

# CHEST Physician™



Dr. Valerie Press said, "Assessment of patient recovery and functional capacity, beyond lung function and dyspnea symptoms, will need to include deconditioning, anxiety, PTSD, weakness, and malnutrition."

## 'Collateral damage': Pandemic threatens patients with COPD

BY THERESE BORDEN  
*MDedge News*

**FROM CHEST** ■ The COVID-19 pandemic may be inflicting collateral damage on vulnerable patients with chronic conditions, in particular, those with chronic obstructive pulmonary disease, according to a commentary published in CHEST (2020 May 28. doi: 10.1016/j.chest.2020.05.549) by a group of physicians who study COPD.

Not only is COPD among the most prevalent underlying diseases in hospitalized COVID-19 patients (Clin Microbiol Infect. 2020 Jun 8. doi: 10.1016/j.cmi.2020.05.041), but other unanticipated factors of treatment put these patients at extra risk. Valerie Press, MD, assistant professor

of medicine and pediatrics at the University of Chicago, and colleagues aimed to alert physicians to be aware of the potential negative effects, or collateral damage, that the pandemic can have on their patients with COPD, even those without a COVID-19 diagnosis.

These concerns include that patients may delay presenting to the ED with acute exacerbations of COPD, and once they present, they could be at later stages of the exacerbation. Further, "evaluation for COVID-19 as a possible trigger of acute exacerbations of COPD (AECOPD) is essential; however, implementing proven AECOPD therapies remains challenging. For instance, routine therapy with corticoste-

**COPD** // continued on page 6

## 'Don't suffer in silence': Get help for emotional distress

BY DEBRA A. SHUTE

**N**isha Mehta, MD, said her phone has been ringing with calls from tearful and shaken physicians who are distressed and unsettled about their work and home situation and don't know what to do.

What's more, many frontline physicians are living apart from family to protect them from infection. "So many physicians have called me crying. ... They can't even come home and get a hug," Dr. Mehta said. "What I'm hearing from a lot of people who are in New York and New Jersey is not just that they go to work all day and it's this exhausting process throughout the entire day, not only physically but also emotionally."

Physician burnout has held a steady spotlight since long before the COVID-19 crisis began, Dr. Mehta said. "The reason for that is multifold, but in part, it's hard for physicians to find an appropriate way to be able to process a lot of the emotions related to their work," she said. "A lot of that brews below the surface, but COVID-19 has really brought many of these issues above that surface."

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# Clinicians using CURE ID to report COVID-19 cases

BY DOUG BRUNK

*MDedge News*

Federal health officials are encouraging clinicians to use the free CURE ID mobile app and

web platform as a tool to collect cases on the treatment of patients with COVID-19, in conjunction with ongoing clinical trial efforts.

“By utilizing the CURE ID platform now for COVID-19 case col-

lection – in conjunction with data gathered from other registries, EHR systems, and clinical trials – data collected during an outbreak can be improved and coordinated,” Heather A. Stone, MPH, said during a

June 9 webinar sponsored by the Food and Drug Administration. “This may allow us to find possible treatments to help ease this pandemic, and prepare us better to fight the next one.”

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THE NEWSPAPER OF THE AMERICAN COLLEGE OF CHEST PHYSICIANS

During the hour-long webinar, Ms. Stone, a health science policy analyst in the office of medical policy at the Food and Drug Administration's Center for Drug Evaluation and Research, demonstrated CURE ID, an Internet-based data repository first developed in 2013 as a collaboration between the FDA and the National Center for Advancing Translation-

al Sciences, a part of the National Institutes of Health. It provides licensed clinicians worldwide with an opportunity to report novel uses of existing drugs for patients with difficult-to-treat infectious diseases, including COVID-19, through a website, a smartphone, or other mobile device. The app can be downloaded for free at <http://cure.ncats.io>.

It can also be downloaded from the Apple app store or the Google Play store by searching "CURE ID."

According to Ms. Stone, the platform's three main goals are to enhance the understanding of new uses of approved medical products, to facilitate clinical trials and drug development, and to serve as a resource for physicians to share in-

formation where no FDA-approved product (which has been proven to be safe and effective) exists for the new use. CURE ID enables users to report their own cases as well as read cases of neglected infectious diseases with no sufficient approved therapies from other clinicians around the world. "It also enables clinicians to engage directly with communities of disease experts around the world, breaking down geographic and specialty silos," Ms. Stone said. "It also enables them to access information on approved therapies for each disease and as well on active clinical trials."

To date, CURE-ID contains information on 325 infectious diseases, including 1,580 case reports and 18,907 clinical trials. Initial pilot priority diseases include COVID-19, mycetoma, atypical mycobacteria, drug-resistant gonorrhea, and rare and resistant fungal infections, as well as multidrug resistant gram-negative bacteria.

As of June 9, COVID-19-related data on the platform includes 151 case reports that have been extracted from the published literature or entered by clinician users, 80 discussion posts, and links to 694 clinical trials, 303 journal articles, 212 news articles, and 34 events. A total of 65 repurposed drugs have been identified as potential treatments for the virus, including 15 drugs with 10 or more cases.

"This facilitates clinicians reporting their real-world experiences treating COVID-19 patients, when patients are unable to be enrolled in a clinical trial," Ms. Stone said. "It includes an updated case report form tailored to COVID-19 and data fields that have been harmonized with other real-world data and clinical trial platforms." She pointed out that voluntary submission of cases to CURE ID is not a substitute for filing information with regulatory and public health authorities, where required. The platform also enables data to be entered and adverse events to be automatically shared with the FDA's MedWatch Adverse Reporting System.

