An Official Publication of the American Association for Respiratory Care
October 2020 Vol. 44, Issue 10 www.aarc.org

AARC Times

THE MAKING OF A VIRTUAL CONFERENCE

Inside This Issue

COLUMNS

General Counsel | Understanding Hospital Boards

Anthony L. DeWitt, JD, RRT, CRT, explains the valuable role board members play in ensuring the hospital (or really, any business) stays on the straight and narrow.

Executive Office Update | We Will Never Forget Them

AARC Executive Director Thomas Kallstrom, MBA, RRT, FAARC, discusses the importance of patient education as a vital tool in helping ensure their well-being once they are discharged from the hospital.

RC Currents

Check out the latest news and industry updates of the profession.

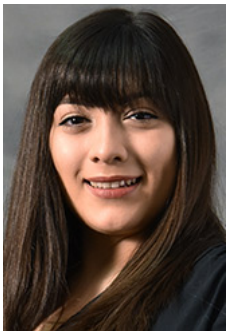
Industry Watch

Read the latest updates important news about the health industry, service industry, pharmaceutical companies, and the events that affect the profession.

AARC STAFF SPOTLIGHT

Always ready to help, the AARC staff works hard to help provide a great membership experience for you. Let's meet a few staff members:

Ada Morton
Senior Accountant
ada.morton@aarc.org
Ada oversees the AARC accounting department.



Jacqueline Segura
Marketing Analyst
jacqueline.segura@aarc.org
Jacqueline develops and executes strategic digital media campaigns for the AARC and maintains the AARC's social media presence.

Tim Myers
Chief Business Officer
timothy.myers@aarc.org
Tim oversees strategic, operational and financial aspects of the organization.

Paul Miniter
Director of Corporate Engagement and Grant Strategy
paul.miniter@aarc.org
Paul seeks out Corporate Partners, sponsors, and grants to support AARC programs.

Your AARC Times Team

Communications Manager
Heather Willden, BS

Managing Editor
Douglas Laher, MBA, RRT, FAARC

Contributors
Debbie Bunch, BA

Manager of Marketing and Production
Amanda de Coster, BA

Senior Graphic Designer
John Knotts

Graphic Designer
Anna Patiño

Director of Business Development
Sarah Vaughn, BS, RRT

Advertising Rates and Media Information
Contact: sarah.vaughn@aarc.org
9425 MacArthur Blvd., Suite 102
Irving, TX 75063
Voice (972) 243-2272
Fax (888) 206-9006

AARC Times and RESPIRATORY CARE — official publications of the AARC

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

Publisher
Thomas J. Kallstrom, MBA, RRT, FAARC

Information Contacts

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

Respiratory Therapist Credentialing & Registration: National Board for Respiratory Care • 18000 W. 105th St., Olathe, KS 66061-7543 • (913) 895-4900 • Fax (913) 895-4650 • www.nbrc. org

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

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

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

Article and Feature Contribution: AARC Tımes welcomes AARC member contributions of feature articles and information for the regular columns. Send all materials via email to Communications Manager Heather Willden at heather.willden@aarc.org. Letters from members will be considered for publication if they relate to specific articles appearing in AARC Tımes within the last three months. Editorials may be published if they are of interest to the AARC membership. The editor reserves the right to edit letters and articles without changing their meaning in order to suit legal and space requirements.

The Making of a Virtual Conference

AARC Congress LIVE! promises to deliver everything the traditional Congress does, and then some

by Debbie Bunch

When the COVID-19 pandemic emerged in the early part of this year, members of the AARC Program - Committee were already hard at work fleshing out an agenda for AARC Congress 2020, which had been scheduled for Orlando, FL, this fall. Like everyone else who looks forward to the Association's annual meeting, they were envisioning four days of face-to-face networking with peers from across the country and around the world in a beautiful setting with great scenery and wonderful food.

If you had asked them in January or even early February if a virus called SARS-CoV-2 might upend what had been an annual rite of passage for folks in their profession since 1955, they would have probably told you that was unthinkable. They'd been going to Congress since they began their careers, and the thought of not having one to go to was impossible to consider.

But it wasn't long before the unthinkable became reality. As February turned to March and March to April, it became increasingly clear that not only was COVID-19 a health care crisis the likes of which the world had not seen since the 1918 influenza pandemic, it was also on track to put the meeting they had already poured their hearts and souls into on hold or worse.

Reality check

Kim Bennion, MsHS, RRT, CHC, is a member of the committee from Salt Lake City, UT, who also serves on the AARC Board of Directors. She says her organization was one of the first in early March to address the need for masking, isolating those who were sick, and working from home whenever possible. All out-of-state travel was canceled as well. "I was not permitted to travel to the AARC Board meeting in March," she says.

Other Board members were in similar circumstances, and the decision was made to hold the meeting via Zoom. Bennion says it was the Association's first test of the virtual format during the pandemic, and it all went well. While she — and her organization back in Utah — initially believed they'd be wrestling with

these new precautions for about a month, as the weeks marched on she realized it was going to be much longer than that. The AARC would have to switch to a virtual environment for more than just Board meetings. The AARC Summer Forum and Congress might be affected as well.

“The reality hit me then that we would need to think strategically about moving to a virtual format,” says Bennion. "I’m thankful to volunteer in an organization like the AARC who realized early on that creative options would be needed.”

Taking it one day at a time

Richard Branson, MSc, RRT, FAARC, FCCM, a committee member from Cincinnati, OH, says the science emerging about how the virus is transmitted made the switch to online meetings the only logical way forward for the AARC. “That doesn’t mean there wasn’t consternation and angst over the consequences and trepidation regarding the ‘how’ of having an online meeting,” he says.

Committee member J. Brady Scott, MSc, RRT, RRT-ACCS, AE-C, FAARC, FCCP, from Chicago, IL, recalls those early days of planning. “As we learned more and more about COVID-19, as the nation started shutting down, as hospitals, universities, and other organizations started restricting travel, it was clear we would have to make a change,” he says. “We started discussing it as a group early on — but to be honest, we had a day-to-day approach at first.”

With the situation in flux, he says they started planning for changes but were honest with themselves about the need to pivot if some new trajectory was uncovered. “Like everything else that seems COVID-19–related, we prepared for the worst and hoped for the best.”

Since the AARC Congress was still a number of months out at that point, the committee turned its attention first to the Summer Forum, which was quickly approaching.

The Summer Forum was canceled and quickly replaced with AARC LIVE! Leading Beyond COVID-19, scheduled to take place on four days placed throughout the month of July. The event was divided into four blocks, and attendees were allowed to register for some or all of them.

According to Kim Bennion, the virtual programs were a huge hit. “Our attendance hit our target, and we were pleased this novel approach was successful both in attendance and attendee comments.”

Just as good or even better

The success seen with the summer meeting boosted the committee’s confidence that the AARC Congress could be shifted to the online format as well. Program Committee Chair Sarah Varekojis, PhD, RRT, RRT-ACCS, FAARC, from Columbus, OH, says the conversion was made with all the moving parts in mind. “The decision to transition to a virtual meeting was given considerable attention and was not undertaken lightly, but was ultimately what the AARC Executive Office and program planning committee felt was the best option to continue to meet the continuing education needs of respiratory therapists while prioritizing the safety of all involved,” she says.

Dr. Varekojis emphasizes that the meeting — dubbed Congress LIVE! — maintains the integrity of the traditional AARC Congress. The main difference — aside from the online format — is that the Congress, which was scheduled for four consecutive days in November, will now take place on four days spaced out over the months of November and December. **The new dates for Congress LIVE! are Nov. 18 and 20 and Dec. 3 and 5.**

“This year’s meeting will indeed cover the same breadth of topics that Congress-goers have come to expect,” she says. “The committee carefully considered the must-have topics identified by the various stakeholders when evaluating content to transition to a virtual meeting.” They also stepped beyond their initial plans to create new opportunities to address the pandemic and the impact it is having on RTs, from COVID-19 patient management to burnout, scarce resources, and ethical challenges. In fact, full-bundle attendees can earn 18+ CRCE.

The virtual format has also expanded the speakers who will be addressing these topics. Says Dr. Varekojis, “A virtual meeting removes some barriers faced when hosting a traditional in-person meeting, including travel and associated costs. This allowed the committee to consider involving speakers who may not have been available to participate in a traditional format, improving on the already high quality of the education provided to the participants.”

Committee member Dr. Brian Carlin, a program director from Pennsylvania, agrees. “The quality of topics will be excellent and will represent what respiratory therapists wish to learn about in the field,” he says. “Experts from all realms within the field will be participating in the meeting.”

The meeting will be delivered via a technology platform developed especially for conferences like the AARC Congress. AARC Associate Executive Director Doug Laher, MBA, CAE, CMP, RRT, FAARC, explains, “The AARC will use the vConference virtual event platform. It promises attendees a virtual experience similar to that of a live meeting. Your virtual Congress experience will include a convention lobby, meeting rooms, a virtual exhibit hall, and a live chat room where you can interact with other attendees.”

Richard Branson notes that while plenty of live interactions will be available, attendees can be assured that they won’t have to be watching a clock to take part in everything they want to see. “The system to deliver content will allow pre-recorded lectures to avoid live streaming issues related to technology,” he says. “But speakers will be present for question and answer.”

