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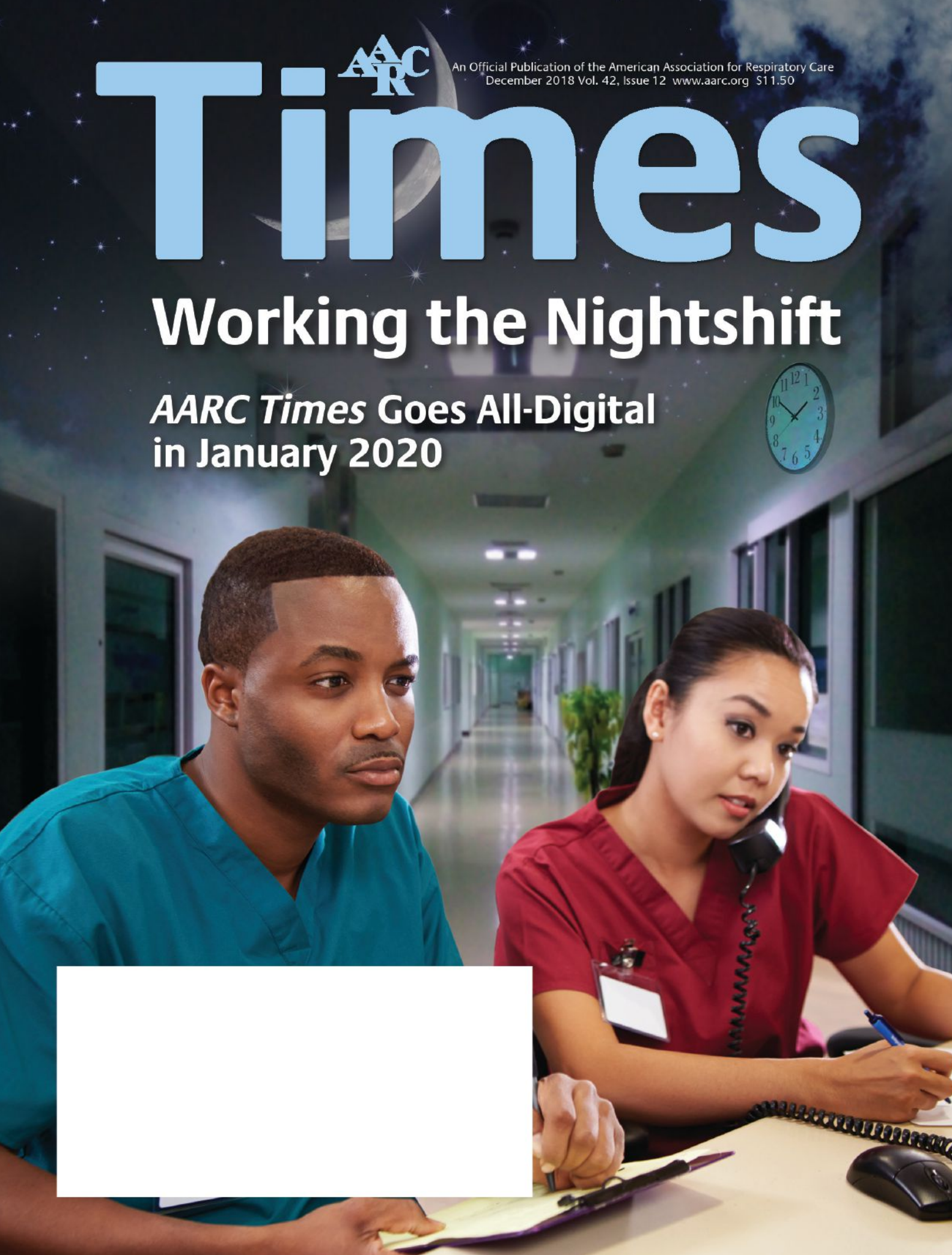

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The Sunflower Campaign: Bloom from Wherever You Are Planted!

by Karen Schell, DHSc, RRT, RRT-NPS, RRT-SDS, RPFT, RPSGT, AE-C, CTTS

You may know that I am from Kansas. Our state flower is the sunflower. The sunflower has many unique meanings across the globe; many cultures share similar views. Long life, adoration, admiration, loyalty and strong bonds, seeking out positivity and strength, nourishment of self and others, brightening your mood, good luck, and lasting happiness have all been associated with these flowers. I have always loved them, even when I was growing up. I have them throughout my office and house in one form or another.

My passion for incorporating the sunflower into my professional activities all started when I was speaker of the AARC House of Delegates (HOD) in 2012. I was seeking a way to encourage respiratory therapists to become more involved and engaged in the profession. At the end of my term, I gave out sunflower seeds to HOD members and visiting students and encouraged them to go back and grow a small field of flowers in their own communities.

The idea was that if we all took the time to "plant the seed" and "grow individuals," our profession would flourish like the sunflower seed into first a beautiful flower and then into a field of flowers that could grow together to move ahead. I encouraged HOD members to emulate the spirit of the sunflower by going back home and mentoring and engaging others. I encouraged the students to become more engaged and involved themselves, and to spread the word to their fellow students as well. I heard back from many that they were indeed back home growing the seeds, and the profession. They all took it to heart and it was fun to hear the progress.

about the author...

Karen Schell is an assistant clinical professor in the respiratory care department at the University of Kansas Medical Center School of Health Professions in Kansas City, KS, and president-elect of the AARC. She will become AARC president on December 5.

Sunflower pins

When I became AARC president-elect in 2017, I wanted to find a way to engage everyone and encourage their growth. The sunflower lapel pin represents a step in that direction. We already see this colorful pin showing up everywhere and on everyone, and we hope it becomes a symbol for involvement and growth, both on an individual basis and as a profession. It is a great conversation starter and a way for everyone who is working together to be recognized for their commitment to the profession, our patients, and our communities.

But we need your willingness to participate. Just like the sunflower seed, if we let our members lay dormant, they will not grow, sometimes for years. If we cultivate the soil and provide water and sunshine, the sunflower seed will grow into a beautiful flower, and our members can do the same. We need you to nurture and grow our profession's future. Reach out to your fellow AARC members and grow them into a beautiful field of sunflowers. We need everyone to engage in growing the profession and mentoring RTs to meet the challenges ahead.

AARC members who have already started to disseminate the pins are enthusiastic about the

impact they can have. "Thanks so much for the sunflowers!" says Teresa Volsko, MBA, RRT, FAARC. "I distributed a few today on my rounds. It was the highlight of my day and a way I can also inform our team about our amazing leader at the AARC!"

"I gave out my first sunflower to my senior, Alicia Paige Fisher," notes Sharon Armstead, EMBA, RRT. "She is a very proactive young lady and I knew that she would be the first to follow up. She is already a member of the Texas Society for Respiratory Care (TSRC) and AARC, and she was the TSRC Foundation Scholarship recipient this past conference."

"I'm going to make the sunflowers a part of my student orientation," says Tim Op't Holt, EdD, RRT, FAARC.

When opportunity presents itself, we need to be willing to stand up, take a breath and commit ourselves to it wholeheartedly. — Oprah Winfrey

Do you have yours yet?

So the sunflower campaign has begun. Do you have your lapel pin yet? Have you engaged with those around you? Do you know someone who is sunflower-worthy? Let's keep the movement growing. Continue to engage your colleagues. Grow the sunflowers in your area. Let's all wear our sunflower pins to AARC Congress 2018 in Las Vegas this month.

An old Mexican proverb says, "They tried to bury us. They didn't know we were seeds." Don't let us be buried. Let's grow our sunflowers and engage our members to be involved. If you need some sunflower lapel pins to engage RTs in your area, you can contact me at kschell@kumc.edu. I will send you some sunflower pins, and we can keep the movement growing. ■

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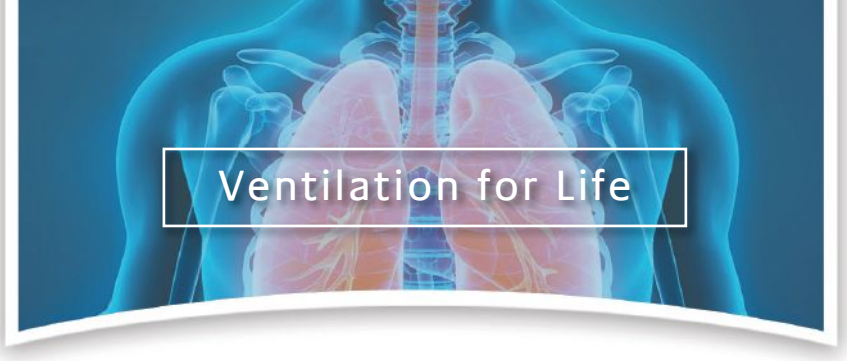

Controversies in Tracheostomy Management

by Constance Mussa, PhD, RRT, RRT-NPS

The area of tracheostomy management is fraught with controversy, beginning with whether the correct term is "tracheostomy" or "tracheotomy." Respiratory therapists are usually on the front line of caring for patients with tracheostomies, and must integrate the best available evidence with their clinical judgment and patient preference to provide optimal care. This article provides a snapshot of three controversial topics related to tracheostomy management and will use the term "tracheostomy" to mean a surgical opening in the trachea through the neck to allow the passage of air via a tube (airway) placed through the surgical opening (stoma).[1]

Overview of challenges in tracheostomy management

Historically, optimal management of tracheostomy patients has been hindered by fragmentation of care because the insertion of a tracheostomy tube disrupts multiple physiologic functions, including airway clearance, speech, swallowing, the ability to eat, and the ability to adequately warm and humidify inspired gases. These problems are usually addressed by different health care professionals, like nurses, nutritionists, physical therapists, physicians from different specialties, respiratory therapists (RTs), and speech-language pathologists.[2] A lack of communication and coordination of care between these health care professionals may result in suboptimal care.[2,3] In addition, patients with tracheostomies are often admitted to general wards, where some caregivers encounter them infrequently and therefore might not have the expertise to provide optimal care, which may result in adverse clinical events.[4] The relative lack of high-quality evidence regarding the many aspects of tracheostomy management is another challenge that has led to several controversies related to the care of these patients. Three common controversies that are related to tracheostomy management and are frequently encountered by RTs are:

(a) When should tracheostomy be considered?
(b) How frequently should tracheostomies be changed?
(c) Which solutions should be used for tracheostomy cleaning?

about the author...

Constance C. Mussa, PhD, RRT, RRT-NPS, is an assistant professor at the department of cardiopulmonary sciences–division of respiratory care and a college of health sciences academic administrative fellow – strategc planning.

When should tracheostomy be considered?

Several studies have compared multiple clinical outcomes in early versus late tracheostomies.[5,6] A meta-analysis that included nine randomized controlled trials with a patient pool of 2,040 subjects (early tracheostomy, *n* = 1,018 subjects; late tracheostomy, *n* = 1,022 subjects) revealed that early tracheostomy (defined as tracheostomy performed ≤10 days post-intubation) was able to reduce the duration of sedation.[6] However, mortality, the incidence of ventilator-associated pneumonia, ICU length of stay, and duration of mechanical ventilation were not significantly changed. Although the current evidence does not facilitate consensus on timing of tracheostomy, it is reasonable to conclude that a specific subset of patients exhibiting respiratory failure such as patients with spinal cord injury above C6 may benefit from having an early tracheostomy.[7]

How often should tracheostomy tubes be changed?

Currently, there is very little evidence regarding how frequently a routine tracheostomy tube change should

be performed, and the quality of the existing evidence is low. In fact, the 2012 Clinical Consensus Statement on Tracheostomy Care developed by the American Academy of Otolaryngology-Head and Neck Surgery[8] does not recommend a frequency for routine tracheostomy tube change; rather, the statement highlighted the need for further research. This has contributed to significant variability in the frequency of tracheostomy tube changes in clinical practice.

One study in a cohort of medically complex adults in a long-term care facility found that changing the tracheostomy tube every two weeks reduced the number of patients who required surgery due to granulation tissue formation at the stoma and the trachea.[9] A later study found significant degradation of tracheostomy tubes after three months in 19 patients with long-term tracheostomies, which led the researchers to recommended changing the tracheostomy tube before the end of three months.[10]

Which solutions should be used to clean the inner cannula of the tracheostomy tube?

Most adult tracheostomy tubes are double-lumen tubes with a disposable inner cannula. These tubes require no cleaning. However, a non-disposable inner cannula requires cleaning to remove secretions and maintain airway patency. There is currently no scientific evidence regarding the most appropriate solution for cleaning the inner cannula. Consequently, a wide variety of solutions are used across care settings, including physiological saline, tap water, soap and water, hydrogen peroxide, and sterile water. Because silicone and metal tubes can be damaged by hydrogen peroxide, the exclusive use of physiological saline has been recommended.[11,12] However, it is prudent for clinicians to review manufacturer cleaning instructions.

The role of respiratory therapists in tracheostomy management

Airway management is central to the practice of respiratory care, and RTs make significant contributions to the care of patients with tracheostomies. Respiratory therapists may engage in tracheostomy management from the beginning by selecting the most appropriate tracheostomy tube for the patient's needs. This requires an understanding of differences in tracheostomy tube sizes across manufacturers and complicated tracheal anatomies. After a tracheostomy is established, RTs help prevent major long-term complications of tracheostomies by providing adequate humidification to manage secretions and optimal care for the tracheostomy tube and stoma. Among the numerous roles the RT plays, one key role is collaborating with speech-language pathologists to determine when and how speech should be attempted. When problems arise, RTs manage tracheostomy-related emergencies and complications of long-term tracheostomy tube use. RTs can also determine when and how decannulation should be attempted. It is important that RTs engage in multidisciplinary quality-improvement initiatives relevant to tracheostomy management, such as The Global Tracheostomy Collaborative (http://globaltrach.org). Respiratory therapists possess technical and clinical skills that enable them to be innovative in finding solutions to complex problems. A salient example of such innovation can be seen in one RT's collaboration with the medical devices department in the use of 3D printing to improve visualization of the extensive abnormalities of a patient's tracheal anatomy, which enabled the care team to determine an appropriate clinical intervention.[13]

Because of the paucity of evidence-based guidelines regarding tracheostomy management, the American Association for Respiratory Care has recently created several teams to perform systematic reviews of the literature on various aspects of pediatric and adult tracheostomy management. The systematic reviews will

facilitate development of evidence-based guidelines to help RTs better manage patients with tracheostomy tubes. Moreover, they will highlight opportunities for respiratory therapists to conduct research to improve the care they provide to these patients. ■

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Improved Payment for Respiratory Care in Skilled Nursing Facilities

by Anne Marie Hummel

The Centers for Medicare and Medicaid Services (CMS) recently finalized rules that will change the way skilled nursing facilities are reimbursed under the prospective payment system. A new Patient-Driven Payment Model (PDPM), which replaces the Resource Utilization Group-IV (RUG-IV) model, offers an opportunity for facilities to receive more accurate payment for services provided by respiratory therapists that in the past have been underpaid.

