An Official Publication of the American Association for Respiratory Care
April 2019 Vol. 43, Issue 4 www.aarc.org $11.50

AARC Times

2019 AARC Summer Forum

Ft. Lauderdale, Florida, July 20–22

Can Respiratory Care Survive as a Profession?

Mobi™

Portable oxygen concentrator

Oxygen is life

Mobi is my reassurance

Introducing portable oxygen from ResMed

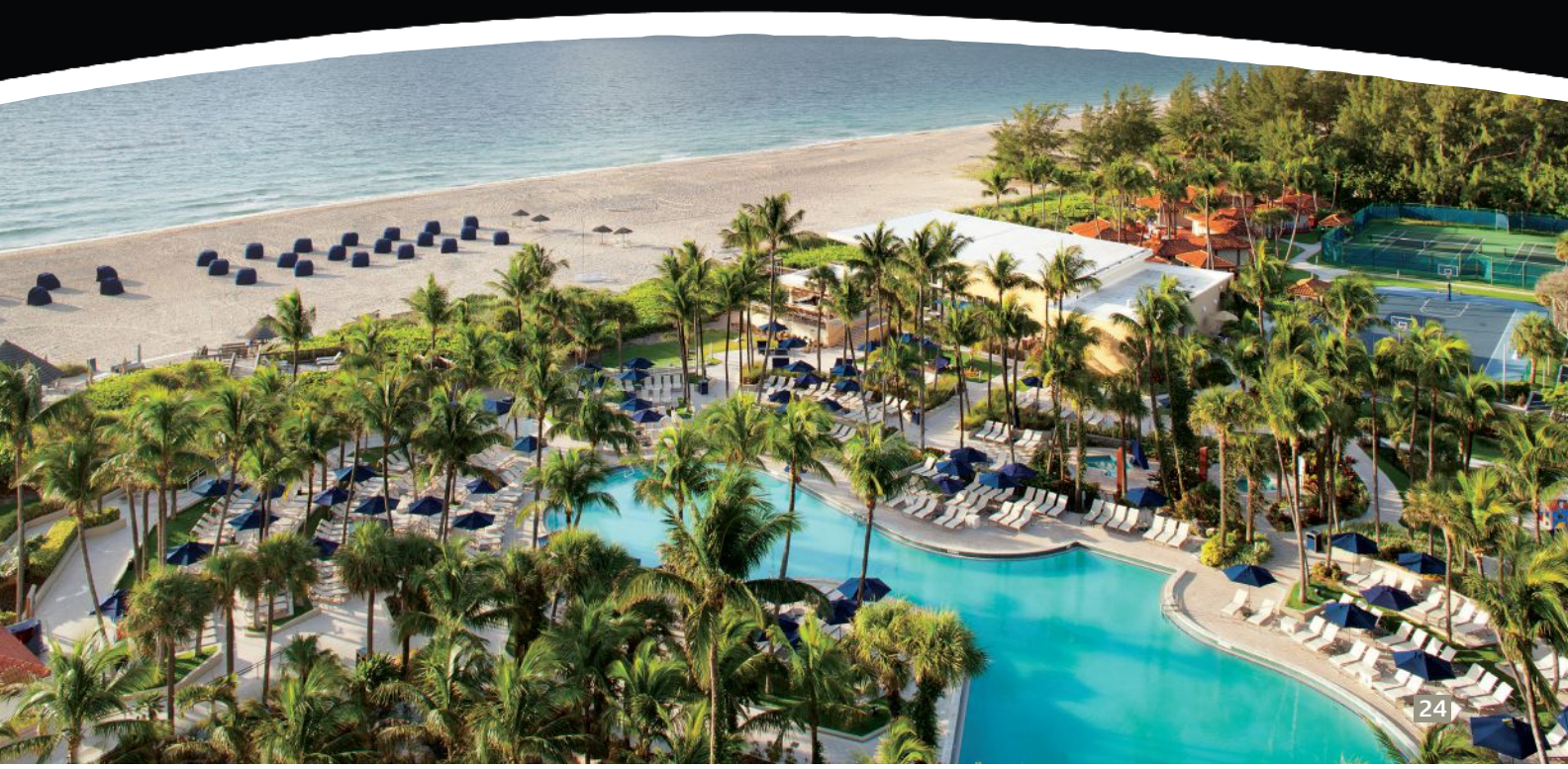
We're excited to welcome the ResMed Mobi portable oxygen concentrator to our award-winning family of respiratory solutions. Mobi features the ideal combination of oxygen volume, weight and battery life needed to help COPD patients live an active life.

Learn how Mobi can be the perfect solution for your business at ResMed.com/MobiPOC

ResMed

Table of Contents

April 2019
Volume 43, Issue 4



AARC Strategic Plan

The American Association for Respiratory Care has a Strategic Plan that includes its Mission and Vision Statements for 2015–2020.

Bookmark this page: http://www.aarc.org/member_services/mission/.

American Association for Respiratory Care

Editor
Marsha Cathcart, BA

Managing Editor
Douglas Laher, MBA, RRT, FAARC

Contributors
Debbie Bunch, BA

Manager of Marketing and Production
Jeanette Chawdhury, MBA

Graphic Designers
Joyce Havins
Michelle Kennedy, BA

Director of Business Development
Sarah Vaughn, BSRC, RRT

Advertising Rates and Media Information
Contact: phil.ganz@aarc.org
Phil Ganz, 48 Abbey Woods Ln., Suite 100, Dallas, TX 75248
Voice (972) 991-4994
Fax (888) 206-9006

Advertising Materials
Send production materials for AARC publications to advertising@aarc.org or AARC
9425 N. MacArthur Blvd.,
Suite 100
Irving TX 75063
c/o Advertising Department
Voice (972) 243-2272
Fax (972) 484-2720

AARC Times and Respiratory Care — official publications of the AARC

Daedalus Enterprises, Inc.
9425 N. MacArthur Blvd.,
Suite 100
Irving, TX 75063
Voice (972) 243-2272
Fax (972) 484-2720

Publisher
Thomas J. Kallstrom, MBA, RRT, FAARC

Printed in USA

Meet the AARC Staff

Heather Willden

Communications Coordinator
heather.willden@aarc.org

Grady Peters

Network Administrator
grady.peters@aarc.org

Jeanette Chawdhury

Marketing and Production Manager
jeanette.chawdhury@aarc.org

Tim Myers

Chief Business Officer
timothy.myers@aarc.org

Dräger

Advanced technology for acute and long-term care

Savina® 300 Select – Software 5.0 Release

Dräger Savina 300 provides respiratory support for adult and pediatric patients with a diverse range of basic and advanced modes of ventilation. When critical moments arise and performance is key, the Savina 300 provides reliability you can trust and long-term value for both acute care and chronic care environments.

For more information, please visit: www.draeger.com/savina300select or call 1-800-437-2437

Dräger. Technology for Life®

Information Contacts:

AARC Membership or Other AARC Services: American Association for Respiratory Care • 9425 N. MacArthur Blvd., Suite 100, Irving, TX 75063 • (972) 243-2272 • Fax (972) 484-2720 • www.AARC.org

Respiratory Therapist Credentialing & Registration: National Board for Respiratory Care • 10801 Mastin Street, Suite 300, Overland Park, KS 66210 • (913) 895-4900 • Fax (913) 712-9283 • www.nbrc.org

Accreditation of Education Programs: Commission on Accreditation for Respiratory Care • 1248 Harwood Rd., Bedford, TX 76021-4244 • (817) 283-2835 • Fax (817) 354-8519 • www.coarc.com

Grants, Scholarships, Community Projects: American Respiratory Care Foundation • 9425 N. MacArthur Blvd., Suite 100, Irving, TX 75063 • (972) 243-2272 • Fax (972) 484-2720 • www.arcfoundation.org

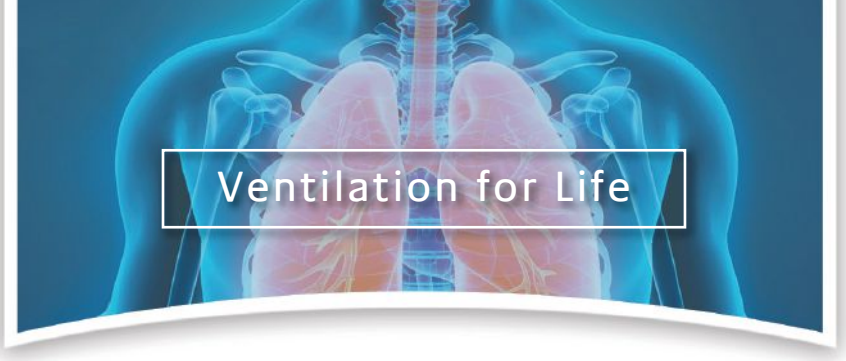
AARC Times **(USPS 491-930)** (ISSN 0893-8520) is a monthly publication of Daedalus Enterprises, Inc., for the American Association for Respiratory Care.

Periodicals Postage: Paid at Irving, TX, and at additional mailing offices. POSTMASTER: Send form 3579 to *AARC Times*, Daedalus Enterprises, Inc., 9425 N. MacArthur Blvd., Suite 100, Irving, TX 75063-4706.

Change of Address: Six weeks' notice is required. AARC members should include their membership number when submitting an address change. Nonmember subscribers should provide old mailing label and new address. Send changes to *AARC Times*, Daedalus Enterprises, Inc., 9425 N. MacArthur Blvd., Suite 100, Irving, TX 75063-4706. Periodicals postage paid at Irving, TX.

Article and Feature Contribution: *AARC Times* welcomes AARC member contributions of feature articles and information for the regular columns. All materials should be submitted via email to Editor Marsha Cathcart at cathcart@aarc.org. Letters from members will be considered for publication if they relate to specific articles appearing in *AARC Times* within the last three months. Editorials may be published if they are of interest to the AARC membership. The editor reserves the right to edit letters and articles without changing their meaning in order to suit legal and space requirements.

Subscriptions: Individual subscriptions are available for $90 per year (12 issues) in the United States or Puerto Rico; $125 per year in all other countries. Airmail postage is an additional $134 per year. Non-member Institution subscription $140 per year. Member rates available at www.AARC.org. Single copies, current and back issues, if available, are $11.50. Write *AARC Times*, Daedalus Enterprises, Inc., 9425 N. MacArthur Blvd., Suite 100, Irving, TX 75063-4706. Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by Daedalus Enterprises, Inc.



High-Flow Nasal Cannula in Pediatrics: Current Uses and Opportunities

by Ryan M. Sharkey, MSc, RRT, RRT-NPS

High-flow nasal cannula (HFNC) therapy in pediatrics, including full-term infants and older, has gained widespread acceptance for managing respiratory failure traditionally requiring noninvasive ventilation. The control of F_{IO_2} and set flow to meet or exceed patient inspiratory flow demand allows for the delivery of higher concentrations of oxygen than a standard low-flow nasal cannula. The addition of humidity to gas flow improves patients' tolerance of higher gas flows. There are several methods of delivering high-flow through dedicated delivery devices, high flow kits in combination with a heater and flowmeter attached to a blender, and some mechanical ventilators deliver HFNC therapy. The precise control of F_{IO_2}, the ability to set flow, and the tolerability of HFNC make it an attractive choice for oxygen and flow delivery.

about the author...

Ryan M. Sharkey, MSc, RRT, RRT-NPS is the Children's Hospital Clinical Coordinator at the University of Virginia Medical Center in Charlottesville, VA.

Gas conditioning

Heating and humidifying inspired gas during HFNC therapy reduces upper airway dryness that can be caused by cold dry gas flow, improving patient tolerance and enhancing mucociliary clearance.[1] Pulmonary compliance and airway conductance are also improved with heated and humidified gas flow when compared to unheated and unhumidified gas flow.[2] Heating and humidifying inspired gas also have been linked to reduced metabolic cost of gas conditioning by patients.[1,2]

Generated pressure

Delivered pressure to the upper airway during HFNC is frequently referenced by clinicians in the health care literature. This pressure is dependent on clinician-set flow, patient weight/size, and leaks. Increasing clinician-set flow can augment pressure transmitted to the upper airway based on the amount of leak from the mouth and around the interface from the nares. Manufacturers of high-flow interfaces have recommended a 50% occlusion of the nares by the cannula prongs to allow for exhalation. There is a risk of uncontrolled expiratory pressure delivered with HFNC, although the fit of the interface has an important role in the regulation of expiratory airway pressure. Pediatric HFNC setups typically incorporate a pressure-relief valve to regulate high circuit pressure, some in excess of 40 cm H_2O.[3] The airway pressure generated from HFNC is often compared to nasal CPAP in infants. Nasal CPAP maintains a constant distending pressure to the airway through a closed circuit, in contrast to the open circuit used with HFNC, which leads to less control of upper airway pressure.[4] In bench study simulations, leakage from the mouth increased dead space washout of CO_2 in both HFNC and nasal CPAP airway models.[4] CO_2 washout was present in HFNC with only a leak around the interface.[3,4] These differences in CO_2 washout may offer the possibility for HFNC to be selected based on the goals of therapy and assessment of the pediatric patient.

Indications for HFNC

High-flow therapy is commonly used in infants with bronchiolitis in an effort to treat hypoxemic respiratory failure.[5] Prior to the rise in popularity of HFNC, bronchiolitis-associated hypoxemic respiratory failure management consisted of invasive positive pressure ventilation, or CPAP. CPAP is thought to mechanically splint small airways open that may be constricted due to inflammation, leading to air trapping associated with bronchiolitis.[6] HFNC is thought to have a similar effect through the reduction in airway resistance and nasopharyngeal dead space in infants. However, there does not appear to be a clear therapeutic

benefit of HFNC over CPAP in the management of bronchiolitis.[7,8] The ease of use and patient comfort make HFNC suitable for first-line management of hypoxemic respiratory failure secondary to bronchiolitis. Escalation in therapy may be necessary in moderate to severe bronchiolitis.

In addition to bronchiolitis, extubation to HFNC has also become a popular use of HFNC therapy. Infants after cardiac surgery have shown benefit in both prevention of extubation failure and reducing work of breathing.[9,10] HFNC is also used in pediatric patients with asthma, pneumonia, post-extubation, and pediatric ARDS, but no studies have shown results to support HFNC in these conditions.[11]

Initiation of HFNC

Recently published articles have used 2 L/kg/min as the set flow for infants with bronchiolitis.[7,8] This may be the maximum flow that is tolerated by infants.[12] Gas flow set at 2 L/kg/min appears to improve work of breathing over lower ranges and seems to be safe when set flows are under 10 L/min.[8,13] Setting gas flow based on weight may lead to higher set flows and should be done judiciously.[2]

Clear clinical goals should be made prior to the initiation of high-flow therapy to determine the most appropriate interface, to note the response to therapy, and to alert team members to the need for escalation or de-escalation of care.

Maintenance and weaning

In a survey of hospital-based respiratory therapists, breathing frequency was the most commonly monitored patient parameter during HFNC and 34% of respondents indicated they used respiratory rate to adjust the clinician-set HFNC gas flow.[11] Examples of published practices indicate a set gas flow preference, such as 2 L/kg/min, and F_{IO_2} titration to an SP_{O_2} target while allowing for intermittent HFNC "vacations." An alternative practice focuses on assessing the patient's work of breathing and respiratory rate to guide the titration of clinician-set gas flow.

There is a dearth of evidence supporting an optimal method for titration of HFNC therapy.[14] There is also little evidence to guide optimal titration of F_{IO_2} or set gas flow, though F_{IO_2} should be weaned quickly as tolerated by the patient. Administering flow that meets or exceeds the patient's inspiratory flow demands allows for precise delivery of up to 1.0 F_{IO_2} to the distal airways. This can lead to a cascade of toxic effects in patients receiving high F_{IO_2}, especially among those who remain hyperoxemic.[15] Respiratory therapists should give special attention to rapid F_{IO_2} reduction in patients receiving HFNC O_2 therapy.

HFNC aerosol delivery

Use of in-line nebulizers with HFNC is an attractive combination in terms of ease of delivery for patients receiving inhaled aerosol medication. Bench studies of aerosol delivery via HFNC suggests that higher flows may reduce the delivery of aerosolized particles, but human subject studies in this area are grossly limited.[16] Heliox increases particle delivery of inhaled aerosolized medications compared to oxygen alone. Vibrating mesh nebulizers are popular in conjunction with HFNC to eliminate the added flow to the circuit seen with a jet nebulizer. There are still many questions regarding the effectiveness of aerosol delivery with HFNC, but this approach offers a potential advantage when it comes to tolerability with pediatric patients.

HFNC outside the ICU

HFNC use in the pediatric ICU setting is well established. Approximately 65% of hospitals use HFNC in the pediatric acute care ward.[11] Use on pediatric acute care wards is safe and can decrease hospital length of stay and costs without occupying an ICU bed.[17] One drawback to operating HFNC outside of the ICU is that reduced staff-to-patient ratios may decrease the frequency of weaning and there is a potential for the nasal cannula to come dislodged leading to hypoxemia. Guidelines and protocols on HFNC are associated with reductions in hospital length of stay, including use outside of an ICU.[17,18]

Respiratory therapist's role

There is no current standard on initiation, maintenance, or titration of support with HFNC in any population of patients. An understanding of physiology during HFNC therapy is the best approach for the management of pediatric patients who require increase in support beyond a low-flow nasal cannula. Respiratory therapists are essential in evaluating HFNC as the appropriate choice of noninvasive ventilation. A survey of 61 RTs reported that 28% of respondents indicated an RT-driven protocol is used to set flow in their hospital.[11] Respiratory therapists can be at the forefront of developing protocols or guidelines for their institution to provide quality, evidence-based patient care with HFNC. The popularity of HFNC use in infants has not led to a consensus on initiation or titration of therapy, and many variations in practice remain. RTs have an opportunity through research to make HFNC safer, to standardize management, and to improve outcomes with HFNC. ■

References

1. Milési C, Boubal M, Jacquot A, Baleine J, Durand S, Odena MP, Cambonie G. High-flow nasal cannula: recommendations for daily practice in pediatrics. Ann Intensive Care 2014;4(1):29.

2. Mikalsen IB, Davis P, Oymar K. High flow nasal cannula in children: a literature review. Scand J Trauma Resusc Emerg Med 2016;2493.
3. Nielsen KR, Ellington LE, Gray AJ, Stanberry LI, Smith LS, DiBlasi RM. Effect of high-flow nasal cannula on expiratory pressure and ventilation in infant, pediatric, and adult models. Respir Care 2018;63(2):147–57.
4. Sivieri EM, Foglia EE, Abbasi S. Carbon dioxide washout during high flow nasal cannula versus nasal CPAP support: an in vitro study. Pediatr Pulmonol 2017;52(6):792–98.
5. Walsh BK, Smallwood CD. Pediatric oxygen therapy: a review and update. Respir Care 2017;62(6):645–61.
6. Yanney M, Vyas H. The treatment of bronchiolitis. Arch Dis Child 2008;93(9):793-98.
7. Milesi C, Essouri S, Pouyau R, Liet J-M, Afanetti M, Portefaix A, Baleine J, et al. High flow nasal cannula (HFNC) versus nasal continuous positive airway pressure (nCPAP) for the initial respiratory management of acute viral bronchiolitis in young infants: a multicenter randomized controlled trial (TRAMONTANE study). Intensive Care Med 2017;43(2):209–16.
8. Weiler T, Kamerkar A, Hotz J, Ross PA, Newth CJL, Khemani RG. The relationship between high flow nasal cannula flow rate and effort of breathing in children. J Pediatr 2017;18966–71.e3.
9. Itagaki T, Nakanishi N, Okuda N, Nakataki E, Onodera M, Oto J, Nishimura M. Effect of high-flow nasal cannula on thoraco-abdominal synchrony in pediatric subjects after cardiac surgery. Respir Care 2019;64(1):10–16.
10. Richter RP, Alten JA, King RW, Gans AD, Rahman AF, Kalra Y, Borasino S. Positive airway pressure versus high-flow nasal cannula for prevention of extubation failure in infants after congenital heart surgery. Pediatr Crit Care Med 2019;20(2):149–57.
11. Miller AG, Gentle MA, Tyler LM, Napolitano N. High-flow nasal cannula in pediatric patients: a survey of clinical practice. Respir Care 2018;63(7):894–99.
12. Milési C, Pierre A-F, Deho A, Pouyau R, Liet J-M, Guillot C, et al. A multicenter randomized controlled trial of a 3-L/kg/min versus 2-L/kg/min high-flow nasal cannula flow rate in young infants with severe viral bronchiolitis (TRAMONTANE 2). Intensive Care Med 2018;44(11):1870–78.
13. Franklin D, Babl FE, Schlapbach LJ, Oakley E, Craig S, Neutze J, et al. A randomized trial of high-flow oxygen therapy in infants with bronchiolitis. N Engl J Med 2018;378(12):1121–31.
14. Riese J, Porter T, Fierce J, Riese A, Richardson T, Alverson BK. Clinical outcomes of bronchiolitis after implementation of a general ward high flow nasal cannula guideline. Hosp Pediatr 2017;7(4):197–203.
15. Numa A, Aneja H, Awad J, Ravindranathan H, Singh P, Swil K, Williams G. Admission hyperoxia is a risk factor for mortality in pediatric intensive care. Pediatr Crit Care Med 2018;19(8):699–704.
16. Ari A, Harwood R, Sheard M, Dailey P, Fink JB. In vitro comparison of heliox and oxygen in aerosol delivery using pediatric high flow nasal cannula. Pediatr Pulmonol 2011;46(8):795–801.
17. Riese J, Fierce J, Riese A, Alverson BK. Effect of a hospital-wide high-flow nasal cannula protocol on clinical outcomes and resource utilization of bronchiolitis patients admitted to the PICU. Hosp Pediatr 2015;5(12):613–18.
18. Collins C, Chan T, Roberts JS, Haaland WL, Wright DR. High-flow nasal cannula in bronchiolitis: modeling the economic effects of a ward-based protocol. Hosp Pediatr 2017;7(8):451–59.

