunteers to work at the festival. The AARC booth will include a number of hands-on activities aimed at engaging the children in the world of respiratory care. She estimates 8,000–10,000 kids could come by the AARC booth, making this event a win-win for the kids who will learn more about respiratory care and respiratory therapists. "We, as an organization, need to foster growth and interest in the scientific future of our profession," says Dr. Strickland.

"I think I can do this"

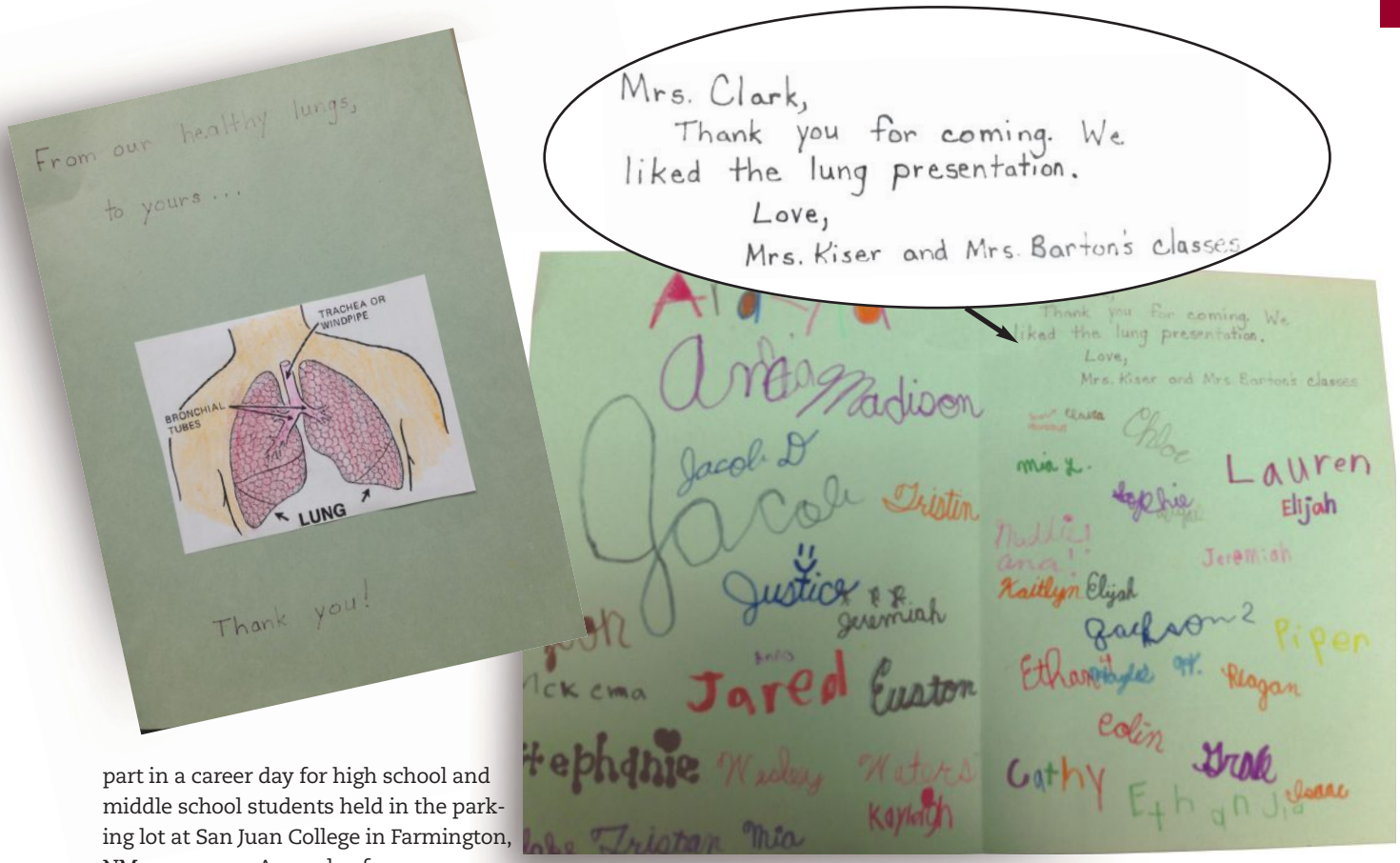
All of these Association-related activities are complemented by the good work that AARC members do out in their own communities year after year to raise awareness of the profession. P.J. Gillen, BSRT, RRT-NPS, AE-C, for example, takes

I'm glad you gave me the book…. I hope you come back again another day. I had fun! — Angela

Thank you so much for coming to our class! It was fun. I wish you could come again. — Lauren

I enjoyed you talking about your career… would have been even better with more time. — Your friend, Sean

It was really fun when you let us use the stuff you use to help people…. When I am an adult, I want my job to be helping people. A respiratory therapist just might be the job for me. — Sincerely, Eddie



part in a career day for high school and middle school students held in the parking lot at San Juan College in Farmington, NM, every year. A couple of years ago she and her colleagues from San Juan Regional Medical Center were even featured in the local newspaper for coming with the equipment needed to allow the kids to intubate a mannequin, an activity the students found intriguing.

"It's fun to introduce kids to our profession," Gillen was quoted as saying, "because all they usually see on TV are doctors and nurses. They don't know about other employment possibilities in the medical field."

Aprilyn Hilton, BS, RRT, did the same thing in her hometown of Freeport, IL, last spring at an event held at Highland Community College. Hilton is a therapist at Freeport Memorial Hospital, and like her peers in New Mexico, set up her booth with everything she would need to give the kids a chance to perform an intubation. As one eighth grader gently slid the tube into the mannequin's mouth, the AARC member was pleased to hear her say, "I think I can do this someday."

Thank you for coming into our classroom. I had a great time. — Your friend, Desiree

I enjoyed hearing from you. You are a very nice person. You know a lot about your work. — Your friend, Alex

It was cool when you showed us how to use the thing when you had to suck air in.... Please come back next time. — From Matt

Last November, Bonnie Boggs, BS, RRT, and her students from Monroe County Community College in Monroe, MI, got into the act as well, bringing information about respiratory conditions and the profession to a group of fifth graders. The kids especially enjoyed dissecting the pig lungs that came along for the ride and listened intently as Boggs explained what RTs do on the job. "We help people stay alive," she told them.

Their suitcases were packed with a set of healthy and smokers' pig lungs, plus a wide variety of AARC educational handouts, a spirometer, smoking-cessation materials, the DRIVE4COPD tools, the AARC's "Life and Breath" DVD, and information on respiratory therapy educational programs in the state.

A few states over, members of the Kansas Respiratory Care Society (KRCS) have found a fairly unique way to make it easy for lots of their members to get the word out about the profession. Their suitcases were packed with a set of healthy and smokers' pig lungs, plus a wide variety of AARC educational handouts, a spirometer, smoking-cessation materials, the DRIVE4COPD tools, the AARC's "Life and Breath" DVD, and information on respiratory therapy educational programs in the state. These ready-made educational kits are available to anyone who wants to go into the classroom and educate children about respiratory conditions and the profession of respiratory care.