Ms. Stone concluded the webinar by announcing the formation of a new private-public partnership between the Critical Path Institute and the FDA and NCATS/NIH known as the CURE Drug Repurposing Collaboratory. The effort will begin with a pilot project focused on furthering drug development for COVID-19 through use of the CURE ID platform. She reported having no financial disclosures.

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roids for AECOPD may be delayed due to diagnostic uncertainty and hesitation to treat COVID-19 with steroids while COVID-19 testing is pending,” the authors stated.

Shortages and scarcity of medications such as albuterol inhalers to treat COPD have been reported. Patients with COPD may be less likely to access their health care providers because of fear of COVID-19 infection. This barrier to care and the current higher threshold for presenting to the hospital may lead to more cases of AECOPD and worsening health in these patients, wrote the authors.

Dr. Press said in an interview: “Access to medications delivered through inhalers is challenging even without the pandemic due to the

*COVID pandemic has highlighted critically important disparities in access to health care and disparities in health.*

high cost of medications. Generic medications are key to improving access for patients with chronic lung disease, so once the generic albuterol becomes available, this should help with access.”

In addition to all of these concerns is the economic toll this pandemic is taking on patients. The association between COPD and socioeconomic status has been studied in depth (Am J Respir Crit Care Med. 2019; 199[8]:961-9) and would indicate that low-income patients with COPD would face an increased burden during an economic downturn.

Dr. Press stressed that the COVID pandemic has highlighted critically important disparities in access to health care and disparities in health. “Many of the recommendations regarding stay-at-home and other safety mechanisms to prevent contracting and spreading COVID-19 have not been feasible for all sub-populations in the United States. Essential workers do not have the ability to stay home. Further, those that rely on public transportation have less opportunities to social distance. Finally, while telemedicine opportunities have advanced for clinical care, not all patients have equal access to these capabilities and health disparities could widen in this regard as well. Clinicians have a responsibility to identify social determinants of health that increase risks to our patients’ health and limit their safety.”

The authors offer some concrete

suggestions of how physicians can address some of these concerns:

- Be alert to potential barriers to accessing medication and be aware of generic albuterol inhaler recently approved by the Food and Drug Administration in response to COVID-19–related shortages.
- Use telemedicine to monitor patients and improve home self-management. Clinicians should help patients “seek care with worsening symptoms and have clear management guidelines regarding seeking phone/video visits; implementing therapy with corticosteroids, antibiotics, or inhalers and nebulizers; COVID-19 testing recommendations; and thresholds for seeking emergent, urgent, or outpatient care in person.”
- Ensure that untried therapy for COVID-19 “does not displace proven and necessary treatments for patients with COPD, hence placing them at increased risk for poor outcomes.”

Dr. Press is also concerned about the post-COVID-19 period for patients with COPD. “It is too early to know if there are specific after effects of the COVID infection on patients with COPD, but given the damage the virus does to even healthy lungs, there is reason to have concern that COVID could cause worsening damage to the lungs of individuals with COPD.”

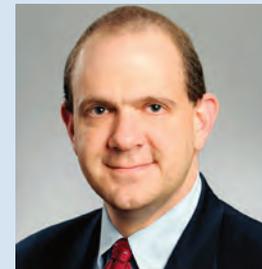
She stressed, “Post-ICU [PICU] syndrome has been recognized in patients with ARDS [acute respiratory distress syndrome] generally, and patients who recover from critical illness may have long-lasting (and permanent) effects on strength, cognition, disability, and pulmonary function. Whether the PICU syndrome in patients with ARDS due to COVID-19 specifically is different from the PICU syndrome due to other causes remains unknown. But clinicians whose patients with COPD survive COVID-19 may expect long-lasting effects and slow recovery in cases where COVID-19 led to severe ARDS and a prolonged ICU stay. Assessment of overall patient recovery and functional capacity (beyond lung function and dyspnea symptoms) will need to include deconditioning, anxiety, PTSD, weakness, and malnutrition. Additionally, clinicians may help patients and their families understand the expected recovery and help facilitate family conversations about residual effects of COVID-19.”

The authors had no disclosures.  
tborden@mdedge.com

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Frustrated that governments weren't doing enough to support health care workers during the pandemic, Dr. Mehta, a radiologist in Charlotte, N.C., decided there needed to be change. On April 4, Dr. Mehta and two physician colleagues submitted to Congress the COVID-19 Pandemic Physician Protection Act, which ensures, among other provisions, mental health coverage for health care workers. An accompanying petition on [change.org](http://change.org) had received nearly 300,000 signatures as of May 29.

### Don't suffer in silence

A career in medicine comes with immense stress in the best of times, she notes, and managing a pandemic in an already strained system has taken those challenges to newer heights. "We need better support structures at baseline for physician mental health," said Dr. Mehta.

"That's something we've always been lacking because it's been against the culture of medicine for so long to say, 'I'm having a hard time.'"

If you're hurting, the first thing to recognize is that you are not alone in facing these challenges. This is true with respect not only to medical care but also to all of the family, financial, and business concerns physicians are currently facing. "Having all of those things hanging over your head is a lot. We've got to find ways to help each other out," Dr. Mehta said.