The Second-Victim Theory

by Anthony L. DeWitt, JD, RRT, FAARC

You are out at the mall on a Saturday evening. As you are walking to your car, you see two men arguing loudly with one another. You give them lots of room, not wanting to involve yourself. Suddenly you hear gunshots. Both men run, but 15 feet away a six-year-old child falls. You run to the victim and, using your training, provide care as best you can, and you have your partner call for the police. By the time the ambulance arrives, it's pretty clear your patient is dying. He looks in your eyes with tears in his and pleads, "Help me!" He is the criminal's first victim; you have just become the second.

Everyone who works in health care has seen senseless violence and death. We often see the after-effects of it in our emergency departments. We all know that bad things happen to good, innocent people. Motor vehicle accidents, fires, and acts of violence happen every day. We do our best, but sometimes, no matter how hard we try, we do not prevail over death. It is the reason we struggle to master our craft. Death is our never-relenting opponent.

But seeing an event unfold, being in the zone of danger, and experiencing first-hand the effects of violence or trauma are themselves traumatic and can cause symptoms similar to posttraumatic stress disorder (PTSD). Ask Thomas Yoxall.

Yoxall found himself in a situation no one wants to find themselves. Driving down an interstate highway, he saw a criminal violently beating a highway patrol officer. Other cars had driven by. Yoxall stopped. He was compelled to act. He got out of his car, confronted the assailant, and ordered the criminal to stop. The criminal continued to rain down blows on the officer, who begged for help. Yoxall shot the assailant three times.

Yoxall told the *Arizona Republic* he remembered thinking after it was all over, "*You ended somebody's life today*." His mind also kept replaying the incident. Not everything. Just the final moment. He found himself reliving the event over and over in his mind. The police officer was the first victim; Yoxall became the second victim. He had to live with making a terrible choice: do something and save a life and, at the same time, end a life.

What relevance does this have to respiratory care? Fortunately, we do not have to decide whose life to save: every life is valuable. But sometimes our own actions may be at issue.

As the scenario above describes, sometimes we are not asked whether we wish to become involved. We do not get to make a choice as to what we see, hear, or do. It is part of living around other people. It carries great rewards, as does the profession. But it also carries with it risks. Therapists should do everything they can to minimize those risks in their personal and professional lives, and I have written here about why

about the author...

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

SAFE
DISPOSABLE
T-PIECE
RESUSCITATION

The safe solution for your smallest patients.

SunMed's SafeT T-piece resuscitation device is the safe solution for emergency neonatal resuscitation and CPAP. Delivering continuous oxygen flow alongside pre-set PIP and PEEP pressures enables clinicians to safely provide the necessary ventilatory support during resuscitation of infants. Designed specifically for use on the delicate lungs of premature babies and newborns under 10 kg/22 lbs.

Allows clinician to deliver consistent PIP and PEEP that meets NRP guidelines.

Exclusively distributed by Tri-anim

tri-anim.com/safet.asp

Tri-anim
Advancing Healthcare, Together

hospitals should develop plans to deal with violence in the hospital.

My purpose here is two-fold: First, if you have been a second victim, either because of what you have witnessed or because of what happened in your military service, you should seek help. Symptoms of PTSD, all well-documented now in the medical literature, arise because people suppress their emotions and feelings rather than deal with them constructively. Jason Kander, a former state official in Missouri, recently withdrew from a political race to deal with his PTSD issues. He did this, in part, because he realized that he could not help others until he himself received some help. There is no shame, there is no stigma, in admitting that you have been a second victim (or any victim, for that matter).

My second reason goes far deeper than that. It goes to your professionalism. If you have never had a near miss (eg, an errant intubation, improper ventilator setting, a medication error, etc.), then you haven't been practicing long enough. There are two kinds of therapists: those who've made a mistake, and those who eventually will.

Those situations usually transpire when it's late or you've worked a long shift. All you really want is a hot meal and a warm shower. Nothing has changed in 10 hours, and you're pretty sure nothing is going to change. But, then it does. Because you're tired, or not paying close enough attention (or because your mind is on your upcoming vacation or your sister's wedding), something slips by you. Maybe it is a blood gas result. Maybe it's a pulse oximeter reading. Maybe it's a clogged nebulizer delivering a critical medication.

Maybe a nurse or another therapist catches the error in time to avoid harm. Maybe no one catches the error, and the patient dies. No one but you knows what really happened.

If you're lucky, however, you catch your error. Your heart rate returns to normal, and you find you can breathe again.

Luck, according to the Roman philosopher Seneca, is what happens when preparation meets opportunity. Near misses are caught because we are well-educated, alert, prepared, and clinically curious. We follow protocols. We know our patients. We react to changing conditions. We use our senses, and we act sensibly. These are the genesis of luck.

I once worked with a therapist who made a terrible error in the neonatal nursery. The therapist was caught off-guard when a newly delivered neonate crashed suddenly. Instead of calmly removing the resuscitator bag and ventilating, the therapist ripped open the plastic bag, sending the parts skittering across the NICU, and then froze. Nursing staff reported the therapist stood there, for at least 10 seconds, and didn't move. When finally compelled to act, the therapist could not put together the bag, and instead of getting a different bag, kept trying to put the bag together while the patient grew steadily worse. The patient eventually expired.

That therapist left the profession. The guilt was simply too much. He was a second victim of his own error.

To avoid a finding of negligence, a person must act like a reasonable professional and do what a reasonable professional would do in that situation. They must be prepared. Preparation must include what to do when ***nothing*** works, because the law that reigns supreme in the intensive care unit is Murphy's Law. Training and in-service education should include segments on what to do when nothing works. Trainers should insist that a therapist be able to quickly diagnose an equipment failure and take immediate action, no matter whether it's a clogged nebulizer or a resuscitator bag missing a one-way valve. Professionalism not only has to involve knowing what to do (and what not to do), it has to involve practicing it. It has to involve imagining how things can go wrong, and gaming that scenario with others.

That is how you avoid becoming a second victim of your own errors. ■

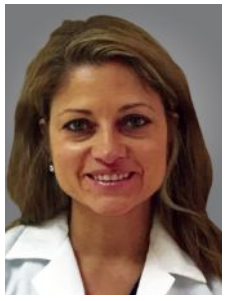
Diagnosis and Management of Septic Shock

by Maria Madden, MS, RRT, RRT-ACCS

Sepsis is a severe response to infection with a severity of diagnosis that is underestimated by many. On a global level, it is estimated that 30 million patients are diagnosed with sepsis each year, with more than 6 million deaths.[1] In the United States alone, sepsis is responsible for more than 210,000 fatalities each year, compared to 180,000 acute myocardial infarctions.[2]

Since 1991, many national organizations have created tasks forces to increase awareness, to establish quality-improvement measures, and to decrease mortality related to sepsis. These organizations also provide updated clinical information and tools for treatment guidelines. The original definition of sepsis was "suspected or known infection with two or more systemic inflammatory response criteria."[1] As clinical information has evolved, the Third International Consensus (Sepsis-3) updated the definition in 2016 to "life-threatening organ dysfunction caused by a dysregulated host response to infection."[1] In addition, septic shock was now defined as "a subset of sepsis in which underlying circulatory and cellular/metabolic abnormalities are profound enough to substantially increase mortality."[1] Subsequently, the term "severe sepsis" was no longer used.

about the author...



Maria Madden, MS, RRT, RRT-ACCS is a research coordinator at University of Maryland Medical Center/R. Adams Cowley Shock Trauma Center and a clinical specialist at ICON.

Diagnosis of Sepsis

Early diagnosis of sepsis can be lifesaving. The Surviving Sepsis Campaign (SSC): International Guidelines for Management of Sepsis and Septic Shock 2016 recommended performance improvement programs for sepsis that included training multidisciplinary clinicians to assist with screening patients.[3] This multidisciplinary approach increases collaboration among clinicians and allows for more frequent assessment of patients than other approaches.[3]

Because early recognition of sepsis is crucial, Sepsis-3 suggested using the Sequential Organ Failure Assessment (SOFA) score to assist in the identification of risk factors of increased mortality.[1] Pao_2, platelet count, and creatinine and bilirubin levels are needed to calculate the SOFA score.[4] For a quicker bedside assessment, Sepsis-3 introduced the (qSOFA). The qSOFA does not require lab results, instead relying on systolic blood pressure, respiratory rate, and mental status. In non-ICU patients, the qSOFA score can assist with predicting an elevated risk of death and extended ICU stay, but it is not designed as a to standalone warning or diagnosis of sepsis.

At the bedside, macrocirculatory assessment (i.e., hemodynamics) and treatment is the primary focus. However, even with sufficient macrocirculation, adequate microcirculation is not ensured. Microcirculatory dysfunction is defined as disturbances in blood flow at the capillary level.[5] Recently developed tools such as the sublingual tonometer can offer bedside assessment for adequate microcirculation, potentially expediting early diagnosis and treatment of microcirculatory compromise.[6]

Treatment

The best treatment for sepsis is to prevent it in the first place by quickly resolving any underlying infections and associated organ dysfunction. Once a patient is septic, treatment is based on the success of early assessment and diagnosis and quickly treating the patient. Studies have demonstrated when treatment is initiated immediately, progression to septic shock may be halted. Therefore, the

SSC has changed their septic therapy bundle to include a more aggressive approach (Table 1). In 2016, the SSC guidelines were changed from what was known as the 3-hour and 6-hour bundles to a 1-hour bundle. The 1-hour bundle recommends treating patients aggressively with fluid resuscitation if hypoperfusion is due to sepsis, followed by frequent hemodynamic assessment and administration of intravenous antibiotics within the first hour of sepsis diagnosis.[3,7] Initiation of vasoactive agents, lactate measurement, and assessment of blood cultures should also be done within the first hour. Because sepsis can progress to septic shock, the key is to ensure adequate tissue perfusion with fluid and vasoactives.

Successful resuscitation may lead to positive results for macrocirculation based on blood pressure, cardiac output, cardiac filling, and mixed venous oxygen saturation. Successful macrocirculation does not guarantee successful microcirculatory recruitment, which may lead to increased mortality rates. Therefore, it is imperative to monitor microcirculation to verify appropriate therapy. The same concept can be applied to mechanical ventilation and the lack of correlation between macroventilatory parameters and microventilatory settings.

Mechanical Ventilation

It is reported that 6–7% of septic patients will develop ARDS, while other studies report that up to 40% of ARDS patients have a diagnosis of sepsis.[8] Causes of ARDS may be a direct injury, such as pneumonia or gastric aspiration, or an indirect injury from non-pulmonary sepsis and trauma. Direct lung injury begins with an insult of the lung epithelium, whereas an indirect injury occurs in the setting of systemic disorders that diffusely damage the vascular endothelium.[9] During ARDS, to improve microventilation, adequate pressure must be applied for a sufficient period of time.[10] Better yet, this type of therapy can be applied starting at the time of intubation to protect the lung from ventilator-induced lung injury (VILI). To keep the lungs more homogenous, using a pressure/time profile that optimizes recruitment should be considered.[10] Applying the appropriate pressure for extending time with an interpretation of ventilator waveforms that give us insight to the microventilation, the TCAV can be titrated to the appropriate dose to decrease ARDS.[11]

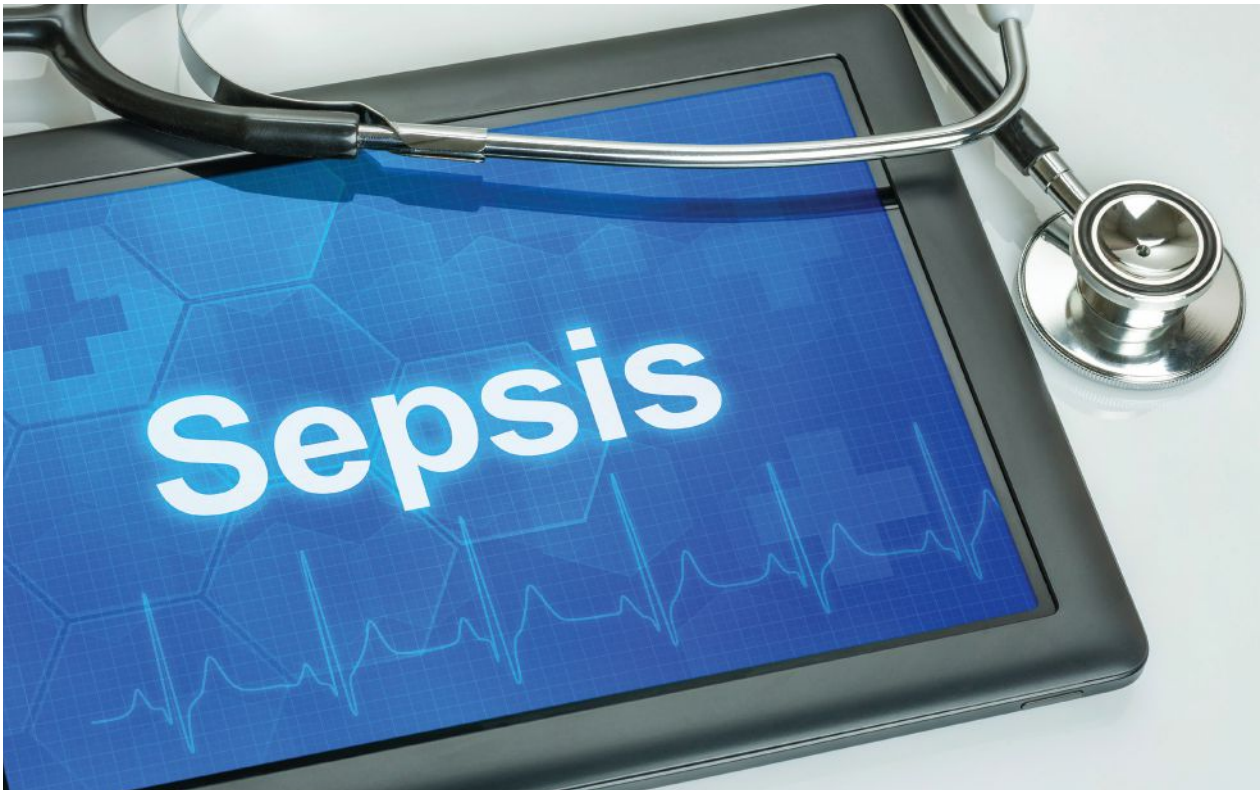
The key during mechanical ventilation is to protect the lungs from VILI. Current recommendations suggest the use of a plateau pressure (P_{plat}) <30 cm H2O, tidal volume (V_T) 4–6 mL/kg of predicted body weight, and positive end-expiratory pressure (PEEP).[8] Although the clinician sets these macroparameters and they are measured on the ventilator, are they good indicators of what is occurring at the microventilatory level? These ventilator goals focus on using the existing surface area of the lung for gas exchange without considering the microenvironment. Reducing V_T and P_{plat} will only make the ventilation occur in the more compliant lung regions and may further decrease microventilation in the less compliant regions of the lung. Similarly, the macrocirculation of the septic patient (i.e., blood pressure) is too often the focus of monitoring a patient, and the microcirculation is often overlooked due to a lack of understanding of its importance in making a difference in outcome.

Oxygen Delivery

During critical illness and sepsis, oxygen delivery must be addressed without always requiring invasive ventilation. Although oxygen can be delivered via nasal cannula or a face mask, there are limitations to the flow rates and humidification. High-flow nasal cannula (HFNC) is an oxygen device that can deliver 100% humidified air/oxygen at 37°C via a wide-bore nasal cannula at a maximum flow rate of 40–60 L/min, depending on the device. Studies show that the use of HFNC in patients with acute hypoxemic respiratory failure without hemodynamic instability.[8] In addition, noninvasive ventilation is another option for patients with respiratory failure. Prolonged use of these devices and the need for intubation after 48 hours has been shown to increase mortality rates.[12] Therefore, improved guidelines for the reassessment of patients requiring

Table 1. SSC 1-hour bundles recommendations7

- Measure lactate level. Remeasure if initial lactate is >2 mmol/L.
- Obtain blood cultures prior to administration of antibiotic.
- Administer broad-spectrum antibiotics.
- Begin rapid administration of 30 mL/kg crystalloid for hypotension or lactate >4 mmol/L.
- Apply vasopressors if patient is hypotensive during or after fluid resuscitation to maintain MP > 65 mm Hg.



prolonged or escalation of ancillary oxygenation devices are imperative for timely application of invasive ventilation.[13,14]

Respiratory Therapists' Role

In cases of sepsis and septic shock, early diagnosis and treatment are pivotal due to the high mortality rate. Respiratory care practitioners (RCPs) have an essential role in providing patient care and can contribute to the assessment and recognition of patients who may be septic. An RCP can use the qSOFA or the SOFA score if concerned that the patient may be septic and then inform the lead care provider. In the emergency room, RCPs may be one of the first clinicians to assess a patient and recognize some of the symptoms. We may also be at a patient's bedside more frequently than other clinicians based on the frequency of therapies we are providing.

Many septic patients require respiratory support with adjunct therapies such as HFNC, noninvasive ventilation, or invasive mechanical ventilation. As RCPs, we are a critical link in preventing and recognizing sepsis. Therefore, it is vital that we are patient advocates and drive for appropriate care to maintain oxygenation and ventilation and to minimize VILI. ■

References

1. Singer M, Deutschman CS, Seymour CW, et al. The Third International Consensus definitions for sepsis and septic shock (Sepsis-3). JAMA. 2016;315(8):801-810.
2. Sherwin R, Farcy DA, Chiu WC, et al. Sepsis and septic shock. In: Critical Care Emergency Medicine, 2nd ed. New York: McGraw-Hill Education, 2013.
3. Rhodes A, Evans LE, Alhazzani W, et al. Surviving Sepsis Campaign: international guidelines for management of sepsis and septic shock: 2016. Crit Care Med 2017;45(3):486-552.
4. Jones AE, Trzeciak S, Kline JA. The Sequential Organ Failure Assessment score for predicting outcome in patients with severe sepsis and evidence of hypoperfusion at the time of emergency department presentation. Crit Care Med 2009;37(5):1649-1654.
5. Østergaard L, Granfeldt A, Secher N, et al. Microcirculatory dysfunction and tissue oxygenation in critical illness. Acta Anaesthesiol Scand 2015;59(10):1246-1259.
6. Palágyi P, Kaszaki J, Rostás A, et al. Monitoring microcirculatory blood flow with a new sublingual tonometer in a porcine model of hemorrhagic shock. Biomed Res Int 2015;5:847152.
7. Levy MM, Evans LE, Rhodes A. The Surviving Sepsis Campaign bundle: 2018 update. Crit Care Med 2018;46(6):997-1000.
8. Kim WY, Hong SB. Sepsis and acute respiratory distress syndrome: recent update. Tuberc Respir Dis (Seoul) 2016;79(2):53-57.
9. Shaver CM, Bastarache JA. Clinical and biological heterogeneity in acute respiratory distress syndrome: direct versus indirect lung injury. Clin Chest Med 2014;35(4):639-653.
10. Kollisch-Singule MC, Jain SV, Andrews PL, et al. Looking beyond macroventilatory parameters and rethinking ventilator-induced lung injury. J Appl Physiol 1985 2018;124(5):1214-1218.
11. Nieman GF, Andrews P, Satalin J, et al. Acute lung injury: how to stabilize a broken lung. Crit Care 2018;22(1):136.
12. Moretti M, Cilione C, Tampieri A, et al. Incidence and causes of non-invasive mechanical ventilation failure after initial success. Thorax 2000;55:819–825.
13. Andrews PL, Shiber JR, Jaruga-Killeen E, et al. Early application of airway pressure release ventilation may reduce mortality in high-risk trauma patients: a systematic review of observational trauma ARDS literature. J Trauma Acute Care Surg 2013;75(4):635-641.