Branson agrees with his colleagues that this meeting will be packed with up-to-date information for respiratory therapists. “In many ways this Congress will be more current than ever,” says Branson. “A number of topics were replaced by new data and experiences related to COVID-19.”

Two for one

Given the ease of joining one or more days of the meeting from the comfort of home or office, the 2020 event could even outpace attendance at the traditional event.

Does that mean that the live, in-person Congress will be a thing of the past? None of these Program Committee members believe that’s in the cards. But they do see room for both settings in the future.

“I don’t think the live, in-person AARC Congress will ever be replaced,” says Brady Scott. “The in-person networking, live exhibit hall, and live interaction with experts and speakers is reason enough, in my opinion, to continue the live meeting.” But he does believe the virtual event this year might provide new opportunities to meet the needs of therapists who just can’t make it to the live event. He is looking forward to the take-home messages everyone will end up with after this year’s virtual session.

Kim Bennion reminds us all that many organizations limit travel to conferences to one time per year, and some don’t even allow for that. Adding a virtual component to the AARC Congress in years to come could markedly increase access for therapists in those situations. “Now that we know we can meet virtually — and while this has not been discussed formally with the Program Committee — I do feel we now have

discovered by necessity some other meeting options that we may build on by choice. Truly, necessity is the mother of invention!"

Dr. Carlin says he's already seen the value of the virtual meeting in his home state of Pennsylvania. "The local Pennsylvania Society for Respiratory Care was scheduled to hold an in-person meeting at the end of April," he says. "This was converted to a virtual meeting, and the attendance was triple that of the historical in-person attendance." He believes the new format for the Congress this year could very well open up the meeting to therapists who otherwise couldn't attend due to work, family, and other commitments.

Program Committee Chair Sarah Varekojis says her group will be examining the outcomes from Congress LIVE! to see how certain aspects of the meeting might be incorporated into the in-person Congress and Summer Forum meetings of the future. "Just like a virtual meeting expands the possibility of new and different speakers, it also expands the possibility of increasing access for respiratory therapists who have not been able to participate in the past," she says, echoing the comments from her committee members. "The committee will be carefully reviewing feedback and evaluations from this year's meeting to determine if there are elements of the virtual meeting that respiratory therapists believe should continue, and if there are elements of the virtual meeting that could be improved upon."

Forever home

Dr. Varekojis speculates, as many have over the past months of the pandemic, that some of the new ways of doing things we've been forced to adopt because of COVID-19 might very well become permanent parts of our lives going forward. While no one believes the in-person Congress will ever be totally replaced with a virtual event, it is clear that the virtual event taking place this year might very well find a forever home in the AARC. "It is likely that the lessons we learn this year will continue to impact AARC meetings in the near future, and will result in unanticipated benefits to respiratory therapists," she says.

Learn more about Congress LIVE! and register today to attend the event.

Following Protocol to Break Barriers

by Anthony L. DeWitt, JD, RRT, FAARC

Back when I was a young pup — what my children would call 1983 BB (before broadband) — I believed in the following concept: "It's better to ask for forgiveness than permission." In moribund institutions (ie, certain hospitals where I worked), this philosophy allowed me to bypass red tape, fix problems the administration didn't know existed, and deliver care better than it had been delivered previously. It was risky. Every now and then an administrator would get pouty. But for the most part they understood that internally over-regulating everything discouraged original thinking.

Original thinking is a good thing. That's how respiratory therapists ditched saline intermittent positive pressure breathing treatments and expanded their scope of practice through protocols. It took someone thinking outside the box at the beginning to put those ideas into motion. As a result, I always believed in the "better to ask forgiveness" school of department management.

Then a funny thing happened: I went to law school.

Okay, maybe law school wasn't funny, but at times it was fun. What's interesting about law school is that it makes you aware of all the landmines you not only stepped on, but actively stomped on, that didn't go off. I remember a respiratory therapist in one neonatal ICU where I worked who, during a tropical storm, when the neonatologist could not be reached, did a pericardiocentesis for cardiac tamponade on an infant. He saved the baby's life by applying the technique he'd learned for pneumothorax to the cardiac tamponade. He saved the baby's life, but he was also sternly rebuked. He likely would have been fired had the baby not survived. But I always looked up to him because he put that infant's life first, and his career and the rules second.

Law school convinces you that taking these kinds of risks this is not a good operational plan. Still, sometimes in emergencies, procedures have to be bypassed, rules have to be broken. Juries understand that and will make an exception, but they won't endorse it as business as usual.

But what about that situation where rules are not clear? What about the situation where the rules are not even actual rules? What if you find yourself caught in a situation where there is a need that must be filled, and you wish to fill it, but neither the law nor the administrative regulations tell you what you can do? What do you do when there is no guidance?

I recently received an email from a therapist named Joelle. Joelle had an important issue. She wanted to offer a new service in her community. She wanted to be one of those job creators and innovators who saw a need and found a way to fill it. There was only one problem. Here's how she phrased it to me:

> I decided to get certified in health coaching so that I could see chronic lung disease patients/clients via video/phone to continue providing basic respiratory education and coaching to this population. Including, sadly, the new members of the post-COVID syndrome club....
>
> My state's practice act says that RTs work "under the direction of a licensed physician." Given that I would only be doing education (disease prevention, health promotion, breathing exercises, etc.), I'm wondering if there is a way I can either do this work under the banner of Certified Health Coach, or if there is another way to think about it. Of course, I want to make sure I do not jeopardize my respiratory license in any way.

She asked me for legal advice about what to do. Those of you who know me know that I practice in Missouri and give legal advice only in Missouri. I am not licensed in Joelle's home state and can't give her advice because I don't want to jeopardize my Missouri law license in any way. So, I passed along the general framework for how a lawyer might help her, and helped her by detailing how to go about finding a lawyer who did that kind of work. Joelle added her own spin to things as you will see.

This happens in my practice about a dozen times a year. I get a question from someone, and I try my best to point them in the right direction. Sometimes people listen. Sometimes I can't help them at all. But I try very hard to help those who ask. As Confucius said, "Many receive advice, but only the wise profit from it."

Joelle profited from it. Today I got this email:

> Hot off the press — I just "attended" the Webex meeting [with the Board], where I was on the agenda after they received my letter asking for an opinion. I had gotten help from one of the lawyers I had found through the process you taught me, as well as from the most recent past director of the respiratory care department of the large hospital I had been working at when the pandemic began. He also is the most recent past chair of this same Board.
>
> Anyway, my request to practice as a non-hands-on health coach without the oversight of an MD was unanimously approved, and they all wished me the best of luck. The lawyer for the Board will send me a [follow-up] letter stating the approval.

I really wish I had been smart enough to recommend the italicized part of Joelle's message. She figured that out on her own, making her a very smart woman indeed. Joelle is a good example of the therapist ethic, which I would state this way: Therapists find a way to help.

Sometimes it is not better to ask for forgiveness instead of asking for permission. Joelle saw a problem, sought help with the problem, and found people who could help her find the right person to help her. But, even more important, she has shown therapists nationwide that they do not need to be confined to the hospital setting. They do not need to work either in a hospital or a nursing home. They can think outside the box.

Joelle gave me permission to share this story with AARC Times readers. I hope it motivates you as much as it thrills me.

about the author…

Anthony L. DeWitt, JD, RRT, FAARC, is an attorney and a partner in the firm Bartimus, Frickleton, 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.

Article and Feature Contribution: AARC Times welcomes AARC member contributions of feature articles and information for the regular columns. Send an outline and objectives of your article idea to Communications Manager Heather Willden at heather.willden@aarc.org.

Assessment and Treatment of Anxiety During Mechanical Ventilation

by Karsten Roberts, MSc, RRT, RRT-ACCS

Patients who are intubated in the ICU may develop anxiety, delirium, and other psychologic disorders.[1] The American Psychological Association defines anxiety as "an emotion characterized by apprehension and somatic symptoms of tension in which an individual anticipates impending danger, catastrophe, or misfortune" (https://dictionary.apa.org/anxiety; accessed *August 29, 2020*). Anxiety can present as rapid heartbeat, shortness of breath, and chest pain.[2] When undergoing prolonged mechanical ventilation, ICU survivors often experience posttraumatic stress distress, anxiety, and depression.[1] This article will review the assessment and treatment of anxiety as it relates to mechanical ventilation.

