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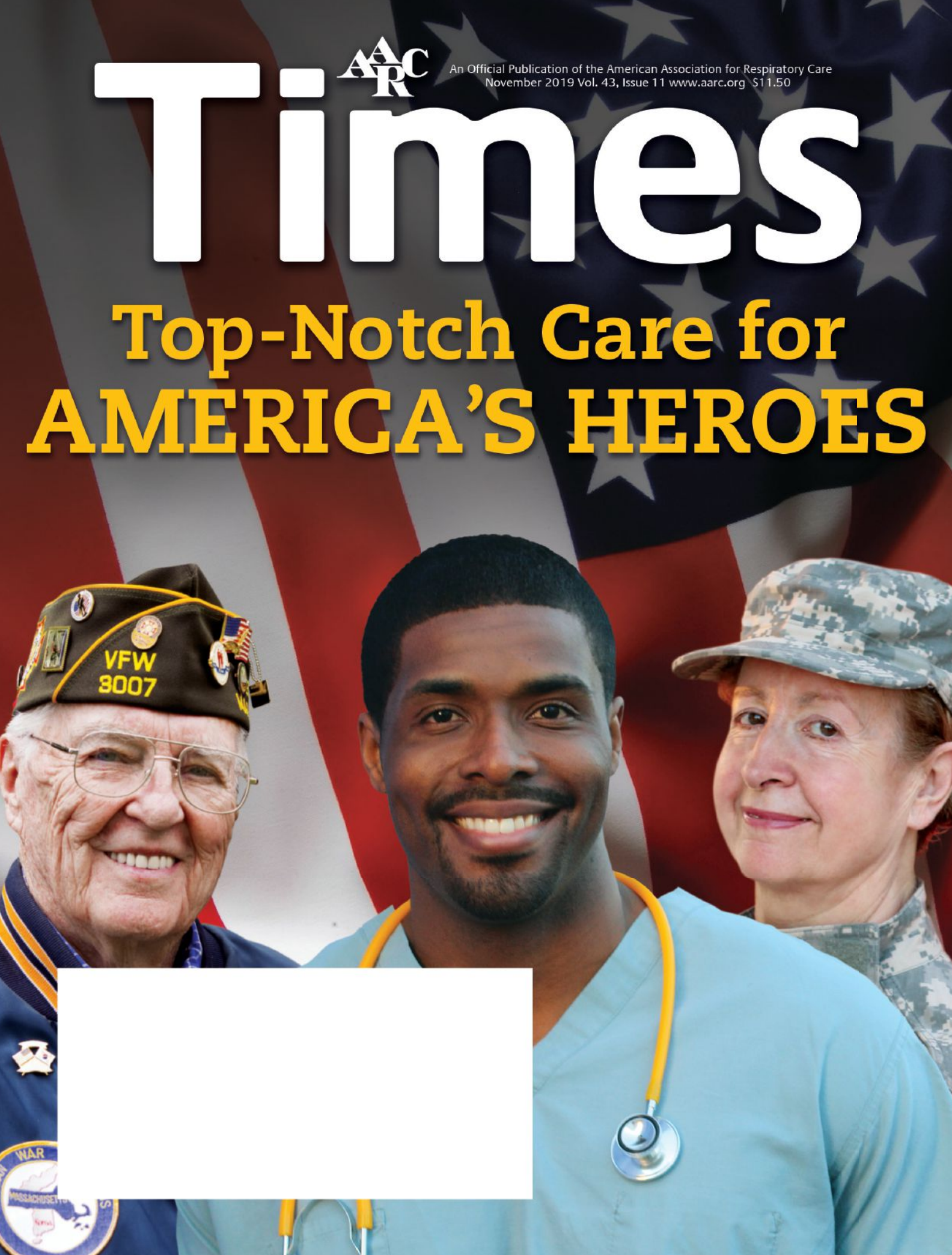

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## AARC Strategic Plan

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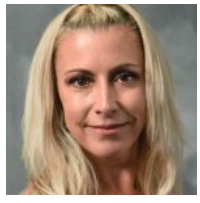

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# Open Mouth, Insert Foot, Chew Vigorously

by Anthony L. DeWitt, JD, RRT, FAARC

It was taken as a given during World War II that Germany and Japan had spies on both U.S. coasts, and that "loose lips could sink ships." This morning, I had a reminder that loose lips can also sink careers and harm job prospects.

Every therapist knows the rules. What happens at the hospital stays at the hospital. What happens in home care stays in that home. They also know that if they have a beef with another therapist, a nurse, or a physician, there is an appropriate way to handle the issue that doesn't involve broadcasting the issue either inside or outside the hospital.

One of my occasional tasks as a lawyer is to speak with experts in various fields. During that discussion, particularly if the expert is a physician, I will relate that I'm a former respiratory therapist. Usually, this results in experts saying things like, "We love our respiratory care staff." Today, however, that was not the case.

In a conversation with an expert witness today, she related to me that one of her friends in the community sent her a text photo of a person eating dinner at a local steakhouse. My expert did not know the person, but her friend informed her that the woman pictured was talking about her and the way she handled a particular patient incident. The patient was not named, but the comments were critical of the physician and, incredibly, the way the physician dressed. Specifically, she said the expert yelled at her.

"That never happened," the doctor told me. "I don't yell at people. I may tell you you're an idiot to your face, but I'm not going to raise my voice doing it."

The doctor wanted to know the name of the person who was complaining about her demeanor and her professional attire. A nurse manager she talked with identified the person as one of the hospital's respiratory therapy managers.

The expert told me she didn't view it as a big deal. Everyone has people they don't like or find abrasive, and the fact that the therapist found her annoying, while not inconsequential, was less an issue than the fact that the conversation was occurring in a crowded restaurant, at a volume sufficient for others to hear, and regarding a patient interaction.

As far as the expert physician knew, no HIPAA information was disclosed during the conversation, but the fact that the therapist in question was discussing hospital business away from the hospital was a red flag waving. Unbeknownst to the physician, the nurse reported it up the chain of command, and senior administrators got involved.

The worst way to come to the attention of senior administrative personnel in any hospital is in the context of third-party reports about your interactions with hospital physicians. Hospitals regard their referral arrangements with physicians as a primary source of revenue and try, within reason, to keep physicians happy. It's difficult to do that when a physician hears from a community resident that her name was being bandied about in an ugly manner.

What lessons can we learn from this? First, there's the danger of discussing work outside work; second, there are problems when professional disagreements are not handled in a professional manner.

So, how does a therapist who takes issue with the way a physician has treated him or her deal with that concern properly? The biggest question is whether the therapist was 100% in the right. If the physician's criticism, unkind or not, had a basis in fact, this is not a battle the therapist is going to win. There is no way to be wrong in a right way. It's better to forget the incident and try harder next time.

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.

But let's say the therapist was right, and the physician was wrong. We've all seen physicians make errors, and we've all tried to correct them, sometimes without a good result. So, when patient safety is at issue, and the issue is important enough to elevate (in other words, not just a situation involving hurt feelings), then the use of the chain of command is the proper way to deal with it. Elevate the issue to the department manager, and let the manager and the medical director work out the problem with the offending physician.

Sometimes, depending on the physician, this will result in an apology like, "Sorry I lost my temper" or even a semi-apology like, "I'm sorry you thought I was wrong, but I wasn't." If it does, accept the apology and move on. Even if you question the sincerity of the apology, be the professional and accept it, and pledge to work harder with that physician. Being professional sometimes means taking a few lumps to the ego. Holding a grudge or talking about the incident thereafter is certain to create additional problems.

Even when you don't get the satisfaction of an apology, you should put the issue behind you. The fact is that you will, at some point, have to deal with that doctor again, and possibly when a patient's life may be in the balance. A doctor who cannot trust you to be giving the best information and making the best recommendations is going to be much more difficult to deal with down the line.

Even more important, remember that elevators, cafeterias, hallways, and staff lounges connect with other rooms, and sound carries. You don't want to be talking about mean old Dr. Doe at the exact time she wanders by your staff lounge. And you don't want Mrs. Smith to overhear you saying something bad about the doctor to whom she's entrusted her child's life.

Years ago, when I worked at Our Lady of Perpetual Billing, we had a therapist we all called "Wild Bill" because he couldn't put a filter on his mouth, and anything he thought came right out of it. In front of a patient, he questioned a particular doctor's sanity and competence, and it was reported back to the doctor by the patient. The doctor sued the hospital for defamation, and Wild Bill was granted a permanent leave of absence. There are no winners on that battleground.

In an age when patient privacy complaints carry both civil and criminal penalties, and when some patients may be looking for any excuse to sue a facility, there is no better time than right now to remind yourself: "What happens in the hospital, stays in the hospital."

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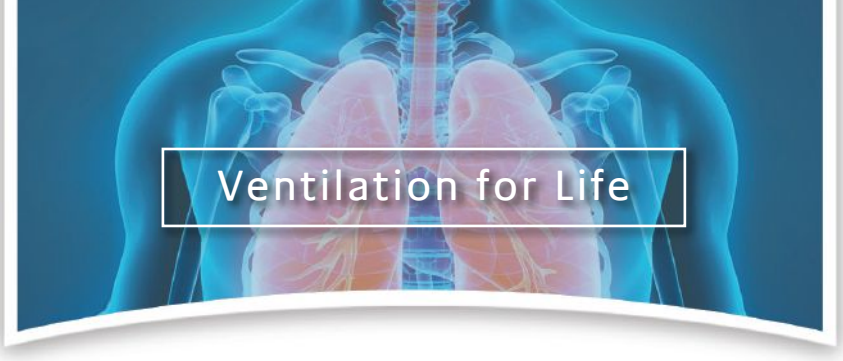



# How Hard Is Your Patient Working?

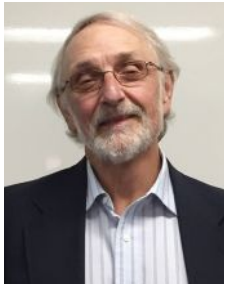
by Terry L. Forrette, MHS, RRT, FAARC

The work of breathing (WOB) during mechanical ventilation, with both continuous mandatory ventilation and continuous spontaneous ventilation, can be a critical factor in liberating patients from the ventilator. This is especially true for patients in a continuous spontaneous ventilation mode, such as pressure support ventilation. This article will identify the categories of WOB during mechanical ventilation, how to diagnose increased WOB, and strategies to reduce WOB.

## Continuous mandatory ventilation

While not as critical to ventilator liberation, the WOB during continuous mandatory ventilation should be taken into consideration when preparing the patient for ventilator liberation. While on a continuous mandatory ventilation mode and breathing above the set rate, patients may exhibit flow dyssynchrony when the preset flow does not match their inspiratory demands. Dyssynchrony (also referred to as asynchrony) is a suboptimal patient–ventilator interaction in which the ventilator's computerized control of breathing is out of sync with the patient's physiologically controlled breathing. When the trigger sensitivity is not set correctly and patients are required to exert extra effort in cycling on the ventilator, this is known as cycle-on dyssynchrony. Conversely, cycle-off dyssynchrony results from the inspiratory time being set too long, which requires the patient to forcefully exhale to end inspiration.

about the author...



Terry L. Forrette, MHS, RRT, FAARC, is an adjunct associate professor with LSUHSC–New Orleans and a member of the Level One Trauma/Critical Service at UMC-New Orleans.

## Continuous spontaneous ventilation

Factors that affect WOB during continuous spontaneous ventilation can be divided into factors related to the ventilator and artificial airway, often referred to as the imposed WOB,[1] and physiologic factors related to the patient's lung-thoracic compliance (often referred to as elastic WOB) and the airway resistance (often referred to as non-elastic WOB). When considering the imposed WOB during continuous spontaneous ventilation, the primary factor is often one of the characteristics of the artificial airway, such as internal diameter. The internal diameter may have been appropriate when the patient was initially intubated, but over time a buildup of biofilm may significantly increase WOB. Consider a patient intubated with the appropriate endotracheal tube, say 8 mm. Even 1 mm of biofilm reduces the internal diameter to 7 mm, with an associated increase in the imposed WOB. The physiologic factors of compliance and airway resistance are often related to a patient's underlying condition (e.g., chronic lung-chest wall disorder, traumatic injury, or pulmonary consolidation secondary to infection). Reactive airway disorders must also be considered as potential causes for an increase in the physiological WOB.

Identifying an increase in the WOB for a patient with a cardiopulmonary disorder who is receiving continuous spontaneous ventilation can be challenging. Consideration must be given to the continuous spontaneous ventilation mode, the patient's underlying cardiopulmonary disorder, and imposed factors such as the integrity of the artificial airway, ventilator sensitivity settings, and the ventilator circuit. The rapid shallow breathing index (RSBI) is often used to assess a patient's spontaneous breathing while on continuous spontaneous ventilation. Unfortunately, in some instances the RSBI may represent an inaccurate accounting of the patient's WOB. As an example, say you are ventilating a morbidly obese patient on pressure support ventilation and note that the RSBI is 101. Your concern is that the patient may become fatigued with

this ventilatory pattern, but you notice no distress from the patient, and they indicate no shortness of breath. This situation is sometimes seen in patients who have a decreased lung-thoracic compliance, especially those who have a distended abdomen. They adopt a ventilatory pattern of rapid respirations with small tidal volumes, which results in a lower spontaneous WOB. Many trauma patients with postoperative or chronic abdominal distention display this type of breathing pattern. We routinely measure their WOB while on continuous spontaneous ventilation and relate the RSBI to the actual WOB being performed. In addition to looking at the RSBI, ventilator graphics can be used to identify patient–ventilator dyssynchrony. Additional information suggesting an increase in the WOB can be obtained by looking at the pressure-volume curve and flow-volume loop. The pressure-volume curve is a good way to assess the patient's compliance.[2] A curve that is more upright, or "standing up" (Figure 1), suggests a normal lung-thorax compliance, however a curve that is "lying flat" (Figure 2) suggests a reduced compliance. We use pressure-volume curves to assess our patient compliance and to titrate PEEP levels.[3] Flow-volume loops can detect an increased inspiratory or expiratory resistance and air trapping (Figures 3 and 4).