TEAM TRAINING

Current Topics in Respiratory Care 2019

- **Visualizing Mechanical Ventilation**
  By Thomas Piraino RRT
- **Alarm Fatigue: Implications for Patient Safety**
  By Marc Schlessinger RRT, RRT-NPS, MBA, FACHE
- **6 ml/kg Tidal Volume is Not Appropriate for All Patients**
  By Neal J. Thomas MD, MSc
- **State of the Art of ECMO: What's new?**
  By Heidi Dalton MD, MCCM
- **When Less is More**
  By Dean Hess PhD, RRT, FAARC
- **Journey to Zero Harm – Developing a Culture of Safety**
  By Michael Anderson MBA, MD
- **The ABCDEF Bundle and the Role of the Respiratory Therapist** *By Wesley Ely MD, MPH*
- **Everyone Needs Oxygen**
  By Jerry Krishnan MD, PhD

8 DVD Team Series
for Team Development
and Continuing Education

CRCE

EARN UP TO 8 CRCE

AARC
American Association
for Respiratory Care

Learn more about the Current Topics series:
http://c.aarc.org/go/ct19-2

Telling the Stories of Our Amazing Patients

by Debbie Bunch

Patients are important people in the lives of respiratory therapists, and that means they've been important people in the life of this magazine as well. From our very first issue, when we followed little Cary Ann Baily through her day in the NICU in a story about an RT who was pioneering neonatal respiratory care, to our 2016 article on lung transplant recipient Venus Talley, we've made it a point to share remarkable stories about patients with lung disease.

But there was no more joyful story than the one our magazine had in 1997 when a young mother in Iowa made history by being the first woman to ever bring seven babies into the world alive at the same time. News of the impending birth was kept hush-hush in the small Iowa community of Carlisle, where Bobbi and Kenny McCaughey lived with their young daughter until about three weeks prior to the planned delivery. But AARC member Mike Wheeler, BS, RRT, and his staff of 102 therapists at Iowa Methodist Medical Center/Blank Children's Hospital in Des Moines had known about it since 18–20 weeks gestation. Along with a large team of physicians, nurses, and other health care professionals, they helped choreograph the entire delivery.

43 intense minutes

Scott Pline, RRT, who was supervisor of the NICU, and AARC member Pat Reeves, RRT, represented the respiratory care department on the planning team, and a group of 13 RTs was assigned to the case, on call for any eventuality. The RT department worked closely with vendors to ensure that all the proper respiratory equipment — including the latest in mechanical ventilators for the neonatal population — would be readily available.

Bobbi McCaughey had been on bedrest since week nine of her pregnancy. She went into the hospital in mid-October and began having contractions on Nov. 18. By then she was in her 31st week of pregnancy — about three weeks past the point considered, at that time, necessary for the viability of the fetuses — and her physicians felt it was time to get the show on the road. A caesarean procedure was scheduled for the next day, and a team of 40 health care professionals sprang into action, including nine of the 13 RTs who had originally been placed on call. "We were

notified at about 11:30 p.m. the night before the delivery to start assembling our group," said Wheeler. The plan was to deliver the babies at Iowa Methodist and then transport them to the NICU at Blank Children's, which was connected to the main hospital.

Five of the RTs, including Scott Pline, started out in the delivery room. "The first two babies delivered were intubated in the OR, then they were put on transport vents and taken to the NICU," Pline told us for the article. Pline accompanied those two infants on the transport, and the other four RTs on the team awaited their arrival in the NICU. "Their umbilical lines, intravenous lines, and other procedures were carried out there," he continued.

The remaining five infants were intubated and had their lines placed in the OR, then were transported one at a time to the NICU. "It was only 43 minutes until all babies were in the NICU," said the amazed RT.

Miracle babies

The babies weighed between 2 lb. 5 oz. and 3 lbs. 4 oz., and by day three the largest of the seven was breathing completely on his own. The remaining six were making good progress toward weaning. Said Wheeler at the time, "The outcome was so amazing. This mother and these babies are getting the best medical care possible. But there has been a huge amount of divine intervention here. That was the number one factor, and the rest just fell into place."

The RTs emphasized the importance of the interdisciplinary team in caring for these miracle babies, and they stressed that while the event was a media circus — they counted 16 satellite trucks in front of the hospital the day after the delivery, and Pline was among the 40-member team at a press conference aired live on CNN — for them, the babies weren't the "Real McCaugheys" as they were being dubbed in the press, but simply seven individual infants who needed their

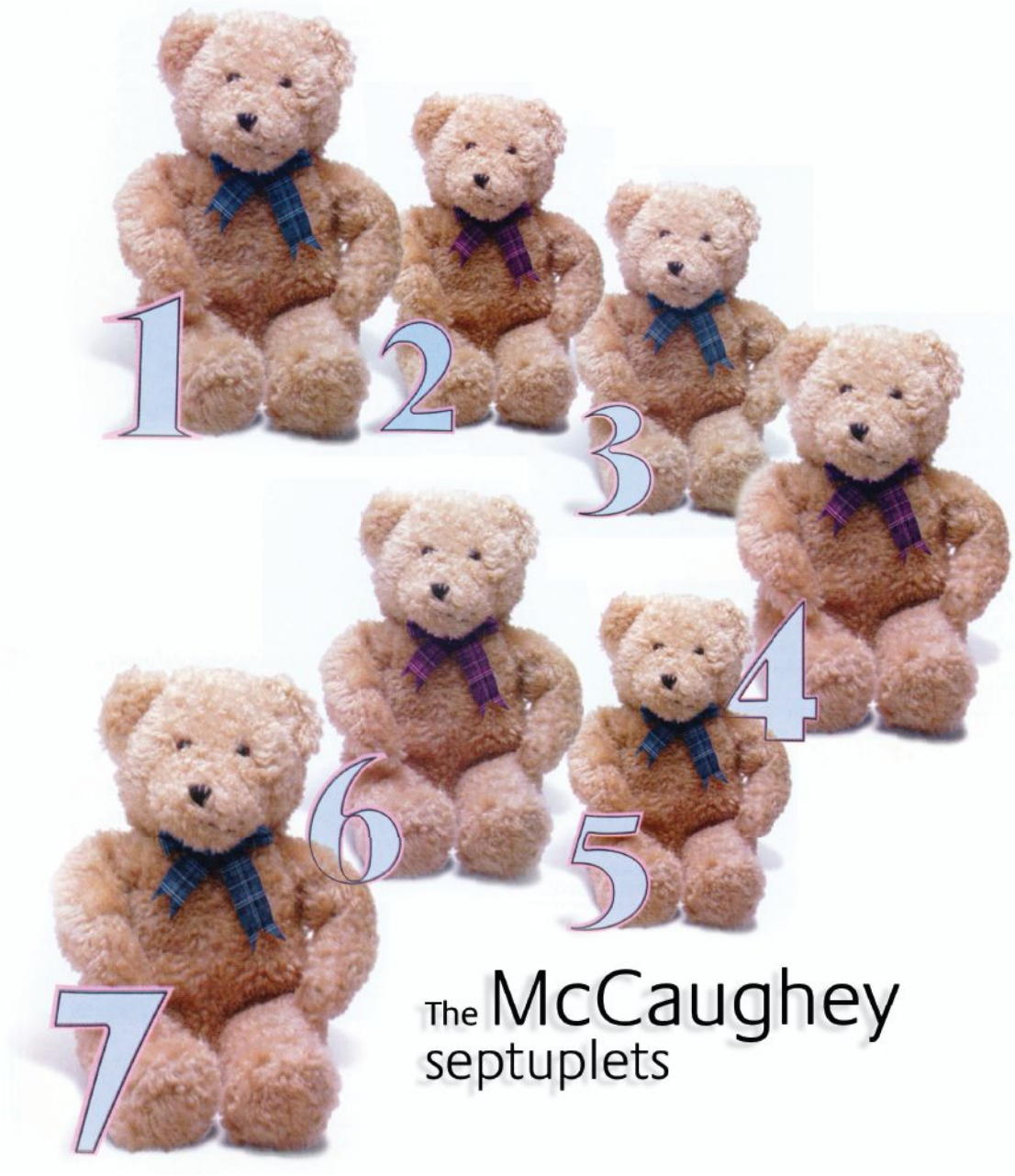
care. "The goal of the hospital, as well as the family, is to treat the babies as individuals, not as a group of seven," said Wheeler. "We will treat them as we would any other patients."

Pline echoed those sentiments. "We're going to keep on keeping on — doing our jobs as we do them every day."

A positive outcome

That certainly worked well for the little McCaugheys. The septuplets celebrated their 21st birthdays on Nov. 19, 2018, and they all appeared to be doing great. Five of them — Kelsey, Natalie, Nathan, Joel, and Alexis — were attending Hannibal-LaGrange University in Missouri, which offered all seven children scholarships when they were born. Kenny, Jr., was enrolled in a local school with an eye toward entering the building trade, and Brandon was deployed overseas with the U.S. Army. Lots of pictures of them at different stages of their lives can easily be found online.

Editor's Note: AARC members can read our entire story titled "RCPs Participate on Interdisciplinary Team Welcoming the McCaughey Seven into the World" in the December 1997 issue in the *AARC Times* archives on AARC.org. ■



New & Updated!

Aerosol Delivery Device Guides

As chronic respiratory diseases grow in prevalence, respiratory therapists' and medical professionals' ability to provide accurate and reliable education to patients is increasingly important. Stay up-to-date on the latest aerosol devices by downloading AARC's easy-to-use aerosol delivery device guides.

3 Formats Available:

Guide to Aerosol Delivery Devices for the Respiratory Therapist—4th Edition

Detailed information that will empower you to provide guidance to your physician, nurse, and pharmacist colleagues—but, most importantly, to your patients.

6 CRCE credit; free for AARC members, $15 for nonmembers

Free Guide Download

Guide to Aerosol Delivery Devices for Physicians, Nurses, Pharmacists and Other Health Care Professionals—3rd Edition

Provides the non-respiratory therapist a comprehensive, step-by-step application for aerosol delivery devices utilized with patients who have chronic respiratory disease.

Free Guide Download

A Patient's Guide to Aerosol Drug Delivery—3rd Edition

Commissioned respiratory therapists who were noted aerosol delivery experts prepared this guide, written with the patient in mind.

Free Guide Download

Visit: c.aarc.org/go/aerosol

AARC
American Association for Respiratory Care

CAN RESPIRATORY CARE SURVIVE AS A PROFESSION?

One of the biggest mistakes we make is assuming that other people think the way we think.

— Morgan Freeman

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

As respiratory therapists (RTs), we believe we provide value in health care, but what proof exists, and who, other than RTs, know and accept our value? If other health professionals and organizations don't recognize the value provided by RTs, can the respiratory care profession survive?

For our purposes in health care, we define value in terms of outcome measured according to the domains of quality, cost, and patient experience. Federal and state governments, payers, executives, consultants, and other key stakeholders measure value in these domains, so it makes sense that we align ourselves with them.

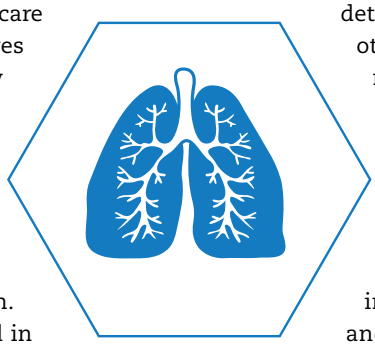
As an incoming president of the AARC in 2000, I solicited advice from leaders in our profession to select goals for the AARC. Without question, the advice was "keep the list short and simple." As a result, the goals I chose were: 1) Establish the science of respiratory care services; 2) Link the RT with those services; and 3) Communicate the value of RTs to all stakeholders. This is the hierarchy I have utilized throughout my management career.

The science is out there

In terms of peer-reviewed articles, best practices, poster presentations, and even anecdotal reports, the "science of respiratory care" truly exists. RTs and colleagues have provided numerous examples of positive outcomes with regard to quality and safety.[1-3] Cost savings resulting from utilization of protocols and evidence-based medicine lag behind respiratory care quality and safety outcomes, but they are increasingly being demonstrated in recent years, particularly in response to external pressures to the health care system.[4,5] RTs have collaborated with physicians and other health professionals to establish standards of care for therapeutic and diagnostic services.[6,7] While our focus has traditionally been on improving quality and clinical outcomes, we are seeing newer studies with the RT playing an important professional role in multidisciplinary teams demonstrating both improved clinical outcomes and improved patient experience.[8]

Respiratory therapists, tear down those walls!

The vast majority of the research and evidence currently is found within the walls of the acute care hospital. This is understandable and is reflective of the fact that the hospital has been the center of the health care system for most RTs throughout our careers. However, the future for health care delivery and, more importantly, population health will be outside the hospital. Thus, while most are comfortable with the volume of evidence that proves the value of respiratory care services in acute care hospitals and especially in critical care units,[9,10] we should challenge ourselves to document the value of respiratory care services outside the hospital, such as with long-term acute care hospitals, skilled nursing facilities, outpatient rehabilitation centers, urgent care centers, retail clinics, home care settings, durable medical equipment services, and telehealth. While our roles have not been defined in all of these care arenas, the evidence for RTs serving as effective disease managers is growing and is being recognized by key stakeholders both within and outside the acute care hospital.[11]



Ingredient to success?

If we agree that respiratory care services demonstrate value, do we have irrefutable evidence that it's the respiratory therapist individually who makes the difference? Here's where the challenge gets even greater. Although there are many high-level studies showing the value of respiratory care services, few have singled out the RT as the sole or primary ingredient for success. Before jumping to any negative conclusions that RTs don't add value, look at the other health professions. Most health care research does not clearly identify one health care professional as the most important or only ingredient in producing positive outcomes.

We are witnessing more studies that focus on RTs in pulmonary rehabilitation, RT navigators, transitional care coordinators, home care, and other roles, which suggests that the RT might very well be one of the most important — if not the most important — ingredient in the health care landscape. However, RTs are scientists, and we must be careful not to attempt to take credit singularly where many other factors, processes, and professionals are involved. Team-based care, multidisciplinary protocols, horizontal and vertical integration of services, and other operational factors all point to the fact that the best outcomes result from collaboration.

As one of the key stakeholders in protocols, transitional care, readmission-reduction programs, post-acute care, telemedicine, and other services, the RT is not only on the team but is often documented as a key component. A great example of why heath care professionals need to be cognizant of the important role they play is the more recent understanding of the social determinants of health. This is a topic for another article, but for our purposes here, the major determinants of individual and population health are not only outside the four walls of the acute care hospital, but also outside the hands of traditional medical care. Literacy, poverty, education, genetics, transportation, behaviors, and other factors are far more important in determining the health of individuals and populations. I mention these because this is an area where RTs must expand their knowledge and competency if we are to further enhance our value throughout the care continuum. The question is, how. We need to come up with some answers.

OK, we have some baggage

We also come with baggage. What are some of the things that weigh us down as a profession? Several concerns need to be addressed. The performance of unproven services, the "stacking" of treatments, the failure to use protocols, and measuring our productivity using "procedures" rather than the nationally accepted standards of the AARC Uniform Reporting Manual (URM) are all current problems for our profession. For example, incentive spirometry continues to be delivered, even though research does not reveal any value beyond coached deep breathing and effective coughing.[12]

The second area of concern is "stacking." One can debate whether there is legislation or regulations that restrict this, but no one should accept the fact that stacking four nebulizer treatments among patients at one time is anything but an unethical practice. Additionally, stacking serves to devalue the RT's role because it reinforces the notion that RTs are not needed for medical or surgical care and that anyone can do a nebulizer treatment with a little instruction.

The third area of concern is that patient-focused respiratory care protocols are not being utilized by many RT departments to provide most of their care. I know this is anecdotal, but in my lectures and workshops, I routinely ask the audience if they utilize protocols and, if so, to what extent protocols are utilized to provide care. With a few exceptions, the responses continue to be that virtually every RT department has at least one protocol in place, but only rarely do more than half of the attendees indicate that their departments utilize protocols for the majority of their care. While not all protocols are based on the highest level of research (i.e., randomized controlled trials), that should not limit our use of protocols because most of medical care practiced today is not validated purely by randomized controlled trials. Protocols based on meta-analysis of randomized trials and single randomized controlled trials are widely accepted to guide the delivery of medical services. If we want to be acknowledged as professionals delivering care based on science, it is imperative that we practice based upon available science.

The fourth area, measuring RT productivity, is challenging for RT leaders and clinicians because how RT productivity is measured determines the full-time staff complement for each department and the quality of care rendered. Increasingly, senior executives and consultants are suggesting that RT productivity should be based on procedures as the metric of choice. It's important to note that executives and consultants aren't out to get the RT, rather they truly believe that counting procedures is a valid methodology. The problem with this is understood among RT leaders: if we were to count every service we provide individually, we would implicitly accept the notion that a small-volume nebulizer treatment is equivalent to a ventilated patient day. In short, the only valid measure is for all RT departments to use the AARC URM, with internal modifications made for services unique to their department.

ABOUT THE AUTHOR

Garry W. Kauffman, RRT, FAARC, MPA FACHE has more than 40 years of experience in management, education, performance improvement, quality assurance, and value analysis. He has served and continues service to the AARC in numerous roles, including past AARC president and current AARC Chartered Affiliate consultant, among other volunteer roles.

The goal is for every RT leader to educate other professionals as to the only scientifically validated process — the AARC URM — to be used to measure clinical productivity. It's not just about a system of measurement — it's about safe and effective patient care. The challenge that RT leaders must undertake is to educate executives, consultants, and other key stakeholders that the value we bring to our organizations should be measured by process measures and by outcomes. Process measures could include percent adherence to RT protocols, percent of patients receiving discharge instructions for their home-therapy regimen, percent of patients entered into a pulmonary rehabilitation

program, percent of discharged patients contacted via phone within 24 hours after discharge, among others. Outcomes could include reduction in length of stay, reduction in cost per inpatient admission, reduction in duration of mechanical ventilation, reduction in ICU days, patient experience with respiratory care services, patient demonstration of effective use of home therapy devices and pharmaceuticals, among others.

The last concern is whether we can communicate our value to every stakeholder. I'll suggest that within our profession, particularly at AARC and Chartered Affiliate educational programs, Respiratory Care, and *AARC Times*, we are exceptional at "talking within the family." To communicate the value of our services beyond our own backyard, we should do the same with every stakeholder in the health care system. Just as clinical RTs and RT leaders know our value, so should health care executives, health care consultants, governmental agencies, payers, and — perhaps most importantly — the patients and families that we serve. A former AARC executive once remarked, "The respiratory therapist is the Rodney Dangerfield of health care." His point was not that we don't add value, but that others don't recognize our value. I think of this quote constantly in my communications with stakeholders outside of our profession. The respect we want will be earned only when all other professionals and organizations who work with RTs have been educated and accept our value without question.