### Check out virtual psychological counseling

Not unlike the way telemedicine has allowed some physicians to keep seeing their patients, many modalities enable participation in therapy

through video, chat, phone call, or any combination thereof. Look for a service that is convenient, flexible, and HIPAA compliant.

Traditional in-office mental health therapy has quickly moved to telemedicine. Many if not most insurers that cover counseling visits



Dr. Mehta

are paying for telepsychiatry or telecounseling. If you don't know of an appropriate therapist, check the American Psychiatric Association or its state chapters; check the American Psychological Association; or look for a licensed mental health counselor.

Because financial constraints are a potential barrier to therapy, Project Parachute, in cooperation with Eleos Health, has organized a cadre of therapists willing to provide pro bono online therapy for health care workers. The amount of free therapy provided to qualified front-line workers is up to the individual therapists. Discuss these parameters with your therapists up front.

Similar services are offered from companies such as Talkspace and BetterHelp on a subscription basis. These services are typically less expensive than in-person sessions. Ask about discounts for healthcare workers. Talkspace, for example, announced in March, "Effective immediately, healthcare workers across the country can get access to a free month of our ... online therapy that includes unlimited text, video, and audio messaging with a licensed therapist."

### Look into online support groups

For more on-demand peer support, look for groups such as the COR Sharing Circle for Healthcare Workers on Facebook. The site's search engine can point users to plenty of other groups, many of which are closed (meaning posts are visible to members only).

Dr. Mehta hosts her own Facebook group called Physician Community. "I would like to think (and genuinely feel) that we've been doing a great job of supporting each other there with daily threads on challenges, treatments, pick-me-ups, vent posts, advocacy, and more," she said.

For anyone in need, PeerRxMed is a free, peer-to-peer program for physicians and other health care workers that is designed to provide support, connection, encouragement, resources, and skill-building to optimize well-being.

For those craving spiritual comfort during this crisis, a number of churches have begun offering that experience virtually, too. First Unitarian Church of Worcester, Mass., for example, offers weekly services via YouTube. Similar online programming is being offered from all sorts of organizations across denominations.

### Download coping apps

For DIY or on-the-spot coping support, apps can help physicians get through the day. Apps and websites that offer guided meditations and other relaxation tools include Headspace, Calm, and Insight Timer. Before downloading, look for special discounts and promotions for health care workers.

Additionally, COVID Coach is a free, secure app designed by the U.S. Department of Veterans Affairs that includes tools to help you cope with stress and stay well, safe, healthy, and connected. It also offers advice on navigating parenting, care giving, and working from home while social distancing, quarantining, or sheltering in place.

For practicing daily gratitude, Delightful Journal is a free app that offers journaling prompts, themes, reminders, and unlimited private space to record one's thoughts.

### Adopt a ritual

Although self-care for physicians is more crucial now than ever, it can look different for every individual. Along the same lines as keeping a journal, wellness experts often recommend beginning a "gratitude practice" to help provide solace and perspective.

Tweak and personalize these activities to suit your own needs, but be sure to use them even when you're feeling well, said Mohana Karlekar, MD, medical director of palliative care and assistant professor at Vanderbilt University Medical Center, Nashville, Tenn.

One exercise she recommends is known as Three Good Things. "Every day, at the end of the day, think about three good things that have happened," she explained. "You can always find the joys. And the joys don't have to be enormous. There is joy – there is hope – in everything," Dr. Karlekar said.

*A version of this article originally appeared on Medscape.com.*

## Where to find support

The medical community has created several pathways to help its own. Types of resources for health care workers on the COVID-19 front lines run the gamut from crisis hotlines to smartphone apps to virtual counseling, often for free or at discounted rates.

The following list represents a cross-section of opportunities for caregivers to receive care for themselves.

### Crisis hotlines

- **Physician Support Line.** This free and confidential hotline was launched by Mona Masood, DO, a Philadelphia-area psychiatrist and moderator of a Facebook forum called the COVID-19 Physicians Group. The PSL is run by more than 600 volunteer psychiatrists who take calls from U.S. phy-

sicians 7 days a week from 8:00 a.m. to 1:00 a.m., with no appointment necessary. The toll-free number is 888-409-0141.

- **For the Frontlines.** This 24/7 help line provides free crisis counseling for front-line workers. They can text FRONTLINE to 741741 in the United States (support is also available for residents of Canada, Ireland, and the United Kingdom).

### Resources from professional groups

- **Action Collaborative on Clinician Well-Being and Resilience.** Created by the National Academy of Medicine in 2017, the Action Collaborative comprises more than 60 organizations committed to reversing trends in clinician burnout. In response to the pandemic, the group has compiled a list of strategies and resources to support the health and well-being of clinicians who are providing health care

during the COVID-19 outbreak.

- **American Medical Association.** The AMA has created a resource center dedicated to providing care for caregivers during the COVID-19 pandemic. The website includes specific guidance for managing mental health during the pandemic.
- **American College of Physicians.** The professional society of internal medicine physicians has created a comprehensive guide for physicians specific to COVID-19, with a section dedicated to clinician well-being that includes information about hotlines, counseling services, grief support, and more.
- **American Hospital Association.** The AHA's website now includes regularly updated resources for health care clinicians and staff, as well as a special section dedicated to protecting and enabling health care workers in the midst of the pandemic.

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# Pandemic can complicate care of patients with PAH

BY HEIDI SPLETE

MDedge News

The presence of pulmonary arterial hypertension, whether preexisting or occurring in conjunction with a COVID-19 infection, will likely increase the risk for morbidity and mortality in these patients, according to a research article published in *Pulmonary Circulation*.