Another method to assess patient WOB is looking for chest wall/abdominal expansion irregularities. Palpating the intercostals and diaphragmatic contraction during spontaneous breathing to identify which group of muscles contracts first can alert the practitioner to an

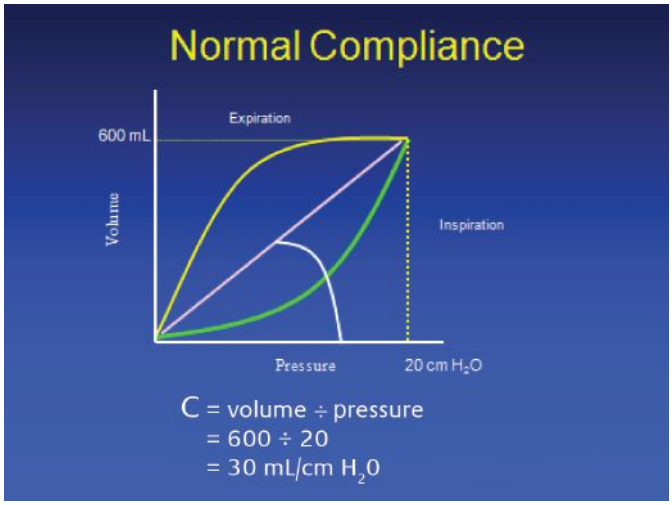



**Figure 1.**
Note how the curve is upright. Compare this to the curve in Figure 2.

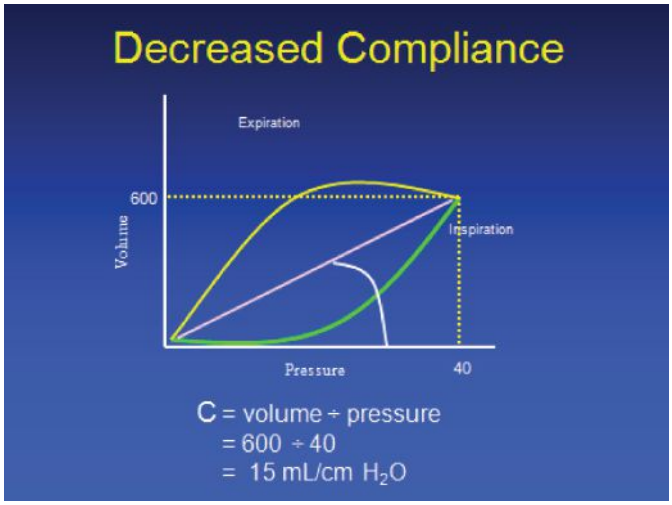



**Figure 2.**
Note how the curve is lying on its side.

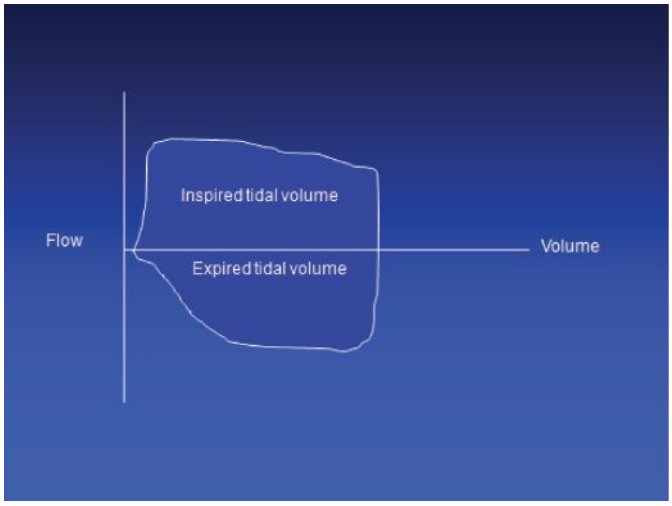



**Figure 3.**
Note how the expired tidal volume closely matches the inspired volume indicating near complete exhalation without air trapping

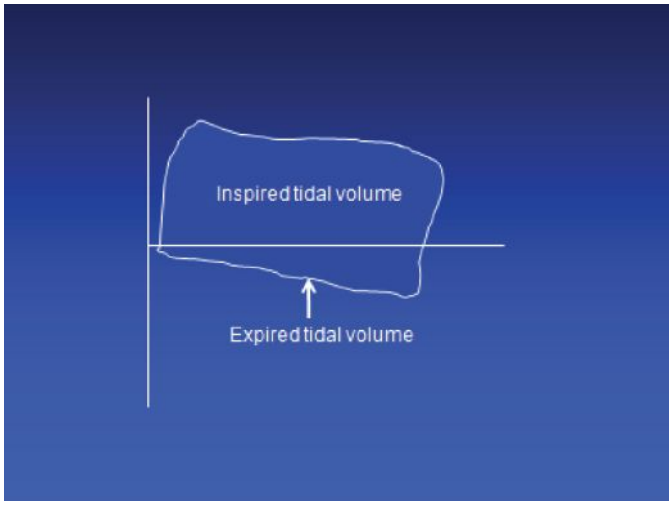



**Figure 4.**
Note the decreased expired tidal volume compared to the inspired portion. This suggests air trapping or a leak.

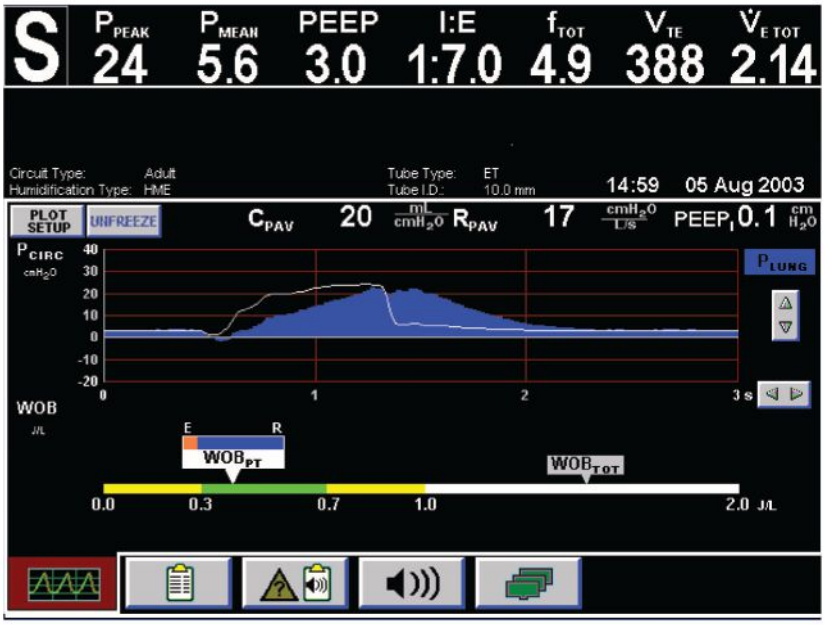



**Figure 5.**
Proportional assist ventilator screen showing patient work of breathing (WOBPT) and total work of breathing (WOBTOT). Note compliance (CPAV) and resistance (RPAV) measurements.

increase in the WOB. In a patient who is not stressed, the diaphragm will contract first, often followed by intercostal contraction. Many patients in distress will exhibit respiratory muscle asynchrony where the intercostals contract, followed by diaphragmatic contraction. Often these patient will exhibit a "rocking" motion of their chest wall and abdomen, suggesting an increase in the WOB.

To reduce the imposed WOB, several products allow for the removal of biofilm from the inside of the artificial airway. They employ a catheter with a balloon that, when inflated and gradually withdrawn, removes secretions that could not be suctioned out. For many patients, however, simply repositioning the patient may relieve the WOB. Patients with distended abdomens secondary to obesity or surgical procedure will often benefit from having the head of their bed raised to 90 degrees. This position allows the diaphragm to more efficiently fulcrum on the abdomen and reduce abdominal restriction on thoracic expansion. Adequate airway clearance therapies can also improve pulmonary compliance. These therapies include chest physiotherapy, oscillatory PEEP devices, and intrapulmonary percussive ventilation.

Other methods to reduce the WOB during continuous spontaneous ventilation include using alternatives to pressure support ventilation. Several ventilators offer an advanced form of continuous spontaneous ventilation, often referred to as knowledge-based ventilation modes. They allow the ventilator to adjust pressure support ventilation based on one or more of these measurements: RSBI, end-tidal carbon dioxide pressure, transdiaphragmatic pressure, or actual measurements of the WOB.

In our trauma ICU, we use a knowledge-based ventilation continuous spontaneous ventilation mode called proportional assist ventilation.[4] This mode calculates the WOB based on the characteristics of the imposed WOB and the measured compliance and airway resistance every 4–10 breaths (Figure 5). These two values are integrated into a formula called the equation of motion, which calculates total WOB. The ventilator is set to perform a percentage of this total work, % Support, thus allowing the patient to generate the remaining work. The ventilator then displays the total WOB in joules per liter (J/L) and the patient WOB. For most patients, we maintain a WOB of 0.3–0.7 J/L. We use proportional assist ventilation not only as a continuous spontaneous ventilation method, but also as a diagnostic tool to assess a patient's physiologic work.

## In conclusion

Understanding and appreciating the characteristics of patient WOB during mechanical ventilation is a key factor in shortening ventilator time and the problems associated with intubation. Assessing the patient and selecting the proper modes, patient position, and airway clearance therapies will greatly aid in improving the WOB and expedite ventilator liberation. ■

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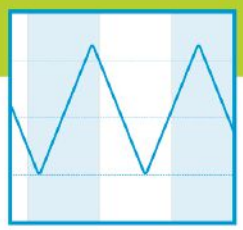

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2. Milla CE, Hansen LG, Warwick WJ. Different frequencies should be prescribed different high frequency chest compression machines. Biomed Instrum Technol 2006;40:319-324. Note: 100 CF patient study comparing triangular vs. sine waveform technology.
3. RespirTech's bronchiectasis patient outcomes program consists of follow-up calls at periodic intervals for up to two years to encourage HFCWO adherence and ensure the device is properly set for individual needs.
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# Evolution of a Pulmonary Function Laboratory Accreditation Program

by Carl D. Mottram, RRT, RPFT, FAARC

Four years ago, the American Thoracic Society (ATS) established a Pulmonary Function Laboratory (PFL) Accreditation Committee to create a laboratory accreditation program. The committee consisted of lung function experts from the ATS and the AARC, along with an AARC leadership liaison. The committee was charged with defining the program's scope and developing the necessary tools and checklists to be used when performing laboratory assessments. The program has now moved into the pilot phase, which includes performing onsite visits and using these tools to evaluate the pre-visit, visit, and post-visit processes. Once the pilot phase is completed, the ATS will decide on the next steps toward broad implementation. In the meantime, the ATS continues to champion quality PFL practices through technical standards and the PFL Registry.[1] The latter is a volunteer registry created to support collegial interactions between like-minded lung PFL clinicians.


about the author...

Carl D. Mottram, RRT, RPFT, FAARC, is the former director of the Mayo Clinic PFT Laboratory and Associate Professor of Medicine. He currently serves as president of the Clinical and Laboratory Standards Institute (CLSI). He also serves as the chair of the NBRC's PFT Examination Committee and is a member of the ATS Working Group on PFL Accreditation. He is the author of Ruppel's Manual of Pulmonary Function Testing, 11th Edition.


## What are the drivers for a PFL accreditation program?

The ATS is not the first organization to envision or promote an accreditation program for pulmonary function laboratories in the United States. There are several PFL accreditation programs in other countries, such as Canada (Alberta, British Columbia, and Ontario), New Zealand, and Australia. So, what is the rationale for accreditation? Laboratory accreditation is a method of assuring the quality of patient test results through compliance with best practice standards. There are three common sources of error in lung function testing: the equipment, the testing personnel, and the patient. A lack of compliance with the equipment quality control (QC) models published by the ATS and the European Respiratory Society (ERS) has been documented — and I've witnessed it myself during PFL visits. Enright, Blonshine, and Harris[2] presented their findings regarding qualifying laboratories for a clinical trial at the 2007 ERS International Congress. They reported that only 30–35% of the laboratories were performing the required QC models (e.g., syringe linearity, syringe diffusing capacity of the lung for carbon monoxide [DLCO], or biological QC [BioQC] testing), which indicates that 65–70% were noncompliant. Jensen et al[3] reported on the prevalence of DLCO equipment errors by performing DLCO simulation testing on 125 systems as part of a clinical trial pre-evaluation of participating laboratories. Thirty of the systems (25%) failed the simulator assessment; 20% passed once a technical problem was resolved, and 5% of the systems had to be replaced. When it comes to personnel, there is also a lack of standardized training programs for even basic spirometry testing. Stoller and colleagues[4] reported their experience at the Cleveland Clinic, where only 15% of the spirometry tests performed outside their PFL met the ATS acceptability and repeatability criteria prior to implementing a quality assurance program. The National Institute for Occupational Safety and Health (NIOSH) has a two- day spirometry training program that is required in occupational testing and includes both didactic and experiential training (https://www.cdc.gov/niosh/topics/spirometry),[5] and the AARC also has a distance-learning program for

spirometry testing, but historically both programs are underutilized.

Several years ago, I was asked to testify before the Clinical and Laboratory Improvement Act (CLIA) Committee as to whether pulmonary laboratories should fall under the CLIA law. I was very straightforward in describing the issues in the field and the need for some degree of oversight, but the committee felt that PFLs were outside the jurisdiction of the law. PFLs often fall into the abyss of oversight, with The Joint Commission thinking the PFL is a "laboratory," so CLIA must be inspecting them, and vice versa. Nevertheless, there are many in the PFL community who see a need for oversight and are looking forward to the new ATS accreditation program.

## Key elements of the ATS PFL accreditation program

The assessment process is based on four key elements: procedural documentation (e.g., policies and procedures), training and competency, QC models (performance and documentation), and test demonstration. Many laboratories perform tests but lack the documentation on how the tests are performed. Procedure manuals, frequently referred to as standard operating procedures (SOPs), are sometimes not available, updated, or reviewed by the medical director as required by accrediting organizations. The ATS PFL Management and Procedure Manual[1] is a great resource for labs that do not have SOPs or need to update their documentation. This manual illustrates how an SOP should be written and describes most of the procedures performed in the PFL. The next element of assessment is training and competency of the testing personnel. The accreditation checklist asks about the staff's experience in testing and whether they're credentialed (i.e., NBRC PFT credentials), and it asks if the laboratory has a defined orientation and training process, and if competency has been documented. Many laboratories have a poorly defined training process and little or no documentation that confirms the training was completed or effective. It is critical to formally assess and document employee competency. An easy method to comply with this requirement is to develop training and competency checklists using the laboratory's SOPs and to have a member of the lab management observe testing (Figures 1 and 2).

The third element reviews whether the laboratory is compliant with the QC models defined in the ATS/ERS technical standards. These include both mechanical and BioQC models. Each of the commonly performed tests (e.g., spirometry, DLCO, and lung volumes), have required QC models that include testing frequency and target limits (Table 1). These procedures should include simple

## Figure 1

## Figure 2

**Spirometry Competency**

Name: _____

| Competency | ME | NFD | Comments |
|---|---|---|---|
| | ME= meets expectations NFD = Needs further development | | |
| 1. Assembles and prepares equipment. | | | |
| 2. Proper verification of order. | | | |
| 3. Gathers appropriate information needed for testing (i.e. previous test, Hgb, and packs per year for smoking history) | | | |
| 4. Enters/verifies patient demographic and clinical history data accurately into testing system. | | | |
| 5. Verifies patient identification, compliance with pretest instructions and explains procedure in simple terms. | | | |
| 6. Proper hand hygiene and/or donning of PPE. | | | |
| 7. Demonstrates and emphasizes need for maximal efforts during testing. | | | |
| 8. Ensure correct patient posture, mouthpiece position and nose clip placement. | | | |
| 9. Spirometry testing carried out accordingly. | | | |
| 10. Repeats maneuver until 3 meet ATS acceptability and 2 meet the repeatability criteria. | | | |
| 11. Recognizes patient understanding of instructions and inability to perform testing due to physical or cognitive limitations. | | | |
| 12. Recognizes errors, submaximal efforts and effect on test results. | | | |
| 13. Evaluates need for additional or alternative testing as indicated by laboratory protocol. | | | |
| 14. Performs FIVCs. | | | |
| 15. Enters in appropriate charges for testing performed. | | | |
| 16. Disposes of items used appropriately once testing is complete. | | | |
| 17. Disinfects room and equipment appropriately. | | | |
| 18. Proper hand hygiene. | | | |

Comments:

_____

_____

**Employee:** _____ **Date:** _____

**Supervisor Consultant/Designee:** _____ **Date:** _____

## Table 1

| Test Procedure | Mechanical Model | BioQC | ATS/ERS Target Limits |
|---|---|---|---|
| Spirometry* | Weekly linearity | Not set but monthly would align with lung volume requirement | Linearity: + 3.5%<br>BioQC: CV < 5% |
| DLCO | Weekly – syringe DLCO | Weekly or whenever the test gas is replaced, or error is suspected | Syringe DLCO: DLCO ≤ 0.5, VA 3L ± 0.3<br>BioQC: 12% or 3 units from mean |
| Lung volumes | Monthly – Isothermal lung volume for plethysmography | Monthly or whenever an error is suspected | Isothermal lung volume: 3% or 50 mL<br>BioQC: within 10% FRC and TLC from mean |

*New standard to be published which might affect these requirements.
DLCO = diffusing capacity of the lung for carbon monoxide
BioQC = biological quality control
CV = Coefficient of Variation
VA = Alveolar Volume
FRC = functional residual capacity
TLC = total lung capacity

## Figure 3

calibration and are used to verify the accuracy of the testing system. Arterial blood gas (ABG) testing can be a helpful analogy to help practitioners understand the difference between calibration and QC: prior to analyzing an ABG sample, the analyzer must pass a two-point calibration and it must be within a known range using three levels of QC materials that verify the calibration. All laboratories calibrate their pulmonary function test instruments, but many do not perform the QC verification process, or they perform it less frequently than required and do not document the results. Many state that they simply do not have the time to perform QC, yet these QC processes take approximately 20–30 minutes per week. As an example, performing a syringe DLCO using a 3L syringe (Figure 3) takes approximately 10 minutes to verify the accuracy of the device and the presence of a leak. The final component of the program is observing as staff members perform a test. There is almost always some variation in how testing is performed, even if the site states that they perform the procedure according to the ATS/ERS technical standards.