We know our value in certain clinical domains. We have solid evidence that our respiratory care services are needed and that we provide respiratory care services at the highest level of quality and cost-effectiveness. The challenge that we must accept is that the future will be the brightest for our profession and all RT professionals if we expand more beyond the hospital setting, have well-educated and highly credentialed people, validate our services, connect the RT to those services, and communicate our value to all stakeholders.

Keys to Ensuring a Bright Future for the RC Profession

1. ESTABLISH THE SCIENCE OF RESPIRATORY CARE SERVICES.

- Continue to perform research, both within our profession and in collaboration with other professionals and with pharmaceutical and industrial colleagues to substantiate the value of respiratory care services for each of the domains of quality, safety, and experience.
- Expand research to include the increasingly important role of health care outside of acute care, to include long-term acute care hospitals, skilled nursing facilities, home health, urgent care centers, retail clinics, durable medical equipment services, and telemedicine.
- Discontinue all services that have been shown to add no value to the patient and replace these with services, devices, and protocols that are scientifically validated.

2. LINK THE RESPIRATORY THERAPIST WITH RESPIRATORY CARE SERVICES.

- For each of the respiratory care services that have been validated, ensure that the respiratory therapist is intimately involved with and seen as absolutely essential to the delivery of high-quality, cost-effective, patient-focused care.
- Realizing that positive health care outcomes are best accomplished by multidisciplinary teams, engage other health care professionals as well as pharmaceutical and industry partners to work collaboratively with RTs to assist in evaluating and documenting our value.

3. COMMUNICATE THE VALUE OF RESPIRATORY THERAPISTS TO ALL STAKEHOLDERS IN HEALTH CARE.

- Create a list of all individuals, professions, and organizations that can be utilized to communicate the value of RTs delivering validated respiratory care services. This list could include RT medical directors, hospitalists, intensivists, primary care physicians, nurse practitioners, physician assistants, nurses, pharmacists, performance improvement, quality assurance, value analysis professionals, executives, boards of directors, national and state government, commercial payers, post-acute care providers, and — most importantly — the patients and families we serve.
- Create focused messaging for each stakeholder that effectively demonstrates why RTs are essential.
- Engage each stakeholder to support and promote the value of the RT.
- At the national, state, regional, and local levels, create consistent, scheduled, and focused communication to ensure that RTs continue to be recognized as key health care professionals.

Are we, as RTs, up the challenge? Can respiratory therapy survive as a profession? If you agree that we are and that we must, let's review the challenges, our knowledge and competencies, and our value that has been documented to date, and then build on this to create a solid case to ensure our value in the future.

I'll conclude by asking the question and presenting the challenge: Can respiratory care survive as a profession?

If we establish the science of respiratory care services, link the respiratory therapist with those services, and communicate the value of RTs to all stakeholders, the answer can only be a resounding YES! ■

References

1. Stoller J, Skibinski C, Giles DK, Kester EL, Haney DJ: Physician-ordered Physician-ordered respiratory care vs physician-ordered use of a respiratory therapy consult service: results of a prospective observational study. Chest 1996;110(2):422–429.
2. Walsh B, Smallwood C, Rettig J, Kacmarek R, Thompson J, Arnold J: Daily goals formulation and enhanced visualization of mechanical ventilation variance improves mechanical ventilation score. Respir Care 2017;62(3):268–278.
3. Jaber S, Lescot T, Futier E, et al: Effect of noninvasive ventilation on tracheal reintubation among patients with hypoxemic respiratory failure following abdominal surgery: a randomized clinical trial. JAMA 2016;315(13):1345–1353.
4. Ehlers K, Albritton S, Stogner S. Common canister protocol vs. individually supplied MDI's at a 537 bed regional center: a pharmacoeconomic analysis. Available at: http://www.rcjournal.com/abstracts/2004. Accessed January 18, 2019.
5. Hart M, Alexander V, Daniel E, D'Etienne J, Millard M: Decreasing the length of stay in the emergency department for patients discharged with asthma. AARC Open Forum Poster, 2008.
6. Gregg L, Ruppel G, Carlin B, Hart M, Doherty B: Office spirometry in primary care for the diagnosis and management of COPD: National Lung Health Education Program Update. Respir Care 2018;63(2): 242–252.
7. Ohar J, Loh C, Lenoir K, Wells B, Peters S: A comprehensive care plan that reduces readmissions after acute exacerbations of COPD. Respir Med 2018;141:20–25.
8. Hart M, Stewardson E, Jamil A, Tecson K, Millard M: Harmonica playing improves outcomes in patients with COPD. Respir Care 2018;63(Suppl 10):3024192.
9. Morris P, Goad A, Thompson C, et al: Early intensive care unit mobility therapy in the treatment of acute respiratory failure. Crit Care Med 2008;36(8):2238–2243.
10. Blackwood B, Burns KE, Cardwell CR, O'Halloran P: Protocolized versus non-protocolized weaning for reducing the duration of mechanical ventilation in critically ill adult patients. Cochrane Database Syst Rev 2014(11):CD006904.
11. Silver P, Kollef, M, Clinkscale D, et al: A respiratory therapist disease management program for subjects hospitalized with COPD. Respir Care 2017;62(1):1–9.
12. Restrepo R, Wettstein R, Wittnebel L, Tracy M: Incentive spirometry: 2011. Respir Care 2011;56(10):1600–1604.

AARC Summer forum

Beach Destination + Continuing Education = Summer Fun

by Debbie Bunch

AARC Summer Forum heads to Fort Lauderdale this July

Managers and educators who come to the AARC's premier mid-year meeting will go home with lots of great information and wonderful memories of a marvelous summer vacation, too

White sandy beaches, turquoise waters, tropical palm trees, cool coastal breezes, serene sunsets . . . is there anything else you need for a great summer vacation?

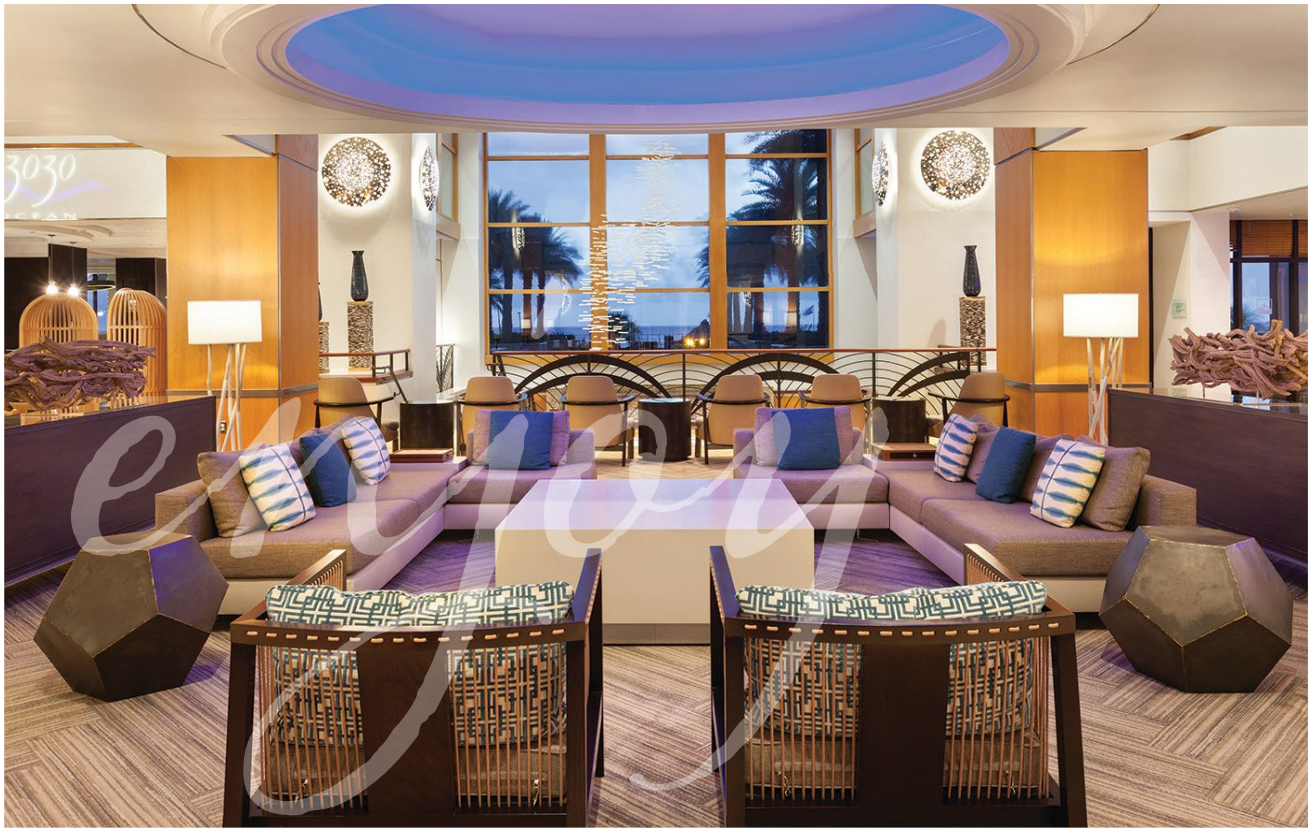
If you find yourself thinking, "How about some cutting-edge continuing education to get me up to speed on the latest developments in respiratory care management and education," or "Some CRCEs to help me maintain my license to practice would be nice," then we have the place for you!

The 2019 AARC Summer Forum will be heading to beautiful Fort Lauderdale, FL, this July 20–22, and the event promises to deliver everything you need to move your organizations and institutions forward throughout the rest of the year while providing some much needed relaxation for you and your family at the same time.

First class resort

The meeting will take place at the fabulous Fort Lauderdale Marriott Harbor Beach Resort & Spa, a five-star facility located on a quarter mile of private beach just minutes from everything that Fort Lauderdale has to offer. Many of the rooms — which are available at significant discounts for AARC Summer Forum attendees — have ocean views or views of the Intracoastal Waterway, and guests can enjoy a wide range of amenities.

A large, full-service spa offers the chance to relax and rejuvenate, with everything from massages to salon treatments, plus a private pool, whirlpool, fitness center, and sauna. The Tropical Lagoon Outdoor Pool is great for guests who just want to swim and lounge, and of course the private beach is perfect for splashing



in the ocean or just relaxing in a comfortable beach chair while enjoying a cool beverage.

The resort is home to several great restaurants as well. **3030 Ocean Restaurant & Bar** features fresh, local seafood along with a host of other options, all in an oceanfront setting. **Sea Level Restaurant and Ocean Bar** serves up American fare outdoors on the waterfront, and **Riva** is the place to enjoy breakfast buffets and lunches, plus seasonal dinners — it's also on the water, with great seaside views. Need your coffee? An in-house **Starbucks** is ready to fulfill all your java needs, and **HB Fresh** on the beach-walk level of the resort has fresh squeezed and cold-pressed juices, healthy snacks, and frozen yogurt.

Top attractions

You could probably spend all your time during the Summer Forum right at the resort, but with so much to see and do in Fort Lauderdale and the surrounding area, you'll surely want to do some sightseeing before or after the meeting. Here are some of the top attractions in this beachfront community:

Beachfront Promenade: This landscaped walkway features a signature white wave wall and brick-paved path, all located just two miles north of Port Everglades. Check out the luxury hotels across the street, and be sure to stop off at The Gallery at Beach Place for shopping and dining. The Sun Trolley will take you from the promenade to downtown Fort Lauderdale for just

$1, or you can check out a B-cycle and bike around the area.

Las Olas Boulevard: Located in downtown Fort Lauderdale, this is the place to go to shop chic boutiques and art galleries, enjoy sidewalk cafes, stroll, and people watch. You can even join a Cycle Party and go on a foodie tour of the boulevard on a quadracycle.

Arts & Entertainment District: From Las Olas Boulevard, you can follow the red brick road through the landscaped Riverwalk park area to the Arts & Entertainment District, located along the New River. The district is home to the Broward Center for the Performing Arts, Florida Grand Opera, Fort Lauderdale History Center, NSU Art Museum Fort Lauderdale, and the Stranahan House, a 1900s-era home filled with antiques. Along the way you'll run into plenty of unique galleries and fabulous dining, and Segway tours and river cruises are also available.

Flamingo Gardens: This 60-acre botanical gardens and Everglades wildlife sanctuary features a Bird of Prey Center and free-flight walk-through aviary. You'll also see alligators, bobcats, black bears, Florida panthers, and, of course, lots of flamingos. They are all housed among exotic and native plants, including Florida's "Champion" trees. A narrated tram tour and Wildlife Encounter are included in the admission price. Adults pay $19.95 and children $12.95; kids under two get in free.

Boat Tours: Get out on the water for a different perspective on Fort Lauderdale. You can take boat tours of the Intracoastal Waterway and Millionaire's Row, a section of the New River famous for its fabulous homes. The Fort Lauderdale Water Taxi offers unlimited all day rides for $28 for adults and $14 for kids. Jungle Queen Riverboat and Riverfront Cruises offer 90-minute and longer cruises.

Bonnet House Museum & Gardens: Nestled between the beach and the Intracoastal Waterway, this 35-acre estate offers visitors the chance to learn more about Fort Lauderdale history, art, nature, and more. Adult admission is $20, for students ages 6–12 it is $16, and children under age six get in free.

Young at Art: Bringing the kids along? They can ride a subway, visit a cave, build sand sculptures and puppets, learn about faraway places, and explore the world of Alice in Wonderscapes in this child-friendly museum. Adults and children: $14.

Hooray for Hollywood: This two-and-a-half-mile (or 2.5-mile) boardwalk in nearby Hollywood, FL, has everything from art galleries and boutiques to sidewalk cafes. Visitors can also walk through the Downtown Hollywood Mural Project, with its contemporary art by nationally and internationally recognized artists. Nearby ArtsPark at Young Circle has even more great art.

Go Shopping: The Galleria at Fort Lauderdale features big name retailers like Neiman-Marcus, H&M, and Red Door Spa, plus lots of great restaurants, too. Bargain hunters won't want to miss the Sawgrass Mills Mall, with more than 350 outlets from brands such as Michael Kors, Kate Spade New York, Tory Burch, Bloomingdale's, Saks Fifth Avenue Off Fifth, and much, much more. Dining options abound there, too.

Casinos and Gaming: With six nearby casinos and the Isle Casino Racing Pompano Park, which offers horse racing every Monday, Tuesday, Wednesday, and Saturday, the Fort Lauderdale area offers a variety of places to try your luck.

Dive Time: If scuba diving is your thing, you'll find 76 artificial reefs to explore in the warm waters of Broward County, and the area is also home to more warm-water wrecks than any other place in the western hemisphere. Among the highlights is the 325-foot SS Copenhagen, which ran aground in 1900 and is now a state underwater museum and archeological site.

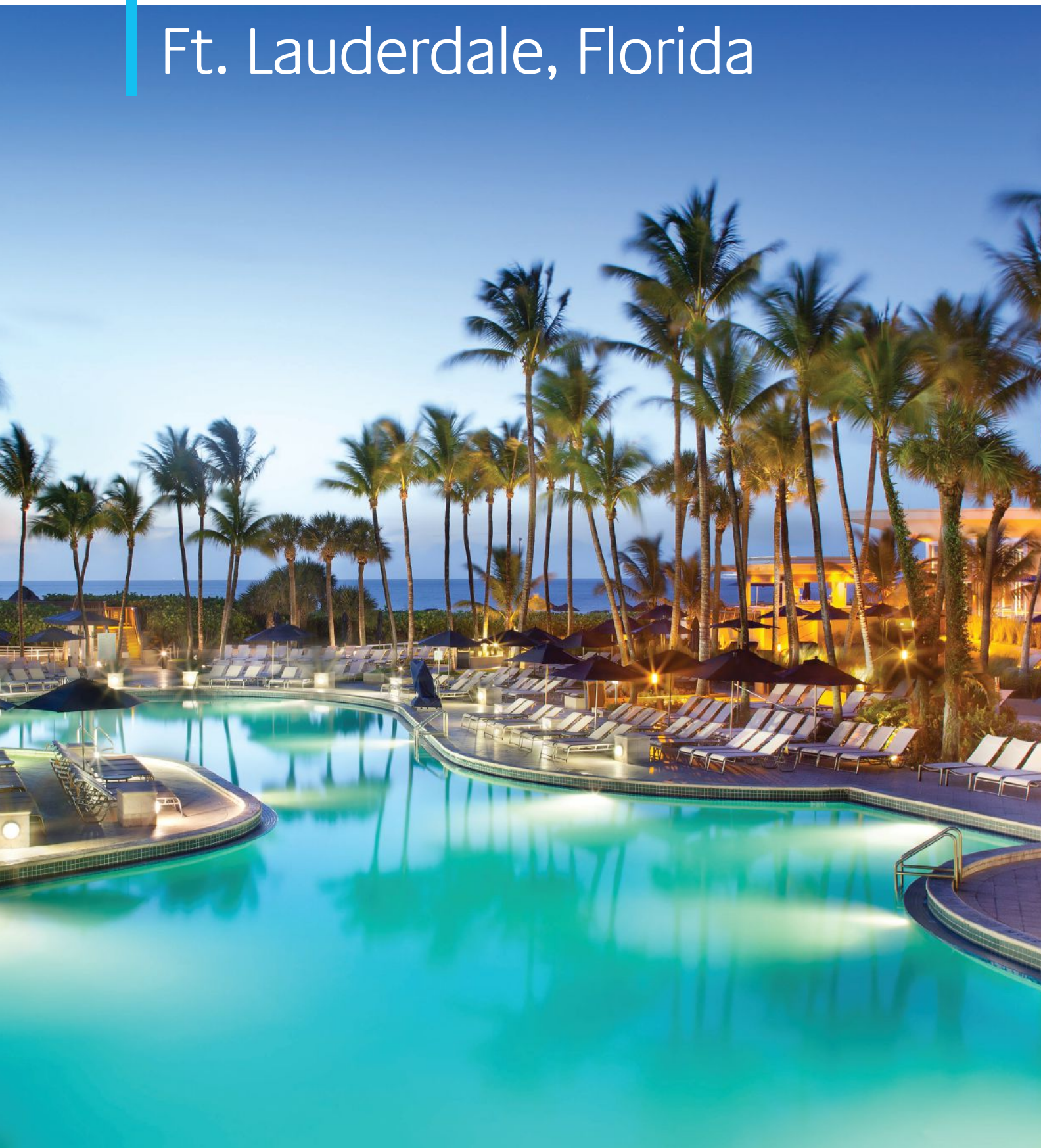
Perfect vacation spot

Add to these activities all the typical things you'd expect from a beach destination — swimming, boating, kayaking, fishing, and snorkeling — and you have the perfect place to spend a little downtime this summer. So make plans now to combine your need for continuing education with some summer fun for you and your family.

Want to learn more about Fort Lauderdale? Visit www.sunny.org for a complete overview. And we'll see you in Fort Lauderdale for the AARC Summer Forum this July 20–22! ■

2019 AARC Summer Forum Program

Ft. Lauderdale, Florida



NATIONAL BOARD FOR RESPIRATORY CARE (NBRC)

8:30 am – 10:30 am

Examination Management: Points an Educator Can Consider

Robert C Shaw Jr PhD RRT FAARC, Overland Park KS

Based on feedback from last year, this session will address issues that educators face while fulfilling their responsibility to assess learning. Topics will include content security, examination administration, item banking, and examination form assembly. There is no pre-registration. The room will accommodate 50 people, so come early to find a seat.

Shaw, Robert

COMMISSION ON ACCREDITATION FOR RESPIRATORY CARE (COARC)

11:00 am – 1:00 pm

Meet the Commission

This session is an opportunity for program personnel and administrators to meet with their program referees on an individual basis to discuss:

- Recent changes to CoARC policies, procedures, and documentation involving the referee process;
- Interpretation of the new CoARC accreditation standards;
- What is recommended for improvement of the institution or program, including any progress reports, and
- How to communicate appropriately and effectively with their program referee and Executive Office staff

Attendance for this session is on a first-come, first-served basis and **attendees are required to pre-register with the CoARC by contacting Tammy Alsup at tammy@coarc.com.**

NEW & IMPROVED!
now includes patient metrics

AARC Benchmarking System

Track AND Compare

Patient & Performance Metrics with Top RT Departments

The AARC Benchmarking System Assists Managers with:

- Department performance evaluations and new process implementation
- Comparing workload performance for high-volume procedures
- Customized compare groups to investigate performance differences
- Advice and consultations via email from other facility managers

MISSED TREATMENTS	VENTS DAYS - PATIENTS
75% ILE	75% ILE
50% ILE	50% ILE
25% ILE	25% ILE
See Website About These Metrics	See Website About These Metrics

These, metrics represent the mean values of all hospitals reporting data into the AARC Benchmarking Systems during the most recent quarter.