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

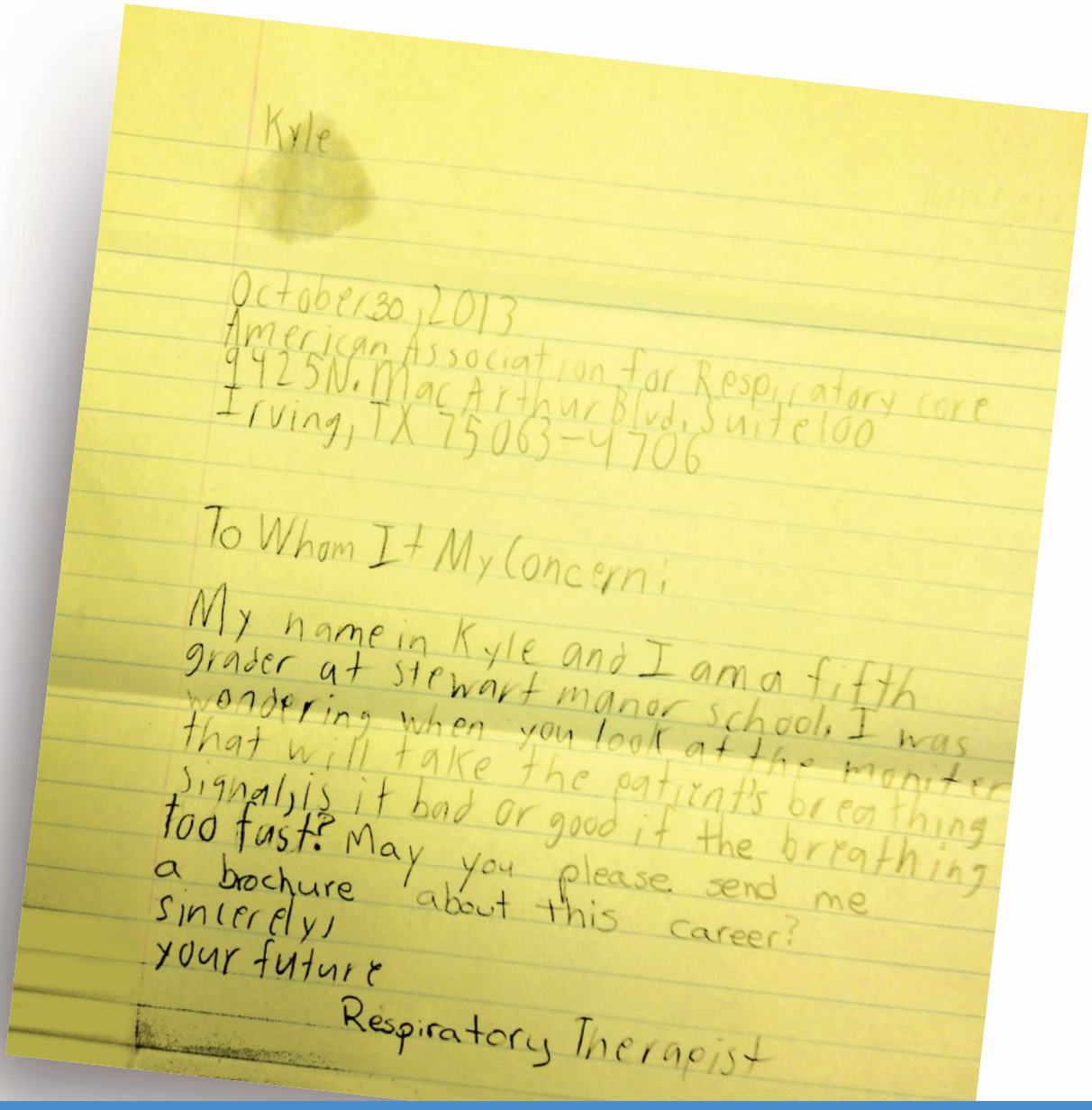
She has had a standing date to bring the kit into the kindergarten and first grade classes at her daughter's school for the past three years, and she really enjoys getting to the kids at that young age. The first year she did it her own daughter was in the class; and last year she got the chance to revisit those kids as well, who were then in third grade. "This is a wonderful way to empower and equip society members to promote our profession and make a difference in the lives of their communities," says Clark.

Leading with "we are RTs"

Down south in Georgia, James Colquitt, MEd, RRT, is working to raise awareness of the profession on numerous fronts, including helping to establish a non-profit organization called Smart Choices 4 Me through his employer, Middle Georgia State College, to educate high school students on the importance of making wise decisions early in life. The organization focuses on wise decisions in a range of areas; but as respiratory therapists, he

I really enjoyed your company. My favorite part was when you called me up to the front and gave me the whatchamacallit.
— Your friend, Jacob

I want to be a respiratory therapist after you talked to our class.
— Sincerely, Stephanie



Kyle

October 30, 2013
American Association for Respiratory Care
9425 N. MacArthur Blvd. Suite 100
Irving, TX 75063-4706

To Whom It My Concern:

My name in Kyle and I am a fifth grader at stewart manor school. I was wondering when you look at the monitor that will take the patient's breathing signal, is it bad or good if the breathing too fast? May you please send me a brochure about this career?
sincerely,
your future
Respiratory Therapist

You are a great respiratory therapist… that breathing machine you gave me, I am always using it and seeing if the numbers improve. — Sincerely, Jessica

I really like your job. I think I might want to do the same job as you when I grow up. I think it would be really fun. — Your friend, Bryan

I think your job is cool because you can help someone's breathing…. We really liked your visit. — Sincerely, Cody

I am writing this letter to you because I want to **thank you for volunteering your time** to come to our class.... *Hope you can come again next year.*

— Sincerely, April

and his colleagues use every opportunity to spread the word about the profession too.

"In these events, we do not hide the fact that we are respiratory therapists. We lead with it," says Colquitt. "We highlight the relationship between good hand washing and the need for a respiratory therapist. We point out the connection between texting, driving, and the respiratory therapist as a trauma care provider. We draw the connection between obesity, asthma, and the respiratory therapist as an asthma care specialist. And, of course, we show the effects of smoking on the lungs using both our pig lungs and our COPD simulator."

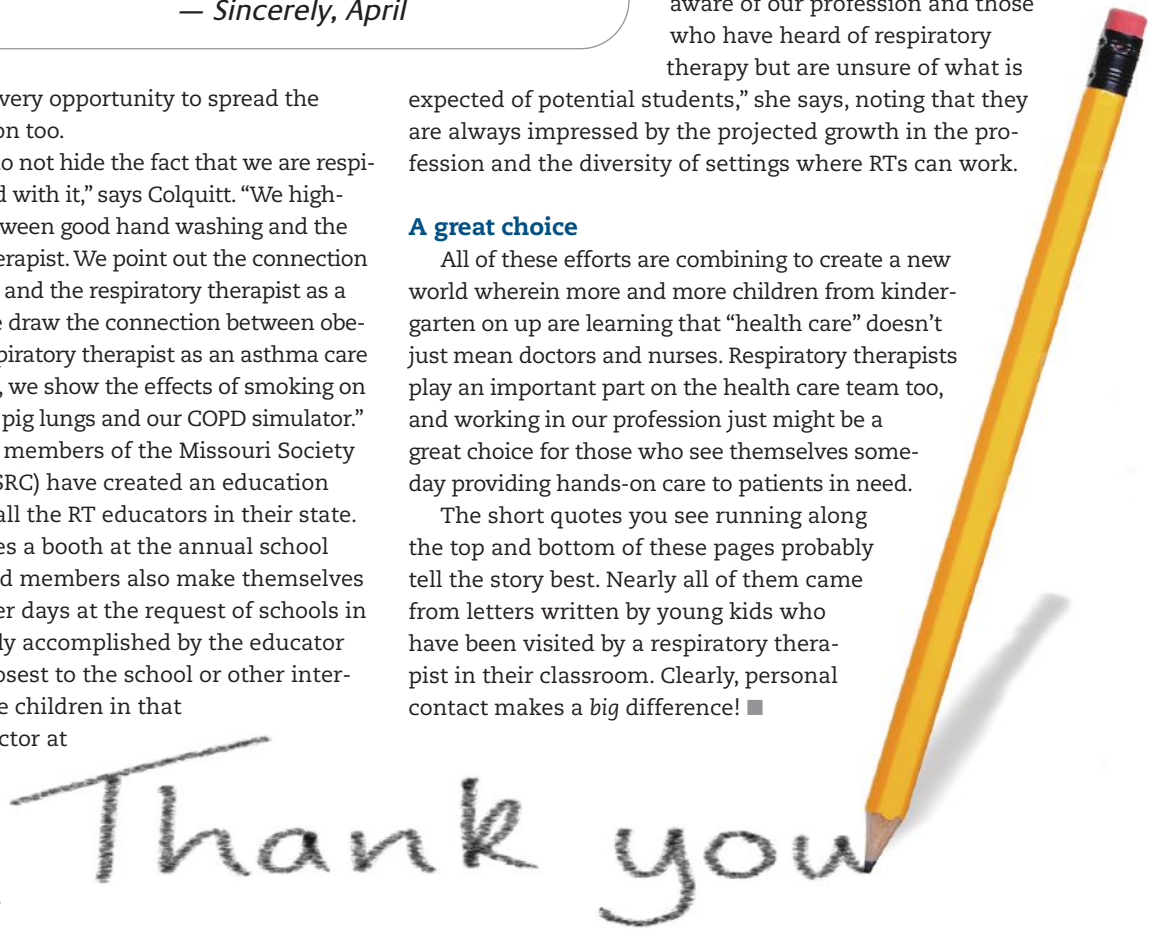
Back in the Midwest, members of the Missouri Society for Respiratory Care (MSRC) have created an education committee made up of all the RT educators in their state. The committee organizes a booth at the annual school counselors' meeting, and members also make themselves available to attend career days at the request of schools in the state. "That is usually accomplished by the educator from the RT program closest to the school or other interested RTs who may have children in that school," says MSRC Director at Large Rose Shafer, BS, RRT.