### It's all about getting it right!

We must remember that when we are performing a test on a patient, we are trying to acquire accurate test results to assist in their diagnosis and treatment. The ATS and ERS have provided us with technical standards to help reduce errors and variability secondary to equipment and non-uniformity in the testing procedures. The ATS, through their PFL accreditation program, is attempting to support laboratories through a systematic review process that will assure compliance with its standards and help us "get it right." ■


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# The 2019 Jimmy A. Young Memorial Lecture: The New NBRC Credential Maintenance Program

Presented by NBRC President, Katherine L. Fedor, MBA, RRT, RRT-NPS, CPFT;
NBRC Chief Executive Officer, Lori M. Tinkler, MBA, and NBRC VP of Examinations, Robert C. Shaw Jr., PhD, RRT, FAARC

The Credential Maintenance Program (CMP) will become available for all credentialed practitioners to participate in starting January 1, 2020. Details of the program and rationales for new features were the focus of this presentation. While the core of the program remains the same, quarterly assessments have been added as an enhancement and as an excellent way to increase active participation in continued learning opportunities, which contributes to elevated patient care.

## Introduction

For over 40 years it has been an honor for the NBRC to present the Jimmy A. Young Memorial Lecture at AARC's Summer Forum to celebrate a man who exemplified what it means to be a respiratory care practitioner. Mr. Young started his 15-year career being trained on the job, serving as Chief Inhalation Therapist at the Peter Bent Brigham Hospital in Boston and going on to achieve the RRT credential in 1965. Some of his accomplishments include publishing a widely used textbook, leading the respiratory therapy department at Massachusetts General Hospital, directing an education program in Boston, and serving as the 22nd President of the AARC in 1973. Jimmy was a trustee of the NBRC when he passed away unexpectedly in 1975. He left an indelible mark on the fabric of respiratory care and truly let excellence define him.

## Why change the program?

In 2016, NBRC's accreditor, the National Commission for Certifying Agencies (NCCA), increased expectations regarding maintaining credentials after determining that the historical standard of relying on documentation of continuing education (CE) credits without the benefit of feedback and direction were no longer enough. Evidence has also shown that individuals who choose to adhere to recertification requirements are linked to staying out of serious trouble with a state licensing agency.

## What has changed?

The CMP includes all of the same recertification options as before, but quarterly assessments have been added to enhance learning and keep practitioners current on hot topics that tend to change rapidly. Job analyses conducted by the NBRC in 2017 and 2018 were used to guide the content and design for each assessment. Participants included therapists and specialists who were asked to identify how often key information about specific tasks change. This information drove assessment content to be focused on topics associated with high patient risk plus high pace of change to stimulate learning.

## Assessment features

The assessments require quarterly participation. The number of questions on each assessment depends on the specific credential(s) held. The more credentials one holds, the more assessment questions there will be each quarter.

Each assessment has its own detailed content outline that identifies content covered in each quarter. Easily accessible through the NBRC Practitioner Portal, the assessments can be completed any time within the specified quarter and can be accessed from any mobile device, making it as easy and convenient as possible for the practitioner to complete.

For each assessment question opened, a 5-minute timer starts, and the question must be completed within this time frame. Once the assessment is complete, the participant will be directed to a personal progress dashboard. Here the practitioner will find valuable information to direct learning, including which completed questions were answered incorrectly, the correct answer along with explanations, and one or more references backing up the correct answer. The assessment dashboard will always show current assessment progress, which also determines if

documented CE credits are required to recertify. Higher assessment scores mean the practitioner will be required to document little to no CE credits with the NBRC. No more than 30 CE credits will ever be required for recertification.

## Summary

While change can be challenging, we highly encourage all practitioners who have an NBRC credential to participate in the quarterly assessments to demonstrate an ongoing commitment to excellence and patient safety within the respiratory care profession. Practitioners can complete the assessments anytime during a given quarter, and, because they can be accessed on any mobile device, they can be completed at any location. The assessments and progress dashboard can be found by logging into the NBRC Practitioner Portal. Correct answers and references are always available in the dashboard to encourage learning.

## We are here to help

For more detailed information about the CMP and assessments options, look for the Credential Maintenance Program on our FAQ page at nbrc.org, where you can find answers to all your questions, including all of your options for recertification and the assessment content outlines. You may also contact our Customer Care Specialists at (913) 895-4900 or nbrc-info@nbrc.org. ■


# Welcome to the Digital Age!

by Debbie Bunch

As we wind down this final year of the print edition of *AARC Times* and look forward to the all-digital magazine coming in January 2020, it is only fitting that we take a moment to revisit our coverage of the internet, how it has changed the AARC, and the benefits it provides to members. It all started back in 1995 with a story in the May issue titled, "AARC Online: A New Service for AARC Members."

## Entering the information age

The first sentence in that article said it all: "The information age comes to the AARC!" AARC Online was being touted for its ability to improve communication between the AARC and its members, as well as between individual members themselves through "private electronic mail" and "public message board areas." Members could access everything from news and information affecting their practice to a library file of documents pertaining to the profession and the Association — including newly released Clinical Practice Guidelines. They could find contact information for key AARC leaders in the national and state organizations as well, along with names and numbers for their members of Congress. Past articles and papers from AARC Times and Respiratory Care were going to be posted, too.

Of course, this AARC Online was a far cry from the AARC website we all know and love today. Back in 1995 there was no such thing as unlimited internet use for the average person. You paid by the hour or sometimes even by the minute! And you had to acquire dedicated software first to load on to your computer to even hope to get it to work. So our article spelled out the small print right up front: to obtain the service, members would have to fill out a coupon at the end of the article and pay $9.95 to get the software. Then it was $14.95 per month for three hours of usage, with each additional hour costing $9.95. Yikes!

But that was the way it was with the internet back in the day, and a great number of AARC members who prided themselves on being on the cutting edge took advantage of it. Luckily, technology — and pricing — rapidly improved, so that just a couple of years later we were covering the debut of www.AARC.org in another article titled, "Log on to AARC Online." As we reported in the December 1997 story, by then service providers were typically offering unlimited access to the internet for a flat monthly fee of about $15 to $20. The website had improved, too. Now, in addition to resources, networking, and contact information, it included products and services, job listings, and dedicated areas for everything from the AARC Specialty Sections to the Sputum Bowl. Help Line, which is still going strong today, kicked off as well.

## What are you waiting for?

Things snowballed from there. Before long, the AARC was offering low-cost and free continuing education via the internet, through programs co-sponsored by government agencies and those produced by and for RTs at the AARC. These online programs have been a boon to therapists who need to earn continuing education credits to maintain their license to practice, and they have helped countless clinicians and RT departments remain up to speed on the latest developments in the profession.

*AARC Times* was there to report on all of them. When the all-digital version of the magazine debuts next year, we'll have come full circle.

Our closing paragraph back in that 1995 article will echo through the years as we leave paper behind: "Now you've seen some snapshots of the great resources available at AARC Online, and you've seen how easy it is to find your way to those resources. So what are you waiting for . . . next chance you get, log on to AARC Online and get the latest, most helpful respiratory care information available!"

Come January, "what are you waiting for" will be part of our invitation to anyone who has yet to experience the ease of reading that comes with the all-digital *AARC Times*. ■

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# Top-Notch Care for AMERICA'S HEROES

## RTS WHO WORK FOR THE VA HEALTHCARE SYSTEM DISPEL THE MYTHS

by Debbie Bunch

**The VA Heathcare System employs thousands of clinicians nationwide, and among them are respiratory therapists who work side by side with their colleagues in other disciplines to ensure high quality care for vets with respiratory conditions. RTs who work for the VA in Des Moines, IA, and Dallas, TX, will be the first to tell you, the services they provide are second to none.**

### Honored to serve

AARC member Joel Meredith, RRT, is director of respiratory care for the Central Iowa system. "I was really drawn to VA Central Iowa through my experience here while in respiratory school," says Meredith. "I saw a place where the patients were respected, and people were honored to serve them." Meredith believes staff are dedicated to fulfilling the promise issued by President Abraham Lincoln when the concept of a VA health system first came to the fore: "To care for him who shall have borne the battle, and for his widow, and his orphan."

The RT department overseen by Meredith consists of 22.7 FTEs who cover not only the inpatient care areas but also serve as outpatient RT care managers, sleep technicians, and pulmonary function technologists. They work in the VA's Community Based Outreach Clinics (CBOCs) as well, which serve outlying communities in the patient catchment area. "This is accomplished via video telehealth and is unique to VA Healthcare," he says.

Only RTs with the highest professional credentials are hired to take on these roles. "At VA Central Iowa we only hire RTs who have graduated from an accredited

Joel Meredith was drawn to work at the VA Central Iowa Health Care System after the experiences he had there as an RT student.

Mary Tyrrel, RRT, RPFT, health systems specialist and national liaison for qualification standards, left, and Christine Way, BS, RRT, AE-C, home oxygen coordinator and outpatient case manager, are honored to serve the veterans under their care.

respiratory program and have achieved their RRT credential," stresses Meredith. "Additional education and credentials are encouraged and rewarded." He says the VA offers a robust program to provide financial assistance to therapists who wish to further their education as well.

Meredith and his RTs follow evidence based medicine (EBM) in everything they do, and they participate on multiple quality improvement teams set up to develop and monitor their EBM protocols. "If we notice that we are not meeting our goals in any area of performance, we stand up improvement teams and strive to provide outstanding care," says Meredith.

## From one soldier to another

Derrick Gillians, RRT, is Meredith's counterpart at the Dallas VA Medical Center. He's worked for the facility for 14 out of the 15 years he's been an RT and came to the job via his own military service. "I am a military vet and I am a disabled military veteran," says Gillians. "What drew me to the VA is I wanted to treat my comrades in arms."

A disabled military vet himself, Derrick Gillians was driven to give back by serving other military vets who need care.

Gillians suffers from asthma — a condition diagnosed while he was serving in Panama — and says that's what led him to go to RT school after his tour of duty in the Army, which included service in Desert Storm, was completed. "I know what it feels like to have shortness of breath," he says. Since the military funded his RT education, he thought it was only fitting to give back by going to work at the VA hospital, and he's never looked back.

Today Gillians oversees 62 FTEs who, like the RTs in Des Moines, are all required to have the RRT credential. They too work in a wide range of areas, from inpatient care to the emergency department to the VA's long-term care facility. Gillians oversees therapists in four outpatient clinics as well — one for pulmonary rehabilitation, one for pulmonary function testing, one for CPAP, and one focusing on ALS patients. He has six supervisors who work under him, including those who manage the blood gas lab and quality control.


Derrick Gillians, top row, in the white shirt, heads up a team of RTs at the Dallas VA who truly care about their patients.

His therapists venture out into the home care setting as well via the home oxygen clinic, ensuring patients are in compliance with VA no smoking requirements and their environments meet safety standards. He also supervises RTs in three outlying hospitals, located in Ft. Worth, Bonham, and Tyler. "We have a very diverse department — every nationality is represented," says Gillians. "We are well balanced. We work great as a team."

## Pushing the envelope

Therapists at the Central Iowa VA are pushing the envelope when it comes to innovation. They are especially proud of their tele-respiratory program, which serves patients who live too far away to easily visit one of the major VA facilities. The program kicked off about seven years ago when Central Iowa received a Rural Health grant to promote respiratory care in the rural areas of their catchment area. A dedicated RT was hired to make regular

## AARC ADDS VA REPRESENTATIVE TO BOMA

by Debbie Bunch

America's veterans of service deserve the very best medical care the nation can provide, and they deserve to receive it throughout their lives. The Veterans Affairs Healthcare System was created to fulfill that need. It is the largest integrated health care system in the United States, providing care to more than nine million vets at 1,255 health care facilities, including 170 VA medical centers and 1,074 outpatient sites.[1]

The AARC has recently stepped up its efforts to connect with the VA system by appointing WC Yarbrough, MD, respiratory therapy medical director at the VA, as a representative to the Board of Medical Advisors (BOMA). "I have been medical director since taking over National Program Director for Pulmonary, Critical Care and Sleep Medicine in 2015," explains the physician. "The job includes sponsoring the revision of the qualification standards for respiratory therapy, which are nearing completion."

William C. Yarbrough, MD, respiratory therapy medical director at the VA

While Dr. Yarbrough does not directly supervise any of the RTs in the system, he believes therapists provide a vast value to the VA. "It is usually one of the top three fields in terms of patient encounters," he says. "Depending on the size of the facility, the RT personnel wear many hats. They perform direct patient care of RT treatments on the wards, in the ICU, and in the outpatient areas, including the ED. They also perform the pulmonary function tests at most facilities. They manage home oxygen testing and distribution, they see sleep patients for CPAP initiation and follow-up, they aid in scheduling and helping the provider during bronchoscopy, and manage home ventilator programs, especially for ALS patients."

Dr. Yarbrough is looking forward to using his new position on the AARC BOMA to expand innovative practice patterns into the RT community as a whole, and the VA RT community in specific. ■

Reference

1. https://www.va.gov/health/aboutvha.asp

visits to CBOCs in these remote areas, and that quickly led to the realization that offering tele-respiratory services from Des Moines would enable more veterans to be served because it would eliminate the drive time from the main campus to the clinics, which are often two hours away.

"Each of the five CBOCs was converted sequentially to telehealth appointments," he says. "We worked with the facility telehealth task force to develop policies and procedures that allow any service offered in a face-to-face respiratory appointment to be offered via telehealth appointments." Next up will be tele-spirometry and tele-respiratory services for home-based primary care patients. "This transition has really created better access for our patients," says Meredith. "They no longer need to drive to or arrange transportation to Des Moines for our services."

The department's telehealth initiative figures into its case management program for COPD patients as well. "Our department is heavily involved in patient education and disease management," explains Meredith. "We are accomplishing this by utilizing our care team-aligned RT care managers and providing better access through telehealth opportunities." Care managers handle all respiratory needs in the outpatient setting, with a focus on home oxygen, PAP therapy, medication optimization, and COPD case management. The patient's specific needs and education remain the top focus during each appointment, with the overall goal being to improve respiratory health.

Meredith says the program recently underwent a revamp with the formation of a multidisciplinary team that includes RT, pulmonary, pharmacy, nutrition, and telehealth. While the team is still collecting outcomes, they have already noticed a significant drop in hospital readmissions and have received very positive feedback from participants.

One patient stands out from the crowd. The stage 4 COPD patient had been homebound for several years due to the disease, but after following the plan established by the team, which included proper medication management and pulmonary rehabilitation, he has been able to renew many of the things he previously loved to do, including refinishing old cars. He has also ventured out into the community to take part in activities and has been able to go on some cross country trips with his family. "Obviously, his disease process is not being reversed but he has been able to optimize medications and build stamina to increase his quality of life," says Meredith.