Patients receiving mechanical ventilation report feeling anxiety, frustration, and despair.[3] Psychological care has been shown to be important in the holistic care of patients. In a review of literature, Merchán-Tahvanainen et al.[3] reported that a patient's emotional state affected weaning from mechanical ventilation. The literature also indicates that patients who successfully wean from mechanical ventilation tend to do so in the short term rather than those who experience the frustration of prolonged mechanical ventilation.[3]

Similarly, Chen et al.[4] examined the psychological consequences of mechanical ventilation related to weaning trials. The authors noted that patients who failed a spontaneous breathing trial were more likely to have increased anxiety in subsequent trials. Subsequently, patients may fail repeated attempts at weaning, leading to unnecessarily prolonged mechanical ventilation.[4]

Assessment

When assessing patients for anxiety, respiratory therapists (RTs) should be aware of agitation. The Richmond Agitation Sedation Scale (RASS) is frequently used to assess agitation. A baseline RASS score of zero denotes a patient who is awake, alert, and oriented to person, place, time, and situation. A patient who is more sedate is said to have a negative RASS score, whereas a patient with a positive score is more agitated.[5] In conjunction with the RASS assessment, patients should have a Confusion Assessment Method for the ICU (CAM-ICU) as well. The patient should have a negative score on the CAM-ICU; if the CAM-ICU score is positive, the patient may be experiencing symptoms of delirium rather than anxiety.[2]

Another important aspect of anxiety assessment is patient reports of dyspnea, a term used to describe the subjective awareness of shortness of breath or a great degree of exertion while breathing.6 Dyspnea is associated with both invasive and noninvasive mechanical ventilation.[7,8] The use of mechanical ventilation can reduce dyspnea; however, it may also contribute to the problem.[6] The neural response to dyspnea is similar to the response to pain. Whereas the pain scale is a major consideration, less attention is paid to dyspnea, which can lead to prolonged mechanical ventilation.[8] High to severe dyspnea is associated with anxiety in patients receiving noninvasive mechanical ventilation in the ICU. Dangers et al.[8] use a patient reported scale (1 – 10) to define level of dyspnea. In their study a score of less than four defined mild dyspnea; whereas a score greater than four equated to moderate-to-severe dyspnea. The authors reported that severe dyspnea frequently led to intubation, lengthened hospitalizations, and increased mortality.

Treatment

Pharmacologic agents are often the treatment of choice when managing anxiety and dyspnea. Anxiolytic medication is often administered to patients on mechanical ventilation to relieve distress.[6] Sedative medications typical for treating anxiety include midazolam, lorazepam, propofol, dexmedetomidine, morphine, fentanyl, hydromorphone, or haloperidol.9 Unfortunately, pharmacologic interventions may lead to morbidity.[6] One such consequence of heavy sedation is delirium; thus it is recommended to use light sedation, daily sedation awake trials, and non-benzodiazepines to decrease deleterious effects.[6] When pharmacologic interventions can be temporized length of mechanical ventilation, drug associated organ dysfunction, and ICU length of stay may decrease. Protocolized approaches to anxiolytic drugs, including daily trials of lightened or discontinued sedation, may assist with weaning from mechanical ventilation.[3]

Alternative therapies

Some non-pharmacologic interventions are also beneficial to decreasing anxiety. Results from a randomized control trial by Chlan et al.[9] indicated benefits of music therapy. Patients were randomized to standard-of-care, noise-cancelling headphones, and self-initiated music therapy. All of the patients in the study were mechanically ventilated. Patients in the music therapy group exhibited decreased anxiety and need for sedation based on a self-reported evaluation.[9] The study did not seek to show outcome benefits and did not include physiologic parameters such as heart rate, blood pressure, or respiratory rate.

Reiki therapy is a natural healing technique that uses the laying on of hands to channel positive energy.[10] While the practice has ancient ties to Buddhist practices, it has made its way into modern medicine with a number of experimental and quasi-experimental studies published since the 1980s. In one such study, Saiz-Vinuesa et al.[10] randomized 256 patients to Reiki therapy versus placebo. While no statistically significant differences were found in ventilator-free days, nonsignificant differences were noted in duration of mechanical ventilation, sedation exposure, and length of stay, and agitation was decreased.[10]

Cognitive behavioral therapy (CBT) has also been suggested as a method of easing anxiety in mechanically ventilated patients. A type of psychological treatment for common mental health disorders CBT targets unhelpful thoughts or behaviors (https://www.apa.org/ptsd-guideline; accessed *August 29, 2020*). A case study published in 2019 described two patients who received CBT while attempting to wean from mechanical ventilation.[2] Prior to the initiation of therapy, the patients had been tracheostomized, having failed weaning from mechanical ventilation for 2 – 4 weeks prior to the initiation of CBT. The psychiatry service was consulted by the ICU team, and each patient was seen by the psychiatry service for 22 days. Prior to the initiation of CBT, the patients were only able to complete 1–2.5 hours of tracheostomy collar trials. Both patients were medically unstable during the 22 day CBT trial. Patient A developed ARDS and acute kidney injury, while patient B experienced lung transplanted related

organ rejection. Despite their medical setbacks, at the end of the trial each patient successfully weaned from the ventilator.[2]

Conclusion

Anxiety and feelings of panic are not uncommon in patients on mechanical ventilation, and multiple interventions exist to help alleviate symptoms. While pharmacologic agents are used often, the exposure to medications may be decreased with the use of alternative therapies. The use of therapies such as Reiki and CBT may be limited to the availability of sub-specialties. However, music therapy may be easily provided to patients as a soothing intervention. More research, including cohort studies and randomized controlled trials, is needed to confirm the effectiveness of alternative therapies.

References

1. Peris A, Bonizzoli M, Iozzelli D, et al. Early intra-intensive care unit psychological intervention promotes recovery from post traumatic stress disorders, anxiety and depression symptoms in critically ill patients. Crit Care 2011;15(1):R41.

2. Cohen JN, Gopal A, Roberts KJ, Anderson E, Siegel AM. Ventilator-dependent patients successfully weaned with cognitive-behavioral therapy: a case series. Psychosomatics 2019;60(6):612–619.
3. Merchán-Tahvanainen ME, Romero-Belmonte C, Cundín-Laguna M, et al. Patients' experience during weaning of invasive mechanical ventilation: a review of the literature. Enferm Intensiva 2017;28(2):64–79.

4. Chen Y-J, Jacobs WJ, Quan SF, et al. Psychophysiological determinants of repeated ventilator weaning failure: an explanatory model. Am J Crit Care 2011;20(4):292–302.

5. Sessler CN, Gosnell MS, Grap MJ, et al. The Richmond Agitation-Sedation Scale. Am J Respir Crit Care Med 2002;166(10):1338–1344.

6. Devlin JW, Skrobik Y, Gélinas C, et al. Clinical practice guidelines for the prevention and management of pain, agitation/sedation, delirium, immobility, and sleep disruption in adult patients in the ICU. Crit Care Med 2018;46(9):e825–e873.

7. Schmidt M, Demoule A, Polito A, et al. Dyspnea in mechanically ventilated critically ill patients. Crit Care Med 2011;39(9):2059–2065.

8. Dangers L, Montlahuc C, Kouatchet A, et al. Dyspnoea in patients receiving noninvasive ventilation for acute respiratory failure: prevalence, risk factors and prognostic impact. Eur Respir J 2018;52(2):1702637.

9. Chlan LL, Weinert CR, Heiderscheit A, et al. Effects of patient-directed music intervention on anxiety and sedative exposure in critically ill patients receiving mechanical ventilatory support: a randomized clinical trial. JAMA 2013;309(22):2335–2344.

10. Saiz-Vinuesa M, Rodríguez-Moreno E, Carrilero-López C, et al. Effectiveness of implementing the Reiki method to reduce the weaning failure: a clinical trial. Enferm Intensiva 2016;27(2):51–61.

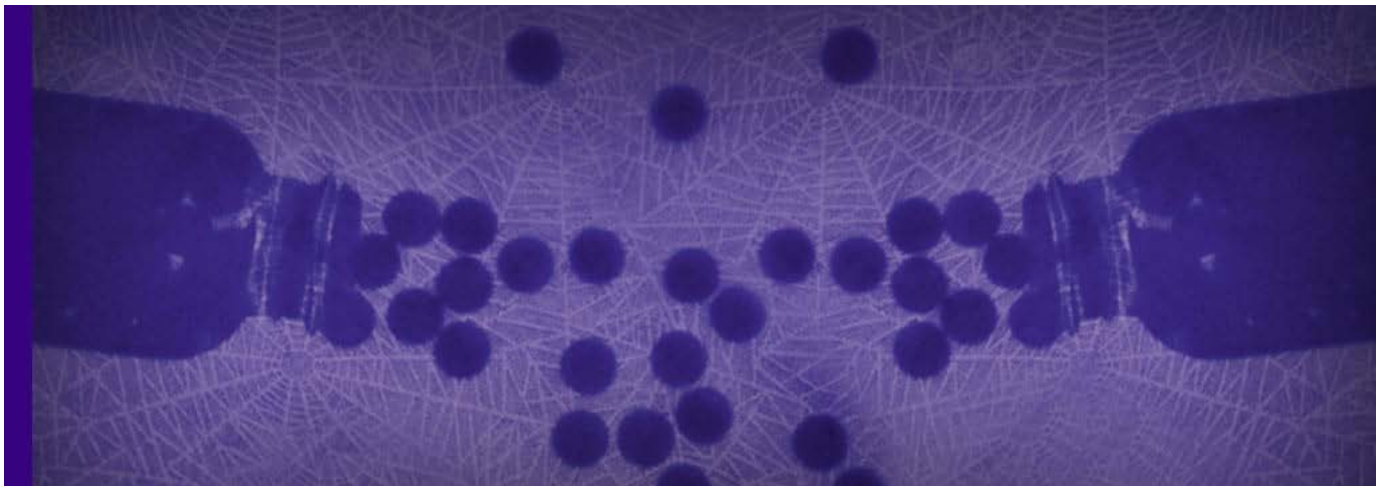
about the author…

Karsten Roberts, MSc, RRT, RRT-ACCS, is a staff therapist at the Hospital of the University of Pennsylvania in Philadelphia and is adjunct faculty at Boise State University.