Dana Evans, MHA, RRT-NPS, AE-C, chairs the committee and says they've received great feedback from the school counselors who have come by their booth at the conference. "We spend a great deal of time chatting with counselors who are unaware of our profession and those who have heard of respiratory therapy but are unsure of what is expected of potential students," she says, noting that they are always impressed by the projected growth in the profession and the diversity of settings where RTs can work.

A great choice

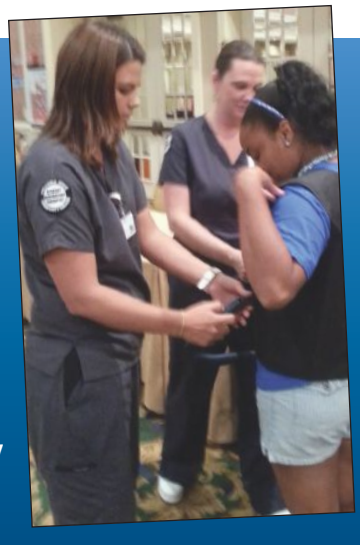
All of these efforts are combining to create a new world wherein more and more children from kindergarten on up are learning that "health care" doesn't just mean doctors and nurses. Respiratory therapists play an important part on the health care team too, and working in our profession just might be a great choice for those who see themselves someday providing hands-on care to patients in need.

The short quotes you see running along the top and bottom of these pages probably tell the story best. Nearly all of them came from letters written by young kids who have been visited by a respiratory therapist in their classroom. Clearly, personal contact makes a *big* difference! ■



My sister has asthma and bronchitis, and she still smokes. Is your career fun? — Bobby

Thank you for coming to show us what you do. — Sincerely, Joey



Thanks for explaining to us about asthma and the respiratory system.... I really liked the magnets that said, "Butts are gross!" — Sincerely, Angela

I think it's so cool how you brought machines.... I love your job! — Sincerely, Erin

Your presentation was great. Thanks for the breathing thing. — Sincerely, Renee

Thank you for coming to our class to tell us about your career. I thought it was pretty cool. And everywhere I look I see people using the pen you gave us. — Sincerely, Tommy

Promote. Educate. Generate Awareness.

Brochures That Help You Get the Word Out.

Distribute at Schools, Job Fairs, Health Fairs or RC Week Events

Public Education Brochure

For Current or Future Patients

Brochure defines what a respiratory therapist is and how they benefit a patient's overall respiratory health. Familiarizes the patient with respiratory care and the treatments performed.

Package of 50. #BR0015
Member Price: $10.95
Nonmember Price: $13.95
Plus Shipping and Handling

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For Students Considering A Career in Health Care

Defines the profession and the growing career opportunities as a respiratory therapist. Describes how to become an "RRT," salary expectations and the numerous specialty areas.

Package of 50. #BR0016
Member Price: $10.95
Nonmember Price: $13.95
Plus Shipping and Handling

For Individuals Considering a Career Change

Presents the exciting and rewarding career opportunities as a respiratory therapist. Describes how to become an "RRT," salary expectations and the numerous specialty areas.

Package of 50. #BR0017
Member Price: $10.95
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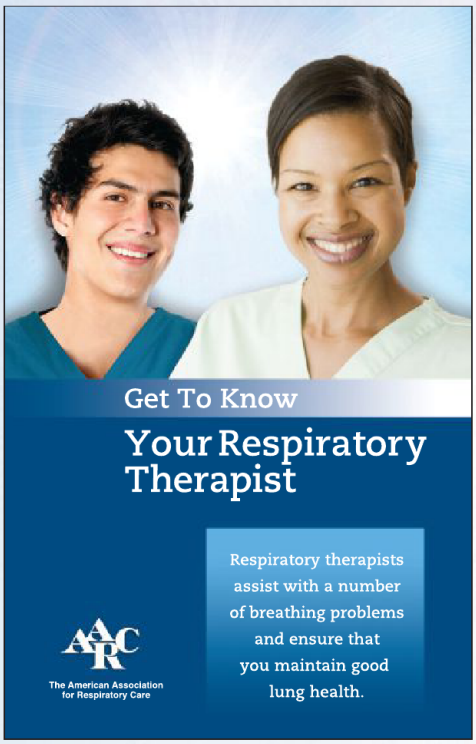
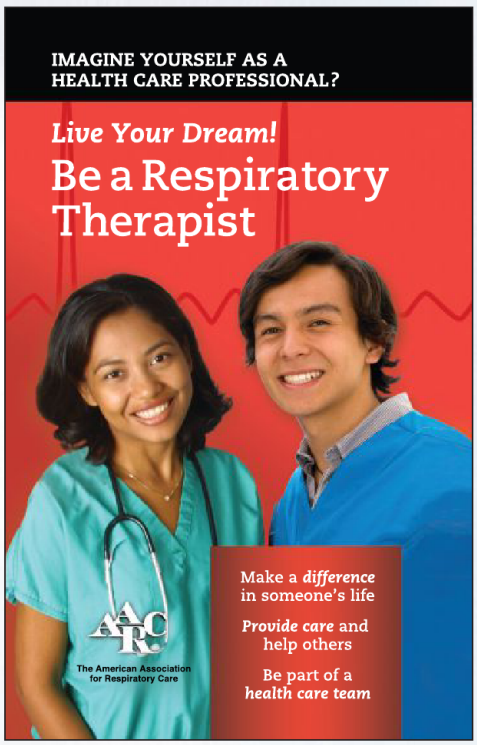
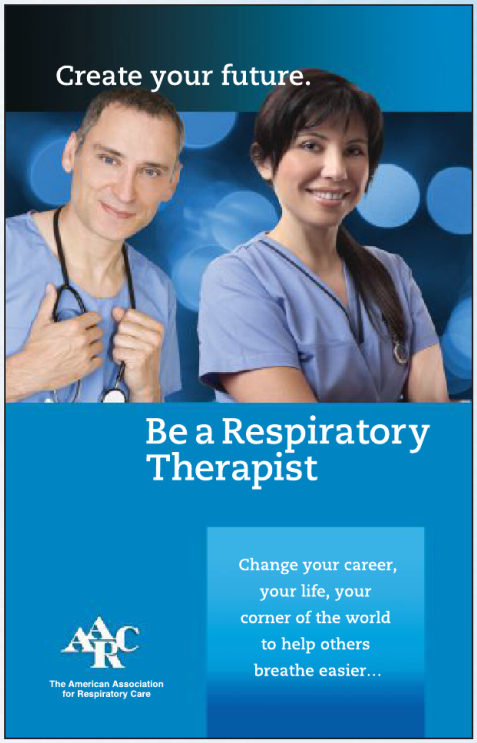
Plus Shipping and Handling

Order Online at the AARC Store:
www.aarc.org







Order Online at at the AARC store: www.aarc.org or Call 972-243-2272

Industry Update

Featuring information on products and equipment from manufacturers

Airway Clearance System

The SmartVest® Airway Clearance System from Electromed Inc. delivers high-frequency chest wall oscillation to patients via a wearable vest surrounding an inflatable air bladder, a programmable air compressor, and a hose connecting the two. The compressor delivers a rapidly repeating pulse of air, alternately squeezing and releasing the upper body, thus simulating a "mini cough" that loosens mucus, reduces its thickness, and propels it toward larger airways where it can be expectorated or suctioned. www.smartvest.com

Affordable Sleep Therapy Device

The REMstar SE from Philips Respironics is an entry-level CPAP device that includes many of the features that make System One such a popular system, such as flex pressure relief, enhanced humidification with heated tube option, and compliance tools. The REMstar SE is also oximetry-module capable and offers on-board memory. This cost-effective solution for individuals seeking a reliable back-up unit can help to ensure patients remain compliant without sacrificing comfortable therapy. www.philips.com

Double Wall Mounted Cabinet

OxySure Systems Inc.'s new double wall mounted cabinet allows customers to house an AED of their choosing along with an OxySure Model 615 unit in the same wall cabinet, facilitating easy, one-step access and reducing response time when seconds count. The cabinet features a powder coated finish and clear impact-resistant acrylic window that provides durability and protection. It comes fully alarmed with a key switch conveniently located in the front. A magnetic door latch provides solid closure and trouble-free opening. www.oxysure.com

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

Be A Part Of The AARC Now!