### Huddling with physicians

RTs at the Dallas VA are serving as case managers as well. In their case, the role requires them to work

closely with physicians to ensure patients get the care and services they need, and like their colleagues in Des Moines, they maintain a significant presence in the area of patient education. "They huddle with all the physicians on the inpatient side, and if education needs to be provided to a patient, the case manager goes in and trains the patient," says Gillians. "They huddle with all the physicians on the inpatient side, and if education needs to be provided to a patient, the case manager goes in and trains the patient," he says.

That training can range from instruction on how to perform trach care, to how to operate the department's Trilogy ventilators or portable suction machines. Department educators play a role in ensuring other clinicians are up to speed on respiratory components of care as well, working with the new nurse orientation program to check new nurses off on skills like trach care and airway clearance.

While they have yet to take the plunge into telehealth, Gillians says that's in their future and he credits his colleagues in Des Moines for helping them get started. "We just received funding for home based PR, which is telehealth," he says. "We worked in conjunction with the Des Moines VA to help get that funding."

## Counteracting negative perceptions

Both Gillians and Meredith are quick to counter anyone who would suggest care provided at VA facilities is somehow not on par with that provided in the private sector. "We offer first class health care," says Gillians. "Compared to the private sector, our equipment is second to none. We have the latest and the greatest technology. I would put the VA system up against any other health care system in the nation."

He challenges anyone who disagrees to come to his hospital and shadow one of his RTs for the day to prove it. "Spend some time with us to see all the services and level of patient care we provide," he says. "Just round with my therapists and you can see the quality of care we provide to our nation's heroes."

Meredith believes much of the perception problem surrounding the VA lies in the fact that when negative events do occur in the VA system, the reporting transparency inherent in the system shines a bright light on them, whereas in the private or nonprofit sector similar negative events often never get the airing they might deserve. "We measure our standards of care against other VAs as well as local health care institutions and national standards," he says. "When we have a few facilities that are not performing well in an area the overall care at all VAs is assumed to be subpar."

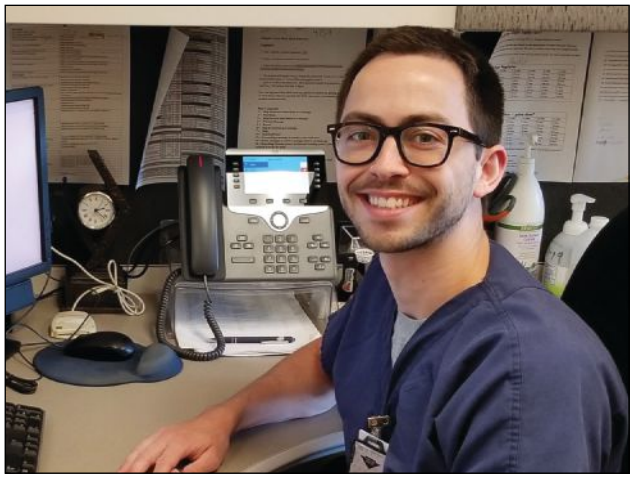
He does what he can to counteract those perceptions by spreading the word about the worth he sees every day on the job. "I always like to point out the good we do," says Meredith. "Having worked here for several years I believe that veterans receive excellent care at VA Central Iowa and generally all VA hospitals. There is a real commitment to the VA mission from the top to the bottom."

## Opportunities abound

Should more RTs consider the VA Healthcare System? The answer is a resounding yes, say both Meredith and Gillians. "VA Healthcare is the largest health care system in the nation. With that we have a very large training network and a very large percentage of physicians doing their training at a VA facility at some point in their career," says Meredith. "This is the same for all health care trainees, including RTs."

Meredith believes it all results in high quality respiratory care for the nation's vets and unique opportunities for the RTs who deliver it. The Rice study published in the American Journal of Respiratory and Critical Care Medicine in 2010 is a case in point. The randomized, double-blind trial was conducted among 743 severe COPD patients in the VA system and found that an RT-led disease management program not only reduced hospitalizations and ED visits for COPD, but also hospitalizations for cardiac or pulmonary conditions other than COPD, hospitalizations for all causes, and ED visits for all causes.[1]

Meredith says the Central Iowa VA is having similar success in this area. "Our facility was recently noted for outstanding progress in lowering COPD readmission rates,



As an outpatient case manager at the Iowa VA, Jared Kindred, RRT, helps vets stay out of the acute care hospital.

and we have shared some of our strategies with other VA hospitals," he says. He believes this is a great example of how VA health care facilities are working together to provide excellent patient outcomes and best practices across the network.

Gillians says the VA is a great place for RTs to expand and grow as clinicians. "You can be challenged here," he says. "We don't have labor and delivery or pediatrics, but this is a great place to work." He believes any RT with a high enough skills set to meet the employment requirements would love serving the nation's veterans of service, and like Meredith, he emphasizes that therapists will have ample opportunity to further their education as well via VA benefits.

## Privileged to serve

For these two therapists, though, working for the VA Healthcare System is really just about helping vets. "I love the stories they have and the pride they take in having served," says Joel Meredith. "I have had the honor to serve many generations of veterans and find that they all have that pride. It is not overt, but you can sense it in all of them, and from the stories I have heard I know they are all heroes and deserve the best possible care we can provide. I feel privileged every day that I can serve this patient base."

Derrick Gillians agrees military vets deserve the best and he is proud to provide it. "My satisfaction is serving our nation's heroes who have sacrificed so much to provide the rights here in this country," he says. "They volunteered to put their lives on the line so we can have peace and opportunity. This is the best place to work, here at the VA." ■

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1. https://www.ncbi.nlm.nih.gov/pubmed/20075385

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# How to make EDUCATION FUN in Pulmonary Rehabilitation

## VA program interjects some friendly competition into the learning process

by Mary Labiche, BS, RRT; Zina White, RRT; Patricia J. Jefferson, RRT, and Vernon Pagson, RRT

AARC members Mary Labiche, Pat Jefferson, and Zina White, from left to right, came up with the quiz bowl idea to keep their patients engaged in learning.

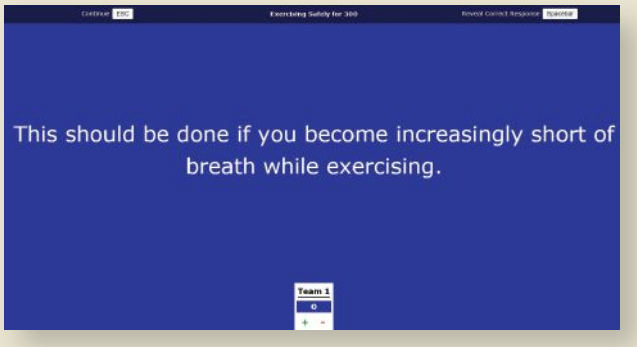
In the pulmonary rehabilitation section at the Southeast Louisiana Veterans Health Care System, we use exercise and education to help veterans with COPD and other respiratory diseases achieve a better quality of life. As part of our education component, we provide patients with information on their disease, nutrition and how to read food labels, how to exercise safely at home, and other topics. We do this because, with the right knowledge, our patients can live better. But it can be a lot to take in. Educating patients who were previously unaware of their COPD starts slowly. We often find that patients don't know things as basic as what the acronym "COPD" stands for, or what the words "chronic obstructive pulmonary disease" mean. It's our job to provide self-care information, and to make it relevant and meaningful for the patients.

Another challenge is reinforcing what has been learned after the patients graduate the first stage of the education component. Retention of learning and application of healthy living practices are important. We need to keep our patients interested in learning, especially because they are likely to have changing needs as they get older while living with COPD. Fortunately, we've developed a new approach to teaching that has our veteran patients excited to learn about being healthier.

### Let the games begin

When working with veterans, it doesn't take long to be reminded that most of them have a competitive side. While we were redesigning our educational program, we decided to take advantage of that competitiveness. We thought about ways to give the patients an


The quiz bowl category grid.




An example of the questions asked during the bowl.

opportunity to show how much they had learned and to be rewarded for it. Then the answer came to us — we decided to develop our first Pulmonary Rehabilitation Quiz Bowl.

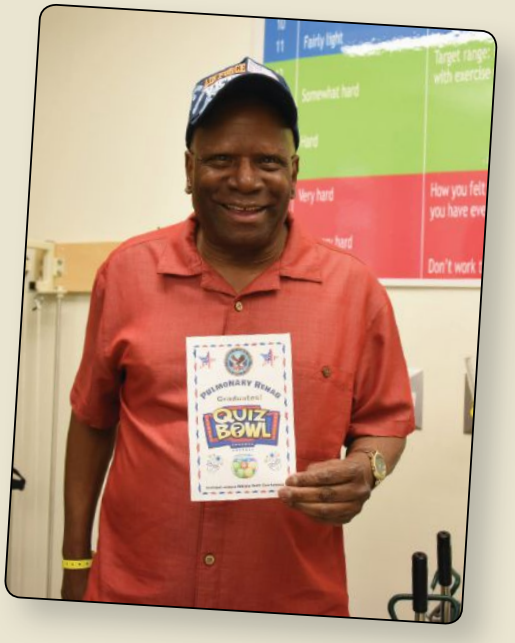
The questions for the quiz bowl came from material we taught in our pulmonary rehab class. We made a study guide that had review questions from the material. It was up to the patients to fill in the answers by reviewing their lessons. They could also ask us for help when needed. Identifying and reviewing the topics for which they had questions provided a great opportunity to focus on concepts the patients weren't clear on.

During the first quiz bowl, we used index cards with questions like, "What are three causes of obstruction in airways?" or "What do you do if you are coughing up green or yellow sputum?" To our delight, the veterans were highly engaged, determined to get the answers right. They kept a close eye on their point totals as the game progressed. At the end, a winner was named and small prizes were given to everyone who participated. Most important was that we had found a way to motivate our patients to learn healthy habits and to remember them.

The participants agreed. "The quiz bowl is very helpful and also reminds you how to breathe and take your medicine the correct way, and it is a lot of fun for all," said David Sterling, who won the first quiz bowl.

Another veteran, Ed Eastman, later commented, "It was so much fun and educational. I'm looking forward to the next challenge."

In fact, the first quiz bowl worked so well that we held another one a few months later. We invited graduates from previous classes and sent them study guides, seeking to reinforce what they had learned. We were pleased when they called to ask questions about the study materials, and we were thrilled when the veterans started their own study groups before class as the quiz bowl drew closer.




COPD patient Dave Smith shows off the quiz bowl invitation he designed for the event.

We now hold the quiz bowl every quarter. The event has evolved into a more highly-produced operation, with questions and point values projected on a screen for contestants to choose from. Our patients are excited about it, even volunteering to design invitations and bring food for the event.

Most importantly, we are seeing gains in the patients' quality of life. They are exercising and learning to manage their condition. Some of them have been able to decrease the amount of oxygen used or completely discontinue their use of oxygen. Others have slowed their decline in lung function.

Quiz bowl participants gather with staff during the event.

### Other methods

The quiz bowl format has worked well at the Southeast Louisiana Veterans Health Care System. But we realize that, just like any teaching strategy, it's not for all situations. So we've developed other ways for the veterans to interact with the material as well, such as crossword puzzles and word searches. Activities such as these can be done at home individually, or jointly with family members who assist in caring for a loved one with COPD. They work well for reviewing and reinforcing information. There are several educational websites that make it easy to create crossword puzzles and word searches.

Whatever methods you choose to teach patients about managing a respiratory condition, it's important to remember that making the learning more exciting encourages patients to spend more time with the content. Learning games are just one set of tools, but they can go a long way toward getting patients to learn and practice healthy behaviors that will lead to a better quality of life. ■

*Mary Labiche and Zina White are with the SECOND WIND outpatient pulmonary rehabilitation program at the Southeast Louisiana Veterans Health Care System. Patricia L. Jefferson is chief of respiratory care and Vernon Pagson is assistant chief of respiratory care for the system.*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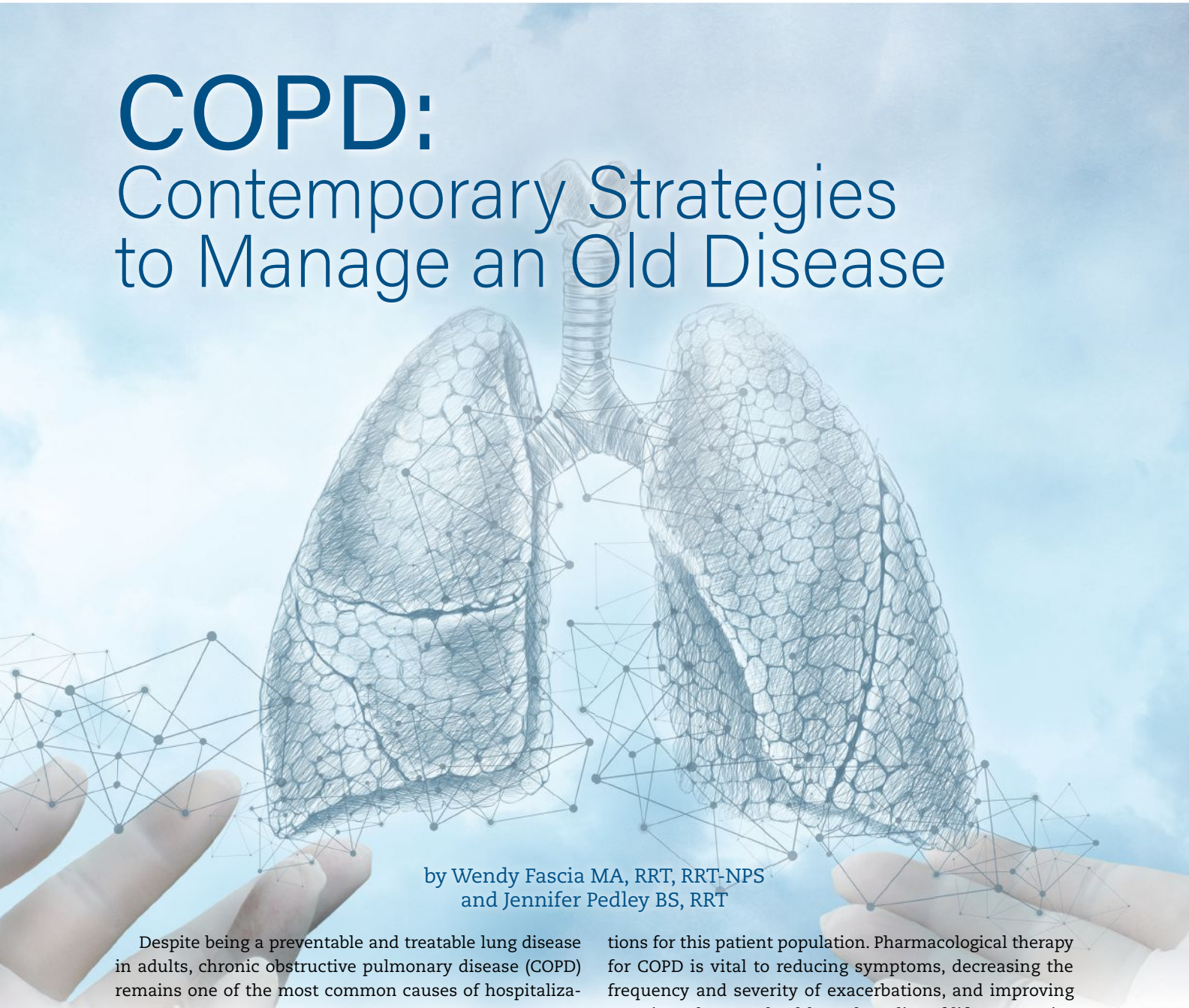
# COPD: Contemporary Strategies to Manage an Old Disease



by Wendy Fascia MA, RRT, RRT-NPS
and Jennifer Pedley BS, RRT

Despite being a preventable and treatable lung disease in adults, chronic obstructive pulmonary disease (COPD) remains one of the most common causes of hospitalizations and readmissions, often consuming a significant amount of health care dollars for avoidable hospital stays.[1] Hindered by fragmented care across the continuum, it remains a struggle for these patients to gain an effective handle on the management of this disease. The reality of having a number of different providers in the mix of one patient's treatment plan, along with the lack of utilization of a structured pathway for treatment, creates chaos in the management of the disease, commonly resulting in omissions and duplications of necessary inhaled medications for this patient population. Pharmacological therapy for COPD is vital to reducing symptoms, decreasing the frequency and severity of exacerbations, and improving exercise tolerance, health, and quality of life.[2] Strategies devised by the Global Initiative for Chronic Obstructive Lung Disease (GOLD) can provide vital structured treatment pathways and "consistent clinical guidance using the best available evidence" to provide for optimization of therapy for this patient population.[2]

## Lung Partners initiative

Optimizing therapy for patients with COPD at Crouse Health in Syracuse, NY, is accomplished by Lung Partners,

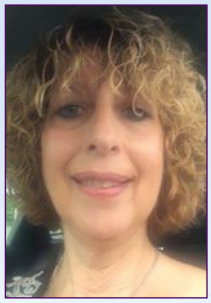
a pulmonary disease management initiative aimed[3] at providing consistency in the care of these patients. Lung Partners combines the education and clinical care expertise of respiratory therapists acting in a primary therapist role for each patient and provides for the management of the unique needs of patients with COPD. The program follows GOLD strategies for managing COPD, not only for pharmacological management, but also for diagnosis, staging, and other treatment needs of this patient population.