Article and Feature Contribution: AARC Times welcomes AARC member contributions of feature articles and information for the regular columns. Send an outline and objectives of your article idea to Communications Manager Heather Wilden at heather.wilden@aarc.org

The Role of Wearable Technology and Smart Phone Applications in COPD Management

by Adam Mullaly, BSRT, RRT, AE-C



Like many of us these days, I have established a physical and somewhat emotional connection with wearable technology, in the form of my smart watch and its affiliated smart phone health application (app). This small computer on my wrist can track my physical activity history as well as my current heart rate variability and an FDA-approved electrocardiogram! In addition, it reminds me to get up from my desk chair for the occasional stretch, tells me when my music volume level may be too high, and provides guided-breathing, focused meditation several times a day. When paired with my Wi-Fi-connected weight scale, blood pressure cuff, and temperature thermometer, the health app on my phone knows more about my current health status than my primary care provider. It is no wonder that many of us working in health care see the potential benefits that wearable technology and smart phone applications may provide our patients with COPD.

Evolution

Wearable technology used for health applications is not new — think of the Holter monitor — but the technologies, engineering, form factor, intentions, and commercial availability are relatively new. Holter monitors have been around for decades, but the difference is that these battery-powered devices were designed for the very specific application of monitoring heart rhythms, and the data they collected was not intended for the user to interact with, rather for the care provider to view and analyze, often long after the data were collected. Today's wearables track numerous data points, are more stylish, and offer applications and interfaces intended to not only allow the user to easily visualize fitness and wellness data, but also to promote and inspire a healthier lifestyle. While this marketing aspect is sound, a recent literature review published in the *International Journal of COPD* reported limited data regarding the monitoring of physical activity in the COPD patient population.[1]

It is important to note that there are essentially two categories of wearable technology and smart phone applications available: those that can be purchased in the marketplace by the average consumer to utilize on their own, and those available only in a medical health care monitoring capacity. Regardless of category, the technology used in most of these wearables is similar, with highly miniaturized components in the form of accelerometers that detect movement, gyroscopes that detect direction of movement, and

photoplethysmography that uses optical light to analyze pulsatile flow, just to name a few. While smart watches and wrist monitors are the most popular, wearables come in many other formats, such as rings, patches, and chest straps.[2]

Integration

As a Respiratory Therapist COPD Navigator, my initial interest in wearables and their potential benefits for my patients was the inexpensive branded pedometers my hospital had purchased as a marketing product. The thought was that showing patients objectively how many steps they were taking each day could encourage a less sedentary lifestyle, which we know can lead to poor outcomes. Rudimentary by today standards, these small devices can be easily worn on clothing or hang around the neck, and they detect the number of steps taken during a day and provide a visual read out for the wearer. A systemic review and meta-analysis suggested that making patients with COPD aware of their steps promoted more steps per day when used as an intervention.[3] While my Better Breathers Club participants found them somewhat intriguing at first, anecdotally I think that, due to the questionable accuracy, lackluster display, and tiny buttons, the allure quickly wore off and their use of the pedometer was abandoned quickly. The good news is that, since then, wearable technology has evolved and is much more appealing and practical while offering the wearer much more data than just step counts! A 2019 qualitative study noted that people with COPD perceive that this new technology could indeed improve their ability to manage their condition by connecting how they feel subjectively to having access to objective physiologic data; however, they also noted real barriers and concerns to integrating this technology into their disease management regimens. These barriers included variability in technology use and comfort, design preferences that include not having the device draw attention to their chronic disease status, confidence in the data accuracy, becoming overwhelmed with numbers, and concerns about the cost of these new technologies for those on fixed incomes.[4]

The 2020 Global Strategy for Prevention, Diagnosis and Management of COPD report states that education alone is not an effective strategy in helping patients with COPD manage their disease; however, teaching them self-management interventions that include action plans and communication with health care professionals can decrease hospital visits.[5] It makes sense that the more a person understands about their personal health, the more empowered they may be in making meaningful behavioral changes. We can only hypothesize that by providing objective and trackable health data with actionable recommendations may help COPD patient management; however, current evidence for today's commercially available wearables and phone applications achieving this is not available.

The COVID-19 effect

The COVID-19 pandemic has upended our world — the way we provided health care just a few months ago has been drastically changed in many ways, and we've been pushed to utilize more telemedicine, which has many potential limitations.[6] There has been some effort to incorporate wearable sensors for the purpose of remote patient monitoring and virtual assessments in this population, which would likely translate to the COPD patient population.[6] Hopefully we will see published data from these projects moving forward to determine if there is indeed evidence of benefit.

The future

While the global market for wearables is accelerating and the opportunity for wearables to positively impact disease management strategies is suggested, we likely need wearables to incorporate accurate breathing frequency and pulse oximetry data, as well as comprehensive rigorous research to demonstrate its value as an intervention.

Anecdotally, I think many of us can see the value in wearables and smart phone applications as tools used to help people with COPD; however, it is important to note that the evidence is not there yet and we should acknowledge that most commercially available devices are marketed solely for fitness and wellness applications, and not for disease management.

References

1. Pericleous P, Tjeerd PS. The use of wearable technology to monitor physical activity in patients with COPD: a literature review. Int J COPD 2019:14:1317–1322.

2. National Institute for Health Research. Implantable & Wearable Medical Devices for Chronic Obstructive Pulmonary Disease. London: National Institute for Health Research; 2019.

3. Armstrong M, Winnard A, Chynkiamis N, et al. Use of pedometers as a tool to promote daily physical activity levels in patients with COPD: a systematic review and meta-analysis. Eur Respir Rev 2019;28(154):190039.

4. Robert CW, Ginsburg S, Son T, Gershon AS. Using wearables and self-management apps in patients with COPD: a qualitative study. ERJ Open Res 2019;5:00036-2019.

5. Global Initiative for Chronic Obstructive Lung Disease. Global Strategy for Prevention, Diagnosis and Management of COPD Report 2020. Available at: https://goldcopd.org/gold-reports. Accessed September 21, 2020.

6. Centers for Disease Control and Prevention. Using telehealth to expand access to essential health services during the COVID-19 pandemic. Available at: https://www.cdc.gov/coronavirus/2019-ncov/hcp/telehealth.html. Accessed September 21, 2020.

7. Seshadri DR, Davies EV, Harlow ER, et al. Wearable sensors for COVID-19: a call to action to harness our digital infrastructure for remote patient monitoring and virtual assessment. Front Digit Health 2020;2. doi: 10.3389/fdgth.2020.00008.

8. Greiwe J, Nyenhuis SM. Wearable technology and how this can be implemented into clinical practice. Curr Allergy Asthma Rep 2020;20(8):36.

about the authors...

Adam Mullaly, BSRT, RRT, AE-C, is the COPD Navigator; Better Breathers Club Facilitator, Department of Respiratory Care, Main Line Health - Bryn Mawr Hospital. A COPD Navigator is focused on implementing and researching innovative, collaborative, evidenced based COPD

patient initiatives that demonstrate Respiratory Therapist value and positively impact clinical outcomes in acute and ambulatory/post-acute care settings.

Invaluable Role of Patient Education

by Thomas Kallstrom, MBA, RRT, FAARC

Have you ever wondered about your patients and their well-being once they are discharged from the hospital? In particular, what about the patients who are discharged with home oxygen orders? Interestingly, many of these patients leave the hospital with little to no preparation for what awaits them once they get home. Now couple that with the infrequent home-based respiratory therapist home visits that would allow for face-to-face assessment and education of the patient and family. Here at the AARC, we are hearing more and more complaints about this very thing.

Regrettably, a couple of months ago I received a letter from a patient in New Jersey who was desperate to speak to a respiratory therapist. Her physician prescribed her to receive oxygen via an oxygen concentrator. The unit was delivered to her home by a delivery person who essentially delivered the unit, plugged it into the wall socket and left. Understandably, the patient was left uncertain how to move forward.

This is a case that could have been prevented had the hospital-based respiratory therapist been engaged with her discharge to provide some level of education regarding what to expect once she got home. Unfortunately, hospital-based respiratory therapists frequently are not involved in the discharge of pulmonary patients.
A recent article from the RESPIRATORY CARE journal found that the provision of respiratory therapists was lacking when it came to preparing and adequately educating the patient and caregivers on the device(s) they were to go home with.1 This was discovered by a survey made available to all AARC members who provided care for patients hospitalized for COPD exacerbations and worked in acute care settings.

Fifty-eight percent of RTs reported consistently (i.e., >75% of the time) evaluating hospitalized patients for home oxygen at rest, 43% with activity, and only 14% during sleep. However, only 25% of RTs reported being involved in selecting the home oxygen equipment for patients before discharge. And in 18% of cases, RT respondents indicated that the durable medical equipment companies made decisions about selection of home oxygen equipment.

In another study, only 22% of patients hospitalized with COPD had an adequate evaluation for home oxygen, and only 16% had adequate documentation of home oxygen requirements.2 Further findings from a multi-center qualitative study suggest that patients who are prescribed home oxygen are not routinely reassessed for their home oxygen need, which may unwittingly lead some to use home oxygen even when they do not need it.3 Studies in patients who are prescribed home oxygen during a respiratory exacerbation (most of whom have COPD or are hospitalized for a COPD exacerbation) suggest that 30–50% of such individuals no longer have

severe resting hypoxemia within three months.4 This means that patients could be on oxygen when they do not need it — even worse, without clinical follow-up, patients may not be receiving adequate oxygen.