“The impetus for this manuscript was a recent discussion within the Pulmonary Hypertension Association (PHA) and [its] Scientific Leadership Council who expressed a need for guidelines from experts in the field,” wrote John J. Ryan, MD, of the University of Utah, Salt Lake City, and colleagues.

The authors highlight some of the unique challenges in caring for patients with pulmonary hypertension (PH), particularly pulmonary arterial hypertension (PAH), in the context of the COVID-19 pandemic.

Telemedicine and temporary visit schedules for new and returning PAH patients can help reduce risk of virus transmission, if patient accessibility to telemedicine is feasible. Protocols to reduce the risk of virus exposure or transmission in the office setting included less frequent echocardiography and 6-Minute Walk Tests (6MWTs) for patients in stable condition. In stable patients, “avoid pulmonary function of V/Q tests when possible,” the authors wrote.

New patients who have been referred for PAH present a challenge in conducting a thorough evaluation that would normally include measurement of invasive hemodynamics in keeping with current diagnostic guidelines. Clinicians will need to balance the potential risks of COVID-19 exposure during elective procedures against the benefits of full evaluations to plan PAH treatment, the authors noted.

For established patients who are clinically stable, remote visits may be an option, with a risk/benefit assessment of the need for in-person diagnostic tests at the current time, they said. However, telemedicine’s limitations include not only patient accessibility and understanding of audio and video technology, but also inability to accurately measure vital signs, they said.

As for routine testing such as echocardiograms, 6MWTs, and other laboratory testing, “it is important to consider the additive value of these sometimes comprehensive tests in the context of the risks associated with visiting the hospital or clinic to obtain them,” the authors said.

Patients who are unstable and experience worsening right heart failure (RHF) at home may have contracted a COVID-19 infection, but the differential diagnosis includes sepsis, ischemia, and PAH disease progression. “During the current pandemic, fever at home in a PAH patient should be assumed to represent a COVID-19 infection,”

and patients with worsening respiratory symptoms that require hospitalization should be tested for COVID-19, the authors emphasized.

Use of extracorporeal membrane oxygenation or other intensive interventions should be considered in the context of risk assessment, the authors said. “As a general recommendation, practitioners should consider utilizing an established PAH-specific risk assessment tool to help identify patients who are more likely to survive heroic interventions during the COVID-19 outbreak,” they wrote.

Training and education of PH providers will continue to be limited by the pandemic, and many clinical trials and research programs have been suspended and will need to be restructured to minimize risk of transmission of the COVID-19 virus, the authors said. However, health care providers must continue to provide PAH patients and families with advice and updates in best practices, while “acknowledging that the situation changes rapidly,” they concluded.

Dr. Ryan disclosed participating on the speaker’s bureau and providing consulting services for, Actelion and Bayer, as well as receiving research support from the Reagan Corporation, the Gordon Family, and the Cushman Family.

chestphysiciannews@chestnet.org

**SOURCE:** Ryan JJ et al. *Pulm Circ*. 2020 Apr 29. doi: 10.1177/2045894020920153.

## Comorbidities increase COVID-19 deaths by factor of 12

BY RICHARD FRANKI

MDedge News

COVID-19 patients with an underlying condition are 6 times as likely to be hospitalized and 12 times as likely to die, compared with those who have no such condition, according to the Centers for Disease Control and Prevention.

Among those with underlying conditions such as cardiovascular disease or diabetes, 45.4% of patients with COVID-19 were hospitalized, versus 7.6% of patients without an underlying condition, said Erin K. Stokes, MPH, and associates of the CDC COVID-19 Emergency Response team.

The difference in deaths was even greater over the study period of Jan. 22–May 30, 2020: 19.5% of COVID-19 patients with underlying conditions died, compared with 1.6% of those with no underlying condition. The gap narrowed, however, for ICU admissions, with corresponding rates of 8.5% and 1.5%, the investigators reported June 15 in the *Morbidity and Mortality Weekly Report*.

“The COVID-19 pandemic continues to be severe, particularly in certain population groups,” they said.

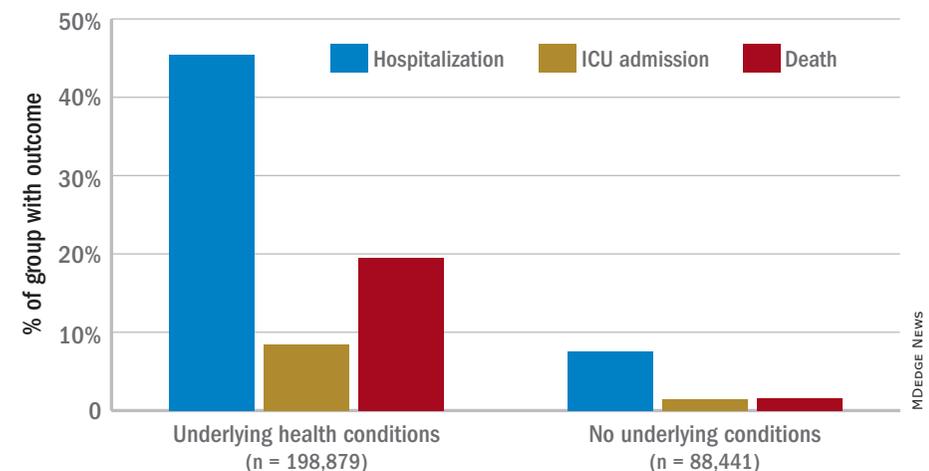
The cumulative incidence of laboratory-confirmed cases up to May 30, for instance, was nearly twice as high for those aged 80 years and over (902 per 100,000 population) than for those aged 70-79 years (464.2 per 100,000). Those aged 50-59 years had the second-highest incidence, 550.5 per 100,000, Ms. Stokes and associates said.