The goal of Lung Partners is to improve the quality of life for patients with COPD by ensuring that they and their caretakers have a thorough understanding of the disease process and homecare plans, as well as the ability to carry out prescribed therapy, obtain resources, and reach out for help after they leave the hospital. This is accomplished every day by a group of licensed respiratory therapists who are specially trained to provide an in-depth initial assessment and daily assessments of the patient's health literacy, physical functionality, anxiety and depression, sleep disorders, nutrition, and medication management, as well as any other barriers that may exist to maintaining their health at home. Lung Partner RTs educate on disease process and self-management, smoking cessation, personalized action plan, patient triggers and barriers to staying healthy outside of the hospital, and medications. This education is revisited as necessary on each daily assessment, along with discussion on progress towards the patient's functional goal. Clinical protocols are in place to increase efficiency and effectiveness of treatment, to allow for timely referral of patients to specialists for further assessment and follow up. Protocols in place include bronchopulmonary hygiene, hyperinflation, obstructive sleep apnea, and medication management. We have shown that this type of disease management approach can decrease emergency department visits, lower hospital readmissions,[3] reduce fragmentation of care, and facilitate the transfer of critical patient information between providers by providing an effective communication path. Lung Partners is unique in that it establishes a lifelong relationship between the patient and members of the respiratory care team, with the program continuing to follow patients, both in-patient and out-patient, utilizing community-based relationships and resources.

## RTs provide skill and expertise

Respiratory therapists have the ability and knowledge to be effective medication management liaisons between the patient and providers, and between providers as needed. Respiratory therapists are focused on the cardiopulmonary system, including disease, therapies, and medications, and they are very knowledgeable regarding medications necessary to provide rescue therapy as well as maintenance therapy for COPD patients. Respiratory therapists are up-to-date on all the new choices available for inhaled medications, as well as the new delivery devices for current inhaled medications, with the newest choices being a nebulized long-acting β agonist (LABA) and new soft mist inhalers (SMIs).

Spending periods of time with these patients during a hospital admission, respiratory therapists have a close connection to their patients and, through their assessments of and relationship with their patients, they can best advocate




## About the Authors...

Wendy Fascia, MA, RRT, RRT-NPS is the manager of respiratory care, sleep, neurophysiology, and ECMO Programs at Crouse Health Syracuse, NY and Jennifer Pedley, BS, RRT is the clinical supervisor at Crouse Health, Syracuse, NY.

cate for the delivery device (i.e., the form of an indicated medication) best suited to the patient in terms of the patient's ability to effectively use the device, to pull in adequate flow to receive the medication, and to adhere to the medication plan. RTs can also advocate for adjustments based on GOLD staging, designations, and medication pathways. Respiratory therapists are essential to the cost management of these inhaled medications, by decreasing omissions of necessary medications, and decreasing duplications of other medications in the treatment plan. Per protocols Lung Partner therapists at Crouse Health can discontinue the duplicates, and change the form of the ordered medication so the device will appropriately match patient condition and ability. This is determined utilizing an inspiratory flow meter and teach back method of the medication education provided to the patient by the RT.[4] Once physicians and other providers understand that respiratory therapists can be very effective in medication management for this patient population, the optimization of therapy will move forward on a larger scale.

## Optimizing therapy using consistency and up-to-date strategies

Optimizing therapy for patients with COPD in any program begins with utilizing up-to-date strategies like GOLD as the backbone for consistency in care management. Consistency begins with diagnosing the disease by utilizing spirometry for assessing air-flow limitations, and ABCD categorization, which combines the assessment of individual patient symptoms and their risk for exacerbations and places the patient in a designated treatment pathway from initial diagnosis forward, with adjustment to a different category and treatment plan based on readmissions.

Changes were made in the 2019 strategies regarding the ABCD designation. GOLD now utilizes the ABCD designation only for the initial diagnosis and treatment plan. Once that is set, the provider should, with each patient visit, review the level and frequency of symptoms and exacerbations, and assess the patient's ability to effectively use the inhaler device currently prescribed (i.e., technique and adherence). Adjustment of the existing treatment plan should then occur based on the information gathered from the patient.

Patients exhibiting a positive response to the initial treatment set by the ABCD grouping will not need any adjustment to their plan. According to the 2019 GOLD update, it is only when the review and assessment of patient symptoms and exacerbations at a provider–patient encounter reveals an increase in either that an adjustment is recommended to the current treatment plan. A decision about whether dyspnea or exacerbations are more prevalent will determine whether to follow the dyspnea or exacerbation pathway. If both dyspnea and exacerbations need to be addressed, then the suggestion is to follow the exacerbation pathway as laid out in the 2019 GOLD update.[2]

Implementing a protocol by which providers who are caring for the patient should follow the GOLD diagnosis and treatment pathways, from spirometry to diagnosing to staging, to the ABCD designation, and then the dyspnea and exacerbation pathways can optimize the individualized COPD treatment plan. This will help reduce the chaos of having numerous providers in the mix who are following their own pathways, which should lead to better management of the health of this patient population. ■

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# Modifying the Progression of COPD

## AARC members explain how they're doing it

by Debbie Bunch

**COPD is not a disease that can be cured, but research clearly shows it is a disease that can be modified. In other words, a newly diagnosed patient has a lot of control over how the disease progresses as the years go by. Respiratory therapists who work with these patients are increasingly stepping in early in the disease process to help ensure more patients get the education they need to stay as healthy as possible for as long as they can.**

### Navigating the way

As the pulmonary disease navigator for Dixie Regional Medical Center in St. George, UT, Tammy Stucki, RRT, RRT-ACCS, starts the conversation about how to manage COPD while patients are still in the hospital, talking to them about their disease process, home care needs, and their desire to control the progression of the disease. Then she follows them throughout the first 30 days after discharge through visits to the facility's 24/7 respiratory outpatient clinic (ROC), phone calls, emails, and even text messages. "It is vital for the patient to know that they have an advocate who cares about them and their disease progression," says Stucki. "Because their steroid regimen is usually 5–14 days, the first two weeks are a crucial period to ensure that they are on the road to recovery."

Stucki works with area physicians as well to reach COPD patients who are newly diagnosed to get them into

As a pulmonary disease navigator, Tammy Stucki works across her system to bring timely education and information to newly diagnosed patients.

educational programs at the ROC before they end up in the hospital. "Most COPD patients do not recognize the early symptoms of an exacerbation; therefore, it is vital to educate newly diagnosed patients," says Stucki. Because many of these patients are younger and still working, they are often more motivated to do something about the condition before it affects their job. "If they receive early education, especially metered-dose inhaler (MDI) training, they would be burdened less with missed days of work," she says.

Those patients often become ambassadors for the program, too. They especially appreciate the fact that they can "pop in" to the ROC to have their lungs checked by a respiratory therapist 24/7 rather than waiting two weeks to see their primary care physician, who will often just tell them to head to the emergency department if things get too bad before their appointment. That, says Stucki, will generally evolve into a hospital admission. She and her colleagues have also partnered with the American Lung Association to form a local Better Breathers Club for those who want

to attend. This group provides another avenue for patients with COPD and other lung conditions to get the education they need and to network with each other.

Stucki has one story to tell about a patient who particularly benefited from the services she and her colleagues provide. "After a new patient visit with the pulmonologist, a very active grandmother was referred to the ROC for disease education and MDI training," she says. "She had seen the commercials on TV for various inhalers and was concerned about how this was going to affect her life. Was she going to have to drag around one of those tanks? How long was she going to live? Can people even come to my home to see me? Am I going to get addicted to oxygen?" After receiving education about her disease process, progression, medications, and inhaler instruction, Stucki says the woman broke down and started to cry happy tears, telling her RTs, "I didn't know that I could still live an active life; I thought that this was a death sentence."

Stories like that are backed up by outcomes of data being collected by the program. According to Stucki, they saw 104 COPD exacerbations in the ROC last winter season, but because of their protocols, only three ended up going to the ED for an advanced workup. "These visits to the ROC save patients time and money because a majority of them are in the donut hole by the time the winter season starts," she says. "In the year that we have been open, we have educated 270 additional COPD patients in the ROC about their disease process."

### She's in their corner

Angela Butler, BS, RRT, RRT-NPS, CPFT, AE-C, NCTTP, is a COPD health advocate within the ambulatory care transitions department at Rhode Island Hospital in Providence. As such, she is involved in bedside COPD education and smoking cessation counseling and believes strongly that early interventions are important for patients and families alike so they can understand the disease process and treatments available to enhance quality of life.

Angela Butler makes sure her patients receive the education and treatment they need to keep COPD in check.

"Our department uses a standardized COPD educational booklet and COPD action plan/calendar that is used by 70 organizations within the state," says Butler. "In order to engage and follow the patient's journey, I work closely with the multidisciplinary teams — case managers and care transitions pharmacists, physicians, etc." She focuses on education during medical rounds as soon as the patient is admitted and works to ensure proper length of stay, along with a safe and supportive discharge from hospital to home. That means reviewing inhalers, providing repeat-back demonstrations for correct technique, and evaluating inspiratory flow with their in-check device. Financial and domestic concerns are addressed with the transition pharmacists and social workers, and appropriate treatments for management and interventions to reduce the frequency of exacerbations are evaluated using the

COPD patients in Angela Butler's Better Breathers Club enjoy putting on harmonica performances during the holiday season.

CAT scores and MRC dyspnea scale in the 2019 GOLD Guidelines. Butler also attends monthly meetings with Healthcentric Advisors, a nonprofit quality-improvement organization serving health care providers in New England, and she's involved with a number of hospital committees charged with examining length of stay and discharge planning for patients with COPD.

But that's just the beginning of the journey. Butler remains in contact with her patients long after discharge, becoming their COPD partner. It starts with a phone call two or three days after discharge to see how they are doing, and it continues with many more calls and visits as the days and months progress. She uses the CAT score to evaluate their quality of life, and she practices motivational interviewing to help them move toward better outcomes. The team has access to a number of resources available in the community setting to help enhance outcomes for patients, and they also keep in touch with the patient's primary care case managers in the outpatient setting to ensure they are up to speed on the patient's admissions and discharge plans. "For a newly diagnosed patient with COPD, it is important that you educate and connect with them and their families as soon as possible," she says. She gets them involved in pulmonary rehabilitation and encourages both them and their families to become active members of the Better Breathers Club she facilitates within the community.

The latter activity has been a blessing for many patients because it gives them a connection with the larger COPD community. "With the Better Breather Club, we join forces with the patients from the pulmonary rehab and the maintenance program with music therapy, playing harmonicas and including different instruments that the patients enjoy," says Butler. "They also participate in the Lung Force Expo with the American Lung Association, speaking on how to be their own health advocate within the health care world." Giving back allows these patients to realize they aren't alone and there is support and empowerment within themselves. The feedback she's received from them has been positive.

Local pulmonologists have sung the praises of the program as well, sharing success stories with her, and she has collected outcomes from a train-the-trainer program she started through Healthcentric Advisors in November 2015. Seventy organizations throughout the state participated, and the COPD readmissions rate went from 26% pre-program to just 11% within 12 months and continues to trend downward. Butler thinks these results speak volumes about the value of her program. "I'm one health advocate RRT working in a level one trauma center with seven ICUs making a difference for our COPD patients," she says. "We are now opening more positions promoting the health advocate RRT throughout our health care organization." The real reward, though, lies in seeing the light that comes back into the eyes of patients who realize that with proper education and treatment they can lead a quality life.

## No hospital too small

Clearly, COPD disease management works, and Jeff Heistand, RRT, and his colleagues at Jefferson Health in Port Townsend, WA, are proving that even a small hospital can do it. "We are a community access hospital in a rural area," says the director of pulmonary and sleep services. The team implemented their COPD program in late summer. It consists of three 45-minute sessions and focuses heavily on medication management, breathing techniques, pulmonary hygiene, and the development of

Jeff Heistand and his colleagues kicked off their COPD disease management program last summer.

a COPD action plan. According to Heistand, they are using demonstration, teach backs, and literature to educate newly hospitalized patients, and he has also subscribed to a video service that allows patients to watch educational videos on tablets. "The subscription service is also available to them after they leave the hospital," he says.

Heistand and his team plan to measure outcomes by looking at CAT and quality of life scores as well as readmissions rates. "We have written a template for a comprehensive note that will be forwarded to the primary care physician at discharge," continues the manager. "It will have suggestions for additional programs or tests that may need to be ordered — a sleep study for high STOPBANG, a pulmonary function test if they don't have one on file, pulmonary rehab, etc." Patients receive follow-up 24–48 hours after discharge and then again 3–4 weeks later and at 6 months.

"Medication management and removing barriers to acquiring and using those medicines is an area where we can make great gains in slowing the progression of COPD," says Heistand. "Starting them in pulmonary rehab will improve quality of life and give patients more independence." He believes programs like this are the way of the future in health care and a source of satisfaction for clinicians as well. "As we move to value-based care, keeping our patients healthy will be the number one priority, but improving their quality of life is where the real reward lies," he says.

## Ensuring a bright future

Patients who are newly diagnosed with COPD are often frightened about what the future holds for them. Getting them the education and treatment they need at the outset can significantly modify the trajectory of the disease. As these AARC members show, RTs can take the lead in providing those services to people in need. ■

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**References: 1.** YUPELRI [package insert]. Morgantown, WV: Mylan Specialty L.P.; May 2019. **2.** Data on file.



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YUPELRI should not be initiated in patients during acutely deteriorating or potentially life-threatening episodes of COPD. YUPELRI has not been studied in subjects with acutely deteriorating COPD. The initiation of YUPELRI in this setting is not appropriate.

YUPELRI is intended as a once-daily maintenance treatment for COPD and should not be used for relief of acute symptoms, i.e. as rescue therapy for the treatment of acute episodes of bronchospasm, 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 YUPELRI 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 YUPELRI beyond the recommended dose is not appropriate in this situation.