According to Jacobs et al.,5 more than 1.5 million adults in the United States use supplemental oxygen for a variety of respiratory disorders to improve their quality of life and to prolong survival. However, oxygen users frequently experience significant and clinically unacceptable problems related to their oxygen equipment that decrease their quality of life. These include functional, mechanical, financial, and educational dimensions that affect their ability to work, exercise, travel, and interact with their families and community. Additionally, many patients are unaware of mechanisms by which to report and resolve their problems. Jacobs et al.5 noted that many health care providers who prescribe oxygen lack the resources and knowledge needed to prescribe oxygen delivery systems and devices correctly and efficiently to meet the specific needs of their patients. Clinicians and patients need better access to durable medical equipment personnel; existing prescriptions; guidelines on quality assurance, prescribing, and documentation; and educational programs and materials. Studies using effectiveness and implementation research designs are needed to develop and test educational programs for clinicians and to design seamless interfaces between clinicians, suppliers, payers, patients, and caregivers.5
This information indicates that there is a strong need for the respiratory therapy profession to step up and use our skills in pre- and post-discharge management. The AARC will continue to push for positioning the respiratory therapist in this essential role.

Telehealth may be another option, and in recent months we have learned that RTs under the COVID-19 relief package(s) are now able to provide telehealth care, and hospitals and physician practices/clinics are able to bill Medicare for the service. This is an opportunity that we need to take advantage of so that we can demonstrate the essential role we play via the new vehicle of telehealth.

The bottom line is that RTs need to step up and be engaged in the ongoing care and education of patients.

References

1. Tan A-YM, Vines DL, Krishnan JA, Prieto-Centurion V, Kallstrom TJ. Home oxygen evaluation by respiratory therapists in patients hospitalized for COPD exacerbations: the RIsOTTO study. Respir Care 2020 [Epub ahead of print] doi: 10.4187/respcare.07628.

2. Zaidi F, Lee RS, Buchcic BA, Bracken NE, Jaffe HA, Joo M, et al. Evaluation and documentation of supplemental oxygen requirements is rarely performed in patients hospitalized with COPD. Chronic Obstr Pulm Dis. 2017;4(4):287–296.

3. Sculley J, Cattamanchi A, Gamino AJ, Asche CV, Au D, Collins EG, et al. The nine chains of care for home oxygen during hospital-to-home transitions in patients with COPD exacerbations. Am J Respir Crit Care Med 2020;201:A7466.

4. Oba Y, Salzman GA, Willsie SK. Reevaluation of continuous oxygen therapy after initial prescription in patients with chronic obstructive pulmonary disease. Respir Care 2000;45(4):401–406.

5. Jacobs SS, Lederer DJ, Garvey CM, Hernandez C, Lindell KO, McLaughlin S, et al. Optimizing home oxygen therapy: an official American Thoracic Society workshop report. Ann Am Thorac Soc 2018;15(12):1369–1381.

about the author…

Thomas J. Kallstrom, MBA, RRT, FAARC, is executive vice president of the ARCF and executive director of the AARC.

Article and Feature Contribution: AARC Tımes welcomes AARC member contributions of feature articles and information for the regular columns. Send an outline and objectives of your article idea to Communications Manager Heather Willden at heather.willden@aarc.org.

Understanding Hospital Boards

by Anthony L. DeWitt, JD, RRT, FAARC

Big wigs. VIPs. Head honchos. There are lots of names for people who get appointed to a corporation's board of directors. For the most part, people who are appointed are selected based on their business acumen, willingness to serve, and ability to contribute to the management of the corporation. In some organizations, like the AARC, the Board is elected by the membership and exercises its control through officers. That arrangement makes the AARC responsive as a business to the needs of its membership. The AARC has had consistently excellent management for many decades.

In a hospital, however, the board is normally made up of people from within the community who are selected by other board members and voted onto the board by those members. Board membership is an honor and a privilege that carries with it significant responsibilities. Being selected is recognition that a person has skills and expertise that are useful to the corporation, and indicates a belief that their guidance may be helpful to that organization.

When I was the director of the cardiopulmonary department at Blessing Hospital, in Quincy, IL, our hospital had a very active board of directors. It was composed of people from several of the larger employers in the city, and all of those employers had a vested interest in keeping one of the city's hospitals running smoothly and efficiently. As a director, I learned just how important a board can be.

Coming to rural Illinois from metropolitan Florida, I was used to much higher prices for things like pulmonary function tests (PFTs) and oxygen therapy. When I suggested increasing these prices to bring the hospital up to the national averages, I was told that it was useless to try this because the board would not agree. I failed to understand that. How could the board not want the hospital to charge enough to make money? Later I realized cost-containment was an important part of what the Blessing Hospital's board did. The board had an equation that matched the return on investment on a piece of clinical equipment (like a PFT machine) against the expected number of procedures and the amount of time it took to do the tests. Prices were set in a very narrow range, and any upward departure had to be scrupulously validated. By enforcing these policies, the board members ensured that the pricing decisions made by the hospital's officers and administrators were truly benefitting the community.

While most people think of board members simply as very important people in the community, they fail to understand their role in the management of the organization. Board members have duties and

obligations to either their stockholders (in a for-profit hospital) or the public (in a not-for-profit hospital). Those duties include, among other things:

• Selecting the chief executive and chief fiscal officers. These individuals keep the organization in the black and oversee the hospital's continued operations. The board evaluates the performance of the CEO and CFO, as well as any officers it appoints. Hiring and supervising the CEO may be its most important job.
• Establishing policy guidance on goals and objectives. In essence, the mission statement of the organization is the product of the board of directors, and it has a duty to ensure that it sets the objectives and establishes the policies that will ensure community service obligations are met.
• Ensuring that the corporate form of the hospital is appropriate for the times. Some boards have converted their not-for-profit hospital to a for-profit entity by selling a hospital's assets. Often this is done when it becomes obvious to the board that the ongoing operation of the hospital simply cannot be sustained in its current format.
• Developing, overseeing, and monitoring the financial performance of the organization and approving any audits done by the hospital's independent auditors. In this way, the board ensures both that its policies are working and that its service and financial objectives are being met.
• Being accountable to the public (for a not-for-profit hospital) or to the stockholders (in a for-profit hospital) for the operation of the organization. This includes ensuring that the hospital is operating within the bounds of the law and that its corporate compliance program is effective.

In addition to these duties, board members can sometimes be subject to personal liability for errors and omissions. Directors of nonprofit corporations are fiduciaries. A fiduciary is someone in a position of trust who owes a duty of good faith and truth-telling. They have a duty to act for the benefit of the community and the nonprofit organization — not for themselves. Because not-for-profit board members are generally volunteers, board members can usually only be held responsible for intentional misconduct or reckless disregard of their duties. Those duties include putting the corporate interests first, paying attention, and adhering to the organization's bylaws.

No advancing personal interests

Board members must be loyal to the organization. They must act for the benefit of the organization and the community it serves. They cannot advance their own interests. A board member who insisted, for example, that the hospital pay $2.00 more per sheet to buy linens from his warehouse rather than put those items up for bid would be violating his fiduciary duties through "self-dealing." In a for-profit setting, he could be sued. In a not-for-profit setting, the state's attorney general could move to oust that board member, or the other board members could take that action.

Paying attention

Board members must be informed prior to making decisions and understand both the financial and legal implications of corporate actions. For example, while car dealers routinely pay a "finder's fee" to customers who send them new customers, such action is a violation of the anti-kickback statute in health care. Board members cannot apply the same rules from their business to the hospital's business. Board members regularly review the organization's finances and its policies and objectives. They hire general counsel to keep them operating legally. Where a board has good records of its discussions preserved in its organizational minutes, there is little chance that the board members can be held liable for a failure to pay attention.

Sticking to the bylaws

Every corporation has bylaws and articles of incorporation that limit how the organization can act. When a corporation does things forbidden by its charter, it is acting ultra vires. A board that approves such action violates its fiduciary duty because taking these actions put its very corporate existence at risk.

While shareholders have the ability to sue the board of directors of a for-profit hospital in what are called shareholder derivative suits, the only person that can challenge a not-for-profit entity is the state's attorney general, who has the duty of monitoring these organizations and ensuring that they behave appropriately. Of course, where a not-for-profit corporation uses its status to shield its officers and directors from tax liability or steals from the entity, law enforcement and even the Internal Revenue Service can get involved.

If you thought being a board member was largely a ceremonial duty, you now see that board members play a valuable role in ensuring the hospital (or really, any business) stays on the straight and narrow. That's why having well-qualified board members is important, and why board membership is both an honor and a responsibility. The jobs of hundreds are held in board members hands.

about the author…

Anthony L. DeWitt, JD, RRT, FAARC, is an attorney and a partner in the firm Bartimus, Frickleton, 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.

Article and Feature Contribution: AARC Times welcomes AARC member contributions of feature articles and information for the regular columns. Send an outline and objectives of your article idea to Communications Manager Heather Willden at heather.willden@aarc.org.