The new model, which becomes effective October 1, 2019, is designed to treat the whole patient, accounting for the complex medical conditions they have at admission rather than focusing on the specific volume of services provided during the length of stay. According to CMS, it will also offer patients more opportunity to choose a skilled nursing facility that offers services tailored to their conditions and preferences.

The current RUG-IV model consists of two components: therapy and nursing. The therapy component consists of physical therapy, occupational therapy, and speech-language pathology. It does not include respiratory therapy. Respiratory therapy is considered a "non-therapy ancillary (NTA) service" along with prescription drugs, medical supplies, medication therapy, and laboratory services. One of the problems with respect to facility payments under the RUG-IV model is that NTA services are part of the nursing component, where payment is derived from nursing staff time, which doesn't capture the true resource utilization necessary to care for patients whose condition requires extensive services, such as ventilator care provided by respiratory therapists.

To address the problem, CMS funded extensive research to determine which comorbidities and extensive services were linked to relative differences in NTA costs. The end result is the new PDPM model, which will consist of five components, not two. CMS will establish a separate component for each of the therapies, e.g., physical therapy, occupational therapy, and speech-language pathology, and will move therapy minutes as the basis for therapy payment. It will keep the nursing component and add a new separate NTA component in which payment is based on resident characteristics that predict NTA resource utilization rather than nursing staff time, leading to more accurate payments.

Under the new model, payment for NTA services would be based on the patient's comorbidities at admission and the extensive services received. All patients will be classified into one of six NTA case-mix classification groups. Case-mix refers to payment adjustments to facilities based on characteristics of the residents' care that lead to average costs being higher or lower than the average cost of the typical skilled nursing facility resident. Further, the per diem payment for a skilled nursing facility adjusts for varying costs throughout the stay. For example, an independent analysis of NTA resource utilization indicates that NTA costs: 1) are very high at the beginning of the stay; 2) drop rapidly after the first three days; and, 3) remain relatively stable from the fourth day of the stay. In addition, day

about the author...

Anne Marie Hummel is an executive associate director of the AARC and specializes in advocacy and government affairs.

four costs are roughly one-third of the costs of the first three days.

The new payment model is very complex, but in the simplest terms, it does a better job of accounting for variations in resource use for respiratory therapy and other NTA services. In determining the appropriate NTA case-mix classification groups, points are assigned ranging from 0 to 12+. For example, residents whose conditions and services have a greater impact on NTA costs are assigned more points, while those with less of an impact are assigned fewer points. There are a number of respiratory conditions and extensive services used for classification purposes. These consist of:

- Ventilator or respirator – post-Admit
- Active diagnoses: asthma, COPD, chronic lung disease
- Cystic fibrosis
- Tracheostomy care – post-Admit
- Suctioning
- Cardio-respiratory failure and shock
- Respiratory arrest
- Pulmonary fibrosis and other chronic lung disease

Four points are assigned to the ventilator/respirator category, two points are assigned to the active diagnoses of asthma, COPD, chronic lung disease, and all other respiratory categories are assigned one point. During the public comment period, AARC recommended that the points assigned to ventilator care should be much higher because the service requires 24-hour assistance by a respiratory therapist. We also asked CMS to remove the outdated term "respirator." In responding to the comments in the final rule, CMS noted it conducted a cost regression analysis of the 50 costliest comorbidities in terms of NTA utilization and assigned four points to ventilator/respirator care to reflect findings that the service "was associated with an increase of about $40 in NTA costs per day." CMS concluded the analysis did not support increasing the points assigned. With respect to removing the term "respirator," CMS stated, "We appreciate the feedback on the appropriateness of the current name and will consider modifying the name of this item as appropriate to reflect current usage." It is unclear whether CMS will make the change prior to implementation at the beginning of 2019, which allows time for facilities to receive education and training on the new payment model .

So, what does this mean for respiratory therapists and patients? Overall, the new PDPM model offers advantages over the RUG-IV payment methodology. It establishes a separate case-mix NTA component, thereby allowing resources to be targeted to medically complex beneficiaries, which results in increased payment accuracy and better care for respiratory patients. It also provides additional resources to facilities for treating beneficiaries that have high NTA utilization and extensive services such as ventilator care and other respiratory conditions.

While AARC would like to see a separate respiratory therapy component, the changes are a step in the right direction that over time will provide CMS with data to make future revisions, which have the potential to give additional recognition to the resources it takes to care for patients with chronic respiratory conditions. ■

Guardians and Choices

by Anthony L. DeWitt, JD, RRT, FAARC

His name was Jon Laurent Jackson, and his diagnosis was severe cardiac disease exacerbated by chronic alcohol abuse and diabetes. After his wife and family urged him to have a three-vessel bypass, the slightly obese 44-year-old agreed. He came off the ventilator quickly, and within three days was sitting up and eating well. On day four, however, he decided what he really wanted was a vodka cocktail, and his doctors determined this was neither medically necessary nor wise. Enraged by this, and having a severe alcohol dependency, he ripped the IVs out of his arms and signed himself out of the hospital against medical advice. He was dead four weeks later from liver failure, but he made a choice and was willing to accept the consequences.

Jon was my brother, and I argued with him repeatedly about staying in the hospital. But, at the end of the day, I did not have him committed as a danger to himself because he knew what he was doing, and he made that knowledge clear to me. At some point, neither law nor medicine has a right to interfere with a person's personal choices so long as they do not harm others. That is the nature of a free society. In spite of that, however, health care organizations, social workers, nursing home administrators, and others frequently take steps to superintend the health care decisions of others.

The amazing tale of young Alyssa Gilderhus is one example.[1] After a brain aneurysm left her near death, she made an amazing recovery, only to be allegedly imprisoned at the Mayo Clinic. There, according to CNN, health care workers tried unsuccessfully to get a guardianship for her to prevent her from leaving the facility. CNN's account of her harrowing story is hard to read. Sadly, such events are not uncommon. They are also sometimes necessary to protect patients.

I represented a man whose wife, afflicted with dementia, had developed stage-four decubitus ulcers on her body while in a nursing home, and those ulcers became infested with maggots. After a long ordeal involving appellate courts and an attempted arbitration proceeding, we finally had an opportunity to go to a jury trial. By that time, however, the four-year delay had allowed my client to become afflicted with dementia and in as bad a need of custodial care as his wife. We wound up getting a guardian appointed for both of them. The settlement went to pay for their care at another facility.

In another case, the nursing home wanted to limit the visitation of a woman's husband, a man who had been married to her for 35 years. He objected and threatened to remove her from the home. The home sought a guardianship to "protect" the patient. The husband had done many things that upset the nursing home (he was loud, gruff, and took no pity on individual nurses that he believed ignored his wife). The nursing home had done some self-defeating things as well (for example, putting her all the way at the end of the hallway where they didn't hear her cries for help). At trial it was hard to tell who had the patient's best interests at heart. As a result, the court awarded guardianship to the public administrator, and she wound up agreeing with the husband that her ward should be moved to another facility.

While guardianships are common in nearly every state, the process by which a guardian is appointed varies from state to state. The key issue in a guardianship — a ruling in which an adult is stripped of their ability

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.

to make their own health care decisions — is whether the ward actually needs protection or is competent to make their own decisions. In other words, even if a person's decisions are bad for them, if they are competent to make them, they get to make them. In a guardianship case, there are usually at least two parties: the protectee or ward, and the person who seeks to be appointed guardian. In some cases, multiple parties seek the role of guardian and a court has to choose who is best for the ward. One way that courts sometimes ensure wards are protected is through the appointment of a "guardian ad litem (GAL)." A GAL is a disinterested lawyer — one not otherwise in the case — who is appointed solely to look out for the interests of the ward. The GAL ensures that any mental health evaluation is carried out properly, that the ward does in fact need protection, and assists the court in determining who among those seeking guardianship has the ward's best interests at heart.

In one case, a patient arrived at the hospital in cardiac arrest, and the facility was able to get a stable cardiac rhythm restored quickly. The patient was intubated and sent to the ICU. Shortly thereafter, the patient's relatives arrived and demanded that the ventilator be discontinued because the patient would not have wanted that intervention. The hospital wisely sought a guardianship to protect the patient because the relatives were essentially asking for an order that would have ended the patient's life. The family was upset, but the move was a wise one because the patient had other relatives with other wishes. The effort was short-lived, however, as the patient expired from cardiac dysrhythmias before the guardianship could be heard.

One of the best discussions of the use of guardianships in the care and treatment of patients who may have little quality of life is found in the Missouri Supreme Court's opinion in Cruzan by Cruzan v. Harmon.[2] Edward D. Robertson, Jr., perhaps one of the greatest judges to ever wear the robe in Missouri, said this about the use of a guardianship to end a patient's life:

> *We find no principled legal basis which permits the coguardians in this case to choose the death of their ward. In the absence of such a legal basis for that decision and in the face of this State's strongly stated policy in favor of life, we choose to err on the side of life, respecting the rights of incompetent persons who may wish to live despite a severely diminished quality of life.*

While Cruzan's case was hopeless, with no possibility of recovery, many guardianships arise out of cases that may be much closer calls, and guardianships are a worthwhile way to protect patients who require that protection. Clearly, family members are the best source for guardians, but every county has a form of "public administrator" who may be a better choice if the facility cannot get along with the family. ■

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The 2018 Jimmy A. Young Memorial Lecture: NBRC Examination Content, Design, and Policies

Since 1978, the NBRC has presented the annual Jimmy A. Young Memorial Lecture at the AARC Summer Forum to honor the memory of a remarkable contributor to the respiratory care profession. NBRC President Katherine L. Fedor, MBA, RRT, RRT-NPS, CPFT, and NBRC Vice President of Examinations Robert C. Shaw, Jr., PhD, RRT, FAARC, began the 2018 lecture by sharing the accomplishments and milestones of Jimmy Young's 15-year career.

Jimmy grew from being trained on the job to achieving the RRT credential (#263). He directed an education program in Boston and led the respiratory therapy department at Massachusetts General Hospital. After serving as the 22nd President of the AARC in 1973, Jimmy was a trustee of the NBRC when he passed away unexpectedly in 1975.

Dr. Shaw described methods used to gather information during the 2017 job analysis study of respiratory therapists and revealed upcoming changes for the Therapist Multiple-Choice and the Clinical Simulation Examinations based on results from the job-analysis study. Two new policy changes to be implemented in 2020 affecting examination candidates were also discussed — first, the information candidates receive on their score reports, and second, a waiting period for some who need to make a repeat examination attempt.

Score reporting

Beginning in 2020, candidate score reports for NBRC examinations will only reflect a total score. Candidates who do not pass an examination will receive information directing them to new documents which will provide guidance about their score. The Accuracy of a Testing Result – Part 1 and Accuracy of a Testing Result – Part 2 are documents published in the document library at nbrc.org that describe why groups of examination scores can include some cases in which measurement error exerts an influence and provide answers to frequently asked questions. The Part 1 document emphasizes it may not be in the interest of failing candidates to immediately make another examination attempt. Candidates who earn scores far below the cut score, especially those with scores below the lower boundary of measurement error are better served by remediating before a repeat attempt. The Part 2 document is intended for other stakeholders (those who educate and hire respiratory therapists) and cautions against possible misinterpretation of the reported scores.

Waiting period between exam attempts

Another policy to become effective in 2020 is the implementation of waiting periods between examination attempts. Prior to the year 2000, there were waiting periods of varying lengths depending on the examination. A candidate only had three opportunities per year to take the examination for the Certified Respiratory Therapist (CRT) credential, which virtually all states that license therapists had linked to licensure by the late 1990s. Examinations for the Registered Respiratory Therapist (RRT) credential were only available twice a year and examinations in specialty areas were only available once a year. There was no limit on the number of attempts a candidate could make at an examination.

With the transition to computerized examination administrations in 2000, the wait between attempts shrunk to a period of days. However, the policy permitting unlimited attempts continued. The problem this created was that incompetent candidates could eventually pass because they became familiar with the examination content, not because remediation permanently increased competency.

Opportunities to learn about examination content were greatly increased after the transition to computer administrations. Consequently, the NBRC Board of Trustees has decided to implement a waiting period between repeat attempts so they can be confident a pass result from a repeat attempt occurs because the candidate has effectively elevated his or her competence to the required level.

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Before agreeing to this policy change, trustees found the NBRC was an outlier in comparison to organizations that credentialed and licensed other health care providers like physicians, nurses, other kinds of therapists, and physician extenders. The table outlines the specifics of the new policy that will be implemented in January 2020. A review of the new policies compared to recent populations of candidates who have taken the NBRC's six examinations tell us that at most about 10% of candidates will likely have to wait before making another attempt.

Respiratory Therapist Job Analysis

While Dr. Shaw facilitated this study, an advisory committee of stakeholders made the decisions about how the study was conducted and how study results were applied to revisions of examination content and design. The committee included representatives of the Therapist-Multiple-Choice and Clinical Simulation Examination Committees, the American Association for Respiratory Care (AARC), the AARC Board of Medical Advisors, and the Commission on Accreditation for Respiratory Care (CoARC). The study sample included active NBRC credential holders, education program faculty, and AHA member hospitals. Additionally, the AARC assisted by promoting the survey in their news and social media, which was appreciated.

The advisory committee evaluated demographic responses from the sample so it could decide whether to use task responses as guidance for examination revisions. The committee decided that task responses from the sample were valid guides to make decisions about:

- Tasks that could serve as linkages for items and problems
- Therapist Multiple-Choice Examination design
  - Content domains
  - Cognitive levels
  - Patient populations
- Clinical Simulation Examination design
  - Problem types

The advisory committee constructed 14 rules so it could systematically and objectively evaluate each task that could lead to potential examination content. Out of the 252 tasks evaluated, 235 were found to be fair when covered in examinations.

Examination design

Once the new examination content was determined, the advisory committee developed new design specifications for the Therapist Multiple-Choice and Clinical Simulation Examinations.

Therapist Multiple-Choice (TMC) Examination

The ways in which content domains and cognitive levels will be emphasized on the TMC Examination starting in January 2020 will be only slightly different than in current examinations. A notable content change is that the first examination therapists take as they enter the profession will include a few items causing them to consider medical ethics. The TMC examination has included content about patients who are neonates, children, and adults for decades, but there will be a new specification for at least some items involving neonates and children starting in January 2020. The quantity of items about ethics, neonates, and children are described in the new detailed content outline that has been published to the document library of nbrc.org.

Clinical Simulation Examination (CSE)

Starting in January 2020, a few sections on the CSE will require candidates to consider medical ethics while choosing the best response, which is a change from making decisions based purely on clinical issues. The advisory committee had collected information within the Job Analysis Study about the prevalence of patient conditions in the practices of therapists. This information was used to create new design specifications, which led to including problems on the CSE involving patients who have the following issues:

- Asthma – 1 adult, 1 pediatric
- Chronic airways disease management – 1 invasive ventilation, 1 noninvasive ventilation, 1 diagnosis, 1 outpatient
- 1 infectious disease
- 1 heart failure
- 1 acute respiratory distress syndrome (ARDS)
- 1 cystic fibrosis
- Neonatal – 1 RDS management, 1 resuscitation

These account for 12 of the 20 problems on the examination. In comparison to the design specifications for the current examination, the following types of problems will receive less emphasis but will still be covered:

- Trauma
- Neurologic/neuromuscular
- Cardiovascular

Continuing the theme of de-emphasizing content, neonatal problems will no longer include meconium

aspiration or congenital defects. Such content will continue to be covered on the NBRC Neonatal/Pediatric Specialty Examination.