METRICS ARE UPDATED BY THE 15TH OF EACH MONTH.

ONE-YEAR SUBSCRIPTION

Nonmember Price: $495
AARC MEMBER PRICE: $395
Member savings $100

6-MONTH SUBSCRIPTION

Nonmember Price: $350
AARC MEMBER PRICE: $300
Member savings $50

Cost Effective Internal System Benchmarking: Add any hospital within your healthcare system for only $150 more.

EXCLUSIVE RENEWAL PRICING: $395

LEARN MORE VISIT: www.aarc.org/resources/benchmarking

Supported in part by an unrestricted educational grant from Dräger

American Association for Respiratory Care

AMERICAN ASSOCIATION FOR RESPIRATORY CARE (AARC)

Course capacity is limited. Pre-registration is required. Deadline is Wednesday, July 17, 2019 or when the course is full. You must attend the entire course to receive CRCE credit; no partial credit will be awarded.

1:00 pm – 5:15 pm

Professional Development: Enter to Learn, Go Forth to Lead!

1:00 pm – 1:15 pm

Kim Bennion MsHs RRT CHC, Murray UT

Welcome and Intro

The Lead Facilitator will welcome attendees to the course and discuss current expectations placed upon respiratory leaders from their employers, senior leaders, students, employees and colleagues as it relates to executive level communications. In turn, a brief gap analysis will be performed that highlights the expectations of respiratory therapy leaders vs. current skill sets prevalent within the profession. Finally, a framework for the rest of the day will be highlighted as well as expectations for each learner/participant.

1:15 pm – 1:55 pm

Kim Bennion MsHs RRT CHC

"Teaming" for Success

Innovation often gets bogged down in project roadblocks. Follow the presenter as she assists attendees in identifying key obstacles and solutions to moving projects forward. A simple team exercise for rapid obstacle recognition and solution identification will be presented. Attendees will practice this exercise in small groups and be prepared to conduct this exercise for "teaming" in their place of employment.

Bennion, Kim

Evans, Dana

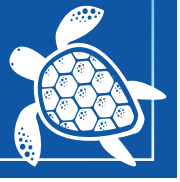
2:00 pm – 2:40 pm

Dana Evans MHA RRT RRT-NPS, Downers Grove IL

Leading High Stakes Conversations

The ability to effectively lead high stakes conversations is necessary in work settings and private relationships whether you are an educator, manager or staff therapist. Join this industry leader as she lays the foundation for conducting effective, high stakes conversations. Attendees will practice conducting scenario-based conversations in small groups and will be provided templates for documenting conversations and improvement initiatives.

Sea Turtle Nesting Season is underway on Greater Fort Lauderdale's beaches and these ancient mariners need all the help they can get. Greater Fort Lauderdale's beach visitors can help sea turtles during the nesting season by keeping beaches clean, being aware of nesting sites and reducing artificial lighting near beaches that can distract & confuse mothers & hatchlings. ***Lights out on the beach begins at 9 pm.**



2:45 pm – 3:25 pm

Kim Bennion MsHs RRT CHC

The Highly Effective 30-Minute Interview

Behavioral-based interviews are not novel; however, some individuals may lack the skills necessary to answer such questions effectively. Whether you are interviewing students or potential candidates for employment or are the candidate yourself, this course is for you. The ability to "find" and then "tell" your story using unique, brief answers will be reviewed and practiced during this interactive session.

3:25 pm – 3:40 pm

Break

3:40 pm – 4:20 pm

Carrie Winberg BS RRT MSHA, Sandy UT

Motivational Patient Interviewing and Goal Attainment Scaling — It's About What THEY Want!

Patients' desires for interventions and care may vary widely. Such conversations require a skilled interviewer to help patients understand, select and document wishes and patient-centered goals. The presenter will introduce the basics of motivational interviewing in terms of use with patients and will guide attendees in practicing these basics in small, break-out groups. While this interactive session is patient-centered, practicing motivational interviewing is applicable to many settings and produces more meaningful conversations. Attendees will receive suggestions for ways to initiate open-ended questions as well as templates for goal attainment scaling and capture of patient discussions.

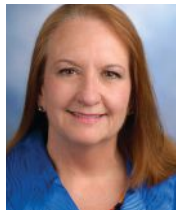
4:25 pm – 5:05 pm

Lynda Goodfellow RRT AE-C FAARC, Peachtree City GA

Writing It So Executives Will Want to Know

Executive leaders often receive only a written proposal on which to make decisions of support, rejection, or resources. Follow the presenter as he shares strategies and templates to create effective written communications. Attendees will practice in small groups creating a high impact SBAR. Participants will also receive a variety of written communication templates including, but not be limited to: SBAR, Survey Guiding Document, Executive Summary, A3s and resumes.

Winberg, Carrie



Goodfellow, Lynda

5:05 pm – 5:15 pm

Kim Bennion MsHs RRT CHC

Closing Comments and Adjournment

The lead facilitator will provide an executive level summary of the learning that took place and tips on how to implement the skills learned through the session in your own workplace.

AMERICAN ASSOCIATION FOR RESPIRATORY CARE (AARC)

8:00 pm – 9:45 pm

Block Party — Beach Edition

See pages 44–46 for registration information, fees, hotel reservation information, and travel discounts.
Approved for up to 11.74 hours of continuing education credit (CRCE).

GENERAL SESSION

7:00 am – 8:40 am

Sarah Varekojis PhD RRT FAARC/
Presiding

7:00 am – 8:00 am

Coffee service for registered attendees

8:00 am – 8:40 am

Karen Schell, DHSc RRT RPFT, Frankfort KS

The State of the Profession

In this keynote address, AARC President Karen Schell will update the audience on the goals, priorities, and strategic focus of the Association for 2019. Attend this presentation and better understand the current and future direction of the profession during Dr. Schell's presidency. This is your opportunity to hear from our president regarding topics that are important to you!

EDUCATOR TRACK

8:50 am – 4:25 pm

Georgianna Sergakis PhD RRT FAARC

Chair, AARC Education Section/
Presiding

CoARC Symposium

8:50 am – 12:40 pm

8:50 am – 9:30 am

Joseph Coyle MD, Boise ID

Integrating Principles of Evidence-Based Investigation into Your Curriculum

This discussion explores the many ways that elements of the evidence-based investigation process can be introduced into the curriculum for respiratory therapy programs. The steps in the process are developed from framing the clinical question in PICO format to searching the medical literature and assessing studies for quality and validity. Many examples will be given to demonstrate how it can be implemented in a way that complements the basic core respiratory care plan of study.

9:35 am – 10:15 am

Brad Leidich MSEd RRT FAARC, Grantville PA

Kevin O'Neil MD MHA, Wilmington NC

Compliance with CoARC Standards — Analyzing Your TMC Subscores by Content Domain and Generating an Effective Action Plan

Attendees will learn the steps needed to successfully analyze the NBRC TMC exam reports, as required by CoARC in the annual report of current status. Attendees will also learn how to improve their curriculum by developing an action plan to address low subscores.


Schell, Karen


Leidich, Brad


O'Neil, Kevin

10:15 am – 11:15 am

Visit our Exhibitors

11:15 am – 11:55 am

Shelley Mishoe PhD RRT FAARC, Virginia Beach VA

Inter-Professional Education: Why Now?

The presenter will provide an overview of the Inter-professional Education (IPE) core competencies and why these are important to Inter-professional Collaborative Practice (IPCP). There will be an emphasis on how these competencies can influence teamwork and the roles of respiratory therapists. The presenter will discuss strategies for implementing programmatic changes and enhancements to address IPE and IPCP. Time will be allotted for questions and comments from members of the audience.

12:00 pm – 12:40 pm

Thomas Hill PhD RRT FAARC, Athena GA

Thomas Smalling PhD RRT FAARC, Northport NY

Update on the 2020 CoARC Standards for Entry into Respiratory Care Professional Practice

The presenters will provide an overview of the proposed 2020 accreditation standards and their implications for programs and the profession. Emphasis will be placed on the most significant differences between current and new standards. Strategies for implementing programmatic changes to address compliance with the new standards will also be discussed. Time will be allotted for questions and comments from members of the audience.

12:40 pm – 2:15 pm

Lunch (On Your Own) and Visit our Exhibitors

Integrating Research into Your Education Program

2:15 PM – 3:40 PM

2:15 pm – 2:55 pm

Lynda Goodfellow RRT AE-C FAARC, Peachtree City GA

Integrating Research into Your Education Program — What Should the Goal Be?

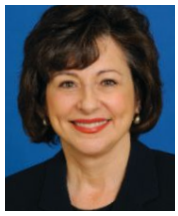
Respiratory Therapy Education programs remain at different levels for both entry to practice and for advancement once a practitioner has clinical experience. The didactic knowledge learned within these programs on evidence-based medicine and research should build in level and provide a baseline within each level of education. This lecture will discuss the recommended education to be provided at each education level and how to integrate these into your program successfully.

3:00 pm – 3:40 pm

Natalie Napolitano MPH RRT FAARC, Philadelphia PA

How to Find a Clinical Research Partner

Many education programs incorporate research into their curriculum nationally. Unfortunately, many may have difficulty finding appropriate research mentors for their students. Having a few research partners for your program can assist in alleviating this problem. Finding a research partner can be challenging and working together on the expectations of the course is important for success.



Mishoe, Shelley

Hill, Thomas

Smalling, Thomas

Goodfellow, Lynda

Napolitano, Natalie

3:45 pm – 4:25 pm

Brian Walsh PhD RRT FAARC, Lynchburg VA

Robert Joyner PhD RRT FAARC, Delmar MD

Update on APRT

This session is an update for the profession on the progress made by the Advanced Practice Respiratory Therapist (APRT) committee.

MANAGER TRACK

8:50 am – 4:25 pm

Kim Bennion MsHs RRT CHC

Chair, AARC Management Section/ *Presiding*

8:50 – 9:30 am

Scott Reistad RRT CPFT FAARC, Colorado Springs CO

Using the Concept of "Compressed Time" to Close the Execution Gap with Goal Setting

The further plans for the future are made, the less predictability exists. With long-term plans, calculated "guesses" are made about future performance based on assumptions regarding today and yesterday. The reality is that it is very difficult, if not impossible, to determine what your daily actions should be 6 months or a year from now. Using a model of "compressed" time, this problem may lend to more predictive success in achieving the goals you desire.

9:35 am – 10:15 am

Kevin McQueen MHA RRT CPPS, Colorado Springs CO

The High Cost of Team Member "Violence" and Collateral Damage

High functioning teams are grounded in mutual respect, personal accountability, and trust. How is a team disrupted when one member elevates self over another team's success? Join the presenter as he provides clear ways to identify "disrupters" and explains the high cost to team reputation these individuals cause. Solutions for moving your team from disruptive collateral damage to productivity will be presented.

10:15 am – 11:15 am

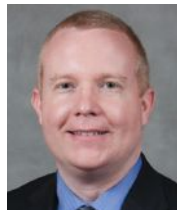
Visit our Exhibitors

11:15 am – 11:55 am

Samantha Davis MS RRT CHSE, Boise ID

Providing a Safe(r) Space for LGBTQ+ Patients, Students, and Staff

When navigating an institution as part of a marginalized group, safe(r) spaces allow individuals to participate, work, learn, receive care, and grow more effectively. Within the LGBTQ+ community, the scarcity of these spaces may create additional barriers for patients, students, or professionals to thrive. This session will discuss strategies for providing safe(r) spaces to individuals in classroom and clinical settings.


Walsh, Brian


Joyner, Robert


Reistad, Scott


McQueen, Kevin


Davis, Samantha

12:00 pm – 12:40 pm

Steven Abplanalp MBA RRT, Murray UT

Secrets to Creating a Dynamic Team Amid Organizational Change!

Success in the constantly changing health care environment depends upon strong "teaming." Creating an environment where employees feel safe to take professional risks, learn from experience, and then grow new ideas into opportunities enables them to reach their highest potential. Strong leadership teams that are dynamic, flexible, and organized to learn make a positive difference for every patient, every day while they revolutionize the health care workplace.

12:40 pm – 2:15 pm

Lunch (On Your Own) and Visit our Exhibitors

2:15 pm – 2:55 pm

Margarete Pierce MS RRT CPFT, Chadds Ford PA

Onboarding New Respiratory Care Services Leadership

New leadership onboarding can prove challenging; therefore, key elements of identifying, growing, and onboarding new leaders is imperative to reduce the loss of Respiratory Care leadership knowledge and strategic positioning. Join this leadership expert as she presents key concepts and stresses the need for formal, strategically implemented succession planning for long-term Respiratory Care viability.

3:00 pm – 3:40 pm

Tammy Stucki RRT RRT-ACCS, St George UT

Generational Perspectives: Are We Listening to Understand?

Generational differences have been well defined in the literature. However, join this unique presentation from the perspective of a "Gen X" presenter as she shares the stage with a "Millennial." They will share ideas about what millennials really want from their manager and provide unique suggestions for retaining millennials in an organization's workforce.

3:45 pm – 4:25 pm

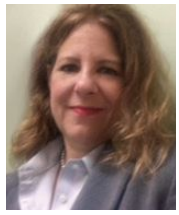
Matthew Pavlichko MS RRT RRT-NPS, Myerstown PA

Shared Governance: Stop Telling Your Team and Start Asking

Employee engagement is becoming a priority metric in the hospital/health care industry. The shared governance theory is a way to engage and develop health care employees. This presentation describes the history, purpose, and structure of shared governance as well as how it can improve employee engagement while driving quality and process improvement.

Abplanalp, Steven

Stucki, Tammy



Pierce, Margaret

Pavlichko, Matthew

GENERAL SESSION

7:15 am – 9:10 am

Sarah Varekojis PhD RRT FAARC/
Presiding

7:15 am – 8:15 am

Full breakfast buffet for registered attendees

8:30 am – 9:10 am

Gabrielle Davis MPH RRT CHSE, Boise ID

Diversity and Inclusion: How to Do It Right!

Diversity and inclusion are the latest buzzwords used in academia and health care to depict safe and welcoming environments. They are found throughout mission and vision statements, course syllabi, websites, and student handbooks all over the country. These terms are often used interchangeably, though their meanings are quite different. This presentation will highlight the true meaning of diversity and inclusion and how they are equally important in the academic and health care settings.

Check the online schedule for unopposed time with exhibitors so you can engage and focus on what they have to offer!

EDUCATOR TRACK

9:20 am – 3:45 pm

Georgianna Sergakis PhD RRT FAARC

Chair, AARC Education Section/
Presiding

9:20 am – 10:00 am

Jody Lester MA RRT, Nampa ID

The Fundamentals of Focused, Fast, and Effective Feedback

These days educators have a large number of tools in their teaching toolbox; do we know which one is most likely to transform learning? According to education experts, such as John Hattie, who have evaluated thousands of studies, effective feedback has a greater effect on learning and achievement than any other teaching strategy. This presentation will explore the research and various methods of providing focused, fast, and effective feedback.

10:05 am – 10:45 am

Kyle Mahan MSM RRT, Louisville KY

Guide Respiratory Therapy Students through Exploration and Better Understanding Using POGIL

POGIL is an acronym for Process Oriented Guided Inquiry Learning. Because POGIL is a student-centered instructional approach, in a typical POGIL classroom or laboratory, students work in small teams with the instructor acting as a facilitator (pogil.org). One benefit of implementing POGIL is that students are put in a position to explain a concept to each other while learning it at the same time, which can aid in retention and mastery of material such as mechanical ventilation.

Davis, Gabrielle

Lester, Jody

Mahan, Kyle

10:45 am – 11:45 am
Visit our Exhibitors

11:45 am – 12:25 pm
William Galvin, RRT MSEd FAARC, Havertown PA

Gen Z Goes to College: Characteristics, Traits, and Learning Preferences of Our Youngest Generation of Students

Generation Z are now entering college and will bring with them a unique set of traits and characteristics. What motivates them? What do they like/dislike? How do they learn? More importantly, what are their learning preferences? This presentation will address the characteristics of students born in the mid-1990s. It will identify their unique interests, needs, likes, and desires. It will identify their learning preferences and teaching/learning strategies to make education more meaningful and effective for them.

12:25 pm – 2:00 pm
Lunch (on your own) and Visit our Exhibitors

2:00 pm – 2:40 pm
Randy Case PhD RRT RRT-NPS, Wichita Falls TX

Insta-BAM or Insta-SHAM? Utilizing Social Media to Recruit and Market Your Respiratory Therapy Program

Traditional forms of student recruitment are on the way out and the future of recruiting and marketing is decidedly social. This presentation provides best practices for using social media as a recruitment and marketing tool for respiratory therapy programs. This presentation will help guide learners on how to harness social media to market prospective students, stay engaged with potential candidates, and empower your program to recruit the next generation of respiratory therapists.

EDUCATION SECTION MEMBERSHIP MEETING

2:45 pm – 3:25 pm
Georgianna Sergakis PhD RRT FAARC

Chair, AARC Education Section/ *Presiding*

Updates on issues important to the section will be discussed, with interactive dialogue on how the section chair and the AARC can better serve the Education Section and its members. This is your opportunity to influence the profession and network with your peers. All Summer Forum attendees are invited to attend.

3:25 pm – 3:45 pm
Visit our Exhibitors

MANAGER TRACK

9:20 am – 3:25 pm
Kim Bennion MsHs RRT CHC

Chair, AARC Management Section/ *Presiding*

9:20 am – 10:00 am
Constance Mussa PhD RRT, Forest Park IL

Standardizing Respiratory Therapy Terms to Measure Patient Outcomes and Value of Respiratory Therapy Practice

Currently, due to a lack of standardized terminology, respiratory care data are seldom captured and aggregated in health information systems to help us generate meaningful information, link respiratory care interventions and outcomes, and evaluate the cost-effectiveness of care. This session will describe work that is currently underway to label and define key respiratory care concepts that describe patient responses to respiratory system dysfunction, events, and interventions.


Galvin, William


Case, Randy


Mussa, Constance

10:05 am – 10:45 am

Larae Sams BS MBA RRT, Aurora CO

EMR: Ongoing Success Post Implementation IS Possible

Developing a new electronic medical record (EMR) or transitioning to a new EMR platform can be challenging and stressful for the respiratory therapy department. However, there are strategies for ensuring the respiratory therapy department is well-represented in the development phase. This presenter will identify development challenges and opportunities pertinent to the respiratory therapy manager during the pre-go-live phase of installing an EMR, as well as assuring ongoing success.

10:45 am – 11:45 am

Visit our Exhibitors

11:45 am – 12:25 pm

Cheryl Hoerr MBA RRT FAARC, Rolla MO

Succession Planning: Developing Future Respiratory Therapy Leaders

Succession planning is simply the process of developing your people. Many respiratory therapy departments do not have a strategic plan for identifying and preparing therapists to advance in the department or organization. A lack of succession planning can lead to department chaos when key people decide to move on. Come to this session and discover proven techniques to improve your department's succession planning.

12:25 pm – 2:00 pm

Lunch (on your own) and Visit our Exhibitors

2:00 pm – 2:40 pm

Scott Reistad RRT CPFT FAARC, Colorado Springs CO

The Dichotomy of Leadership

Every leader must walk a very fine line between opposing viewpoints within leadership in regard to topics like "humble, yet not passive," "competitive, but still a gracious loser," "leader, but also a good follower." Leaning too far either direction can cause challenges to accomplishing goals and providing effective leadership. This presentation will provide insights to balance these opposing views to enhance leadership success.