### Paradoxical Bronchospasm

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

### Worsening of Narrow-Angle Glaucoma

YUPELRI 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 if any of these signs or symptoms develops.

### Worsening of Urinary Retention

YUPELRI 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 healthcare provider immediately if any of these signs or symptoms develops.

### Immediate Hypersensitivity Reactions

Immediate hypersensitivity reactions may occur after administration of YUPELRI. If such a reaction occurs, therapy with YUPELRI should be stopped at once and alternative treatments should be considered.

## ADVERSE REACTIONS

The following potential adverse reactions are described in greater detail in other sections:

- Paradoxical bronchospasm *[see Warnings and Precautions]*
- Worsening of narrow-angle glaucoma *[see Warnings and Precautions]*
- Worsening of urinary retention *[see Warnings and Precautions]*
- Immediate hypersensitivity reactions *[see Warnings and Precautions]*

### Clinical Trial 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 YUPELRI safety database included 2,285 subjects with COPD in two 12-week efficacy studies and one 52-week long-term safety study. A total of 730 subjects received treatment with YUPELRI 175 mcg once daily. The safety data described below are based on the two 12-week trials and the one 52-week trial.

*12-Week Trials*

YUPELRI was studied in two 12-week replicate placebo-controlled trials in patients with moderate to very severe COPD (Trials 1 and 2). In these trials, 395 patients were treated with YUPELRI at the recommended dose of 175 mcg once daily.

The population had a mean age of 64 years (range from 41 to 88 years), with 50% males, 90% Caucasian, and had COPD with a mean post-bronchodilator forced expiratory volume in one second ($FEV_1$) percent predicted of 55%. Of subjects enrolled in the two 12-week trials, 37% were taking concurrent LABA or ICS/LABA therapy. Patients with unstable cardiac disease, narrow-angle glaucoma, or symptomatic prostatic hypertrophy or bladder outlet obstruction were excluded from these trials.

Table 1 shows the most common adverse reactions that occurred with a frequency of greater than or equal to 2% in the YUPELRI group and higher than placebo in the two 12 week placebo- controlled trials.

The proportion of subjects who discontinued treatment due to adverse reactions was 13% for the YUPELRI-treated subjects and 19% for placebo-treated subjects.

**Table 1: Adverse Events with YUPELRI ≥2% Incidence and Higher than Placebo**

| | Placebo (N = 418) | YUPELRI 175 mcg (N = 395) |
|---|---|---|
| **Respiratory, Thoracic and Mediastinal Disorders** | | |
| Cough | 17 (4%) | 17 (4%) |
| **Infections and Infestations** | | |
| Nasopharyngitis | 9 (2%) | 15 (4%) |
| Upper respiratory tract infection | 9 (2%) | 11 (3%) |
| **Nervous System Disorders** | | |
| Headache | 11 (3%) | 16 (4%) |
| **Musculoskeletal and Connective Tissue Disorders** | | |
| Back pain | 3 (1%) | 9 (2%) |

Other adverse reactions defined as events with an incidence of ≥1.0%, less than 2.0%, and more common than with placebo included the following: hypertension, dizziness, oropharyngeal pain, and bronchitis.

*52-Week Trial*

YUPELRI was studied in one 52-week, open-label, active-control (tiotropium 18 mcg once daily) trial in 1,055 patients with COPD. In this trial, 335 patients were treated with YUPELRI 175 mcg once daily and 356 patients with tiotropium. The demographic and baseline characteristics of the long-term safety trial were similar to those of the placebo-controlled 12-week studies described, with the exception that concurrent LABA or LABA/ICS therapy was used in 50% of patients. The adverse reactions reported in the long-term safety trial for YUPELRI were consistent with those observed in the placebo-controlled studies of 12-weeks.

## DRUG INTERACTIONS

### Anticholinergics

There is potential for an additive interaction with concomitantly used anticholinergic medicines. Therefore, avoid coadministration of YUPELRI with other anticholinergic-containing drugs as this may lead to an increase in anticholinergic adverse effects *[see Warnings and Precautions]*.

### Transporter-Related Drug Interactions

OATP1B1 and OATP1B3 inhibitors (e.g. rifampicin, cyclosporine, etc.) could lead to an increase in systemic exposure of the active metabolite. Therefore, coadministration with YUPELRI is not recommended *[see Clinical Pharmacology.]*

## USE IN SPECIFIC POPULATIONS

### Pregnancy

Risk Summary

There are no adequate and well-controlled studies with YUPELRI in pregnant women. Women should be advised to contact their physician if they become pregnant while taking YUPELRI. In animal reproduction studies, subcutaneous administration of revefenacin to pregnant rats and rabbits during the period of organogenesis produced no evidence of fetal harm at respective exposures approximately 209 times the exposure at the maximum recommended human dose (MRHD) (on an area under the curve [AUC] basis) *(see Data)*.

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.

Data

*Animal Data*

In an embryo fetal development study in pregnant rats dosed during the period of organogenesis from gestation days 6 to 17, revefenacin was not teratogenic and did not affect fetal survival at exposures up to 209 times the MRHD (based upon summed AUCs for revefenacin and its active metabolite at maternal subcutaneous doses up to 500 mcg/kg/day).

In an embryo fetal development study in pregnant rabbits dosed during the period of organogenesis from gestation days 7 to 19, revefenacin was not teratogenic and did not affect fetal survival at exposures up to 694 times the MRHD (based upon summed AUCs for revefenacin and its active metabolite at maternal subcutaneous doses up to 500 mcg/kg/day).

Placental transfer of revefenacin and its active metabolite was observed in pregnant rabbits.

In a pre- and postnatal development (PPND) study in pregnant rats dosed during the periods of organogenesis and lactation from gestation day 6 to lactation day 20, revefenacin had no adverse developmental effects on pups at exposures up to 196 times the MRHD (based upon summed AUCs for revefenacin and its active metabolite at maternal subcutaneous doses up to 500 mcg/kg/day).

### Lactation

Risk Summary

There is no information regarding the presence of revefenacin in human milk, the effects on the breastfed infant, or the effects on milk production. However, revefenacin was present in the milk of lactating rats following dosing during pregnancy and lactation *(see Data)*.

The developmental and health benefits of breastfeeding should be considered along with the mother's clinical need for YUPELRI and any potential adverse effects on the breastfed infant from YUPELRI or from the underlying maternal condition.

Data

*Animal Data*

In a PPND study *[see Pregnancy]*, revefenacin and its active metabolite were present in milk of lactating rats on lactation day 22. Milk-to-plasma concentration ratios were up to 10 for revefenacin and its active metabolite.

### Pediatric Use

YUPELRI is not indicated for use in children. The safety and efficacy in pediatric patients have not been established.

### Geriatric Use

Based on available data, no adjustment of the dosage of YUPELRI in geriatric patients is necessary.

Clinical trials of YUPELRI included 441 subjects aged 65 years and older, and of those, 101 subjects were aged 75 years 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.

### Hepatic Impairment

The systemic exposure of revefenacin is unchanged while that of its active metabolite is increased in subjects with moderate hepatic impairment. The safety of YUPELRI has not been evaluated in COPD patients with mild-to-severe hepatic impairment. YUPELRI is not recommended in patients with any degree of hepatic impairment. *[see Clinical Pharmacology]*.

### Renal Impairment

No dosage adjustment is required in patients with renal impairment. Monitor for systemic antimuscarinic side effects in COPD patients with severe renal impairment. *[see Clinical Pharmacology]*.

## OVERDOSAGE

An overdose of YUPELRI 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 YUPELRI at a once-daily dose of up to 700 mcg (4 times the maximum recommended daily dose) for 7 days was well tolerated.

Treatment of overdosage consists of discontinuation of YUPELRI along with institution of appropriate symptomatic and/or supportive therapy.

## NONCLINICAL TOXICOLOGY

### Carcinogenesis, Mutagenesis, Impairment of Fertility

Two-year inhalation studies in Sprague-Dawley rats and CD1 mice were conducted to assess the carcinogenic potential of revefenacin. No evidence of tumorigenicity was observed in male and female rats at inhaled doses up to 338 mcg/kg/day (approximately 35 times the MRHD based upon summed AUCs for revefenacin and its active metabolite). No evidence of tumorigenicity was observed in male and female mice at inhaled doses up to 326 mcg/kg/day (approximately 40 times the MRHD based on summed AUCs for revefenacin and its active metabolite).

Revefenacin and its active metabolite were negative for mutagenicity in the Ames test for bacterial gene mutation. Revefenacin was negative for genotoxicity in the *in vitro* mouse lymphoma assay and *in vivo* rat bone marrow micronucleus assay.

There were no effects on male or female fertility and reproductive performance in rats at subcutaneous revefenacin doses up to 500 mcg/kg/day (approximately 30 times the MRHD on an mg/m$^2$ basis for revefenacin).

## PATIENT COUNSELING INFORMATION

Advise the patient to read the FDA-approved patient labeling (Patient Information and Instructions for Use) with each new prescription and refill.

Not for Acute Symptoms

Inform patients that YUPELRI is not meant to relieve acute symptoms of COPD and extra doses should not be used for that purpose. Advise patients to treat acute symptoms with an inhaled, short-acting beta$_2$-agonist such as albuterol. Provide patients with such medicine and instruct them in how it should be used.

Instruct patients to seek medical attention immediately if they experience any of the following:

- Decreasing effectiveness of inhaled, short-acting beta$_2$-agonists
- Need for more inhalations than usual of inhaled, short-acting beta$_2$-agonists
- Significant decrease in lung function as outlined by the physician

Tell patients they should not stop therapy with YUPELRI without healthcare provider guidance since symptoms may recur after discontinuation.

Paradoxical Bronchospasm

As with other inhaled medicines, YUPELRI can cause paradoxical bronchospasm. If paradoxical bronchospasm occurs, instruct patients to discontinue YUPELRI.

Worsening of Narrow-Angle Glaucoma

Instruct patients to 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 healthcare provider immediately if any of these signs or symptoms develops.

Worsening of Urinary Retention

Instruct patients to be alert for signs and symptoms of urinary retention (e.g. difficulty passing urine, painful urination). Instruct patients to consult a healthcare provider immediately if any of these signs or symptoms develops.

Instructions for Administering YUPELRI

It is important for patients to understand how to correctly administer YUPELRI using a standard jet nebulizer [see Instructions for Use]. Instruct patients that YUPELRI should only be administered via a standard jet nebulizer. Patients should be instructed not to inject or swallow the YUPELRI solution. Patients should be instructed not to mix other medications with YUPELRI.

Patients should not inhale more than one dose at any one time. The daily dosage of YUPELRI should not exceed one unit-dose vial. Inform patients to use the contents of one vial of YUPELRI orally inhaled daily at the same time every day. Patients should throw the plastic dispensing vials away immediately after use. Due to their small size, the vials pose a danger of choking to young children.



REV-2019-0194


# RC Currents

IN THE NEWS

## Tell Your Story

Every therapist has a story to tell about a favorite or most memorable patient that would interest others in the profession. Maybe it was an "aha moment" when you knew you had made the right professional decision for that patient. Maybe it was when you first realized how much difference you were making in the lives of that patient and his family. Or maybe it was just something the patient said or did that made you laugh or cry or just be inspired to be a better RT. Our "Storytellers" column is the place to share them. Send your story to heather.willden@aarc.org. ■

## Contribute to the AARC "Transitions" Column

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

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

## Paying It Forward

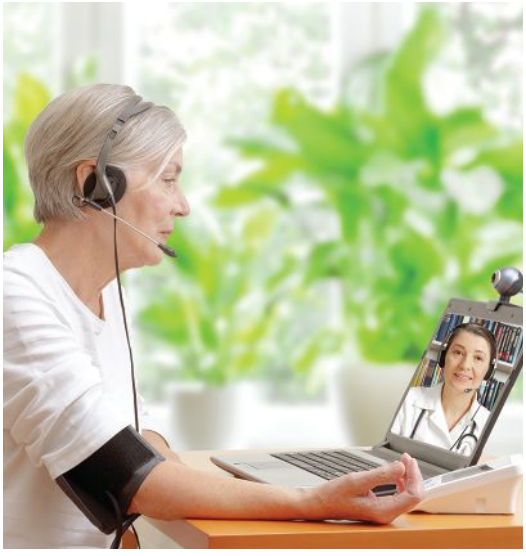
Last March, the state of Nebraska suffered devastating floods affecting more than 60 counties. Some hospitals had to move patients for the safety of both patients and the clinicians caring for them. At the same time, the Nebraska Society for Respiratory Care (NSRC) was scheduled to celebrate its 40th anniversary at a retreat-like conference at the Lied Conference Center in Nebraska City, and planners recognized that the flooding would impact both vendors and participants attending the state meeting. Along with the NSRC vice president and the state board, then-president Lisa Fuchs, MHA, RRT, CTTS, CHWC, had to make some big decisions on whether to cancel the conference or move forward.

First, Fuchs wrote a letter to AARC President Karen Schell, DHSc, RRT, RRT-NPS, RRT-SDS, RPFT, RPSGT, AE-C, CTTS, and the AARC asking for Disaster Relief funds. Within a matter of days, the AARC responded and granted AARC members in the state of Nebraska mini-grants to help them get back on their feet. The NSRC conference ultimately went on as planned, with more than 112 attendees and 20 vendors. The NSRC sponsored a cornhole event during the conference that raised $200 to pay it forward for the next request for AARC Disaster Relief aid. Their story adheres to the strength of a state society and a national society working together to support its members. ■

# More Evidence for Telemonitoring

Texas researchers are touting the role telemonitoring can play in keeping people in rural areas healthy in a report published by Texas A&M University. The investigators reviewed the successful implementation of a semi-autonomous home health monitoring system that measures the blood pressure and/or blood glucose level of a patient and alerts medical staff when either target hits a dangerous level. If an alert occurs, staff contact the patient to determine if the situation reported by the system was accurate and if they need medical assistance. "This system can help clinicians focus on the patients that need the most attention, even if they are located remotely," said Dr. Hye-Chung Kum, associate professor in the School of Public Health at Texas A&M University Health Science Center and principal investigator on the report. "Cost-effective, semi-automated telemonitoring systems have the potential to improve the health of the population through increased access to quality medical care."

The AARC is supporting greater use of telemonitoring and telehealth for patients with respiratory conditions such as COPD. Read more about The Breathe Act on www.aarc.org. ■



## As-Needed Meds Work for Kids with Mild Asthma

Do kids with mild asthma need to be on daily medications? Researchers from Washington University School of Medicine believe the answer may be no.

Their study was conducted among 206 African-American children 6–17 years of age with mild asthma that was adequately controlled with asthma controller steroid medication. The patients were randomly assigned to either take a dose from an inhaler containing the steroid beclomethasone as needed when symptoms arose, along with the rescue bronchodilator albuterol, or to take a specific inhaled dose of the steroid beclomethasone daily, regardless of symptoms, plus the rescue bronchodilator as needed in response to symptoms.

No differences were seen between the two groups in either asthma control surveys or lung function tests at the conclusion of the one-year trial, nor was one group more likely than the other to seek office visits or emergency department visits for their asthma. Patients in the symptom-based group were able to cut the amount of beclomethasone they used by nearly 75%, however, reducing their exposure to a drug that could potentially stunt their growth.