Summary

As new examination content and designs are introduced in January 2020 for the Therapist Multiple-Choice and Clinical Simulation Examinations, a new score report showing only a total score will be implemented. All NBRC examinations will follow this model, updating score reports in conjunction with new exam content release. Candidates who fail will be guided to remediate before their next examination attempt. Those who need multiple repeat attempts will eventually encounter a waiting period.

To thoroughly compare current and future content and designs for the multiple-choice and clinical simulation examinations, please access the respective detailed content outlines published in the document library at nbrc.org. ■

Examinations	Attempts Without Waiting	Days Between Subsequent Attempts
Therapist Multiple-Choice	3	120
Clinical Simulation	3	120
Pulmonary Function Technology	2	180
Neonatal/Pediatric Specialty	2	180
Sleep Disorders Specialty	2	180
Adult Critical Care Specialty	2	180

Pharmacology in Sleep Medicine

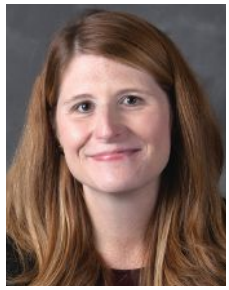
by Jessica Schweller, MS, APRN-CNP, RRT, RRT-SDS

Our natural circadian clock is what tells our body that it is time to go to sleep at night, as well as when to wake up and stay up during the daylight hours. For many patients, there is no issue regulating their sleep-wake cycles, and the 24-hour clock is reset each day for the patient to function without impairment. Other patients have complaints that they cannot fall asleep or stay asleep during the night and then have difficulty functioning during the day. Others have no problem sleeping at night but cannot wake up rested in the morning and find themselves sleepy throughout the day. Evaluations in the sleep clinic generally include one or more of these issues and patients seek treatment to improve their quality of living.

Insomnia

The prevalence of insomnia is about 30% of the general population and affects different people at different times.[1] Insomnia can be defined as acute or chronic. Acute insomnia lasts for less than 3 months and is generally caused by an event such as trauma, death/grieving, underlying medical conditions, pregnancy, and side effects of medication. For these patients, alleviating the underlying cause can be treatment enough, but sometimes an acute insomnia can lead to a more chronic condition. Chronic insomnia is defined as difficulty initiating or maintaining sleep that leads to daytime impairment and occurs for longer than three months. Patients who are of older age, female gender, and those who have comorbid medical and psychiatric issues are more likely to develop chronic insomnia.[2] It can also be caused by an underlying sleep disorder, such as obstructive sleep apnea, periodic limb movement disorder, restless legs syndrome, or general dyspnea. Patients with poor sleep at night are at an increased risk for accidents during the day due to impaired sleep quality.[1]

about the author...



Jessica Schweller received her BS in respiratory therapy and her MS in nursing from The Ohio State University. She is a sleep nurse practitioner at The Ohio State University Lung and Sleep Disorders Center and is the current AARC Sleep Section chair.

Treatment for Insomnia

Treatment for insomnia typically begins with stimulus control and sleep hygiene, also known as cognitive behavioral therapy for insomnia (CBT-I), as well as sleep restriction, and relaxation techniques.[1] Despite making changes to their sleep routine, many patients require pharmacologic treatment in addition to CBT-I. There are several classes of medications used to treat insomnia. They include benzodiazepines, non-benzodiazepine benzodiazepine receptor agonists, melatonin agents, antidepressants, and orexin antagonists.[3] The choice of which class is used can be based on the patient's age, gender, occupation, and health history. Sleep aids should be avoided in patients who have to make decisions during the night or who are on call. Some sedating medications (benzodiazepines) can suppress breathing and should be avoided in those with sleep disordered breathing. Caution should be taken with older adults when taking sleep aids as it can increase their risk for falls. Some medications are shorter acting and should be used for those patients with sleep onset issues. Others with a longer half-life can be used to help both initiate and maintain sleep.[4]

Benzodiazepines bind to several GABA-A receptors in the brain to help reduce sleep onset, prolong stage 2 sleep, prolong total sleep time, and can reduce

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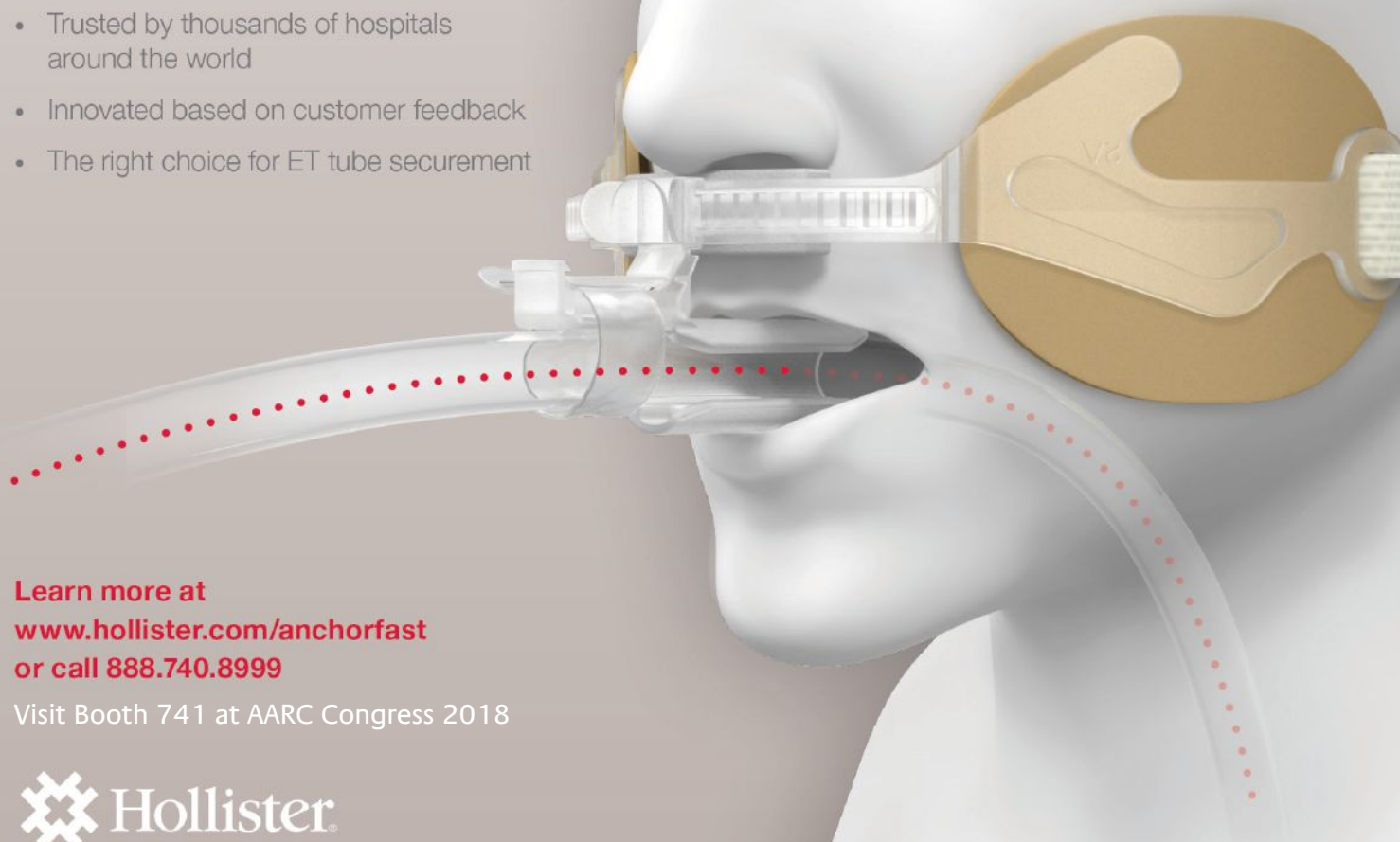

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rapid eye movement (REM) sleep.[4] Commonly used in treating insomnia include triazolam (short acting), estazolam, lorazepam, temazepam (intermediate acting), flurazepam, quazepam, and clonazepam (long acting). Their duration of action is what sets some of these medications apart. Side effects include residual daytime sleepiness, drowsiness, dizziness, cognitive impairment, motor incoordination and dependence. Long term use can be habit forming and can lead to rebound insomnia when stopped.[4]

Non-benzodiazepine benzodiazepine receptor agonists are another class of medications used commonly to treat insomnia. They bind to a one of kind GABA-A receptor in the brain and therefore producing less anxiolytic effects.[4] Common medications used are zaleplon (Sonata), zolpidem (Ambien), eszopiclone (Lunesta), and zolpidem extended release. Zaleplon has a very short half-life and is ideal for sleep onset insomnia. Patients can also take this medication in the middle of the night to get back to sleep if they have four or more hours remaining. Zolpidem has a half life of 1.5-4 hours and can be used for both sleep onset and sleep maintenance.[4] The extended release version is released over time during the night. There is also a dissolvable tablet that is available in lower doses to help patients return to sleep at night as well as an oral spray. Eszopiclone has a 6 hour half-life and is intended for both sleep onset and maintenance. It has an unpleasant metallic taste that patients will complain of when taking. Side effects of this group include those similar to benzodiazepines but it should be noted eszopiclone and zolpidem has been FDA approved for long term use. It has been recommended that women are prescribed a lower dose based on metabolism of the medication and side effects. Recently it was recommended that the dose consideration should be made for male patients as well.

Melatonin agonists bind to the melatonin receptors in the suprachiasmatic nucleus to help promote sleep.[4] Ramelteon (Rozerem) is metabolized by the liver and should be used with caution in those with hepatic insufficiency. The half life of this medication is 1.5-5 hours and has been shown to mildly improve insomnia.

Orexin receptor antagonists work differently than the other medications mentioned before. This medication helps to block the wake promoting centers of the in the hypothalamus thus improving sleep.[4] Suvorexant (Belsomra) is a dual orexin receptor antagonist with a 12 hour half life and should be avoided those with narcolepsy. The use of suvorexant can lead to increased daytime fatigue, REM behavior disorder, sleep walking, and hallucinations. There are minor affects on sleep disordered breathing, but it should be used with caution.

Antidepressants such as doxepin and trazodone have been used for patients with comorbid anxiety, depression and insomnia.[4] They found their role in sleep medicine due to the side effect of sedation. They are not FDA approved for insomnia but are commonly used in primary care due to the minimal side effects associated with the medication. Doxepin is used in a lower dose (3-6 mg) and branded as Silenor to help promote sleep.

Over the counter sleep aids generally containing diphenhydramine as well as melatonin have been shown to help with sleep quality but should be monitored closely by the practitioner. Many patients self-medicate and may take more than the prescribed quantity or mix with alcohol, which can lead to further central nervous system depression.

Hypersomnia

Hypersomnia is used to define a state of excessive daytime sleepiness and can be caused by a variety of conditions. About 10-25% of the general population complains of excessive sleepiness.[5] Patients with narcolepsy and obstructive sleep apnea are commonly treated for hypersomnia; however those with sleepiness due to medication side effects and chronic health conditions will present similarly in the clinic settings. Treatment for hypersomnolence is to first treat the underlying cause if possible or reduce the sedating medication. For narcolepsy, treatment includes wake-promoting or stimulant therapy to improve the urge to go to sleep. For patients with OSA that have daytime sleepiness despite adequate PAP therapy, stimulant therapy is warranted. Stimulants can also be used in the treatment of shift work disorder and can also improve fatigue from multiple sclerosis and post-traumatic brain injury.[5,6]

Treatment for hypersomnia includes the use of modafinil (Provigil), armodafinil (Nuvigil), amphetamines (Adderall), and methylphenidate (Ritalin). Modafinil and armodafinil are considered wake-promoting medications and the mechanism of action is unknown.[6] Armodafinil is dosed only once daily, where as modafinil generally requires twice daily dosing to achieve a therapeutic effect. Side effects include headache, nausea, nervousness, and jitteriness. The cardiac side effects are low, however it can lower the efficacy of oral contraceptives and therefore counseling about barrier methods should be given.

The mechanism of action of amphetamines and methylphenidate is also not fully known but it is suggested that they stimulate CNS activity by blocking reuptake and increasing the release of norepinephrine and dopamine in the extraneural space. Side effects are similar to modafinil; however, they are at an increased risk for causing more anxiety, palpitations, mania, risk for stroke, hypertension and anorexia.[7]

The RT role in pharmacology management of sleep disorders is important. As therapists in critical care settings, it is crucial to know what medications patients were taking before admittance and how it will impact sleep/wake cycles in the hospital. Withdrawal from any of these medications can lead to worsening symptoms and impact the patient's wellbeing. Sleep is important both in and out of the hospital, and acute changes to health can lead to worsening sleep behaviors. Knowledge about medications used in sleep medicine can help therapists understand how possibly they can step in and be a patient advocate for those who are impaired from sleeping and/or sleeping too much to help improve healing as well as long-term outcomes. ■

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INDICATION

LONHALA® MAGNAIR® (glycopyrrolate) is an anticholinergic indicated for the long-term maintenance treatment of airflow obstruction in patients with chronic obstructive pulmonary disease (COPD), including chronic bronchitis and/or emphysema.

IMPORTANT SAFETY INFORMATION

LONHALA MAGNAIR is contraindicated in patients with a hypersensitivity to glycopyrrolate or to any of the ingredients.

LONHALA MAGNAIR should not be initiated in patients with acutely deteriorating or potentially life-threatening episodes of COPD or used as rescue therapy for acute episodes of bronchospasm. Acute symptoms should be treated with an inhaled short-acting beta$_2$-agonist.

As with other inhaled medicines, LONHALA MAGNAIR can produce paradoxical bronchospasm that may be life-threatening. If paradoxical bronchospasm occurs following dosing with LONHALA MAGNAIR, it should be treated immediately with an inhaled, short-acting bronchodilator; LONHALA MAGNAIR should be discontinued immediately and alternative therapy instituted.

Immediate hypersensitivity reactions have been reported with LONHALA MAGNAIR. If signs occur, discontinue LONHALA MAGNAIR immediately and institute alternative therapy.

LONHALA MAGNAIR should be used with caution in patients with narrow-angle glaucoma and in patients with urinary retention. Prescribers and patients should be alert for signs and symptoms of acute narrow-angle glaucoma (e.g., eye pain or discomfort, blurred vision, visual halos or colored images in association with red eyes from conjunctival congestion and corneal edema) and of urinary retention (e.g., difficulty passing urine, painful urination), especially in patients with prostatic hyperplasia or bladder-neck obstruction. Patients should be instructed to consult a physician immediately should any of these signs or symptoms develop.