“Among cases with known race and ethnicity, 33% of persons were Hispanic, 22% were black, and 1.3% were [American Indian/Alaska Native]. These findings suggest that persons in these groups, who account for 18%, 13%, and 0.7% of the U.S. population, respectively, are disproportionately affected by the COVID-19 pandemic,” they wrote.

Another source of disparity: “Incidence among males and females was similar overall, [but] severe outcomes were more commonly reported among males,” the investigators noted. Cumulative incidence was 401.1 per 100,000 for males and 406.0 for females, but 6.0% of male patients died, compared with 4.8% of females.

As of May 30, a total of 1,761,503 cases and 103,700 deaths had been reported to the CDC. Of those cases, approximately 1.3 million were

### Outcomes among patients with COVID-19 by comorbidity status



**Notes:** 1,761,503 cases were reported in the United States as of May 30, 2020. Outcome and underlying-condition status are unknown for the majority of those patients.

**Source:** MMWR. 2020 Jun 15;69(early release):1-7

included in the analysis, with data on individual underlying health conditions available for 287,320 (22%). The split on those cases was 198,879 with health conditions and 88,411 without, the CDC data show.

The most frequently reported underlying conditions were cardiovascular disease (32%), diabetes (30%), chronic lung disease (18%), and renal disease (7.6%), and there were no significant differences between

males and females, Ms. Stokes and associates said.

The pandemic “is an ongoing public health crisis in the United States that continues to affect all populations and result in severe outcomes including death,” they said, emphasizing “the continued need for community mitigation strategies, especially for vulnerable populations, to slow COVID-19 transmission.”

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**CRITICAL CARE MEDICINE**

# Role of secondary infections in COVID-19 remains a mystery

BY BRUCE JANCIN

MDedge News

**S**econdary respiratory infections appear to be highly prevalent among patients with severe COVID-19, but at this point, most pulmonologists aren't sure what to make of this understudied phenomenon.

"We really do not understand the implications of secondary infections on outcomes in COVID-19 patients," David L. Bowton, MD, FCCP, said

in an interview. "In most early reports the incidence of secondary infections was much higher in patients dying from COVID-19, compared to survivors, but it isn't clear whether this indicates that the secondary infection itself led to excess mortality or was more a marker of the severity of the COVID-19 infection.

"Details of the diagnostic criteria used, the microbiology, and the appropriateness of treatment of these secondary infections has not generally been included in these reports," said Dr. Bowton, a pulmonologist and professor emeritus of critical care anesthesiology at Wake Forest University, Winston-Salem, N.C.

One such early retrospective cohort study included 191 COVID-19 patients in Wuhan, China. Of the 54 who died in hospital, half had secondary bacterial lung infections (*Lancet*. 2020 Mar 28;395[10229]:1054-62).

This comes as no surprise to U.S. pulmonologists, who learned back in their training that many deaths during the so-called Spanish influenza epidemic of 1918-1920 were actually caused by secondary pneumonia involving *Staphylococcus aureus*, commented Daniel Ouellette, MD, FCCP, associate director of medical critical care at Henry Ford Hospital, Detroit.

Study of secondary infections may be difficult given the challenges of obtaining bronchoalveolar lavage samples in mechanically ventilated patients with COVID-19, accord-

ing to Eric Gartman, MD, FCCP, a pulmonologist at Brown University, Providence, R.I., and director of the pulmonary function laboratory at the Providence Veterans Affairs Medical Center.

"Unfortunately, many of the invasive modalities that are typically employed to help diagnose secondary infections in critically ill patients are being severely limited or even prohibited in COVID-19 patients due to infection control measures," he said. As a result, Dr. Gartman noted, intensivists are often resorting to empiric broad-spectrum antimicrobial therapy in patients with severe COVID-19 and are without ready access to the bacterial cultures which might otherwise permit later treatment de-escalation or retargeting.

Among the myriad areas of uncertainty regarding COVID-19 is the proportion of bacterial coinfections that are hospital acquired. Given the lengthy duration of invasive mechanical ventilation in patients with severe COVID-19 – a mean of 9.1

days in the United Kingdom – the chances of hospital-acquired infection are likely substantial. Moreover, a recent single-center U.K. study involving microbiologic testing in 195 consecutive patients newly hospitalized for COVID-19 reported that community-acquired bacterial infection was uncommon: Just 4% of patients had pneumococcal coinfection at hospital admission, and *S. aureus* wasn't detected in anyone (*Lancet*. 2020;1:362. doi: 10.1016/S2666-5247[20]30036-7). French investigators have reported detecting putative invasive pulmonary aspergillosis in nearly one-third of a small series of 27 consecutive mechanically ventilated COVID-19 patients (*Lancet Resp Med*. 2020; 8[6]:e48-9). Dr. Gartman said the diagnostic testing methods utilized in this and similar reports haven't been prospectively validated in COVID-19. The testing methods may not indicate invasive *Aspergillus*

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# COVID-19 + diabetes: Focus on glycemic control

BY JENNIFER LUBELL

Optimizing glycemic control “is the key to overall treatment in people with diabetes and COVID-19,” said Antonio Ceriello, MD, during a webinar sponsored by Harvard Medical School, Boston.