MANAGEMENT SECTION MEMBERSHIP MEETING

2:45 pm – 3:25 pm

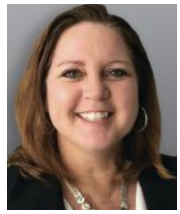
Kim Bennion MsHs RRT CHC

Chair, AARC Management Section/ *Presiding*

Updates on issues important to the section will be discussed, with interactive dialogue on how the section chair and the AARC can better serve the Management Section and its members. This is your opportunity to influence the profession and network with your peers. All Summer Forum attendees are invited to attend.

3:25 pm – 3:45 pm

Visit our Exhibitors



Sams, Larae

Hoerr, Cheryl

Reistad, Scott

GENERAL SESSION

3:45 pm – 4:25 pm

Sarah Varekojis PhD RRT FAARC/
Presiding

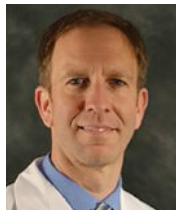
Allen Gustin Jr MD FCCP, Maywood IL

Cheryl Hoerr MBA RRT FAARC, Rolla MO

Peggy Reed-Watts MSEd RRT, St Louis MO

The Next Step in Your Professional Development

Personal and professional development are essential to successfully advance one's career. This plenary session is designed to help respiratory therapists consider and cultivate their leadership presence and their communication skills as they pursue various professional career pathways.



Gustin, Allen

Reed-Watts, Peggy

GENERAL SESSION

7:00 am – 8:55 am

Sarah Varekojis PhD RRT FAARC/
Presiding

7:00 am – 8:00 am

Coffee service for registered attendees

Agency Updates

8:00 am – 8:55 am

Karen Schell PhD RRT FAARC – AARC President

Thomas J Kallstrom MBA RRT FAARC – ARCF Vice President

Katherine Fedor MBA RRT RRT-NPS – NBRC President

Allen Gustin Jr MD FCCP – CoARC President

The leadership of the AARC, ARCF, CoARC, and NBRC will join attendees to discuss the latest professional, research, accreditation, and credentialing issues facing respiratory care.

EDUCATOR TRACK

9:00 am – 11:45 am

Georgianna Sergakis PhD RRT FAARC

Chair, AARC Education Section/
Presiding

9:00 am – 10:30 am

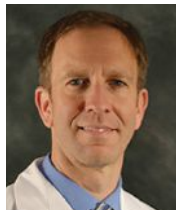
JIMMY A YOUNG MEMORIAL LECTURE

Presented by the National Board for Respiratory Care

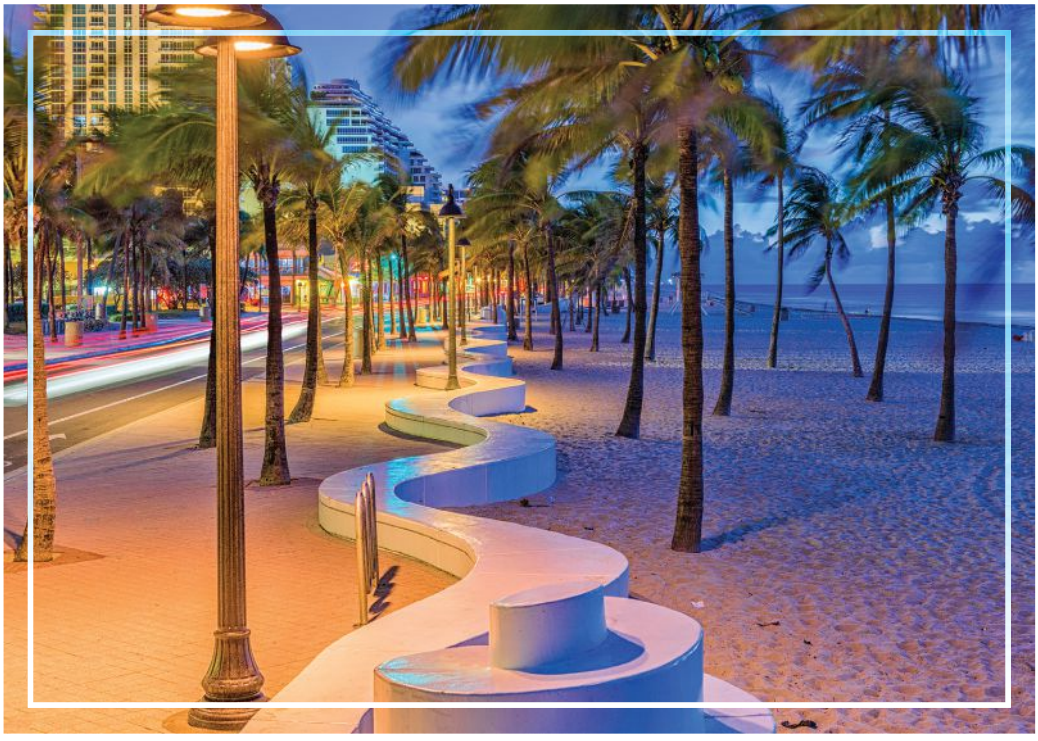
Schell, Karen

Kallstrom, Thomas

Fedor, Katherine



Gustin, Allen



Monday, July 22

Katherine Fedor MBA RRT RRT-NPS, Cleveland OH

Lori Tinkler MBA, Overland Park KS

Robert C Shaw Jr PhD RRT FAARC, Overland Park KS

The New NBRC Credential Maintenance Program

The new credential maintenance program will be described along with a rationale for each feature. New policies, longitudinal assessments, and a dashboard communicating feedback will be described.

10:30 am – 10:45 am

Break

10:45 am – 11:45

DR H FRED HELMHOLZ EDUCATION LECTURE SERIES

Presented by the Commission on Accreditation for Respiratory Care

Kenneth Winn MHA RRT, Clemmons NC

Supporting Graduate and Student Engagement

A key purpose of higher education is to develop students into "lifelong learners". Ideally the workplace should provide the medium in which the graduate will learn and develop. This talk will highlight how faculty and employers can collaborate to transition students into "lifelong learners" and own their professional development as graduates.

MANAGER TRACK

10:45 am – 11:45 am

Kim Bennion MsHs RRT CHC

Chair, AARC Management Section/ *Presiding*

10:45 am – 11:45 am

Teresa Volsko MBA RRT FAARC, Canfield OH

How Do Your Leadership Skills Measure Up?

Leadership is an elusive concept with vague and ambiguous rules. This presentation will focus on the art and science of leadership. Discover insights into better practices to produce movement and constructive or adaptive change by establishing direction through visioning, aligning people, motivating, and inspiring.

CLOSING CEREMONY

12:00 pm – 12:40 pm

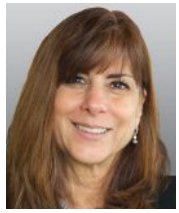
Douglas S Laher MBA RRT FAARC

AARC AARC Associate Executive Director/*Presiding*

LECTURE TBA

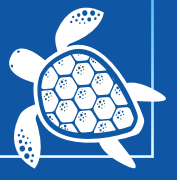
Tinkler, Lori

Shaw, Robert



Volsko, Teresa

Sea turtles are tempting to touch & observe, but lights and people disturb them. Give nesting areas space, and do not disturb as they emerge from the ocean and avoid as they head back to water.
***Lights out on the beach begins at 9 pm.**



2019 AARC Summer Forum

Registration Form

Saturday–Monday, July 20–22, 2019 • Ft. Lauderdale, FL

INTERNET: Go to www.AARC.org to register online and to receive a confirmation.
or MAIL: Send this form to AARC Summer Forum, 9425 N. MacArthur Blvd., Ste. 100, Irving, TX 75063-4706 U.S.A.
Full payment must be included with your registration form. Make checks payable to the AARC.
or FAX: If paying by American Express, MasterCard, VISA or Discover, you may fax your registration form to 972-484-2720.

PLEASE PRINT

First/Last Name for Badge _____

Credential (check up to three to be printed after your name): ☐ RRT ☐ PhD ☐ MS ☐ MBA ☐ FAARC ☐ Other_____

AARC Member # _____ **E-mail Address** _____ **@** _____

Employer _____

Preferred Mailing Address ☐ **Home or** ☐ **Business** **Daytime Phone ( )** _____

Address: _____

City _____ **State** _____ **Zip** _____

Military Registration

The AARC pre-course and Summer Forum registration fees are being waived for all active duty military health care professionals (not just respiratory therapists) to thank you for your service. Go to www.aarc.org/aarc-meetings/summer-forum-2019/military.php to view the instructions and download a military registration form.

Pre-Course

Professional Development: Enter to Learn, Go Forth to Lead!

Friday, July 19, 1:00 pm – 5:15 pm

CHECK ONE:	Through April 8	Through June 17	After June 17 and On-Site
AARC Member	☐ $100	☐ $125	☐ $147
AARC Senior Member	☐ $25	☐ $30	☐ $37
AARC Student Member*	☐ $20	☐ $20	☐ $20
Non-member	☐ $197	☐ $217	☐ $237

*Must be registered for the Summer Forum. Will not receive CRCE credit.

Summer Forum

Saturday, July 20, 8:00 am – Monday, July 22, 12:40 pm

CHECK ONE:	Through April 8	Through June 17	After June 17 and On-Site
AARC Member	☐ $327	☐ $392	☐ $457
AARC Senior Member	☐ $80	☐ $100	☐ $115
AARC Student Member**	☐ $50	☐ $50	☐ $50
Non-member***	☐ $487	☐ $552	☐ $577
Guest**	☐ $50	☐ $60	☐ $75

Which track will you primarily attend? ☐ **Education** ☐ **Management**

**Will not receive CRCE credit.

***Join the AARC and save! If you opt to pay the non-member fee, you are entitled to free, automatic 1 year AARC membership.

Check here ☐ if you **DO NOT** wish to receive this complimentary membership.

Method of Payment

Check or Money Order enclosed ☐

Charge my ☐ **Visa** ☐ **MasterCard** ☐ **American Express** ☐ **Discover**

Name of Card Holder (print) _____

Credit Card # _____

Expiration Date _____ / _____

Signature _____

☐ **I am purchasing Cancellation Protection for $27**

CANCELLATION PROTECTION

Cancellation protection may be purchased for $27 at the time of registration only. By purchasing this option you may cancel for any reason by July 15, 2019 and receive a 100% refund. Protection covers the total amount paid for AARC Summer Forum 2019 registration fees, purchased pre-course and guest fees, if applicable. Without cancellation protection, you may cancel for any reason by July 15, 2019 and receive a full refund minus a $125 cancellation/processing fee. Cancellation protection is not available for seniors or students.

A written cancellation and refund request is required via e-mail. Emails must be dated no later than Monday, July 15, 2019 at 11:59 p.m. No refund requests will be accepted thereafter. Refunds will be processed after the meeting. Fees will not be refunded for no-shows. Send request to **info@aarc.org**.

Updated 03.05.19

Site and Travel Information

Save with Discounted Transportation and Lodging

Site

All AARC Summer Forum meetings will be held at the Fort Lauderdale Marriott Harbor Beach Resort & Spa, 3030 Holiday Dr., Fort Lauderdale, Florida 33316; phone 954-525-4000.

Hotel Rates

- Rate shown is per room per night for single through quad occupancy.
- $179 + 13% tax ($202.27)

Nightly Rate Includes:

- Complimentary Basic Internet in guest rooms and lobby for Marriott Reward Members
- Discounted self-parking charges of $10 per day
- 10% off Spa pricing for registered attendees during program dates for services of 50 minutes or more, excluding nail and hair treatments. Reservations required. To receive the discount, let the Spa receptionist know you are an AARC attendee when you check in.
- Complimentary access to the 24 hour fitness center

Resort Fee Benefits

The optional, additional resort fee is $25 per night per room. Rate is plus 13% tax. Show your Resort Fee wristband for discounts and access.

- Enhanced high speed Internet access in guest room only
- Two welcome drink vouchers per stay
- Two bottles of water per room per day
- One beach umbrella daily
- Two beach chairs daily
- One hour rental of non-motorized water sport equipment (surf/paddle/boogey boards and kayaks) per room per day; first come-first served.
- Two fitness classes per room per day. Reservations required and made through the Spa.
- One hour of tennis, including rackets and balls, per room per stay. Reservations highly recommended through the towel booth outside by the pool.
- One hour snorkeling gear rental per room per day

Hotel Reservations/Deadline

- Deadline for the AARC's special sleeping room rate is **Friday, June 28.**
- **Call** 800-222-6543. Refer to AARC Summer Meetings. Discounted rates are available only through this phone number.
- **Online** at https://book.passkey.com/go/AARC2019SummerMeetings

Airline Discounts

Delta and United discount codes are valid for fares to the airports in Ft. Lauderdale and Miami, Florida. Discounts also apply to family and friends. Fort Lauderdale-Hollywood International Airport (FLL) is approximately 5 miles from the Resort. Miami International Airport (MIA) is approximately 32 miles south of the Resort.

DELTA

- **Online** at www.delta.com. Click "Advanced Search" and enter Meeting Event Code **NY2NJ** in the box provided on the Book A Flight page.
- **Call** Delta Meeting Network at 800-328-1111. Refer to meeting code **NY2NJ**.

UNITED

- **Online** at www.united.com. Click "Advanced Search". On the "Book a Flight" page, enter Offer Code **ZGJC750710** in the "Promotions and Certificates" box at the bottom of the page.
- **Call** United Reservations Meetings Desk at 800-426-1122. Refer to Z code **ZGJC** and Agreement Code **750710**.

Ground Transportation

The Resort does not provide shuttle service.

To access all ground transportation, follow the easy to read signs in the terminal from your gate to the baggage claim area located on the lower level. After you pick up your bags, go outside the terminal. You can make arrangements for a taxi cab, shared ride, or a luxury sedan car at a Transportation Podium located at the curb outside of the baggage claim area.

Rental cars are available for transportation from the Miami Airport.

Taxi Service/ Rideshare/ SuperShuttle from FLL

TAXI

Taxi: Taxicab fare to the Ft. Lauderdale Marriott Harbor Beach Resort & Spa is approximately $25 per cab.

RIDESHARE

Uber/Lyft: Request via provider's app when you're ready to walk outside. Set your pickup location to the "Commercial Passenger Vehicle" area located between terminals. Exit on the lower arrivals level. Follow the signs to the rideshare pickup area(s) located between Terminals 1 and 2 and 3 and 4 on the innermost curb. Wait curbside. Cost varies based on size of car, tolls, destination, etc.

Super Shuttle: Super Shuttle offers shared ride service between the Ft. Lauderdale-Hollywood International Airport (FLL) and the Ft. Lauderdale Marriott Harbor Beach Resort & Spa. There is a SuperShuttle kiosk in each terminal in the baggage claim area. To meet your pre-arranged/reserved shuttle, after collecting your luggage, proceed to the curb and follow signs for the VAN PICKUP area, located between terminals. The van may make additional stops in route to your destination. Reserve online at supershuttle.com or call 800-258-3826. Reserve using the SuperShuttle app and save 10% with Discount Code **APP10**.

Rental Cars

Car rental discounts are valid for the Budget, Enterprise and Hertz locations at the Ft. Lauderdale and Miami International airports. A Hertz counter is also located in the Resort.

Budget®

- **Online** at www.budget.com. Enter the **BCD** number, **U064639**, to receive the discount.
- **Call** 800-842-5628. Refer to **BCD** number **U064639**.

enterprise rent-a-car

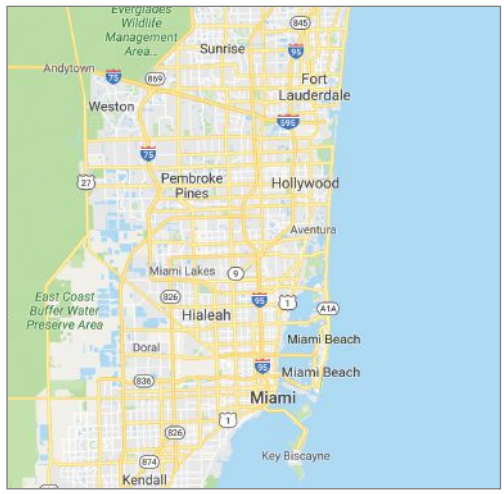
- **Online** at www.enterprise.com. Enter Discount Rate Code **L9D0194** in the "Promotion Code" box.
- **Call** 800-736-8222. Refer to Discount Rate Code **L9D0194**.

Hertz®

- **Online** at www.hertz.com. Enter **049T0015** in the Convention Number (**CV**) discount code box.
- **Call** 800-654-2240 or 405-749-4434. Refer to Convention Discount Number **049T0015**.

What to See and Do

Greater Fort Lauderdale
https://www.sunny.org
Free Things To Do
https://vacationplanner.sunny.org/things-to-do/free
Unique Things To Do
https://www.sunny.org/things-to-do/unique-things-to-do/
Beach cams
https://www.sunny.org/webcam/



Map of Ft. Lauderdale and Miami

AARC'S COMPLETELY REDESIGNED MARKETPLACE FOR RESPIRATORY CARE PRACTITIONERS

Guiding you to an even smarter search

AARC has officially launched the most connected resource for Respiratory Care Practitioners. The new Marketplace is even easier to use, with new features that take the user experience to a whole new level.

Fluidity across all devices

No more scrolling, no more zooming – the Marketplace will react to your screen size, from your desktop to your tablet to your mobile phone.

Search with purpose

With its newest search technology, visitors will find results with increased relevancy at an unbelievable speed. Find what you're looking for – the first time around.

Fully-loaded listings

Enhanced company profile pages give users access to more information, including additional product/company photos, maps, certifications, key contacts and social media links.

The new AARC Respiratory Care Marketplace for RCPs helps you work smarter, not harder. **The future of product sourcing is here today!**

RESPIRATORYCAREMARKETPLACE.COM

972.402.7070 | aarc@mulitiview.com

American Association for Respiratory Care

MULTIVIEW

AARC CORPORATE PARTNERS

THE 2019 AARC CORPORATE PARTNERS

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

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

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

AARC PLATINUM SPONSOR

- Masimo
- Medtronic Further, Together
- monaghan
- Fisher & Paykel HEALTHCARE
- HAMILTON MEDICAL Intelligent Ventilation since 1983
- Mallinckrodt Pharmaceuticals
- SUNOVION Healthy bodies, healthy lives
- VAPOTHERM

AARC SILVER SPONSOR

- Boehringer Ingelheim

Industry Watch

Circassia, AIT Therapeutics collaborate

Circassia Pharmaceuticals plc, a specialty pharmaceutical company focused on respiratory disease, has entered into a definitive agreement to acquire the exclusive commercialization rights from AIT Therapeutics, Inc., for its ventilator-compatible nitric oxide product, AirNOvent, in the United States and China. The rights cover all potential indications in the hospital setting for the administration of inhaled nitric oxide at up to 80 parts per million, which includes hypoxic respiratory failure associated with persistent pulmonary hypertension of the newborn (PPHN). AIT anticipates applying to the FDA for Premarket Approval for AirNOvent in the second quarter of 2019 for use in the treatment of PPHN; if approved, the company anticipates launching the product in the first half of next year.

FDA approval for Teva digital inhaler

According to Teva Pharmaceuticals, the FDA has approved the ProAir® Digihaler™ (albuterol sulfate 117 µg) inhalation powder, the first digital inhaler with built-in sensors that can connect to a companion mobile application and provide inhaler-use information to people with asthma and COPD. The device is indicated for the prevention or treatment of bronchospasm in patients with reversible obstructive airway disease who are age four and older, as well as for the prevention of exercise-induced bronchospasm in patients age four and older. "The digital technology built into ProAir Digihaler provides patients with data on their inhaler use, which may help them to have a more informed dialogue with their health care provider regarding their asthma or COPD management," said Teva Executive Vice President Sven Dethlefs.

FDA approves Fluzone for young kids

The FDA has approved the use of the 0.5-mL dose of the Fluzone® Quadrivalent influenza vaccine to include children 6–35 months old. The approval is supported by clinical data from a phase 4 safety and immunogenicity study conducted in nearly 2,000 children. Results showed that one or two 0.5-mL doses of the vaccine in children 6–35 months old had a safety profile comparable to one or two 0.25-mL doses of the vaccine and induced a robust immune response. Sanofi Pasteur, the vaccine division of Sanofi, will have the 0.5-mL dose, in addition to the 0.25-mL dose, available for this expanded age range in time for the next flu season.