Your Membership Makes A Difference

Membership Application

ACTIVE MEMBER

An individual is eligible if he/she lives in the U.S. or its territories or was an Active Member prior to moving outside its borders or territories, and meets ONE of the following criteria: (1) is legally credentialed as a respiratory care professional if employed in a state that mandates such, OR (2) is a graduate of an accredited educational program in respiratory care, OR (3) holds a credential issued by the NBRC.

ASSOCIATE OR SPECIAL MEMBER

Individuals who hold a position related to respiratory care but do not meet the requirements of Active Member shall be Associate Members. They have all the rights and benefits of the Association except to hold office, vote, or serve as chair of a standing committee. The following subclasses of Associate Membership are available: Foreign, Physician, and Industrial (individuals whose primary occupation is directly or indirectly devoted to the manufacture, sale, or distribution of respiratory care equipment or supplies). Special Members are those not working in a respiratory care-related field.

STUDENT MEMBER

Individuals will be classified as Student Members if they meet all the requirements for Associate Membership and are enrolled in an educational program in respiratory care accredited by, or in the process of seeking accreditation from, an AARC-recognized agency.

Please read the eligibility requirements for each of the classifications to the left, then complete the form. All information requested must be provided, except where indicated as optional. See **side 2** for more information and fee schedule. Please sign and date application on **side 2** and type or print clearly. Processing of application takes approximately 15 days.

You may apply or renew instantly on-line by going to https://secure.aarc.org/membership/

☐ Active ☐ Associate (Foreign) ☐ Associate (Physician) ☐ Associate (Industrial) ☐ Special ☐ Student

Last Name _____ First Name _____

Social Security No. (last four digits only) _____ Home Address _____

City _____ State _____ Zip _____

Phone No. (_____) _____ Email Address _____

Your AARC dues includes membership in your state society. A portion of your money will be given to them.
You are automatically assigned to a state society based on your **home address**. If you wish to be assigned to a different state society, please indicate which state that is here: _____

Work Information: Place of Employment _____

Address _____ City _____

State _____ Zip _____ Phone No. (_____) _____

Preferred Fax No.(_____) _____ Preferred Email Address _____

Preferred Mailing Address: ☐ Home ☐ Business

Have you ever been or are you currently in the military? ☐ Yes ☐ No

For Student Member (Required)

School/RC Program _____ Address _____

City _____ State _____ Zip _____

Phone No. (_____) _____ Program Director _____

Expected Date of Graduation Month _____ Year _____

Please answer these questions to help us design services and programs that meet your needs.(Optional)

Primary Job Responsibility (check one only)

☐ Clinical Specialist ☐ Director of Clinical Education ☐ Director ☐ Disease Manager
☐ Diagnostic Technologist ☐ Instructor/Faculty/Professor ☐ Medical Director ☐ Manager
☐ Marketing ☐ Nurse ☐ Owner ☐ Other
☐ Program Director ☐ Patient Educator ☐ Pulmonary Function Technologist ☐ Product Management
☐ Sales ☐ Supervisor/Coordinator ☐ Sleep Technologist/Polysomnographer ☐ Sleep Technologist/Specialist
☐ Staff Therapist ☐ Student

Type of Business

☐ DME/HME ☐ Educational Institution ☐ Home Health Agency ☐ Long Term Acute Care/Rehab
☐ Manufacturer/Distributor/Pharma ☐ Military ☐ Hospital ☐ Other
☐ Physician's Office ☐ Skilled Nursing Facility ☐ Sleep Lab Free Standing ☐ Sleep Lab Hospital Based
☐ Student ☐ Temp ☐ Outpatient Facility

Check the Highest Degree Earned

☐ PhD ☐ EdD ☐ DHSc ☐ MEd ☐ MBA ☐ MS ☐ MHA ☐ MHS ☐ MPA ☐ MPH ☐ MSEd ☐ MSN
☐ MA ☐ BSRT ☐ BSRC ☐ BS ☐ BHS ☐ BSEd ☐ BSN ☐ BA ☐ AAS ☐ AS ☐ AA

Job Status ☐ Full Time ☐ Part Time ☐ Years in Respiratory Care _____

Credentials ☐ MD ☐ DO ☐ RRT-NPS ☐ RRT-SDS ☐ RRT-ACCS ☐ RRT ☐ RPFT ☐ CRT-NPS ☐ CRT-SDS ☐ CRT-ACCS
☐ CRT ☐ CPFT ☐ RN ☐ RPSGT ☐ AE-C ☐ CTTS ☐ EMT-P ☐ LPN ☐ LVN

Honorary Credentials ☐ FAARC ☐ FACHE ☐ FAACVPR ☐ FCCM ☐ FCCP

Date of Birth _____ **Sex** _____

American Association for Respiratory Care

AARC An Excellent Investment

Membership has many personal and professional benefits. The potential savings from these benefits go well beyond the cost of AARC membership, only a quarter a day!

PLEASE SIGN

I hereby apply for membership in the American Association for Respiratory Care. If approved for membership in the AARC, I will abide by its bylaws and professional code of ethics. I authorize investigation of all statements contained herein and understand that misrepresentations or omissions of facts called for is cause for rejection or expulsion.

A yearly subscription to Respiratory Care journal and *AARC Times* magazine includes an allocation of $11.50 from my dues for each of these publications.

NOTE: Contributions or gifts to the AARC are not tax deductible as charitable contributions for income tax purposes. However, they may be tax deductible as ordinary and necessary business expenses subject to restrictions imposed as a result of Association lobbying activities. The AARC estimates that the nond-eductible portion of your dues — the portion which is allocable to lobbying — is 20%.

Signature _____ **Date** _____

You may apply or renew instantly on-line by going to https://secure.aarc.org/membership/

Membership Fees (U.S. dollars only)

Payment must accompany your application to the AARC. Fees are for 12 months. These fees contain the $12.50 new members processing fee. **Renewing members (except students) can deduct $12.50.**

Choose One Level of Membership

AARC PRINT MEMBERSHIP (Receive both *AARC Times* magazine and Respiratory Care journal)

☐ Active $102.50 ☐ Associate (Industrial or Physician) $102.50 ☐ Associate (Foreign) $137.50 ☐ Special $102.50 ☐ Student $50.00

→ **VALUE! AARC PRINT MULTI-YEAR MEMBERSHIP** ☐ Active **or** ☐ Associate (U.S. only) **or** ☐ Special **for:** ☐ 2 years $170 **or** ☐ 3 years $240

Or

AARC 1+1 MEMBERSHIP (Choose one publication) I want ☐ *AARC Times* magazine **or** ☐ Respiratory Care journal

☐ Active $96.75 ☐ Associate (Industrial or Physician) $96.75 ☐ Associate (Foreign) $117.50 ☐ Special $96.75

Or

AARC DIGITAL MEMBERSHIP (All publications and other special benefits)

☐ Active $91.00 ☐ Associate (Industrial or Physician) $91.00 ☐ Associate (Foreign) $102.50 ☐ Special $91.00

PLUS UPGRADE ☐ $35.00 per year (Includes one **free** specialty section – please mark your choice below.)

Specialty Sections (Open to all members) E-mail address is required.

Membership in AARC Specialty Sections connects you to others who practice in your area of respiratory care through an electronic mailing list, monthly E-Newsletters, quarterly Section E-Bulletins, and an information-rich Specialty Section website. Programs created by specialty section members are integral to the AARC Summer Forum and AARC Congress.

☐ Adult Acute Care Section $15.00 ☐ Education Section $20.00 ☐ Neonatal-Pediatric Section $15.00 ☐ Diagnostics Section $15.00
☐ Management Section $20.00 ☐ Transport Section $15.00 ☐ Long-Term Care Section $15.00 ☐ Home Care Section $15.00
☐ Continuing Care Rehabilitation Section $15.00 ☐ Sleep Section $15.00

***Voluntary PAC Contribution $**_____ ****Voluntary ARCF Contribution $**_____

* AARCPAC is a separate aggregated fund. Voluntary political contributions by individuals should be written on personal checks. Contributions from corporations are illegal and cannot be accepted. The AARC will not favor or disadvantage anyone based upon the amounts of or refusal to make AARCPAC contributions. Contributions to a political action committee are not deductible for federal income tax purposes.
** American Respiratory Care Foundation (ARCF) is a not-for-profit organization formed for the purpose of supporting research, education, and charitable activities in respiratory care. Contributions to the ARCF are tax deductible.