RC Currents

IN THE NEWS

Tocilizumab May Be Good Backup Therapy for Severe COVID-19

University of Michigan researchers publishing in *Clinical Infectious Diseases* in July reported that patients with COVID-19 who received intravenous tocilizumab to calm their overactive immune systems were 45% less likely to die than those who did not. They were also more likely to be discharged from the hospital or weaned from the ventilator one month following treatment. The outcomes on death held true even though these patients were more likely than others to develop an additional infection on top of SARS-CoV-2, most commonly ventilator-associated pneumonia.

The study was based on a review of data on 154 critically ill patients treated at Michigan Medicine during the first six weeks of the pandemic's arrival in Michigan. About half received a single dose of tocilizumab, and half did not. Most of the patients who did receive it received it within 24 hours of intubation.

The authors note that a larger study released in June reported significant benefits for the use of dexamethasone in preventing the cytokine storm as well, and since dexamethasone is a much less expensive drug, they recommend using it instead of tocilizumab. But they still see a role for tocilizumab in treating patients with COVID-19.

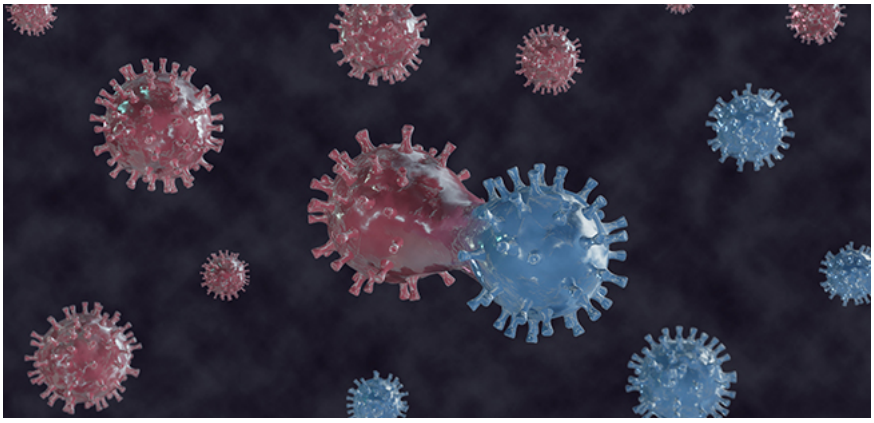
“For a retrospective, single-center study, our data are robust,” said study author Jason Pogue, PharmD. “But at this time, due to the lack of randomized controlled trial data and the much higher cost, we recommend reserving tocilizumab for the treatment of select patients who decompensate while on or after receiving dexamethasone or in patients where the risks of adverse events from steroid therapy outweigh the potential benefits.”

New System May Increase Usability of Donor Lungs

Increasing the usability of donor lungs could save many lives, but currently most lungs are deemed too damaged to be used. While ex vivo lung perfusion (EVLP) can be used to provide lung support outside the body and recover donor lungs of marginal quality before transplantation, EVLP only provides six to eight hours of support, which is generally too short to recover the majority of severely damaged donor lungs.

Researchers from Columbia Engineering and Vanderbilt University have come up with a new way to allow more of those lungs to be transplanted. They have found that these lungs can be recovered outside the body by a platform that uses cross-circulation of whole blood between the donor lung and an animal host. The investigators reported their first successful recovery of a severely injured human lung that failed to recover using the standard clinical EVLP in *Nature Medicine* in July.

Throughout the 24 hours of cross-circulation, the team saw substantial improvements of cell viability, tissue quality, inflammatory responses, and, most importantly, respiratory function. “We were able to recover a donor lung that failed to recover on the clinical ex vivo lung perfusion system, which is the current standard of care,” said study author Gordana Vunjak-Novakovic, from Columbia Engineering. “This was the most rigorous validation of our cross-circulation platform to date, showing great promise for its clinical utility.”



New Flu Mutation

A mutation in the H3N2 influenza virus is helping it block antibodies from binding to a key viral protein that isn't targeted by current vaccines, find Johns Hopkins researchers publishing in *PLoS Pathogens*.

The mutation was first detected in some H3N2 flu strains in the 2014–2015 flu season and is now present in virtually all circulating H3N2 strains. While this alteration reduces the ability of the flu virus to replicate in a type of human nasal cell that it normally infects, the researchers found evidence that it also sets up a physical barrier that hinders antibodies from binding to the viral protein neuraminidase.

The authors note that most flu vaccines are designed to induce antibody responses against a viral protein called hemagglutinin and believe their findings suggest a need to target multiple sites on the virus to reduce the chance that single mutations like this one involving neuraminidase can confer such resistance. "These findings tell us that flu vaccines focusing on the hemagglutinin protein are leaving the virus openings to evolve and evade other types of immunity," said senior study author Andrew Pekosz, PhD.

Intrauterine Transmission of SARS-CoV-2

An infant in Texas is the first documented case of intrauterine transmission of SARS-CoV-2 from mother to child. Physicians from the University of Texas Southwestern Medical Center related the case in a recent edition of the *Pediatric Infectious Disease Journal*, noting that the premature baby girl, who was born at 34 weeks to a mother with type 2 diabetes, developed a fever and breathing problems on the second day of life. She tested positive for SARS-CoV-2 at 24 and 48 hours following birth. The infant was treated with supplemental oxygen for several days but did not need mechanical ventilation. COVID-19 tests remained positive for up to 14 days. At 21 days, the mother and infant were sent home in good condition.

The researchers confirmed the intrauterine transmission by examining the placenta, which showed signs of tissue inflammation, and by running specialized tests documenting the presence of coronavirus particles as well as the SARS-CoV-2 nucleocapsid protein specific for the COVID-19 virus in fetal cells of the placenta.

Rape May Lead to Breathing Difficulties

A new study out of New Zealand suggests victims of rape — both women and men — are at higher risk for breathing problems. The finding comes from an analysis of data from the Dunedin Multidisciplinary Health and Development Study, a longitudinal investigation of health and behavior in 1,037 people born in Dunedin in 1972 or 1973 and followed regularly throughout their lives.

Nearly 20% of the women and 4% of the men in the study reported being raped, and these individuals were more likely to have dysfunctional breathing at age 38. Self-reported diagnoses of asthma and symptoms of wheeze were more common among the women as well, but not among the men. However, the association between rape and hyperventilation syndrome was equally as strong or even stronger among the men who reported rape when compared to the women.

"The findings indicate that dysfunctional breathing may be a consequence of severe psychological trauma and are consistent with case reports of sexual abuse in patients with other patterns of breathing difficulty," said study author Professor Bob Hancox, from the University of Otago. "Health professionals should recognize the possibility of prior traumatic experiences triggering either dysfunctional breathing or late-onset asthma and consider whether psychological counseling or other forms of therapy would help their patients." The study appeared in a recent edition of the *European Respiratory Journal*.

Follow-Up Visits May Not Be Necessary for Kids With Bronchiolitis

Do children diagnosed with bronchiolitis really need a follow-up visit? Researchers from Intermountain Primary Children's Hospital in Salt Lake City believe the answer is no. They randomly assigned 304 children who were under the age of two and had been hospitalized for bronchiolitis to either a scheduled post-hospitalization follow-up visit or an as-needed follow-up visit. Parents in the as-needed follow-up

group were told that they did not necessarily need to have a follow-up visit, but should do so if their child was not getting better at home.

Results showed that families in the as-needed follow-up group chose to attend substantially fewer clinic visits but otherwise experienced equivalent outcomes to families in the scheduled follow-up group. The two groups were equivalent in terms of parent anxiety, duration of the child's symptoms, parent satisfaction with care, and risk of readmission to the hospital.

"Our findings suggest that we may be inefficiently using our limited health care resources for these patients," said study author Eric Coon, MD, MS. "This is especially true for families where a follow-up appointment could be another financial stressor on top of a child already being in the hospital." The study was published in *JAMA Pediatrics* last summer.

Urine Test for CF

Danish investigators believe a simple urine test might be able to help clinicians measure how much CFTR function is defective in patients with cystic fibrosis (CF). The researchers reached that conclusion after conducting studies aimed at defining how CF affects the kidneys in mouse models, patients with CF, and various cell types. Specifically, they looked at the mechanisms involved in the urinary excretion of bicarbonate, which is stimulated by the hormone secretin in the pancreas to neutralize acids and requires a functioning CFTR. A urine test of bicarbonate may not only help assess CFTR function in patients, it could also be useful for assessing the potential of new medications, note the authors. The study was published in a recent edition of the Journal of the *American Society for Nephrology*.

Who Benefits From Steroids, and Who Doesn't

The U.K. RECOVERY trial, a prospective, randomized, placebo-controlled study involving more than 6,000 patients with COVID-19, report that the steroid dexamethasone reduced deaths by about one third in patients on ventilators and by about one fifth among people who needed oxygen but were not on ventilators. Researchers from Albert Einstein College of Medicine and Montefiore Health System have not only confirmed those findings, but also shed some light on which patients are most likely to benefit from the treatment and, just as importantly, which patients are not.

Their investigation compared outcomes for two groups selected from nearly 3,000 people hospitalized at Montefiore with a positive COVID-19 test. One group of 140 patients was treated with steroids within 48 hours of hospital admission. A control group of 1,666 similar patients did not receive steroid therapy. Most of the patients who received steroid therapy received prednisone. Some received dexamethasone and methylprednisolone.

Nearly all patients initially had a blood test to measure levels of C-reactive protein (CRP), which the liver produces in response to inflammation. The higher the CRP level in the blood, the greater the amount of inflammation. A normal CRP level was reported in the study as less than 0.8 mg/dL of blood.