The most common adverse events reported in ≥2% of patients taking LONHALA MAGNAIR, and occurring more frequently than in patients taking placebo, were dyspnea (4.9% vs 3.0%) and urinary tract infection (2.1% vs 1.4%).

LONHALA solution is for oral inhalation only and should not be injected or swallowed. LONHALA vials should only be administered with MAGNAIR.

You are encouraged to report negative side effects of prescription drugs to the FDA. Visit www.fda.gov/medwatch or call 1-800-FDA-1088.

For additional information, please see the Brief Summary of Prescribing Information on the following page. Please see full Prescribing Information and Patient Information for LONHALA MAGNAIR at www.sunovionprofile.com/lonhala-magnair.

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†Improper cleaning and maintenance may increase administration time.[2]

COPD = chronic obstructive pulmonary disease; GOLD = Global Initiative for Chronic Obstructive Lung Disease.

LONHALA® MAGNAIR® (glycopyrrolate) Inhalation Solution for the treatment of COPD

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(glycopyrrolate) Inhalation Solution
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LONHALA® MAGNAIR®

(glycopyrrolate) inhalation solution, for oral inhalation use

BRIEF SUMMARY OF FULL PRESCRIBING INFORMATION

Please see package insert for full Prescribing Information, including Patient Information.

INDICATIONS AND USAGE: LONHALA® MAGNAIR® is an anticholinergic indicated for the long-term maintenance treatment of airflow obstruction in patients with chronic obstructive pulmonary disease (COPD), including chronic bronchitis and/or emphysema.

CONTRAINDICATIONS: LONHALA MAGNAIR is contraindicated in patients with a hypersensitivity to glycopyrrolate or any of the ingredients.

WARNINGS AND PRECAUTIONS: Deterioration of Disease and Acute Episodes: LONHALA MAGNAIR should not be initiated in patients during acutely deteriorating or potentially life-threatening episodes of COPD. LONHALA MAGNAIR has not been studied in subjects with acutely deteriorating COPD. The initiation of LONHALA MAGNAIR in this setting is not appropriate. LONHALA MAGNAIR should not be used as rescue therapy for the treatment of acute episodes of bronchospasm. LONHALA MAGNAIR has not been studied in the relief of acute symptoms and extra doses should not be used for that purpose. Acute symptoms should be treated with an inhaled, short-acting $beta_2$-agonist. COPD may deteriorate acutely over a period of hours or chronically over several days or longer. If LONHALA MAGNAIR no longer controls symptoms of bronchoconstriction the patient's inhaled, short-acting $beta_2$-agonist becomes less effective; or the patient needs more inhalations of a short-acting $beta_2$-agonist than usual, these may be markers of deterioration of disease. In this setting, a re-evaluation of the patient and the COPD treatment regimen should be undertaken at once. Increasing the daily dose of LONHALA MAGNAIR beyond the recommended dose is not appropriate in this situation. **Paradoxical Bronchospasm:** As with other inhaled medicines, LONHALA MAGNAIR can produce paradoxical bronchospasm that may be life-threatening. If paradoxical bronchospasm occurs following dosing with LONHALA MAGNAIR, it should be treated immediately with an inhaled, short-acting bronchodilator; LONHALA MAGNAIR should be discontinued immediately, and alternative therapy instituted. **Immediate Hypersensitivity Reactions:** Immediate hypersensitivity reactions may occur after administration of LONHALA MAGNAIR. If signs suggesting allergic reactions occur, in particular, angioedema (including difficulties in breathing or swallowing, swelling of the tongue, lips, and face), urticaria, or skin rash, LONHALA MAGNAIR should be discontinued immediately and alternative therapy instituted. **Worsening of Narrow-Angle Glaucoma:** LONHALA MAGNAIR should be used with caution in patients with narrow-angle glaucoma. Prescribers and patients should be alert for signs and symptoms of acute narrow-angle glaucoma (e.g., eye pain or discomfort, blurred vision, visual halos or colored images in association with red eyes from conjunctival congestion and corneal edema). Instruct patients to consult a physician immediately should any of these signs or symptoms develop. **Worsening of Urinary Retention:** LONHALA MAGNAIR should be used with caution in patients with urinary retention. Prescribers and patients should be alert for signs and symptoms of urinary retention (e.g., difficulty passing urine, painful urination), especially in patients with prostatic hyperplasia or bladder-neck obstruction. Instruct patients to consult a physician immediately should any of these signs or symptoms develop.

ADVERSE REACTIONS: Clinical Trials Experience: Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice. The LONHALA MAGNAIR safety database included 2379 subjects with COPD in two 12-week efficacy studies and one 48-week long-term safety study. A total of 431 subjects received treatment with LONHALA MAGNAIR 25 mcg twice-daily (BID). The safety data described below are based on the two 12-week trials and the one 48-week trial. **12-Week Trials:** LONHALA MAGNAIR was studied in two 12-week placebo-controlled trials in 431 subjects with COPD, treated with LONHALA MAGNAIR at the recommended dose of 25 mcg, twice daily. The population had a mean age of 63 years (ranging from 40 to 87 years), with 56% males, 90% Caucasian, and a mean post-bronchodilator forced expiratory volume in one second (FEV_1) percent predicted of 52% of predicted normal value (20%-80%) at study entry. The study population also included subjects with pre-existing cardiovascular disease as well as subjects with continued use of stable long-acting bronchodilator (LABA) +/- inhaled corticosteroid (ICS) and ipratropium bromide background therapy. Subjects with unstable cardiac disease, narrow-angle glaucoma, or symptomatic prostatic hypertrophy or bladder outlet obstruction were excluded from these studies. The proportion of subjects who discontinued treatment due to adverse reactions was 5% for the LONHALA MAGNAIR-treated subjects and 9% for placebo-treated subjects.

Table 1: Adverse Reactions with LONHALA MAGNAIR ≥ 2.0% Incidence and Higher than Placebo

	Placebo (N=430) N (%)	LONHALA MAGNAIR 25 mcg BID (N=431) N (%)
Dyspnea	13 (3.0)	21 (4.9)
Urinary Tract Infection	6 (1.4)	9 (2.1)

Other adverse reactions defined as events with an incidence of ≥ 1.0% but less than 2.0% with LONHALA MAGNAIR but more common than with placebo included the following: wheezing, upper respiratory tract infection, nasopharyngitis, oedema peripheral, and fatigue. **48-Week Trial:** In a long-term open-label safety trial, 1086 subjects were treated for up to 48 weeks with LONHALA MAGNAIR 50 mcg twice-daily (N=620) or tiotropium (N=466). The demographic and baseline characteristics of the long-term safety trial were similar to those of the placebo-controlled efficacy studies described above. The adverse reactions reported in the long-term safety trial were consistent with those observed in the placebo-controlled studies of 12 weeks. Adverse reactions that occurred at a frequency greater than that seen in either active treatment dose in the pooled 12-week placebo controlled studies and ≥ 2.0% were: diarrhea, edema peripheral, bronchitis, nasopharyngitis, pneumonia, sinusitis, upper respiratory tract infection, urinary tract infection, back pain, headache, Chronic Obstructive Pulmonary Disease, cough, dyspnea, oropharyngeal pain, and hypertension.

DRUG INTERACTIONS: Anticholinergics: There is a potential for an additive interaction with concomitantly used anticholinergic medications. Therefore, avoid unnecessary co-administration of LONHALA MAGNAIR with other anticholinergic-containing drugs as this may lead to an increase in anticholinergic effects.

USE IN SPECIFIC POPULATIONS: Pregnancy: Risk Summary: There are no adequate and well-controlled studies in pregnant women. LONHALA MAGNAIR should only be used during pregnancy if the expected benefit to the patient outweighs the potential risk to the fetus. Women should be advised to contact their physician if they become pregnant while taking LONHALA MAGNAIR. In animal reproduction studies, there were no teratogenic effects in Wistar rats and New Zealand White rabbits at inhaled doses approximating 1521 and 580 times, respectively, the maximum recommended human daily inhalation dose (MRHDID) based on an AUC comparison. The estimated background risk of major birth defects and miscarriage for the indicated population is unknown. In the U.S. general population, the estimated background risk of major birth defects and miscarriage in clinically recognized pregnancies is 2-4% and 15-20%, respectively. **Labor or Delivery:** The potential effect of LONHALA MAGNAIR on labor and delivery is unknown. LONHALA MAGNAIR should be used during labor and delivery only if the potential benefit to the patient justifies the potential risk to the fetus. **Animal Data:** Developmental studies in Wistar rats and New Zealand White rabbits in which glycopyrrolate was administered by inhalation during the period of organogenesis did not result in evidence of teratogenicity at exposures approximately 1521 and 580 times, respectively, the MRHDID of LONHALA MAGNAIR based on a comparison of plasma AUC levels (maternal doses up to 3.8 mg/kg/day in rats and 4.4 mg/kg/day in rabbits). Glycopyrrolate had no effects on peri-natal and post-natal development in rats following subcutaneous exposure of approximately 1137 times the MRHDID of LONHALA MAGNAIR based on an AUC comparison (at a maternal dose of up to 1.885 mg/kg/day). **Lactation: Risk Summary:** There are no data on the presence of glycopyrrolate or its metabolites in human milk, the effects on the breastfed infant, or the effects on milk production. However, in a study of lactating rats, glycopyrrolate was present in the milk. The developmental and health benefits of breastfeeding should be considered along with the mother's clinical need for LONHALA MAGNAIR and any potential adverse effects on the breastfed infant from LONHALA MAGNAIR or from the underlying maternal condition. **Data:** Glycopyrrolate (and its metabolites) was detected in the milk of lactating rats following a single intravenous injection of 4 mg/kg of radiolabeled glycopyrrolate. **Pediatric Use:** LONHALA MAGNAIR is not indicated for use in children. The safety and efficacy of LONHALA MAGNAIR in pediatric patients have not been established. **Geriatric Use:** Based on available data, no adjustment of the dosage of LONHALA MAGNAIR in geriatric patients is warranted. LONHALA MAGNAIR can be used at the recommended dose in elderly patients 75 years of age and older. Of the total number of subjects in clinical studies of LONHALA MAGNAIR, 41% were aged 65 and older, while 8% were aged 75 and older. No overall differences in safety or effectiveness were observed between these subjects and younger subjects, and other reported clinical experience has not identified differences in responses between the elderly and younger patients, but greater sensitivity of some older individuals cannot be ruled out. **Renal Impairment:** No dose adjustment is required for patients with mild and moderate renal impairment. The effects of renal impairment on the pharmacokinetics of glycopyrrolate have not been studied. **Hepatic Impairment:** No dose adjustment is required for patients with hepatic impairment. The effects of hepatic impairment on the pharmacokinetics of glycopyrrolate have not been studied.

OVERDOSAGE: An overdose of glycopyrrolate may lead to anticholinergic signs and symptoms such as nausea, vomiting, dizziness, lightheadedness, blurred vision, increased intraocular pressure (causing pain, vision disturbances, or reddening of the eye), obstipation or difficulties in voiding. In COPD patients, orally inhaled administration of LONHALA MAGNAIR at a total daily dose of 200 mcg for 28 consecutive days (maximum of 1 mg) was well tolerated.

PATIENT COUNSELING INFORMATION: Advise the patient to read the FDA-approved patient labeling (Patient Information and Instructions for Use).

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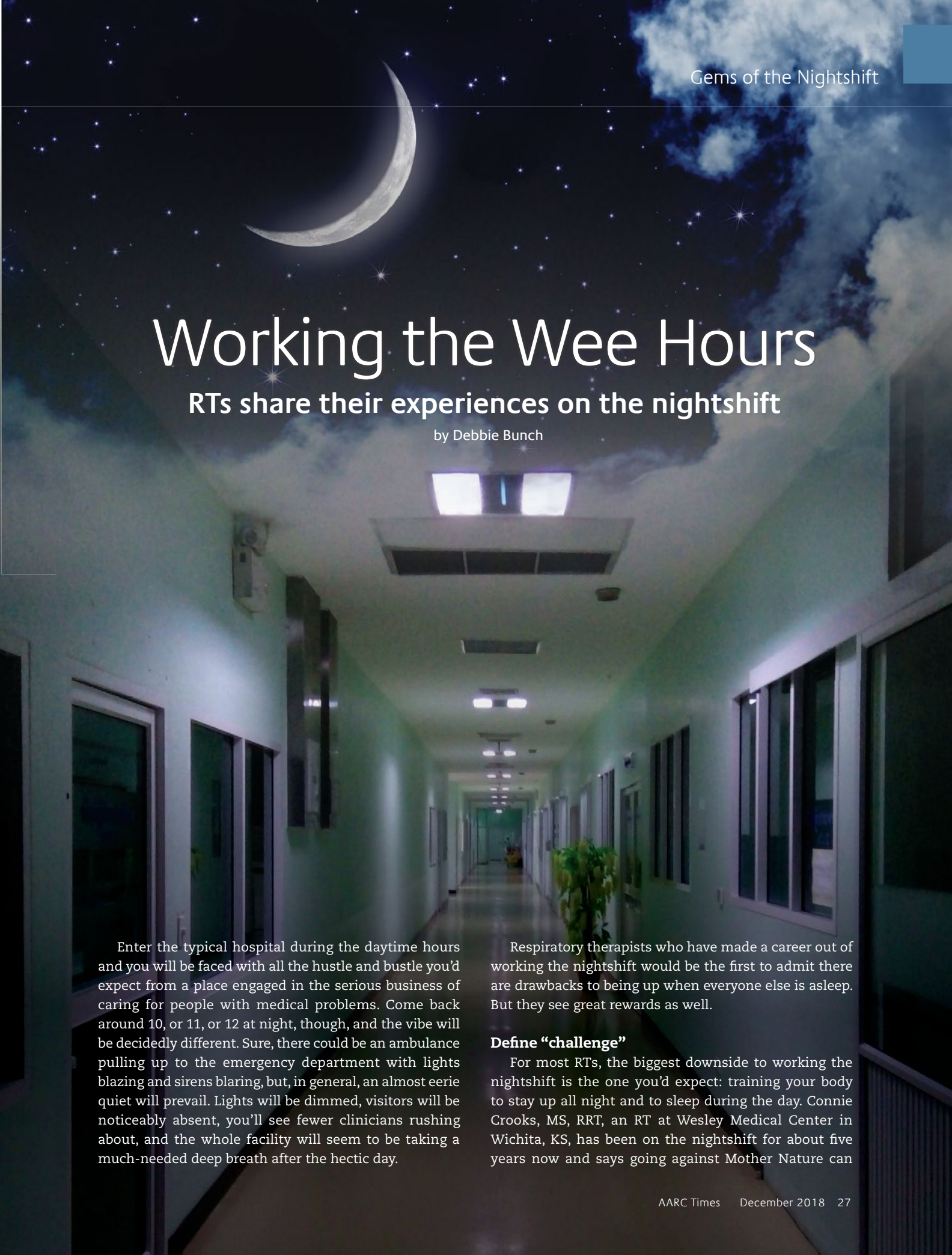

Working the Wee Hours

RTs share their experiences on the nightshift

by Debbie Bunch

Enter the typical hospital during the daytime hours and you will be faced with all the hustle and bustle you'd expect from a place engaged in the serious business of caring for people with medical problems. Come back around 10, or 11, or 12 at night, though, and the vibe will be decidedly different. Sure, there could be an ambulance pulling up to the emergency department with lights blazing and sirens blaring, but, in general, an almost eerie quiet will prevail. Lights will be dimmed, visitors will be noticeably absent, you'll see fewer clinicians rushing about, and the whole facility will seem to be taking a much-needed deep breath after the hectic day.