Payment Information

Enclosed is a check for the membership fee I selected ***plus*** any specialty section fees ***plus*** any contributions to AARCPAC or ARCF for the total amount of

$_____. Please make checks payable to the AARC.

Please charge my dues to: ☐ MasterCard ☐ Visa ☐ American Express

Card Number _____ Card Expires _____ /_____ Signature _____

Send this application and fees to:
American Association for Respiratory Care
9425 N. MacArthur Blvd., Suite 100, Irving, TX 75063-4706 (if using a credit card)
or P.O. Box 650097, Dallas, TX 75265-0097 (if sending a check)
Fax: 972-484-2720 • Phone: 972-243-2272

Did you remember to give us your email address on page 1?

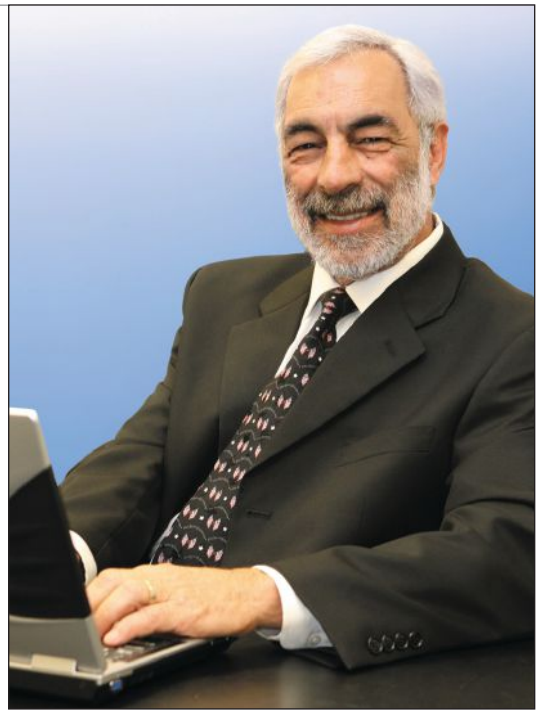
Thanks for Being Part of the Team

Revised July 2013

RC Currents

IN THE NEWS

Dr. Louis Sinopoli Passes Away



The AARC was saddened to learn of the death on Jan. 8 of Louis Sinopoli, EdD, RRT, FAARC. "The entire AARC community, including educators across the nation, are mourning Dr. Sinopoli's loss," says AARC President George Gaebler, MSEd, RRT, FAARC. "His contributions to advancing the educational standing of our profession are great."

Renowned throughout respiratory care for his ability to innovate, Dr. Sinopoli will particularly be remembered for the work he did to advance respiratory care into the world of defensible, statistically validated competency examinations. Working with the NBRC, where he served as both a volunteer and as a Board Trustee over many years, he was instrumental in upgrading the quality of the RT written examination, making it possible for the profession to move to the forefront of competency-based testing years ahead of similar professions.

A devoted advocate of distance learning strategies, Dr. Sinopoli was also one of the earliest RT educators to adopt the principles of computer-based instruction, and he shared his expertise with the AARC on many projects.

When the AARC was awarded several significant federal grants to develop instructional and curriculum tools for respiratory therapy training programs in the 1970s, Dr. Sinopoli played a major role as well. The work that came out of those grants went a long way toward providing much-needed resources to enhance the quality of entry-level programs across the country.

He was awarded the Association's highest honor, the Jimmy A. Young Medal, in 2004. ■

AARC Leadership Institute

This series of courses was designed to provide real-world education for respiratory therapists who wish to expand their breadth and depth of knowledge beyond the clinical realm. The Leadership Institute was designed and developed by content experts in respiratory care education, management, and research and provides a foundation for future growth in your career.

The Leadership Institute is presented in three formats: as a Web-based course, as PDF documents available for downloading, and as an ePub download for your electronic reader. You can complete the course at your individual pace, in the location that works best for you, at the time that works best for you.

In addition, the Leadership Institute offers RTs a unique opportunity to engage with the authors, other experts in the field, and fellow Leadership Institute participants in a special community on AARConnect. Each registration grants access to the corresponding Leadership Institute community so that you can ask questions, engage in discussions, and debate important topics in an online discussion board.

Each track is composed of six to eight modules each and is approved for 15 CRCEs. This educational activity is sponsored in part by an unrestricted educational grant from Draeger. For more information, see www.aarc.org/education/leadership/. ■

AARC
LEADERSHIP INSTITUTE

Est. 2014

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.irccouncil.org/fellowship/. The fellowships take place in the fall just prior to AARC Congress 2014, scheduled this year for Dec. 9–12 in Las Vegas, NV. For more information, contact April Lynch at lynch@aarc.org. ■

Educators: Help Recognize Outstanding Students

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 2014, to be held Dec. 9–12 in Las Vegas, NV.

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. ■

ARCF NOW ACCEPTING APPLICATIONS FOR THE 2014 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.

2014

The three-week program takes each participant to two host cities in the United States and concludes with attendance and acknowledgement at AARC Congress 2014 to be held Dec. 9–12 in Las Vegas, NV.

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

AARC Leaders Attend Meetings

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

Thomas J. Kallstrom, AARC Executive Director/CEO

- Speaking on The Affordable Care Act and Opportunities in Respiratory Care at the spring conference of the Michigan Society for Respiratory Care in Dearborn, MI.

Douglas S. Laher, AARC Associate Executive Director

- Presenting at the Pennsylvania Society for Respiratory Care meeting on the Affordable Care Act and Its Impact on the Profession.

Shawna Strickland, Associate Executive Director of Education

- Speaking on palliative care at the New York Downstate Association for Respiratory Therapists' spring symposium.

Enter the 2014 AARC Photo Contest

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 *AARC Times*. For information on how to enter, select the *AARC Times* icon on www.AARC.org and click on the "Photo-of-the-Year Contest" link. Deadline to submit photos is **Nov. 14**, 2014. ■

Call for Open Forum Abstracts for AARC Congress 2014

AARC CONGRESS 2014

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

National Health Observances

National Sleep Awareness Week; March 2–9; National Sleep Foundation; (703) 243-1697; www.sleepfoundation.org

Pulmonary Rehabilitation Week; March 9–15; American Association of Cardiovascular and Pulmonary Rehabilitation; www.aacvpr.org

World Tuberculosis Day; March 24; World Health Organization; www.stoptb.org/events/world_tb_day

Go Local

A Georgia State University (GSU) investigator who analyzed data from the Healthcare Cost and Utilization Project state inpatient databases and the American Nonsmokers' Rights Foundation Smoke-Free Laws database found a statistically significant association between the implementation of county smoke-free laws and reductions in asthma discharges for adults and children. Other variables such as state smoke-free laws alone showed no similar association with asthma discharges.

While the author doesn't believe state smoke-free laws are ineffective, he does suggest local laws may be better at truly curtailing secondhand smoke exposure. "Efforts might be better focused at the local level, where there is evidence of a significant impact," writes Glenn Landers from the Georgia Health Policy Center at GSU. The study appeared in a recent issue of the *American Journal of Public Health*. ■

AARC "New Members" Column Now Online

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

Transitions

Pat Munzer, DHSc, RRT, FAARC, has been appointed to serve as dean of the School of Applied Sciences at Washburn University in Topeka, KS. Munzer first joined the university as director of the respiratory therapy department in 1984 and was named chair of the allied health department in 1997. She was named interim associate vice president for academic affairs in 2011 and interim dean of the School of Applied Studies in 2013.

Harold Oglesby, RRT, received one of 10 Georgia Hospital Heroes Awards bestowed by the Georgia Hospital Association late last year. The manager at St. Joseph's/Candler Hospital in Savannah was honored for going above and beyond for his patients, co-workers, and community.

Long-time patient advocate **Barbara Rogers** lost her battle with lung disease in December. The founder of BREETHEZY, a national respiratory education, recovery, and support program for people with respiratory illnesses, Rogers also served as president of the National Emphysema/COPD Association and was a former chair of the AARC's Consumer Roundtable. She received the Dr. Charles H. Hudson Award for Cardiopulmonary Public Health from the American Respiratory Care Foundation in 2003.