Results showed patients with a CRP level greater than 20 had a 75% reduction in the risk of needing mechanical ventilation or dying when they received steroids, and that finding held true for men and women and across ethnic groups. But for those with a CRP level under 10, steroids increased the risk of mechanical ventilation or death by nearly 200%.

“Our findings suggest that steroid therapy should be reserved for people with high inflammation, as indicated by markedly elevated CRP levels,” said William Southern, MD, MS, the study’s senior author. “It’s a different story for people who do not have significant inflammation: for them, any benefit is outweighed by the risks from using steroids.” The study was published in the *Journal of Hospital Medicine*.

HIIT Can Improve Fitness in Teens With Asthma

High-intensity interval training (HIIT) was found to be effective in adolescents with asthma in a study published by *Medicine & Science in Sports & Exercise* last summer. The investigators speculated that the training — which allows for short rest periods — would work for kids with asthma because the rest periods would be likely to take place before an asthma attack could get started. They tested their theory in 35 high school students, 17 with asthma, who took part in three 30-minute HIIT sessions per week over a six-month period. These students were compared to 34 other kids, 19 of them with asthma, who didn’t take part in the sessions.

The investigators found aerobic fitness markers improved in the HIIT group and asthma had no effect on the degree of improvement. They believe HIIT can improve fitness in teens with asthma.

New Guideline for Tobacco Dependency Treatment

The American Thoracic Society has released a new clinical practice guideline aimed at directing treatment for adult tobacco users who may be reluctant to quit. According to the authors, the recommendations are based on the principle that all tobacco users should receive treatment for their dependence rather than simply be encouraged to kick the habit. These are their specific recommendations —

1. For tobacco-dependent adults in whom treatment is being initiated, varenicline is recommended over a nicotine patch.

2. For tobacco-dependent adults in whom treatment is being initiated, varenicline is recommended over bupropion.

3. For tobacco-dependent adults in whom treatment is being initiated, varenicline plus a nicotine patch is recommended over varenicline alone.

4 For tobacco-dependent adults in whom treatment is being initiated, varenicline is recommended over electronic cigarettes.

5. In tobacco-dependent adults who are not ready to discontinue tobacco use, the authors recommend that clinicians begin treatment with varenicline rather than waiting until the tobacco user is ready to stop tobacco use.

6. For tobacco-dependent adults with comorbid psychiatric conditions, including substance use disorder, depression, anxiety, schizophrenia, and/or bipolar disorder, for whom treatment is being initiated, the authors recommend varenicline over a nicotine patch.

7. For tobacco-dependent adults for whom treatment is being initiated with a controller, the authors recommend using extended duration (greater than 12 weeks) over standard duration (6–12 weeks).

The guideline was published by the *American Journal of Respiratory and Critical Care Medicine* in July.

Flu Drug Found Effective

The anti-flu drug baloxavir was found to significantly reduce the risk of infection with the flu among household members who were exposed to influenza by another household member. The double-blind study, which was conducted by investigators from the University of Virginia School of Medicine and elsewhere, involved 752 household contacts of 545 patients with the flu. Among uninfected household contacts who took a single dose of the drug, only 1.9% ended up getting the flu. That compared to 13.6% of those who received a placebo. The drug was effective in a range of contacts, including children and those who were considered at high risk for the flu, and it worked regardless of whether they had received the flu vaccine or not. The authors believe baloxavir prophylaxis could prove effective in other settings as well, including in nursing homes and health care facilities. The study was published in *The New England Journal of Medicine* earlier this year.

Standardized Packaging Leads to Lower Cigarette Sales

Standardized packaging of cigarettes led to a significant decline in cigarette sales in the U.K., report researchers from the University of Bath. When they analyzed sales data over a three-year period, they found cigarette sales declined on average by about 12 million a month before the standardized packaging law went into effect. After the law was implemented, cigarette sales declined by 20 million per month. During this period, a new tax on cigarettes was imposed as well.

"Governments around the world considering plain packaging can be reassured that this policy works and that the real reason the industry opposes this legislation so vehemently is because it threatens its profitability," said study author Anna Gilmore, PhD. "With coronavirus already posing a threat to tobacco company sales, and plain packaging of tobacco taking off in other jurisdictions, our findings are more bad news for tobacco companies." The study appeared in a recent edition of *Tobacco Control*.

Remote Monitoring Benefits Lung Transplant Patients

Lung transplant patients often experience complications once they go home from the hospital. Researchers from Keck Medicine of the University of Southern California have found that monitoring these patients with Bluetooth-enabled devices and computer tablets can reduce the incidence of those complications.

The study was conducted among 28 patients who were followed with the remote tracking devices, which measured blood pressure, heart rate, weight, blood glucose, oxygen saturation, and pulmonary function, and 28 others who did not have these devices. Patients measured their vital signs and reported symptoms daily for the first three months of the two-year study. After that, they reported in three times a week. The tablets were used to track appointments and medication compliance, and to conduct videoconferences and access educational videos.

The researchers found that patients in the remote monitoring group had 44% fewer hospital readmissions overall, and when they were readmitted, they spent 54% fewer days in the facility. They were less likely to be admitted for infections and non-organ rejection/non-infection causes such as shortness of breath or hypertension, and they also had a lower, but not statistically significant, readmission for organ rejection and for death.

The study was published in a recent edition of the *American Journal of Transplantation*.

Flavored Cigarette Ban Led to Lower Youth Smoking Rates

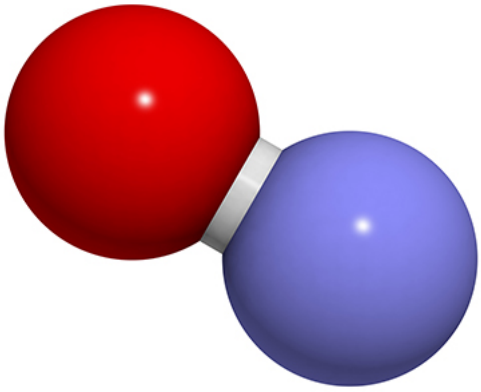
The FDA banned the sale of flavored cigarettes, other than menthol, in 2009. According to a new study out of George Mason University, that ban has led to a significant reduction in smoking among young people. Using data from the 2002–2017 National Survey of Drug Use and Health, they found a reduction of 43% in kids 12–17 years old and a reduction of 27% in young adults 18–25 years old. “Our study suggests that the ban of flavored cigarettes was extremely effective at reducing smoking among young people,” explained study author Dr. Matthew Rossheim. “This shows incredible promise for future comprehensive bans of flavored tobacco products, including those in e-cigarettes.” The researchers published their findings in *the Journal of Adolescent Health* earlier this year.

Why Obesity Worsens COVID-19

Since the beginning of the COVID-19 pandemic, statistics have shown that obesity increases the risk for a severe case. Researchers from the Pennington Biomedical Research Center in Baton Rouge, LA, suggest that higher leptin levels in obese people are playing a significant role.

"The problem for people with obesity is that their leptin levels are always high, and that can affect the response to a COVID-19 infection," said Candida Rebello, PhD, RD, lead author of the study. She explains that the hormone leptin not only regulates appetite and metabolism but also regulates the cells that fight infection. Elevated leptin levels hamper the body's ability to battle infections in the lungs and other parts of the body, promoting a low-grade systemic inflammatory state.

"Your entire body, including your lungs, may be inflamed. Your immune response is likely compromised, and your lung capacity reduced," added study co-author John Kirwan, PhD. "Add in a virus that further weakens the body's ability to fight infection, that can limit the body's ability to control lung inflammation, and you have the recipe for disaster." The study appeared in a recent edition of the *International Journal of Obesity*.



Nitric Oxide May Have a Role in COVID-19

Nitric oxide may have a role to play in the battle against COVID-19, report George Washington University researchers who published a review on the topic in a recent edition of *Nitric Oxide*. The team reviewed data from 1993 to 2020 on the pathogenesis of coronaviruses and the use of nitric oxide as a treatment for respiratory illness, highlighting the potential for inhaled nitric oxide to contribute to better clinical outcomes. For example, nitric oxide proved effective in inhibiting the viral replication by cytotoxic reactions through intermediates such as peroxynitrite during the 2003 SARS outbreak. The authors note

that nitric oxide is one of several potential COVID-19 treatments included in the FDA's emergency expanded access program.

Pandemic May Be Causing Depression in Health Care Workers

Health care workers will be the first to admit that the COVID-19 pandemic is taking its toll on their own personal wellbeing. But just how big is the problem? According researchers from the Georgia Institute of Technology and North Carolina State University (NC State), it may be huge.

They conducted a survey among 90 people who identified as health care workers and 90 people who did not work in health care. The health care worker group included physicians, nurses, medical technicians, and others, including hospital administrators. Questions on the survey were aimed at capturing various aspects of mental health and wellbeing.

Results showed higher levels of stress, anxiety, and tiredness, as well as lower feelings of control over their lives, in the health care worker group. Overall, health care workers averaged a depressive symptoms score that would qualify as clinical depression. "It was approximately 30% higher than the depressive symptoms score for the control group," said study author Dr. Shevaun Neupert, from NC State. "You don't expect to see an entire workforce score like that on a depression diagnostic tool." Health care workers were also less likely to engage in the practice of "proactive coping." In other words, they weren't doing anything to prepare for the future stress or adverse events likely to come their way.