Dr. Ceriello, a research consultant with the Italian Ministry of Health, IRCCS Multi-Medica, Milan, highlighted a recent study that examined the association of blood glucose control and outcomes in COVID-19 patients with preexisting type 2 diabetes.

Among 7,000 cases of COVID-19, type 2 diabetes correlated with a higher death rate. However, those with well-controlled blood glucose (upper limit  $\leq 10$  mmol/L) had a survival rate of 98.9%, compared with just 11% among those with poorly controlled blood glucose (upper limit  $> 10$  mmol/L), a reduction in risk of 86% (adjusted hazard ratio, 0.14; *Cell Metab.* 2020 May 1. doi: 10.1016/j.cmet.2020.04.021).

Clinicians should also consider the possible side effects of hypoglycemic agents in the evolution of this disease. This is true of all patients, not just diabetes patients, Dr. Ceriello said. “We have data showing that ... hyperglycemia contributes directly to worsening the prognosis of COVID-19 independent of the presence of diabetes.”

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infection in this population with a high degree of certainty, since they have previously been performed mainly in patients with hematologic malignancies.

“Although there is nothing definitive regarding this research, as a practicing critical care doctor one should respect these findings and consider this secondary diagnosis if the supporting clinical data is positive, especially given that the mortality risk in this population is high,” he advised.

Dr. Bowton said that he and his fellow intensivists at Wake Forest Baptist Health don’t routinely screen COVID-19 patients for secondary bacterial or fungal infections. And in talking with colleagues around the country, it’s his impression that most have similarly elected not to do so. But he added, “Our clinical index of suspicion for secondary infections is heightened and, if triggered, will initiate a search for and treatment of these secondary infections.”

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Another risk factor is thrombosis, a clear contributor to death rates in COVID-19. Research on thrombosis incidence in COVID-19 patients with diabetes reported higher levels of D-dimer

levels in people with diabetes, especially among those who couldn’t manage their disease.

Tying all of these factors together, Dr. Ceriello discussed how ACE-2 glycosylation, in combination

with other factors in SARS-CoV-2 infection, could lead to hyperglycemia, thrombosis, and subsequently multiorgan damage in diabetes patients.

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# Sleep burden index predicts recurrent stroke

BY PAULINE ANDERSON

**A** sleep burden index that considers multiple sleep-wake disturbances (SWDs) predicts subsequent cardiocerebrovascular

events during the 2 years after a stroke, preliminary results on an ongoing study suggest.

The index, which combines sleep duration, sleep-disordered breathing, restless leg syndrome (RLS),

insomnia, and sleep duration, is a better predictor of new events than a single sleep disorder alone.

With further evidence of its usefulness, “the sleep burden index could be integrated into clinical rou-

tine,” Simone B. Duss, PhD, of the department of neurology at Bern (Switzerland) University Hospital, told a press briefing.

The findings were presented online at the Congress of the European

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Academy of Neurology 2020, which transitioned to a virtual meeting because of the COVID-19 pandemic.

Sleep-wake disorders are very common in stroke patients and may preexist or appear de novo as a consequence of brain damage, said Dr. Duss. “They may also be a result of medical, psychological, or environmental challenges these patients face after a stroke.”

### Clear evidence

There’s “clear evidence” that sleep disordered breathing is a risk factor for stroke, and negatively affects stroke outcome if left untreated, said Dr. Duss.

But for other SWDs, such as insomnia, RLS, and long and short sleep duration, “the evidence is less compelling,” she said. “However,

some studies still suggest they influence stroke risk and outcome.”

Experts believe that sleep disturbances after a stroke lead to sleep fragmentation, as well as decreased slow wave sleep and REM sleep.

“This negatively affects inflammatory neuroprotective and synaptic plasticity processes during the recovery process of a stroke,” said

Dr. Duss. “In the end, this results in worse outcomes with regard to recurrent events but also in activities of daily living and mood.”

The new analysis aimed to assess the impact of sleep-wake disturbances on recurrent events and outcomes following a stroke or transient ischemic attack (TIA). It included 438 patients with acute stroke (85%) or TIA (15%). The mean age of the study population was 65 years, and 64% were male.

Researchers used the National Institutes of Health Stroke Scale

*The index, which combines sleep duration, sleep-disordered breathing, restless leg syndrome, insomnia, and sleep duration, is a better predictor of new events.*

(NIHSS) to assess stroke severity. At admission, the mean NIHSS score was 4. Most strokes (77.2%) were supratentorial.

About one-fifth of stroke patients and one-third of TIA patients had experienced a previous event.

Researchers used functional outcome scores to assess the clinical course of the stroke or TIA. In addition, they regularly asked patients about recurrence of cardiocerebrovascular events.

Investigators assessed sleep disordered breathing during the acute phase of stroke, so within the first few days, using respirometry. They collected information on the presence of other sleep-wake disturbances from questionnaires and clinical interviews at 1 month, 3 months, 1 year, and 2 years after the event.

About 26% of subjects showed severe sleep disordered breathing, “meaning that they had more than 20 apnea-hypopnea events per hour,” said Dr. Duss.

More than a quarter of patients reported subclinical symptoms of insomnia (measured using the Insomnia Severity Index), and up to 10% reported severe insomnia symptoms corresponding to the clinical diagnosis of insomnia, she said.