Respiratory therapists who have made a career out of working the nightshift would be the first to admit there are drawbacks to being up when everyone else is asleep. But they see great rewards as well.

Define "challenge"

For most RTs, the biggest downside to working the nightshift is the one you'd expect: training your body to stay up all night and to sleep during the day. Connie Crooks, MS, RRT, an RT at Wesley Medical Center in Wichita, KS, has been on the nightshift for about five years now and says going against Mother Nature can

take a physical toll. "Challenges center around working a shift that is not in time with a normal circadian rhythm," says Crooks.

Amber Galer, BS, RRT, agrees. "Sometimes it can be difficult to stay awake and deal with the physical issues such as daily brain fog, fatigue, or sensitivity to light — a.k.a. that 'zombie feeling," says the RT at Shriner's Hospital for Children in Salt Lake City, UT. She believes working nights and sleeping days can hit RTs and other clinicians in the gut, too. "Some people experience abdominal disturbances caused by eating at night, especially if they are not accustomed to shift work," says Galer.

Kristie Vaquero, BS, RRT, who works nights at Children's Healthcare of Atlanta in Atlanta, GA, advises anyone considering nightshift work to realize that adapting to these physical realities won't happen overnight. "I think for me it took about a year and a half," says Vaquero. "Now it does not really matter how much I sleep in the day — I can make it through most nights."

Other lifestyle challenges that some might associate with the nightshift, however, aren't really perceived as challenges at all by those who work this schedule. The biggest surprise on the list? The impact nightshift has on family and social life. "Nightshift offers great work/life balance," says Suzanne Iniguez, BSN, RN, RRT, RRT-NPS, RRT-ACCS, AE-C, C-NPT, CHSE, respiratory care coordinator at Texas Children's Hospital in Houston, TX. "Nights allowed me to attend all of my children's doctor/dentist/orthodontist appointments and attend school functions," she says.

Ronald Clarke, CRT, CRT-NPS, who works at TriCity Medical Center in San Diego, CA, says working nights did wonders for his household, too. "As my wife and I had twins, we worked opposite shifts — she was a labor and delivery RN — so we would need no child care," says Clarke, who recently switched to days after about 23 years on the nightshift. "This worked well for us."

That's been the case for Vaquero, too. "Nightshift works for my family life right now — I work weekends and my husband works weekdays, so there is always a parent present," she says. "We still have one child left at home finishing high school." Galer chimes in on this score as well. "Working nights has allowed me to work three jobs without using daycare and be present for school programs," she says. "The added night and weekend premium isn't bad either."

Job-related issues

These therapists and others see job-related advantages and disadvantages to working the nightshift, too. On the negative side, Iniguez notes that there are fewer personnel

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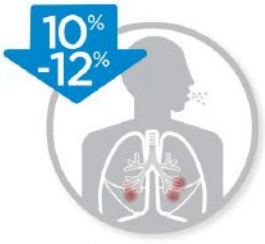

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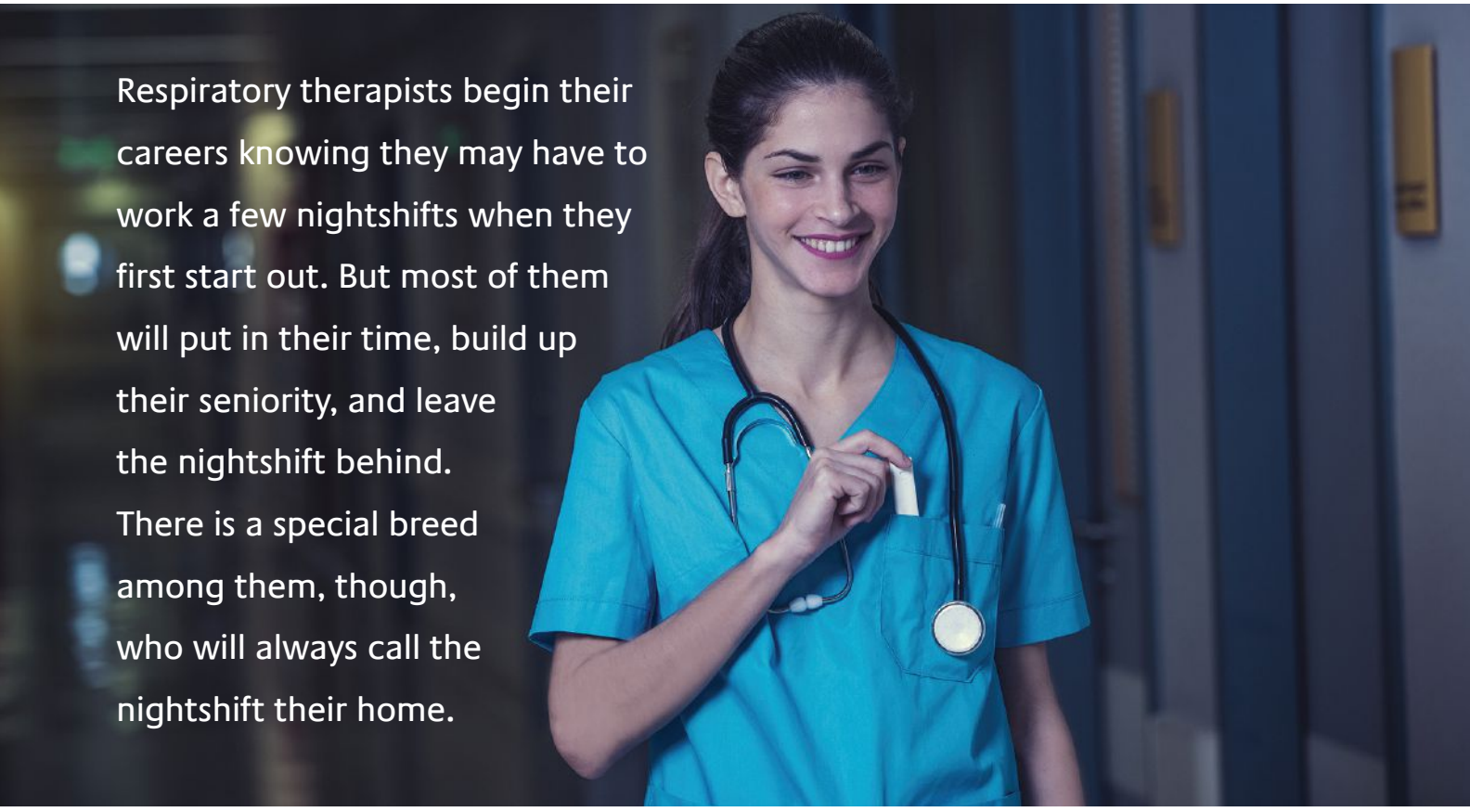

and fewer resources available on the nightshift, and educational opportunities are more limited. Crooks says nightshift staff are often left out of the loop when it comes to departmental or hospital activities, too. "You can lose track of things that occur only on dayshift," she says. "There are physicians who only work on dayshift, so I have no relationships with them."

Of course, having less going on at nights can be a good thing, too. For example, Iniguez says the flip side to fewer resources is a greater degree of autonomy. "Due to the decreased number of personnel and resources, I feel those on the nightshift are more self-reliant and have increased teamwork," she says. "I love being able to come in and do my work without all of the 'traffic' — rounds, consult services, visitors, vendors, etc. — that are present on dayshift."

Having fewer distractions makes for a more peaceful shift, agrees Galer — and that's true even when things do get busy. "Some nights can be chaotic, but they don't have the added stress of day distractions," she says. For example, meetings are not usually scheduled, administrators have gone home, physical therapy and lab appointments are rare, and supervisors tend to be more relaxed and focused on keeping the team upbeat throughout the endless night hours.

The absence of distractions makes the nightshift a great place for patient education as well, says Terrance "Terri" Robinson, CRT, an RT at Children's National Medical Center in Washington, DC, who has been working the nightshift for 35 years. She takes advantage of the less hectic atmosphere to engage in her passion, which is teaching asthmatics how to manage their conditions. She lost her adult daughter to the condition three years ago and feels strongly that she should do whatever she can to convince her patients what it takes to keep asthma under control. "Even after my Ebony's passing, I continue to treat my asthmatic hardheads, sharing our story about the importance of self care for their illness," says Robinson.

Theresa Simmons, RRT, says the nightshift is also a great place to pass on her respiratory expertise to other clinicians. "Most of the new nurses are hired for nights, and I get a chance to 'respi-mold' them the way they should be," says the therapist at Sisters of Charity Hospital in Buffalo, NY. "I have worked the nightshift for over 30 years and would not trade it for anything."

Stories to tell

It might be tempting to think the slower pace of the nightshift means nothing exciting or interesting ever

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happens there — outside of the emergency department, of course. Think again, say these therapists. Amber Galer cites one experience she had on the nightshift that led to the development of a new patient safety policy in her hospital.

"We had an infant who, respiratory-wise, declined in the early hours," she recalls. "He required immediate admittance from the outpatient sleep lab to the pediatric ICU." Both in-hospital and outside attending physicians were notified about the need for the admission, but clear decisions were not made in a timely manner. Residents arrived to evaluate the infant, but didn't have the authority to approve the admission, nor did the PICU charge nurse who received information about the patient. Galer says she was in the room with a sleep technician when the chief medical officer just happened to walk by while on his way to an after-hours meeting. They drew him into the room to assist the rapid response with bag and mask ventilation. "It was an amazing experience to work at the bedside hand in hand with the chief medical officer and a diligent sleep technician," says Galer. Together they stabilized the infant and he went on to undergo emergency surgery for his condition. "It was truly a learning experience for everyone, and one that nobody will forget anytime soon."

Kristie Vaquero dispels the myth that nightshifts are never really that busy with a story about one shift in particular when she and the one other RT on duty ended up doing 11 neonatal ICU admissions in a row. "While one was out on a delivery, the other was tucking one in in the unit, cleaning up the transporter, then running it back to to bring another back," she says. "Whew! We turned around and the night was over!"

She also recalls a New Year's Eve when she and her fellow nightshift staff broke out some sparkling grape juice just before the clock struck midnight and shared it with the parents who were still there watching over their little ones — all of them, she says, "thanking God all the babies were stable."

But Ronald Clarke probably has the funniest story to share. "Back when we did O_2 rounds, I had the experience of coming into a room about 1:30 a.m., and the patient was wide awake and watching an old movie," he recalls. He asked what she was watching, and they spent some time chatting about the film. Then he noted it was getting late and suggested she might want to get some sleep. "She looked at her watch and said, yes it was, and she promptly turned the light off, put the bed flat, rolled over, and went to sleep," he says. When he looked at his billing report, it stated the patient was five years old — something his own eyes told him could not possibly be correct. "When I looked at her chart, as I suspected, she was 105," he says. She was in the hospital for observation after experiencing a fall at home, and he was impressed with how sharp she was mentally. "We see so many very sick and dying patients. She was really a breath of fresh air as to what aging can be. She was so full of life," says Clarke. "I still smile when I think of her."

It's all about family

For most RTs who work nights, though, the job can be best defined by the companionship that develops between them and their fellow clinicians. Says Suzanne Iniguez, "There are so many experiences on nights, but most of them come down to the 'family' that you work with — meals shared, tales told, watching co-workers' children grow up through pictures and stories, and the camaraderie that comes with loving the job that you do and everyone together doing it well."

Theresa Simmons agrees. "I work with a great team and the laughs and tears we share have made me a better person." ■

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BACK TO THE FUTURE:

AARC Times Will Go All-Digital in January 2020

Big changes are coming to your news and feature magazine

by Debbie Bunch

Who needs paper when you've got the power of the Internet in the palm of your hand?

Hello *AARC Times* readers! We know you all must be very busy taking care of people with respiratory needs, but we just got the chance to borrow Doc Brown's DeLorean and were hoping you could take a minute or two out of your day to take a little trip back to a pivotal year in the history of your AARC. Our destination? Early spring 1977.

Everyone buckled up? Good, then *let's goooooo!*

Wow, things are really different for respiratory therapists back here in 1977, aren't they? Those RTs over there are still being called "inhalation therapists." That ventilator in the ICU looks like something out of an antique store. Lots of therapists are running around the hospital, but seems like the main thing they're doing is starting nebulizer treatments. We just asked someone what the latest "evidence-based medicine" is, and we got a confused look in reply.

But we see your 1977 AARC leaders over there, too. Looks like they're working on an innovative idea — a news and feature magazine just for our profession. Sounds like it will have updates on treatments and modalities, news about changes in the health care landscape, and lots of feature stories on real RTs and what they're doing to help patients every day.

They want it to be the *Time* magazine of the profession, and they're going to call it "*AARC Times*." They hire a staff to develop the concept, and they publish the very first issue in July of that year.

Like all magazines of this time, it's printed on paper and it arrives every month in the mailboxes of AARC members across the country who relish the chance to hold a magazine in their hands that's devoted entirely to *them* and their profession. Those pages foster a better understanding of important concepts and issues, and they promote a sense of community the likes of which the AARC has never experienced before.

But hey, you need to get back to your patients, and we're already missing our smartphones! So let's pile back into the DeLorean and get back to the future ASAP!

Oh, what changes we've seen

Clearly, a lot of things have changed since *AARC Times* published its first issue in July 1977. The profession we know today is a far cry from the one that existed back then. Therapists now are considered integral members of the interdisciplinary team charged with assessing and educating their patients in addition to providing them with hands-on care.

Things have changed markedly in the publishing world during those 41 years as well. Some magazines are still around in printed form, but increasingly, people are turning to their screens and devices to get the news and information of the day. If you're like most people, you've installed apps for your favorite media outlets on your phone or tablet, and that's how you keep up with what's happening in the world.

If you're like us, you'd just as soon not have all that paper piling up around your office or your home either. Sure, it can be recycled, but why not save the trees it was all made from in the first place? More oxygen for everyone on the planet that way.

The spirit is alive and well

Beginning in January 2020, the AARC is taking *AARC Times* to a digital-only format. According to AARC Associate Executive Director and *AARC Times* Managing Editor Doug Laher, MBA, RRT, FAARC, the decision was really driven by the AARC membership. "We're seeing an increase in digital members every month," says Laher, who believes that following their lead amounts to "consumer sovereignty." In other words, *AARC Times* management is really just giving members what they have already said they want.

"There are also some cost savings to the all-digital approach for everyone," says Laher. As the number of people choosing the print option has declined, the price to print the magazine has risen. "We lose production, printing, and shipping discounts with the lower volume of issues printed," he explains, "thus making our cost per issue to produce the magazine go up." That's money that could be used for other projects and programs with greater inherent value to the respiratory therapist. And while those members subscribing to the digital edition of the magazine already pay a lower price, those transitioning from paper to digital will now pay the lower digital price as well.