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

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

- New CRCE for the new year — www.aarc.org/headlines/14/01/crce.cfm
- Learn the basics of discharge planning — www.aarc.org/headlines/14/01/cms.cfm

COPD Linked to Cognitive Impairment

People with COPD are significantly more likely to develop mild cognitive impairment (MCI) that includes memory loss, find investigators from the Mayo Clinic who looked at about 2,000 people 70–89 years old in the Mayo Clinic Study on Aging. About 1,600 were cognitively normal, 317 had MCI, and 288 had COPD.

Nearly a two-fold increase in the odds of MCI was seen in the people with COPD, and the longer someone had the condition, the greater the risk. "COPD is reversible in early stages, especially in smokers," lead author Balwinder Singh, MD, was quoted as saying. "These findings are important because they highlight the importance of COPD as a potential risk factor for MCI and will hopefully lead to early intervention to prevent incidence or progression."

The study was funded in part by a grant from the National Institutes of Health and was published in the *Mayo Clinic Proceedings*. ■

Predicting Acute Mountain Sickness by Measuring Saturations

This time of year many people are heading up into the mountains for family ski vacations, and many of them will experience altitude sickness during the trip. Most will quickly recover; but for some people, high altitudes can lead to a potentially deadly condition known as acute mountain sickness (AMS).

European researchers presenting at EuroEcho-Imaging 2013 last fall outlined a new test that could help predict which people will be affected by the condition. By combining oxygen saturation with the tricuspid annular plane systolic excursion (TAPSE), they found that a TAPSE value <28 mm and an O_2 saturation <87% after four hours of exposure to high altitude could predict who would develop AMS the day after. The test had a negative predictive value of 94% and a sensitivity of 92%.

"If these results are confirmed by larger studies, it will be possible to identify vulnerable individuals and suggest particular behaviors and drugs only to this subgroup," study author Dr. Rosa Maria Bruno was quoted as saying. ■

Equal Opportunity Condition

A University of Kentucky researcher reviewed some of the reasons why COPD is now becoming just as much a woman's disease as a man's in a recent issue of *Translational Research*. According to Dr. David Mannino:

- In developing countries, the prevalence of female smokers is predicted to increase to 20% by 2025, up from only 9% in 2000.
- Environmental risk factors, such as exposures to occupational dusts or chemicals and air pollution, may be due to women taking on historically male jobs.
- Newer evidence suggests men and women differ in susceptibility to smoking, possibly because of hormonal mechanisms. For example, female sex hormones have been known to influence airway function, and during childhood, girls experience a larger reduction in lung function than boys when exposed to either tobacco smoke or environmental air pollution.
- The clinical presentation, comorbidities, and disease perception of COPD may vary between the genders and ultimately influence treatment decisions and strategies.

"Over my 30 years of treating patients, I've seen the number of women with COPD increase dramatically to where they now outnumber the number of men with COPD in my practice," Dr. Mannino noted. ■

CDC Proves the Flu Vaccine Works

Since 2010, the Advisory Committee on Immunization Practices has recommended that all persons aged six months and older receive the annual influenza vaccine. In 2013, the Centers for Disease Control and Prevention (CDC) published a model to quantify the annual number of influenza-associated illnesses and hospitalizations averted by influenza vaccination. Using that model with 2012–2013 influenza season data, they estimate that vaccination resulted in 79,000 (17%) fewer hospitalizations than otherwise might have occurred.

Based on estimates of the percentage of influenza illnesses that involve hospitalization or medical attention, vaccination also prevented approximately 6.6 million influenza illnesses and 3.2 million medically attended illnesses. While influenza vaccination during the 2012–2013 season produced a substantial reduction in influenza-associated illness, fewer than half of eligible individuals were vaccinated. The CDC believes higher vaccination rates would have resulted in prevention of a substantial number of additional cases and hospitalizations. ■

AANMA Announces New CEO

AARC partner organization, the Allergy & Asthma Network Mothers of Asthmatics (AANMA), is welcoming a new CEO. Tonya Winders, who has served as AANMA's chief operating officer since January 2013, succeeds AANMA founder Nancy Sander, who led the organization for 28 years before her retirement last September.

Winders came to AANMA after 15 years in leadership roles in the allergy and asthma industry, where she worked tirelessly to ensure access to effective diagnostic and treatment tools for patients. She earned her bachelor's of science degree in business and human resources management and her master's degree in business administration and marketing from Louisiana State University.

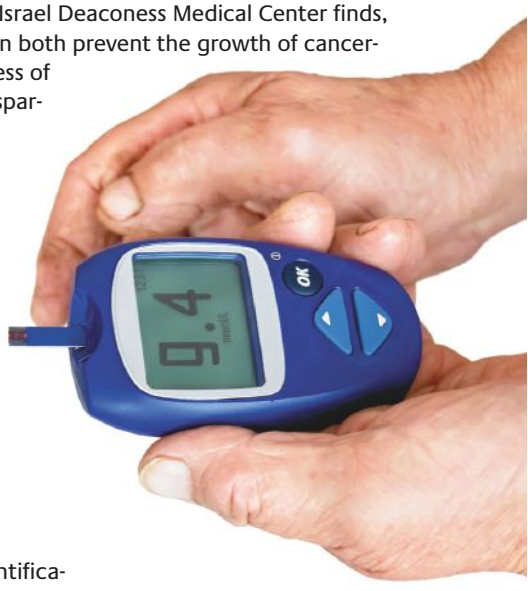
AANMA board chair Michael T. Amato, who also chairs the board of the American Respiratory Care Foundation, noted, "Working closely with Tonya during the last year, I know that her expertise and proven leadership will build on AANMA's strong foundation and position the organization for the future." ■

STRANGE BUT TRUE…

Old breath: University of Utah researchers who studied the breathing patterns of monitor lizards are pushing back the clock on the development of the one-way airflow common in birds. Their findings suggest one-way breathing could have emerged as early as 270 million years ago.

Some good with the bad: Carbon monoxide may have deleterious effects on the body. But a new study out of Beth Israel Deaconess Medical Center finds, in cell culture and animal models, it can both prevent the growth of cancerous tumors and amplify the effectiveness of chemotherapy 1,000-fold — all while sparing noncancerous tissue from chemo's sometimes debilitating side effects.

No more finger pricks? Investigators from Western New England University have invented a breathalyzer that could help diabetics control their blood sugar by measuring the amount of acetone in their breath. About the size of a book, the device uses nanometer-thick films consisting of two polymers that react with acetone. This crosslinks the polymers and alters the physiochemical nature of the film, providing a quantification of the acetone and, therefore, blood-glucose levels. ■



Back to the Future

The H2N2 influenza virus that killed millions of people worldwide is still out there and poses a particular threat to those under the age of 50. That's the take-home message from new research out of St. Jude Children's Research Hospital that included 22 H2N2 avian viruses collected from domestic poultry and wild aquatic birds between 1961–2008, making it the most comprehensive analysis yet of avian H2N2 viruses.

In addition to finding that the viruses could infect human respiratory cells, the investigators identified several strains that also infected and spread among ferrets, which are susceptible to the same flu viruses as humans. Researchers found evidence the viruses were susceptible to current antiviral medications and could likely be controlled with an available prototype vaccine.

"This study suggests H2N2 has the characteristics necessary to re-emerge as a significant threat to human health in part because most individuals under the age of 50 lack immunity to the virus," author Robert Webster, PhD, was quoted as saying. "This highlights the importance of continued surveillance of viruses circulating in animals and additional research to enhance our ability to identify viruses that are emerging health threats."

The study was published in an online edition of the *Journal of Virology* late last year. ■

Predicting Which Patients Are at Risk for Readmission

University of Pennsylvania researchers who conducted a study to see which factors were most closely related to a subsequent hospital admission for discharged patients found one factor stood out from the rest: having two or more previous hospital admissions within the past 12 months. The risk factor was then incorporated into the electronic health record at their hospital, and a follow-up study found patients who were flagged as readmission risks using the automated tool were readmitted 31% of the time. That compared to 11% for those who were not flagged.