"Our findings suggest that health care workers are at much higher risk right now of negative outcomes, such as depression," continued Neupert. "That's not sustainable, and we need to figure out what we're going to do about it." The study was published in *Frontiers in Psychology*.

Strange but True . . .

Eat more fish: Air pollution can take its toll on the brain, but according to researchers from Columbia University, getting more omega-3 fatty acids from fish can counteract the effects. They found lower levels of brain shrinkage in older women living in high air pollution areas who had higher levels of omega-3 fatty acids in their blood.

Fido to the rescue: Australian researchers are training dogs to sniff out COVID-19 infections. They embarked on the effort because previous research has shown canines are capable of detecting the presence of specific volatile olfactory compounds caused by a viral infection in people. They envision

placing the COVID-sniffing dogs in airports, health care facilities, and other places where people need to be screened.

More reason to get a flu shot: In the midst of a global pandemic, influenza vaccination will be key. Researchers from the University of Texas Health Science Center at Houston have found another good reason to roll up your sleeve: their study showed people who received at least one flu vaccination were 17% less likely to get Alzheimer's disease over the course of a lifetime. They speculate some of the proteins in the flu virus may train the body's immune response to better protect against Alzheimer's disease.

Here kitty, kitty, kitty: A drug used to treat a coronavirus in cats could potentially block the replication and spread of SARS-CoV-2 in people, report researchers from the University of Alberta. The strategy would be to combine the drug with a specific enzyme called a protease that breaks down proteins in SARS-CoV-2.

Contribute to the AARC "Transitions" Column

The AARC "Transitions" column is devoted to sharing news about the passing of AARC members. Submit news about your colleagues' recent passing using our Transitions online form. 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.

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. Submit news about your colleagues' recent passing using our Transitions online form. 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.

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.

Industry Watch

COVID-19 detection test in development

A research team at the Aikens Research Center at the Beaumont Research Institute has identified the technology needed to develop a detection test for COVID-19 via urine, blood, saliva, or a mouth-swab sample in just 30–45 minutes. The researchers compared the new technology with existing technology and found it to be highly accurate. The investigators say the test is also relatively inexpensive to develop and operate. The initial findings were published in a recent edition of *PLOS One*. The team is now trying to secure corporate sponsorship to fund the next phase of the development.

IPF atlas available now

NuMedii, Inc., has announced the availability of the world's first single-cell sequencing atlas for idiopathic pulmonary fibrosis (IPF). The atlas was the result of a strategic research collaboration between the Yale School of Medicine, Baylor College of Medicine, Brigham and Women's Hospital, and NuMedii. The comprehensive catalog reveals the complexity and diversity of 35 aberrant cellular populations in IPF. "The opportunity to apply NuMedii's artificial intelligence–driven technology to such a rich dataset has fostered a greater understanding of the mechanisms driving lung fibrosis and greatly augmented our IPF therapeutic discovery programs," said Heather Arnett, PhD, vice president of research at NuMedii.

Research to continue on ALS drug

An experimental drug for a rare, inherited form of amyotrophic lateral sclerosis (ALS) has shown promise in a Phase 1/Phase 2 clinical trial conducted at Washington University School of Medicine in St. Louis, Massachusetts General Hospital in Boston, and other sites around the world. Sponsored by the pharmaceutical company Biogen, Inc., the trial indicated that the drug, known as tofersen, shows evidence of safety that warrants further investigation and lowers levels of a disease-causing protein in people with ALS caused by mutations in the gene *SOD1*. The results of the study, published July 9 in The *New England Journal of Medicine*, have led to the launch of a Phase 3 clinical trial to further evaluate the safety and efficacy of tofersen.

Air filter kills SARS-CoV-2

Researchers from the University of Houston (UH) have designed a "catch and kill" air filter that can trap the virus responsible for COVID-19, killing it instantly. Zhifeng Ren, director of the Texas Center for Superconductivity at UH, collaborated with Monzer Hourani, CEO of Medistar, a Houston-based medical real estate development firm, and other researchers to design the filter, which was described in a paper published in *Materials Today Physics*. The researchers reported that virus tests at the Galveston National Laboratory found that 99.8% of SARS-CoV-2 was killed in a single pass through a filter made from commercially available nickel foam heated to 200°C, or about 392°F. It also killed 99.9% of the anthrax spores in testing at the national lab, which is run by the University of Texas Medical Branch.

AI study hopes to identify high-risk COVID-19 patients

Investigators from the Rensselaer Polytechnic Institute have received a grant from the National Institutes of Health to support the rapid development and integration of a series of artificial intelligence (AI) algorithms that will analyze multiple pieces of health data — from chest computed tomography images to vital signs —to help clinicians assess disease severity and predict patient outcomes in those with COVID-19. "Screening out the high-risk patients who may need intensive care later, and monitoring them more closely to provide early intervention, may help save their lives," said lead researcher Pingkun Yan.

Grant to further lung cancer research

Yale Cancer Center researchers were awarded an $11 million grant renewal from the National Institutes of Health to fund the Yale Specialized Program of Research Excellence in Lung Cancer. The initiative will focus on three primary projects during the next funding period. The first will analyze the immune suppressor capabilities of Siglec-15 and the potential success of Siglec-15 inhibition in patients with lung cancer with the development of predictive biomarkers. The second project will evaluate approaches to prevent tyrosine kinase inhibitor resistance in EGFR-mutant lung cancer. The third project will target lung cancer metastasis and drug resistance in the central nervous system.

Antiviral study underway now

An international study is evaluating the safety and efficacy of an antiviral drug, DAS181, as a possible treatment for hospitalized patients with severe COVID-19. DAS181 has been shown to be effective in fighting respiratory viruses, and limited preliminary data suggest that the drug may be beneficial for patients with COVID-19. The Phase 3 clinical trial is a double-blind, randomized controlled study. Half the participants will receive DAS181 through a nebulizer, and half will receive a placebo. The nebulizer is fitted with a mesh device that minimizes the risk of virus spread to health care workers. More than 30 sites across the United States, as well as sites in Australia, South Korea, and Taiwan, are participating in the trial. DAS181 is manufactured by Ansun Biopharma, Inc., which is sponsoring the study.

Digital tobacco cessation program offered to frontline workers free of charge

Digital health company Carrot, Inc., is partnering with #FirstRespondersFirst, an initiative of the Harvard T.H. Chan School of Public Health, Thrive Global, and the CAA Foundation aimed at supporting health care workers serving on the frontlines of the COVID-19 pandemic, to offer their Pivot digital tobacco cessation program to these workers at no cost during the COVID-19 crisis. Pivot is an evidence-based tobacco cessation program that includes the first FDA-cleared personal carbon monoxide breath sensor, a mobile

app for motivation and skill building, personal coaching, free nicotine-replacement medications, community support, lessons and challenges, and a clear path to helping users quit. Pivot will be launched initially in Boston, with the option for national expansion.

Phase 2 study to look at investigational therapy for COVID-19

A randomized Phase 2 clinical trial is now underway at the University of Texas Health Science Center at Houston (UTHealth) to gauge whether the investigational therapy called vadadustat could protect the lungs of patients with COVID-19 by triggering the body's protective response to low oxygen levels. Vadadustat, which is made by Akebia Therapeutics, is being tested in a Phase 3 clinical trial for anemia in patients with chronic kidney disease.

T cell therapy, bivalent vaccine in development

Tevogen Bio is planning to evaluate its proprietary antigen-specific T cell technology as a potential treatment for COVID-19 and is also developing a bivalent COVID-19 and influenza vaccine to assess its ability to generate cellular immunity. "I am excited to be involved in a scientific effort that will explore innovative approaches using the power of T cell therapy," says Tevogen CEO Ryan Saadi, MD, MPH. "We hope that these ideas can be harnessed to bring needed care for patients with COVID-19 and influenza A. We've discovered therapies that we anticipate will hold real promise in the fight against both viruses."

Tobacco treatment program goes online

The Duke-UNC Tobacco Treatment Specialist Training Program (Duke-UNC TTS) completed its first fully online, interactive training program last June. The online program brings the organization's on-site curriculum to a purely virtual environment while maintaining a highly interactive, skills-based training experience. Participants from 16 states took part in the session. "With our expertise in both medical and behavioral health approaches and addressing disparities in tobacco use treatment in different populations, Duke-UNC TTS is helpful across the broad spectrum of professionals who work with tobacco dependence," said Program Co-Director Adam Goldstein, MD.

Luminex adds SARS-CoV-2 to respiratory pathogen panel

Luminex Corporation has submitted an Emergency Use Authorization request to the FDA for a new expanded version of its NxTAG® Respiratory Pathogen Panel (RPP) to include the SARS-CoV-2 virus for high-throughput COVID-19 testing. The new test is a combination of the company's original NxTAG RPP, an FDA-cleared in vitro diagnostic for syndromic respiratory infection testing, and the most relevant circulating pathogen today, SARS-CoV-2. NxTAG RPP provides scalable throughput, allowing clinical labs to run up to 96 samples at a time and generate results in approximately four hours, with minimal hands-on time. The test runs on Luminex's MAGPIX® System and is designed for use in high-complexity molecular laboratories.