So the print version of *AARC Times* will cease with the December 2019 issue. But the spirit of the magazine will still be going strong, as evidenced by the new and improved digital version that debuted with the September 2018 issue. Laher outlines some of the features you'll find in this new and enhanced online format –

- A front page presented in colorful, clickable blocks that lead to all the stories in the issue.
- The ability to scroll down the page and see past issues in the same colorful, clickable block format.
- Articles presented in a more web-based format, making them easy to read on any device.
- Audio versions of each article — great for catching up on *AARC Times* while you're driving, cooking dinner, or even just relaxing in your backyard. Find the icon at the top of each article.
- Still want to read on paper? No worries — a "print" icon also appears at the top of each article page. Print out all the articles or just those you really want to read or share with others.
- Links to social media appear there, too, so you can easily share articles in your news feeds. Or you can use the email icon to send specific articles directly to friends and colleagues.
- Want to see the digital magazine in printed magazine format? You can have that, too. Just click on "page view" at the top of the front page to access a format similar to the previous print magazine.

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- You can catch up with other AARC news and information right from the front page of *AARC Times* as well — links at the top of the page will take you to everything from AARC News to Industry News to Member Services and more.

Into the future

The world we live in today is a digital world, and the AARC's decision to take its news and feature magazine further into that world is a good thing for the Association and its members. As Doc Brown so famously replied when Marty McFly questioned whether there would be enough road to get the DeLorean up to 88 miles per hour: "Roads? Where we're going, we don't need roads!"

We could say the same thing about paper! ■

Editor's Note: Dallas-based writer Debbie Bunch wrote the first feature article *AARC Times* ever published back in the summer of 1977 and continues to write for the magazine today.

AARC Times Rewind

To celebrate our transition from a print magazine to an all-digital magazine, we plan to feature a new column throughout 2019 called "AARC Times Rewind" where we'll be highlighting some of our most interesting, enlightening, and informative articles from the past 40+ years. So stay tuned for a great year of reading — and spend some time getting to know the new and improved digital version of *AARC Times*. ■

Thank You, 2018 *AARC Times* Article Reviewers!

The *AARC Times* staff offers our sincere thanks to the people who took time to review the clinical articles in our publication throughout this year. Your special expertise and dedication to the respiratory care profession were critical to our ability to publish informative articles for the respiratory care professional. Thank you, reviewers!

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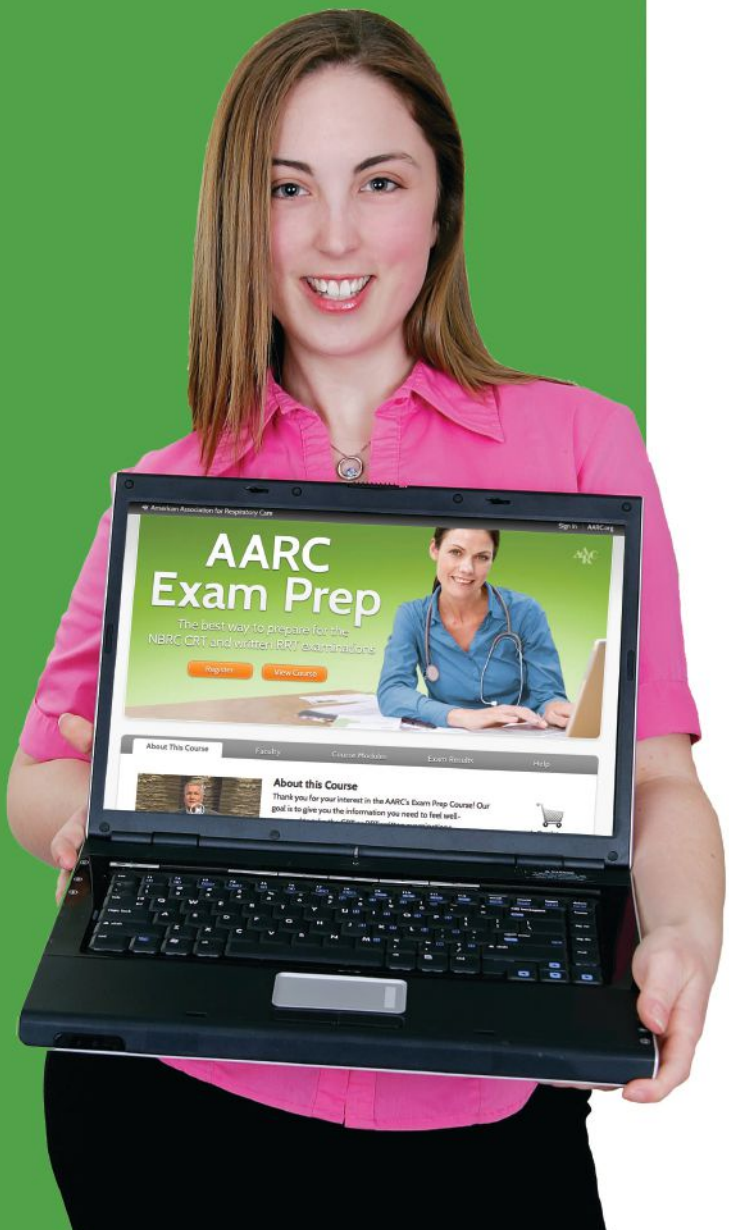

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30th Annual New Horizons Symposium with Bonus Content – $2.99

Acute hypoxemic respiratory failure (AHRF) that is refractory to supplemental O2 is caused by intrapulmonary shunting of blood resulting from airspace filling or collapse. Treatment usually requires mechanical ventilation. This e-book looks at a variety of treatment strategies from the 30th Annual New Horizons Symposium and two recent published manuscripts.

2013 New Horizons Symposium – $2.99

Evidence-based medicine (EBM) is the integration of individual clinical expertise with the best available research evidence from systematic research and the patient's values and expectations. Although all tenets of EBM are not universally accepted, the principles of EBM nonetheless provide a valuable approach to respiratory care practice.

2014 Best of Aerosol Therapy – $4.99

Management of acute and chronic respiratory conditions with inhaled medications are a cornerstone of the profession of respiratory care. This eBook contains the Top 7 must-read manuscript selections from 2014 in the clinical area of aerosol therapy.

2014 New Horizons Symposium – $2.99

There are various aspects to the basics in respiratory physiology in the mechanically ventilated, critically ill patient. This covers the nuances of oxygenation, ventilation, lung mechanics, respiratory physiology and cardiopulmonary interactions. Detail reviews of management techniques and interpretation of clinical data is discussed in detail.

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It is important for clinicians to appreciate the nuances of care for patients with a tracheostomy. They must know when a tracheostomy is indicated, how to select the proper device, how to adequately humidify the inspired gas, how to manage the wound, and how to recognize when the tube can be removed (decannulation).

Year in Review 2014 – $4.99

This e-book in the Best of Respiratory Care contains a series of papers that were comprehensive reviews from manuscripts published in various peer reviewed journals in 2014 covering various aspects of airway clearance procedures and devices, aerosol delivery devices, the diseases of asthma and COPD, mechanical ventilation and patient safety.

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Industry Watch

Ofev may slow disease progression in IPF

Results from the INPULSIS-ON trial, published in Lancet Respiratory Medicine, suggest that the effect of Ofev® (nintedanib) on slowing disease progression in patients with idiopathic pulmonary fibrosis (IPF) persists beyond four years. The findings also indicate that the long-term efficacy of Ofev in reducing disease progression may be sustained in patients who require dose adjustments. "The INPULSIS-ON results provide valuable insights about the long-term safety and efficacy of Ofev in IPF and supply further evidence of its positive impact on the lives of people living with this disease," according to Dr. Susanne Stowasser, associate head of Medicine Respiratory at Boehringer Ingelheim. "Progressive fibrosing lung diseases like IPF continue to have a devastating impact on people's lives, and our focus remains on researching and bringing to market treatments that improve the lives of these patients at need."

FDA campaign aims to prevent kids from using e-cigarettes

The FDA has launched the "The Real Cost" Youth E-Cigarette Prevention Campaign to educate kids about the dangers of e-cigarettes. The campaign is targeting nearly 10.7 million youth, aged 12–17, who have used e-cigarettes or are open to trying them, and features hard-hitting advertising on digital and social media sites popular among teens. Posters with e-cigarette prevention messages will be placed in high schools across the nation as well."… the FDA won't tolerate a whole generation of young people becoming addicted to nicotine as a tradeoff for enabling adults to have unfettered access to these same products," FDA Commissioner Scott Gottlieb, MD, was quoted as saying. "Making sure e-cigs aren't being marketed to, sold to, or used by kids is a core priority and the guiding principle behind our efforts."

Results positive for eosinophilic asthma treatment

AstraZeneca has announced results from the Phase 3 extension BORA trial evaluating the long-term safety and efficacy of FASENRA™ (benralizumab) as an add-on maintenance treatment in patients with severe eosinophilic asthma who had previously completed one of the two pivotal SIROCCO or CALIMA Phase 3 trials. Results showed that 74% of patients with a baseline blood eosinophil count of 300 cells/µL or greater who received FASENRA every eight weeks continuously from SIROCCO or CALIMA and into BORA were exacerbation-free in their second year of treatment and maintained improvements in lung function and asthma control.

Cedars-Sinai will study deadly lung conditions

A scientific team led by Cedars-Sinai has been awarded $12 million from the National Institutes of Health to investigate two deadly lung conditions: idiopathic pulmonary fibrosis and chronic lung allograft dysfunction. The grant builds on pioneering work by the investigators and will result in three projects aimed at taking a closer look at how immune checkpoint inhibitors and epithelial progenitor cells figure into the two conditions. "The new funding will help Cedars-Sinai, an internationally recognized leader in lung fibrosis research, continue to expand the frontiers of knowledge in pulmonary medicine," said Shlomo Melmed, MB, ChB, executive vice president and dean of the faculty at Cedars-Sinai.

Study of Merck drug for HABP and VABP meets pre-specified endpoints

According to Merck, the company's Phase 3 clinical study evaluating ZERBAXA® (ceftolozane and tazobactam) at an investigational dose for adult patients with either ventilated hospital-acquired bacterial pneumonia (HABP) or ventilated-associated bacterial pneumonia (VABP) met the pre-specified endpoints. ZERBAXA showed non-inferiority to comparator meropenem in day-28 all-cause mortality and in clinical cure rate at the test-of-cure visit. Based on these results, the company plans to submit supplemental new drug applications seeking regulatory approval of ZERBAXA for these new indications in the United States and the European Union.

Circassa Pharmaceuticals expects sales boost from Aetna requirement

Circassa Pharmaceuticals, Inc., believes a new policy issued by Aetna deeming

the measurement of exhaled nitric oxide as "medically necessary" to evaluate the level of inflammation in asthma patients will boost the sales of its NIOX technology. According to the company, NIOX is the only point-of-care device currently available to accurately measure inflammation in the airways of people with asthma.

ClariFix device treats chronic rhinitis

A new treatment that delivers a freezing or near-freezing temperature to the back of the nose can offer relief to people suffering from chronic stuffy or runny nose, postnasal drip, and cough. Called ClariFix, the treatment is a form of cryotherapy — the use of cold temperatures as a medical treatment — that targets out-of-balance nerves that result in chronic rhinitis. The ClariFix device includes a small, chilled pad on a thin stem that is inserted through a nostril and applied to a targeted spot inside the nasal cavity, where it interrupts the neural pathway that triggers rhinitis symptoms. The device is the only FDA-approved device for treating chronic rhinitis and is currently being used by Rush University Medical Center specialists.

Portable Oxygen Solutions on list of fastest-growing companies

Portable Oxygen Solutions recently placed number 1,055 on Inc.'s annual list of the 5,000 fastest-growing companies in the United States. Average companies bearing this distinction have grown as much as six-fold in the previous year. The award earns Portable Oxygen Solutions a distinction once shared with household names like Inuit, Zappos, Under Armour, and Microsoft. "We are happy to receive this award from Inc. It lets us know that our team here is doing an amazing job," company owner Todd Flesch was quoted as saying. "We take great pride in providing advice and guidance to help each of our clients select the right portable oxygen concentrator that fits their specific needs and lifestyle."

CSA Medical optimistic on new COPD treatment

CSA Medical, Inc., presented positive results from its feasibility study of the RejuvenAir® Metered Cryospray™ system at the 2018 European Respiratory Society (ERS) Congress in Paris, France. In an analysis of 30 patients at six-month follow-up, treatment with RejuvenAir® resulted in clinically meaningful improvement in quality of life as measured by the Saint George's Respiratory Questionnaire and COPD Assessment Test, demonstrated a strong safety profile, and was well tolerated. "The RejuvenAir therapy appears to have a beneficial response with a decrease in cough and mucus production even in our patients who had optimized medical management," noted Dirk-Jan Slebos, MD, PhD, from the University Medical Center Groningen in The Netherlands. "The overall improvement in breathing resulted in increased physical activity, supporting the potential for RejuvenAir to measurably improve quality of life in chronic bronchitis patients."

Conversa Health's AI-based platform receives award

Frost & Sullivan has recognized Conversa Health with the 2018 North American Technology Leadership Award for filling the gaps in traditional care through its automated, artificial intelligence (AI)–based Conversa Conversation Platform™. The consumer-centric platform optimizes patient engagement, care team satisfaction, and clinical and financial outcomes through targeted patient outreach and coordinated care management. The platform includes a library of more than 500 conversation programs addressing conditions such as asthma, COPD, and hypertension.

New biopharmaceutical company takes off

Roivant Sciences has launched a new biopharmaceutical company called Respivant Sciences that is focused on improving the lives of patients suffering from serious respiratory diseases. Respivant's pipeline is anchored by RVT-1601, an inhaled therapeutic being developed for the treatment of chronic cough in patients with idiopathic pulmonary fibrosis (IPF). RVT-1601 is a mast cell stabilizer with pleotropic immune-modulating properties delivered directly to the lungs via a handheld aerosol device that produces a soft mist for patients to inhale. In a Phase 2a clinical trial, RVT-1601 demonstrated a statistically significant reduction in cough frequency among patients with IPF after 14 days of treatment. Respivant plans to initiate a Phase 2b study for RVT-1601 in the first quarter of 2019.

New chronic bronchitis treatment data released

Gala Therapeutics has announced positive results from its first-in-human trial of RheOx™ in patients with chronic bronchitis. The data showed a favorable safety profile and clinically meaningful benefits after Bronchial Rheoplasty™. "These preliminary data demonstrate safety as well as significant improvement in quality of life, validated by biopsy evidence of a reduction in mucus-producing goblet cells and increases in airway volumes on CT scan imaging," noted Arschang Valipour, MD, FCCP, from the Ludwig-Boltzmann-Institute for COPD and Respiratory Epidemiology at the Otto Wagner Spital in Vienna, Austria. "This supports further study of RheOx as a potential new therapeutic option for a disease state that is not sufficiently addressed by pharmacotherapy." This study was also presented at the recent ERS Congress in Paris.