"Many families are concerned about the cost of this medication as well as the growth-related side effects, and stop taking their steroid medicine altogether," said study author Kaharu Sumino, MD. "So it's nice to show that less medication — used as needed — is just as effective." The study appeared in a recent edition of the *Journal of Allergy and Clinical Immunology: In Practice*. ■

## Never Too Late to Quit

Heavy smokers often think they've already damaged their bodies, so why bother to quit. According to researchers publishing in a recent edition of *JAMA*, even those smokers can significantly improve their health. In a study that looked at data on people taking part in the long-running Framingham Heart Study, they found that heavy smokers with at least a 20-year pack history of smoking reduced their risk of cardiovascular disease by 39% within five years of quitting. "The cardiovascular system begins to heal relatively quickly after quitting smoking, even for people who have smoked heavily over decades," said senior author Hilary Tindle, MD, MPH, medical director of the Vanderbilt University Medical Center Tobacco Treatment Service and founding director of the Vanderbilt Center for Tobacco Addiction and Lifestyle. ■

## Hospital Revisits on the Rise

The Hospital Readmissions Reduction Program was established to cut costs for unnecessary readmissions and save patients from having to go back to the hospital so soon after discharge. Is it working? If you figure in all hospital revisits (not just inpatient readmissions), researchers from Beth Israel Deaconess Medical Center in Boston, MA, say the answer is no.

They looked at hospital revisits for heart attack, heart failure, and pneumonia to see whether they have changed since the implementation of the program. To capture all revisits, they included emergency department visits, observation stays, and inpatient readmissions in their analysis. Results showed an increase in 30-day hospital revisits due to a rise in post-discharge emergency department visits and observation stays. On a national level, these revisits exceeded the decline in readmissions noted by the program, suggesting that focusing solely on 30-day readmissions provides an incomplete picture of hospital performance and health care use in the post-discharge period. The findings were published in the *British Medical Journal*. ■

## Emphysema Linked to Air Pollution

Long-term exposure to air pollution may be contributing to some cases of emphysema, report investigators from the National Institute of Environmental Health Sciences (NIEHS). They measured the relationship between air pollutants and emphysema via computed tomography (CT) lung imaging and lung function testing. Participants came from the Multi-Ethnic Study of Atherosclerosis, a medical trial involving more than 7,000 men and women from six localities. Consistent results were seen across all six areas: Winston-Salem, NC; St. Paul, MN; New York City, NY; Baltimore, MD; Chicago, IL; and Los Angeles, CA.

"The combined health effect of multiple air pollutants — ozone, fine particles known as PM2.5, nitrogen oxides, and black carbon — was greater than when the pollutants were assessed individually," said Bonnie Joubert, PhD, a scientific program director at NIEHS. "With the study's long-running duration, repeated CT scans allowed analysis of changes in emphysema over time." The study was published in a recent edition of *JAMA*. ■

## Air Pollution Hot Spots Remain

While the nation's air quality has improved over the past 70 years, that improvement is not spread equally across the country. Researchers presenting at the American Sociological Association meeting earlier this year find there are pockets of disease-causing air pollution still around, and most of them exist in poor, African-American neighborhoods.

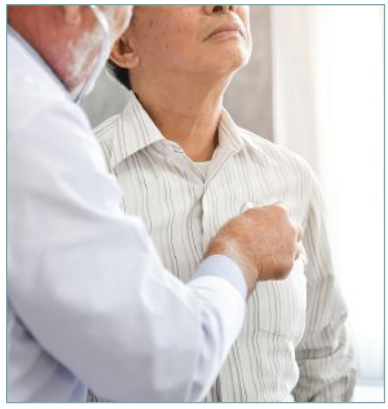
Using a variety of data sources, the Ohio State investigators examined air pollution and the demographics of people living in 1-km$^2$ areas throughout a six-state region including Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. These states make up the EPA region with the highest level of unequal distribution of air toxins between whites and African-Americans. The four-year study, which was conducted in the years after President Bill Clinton signed an executive order aimed at achieving environmental protection for all communities, showed persistent air pollution hot spots that did not improve.

"We're seeing that these pollution hot spots are the same, year after year, and every time they are in low-income communities — often communities of color," said study author Kerry Ard. "This has implications for a wide array of health disparities, from preterm births and infant mortality, to developmental delays in childhood, to heart and lung disease later in life." ■

## Older Lungs Have a Hard Time Battling TB

*In vitro* and *in vivo* studies conducted by researchers from Texas Biomed have found that the fluid in the lining of the lungs of elderly people is less able to fight off infection by the bacteria that causes tuberculosis.

The fluid samples were collected from older and younger volunteers who underwent a bronchoalveolar lavage. In healthy, young donors, the molecules in the lung lining fluid interacted with *Mycobacterium tuberculosis* (*Mtb*), sending bacteria to macrophages to be killed. In older donors, however, the molecules in the lung lining fluid presented some dysfunctionalities, allowing bacteria to infect and grow within macrophages, thus driving susceptibility and higher risk of infection. *In vivo* experiments conducted in healthy young mice showed mice that received *Mtb* that had been incubated in lung lining fluid from older humans could not control the infection as well as mice that received *Mtb* incubated with lung lining fluid from a younger person. The study was published in the *Journal of Infectious Diseases* earlier this year. ■



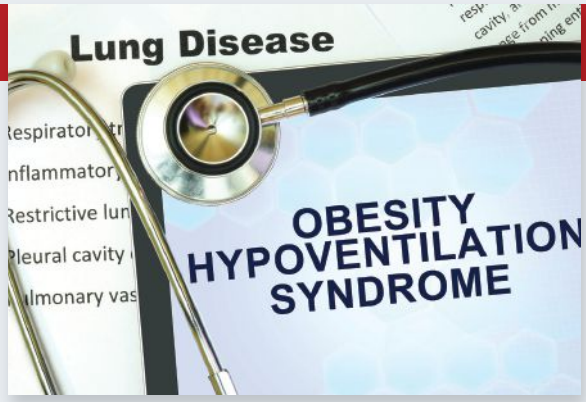
## Predicting Oral Appliance Success

Some people with sleep apnea may have more success with an oral appliance than others. That's the key finding from a study conducted by Harvard investigators who looked at two traits related to the upper airway: collapsibility and muscle compensation. Patients without severe collapsibility benefitted more from the oral appliance, as did those with a weaker reflex response of the throat muscles that act to maintain an open airway, known as lower muscle compensation. Based on these traits, oral appliances were predicted to be effective in treating sleep apnea in 61%, with those patients experiencing a 73% reduction in the apnea-hypopnea index (AHI). Patients without these traits experienced a smaller reduction in the AHI and had twice the number of breathing pauses while using the oral appliance. The study was published by the *Annals of the American Thoracic Society* earlier this year. ■

## ATS Publishes OHS Guideline

The American Thoracic Society (ATS) has published a clinical guideline on the evaluation and management of obesity hypoventilation syndrome (OHS). A panel of 18 experts offered these five recommendations —

1. That clinicians use a serum bicarbonate level <27 mmol/L to exclude the diagnosis of OHS in obese patients with sleep-disordered breathing when suspicion for OHS is not very high, but to measure arterial blood gases in patients strongly suspected of having OHS.
2. That stable ambulatory patients with OHS receive positive airway pressure (PAP).
3. That CPAP rather than noninvasive ventilation (NIV) be offered as the first-line treatment to stable ambulatory patients with OHS and co-existent severe obstructive sleep apnea.
4. That patients hospitalized with respiratory failure and suspected of having OHS be discharged with NIV until they undergo outpatient diagnostic procedures and PAP titration in the sleep laboratory (ideally within 2–3 months).
5. That patients with OHS use weight-loss interventions that produce sustained weight loss of 25–30% of body weight (more likely to be obtained with bariatric surgery) to achieve resolution of OHS.




All the recommendations were deemed "conditional" by the panel due to the very low level of certainty in the evidence. "The purpose of the guideline is to improve early recognition of OHS and advise clinicians concerning the management of OHS, with the goal of reducing variability in clinical practice and optimizing the evaluation and management of patients with OHS," said guideline panel chair Babak Mokhlesi, MD, MSc, a pulmonologist and sleep specialist at the University of Chicago. "The panel believes that early recognition and effective treatment of OHS are important in improving morbidity and mortality." The guideline appeared in a recent edition of the *American Journal of Respiratory and Critical Care Medicine*. ■

# Docs Trade Cough and Cold Meds for Antihistamines

In 2008, the FDA recommended against the use of cough and cold medications in children under two years old, and the American Academy of Pediatrics subsequently made the same recommendation for kids under six as well. Are pediatricians following that recommendation? A new study from researchers at Rutgers suggests they are, but the alternative doctors are recommending instead may not be any better.

The investigators looked at national surveys representing 3.1 billion pediatric ambulatory clinic and emergency department visits in the United States from 2002 to 2015. During that period, physicians ordered approximately 95.7 million cough and cold medications, 12% of which contained opioids. After the FDA's 2008 public health advisory, physician recommendations declined by 56% for non-opioid cough and cold medicines in children under two and by 68% for opioid-containing medicines in children under six. However, a 25% increase was seen in doctor recommendations for antihistamines to treat respiratory infections in children under 12 years old.

"There is little evidence that antihistamines actually help children with colds feel better or recover faster," said lead author Daniel Horton. "We do know that these medicines can make kids sleepy and some kids quite hyper."

Co-author Brian Strom, chancellor of Rutgers Biomedical and Health Sciences, echoed those sentiments. "It is nice to see physicians are heeding the advice to avoid cough and cold medications for children, but switching them to antihistamines is not necessarily an improvement," he said. The study appeared in *JAMA Pediatrics* earlier this year. ■

## Broad-Spectrum Antibiotics May be Overused in Pneumonia

Administering broad-spectrum antibiotics to people with pneumonia may be doing more harm than good, find Intermountain Healthcare researchers publishing in the *European Respiratory Journal*. Their study was conducted among 1,995 adults who came to four Intermountain Healthcare hospital emergency rooms with community-onset pneumonia. When reviewing the cases, the investigators found those who received broad-spectrum antibiotics had longer hospital stays, greater costs of care, and increased rates of *Clostridioides difficile* infection, a type of infectious diarrhea known to be a side-effect of antibiotics. Antibiotic-associated events were identified in 17.5% of the patients who passed away. When the researchers looked at whether broad-spectrum antibiotics were appropriately prescribed, they found only 3% of the 39.7% of patients who received them actually had drug-resistant pathogens that required treatment with the antibiotics. ■

## Bronchi on a Chip

Using a microdevice that mimics the behavior of the human airway, researchers have discovered how bronchospasms occur in the airways of people with asthma. The "bronchi on a chip" is one-thousandth the size of a human hair and contains cells from healthy and asthmatic lungs that mimic the function of a lung on single-cell levels. When the investigators triggered a simulated bronchospasm on the device, they found that the initial contraction prompted the secretion of hormone-like compounds that either induce an additional constriction or relax the spasm. They also found that inducing a second asthmatic trigger during a bronchial spasm at a precise time could actually cause the smooth muscle to relax and stop the spasm.

"The microdevice allowed us to drill down into how single cells interact with each other in relation to smooth muscle contraction," said study co-author Reynold Panettieri, director of the Rutgers Institute for Translational Medicine and Science. "Being able to study the mechanics on the single-cell level and view thousands of cells simultaneously can be an important screening tool for the development of new drugs for people with asthma who don't respond to current treatment." The study appeared in *Nature Biomedical Engineering* earlier this year. ■

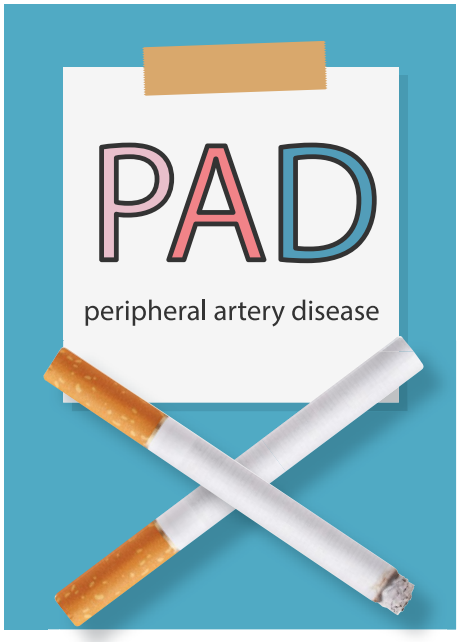
## PVC Flooring May Reduce Lung Function in Kids

Home renovations that include new polyvinyl chloride (PVC) flooring may be harming the lungs of children. In a study conducted in China by Chinese and U.S. researchers, investigators found greater odds of diminished lung function in kids exposed to this type of flooring. "Home renovations are often undertaken with little consideration of the health effects of the people living in the home," noted the authors. "Though more research on this topic is warranted, many of the same materials are used for renovation around the world, and as such, homeowners should be aware and take precautions to limit exposure." The study was published in *Indoor Air*. ■

# Eat More Zinc

Eating more foods that contain zinc may help combat the key cause of pneumonia, find Australian researchers. In a study published in *PLOS Pathogens*, they found that mice with lower zinc intake succumbed to infection with *Streptococcus pneumoniae* up to three times faster because their immune systems had insufficient zinc to aid in killing the bacteria. "Dietary zinc is associated with immune function and resistance to bacterial infection, but how it provides protection has remained elusive," said study author Dr. Bart Eijkelkamp, from the University of Adelaide. "Our work shows that zinc is mobilized to sites of infection where it stresses the invading bacteria and helps specific immune cells kill *Streptococcus pneumoniae*." ■

## Smoking Ups Peripheral Artery Disease Risk




New research out of Johns Hopkins in Baltimore, MD, has found a significantly increased risk for peripheral artery disease among smokers. Compared with never-smokers, those who smoked for more than 40 pack-years had roughly four times more risk. That compares to 2.1 times and 1.8 times additional risk for coronary heart disease and stroke, respectively. Those who were currently smoking more than a pack per day had a relative increased risk that was 5.4 times more for peripheral artery disease vs. 2.4 for coronary heart disease and 1.9 for stroke.

The analysis was based on 13,355 participants in the Atherosclerosis Risk in Communities trial, including 3,323 current smokers and 4,185 former smokers, who were tracked for a median of 26 years. It is the first comprehensive comparison of the smoking-elevated risks of peripheral artery disease, coronary heart disease, and stroke in a large population over time. The good news: people who quit smoking saw a drop in their peripheral artery disease, coronary heart disease, and stroke risk within about five years. The study was published in the *Journal of the American College of Cardiology* earlier this year. ■

## One E-Cig Can Confer Harm

In a study supported by a grant from the National Heart, Lung and Blood Institute, researchers from the Perelman School of Medicine at the University of Pennsylvania have found that even a single e-cigarette with nicotine-free vapor can be harmful to the blood vessels. The investigators performed magnetic resonance imaging (MRI) exams on 31 healthy, non-smoking adults before and after vaping a nicotine-free e-cigarette. A comparison of pre- and post-MRI data showed that the single episode of vaping resulted in reduced blood flow and impaired endothelial function in the large femoral artery that supplies blood to the thigh and leg. The authors note that once the endothelium is damaged, arteries thicken and blood flow to the heart and the brain can be cut off, resulting in heart attack or stroke.

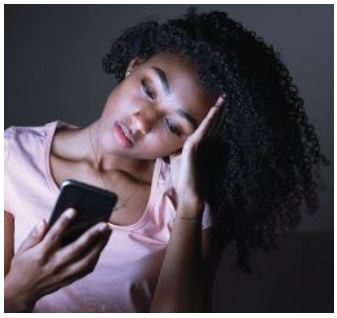
"While e-cigarette liquid may be relatively harmless, the vaporization process can transform the molecules — primarily propylene glycol and glycerol — into toxic substances," said study author Felix W. Wehrli, PhD. "Beyond the harmful effects of nicotine, we've shown that vaping has a sudden, immediate effect on the body's vascular function, and could potentially lead to long-term harmful consequences." The study was published in a recent edition of *Radiology*. ■

# Strange But True…

**Harvest time:** Hospitals are great places to promote healthy eating. Boston Medical Center has taken this concept up a notch. Since 2017, they've been cultivating more than 25 crop varieties and making honey from two beehives located on the rooftop terrace of their facility.