"The results we've seen with this tool show that we can predict, with a good deal of accuracy, patients who are at risk of being readmitted within 30 days of discharge," lead author Charles A. Baillie, MD, was quoted as saying. "With this knowledge, care teams have the ability to target these patients, making sure they receive the most intensive interventions necessary to prevent their readmission."

The original study was based on two years' worth of retrospective data and also included variables like visits to the emergency department, previous 30-day readmissions, and the presence of multiple medical disorders. The number of prior admissions was the best predictor of subsequent admission. The investigators published their findings in the December edition of the *Journal of Hospital Medicine*. ■

MORE GRAPHIC WARNINGS ON CIGARETTES DESERVE A SECOND LOOK

Contrary to findings from the U.S. Food and Drug Administration, if the United States were to adopt the graphic warnings on cigarette packages used in Canada, smoking rates here could drop by as much as 4.7%, report University of Illinois at Chicago researchers publishing online in *Tobacco Control*.

They used statistical methods to compare smoking rates in the United States and Canada for a nine-year period before and after the graphic warning labels were introduced in Canada nearly a decade ago. The price of cigarettes was factored into the analyses. Results showed the regulatory impact analysis used by the FDA to gauge the effectiveness of Canada's graphic warning labels to be inaccurate. The FDA had estimated only a 0.088% reduction in smoking rates after graphic warning labels were mandated in Canada. The new study put the percentage at between 2.9 and 4.7%. If similar results were seen here, that could mean 5.3 to 8.6 million fewer smokers.

The authors hope their findings will spur the FDA to revisit the idea of graphic warnings on cigarette packages in the United States. ■

Researchers Note Possible CPAP Alternative for Noncompliant Patients

Mild electronic stimulation therapy to the upper airway during sleep using an implantable electronic stimulation device could be an alternative to continuous positive airway pressure (CPAP) in patients with obstructive sleep apnea (OSA) in the future, report researchers from University Hospitals Case Medical Center in Cleveland, OH.

They compared outcomes among 126 patients with moderate-to-severe OSA who had proved unable to accept or adhere to CPAP therapy. Patients were enrolled in the study only if they had a body mass index under 32 and evidence that their sleep-related obstruction may be at the level of the tongue.

At 12 months, a 68% reduction was seen in the median apnea-hypopnea index (AHI) score, and the oxygen desaturation index score decreased by 70%. Most participants reported a reduction of sleep apnea symptoms and improved quality of life as well.

From there, a substudy compared 23 participants who continued with the therapy with 23 who had the therapy withdrawn for a week. The withdrawal group experienced a sharp rise in median AHI score, along with snoring and fatigue, indicating that the stimulation by the device was the effective agent.

The study was published in the January 9 edition of the *New England Journal of Medicine*. ■

RESEARCHERS USE HUMAN STEM CELLS TO MAKE FUNCTIONAL LUNG CELLS

A team of investigators from Columbia University Medical Center has succeeded in transforming human stem cells into functional lung and airway cells. The discovery, which was published in a recent issue of *Nature Biotechnology*, could have a major impact on a wide range of lung conditions, including generating lung tissue for transplantation.

The research builds on a 2011 discovery of a set of chemical factors that can turn human embryonic stem (ES) cells or human induced pluripotent stem (iPS) cells into anterior foregut endoderm — precursors of lung and airway cells. In the current study, Hans-Willem Snoeck, MD, PhD, and his colleagues found new factors that can complete the transformation of human ES or iPS cells into functional lung epithelial cells. The resultant cells were found to express markers of at least six types of lung and airway epithelial cells, particularly markers of type 2 alveolar epithelial cells, which produce surfactant.

The investigators believe their discovery could have particularly big implications for lung conditions like idiopathic pulmonary fibrosis, for which there are currently no effective treatments, because type 2 alveolar epithelial cells are thought to play a major role in those conditions. ■

Industry Watch

Duke Medicine launches new ETS research program

Duke Medicine has established a new research program to investigate the relationship between exposure to environmental tobacco smoke (ETS) during pregnancy and childhood and attention deficit hyperactivity disorder in children. Funded jointly by the National Institute of Environmental Health Sciences and the EPA, the Center for Study of Neurodevelopment and Improving Children's Health following Environmental tobacco Smoke exposure, or "NICHES," at Duke will receive approximately $7.8 million until 2018.

InspiRX receives NIH/SBIR grant

InspiRx Pharma, a New Jersey-based drug/device company, has been awarded a National Institutes of Health Small Business Innovation Research phase I grant for the purpose of developing an MDR-TB cocktail to be used in the global fight against tuberculosis. The development by InspiRx will combine its patented aerosol, Interferon Gamma, with a number of currently available TB drugs, with delivery by an InspiRx proprietary platform, according to CEO Michael Amato.

GSK, Theravance announce study results

According to GlaxoSmithKline Plc and Theravance Inc., their combination of the inhaled corticosteroid fluticasone furoate (FF) and the long-acting bronchodilator vilanterol (VI) met its primary efficacy end point of improving lung function in adult asthma patients in the United States in a late-stage trial. The double-blind, parallel group, multicenter study was conducted over a period of 12 weeks to assess the efficacy and safety of FF/VI 200/25 mcg inhalation powder, FF/VI 100/25 mcg inhalation powder, and FF 100 mcg inhalation powder. The study evaluated 990 patients with moderate to severe persistent asthma. Patients were randomized to one of the three treatments taken once daily in the evening.

Oregon rural network receives AHRQ grant

The AHRQ has awarded a two-year, $500,000 grant to the Oregon Rural Practice-based Research Network to implement self-management support tools with patients and health care practices. Self-management support assists patients and providers by promoting and delivering education to increase patients' skills to cope with the burden of chronic illness. The study will assess the impact of self-management support tools on patients and their health care teams and aims to identify factors associated with successful implementation of disease self-management programs in primary care.

Acutronic adopts Masimo technology

Acutronic Medical Systems AG has integrated Masimo SET® Measure-through Motion and Low Perfusion™ pulse oximetry into Acutronic's fabian HFO Neonatal Critical Care Ventilator for improved patient outcomes. "The integration of Masimo SET within Acutronic's fabian HFO ventilator is providing caregivers the ability to better assess their patients' oxygenation status, even during challenging conditions of patient motion and low perfusion," according to Roland Hotz, president of Acutronic.

Report focuses on respiratory diseases

A new report from the Forum of International Respiratory Societies (FIRS) is providing an overview of lung health around the globe. "Respiratory Diseases in the World. Realities of Today — Opportunities for Tomorrow," features five major disease areas that are of immediate and greatest concern. It also gives 10 recommendations that FIRS considers essential to reducing the burden of respiratory diseases.

Cornerstone debuts new CF treatment

Cornerstone Therapeutics Inc. has launched BETHKIS® (Tobramycin Inhalation Solution), a nebulized therapy indicated for the management of CF patients with *Pseudomonas aeruginosa*. BETHKIS contains

300 mg of tobramycin — the most widely used aerosolized antibiotic in patients with CF. Their concentrated formulation delivers the same amount of antibiotic as other available nebulized tobramycin products (300 mg) in only 4 mLs, allowing nebulization in approximately 15 minutes via the PARI LC® PLUS, according to the company. However, safety and efficacy have not been demonstrated in patients under the age of six years, patients with FEV_1 <40% or >80% predicted, or patients colonized with *Burkholderia cepacia*.

Universities receive NHLBI grant for sleep research

A $7.7 million grant from the National Institutes of Health to Brigham and Women's Hospital and Case Western Reserve University School of Medicine will establish the NHLBI National Sleep Research Resource, a comprehensive, easily accessible national repository of sleep data. The five-year grant will make data from more than 50,000 sleep studies available to sleep researchers across the country. "This project represents a true collaborative partnership among informaticians, data scientists, and clinical investigators," says GQ Zhang, PhD, division chief of medical informatics and professor of computer science at Case Western.

Insmed completes patient enrollment in TB study

Insmed Incorporated has completed patient enrollment in its Phase 2 clinical study of ARIKACE® (liposomal amikacin for inhalation) for patients with recalcitrant nontuberculous mycobacterial (NTM) lung infection in the United States and Canada. ARIKACE has received FDA orphan drug, qualified infectious disease product and fast track designations for the treatment of NTM lung infections. The primary efficacy endpoint in the study is the measurement of the change in mycobacterial density on a seven-point scale from baseline to the end of the randomized portion of the trial on day 84.