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

— 2018 —

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.

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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.

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RC Currents

IN THE NEWS

Transitions

1969 AARC PRESIDENT ROBERT H. MILLER PASSES AWAY

The AARC has been saddened to learn of the death of 1969 AARC President Robert H. Miller, RRT, who passed away at age 85 after a 15-year battle with Parkinson's disease. He is widely recognized for his contributions to respiratory care school accreditation that ultimately led to the creation of the Joint Review Committee for Inhalation Therapy Education, the precursor to today's Commission on Accreditation for Respiratory Care.

Miller was active in the National Board for Respiratory Therapy (now the NBRC) between 1972 and 1977 and was the first respiratory therapist president of the NBRT in 1975, serving in that capacity for two years. The NBRC annually presents its Robert H. Miller, RRT Award to a respiratory therapist or pulmonary function technologist demonstrating outstanding service to the profession and/or the credentialing system.

Robert H. Miller

He started his professional career as an operating room technician and was one of the first clinicians trained in the operation of the iconic open heart surgery bypass machine at Massachusetts General Hospital. He entered the respiratory care profession during its infancy and went on to have a long and varied career. He served as manager of an RT department at Maine Medical Center and later in respiratory home care for 15 years, caring for patients in Maine and New Hampshire. He was renowned for creating unique systems to provide oxygen to patients.

In his off-duty life, Miller enjoyed gospel singing and was an avid outdoorsman. The cover photo of the 2005 Maine State Fishing Laws booklet showed him proudly preparing to release a trophy salmon back into the water. ■

Retirees: Tell Us Your Career Story

This year *AARC Times* is looking for contributions to our "Reflections" column, which features AARC members who have recently retired from the respiratory care profession. We ask that you look back at your career or some aspect of it and tell us what it meant to you and why. You can submit your story to *AARC Times* Editor Marsha Cathcart at cathcart@aarc.org. ■

Marathons and Research: More in Common than You Think

Prof. Robert Chatburn, MS, RRT, RRT-NPS, FAARC

One of the strategies mentioned in the AARC Strategic Plan 2015-2020 reads as follows: "Promote positive models of excellence in respiratory care for clinical, research, and leadership." Indeed, the AARC's Leadership Institute offers three educational tracks: Education, Management, and Research. Most large academic hospitals word their mission statements to include components of patient care, education for clinicians, and research aimed at improving both.

At Cleveland Clinic, one of our programs to cultivate the next generation of researchers is called the Science Internship Program. This program gives Northeast Ohio high school students the opportunity to learn and work alongside world-renowned caregivers. Goals of the program include increasing the interns' science and research experience along with their analytical research skills. I have been associated with this program since 2008 and each year my interns have been able to publish abstracts of their studies in Respiratory Care. Two of them have even co-authored full articles published in the Journal.[1,2]

My point in describing this program is to share some insights that might encourage respiratory care professionals to get involved in a research project. In my experience, the biggest barrier to entry is simply the feeling that the challenge of gaining research skills and experience may be overwhelming. The following came to me unsolicited from my latest high school science intern, Angela Demchuk, after she completed the nine-week program. I believe it may help to put things into perspective for would-be RT researchers who are still wondering if they are up for the challenge.

Ms. Demchuk writes…

I am a high school ultra-marathon runner. The term "ultra-marathon" is used to describe any running race over 26.2 miles. Most of my "ultras" are 24-hour races where I run up to 80 miles. I was thinking it over and I realized that the thought process throughout an ultra is similar to the research process. You begin by deciding to do something that scares you, such as signing up for a 24-hour race or applying for your first research internship. You do all the prep work — training, group runs, solo runs, interviews, night runs, cover letters. After months of preparation, you do the hardest step. Start. Every fear and every unknown is in front of you. "How will I make it for 24 hours?" or "How do I write a research abstract in just nine weeks?" Despite all the uncertainty, you show up on day one (or hour one).

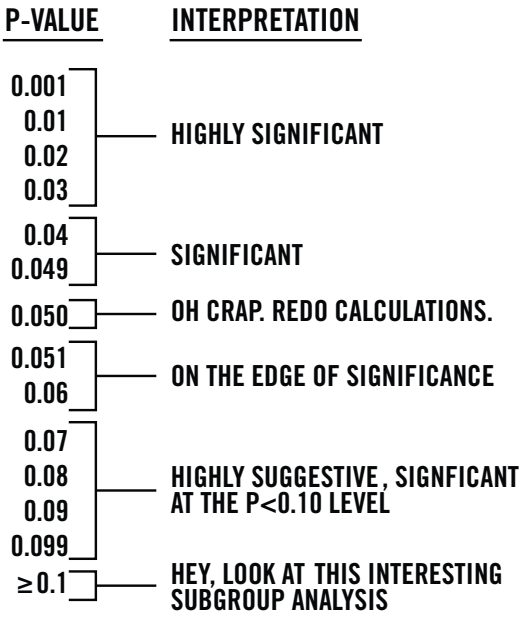
Now you are in for the long haul. The fears and uncertainties start to subside as you begin to learn the process. It's literally just running. You meet cool people, share life stories, eat food, run, eat more food, study the neuron pathway, eat more food. The same thing happens in the research process. You learn the steps, read books, meet cool people, eat food, read more journals, collect some data. You keep going.

Here's the part where you think you have it — but you really don't. The dark hours of the ultra begin (or the data analysis starts). In past ultras, this was your favorite part because it's cool out and you usually get the most miles in the nighttime hours. You are ready for the routine (or data that make sense). And then you turn on your headlamp, and instant nausea hits. Your eyes can't track the light like they used to. The strength they had a year ago is no longer there. In everyday life you didn't notice this as much because you just naturally adjusted. But when it's pitch black out, your eyes let you know. The reality of decreased visual bandwidth hits you. That, combined with 50 some miles and who knows what type of chemical reactions going on in your body, causes you to sit in your lawn chair by your tent and bawl your eyes out. This goes on for 45 minutes before you realize that the tears are probably not going to stop. So you might as well get some miles in anyway.

You get up, turn your headlamp off, and run the trail in the dark by memory because memory and forward motion are the only choice you have. (Similar things happen when you look at the data sheet for four hours and realize you have absolutely no idea what any of your data mean — minus the 50 miles, of course.)

Then, 15 tearful but successful miles later, you return to your tent to see the (spoiler alert) first place female in her lawn chair, crying. This is where the teamwork

Figure 1. Realizations in research



comes in. You look at each other, the facial expressions explaining that you are going to work together to get another mile done. Halfway through the loop, you tell the runner: "You didn't know this, but you have guided me through the whole time. Because of you and your bright socks, I was able to do another loop" (or in the case of research, you then inform your mentor that you are momentarily clueless and need to go over the data. Thankfully, with his help, you understand what's going on again.) Teamwork. It totally matters.

Pure joy hits you when you cross the finish line (or write your first abstract). You did what you thought you couldn't do. Running 80 miles. Fighting off all the brain monsters. Taking in the experience. When doing both ultras and research, you learn more than just running and methodology. You learn about life. You come across experiences you wouldn't have had if you didn't start.

And then a few days later, the cycle starts again. You decide to sign up for the 2019 Burning River 100 Mile Trail Race (or carry out a full research paper).

That's the cycle of doing stuff that scares you. ■

Professor Chatburn is the program director for System Respiratory Care at the Cleveland Clinic and professor of medicine at Lerner College of Medicine of Case Western Reserve University in Cleveland, OH.

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2.Zhou S, Chatburn RL. Effect of the anatomic reservoir on low-flow oxygen delivery via nasal cannula: constant flow versus pulse flow with portable oxygen concentrator. Respir Care 2014;59(8):1199-1209.

Five Take-aways from the 2018 GOLD Report

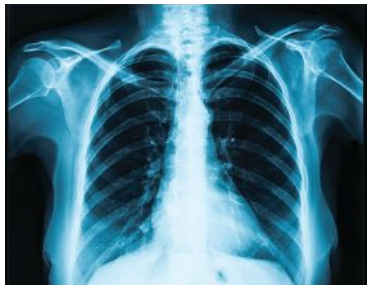
Mayo Clinic researchers who reviewed the 2018 report from Global Initiative for Chronic Obstructive Lung Disease (GOLD) have cited these five take-aways:

1. Influenza and pneumococcal vaccinations are recommended for patients with COPD.
2. Pulmonary function is essential in establishing a diagnosis, but it is underutilized.
3. Treatment algorithms in the new guidelines have been simplified to rely primarily on symptoms and exacerbation frequency to determine specifics of therapy.
4. Other health conditions, particularly lung cancer and heart disease, play an important role in the health of those with COPD. Thus, prevention and vigilance against these conditions is important.
5. The panel stresses the need for education, training, and assessments at every visit, especially with the often complex medication-delivery devices that are part of treatments.

"The majority of people with COPD have mild disease that requires very little treatment other than smoking cessation and possibly a short-acting bronchodilator," notes Dr. Paul Scanlon, a Mayo Clinic pulmonologist and the article's senior author. "For the minority of people with more advanced disease, current therapy is very effective, improves symptoms and quality of life, increases exercise tolerance, and reduces frequency of exacerbations."

The report appeared in a recent edition of *Mayo Clinic Proceedings*. The Global Initiative for Chronic Obstructive Lung Disease is composed of an international group of respiratory experts. ■

Thoracic Societies Publish New Guideline on the Management of MPEs



The American Thoracic Society (ATS), the Society of Thoracic Surgeons, and the Society of Thoracic Radiology have published a new clinical practice guideline on the management of malignant pleural effusions (MPEs). Given the short survival time of patients with MPEs and the fact that most patients suffer from significant dyspnea, the guideline places an emphasis on patient-centered outcomes, such as relieving dyspnea in a minimally invasive manner and reducing, if not eliminating, the need for repeated procedures and health care visits.

"In the 17 years since the ATS published its first guidelines on the management of MPE, there has been a significant amount of high-quality research that significantly improves our care of these patients," noted panel co-chair David J. Feller-Kopman, MD, professor of medicine and director of interventional pulmonology at Johns Hopkins Hospital. "These new recommendations are the effort of a multidisciplinary group with representation from pulmonary, thoracic surgery, and thoracic radiology, with the goals of highlighting recent research and increasing 'buy in' due to the collaboration of multiple societies."

The new guideline was published in a recent edition of the *American Journal of Respiratory and Critical Care Medicine*. ■

A CIGARETTE BY ANY OTHER NAME

Calling vaping devices "e-cigarettes" may be confusing many issues, report Northwestern Medicine researchers publishing in a recent edition of *Nicotine & Tobacco Research*.

"Comparing cigarettes to e-cigarettes can give us a false sense of what dangers exist because it misses the gap in understanding how people use them and how they can make people dependent," according to first author Matthew Olonoff, a PhD student at Northwestern University Feinberg School of Medicine. "There are enough key differences between cigarettes and these products, especially newer-generation devices, to show that they are not interchangeable nicotine delivery systems."

The authors go on to make the case that while researchers have a good sense of what constitutes a "cigarette" — such as how many puffs are typically in one, how people use it, the amount of nicotine included, etc. — e-cigarette devices vary widely, including in the amount of nicotine they deliver.

The paper notes that the National Institute on Drug Abuse introduced a standardized research-specific e-cigarette in March 2018 that researchers can purchase for use in their studies. Using the standardized e-cigarette will allow all investigators to study the same e-cigarette so that the chemical components and the number of puffs it takes to finish the e-cigarette are consistent across studies. The Northwestern Medicine authors encourage researchers to use the standardized e-cigarette in their work. ■

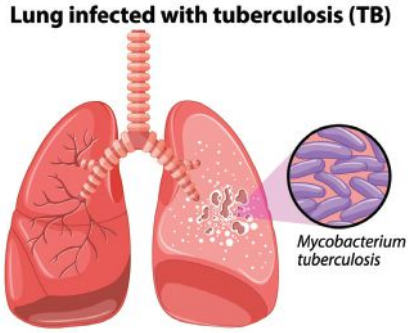
Contribute to the "Transitions" Column

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 obituary so that we can share it with the membership and pay tribute. ■

$2 Test Could Improve TB Detection and Treatment in the Developing World

A $2 test may help developing nations better identify tuberculosis (TB) so more people can begin treatment.
It may also help determine which patients have antibiotic-resistant strains.

Developed by researchers from the Imperial College of London and Cayetano Heredia University in Peru, the test requires a phlegm sample, which is then divided between four compartments, three of which contain one of three antibiotics used to treat the infection: ciproflaxin, isoniazid, or rifampicin. If the bacteria grow in any of those compartments, the test shows that the tuberculosis is resistant to one or more common treatments.



Advanced molecular tests used in the United States and other wealthy countries can accomplish that same goal, but they are not available in the developing world due to high cost and the need for specific supplies and training. "This new $2 CX-test is fast, effective, and cheap and enables clinicians to know about drug resistance up front so that they can personalize treatment," explained study author Jesse Kwiek, an associate professor of microbiology at The Ohio State University. Kwiek participated in a study of the test in 96 people considered at high risk for TB in Malawi. Results showed the test was easy to use in the field and reliably found TB cases, although none of the cases were drug-resistant. More study is under way. The research appeared in a recent edition of the *African Journal of Laboratory Medicine*. ■

HEPA Filters Are Effective

Due to temperature inversions in the wintertime that trap cold, dirty air inside the Salt Lake Valley, the state of Utah has some of the worst air in the country. Researchers from Intermountain Health in Salt Lake City monitored air quality for 12 weeks in the homes of 30 people with respiratory problems, and they found that HEPA filters reduced fine particulate matter by 55% and the amount of particulate pollution making its way inside from outside by 23%. With the HEPA filters, only 5% of outdoor air composed of particulate matter 2.5 µm or less in diameter contributed to the indoor air quality, compared to 28% when HEPA filters weren't in use.

"One of the reasons we wanted to research the effectiveness of HEPA air filters in the home is because people often ask what they can do to protect their lungs during poor air-quality days," said study author Denitza Blagev, MD. "We found that running a stand-alone in-home HEPA filter and having the windows in the home closed can provide cleaner air inside the home, especially when outdoor air is so poor."

Results of the study were presented during the European Respiratory Society's International Congress in Paris, France. ■

Diabetes Mellitus Linked to Pulmonary Hypertension

Could diabetes mellitus (DM) serve as a prognostic factor for pulmonary hypertension (PH) in people with chronic respiratory disease? Japanese researchers who studied 386 people with chronic respiratory conditions believe the answer may be yes.

Among the subjects, 42 were diagnosed with PH, and those patients were more likely to have diabetes as well. "DM is potentially associated with PH and is an independent factor for prediction of PH in patients with chronic respiratory disease," conclude the investigators. The study was published by *PLoS One* earlier this year. ■

pH and Oxygen May Affect Antibiotic Efficacy in CF

Could factors such as pH balance and oxygen be playing a role in the chronic lung infections suffered by people with cystic fibrosis (CF)? According to researchers led by a team from the University of California San Diego, the answer may be yes. They found that tweaking these factors helped eradicate pathogenic bacteria while minimizing risks of antibiotic resistance and overgrowth of other microorganisms in a CF lung model.