**The eyes have it:** Ohio researchers working in a mouse model have found a possible new use for the asthma medication montelukast. According to their research, it can inhibit early changes in diabetic retinopathy caused by type 1 diabetes. The drug worked by disrupting the signaling of leukotrienes, which in turn significantly disrupts small blood vessel and nerve damage seen in the early stages of the condition.

**More work equals more flu:** Low unemployment is a good thing, right? Maybe not for infection control. University of Alabama at Birmingham researchers have found that a 1% increase in the employment rate increases the number of flu-related outpatient doctor visits by 19%, with these effects highly pronounced in the retail and health care sectors due to their high levels of interpersonal contact.



**Epic fail:** Apps designed to track sleep are intended to help people sleep more and sleep better. According to a series of case studies conducted by Chicago investigators, they may be doing just the opposite. They found people who used these apps ended up obsessing over the data they provided, causing them to be more anxious and leading them to develop insomnia. ■


# Two Years After: My Recovery from Hemorrhagic Stroke

by George Gaebler, MSEd, RRT, FAARC

This story begins with the large hemorrhagic stroke I suffered at home in the summer of 2017. My wife, who is a nursing educator, asked the first responders to take me directly to the hospital that I retired from only months before, which just happens to be a Regional Stroke Center. This allowed me to bypass the normal EMS rules, which would have caused me to go to a very fine local hospital, but one without any stroke specialty designation.

Imagine arriving at the hospital where you worked for so many years and knowing nearly everyone you knew there would, within a couple of minutes, realize the size of the insult your brain had just sustained! Let's agree that not knowing what a ball was or what it was called (one week post stroke) was scary for me.

## Much could be done

The important thing is that I went to a Regional Stroke Center, where much can be done. After a five-day stay in the neuro ICU, I started acute rehabilitation at the Stroke Center. I was placed in a short-term unit with specialty staff for intensive rehabilitation, who were using best practices for stroke. Upon discharge I went to a longer-term center with a special stroke-rehabilitation staff of physicians and nurses, as well as other therapists specializing in various areas of expertise. Because of my background in respiratory care, I at least knew how important it was to do each exercise and try my best.

I was set up for seven weeks of rehabilitation instead of the standard four. During my stay, I had a specialty physician who introduced some very different treatment concepts. I remember calling my wife and asking, "Is there any reason not to accept the seemingly odd orders being suggested?" She simply replied that things were going well, so let's do it.

I recovered quite a bit in those seven weeks and was able to go home with a wheelchair and various other gadgets on September 15. At home, both my wife and I continued to learn what's possible when one keeps trying and how to make the affected side of one's brain work again. I was right-handed, but now I do things as a lefty!

## I could write a book

What I have learned would fill the pages of a long book. But maybe I can convey the gist of it by telling you what I am able to do now. Each and every thing I work on only gets me a little closer to the next level of independence. Time, patience, practice, and repetition are critical to recovery. I have learned to acknowledge that one thing has permanently changed—my short-term memory will always be affected by the damage done by the stroke. For example, when I realized that I kept getting lost in the large physical therapy office I was attending, I moved my physical therapy to a smaller office in a small town with the same practice, and that enabled me to make better use of what I knew.

I needed help learning to drive again, so I took lessons from an adaptive driving specialist, had my car adapted with a left gas pedal and a steering wheel spinner, and now I drive nearly every day to get newspapers and other things we may need. Just like in respiratory care, there are folks who teach and test these skills (in my case, driving!) with new standards. I had to have my license altered for the police so they know I have met the standards that make us all feel safe when I am driving. I found out the importance of these rules first-hand when I attempted to leave a parking lot and was involved in an accident with $6,000 in damages to the car. Thankfully, new changes in manufacturer

about the author...

George Gaebler, MSEd, RRT, FAARC spent many years in management at Upstate University Hospital in Syracuse, NY. He served as AARC president from 2012 to 2014.

standards have improved adaptive driving, so the enhancements put in place for me are easily disabled when my wife needs to drive my car, and I can switch them back just about as quickly.

Each week I go to physical therapy, driving myself to and from home and moving a little closer to normal life. I pilot our new boat, help with our personal business, and continue to do building projects on our camp and home (although at a much slower pace, as my right arm and hand are still recovering). According to my physical therapist, the last body parts to recover are those most distal, so I hope to walk without a cane shortly, which I thought early on would never happen. I am actually very fortunate that I had no permanent aphasia or speech impairment, so to most I sound like I always have.

Some things have actually improved; my eyesight is now 20:10 in both eyes, so I no longer need contacts, even though I have needed them since I was 25 years old. Even my neurologist can't explain that. Maybe you just win some when other facets have been lost. I have learned about perseverance and patience, and maybe that is one of the best lessons learned to date. I have fully realized that we only know what has been learned up to today. Tomorrow it might, and probably will, change. I remember what the respiratory certification examinations measured back when I took them, and how little we really knew then compared to what is known now. It's almost a joke that my registry certificate is listed as number 3188 when today new registry numbers are listed in the hundreds of thousands.

### Continuous quality improvement

I continue to improve, which indicates that post-stroke care is one of the best examples of continuous quality improvement in action. That said, I do everything more slowly now, some things just because I have to, and others because it's wonderful to be able to enjoy life and family. Without many of those who serve their professions so well, I probably would not be here to relate this story.

For those of you with whom I worked for many years, including during my term as AARC president, and whom I now count as friends, I can assure you that some things are not so bad:

- I have lost more than 60 pounds.
- I treasure having served the respiratory care profession.
- I have met and served with so many of you.
- My blood pressure is normal (finally!).
- I became a Medicare recipient on June 1, 2019. ■

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

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

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# Industry Watch

## CMS issues final rule on rural hospitals

CMS issued a final rule late last summer updating Medicare payment policies for hospitals under the Inpatient Prospective Payment System and the Long-Term Care Hospital Prospective Payment System for fiscal year 2020. The rule represents historic changes to the way many low-wage index hospitals, which tend to be rural, are paid, and supports the agency's priority of "Rethinking Rural Health." By improving the accuracy of Medicare payments to these low-wage hospitals, they will be able to increase what they pay their workers, and this will help ensure that patients, including those living in rural areas, continue to have access to high-quality, affordable health care. In addition, the new technology policies in the rule will help ensure that Medicare beneficiaries continue to have access to potentially life-saving diagnostics and therapies by unleashing innovation and removing barriers to competition.

## Study to look at asthma in the elderly

Researchers from Montefiore and Mount Sinai are launching a first-of-its-kind study to examine the relationships between asthma-related inflammation, adherence to treatment, and major depression in older adults. Funded with a $3.4 million grant from the National Heart, Lung and Blood Institute, the study is one of the largest ever conducted on asthma in the elderly. "Asthma in older patients is largely understudied and a major unmet medical need," said Paula J. Busse, MD, associate professor of medicine at Icahn School of Medicine at Mount Sinai. "This funding allows us to investigate the underlying inflammation in older patients with asthma, which is not well characterized, and how it can be altered by depression. This knowledge can translate to new approaches of asthma therapy in the aged, and document the need for developing a multidisciplinary treatment approach for this vulnerable patient population."

## New lung cancer grant

The Society of Thoracic Surgeons, along with its charitable arm, The Thoracic Surgery Foundation (TSF), has joined with the American Lung Association to establish a new grant designed to support investigators performing impactful lung cancer research. The American Lung Association/TSF Lung Cancer Research Award is available for cardiothoracic surgeons, pulmonologists, and other investigators — primarily those early in their careers — who are seeking support and recognition for their original lung cancer research projects. Awards of up to $40,000 per year for up to two years will be granted to fund innovative medical and scientific research with measurable outcomes.

## Finalist named in Escape Respirator Challenge

The Department of Homeland Security Science and Technology Directorate (S&T) has announced three finalists for the first stage of the $250,000 Escape Respirator Challenge. S&T issued the Challenge seeking new concepts for a compact, discreetly carried escape respirator that can be donned quickly for safe egress from smoke-filled, oxygen-deficient, and chemical, biological, and radiological environments. Among the finalists: Elmridge Protection Products, LLC; Team VITNI; and UP Enterprizes. Each will receive $50,000 to expand their concepts and develop working prototypes as they advance to Stage II, where they will demonstrate their prototypes and compete for a final cash prize of $100,000.

## NIH funds new COPD study

A University of Buffalo team has received a five-year, $2.7-million grant from the National Institutes of Health to develop a more precise method of treatment for bacterial infections in people with COPD based on the selective eradication of specific pathogens in the airways. In addition to studying the DNA of the bacteria that cause infections, and thus affect quality of life and lead to the loss of lung function over time, the scientists will study the RNA that the DNA expresses so they can understand which genes turn on or off during infection. "Traditional antibiotics wipe out the normal microbiome, leaving the patient more susceptible to infection and causing unpleasant side effects," said team member Timothy F. Murphy, MD. "Selective eradication of pathogens is an entirely new approach to the problem."

## Pulmatrix receives patent for iSPERSE formulations

Pulmatrix, Inc., has received a grant from the U.S. Patent and Trade-

mark Office for claims covering iSPERSE formulations of Pulmazole, the company's lead pipeline program. The patent, entitled "Monovalent Metal Cation Dry Powders for Inhalation," protects formulations that contain an anti-fungal agent with iSPERSE formulations. iSPERSE is Pulmatrix's proprietary inhaled engineered particle technology. "The expansion of our iSPERSE intellectual property rights in the United States builds upon our growing worldwide patent estate supporting our platform technology and our proprietary programs," said Pulmatrix CEO Ted Raad. "This patent is a valuable step in supporting the development of our lead anti-fungal program to serve unmet needs of patients worldwide."

## AFM study gets underway

Researchers from Johns Hopkins Medicine and the University of Alabama at Birmingham (UAB) will lead a multicenter, multinational study of acute flaccid myelitis (AFM), the "polio-like" condition affecting children that causes loss of muscle control. The National Institute of Allergy and Infectious Diseases awarded an approximately $10 million contract to fund at least 38 research sites across the United States, Canada, the United Kingdom, and Peru. AFM is a rare condition that causes inflammation and damage to the spinal cord in children, resulting in a sudden paralysis of arms and/or legs and loss of muscle strength and reflexes. Other symptoms can include facial drooping, difficulty swallowing, slurred speech, and trouble breathing.

## Nuvaira announces publications on TLD

Nuvaira's dNerva® Lung Denervation System has demonstrated safety and feasibility in three completed clinical studies. The IPS-II trial presented physiologic evidence that the lungs of patients treated with targeted lung denervation (TLD) were successfully denervated through monitoring of an established neural link between breathing and heart rate. The AIRFLOW-1 study confirmed 12-month safety and feasibility of TLD in patients with moderate-to-severe COPD, and the AIRFLOW-2 study reported that the risk of severe COPD exacerbation requiring hospitalization was significantly lower in the TLD treatment group compared to the sham treatment group through 12.5 months of randomization. The company is now enrolling patients in its FDA pivotal trial, AIRFLOW-3.

## 1800CPAP.com redesigns website

1800CPAP.com, which offers direct-to-consumer CPAP products for the treatment of sleep apnea and snoring, has revamped its website. The new website has a clean, uncluttered design with improved functionality that will give CPAP users a better shopping experience. "We are excited about the new website launch and functionality it offers our customers," said Jason Crowe, Ohio Sleep Awareness CFO. "Our product pages offer greater detailed content as well as improved images to help CPAP users find the exact product that fits their individual needs."

## New food allergy PSA targets underserved schools and communities

End Allergies Together, a non-profit organization that funds research to help solve the growing food allergy epidemic affecting 32 million Americans, has joined forces with four food allergy patient organizations to launch a new Public Service Announcement (PSA) called "Spell It Out." The PSA promotes the need for basic food allergy education in underserved schools and communities and stars teen actors Mace Coronel (of Nickelodeon's *Nicky, Ricky, Dicky and Dawn*) and Laya Deleon Hayes (the voice behind Disney's Doc McStuffins) as Spelling Bee judges. Five children between the ages of six and nine years old, who all have food allergies, appear as the Spelling Bee contestants. Aimed at children and their caregivers, the PSA addresses several key concepts about food allergies that are often misunderstood: food allergies are real and can be life threatening; anyone can be allergic to any food, at any age; food allergies should be monitored by a doctor.

## Windgap Medical, ALK team up on new EAI

Windgap Medical, Inc., has entered into a strategic partnership with ALK-Abelló, A/S (ALK) to commercialize Windgap's epinephrine autoinjector (EAI) for the treatment of anaphylactic shock. "Windgap is excited to be working with ALK, a world-leader in the treatment of allergy with a strong understanding of the worldwide EAI market, to help commercialize our product. Our teams are working well in partnership to support that effort," said Windgap CEO and co-founder Chris Stepanian. Windgap's products have not been reviewed by the FDA, but the company plans to seek approval first for its epinephrine product for anaphylaxis.

## FDA approves Pretomanid for drug-resistant TB

The FDA has approved pretomanid, a novel compound developed by the non-profit organization TB Alliance, for the treatment of some of the most drug-resistant forms of tuberculosis (TB). The new drug was approved under the Limited Population Pathway for Antibacterial and Antifungal Drugs (LPAD pathway). It is part of a three-drug, six-month, all-oral regimen for the treatment of extensively drug-resistant TB or multidrug-resistant TB in people who are treatment-intolerant or non-responsive. The LPAD pathway was established by the FDA as a tool to encourage further development of antibacterial and antifungal drugs to treat serious, life-threatening infections that affect a limited population of patients with unmet needs. ■


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# Industry Update

Featuring information on products and equipment from manufacturers

# Calendar of Events

**AARC & State Society Programs**

**November 1, 2019**
**Columbia, SC**
4th Annual SC COPD Update
Contact: selma.watson@gmail.com

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**November 2, 2019**
**Columbus, OH**
Pulmonary Function and Sleep Diagnostics Conference
Contact: Deborah Chandler and Tyler Voorhees or https://ohiosocietyrespiratorycare.wufoo.com/forms/m1923t1406e9xsr/

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**November 2, 2019**
**Erie, PA**
2019 PSRC NW Fall Seminary
Contact: https://www.psrc.net/

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**November 6, 2019**
**Omaha, NE**
Lung Force Expo 2019
Contact: erin.smith@lung.org

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**November 8, 2019**
**Orlando, FL**
**American Lung Association Lung Force Expo**
Contact: kellie.brunner@lung.org

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**November 18, 2019**
**Wauwatosa, WI**
**2019 Adult Critical Care and PFT CRCE Conference**
Contact: https://www.wsrc.online/uploads/1/1/2/1/112159439/2019_adult_critical_care_and_pft_crce_conference_registration.pdf

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**November 21, 2019**
**Middleton, WI**
District 3 Green Bay – COPD Dinner Lecture
Contact: deanne.lenz@boehringer-ingelheim.com or https://www.wsrc.online/uploads/1/1/2/1/112159439/wsrcnov21.pdf

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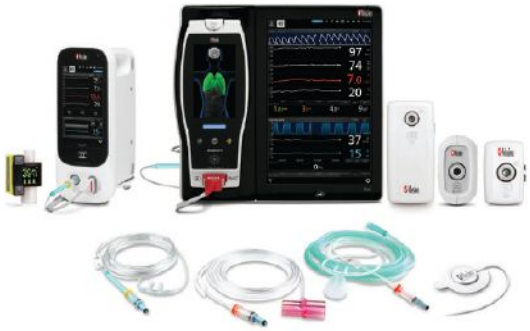

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