MDA grant supports study of ALS treatment

The Muscular Dystrophy Association (MDA) has awarded an MDA Venture Philanthropy grant totaling $300,000 over two years to AcuraStem, Inc., to support preclinical development of a novel, small-molecule therapeutic for amyotrophic lateral sclerosis (ALS). MDA believes the treatment has the potential to be transformative for a broad range of patients with ALS. "We are encouraged by the progress AcuraStem and its founders have made in discovering a novel ALS drug target using patient-derived stem cells," said MDA Scientific Portfolio Director Amanda Haidet-Phillips, PhD. "MDA's investment in biotech-driven research through its venture philanthropy program ensures that promising therapies can move swiftly from conceptualization in the laboratory to testing in people with ALS."

Spiration Valve System to treat emphysema

Olympus has announced the market availability of its FDA-approved Spiration Valve System (SVS) for the treatment of severe emphysema. According to the company, guidelines recommend minimally invasive bronchoscopic lung-volume reduction using endobronchial valves as an alternative treatment option for severe emphysema instead of more invasive options such as surgery. Placed in targeted airways of the lung during a short bronchoscopic procedure, the Spiration Valve is an umbrella-shaped device that improves breathing by redirecting air from diseased parts of the lungs to healthier parts, enabling healthier tissue to expand. FDA approval of the SVS was based on results of the EMPROVE clinical trial, which demonstrated that patients treated with the SVS benefited from

statistically significant and clinically meaningful improvements in lung function and quality of life compared to standard of care medical management.

Universal flu vaccine development underway

Thanks to a five-year, $3.46 million grant from the National Institute of Allergy and Infectious Diseases, Texas Tech University researchers already known for their work in immunotherapy and infectious diseases will now be working to develop a universal flu vaccine. "The concept behind a universal flu vaccine is to create a vaccine that shows enhanced breadth of protection and ideally protects against strains that are significantly different from each other," said Harvinder Gill, an associate professor in the department of chemical engineering and one of the grant recipients. "Such a vaccine is expected to offer many advantages, including not having to change the formulations every year and providing greater and consistent vaccine efficacy year after year."

MetTel and Rotech expand services with mobile plan

MetTel is helping home medical products company Rotech Healthcare, Inc., drive better patient care and personalization at health care facilities and at home through an innovative mobile initiative that has raised Rotech's workforce productivity and doubled customer contact. The companies have deployed more than 700 customized Samsung tablets to field technicians, eliminating manual log sheets and generating increased scheduling efficiency and productivity. The Rotech technicians also have the ability to adjust their schedules based on new patient or delivery data. With the support of MetTel, Rotech has been able to bolster its mobile workforce by connecting field service technicians and sales representatives more efficiently.

Nonprofit grant will further therapies for DMD

Parent Project Muscular Dystrophy (PPMD), a nonprofit organization leading the fight to end Duchenne muscular dystrophy (DMD), has awarded a $329,000 grant to Kanneboyina Nagaraju and his team at Binghamton University. Dr. Nagaraju will use the grant to continue his work examining the body's immune response to the production of new dystrophin protein resulting from exon skipping and gene-therapy treatments. "For almost 25 years, PPMD has funded research aimed at treating Duchenne, and finally therapies like exon skipping and gene therapy are near term," said Abby Bronson, PPMD's senior vice president of research strategy. "We believe there is great value in the work Dr. Nagaraju and his team are doing — work that could improve the post-treatment outcome of these potential therapies."

Another universal flu vaccine in the works

Blue Water Vaccines, Inc., has entered into an agreement with the University of Oxford in the United Kingdom that provides Blue Water Vaccines the option to exclusively license a novel universal influenza vaccine. Developed by scientists at Oxford, the vaccine protects against all influenza strains by targeting parts of the virus that induce a protective immune response but are also limited in variability. The technology has the potential to provide life-long immunity against flu according to investigators in a study published in *Nature Communications* in late 2018.

First patient treated with RheOx for bronchitis

According to Gala Therapeutics, the first patient at Temple Lung Center in Philadelphia, PA, was treated in mid-January as part of the Early Feasibility Study of RheOx™ for chronic bronchitis. RheOx is an electrosurgical system that targets the abnormal mucus-producing cells in the airways. In a minimally invasive procedure, a pulmonologist guides an endoscope into the airways and inserts the RheOx catheter, delivering short bursts of electrical energy to the airway walls. Within days, the abnormal cells that produce large volumes of mucus are replaced by new cells that produce less mucus, explained study participant Victor Kim, MD, ATSF, AASM.

Promise for robotic-assisted procedure to treat LVRS

Northwestern Memorial Hospital became the first institution in the country to successfully complete robotic-assisted lung-volume reduction surgery (LVRS) using the da Vinci Xi Surgical System® earlier this year. The robotic procedure allows the surgeon to precisely remove the diseased portions of the lungs, which may reduce pain and scarring, lower the risk of infection, and shorten recovery time compared to traditional robotic lung volume reduction surgery. "By providing this innovative surgical option to our patients, we are changing the paradigm of emphysema management," said Ankit Bharat, MD, surgical director of the Lung Transplant Program & ECMO at the hospital. ■

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

CALL FOR ABSTRACTS

FOR THE 2019 OPEN FORUM

IN NEW ORLEANS, LA

AARC CONGRESS 2019 November 9-12, 2019

All abstracts must be submitted online at rcjournal.com by June 1, 2019, 11:59 pm PT

Visit the Journal website to submit your abstract

rcjournal.com

FOR ALL INFORMATION!

Industry Update

Featuring information on products and equipment from manufacturers

RC Currents

IN THE NEWS

Educators: Help Recognize Outstanding Students

The American Respiratory Care Foundation (ARCF) is accepting applications for its undergraduate and postgraduate Education Recognition Awards now through June 1 and is asking respiratory care educators to help get the word out to their students. Check out the list of available awards at www.arcfoundation.org/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 pursuing advanced degrees. Awards include registration and airfare to attend the AARC Congress in 2019. For more information, contact Crystal Maldonado at crystal.maldonado@aarc.org. ■

Students and Seniors Get Price Breaks on Dues

AARC members who are just starting out in their careers and those who are getting ready to wrap things up can both benefit from exclusive membership offers developed just for them.

The transitional student membership is available to student members who are preparing to graduate. AARC student members who renew their membership at least 91 days prior to graduation will save the most on dues, but savings are available up to 150 days past graduation. Those nearing graduation should look for an email with specific instructions on how to claim this special membership price break or call AARC Customer Service at (972) 243-2272 to participate.

Members age 65 and older who have been AARC members for at least 20 years are eligible to maintain their membership in the Association for just $25 per year. Alternatively, they can pay $200 and become members for life. This digital membership gives these loyal members the chance to stay in touch with everything going on in the respiratory care industry while they're planning for or entering retirement. Members eligible for this senior status can call AARC Customer Service at (972) 243-2272 to learn more about signing up. ■

Molecular Signatures Could Help Direct CF Therapies

Identifying molecular signatures using microarray technology may one day be used to help predict disease severity and treatment response in children with cystic fibrosis, report researchers from the Stanley Manne Children's Research Institute at Ann & Robert H. Lurie Children's Hospital of Chicago and their colleagues. The technique may lead to therapies that can be tailor-made for each child's precise biology as well.

"Our study was the first to identify molecular signatures of cystic fibrosis from a blood test taken during a routine clinic visit, giving us a baseline," said lead author Hara Levy, MD, MMSc. "Greater understanding of these molecular signatures may lead to unique molecular markers that could help us intervene earlier to changes in a patient's inflammatory response to airway infection or pancreatic function, allowing us to provide more focused treatment. It would be a huge improvement over the one-size-fits-all treatment approach we currently have for patients with cystic fibrosis."

The study appeared in *Physiological Genomics*. ■

Less Toxicant Exposure with E-Cigs

Another study adds to the debate over the advisability of using e-cigarettes to quit smoking. In the largest trial of its kind to date, investigators from the Roswell Park Comprehensive Cancer Center have found users of e-cigarettes were exposed to significantly fewer toxicants than those who smoked traditional cigarettes — as long as they didn't use traditional cigarettes, too. They were still exposed to more toxicants than people who didn't use e-cigarettes or traditional cigarettes, but the authors concluded the benefits are real for people who can't quit entirely. "The findings are striking, because we now have solid evidence that e-cigarettes — while they still expose users to some toxicants — appear to significantly reduce this exposure compared to combustible cigarettes," said study author Maciej Goniewicz, PhD, PharmD. The study was published by *JAMA Network.* ■

Better Flu Vaccination Rates this Season?

Have more people gotten the influenza vaccination this flu season compared to last flu season? The U.S. appeared to be on track to answer yes in a poll taken this past fall. The nationwide survey of 1,020 adults conducted between Oct. 16 and Nov. 5 of 2018 found that 27% of respondents overall, and 46% of those age 65 years and older, had already received a flu vaccination. Another 21% indicated they would definitely receive one, and 13% said they would probably receive one.

These statistics compare favorably to final results from the 2017–2018 flu season, when only 37% of adults were vaccinated against the flu. The study was conducted on behalf of the University of Georgia's Grady College of Journalism & Mass Communication Center for Health and Risk Communication. ■

ILI Linked to Deaths in Kidney Failure Patients

Influenza-like illness (ILI) may be responsible for more than 1,000 deaths a year in people with kidney failure, report U.S. researchers publishing in the *Journal of the American Society of Nephrology*. Using CDC and CMS data, the team calculated mortality trends in each quarter of the year, with the ILI season represented by the fourth quarter (Q4) of each year and the first quarter (Q1) of the following year. Results showed that a 1% absolute increase in Q4 ILI was associated with a 1.5% increase in Q4 mortality relative to the average in Q3, which represented the summer months. A 1% absolute increase in Q1 ILI was associated with a 2.0% increase in Q1 mortality relative to Q3. The average number of annual deaths potentially attributable to ILI was substantial, at about 1,100 per year. ■

Share Your Career Story in "Reflections"

AARC Times is looking for contributions to our "Reflections" column from senior members of the Association — the membership category reserved for seasoned RTs who have been AARC members for 20 years or more. We ask that you look back at your long respiratory care career and tell us what it has meant to you and why. You can submit your story to *AARC Times* at cathcart@aarc.org. Please write "Reflections" in the subject line. ■

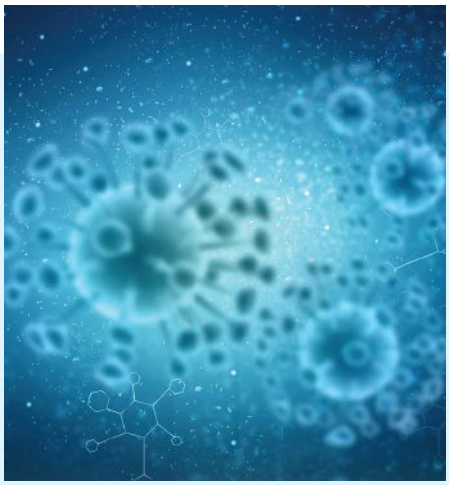
Contribute to the AARC "Transitions" Column

The AARC "Transitions" column is devoted to sharing news about the passing of AARC members. You can submit news about your colleagues' recent passing by going to http:c.AARC.org/transitions.

Please provide any information about the member's recent death, such as an obituary, so that we can share it with our members and pay tribute. ■

Survey Says Parents Still Grabbing at Cold-Prevention Straws

Studies have shown certain things just don't work when it comes to helping kids ward off a cold. A new survey conducted by researchers from C.S. Mott Children's Hospital finds more than half of parents try them anyway. For example, 51% of parents say they have given their children an over-the-counter vitamin or supplement to prevent colds, and 71% report following "folklore" advice such as keeping their kids from going outside with wet hair or keeping them inside during cold weather. The good news is that 99% of parents do encourage personal hygiene practices such as hand-washing and not sharing utensils or drinks — methods that have been shown to minimize the spread of colds. ■



Unraveling the Cellular Mechanisms Involved in COPD

A new study from U.S. researchers is helping unravel the factors involved in lung damage caused by COPD. According to the investigators, a novel, previously unreported pathogenic entity is a fundamental link between chronic inflammation and tissue destruction in the lungs of patients with the condition. This pathogenic entity — exosomes from activated polymorphonuclear leukocytes (PMNs) — caused COPD damage when the small, subcellular particles, collected from purified PMNs, were instilled into the lungs of healthy mice. When the researchers collected exosomes from the lung fluids of human patients with COPD and NICU infants with bronchopulmonary dysplasia and instilled them into the lungs of healthy mice, they also caused COPD lung damage.

"These findings highlight a novel role of the innate immune response in chronic lung diseases and could be used for the development of new diagnostics and therapeutics for COPD and possibly cystic fibrosis," commented James Kiley, PhD, director of the Division of Lung Diseases at the National Heart, Lung, and Blood Institute. The study was published in *Cell* earlier this year. ■

Human Respiratory Viruses Hit Chimps

A study led by an investigator from the University of Wisconsin-Madison (UW-Madison) suggests that common respiratory viruses in humans are being transmitted to chimpanzees in Africa. The outbreaks were discovered in two chimp groups — the Ngogo community, consisting of 205 animals, and the Kanyawara community, consisting of 55 animals.

Because the outbreaks occurred at the same time, the researchers speculated that they might have a common cause, but this was not the case. An analysis of viral genetic material from the Ngogo chimps revealed infection by metapneumovirus, a common cause of wheezing in infants, while a similar analysis in the Kanyawara chimps revealed the parainfluenza virus 3, which causes croup in preschoolers.

Both viruses are far more serious in the chimps than they are in human children. "These are very common human viruses that circulate worldwide and cause 'the sniffles' in kids," said Tony Goldberg, a professor in the UW-Madison School of Veterinary Medicine. "In people, they are no big deal unless the patient has asthma or another underlying condition. The chimps cough and sneeze and lie on the forest floor, looking miserable. And they lose a lot of weight."

Governments and conservation groups in Africa are seeking to limit transmission of these viruses to chimps by requiring face masks and hand sanitizers for people who need to come in contact with the animals, and ensuring tourists keep their distance. The study was published in a recent edition of *Emerging Microbes and Infections*. ■

Flu in Pregnancy Can Have Adverse Effects on Newborns

Pregnant women are advised to receive the flu shot. A new study out of the University of Florida suggests that pregnant women should follow that recommendation to protect the health of their infants.

The investigation was conducted among 490 pregnant women with influenza, 1,451 women without influenza with pregnancies in the same year, and 1,446 pregnant women without influenza with prior year pregnancies. Women with 2009 H1N1 influenza admitted to an ICU were more likely to deliver preterm infants, low birth weight infants, and infants with low Apgar scores than were women in the other groups. Women with influenza who were not hospitalized, as well as hospitalized women not admitted to the ICU, did not have significantly elevated risks for adverse infant outcomes.

"These findings support the importance of pregnant women receiving the influenza vaccine and of prompt treatment with antiviral medications for pregnant women suspected of having influenza," said study author Dr. Sonja Rasmussen. The study was published in *Birth Defects Research*. ■

Latino, African-American Teens Less Likely to Have Undiagnosed Asthma

In the first study to look at how individual-level and neighborhood-level factors are associated with undiagnosed asthma in a large cohort of urban adolescents, Columbia University researchers have found that low-income Latino and African-American youth are less likely to have undiagnosed asthma than whites — despite known health care disparities in these groups.

The study was conducted between 2008 and 2012 and involved 33,596 students from 44 public schools in New York City. Specific findings revealed —

- A little over 20% of adolescents reported having symptoms consistent with asthma but said they had never been diagnosed, twice that of those who reported being diagnosed with asthma.
- Compared with to whites, Asian-American adolescents were 41% more likely to be symptomatic but undiagnosed.
- Latinos and African-Americans were 33% and 34% less likely to be undiagnosed, respectively.
- Compared with males, females were 25% more likely to be undiagnosed.
- Living in a neighborhood deemed a "health care provider shortage area" was associated with a 29% lower risk of being undiagnosed.

The authors believe known asthma disparities among Latino and African-American youth may have led health care providers to be more likely to assess them for asthma, leading to fewer undiagnosed cases compared with to Asian-Americans or whites. However, the finding that undiagnosed asthma may be nearly twice as prevalent as diagnosed asthma in urban adolescents overall suggests that greater efforts to promote the screening and diagnosis of asthma among adolescents are warranted.

The study appeared in a recent edition of the *Journal of Urban Health*. ■

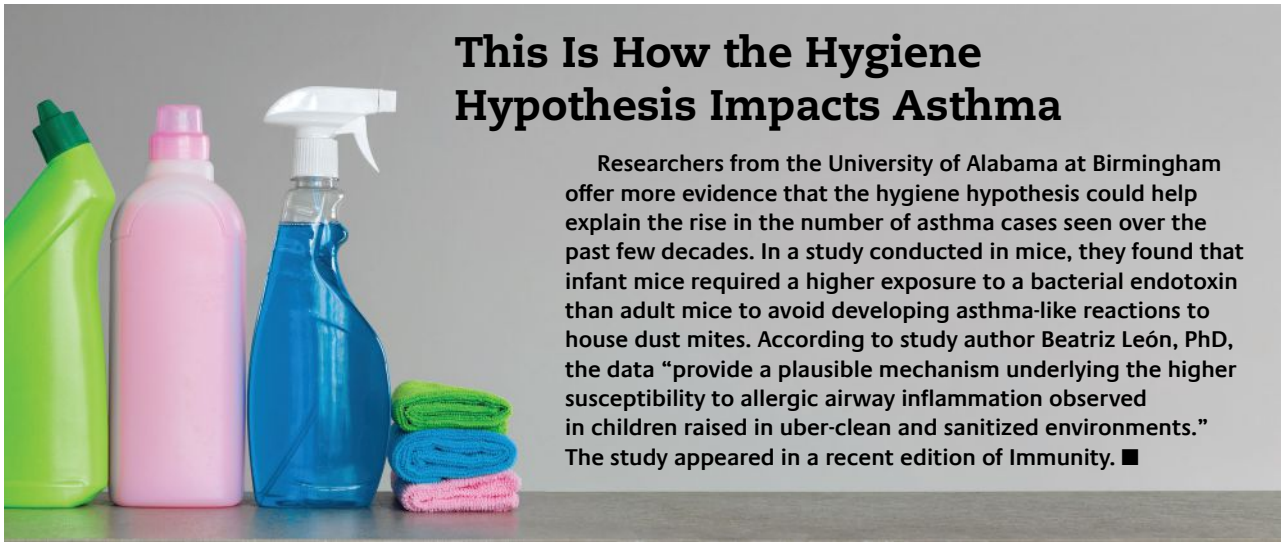
Complication Rates After Lung Cancer Screening May Be Higher Than Thought

MD Anderson Cancer Center researchers who looked at complication rates for patients undergoing invasive diagnostic testing for lung cancer in the community setting believe their results question findings from carefully controlled clinical trials that looked at complications in patients who had undergone low-dose computed tomography (LDCT) screening for lung cancer.

To determine a baseline level for complication rates, the researchers analyzed claims data from the MarketScan database between 2008 and 2013. The sample included 174,702 individuals 55–77 years old who had invasive diagnostic procedures and a matched-control group of 169,808 individuals who did not have these procedures. Because these data do not indicate if an individual had LDCT screening prior to undergoing the invasive procedure — the relevant billing code for LDCT was not established until February 2015 — they analyzed claims for patients who had procedures for lung abnormalities similar to those reported in the National Lung Screening Trial (NLST). The NLST demonstrated that LDCT screening in high-risk individuals reduced the mortality rate from lung cancer by 16% and served as the basis for current U.S. Preventive Services Task Force recommendations that certain current and former smokers who are 55–80 years old undergo annual LDCT screening for lung cancer.

The NLST reported false-positives in nearly one quarter of participants. Complication rates for invasive diagnostic procedures, which included cytology/needle biopsies and bronchoscopies or thoracic surgeries, were under 10%. The new study found that the post-procedural complication rate was 22.2% among the younger patients in the study (55–64 years old) vs. just 9.8% in the NLST. For older individuals (65–77 years old), the complication rate was 23.8% vs. 8.5% in the NLST. An analysis of associated downstream costs from post-procedural complications found that managing these complications resulted in higher costs on average than the diagnostic procedures, ranging from $6,320 for minor complications to $56,845 for major complications.