The investigators collected sputum samples from 18 CF patients and then altered factors such as pH, oxygen levels, and antibiotics to map approximately 600 different CF lung conditions. As a result of these pH and oxygen gradients, they found that microbes in CF lungs divide themselves into two distinct communities: known pathogens living in oxygen-rich regions and high pH, and anaerobes that thrive in areas low in oxygen and low pH.

From there, they added the anti-*Pseudomonas aeruginosa* antibiotic tobramycin to the top of the culture in their model, simulating inhalation into an airway with mucus-plugged bronchioles. The antibiotic caused drastic changes in the system's microbial makeup. Some bacterial species were killed in all regions of the column; some were killed in the higher, more oxygen-rich layers but survived at lower depths; and others continued to thrive at the lower depth. The chemical structure of the antibiotic itself was also modified by the microbes, which could help bacteria resist its effect. However, when the investigators lowered the pH of the cystic fibrosis mucus in the system by one unit, the bacterial makeup of the sample shifted from 70% P. aeruginosa to essentially zero.

"It may be that in some cases antibiotics may not even be as effective as that simple pH change our laboratory experiment suggests, something worth exploring clinically," explained study author Pieter Dorrestein, PhD. While his team emphasizes that much more study is needed before this model can be used in patient care, they believe the day may come when clinicians can rapidly analyze each patient's sputum for unique molecular and microbial patterns and test different combinations of treatment options in the lab — pH change, oxygen levels, antibiotics — before prescribing them to the patient. The study appeared in a recent edition of *Science Advances*. ■

COPD Linked to Albuminuria

A new study led by investigators from Columbia University has found a link between albuminuria, the amount of the protein albumin in urine, and COPD. The investigators pooled data from 31,877 participants from six cohort studies to arrive at their findings. People with COPD or asthma at the time of enrollment were excluded.

Participants were followed for changes in lung function over a median of six years and for respiratory hospitalizations and mortality over a median of 15 years. Results showed that for each standard deviation increase in albuminuria, there was a:

- 15% increase in those who developed moderate-to-severe COPD;
- 26% increase in COPD hospitalizations and deaths; and
- 3% greater decline in FEV_1 and an 11% greater decline in FEV_1/FVC.

These associations remained significant even after the results were adjusted for other factors, such as smoking history, diabetes, hypertension, and cardiovascular disease. Interestingly, while smoking is known to cause both endothelial damage and COPD, the results were found to be similar in never-smokers. No significant association was seen between albuminuria and asthma.

Study author Elizabeth C. Oelsner, MD, MPH, noted that her colleagues' study helps explain why COPD patients often have several vascular problems, including heart and kidney diseases, noting, "This makes it all the more important for clinicians to encourage avoidance of exposures like smoking and treatment of diseases like hypertension and diabetes that cause endothelial dysfunction." The study appeared in a recent edition of the *American Journal of Respiratory and Critical Care Medicine*. ■

For-Profit Facilities Have More Readmissions

Readmissions are significantly more common in for-profit hospitals, according to University of Illinois at Chicago researchers who analyzed readmission data obtained from the national Hospital Readmission Reduction Program (HRRP) from 2012 to 2015 for six major and common diseases: heart attack, heart failure, coronary artery bypass surgery, pneumonia, COPD, and total hip or knee replacement surgery. Across all six major diseases, hospitals with fewer readmissions than expected, based on a government ratio accounting for disease severity, were primarily public and nonprofit. Hospitals with more readmissions than expected were predominated by for-profit hospitals. In each category, for-profit hospitals had the highest mean and median readmission ratios.

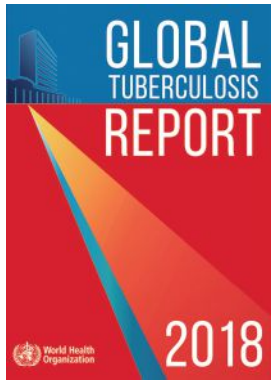
"It is remarkable to see such clear data in a study like this," study author Andrew Boyd was quoted as saying. "There is not a single category in which for-profit hospitals shined when it came to readmissions. This was unexpected. It was also surprising to see that the trend existed independent of geography." The study was published in a recent edition of *PLoS One*. ■

Tuberculosis Targeted by WHO Report, UN General Assembly

Tuberculosis is an international health problem, and last fall, the United Nations General Assembly held its first-ever meeting to accelerate efforts against the disease. The World Health Organization (WHO) released the *2018 Global TB Report* prior to the assembly and called for "an unprecedented mobilization of national and international commitments" in the battle against TB, urging political leaders attending the meeting "to take decisive action."

Key messages delivered during the meeting included:

- TB is preventable and curable, yet it remains the world's most common infectious disease killer.
- Childhood TB remains an uncontrolled epidemic. An estimated one million children succumb to TB annually, but only one in three children with TB is diagnosed (much less treated).
- Despite its prevalence, TB resources continue to be chronically under-funded. The WHO estimates that research and development budgets for TB currently have a funding gap of $1.2 billion per year.
- For TB to be eradicated, WHO says it is essential that countries commit to ambitious targets for accelerating global progress against TB, including funding for TB programs and research and development. This is an uphill battle in many countries.



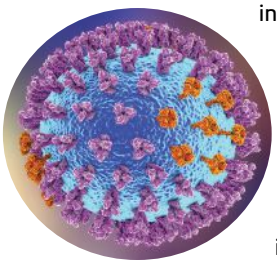
"We have the opportunity to end TB, the world's leading infectious killer," said international TB expert Dean Schraufnagel, MD, who has served on the board of directors of the Union Against Tuberculosis and Lung Disease and is executive director of the Forum of International Respiratory Societies.

According to the report, TB deaths declined from 1.7 million in 2016 to 1.6 million in 2017, for the fourth year in a row, but TB remained the leading global infectious killer. The report also notes that drug-resistant TB is an ongoing public health crisis, with only about one in four people with drug-resistant TB being treated. ■

How Flu Affects Lung-derived Cell Lines

Researchers in Germany and Switzerland have investigated the effect of influenza A on three lung-derived cell lines. The study quantified virus-induced changes in protein levels and found that a majority of the changes are cell-line specific.

Protein levels of 70% of the roughly 7,000 proteins they could detect using a mass spectrometry-based isotope-labeling approach known as SILAC were quantified in the study. Influenza infection of lung cells changed the overall abundance of only a few proteins, mostly related to immunity, but SILAC comparisons showed that the virus changed the cellular location of many proteins. In particular, they detected an increase in viral and ribosomal proteins in the autophagosome, which they linked to a reduction in successful autophagy, suggesting that the virus may hijack autophagosomes, perhaps using the compartments for viral protein translation.



The investigators published their results in a recent edition of *Molecular & Cellular Proteomics*. ■

EBT May Assist in Prognosis for PH

Exhaled breath temperature (EBT) may have a role to play in determining prognosis for people with pulmonary hypertension (PH), find Italian researchers publishing in a recent edition of Biomed Research International.

To assess the effect of EBT on various types of PH, they divided 24 PH patients into three groups. Ten had pulmonary arterial hypertension, 11 had PH due to COPD, and three suffered from PH related to left heart disease. Results showed significantly lower EBT in the third group compared to the other two groups, and when the researchers evaluated the findings in relation to respiratory function, EBT levels were inversely correlated to mean pulmonary arterial pressure, leading them to conclude that the lower the EBT level, the higher the mean pulmonary arterial pressure and the greater severity of PH. ■

Low Ozone Levels Still Affect Kids with Asthma

In a study conducted among 23 African-American youth ages 12–17 with persistent asthma, researchers from the University of North Carolina School of Medicine have found that even low levels of ozone can be detrimental.

Treatment plans for the patients were reviewed and optimized at the beginning of the study, and each child was evaluated for lung function and lipid markers six times over 15 months. At the same time, the investigators tracked ozone levels in their communities on the day of the clinic visit and for four days leading up to it to determine when levels were above the Environmental Protection Agency's current eight-hour National Ambient Air Quality Standard (NAAQS) of 70 parts per billion.

Despite adequate asthma control, lung function decreased even when the patients were exposed to ozone levels below the current NAAQS levels. Ozone was also associated with an increase in total cholesterol levels. The study was published in a recent edition of the *Journal of Allergy and Clinical Immunology*. ■

Burning Wood or Coal to Cook Increases Respiratory Risks

Chinese investigators working with colleagues in the United Kingdom have found that burning wood or coal to cook food raises the risk of hospitalization or death from respiratory conditions.

They arrived at that finding after reviewing the health records of 280,000 adults, age 30–79, who had never smoked and were free of respiratory and other major chronic diseases when they enrolled in the study. Over the next nine years, 19,823 were either hospitalized or died from a major respiratory disease.
Of these events, 10,553 were due to asthma or COPD, and 7,324 were due to acute lower respiratory infections, most often pneumonia. Chronic and acute respiratory disease hospitalizations or deaths were 36% higher among those who used wood or coal for cooking, compared to those who used electricity or gas.

The study appeared in a recent edition of the *American Journal of Respiratory and Critical Care Medicine*. ■

Strange But True…

Smart air: People with asthma and other conditions affected by air quality may one day benefit from a "SmartAir" system designed by researchers at the University of Utah. Based on readings from air-quality sensors installed around the house and outdoors, the system automatically turns the HVAC fan on when air quality drops, thus cleaning the indoor air.

Sniff it out: Researchers from the Monell Center have found that sick animals give off a scent that is picked up by the healthy animals living with them. The investigators believe the scents may trigger protective or preparative responses that minimize the risk of impending infection. ■

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One Last Selfie: A Farewell Message

by Frank R. Salvatore, Jr., MBA, RRT, FAARC

If your actions inspire others to dream more, learn more, do more, and become more, you are a leader. — John Quincy Adams, 6th President of the United States

In the fall of 2013, I was honored when you elected me to be president of the AARC for 2015–2016. It was a long-held dream of mine to serve my profession in this capacity, something I'd been thinking about since the mid-'90s when I was appointed to serve as a board member for the Connecticut Society for Respiratory Care (CTSRC). During a state meeting, the CTSRC president read a communication from the AARC Elections Committee calling for the nomination of members to serve on the AARC Board of Directors and Executive Committee. I looked at a fellow CTSRC board member who was also appointed to serve in a vacant board seat and said, "One day I'm going to answer that call."

about the author...

Frank Salvatore, MBA, RRT, FAARC, is the AARC's past president.

You can do it, too

In the five years I've served in the "President's Track" of our great organization (president-elect, president, and immediate past president), I've met many fellow respiratory therapists. But one of the highlights of my time in office has been meeting the students. One of the reasons why they and others may remember me is due to my use of the "Frank Selfie." Believe it or not, in my consultations with many of my predecessors, the concern was raised that my use of the selfie might diminish the view of the presidency, but I found it to be very much to the contrary.

In a time where volunteerism is on a steep downslope, I believe the use of the selfie made the role of AARC president less of an unreachable goal for many. Each time someone came up to me for a selfie, they found that the president was one of them, and I tried in all instances to not just "take a selfie" but to talk to them. In many cases, and especially with students, I ended with, "Who knows, maybe one day I'll come up to you asking to take selfie because you are now our AARC president!"

My five years in the presidential track has taught me that service to our organization is needed more today than ever before. Our profession is in a period of evolution once again. Our care-delivery system needs to be revised so that we can add even more value to patient outcomes than we do now. I've mentioned this many times, but the act of delivering a nebulizer treatment to a patient isn't the "value-added" part of what we do! We must change that paradigm and advocate more for the management of our patients' pulmonary disease through greater interaction with a respiratory therapist, not only in the hospital, but in other venues as well. Our ability to educate our patients and impact outcomes through decreased readmissions is what needs to be front and center.

Many of you have asked me, "How do I get involved?" Here is the secret: start with your state society. Every state affiliate needs good volunteers who want to advance the profession within the state. It is here where you get to know the movers and shakers within your state. This is the time to make your move by volunteering to become a member of the state board. Hopefully, you'll decide to move on to the executive committee of that board and possibly the state society presidency.

From the presidency, I've seen many members become delegates to the AARC House of Delegates. Talk about a body of movers and shakers! It was in

Salvatore showed off the crowd at the House of Delegates meeting in this selfie taken right before AARC Congress 2015 kicked off in Tampa.

Frank and students: RT students loved getting the chance to take a selfie with Frank Salvatore during this meet and greet at the 2016 AARC Congress in San Antonio.

this body that I really got to see the respiratory care profession on a national level. The House is the place where I made lifelong friends who have taught me more about our profession and best practices than I could ever have learned from my workplace. This body inspired me so much that I put my hat into the ring to become its treasurer one year, and after that term, I was elected to be the speaker of the House.

From the House of Delegates, you can move on to national service through election to the AARC Board of Directors or by volunteering to be on a committee — or both! When you rise to the level of national service, you really get to see how the profession is impacted by the AARC's involvement in everything from continuing education to government affairs. Sometimes it's subtle, with the AARC providing information to a state society to help them fight a local issue, or advancing our practice by advocating for licensure, or more recently, moving to have the RRT credential established as the entry to licensure requirement. Sometimes the impact is not so subtle, like when the AARC advocated for RT inclusion in the national laboratory regulations. If we had not been included, we would have been cut out of arterial blood gas analysis. There are many more examples, but I think you get the picture of what it's like to be involved nationally.

On the cusp of an evolution

Our profession is on the cusp of an evolution that those of us who started many years ago may not have been able to visualize when we first began. Too many times I've heard, "I'm a few years away from retirement; I just want to do my job and get to that finish line." I have no patience for that kind of thinking or the apathy that exists within our ranks.

That's why I'm writing this farewell. I hope to give a not so gentle nudge to all who read this column to get involved. It doesn't matter if you're a new member of our profession or someone who has more years than fingers and toes to count. You are part of a profession that needs its membership to step up and show our value, not only to our patients, but to the health care system as a whole. Let us forever ban the moniker of "treatment jockey"! We need to bring ourselves to the many tables where care decisions are made and show that a respiratory therapist is a member of the health care team who must not be ignored. Our ability to manage pulmonary disease is second to none. We just have to exude that when we interact with others!

On December 5, 2018, 1,455 days after I took the oath to serve our profession as your president, I will end that service in the same spot where it started: the AARC Congress in Las Vegas. I will always treasure the fact that you allowed me to serve, but it will not be the end of my service to the profession. I will continue to serve as long as AARC presidents allow me to be an advocate through the AARC Advocacy and Government Affairs Committee and other activities where they feel my services would benefit the profession.

In the end, my plea to you is to join me in active involvement. Please know that our profession can only move forward when its members advocate and push for our inclusion in all aspects and venues of health care where respiratory patients are found. Before closing this column, I want to thank the membership for entrusting me with the leadership of our organization, and I especially want to thank staff in the AARC Executive Office in Irving, TX, for their assistance in helping me govern during my time in office.

So, for the last time, I thank you not only for allowing me to serve, but I thank you for what you do for our patients and profession. ■

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