About 9% of patients in the acute phase of stroke, and 6% in the more chronic phase, fulfilled the diagnostic criteria of RLS.

### More ‘skewed’

The results for sleep duration were relatively “skewed,” said Dr. Duss. More

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# Children with cystic fibrosis and their caregivers face sleep difficulties

BY JENNIE SMITH

MDedge News

Children with cystic fibrosis have inadequate sleep even during times of normal lung function, according to results from a new study.

Children aged 6-12 years had more sleep issues compared with preschoolers or teenagers, researchers also found, and the quality of sleep among caregivers was seen strongly linked to that of their children with CF.

For research published in the *Journal of Cystic Fibrosis*, Kelly C. Byars, PsyD, and colleagues at Cincinnati Children's Medical Center and the University of Cincinnati surveyed parents of 91 medically stable patients with cystic fibrosis aged 18 and younger at a single CF treatment center between 2016 and 2017.

Fifty-four percent of the children in the study were female, the mean age was 9 years, and 90% of the caregivers were mothers. In addition to the sleep questionnaires, the researchers looked at the children's available lung function data from around the time of the survey. Forced expiratory volume in 1 second (FEV<sub>1</sub>) measures showed the vast majority had no obstructive lung disease (73% of the cohort) or only mild symptoms (18%) at the time their caregivers were surveyed.

Overall, some 40% of caregivers said they had concerns about their own sleep, while 29% said they were concerned for their children's sleep.

Parents reported night waking, daytime sleepiness, and difficulty falling asleep as their main problems, and difficulty falling asleep as the top issue for their children, along with daytime sleepiness, night waking, and mouth breathing.

Sleep issues were most pronounced for children aged 6-12 and their caregivers, a group for which 44% of caregivers said they were concerned for their children's sleep and 55% for their own sleep. For this same group only 8% of parents reported their children having nocturnal cough, and just 5% reported gastrointestinal problems at night.



Dr. Artinian

Overall, the caregivers in the study reported inadequate sleep, with more than half saying they got less than 7 hours per night. Similarly, more than half of the school-age and adolescent patients with CF were getting less than the nightly minimum recommended by the American Academy of Sleep Medicine.

The researchers noted "large effects for parent and child associations for insomnia symptoms that may be amenable to treatment," especially trouble returning to sleep and daytime sleepiness.

The study "is the first to examine parent reported sleep disturbances and sleep duration in both parents and their children with CF spanning

a broad age range and including patients who were medically stable and predominantly free of lung dysfunction," Dr. Byars and colleagues wrote in their analysis, adding that sleep health should be integrated into care protocols for CF patients and their families, and families of children with other chronic illnesses.

In a comment on Dr. Byars and colleagues' study, Hovig Artinian, MD, a pediatric pulmonary and sleep medicine specialist at Helen DeVos Children's Hospital in Grand Rapids, Mich., said the findings "highlight for all of us that we must regularly assess and address sleep disturbances in our children with CF specifically, but also in all children with chronic conditions."

Children with CF "carry a heavy burden," Dr. Artinian said, "balancing living their lives with daily interruptions to their typical day to complete multiple treatments. As a result, sleep can be impacted even when there are no other clinical or objective signs of illness, so that was not an entirely surprising finding." Difficulties with sleep onset and maintenance can be prevalent in the absence of changes in children's daytime behavior or any other psychological signs, Dr. Artinian said, noting that in his practice he routinely asks families whether children snore (something recommended by the American Academy of Pediatrics for all well-child checks) and whether they have any other concerns about their sleep.

"Even if the answer is 'no' the first time, the act of asking plants a seed in their minds to keep an eye open and to know they can discuss it with us at a future visit if concerns come up," Dr. Artinian said.

Dr. Byars and colleagues noted several limitations to their study including its cross-sectional, single-center design, potential participant selection bias, reliance on parent reports of child sleep, and use of a novel, nonvalidated survey instrument.

The researchers received funding from the Boomer Esiason Foundation for their study and disclosed no financial conflicts of interest. Dr. Artinian had no relevant disclosures.

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**SOURCE:** Byars KC et al. *J Cyst Fibros*. 2020 May. doi: 10.1016/j.jcf.2020.04.003.



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patients reported longer sleep duration (more than 9 hours) at 1 month than at month 3, and more reported shorter sleep duration (4.0 hours or less) at month 3 than at month 1.

The researchers built a sleep burden index for the combined impact of the various sleep-wake disturbances.

They used this index as a predictor of subsequent cardiocerebrovascular events within 3 months after an event. They used a composite outcome that included recurrent

stroke or TIA, MI, heart failure, and urgent revascularization, as well as new cardiocerebrovascular events, from 3 to 24 months.

The analysis showed that the mean sleep burden index was higher for stroke patients with a recurrent event, compared with stroke or TIA patients without a recurrent event ( $P = .0002$ ).

A multiple logistical regression model with the presence or absence of a recurrent event as an outcome showed that the sleep burden index is a significant predictor of recurrent

events (odds ratio, 2.10;  $P = .001$ ). This was true even after controlling for age, gender, and baseline stroke severity.

The baseline apnea/hypopnea index and sleep duration were also significant predictors of new events. Importantly, though, the sleep burden index remained a significant predictor of recurrent events even after excluding the apnea/hypopnea index component, said Dr. Duss. "So the predictive power of the sleep burden index is not only driven by the apnea-hypopnea index at the beginning of a stroke."