"It's very important for physicians to include information about possible adverse risks when communicating with their patients considering lung cancer screening," said study author Ya Chen Tina Shih, PhD. "Our findings suggest these complications may be higher than anticipated when implementing lung cancer screening programs outside a clinical-trial setting, and the health care system needs to be ready for that potential issue." The study was published in *JAMA* Internal Medicine. ■



This Is How the Hygiene Hypothesis Impacts Asthma

Researchers from the University of Alabama at Birmingham offer more evidence that the hygiene hypothesis could help explain the rise in the number of asthma cases seen over the past few decades. In a study conducted in mice, they found that infant mice required a higher exposure to a bacterial endotoxin than adult mice to avoid developing asthma-like reactions to house dust mites. According to study author Beatriz León, PhD, the data "provide a plausible mechanism underlying the higher susceptibility to allergic airway inflammation observed in children raised in uber-clean and sanitized environments." The study appeared in a recent edition of Immunity. ■

Creating a Sleep-Friendly Unit

Patients will be the first to tell you that hospitals are not the best places in the world to get restful sleep. University of Chicago researchers believe it can be improved upon, and they conducted a study called Sleep for Inpatients: Empowering Staff To Act — SIESTA for short — aimed at proving it.

Using "nudges" via the patient's electronic health record (EHR), the program urged clinicians to avoid interruptions in the patient's sleep that offered only minimal value to the patient, such as waking him up during the night to measure vital signs or administer non-urgent medications. They made a 20-minute presentation to clinicians as well to educate them on the consequences of sleep deprivation.

When they compared outcomes for patients in a SIESTA-enhanced general medicine unit and a similar unit that, while staffed by the same physicians, did not specifically follow the SIESTA paradigm, they found better outcomes in the SIESTA unit. In that unit, decisions to forego nighttime vital signs went from 4% to 34% and sleep-friendly timing of nighttime medications such as anticoagulants to prevent blood clots rose from 15% to 42%. Nighttime room entries declined by 44%.

Overall, patients experienced six times fewer room entries during sleeping hours, and they reported four times fewer disruptions due to medications and three times fewer disruptions due to routine vital signs. The SIESTA unit improved its score on the nationally used quiet-at-night patient experience measure as well. The study was published in the *Journal of Hospital Medicine*. ■

Unanticipated Consequences?

The federal government's Hospital Readmissions Reduction Program (HRRP) was aimed at reducing unnecessary readmissions for patients with a range of conditions, including pneumonia and COPD. Researchers from Beth Israel Deaconess Medical Center believe it has had some unintended consequences as well. Their study links the HRRP with a significant increase in post-discharge mortality for patients with heart failure and pneumonia.

The investigators evaluated trends in mortality among Medicare patients who were hospitalized for heart failure, heart attack, or pneumonia before the establishment of the HRRP, then determined whether there was a significant change in mortality after the HRRP was announced in 2010, and then again after the policy was implemented in 2012. More than eight million Medicare fee-for-service hospitalizations from 2005 to 2015 were included in the analysis.

Results showed that 30-day post-discharge mortality was increasing among patients hospitalized for heart failure in the years before the HRRP was established, but the rise accelerated after the policy was implemented. Mortality rates among patients with pneumonia were actually stable prior to the HRRP, but they began increasing after it launched. While the researchers emphasize that more study is needed to fully blame the HRRP for these increases in mortality, if their findings bear out, the program could have been responsible for an additional 10,000 deaths among patients with heart failure and pneumonia during the five-year period after the HRRP announcement. The study appeared in a recent edition of *JAMA*. ■

ASSESSING ICU PATIENTS FOR PICS

A stay in the ICU places a great deal of strain on a patient, and for some that strain translates to post-intensive care syndrome (PICS). But which patients are most likely to develop PICS? Researchers from Indiana believe a questionnaire initially developed to assess dementia may also be useful in determining who will and who won't develop PICS.

The study was conducted among 142 patients being seen in the Critical Care Recovery Center (CCRC) at the Sidney & Lois Eskenazi Hospital in Indianapolis. All of the patients had completed standardized assessments during their initial visit and the Healthy Aging Brain Care Monitor Self-Report (HABC-M SR) questionnaire either that day or within a week. These patients were then compared to 291 patients seen in primary care settings who also completed the HABC-M SR questionnaire.

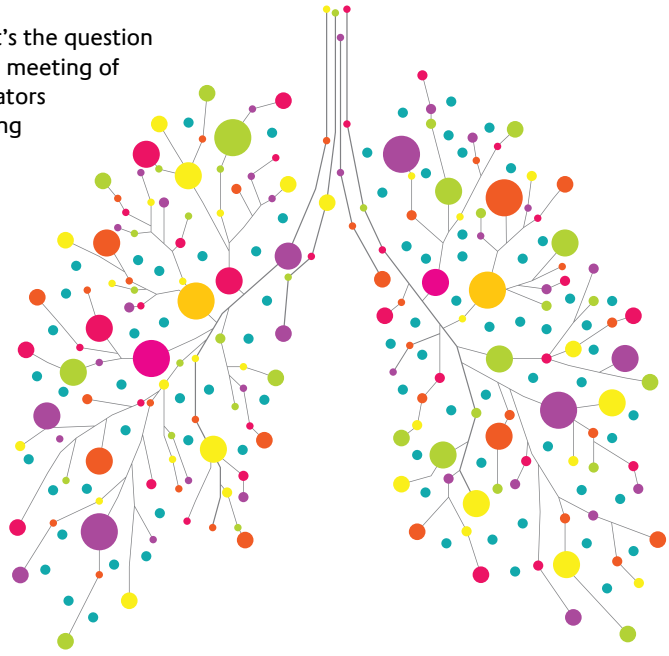
The CCRC patients were more likely to report cognitive, psychological, or functional symptoms than the primary care patients, and patients with PICS had significantly worse scores on subscales, with CCRC patients having mean total HABC-M SR scores nearly double those of the primary care patients. The authors note the HABC-M SR requires little to no training to administer, making it a good questionnaire to use to assess patients for PICS across multiple settings. The study was published in the *American Journal of Critical Care*. ■

Regionalizing Lung Surgery Pays Off

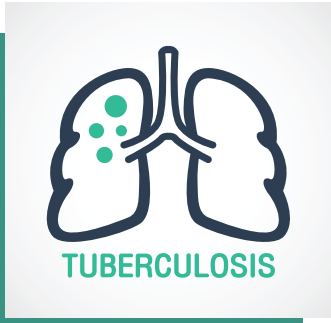
Should lung cancer surgery be regionalized? That's the question researchers asked in a study presented at the recent meeting of the Society of Thoracic Surgeons. California investigators looked at data on patients who underwent major lung surgery at hospitals within the Kaiser Permanente Northern California network, which shifted thoracic surgery care from 16 hospitals to five designated Centers of Excellence in 2014.

Comparing 782 patients treated before regionalization with 845 patients treated after regionalization, the investigators found that patients spent less (or no) time in the ICU, were able to leave the hospital about three days sooner, and had fewer major complications after regionalization went into effect.

Regionalization also resulted in increased use of minimally invasive video-assisted thoracoscopic surgery (VATS), and the average operating time for VATS lobectomies decreased by more than 30 minutes, possibly due to the surgical team's efficiency with repetition of these cases. ■



Stamping Out TB



The tuberculosis rate in the United States is already low — about 2.8 cases per 100,000 population — but efforts to stamp the disease out entirely have largely failed. A researcher from Saint Louis University believes a new tool aimed at determining which patients are most likely to progress to an active infection may help.

Soumya Chatterjee, MD, and his team used five years of existing data on clinic patients with a latent TB diagnosis to create an online risk calculator. Results published in PLOS One showed that 22% of those with inactive TB were at high risk for progressing to an active infection, and that patients of all risk levels had the same treatment completion rate. Dr. Chatterjee and his colleagues believe the risk stratification tool could help physicians place a greater emphasis on treatment completion in patients at highest risk for progression to an active infection. That, in turn, could prevent many active infections from occurring and perhaps stem the spread of TB altogether.

The next step will be to study patients taking a new treatment regimen that calls for one tablet once a week for three months, for just 12 doses overall. The CDC recommends directly observed therapy to ensure patients take all the doses. "We're taking a telemedicine approach for this," Dr. Chatterjee said. "With a HIPAA-approved app for a patient's phone, a nurse at a computer will watch the patient take the medication and will record the treatment. This way, we'll have clear documentation that the treatment was finished." ■

Organ Availability May Depend on Where You Live

Is the organ allocation system in the United States really fair? Researchers from Johns Hopkins Medicine who analyzed data on lung transplants believe the answer may be no — despite new rules established by the United Network for Organ Sharing (UNOS) after a court case found its old rules were favoring some regions of the country over others.

Under the old rules, donwor lungs were to be assigned to the sickest patients on a regional basis, a system designed to use donor organs locally because of time constraints. After the court ruling, UNOS changed its policy so that organs would be offered to the highest-ranking candidate within 250 nautical miles, rather than within donor service area (DSA) boundaries.

The problem under the old DSA rule was that people living in DSAs with fewer available organs missed out, even though they may have been living right next to a DSA with a much greater supply, such as on the other side of a river or other predetermined boundary. The new 250 mile rule is better, but it still favors some areas over others. For example, certain areas of the country have much higher organ donation rates because of the rising drug-overdose pandemic or deaths due to traumatic events. Some local donor organizations do a better job of communicating with families and communities about the importance of organ donation as well.

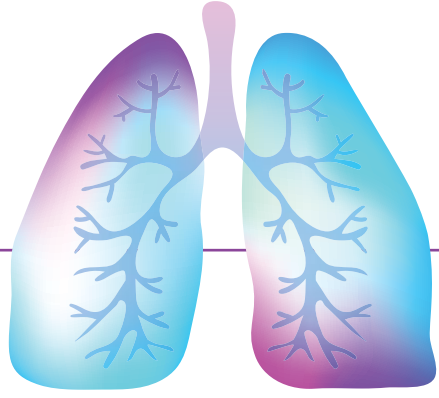
The study was published in the *American Journal of Transplantation*. ■

Decision Aids Fall Short

Decision aids commonly used to help families of patients on prolonged life support make decisions about their loved one's care may not live up to expectations, report U.S. researchers who randomized 416 decision-makers for 277 patients into groups that received or did not receive assistance from a computerized decision tool. All of their loved ones had been on life support for at least 10 days. Results showed —

- The decision aid did not change whether the decision-maker advocated for aggressive medical care or favored palliative care.
- There was no difference in hospital length of stay or mortality rates between patients whose caregivers used the guide and those whose caregivers didn't use it.
- More than half of the family caregivers disregarded the guide's recommendations in favor of more aggressive treatment, despite the fact that the recommendations were made based on the information they had provided about the patient's values.

The study was published in the *Annals of Internal Medicine*. ■



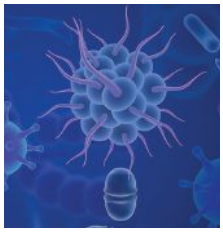
Air Pollution Linked to Respiratory ER Visits

The largest study of air pollution and emergency room visits for respiratory problems to date has found that more patients end up in the ER as ozone and fine-particulate pollution (PM2.5) levels rise. But the impact is more prominent in some individuals than in others. According to the CDC investigators —

- Per 20 parts per billion (ppb) increase in ozone, the rate of an ER visit for respiratory problems increased 1.7% among children, 5.1% among adults under 65 years old, and 3.3% among adults over 65.
- Increased levels of ozone resulted in increased ER visits for individuals with asthma, acute respiratory infections, COPD, and pneumonia. Overall, the association was strongest for asthma among adults under 65.
- An association was found between fine-particulate pollution (PM5) and respiratory ER visits among children and adults under age 65, with the strongest association seen among children. Per 10 microgram per cubic meter increase in PM2.5, the rate of an ER visit increased 2.4% in children and 0.8% among adults under 65.
- Increased levels of fine-particulate matter resulted in increased visits for asthma, acute respiratory infections, and pneumonia.

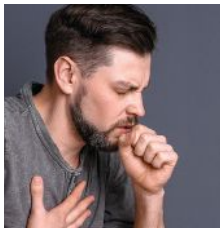
The study was published by the *American Journal of Respiratory and Critical Care Medicine* earlier this year. ■

Strange But True...



Fantastic voyage: A microscopic swimming robot that can change its shape depending on the environment in which it is swimming is being developed by Swiss scientists, with the hopes of one day sending it into the body to deliver drugs to targeted sites. These swimmers are built from hydrogel nanocomposites containing magnetic particles so that their movement can be guided by magnetic controllers outside the body.

Breath biopsy: British investigators are working on a new device that they believe may one day be able to detect cancer in its earliest stages by measuring levels of volatile organic compounds in a person's breath. The concept has been around for a while, but they are improving upon it with a device that captures exhaled airborne molecules like a sponge and keeps them intact so they can later be analyzed in a lab.



The best medicine: What's the best way to stop a cough? Researchers from the University of Hull believe a milk chocolate bar may get the job done as well as any cough syrup out there today. Their study of 163 people found that those who took a cocoa-based medicine saw relief in just two days.

Clear the air: Small molecules like chloroform and benzene, which have been linked to cancer, are too tiny to be captured by HEPA filters. Researchers from the University of Washington have genetically engineered the common houseplant pothos ivy to get the job done. The modified plant expresses a protein that transforms these compounds into molecules that the plants can then use to support their own growth.

Calendar of Events

AARC & State Society Programs

April 3, 2019 – April 5, 2019

Kalamazoo, MI

Michigan Society for Respiratory Care Spring Conference

Contact: associations@mhsa.com or www.michganrc.org

April 17, 2019 – April 19, 2019

Osage Beach, MO

Missouri Society 48th Annual State Conference

Contact: terra.saunders-crouch@mercy.net or www.MoSRC.org

April 24, 2019 – April 26, 2019

Baton Rouge, LA

I Am Your Respiratory Therapist Seminar

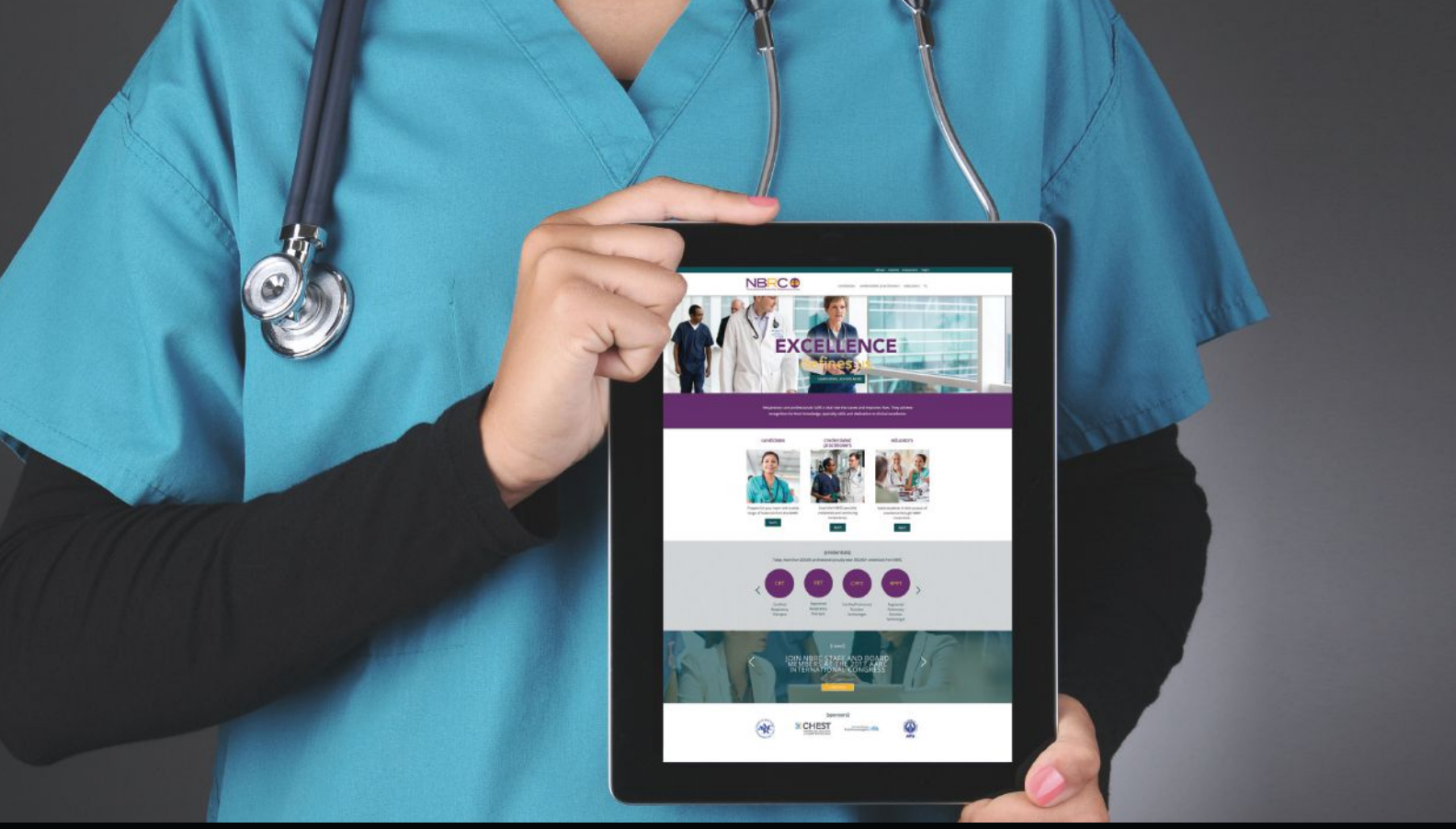
Contact: djguillot29@gmail.com or www.lsrc.net

Recruitment Display Advertising Information & Requirements:

For Recruitment Display Ad Rates, go to http://www.aarc.org/resources/publications/media-kit/ or contact AARC Respiratory Jobs • Respiratory.Jobs@aarc.org (972) 243-2272 • Fax (972) 484-2720
9425 N. MacArthur Blvd., Suite 100, Irving, TX 75063

Advertiser Index

To advertise, contact: Phil Ganz, 48 Abbey Woods Ln., Suite100, Dallas, TX 75248, Voice (972) 991-4994, Fax (888) 206-9006, phil.ganz@aarc.org. Or contact Sarah Vaughn, Director of Business Development, Daedalus Enterprises, Inc., 9425 N. MacArthur Blvd., Suite 100, Irving, TX 75063-4706, (972) 243-2272, Fax (972) 484-2720, advertising@aarc.org.



RENEW YOUR NBRC CREDENTIALS

IN JUST A FEW CLICKS.

Experience the priceless benefit of an AARC membership. AARC members will now find the easiest way to renew their credentials will be by submitting AARC CRCE® credits to the NBRC. By simply entering an AARC member number into the NBRC's website, AARC members can now import their entire AARC CRCE® credits and transcript, and eliminate any need for manual entry of their CRCE® continuing education credits on the NBRC's website.

Visit **AARC University** at https://my.aarc.org/education/aarcu to take CRCE® courses today!

AMERICAN ASSOCIATION FOR RESPIRATORY CARE

NBRC
The National Board for Respiratory Care

CRCE
Continuing Respiratory Care Education

A Full Spectrum of Ventilation Solutions

NomoLine® Capnography and Gas Monitoring

Masimo offers a complete portfolio of capnography and gas monitoring solutions, both sidestream and mainstream, to meet the challenges of ventilation and gas monitoring across care areas – from pre-hospital and in-hospital to transport, long-term care, home care and more.[1]

Capnography-enabled Masimo devices need virtually no warm-up time, provide full accuracy performance in ten seconds, require no calibration,[2] and benefit from the unique moisture-wicking technology of NomoLine sampling lines, helping clinicians make more informed decisions.

Learn more at

masimo.com/capnography

MASIMO

[1] Products shown may not be available for use in all care areas. [2] For complete specifications, including measurements, see Operator's Manual.

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