S-TARget achieves proof of concept for new drug

S-TARget therapeutics has achieved clinical proof of concept for its drug candidate SG100 in non-human primates. SG100 is being developed for the prevention and therapy of severe allergic asthma caused by house dust mite allergens. Dr. Michael van Scott from East Carolina University led the study and said: "Our group has been performing pre-clinical assessments of respiratory therapeutics in non-human primates since 1998 with drugs from several renowned international pharma and biotech companies. SG100 was the first drug that was able to significantly change both early and late asthma responses."

MD Anderson to study asthma drug

Research on an aerosol that jump-starts a rapid immune response to stifle viral respiratory infections before they can provoke asthma attacks has earned major funding from the NIH. The NIH named Scott Evans, MD, associate professor of pulmonary medicine at The University of Texas MD Anderson Cancer Center, a New Innovator award winner. The award is part of the institute's High Risk High Reward program to address major challenges in biomedical research. The five-year, $2.4 million grant will fund preclinical research in lung cells and mouse models, which is expected to translate to clinical trials for the prevention of asthma attacks.

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

March 2–4
Birmingham, Alabama
Alabama Society for Respiratory Care Annual Meeting
Contact: www.ALSRC.org

April 2
Topeka, Kansas
Kansas State Society Seminar
Contact: Suzanne Bollig, (785) 623-5376

April 3
Ogden, Utah
Utah State Society Seminar
Contact: utahsrc@gmail.com, (801) 626-7141

April 9–11
Big Sky, Montana
Annual Montana State Respiratory Therapy Conference
Contact: Pattie Stefans, (406) 559-6482, www.msrcmt.com

April 13–15
Spokane, Washington
The Respiratory Care Society of Washington's 41st Annual Pacific Northwest Regional Respiratory Care Conference and Scientific Assembly
Contact: Garth Arkell, mlungs@yahoo.com; Patti Martin, bapjmartin82@hotmail.com; www.rcsw.org

April 23–25
Baton Rouge, Louisiana
LSRC 44th Annual Educational Meeting & Exhibits
Contact: Raymond Pisani

April 24
West Des Moines, Iowa
IaSRC Lung Conference
Contact: kimberlydkuiper@gmail.com, (605) 595-5333

April 30 – May 2
Vail, Colorado
2014 State Conference
Contact: www.colosrc.org

May 1–3
Scottsdale, Arizona
AARC's and the American Sleep & Breathing Academy's Sleep & Wellness 2014: A Conference for Professionals
Contact: www.americansleepandbreathingacademy.com

May 5–6
Minot, North Dakota
North Dakota Society for Respiratory Care Annual Spring Convention
Contact: Cherri S. Larson, www.ndsrc.org

May 14–15
Portland, Maine
Maine Society for Respiratory Care's annual conference
Contact: Amanda S. Albee, amandaalbee@gmail.com, www.mesrc.org

May 28–30
Oak Brook Terrace, Illinois
46th Conference & Exposition, Respiratory Care
Contact: www.isrc.org or Audrea Hardwicks-Williams, (773) 827-5855

September 16
Rapid City, South Dakota
South Dakota State Respiratory Conference
Contact: Sandy Brown, (605) 328-2436

October 1
Hot Springs, Arkansas
43rd Annual Arkansas Society for Respiratory Care State Meeting
Contact: John Lindsey, (501) 620-3281

October 9
Bloomington, Indiana
Indiana Society Seminar
Contact: pingle@in-isrc.org, (317) 962-5058

Other Meetings

May 1–2
Columbus, Ohio
5th Annual Pediatric Asthma Conference
Contact: Nationwide Children's Hospital, (614) 355-0676, www.NationwideChildrens.org/courses-conferences

May 16–21
San Diego, California
ATS 2014: Pulmonary, Critical Care, and Sleep Medicine
Contact: http://conference.thoracic.org/2014/

Submissions for the next available issue are due March 19.

For information on submitting calendar events, contact: Beth Binkley, AARC Times
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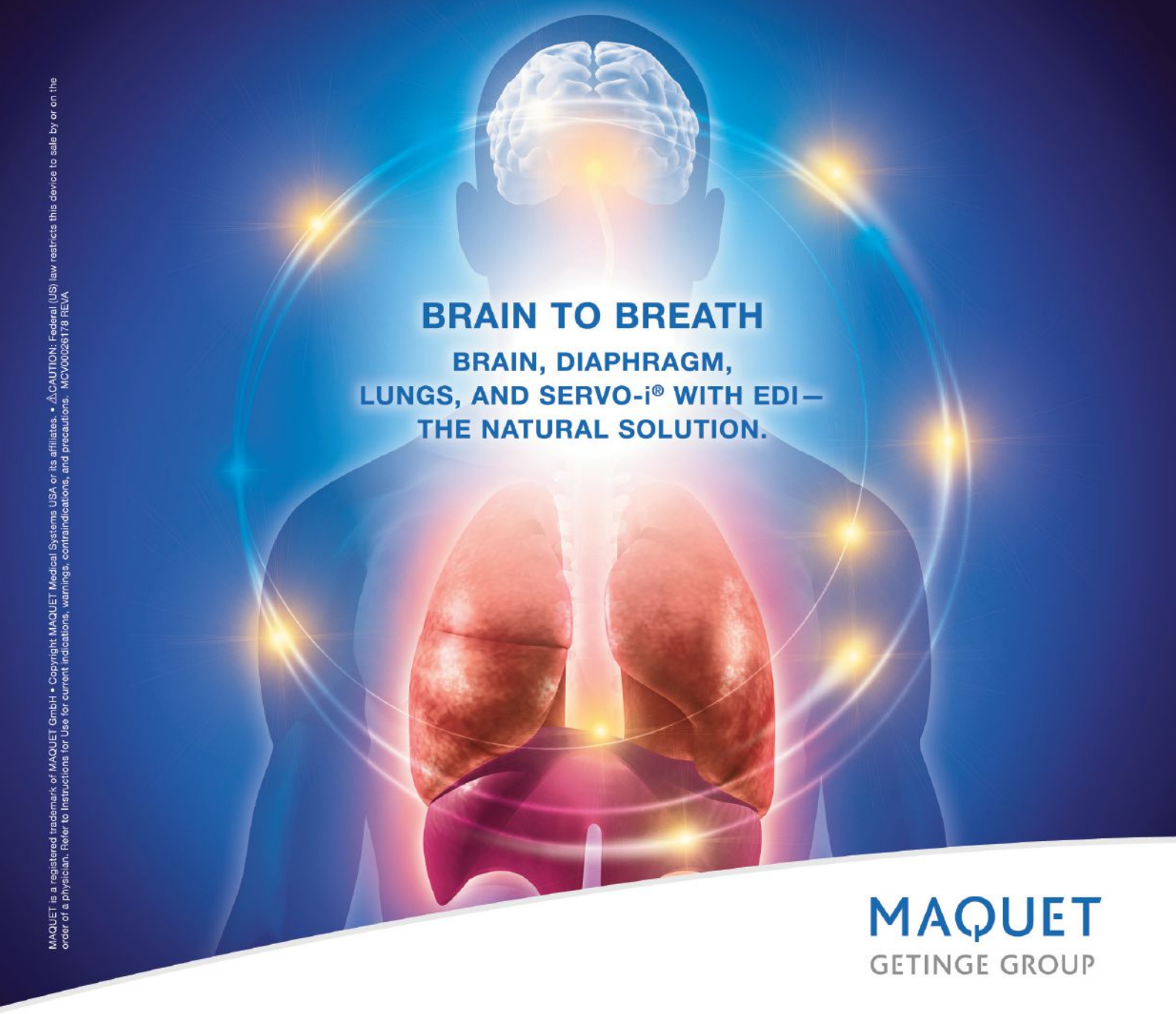

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1. Piquilloud L, Vignaux L, Bialais E, et al. Neurally adjusted ventilatory assist improves patient-ventilator interaction. *Intensive Care Med.* 2011 Feb;37(2):263-71.
2. Sassoon CSh, Caiozzo VJ. Bench-to-bedside review: Diaphragm muscle function in disuse and acute high-dose corticosteroid treatment. *Critical Care.* 2009;13(5):221.
3. de la Oliva P, Schüffelmann C, Gómez-Zamora A, et al. Asynchrony, neural drive, ventilatory variability and comfort: NAVA versus pressure support in pediatric patients. *Intensive Care Med.* 2012 May;38(5):838-46.

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