Sleep-wake disturbances "should be more carefully assessed and considered in comprehensive treatment approaches," not only in stroke patients, but in neurologic patients in general, said Dr. Duss.

The research was supported by grants from the Swiss National Science Foundation and the Swiss Heart Foundation. Dr. Duss and Dr. Dawson disclosed no relevant financial relationships.

A version of this article originally appeared on *Medscape.com*.

# ACE inhibitors and severe COVID-19 under study

BY SUE HUGHES

**A** new nationwide U.S. observational study suggests that ACE inhibitors may protect against severe illness in older people with COVID-19, prompting the start of a randomized clinical trial to test the strategy.

A new meta-analysis of all the available data on the use of ACE inhibitors and angiotensin-receptor blockers (ARBs) in COVID-19-infected patients has concluded that these drugs are not associated with more severe disease and do not increase susceptibility to infection.

The observational study (doi: 10.1101/2020.05.17.20104943), which

– can reduce hospitalization of patients infected with COVID-19,” added Dr. Krumholz, professor of medicine at Yale and director of the Yale New Haven Hospital Center for Outcomes Research.

A pragmatic clinical trial is now being planned. In this trial, 10,000 older people who test positive for COVID-19 will be randomly assigned to receive either a low dose of an ACE inhibitor or placebo.

Recruitment for the trial began in June of 2020. It is open to all eligible Americans who are older than 50 years, who test negative for COVID-19, and who are not tak-

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**Dr. Harlan M. Krumholz**

was published on the MedRxiv preprint server on May 19 and has not yet been peer reviewed, was conducted by the health insurance company United Health Group and by Yale University, New Haven, Conn.

The investigators analyzed data from 10,000 patients from across the United States who had tested positive for COVID-19, who were enrolled in Medicare Advantage insurance plans or were commercially insured, and who had received a prescription for one or more antihypertensive medications.

Results showed that the use of ACE inhibitors was associated with an almost 40% lower risk for COVID-19 hospitalization for older people enrolled in Medicare Advantage plans. No such benefit was seen in the younger commercially insured patients or in either group with ARBs.

At a telephone media briefing on the study, senior investigator Harlan M. Krumholz, MD, said: “We don’t believe this is enough info to change practice, but we do think this is an interesting and intriguing result.

“These findings merit a clinical trial to formally test whether ACE inhibitors – which are cheap, widely available, and well-tolerated drugs

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ing medications for hypertension. Prospective patients can sign up at a dedicated website (<https://www.unitedinresearch.com>).

The randomized trial, also conducted by United Health Group and Yale, is said to be “one of the first virtual COVID-19 clinical trials to be launched at scale.”

For the observational study, the researchers identified 2,263 people who were receiving medication for hypertension and who tested positive for COVID-19. Of these, approximately two-thirds were older, Medicare Advantage enrollees; one-third were younger, commercially insured individuals.

In a propensity score-matched

analysis, the investigators matched 441 patients who were taking ACE inhibitors to 441 patients who were taking other antihypertensive agents; and 412 patients who were receiving an ARB to 412 patients who were receiving other antihypertensive agents.

Results showed that, during a median of 30 days after testing positive, 12.7% of the cohort were hospital-

ized for COVID-19. In propensity score-matched analyses, neither ACE inhibitors (hazard ratio, 0.77;  $P = .18$ ) nor ARBs (HR, 0.88;  $P = .48$ ) were significantly associated with risk for hospitalization.

However, in analyses stratified by the insurance group, ACE inhibitors (but not ARBs) were associated with a significant lower risk for hospital-

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ization among the Medicare group (HR, 0.61;  $P = .02$ ) but not among the commercially insured group (HR, 2.14;  $P = .12$ ).

A second study examined outcomes of 7,933 individuals with hypertension who were hospitalized with COVID-19 (92% of these patients were Medicare Advantage enrollees). Of these, 14.2% died, 59.5%

survived to discharge, and 26.3% underwent ongoing hospitalization. In propensity score-matched analyses, use of neither an ACE inhibitor

*“These findings merit a clinical trial to formally test whether ACE inhibitors – which are cheap, widely available, and well-tolerated drugs – can reduce hospitalization of patients infected with COVID-19.”*

(HR, 0.97;  $P = .74$ ) nor an ARB (HR, 1.15;  $P = .15$ ) was associated with risk of in-hospital mortality.

The researchers said their findings

are consistent with prior evidence from randomized clinical trials suggesting a reduced risk for pneumonia with ACE inhibitors that is not observed with ARBs.

They also cited some preclinical evidence that they said suggests a possible protective role for ACE inhibitors in COVID-19: that ACE

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inhibitors, but not ARBs, are associated with the upregulation of ACE2 receptors, which modulate the local interactions of the renin-angiotensin-aldosterone system in the lung tissue.

“The presence of ACE2 receptors, therefore, exerts a protective effect against the development of

acute lung injury in infections with SARS coronaviruses, which lead to dysregulation of these mechanisms and endothelial damage,” they added. “Further, our observations do not support theoretical concerns of adverse outcomes due to enhanced virulence of SARS coronaviruses due to overexpression of ACE2 receptors in cell cultures – an indirect

binding site for these viruses.”

The authors also noted that their findings have “important implications” for four ongoing randomized trials of ACE inhibitors/ARBs in COVID-19, “as none of them align with the observations of our study.”

They pointed out that of the four ongoing trials, three are testing the use of ACE inhibitors or ARBs

in the treatment of hospitalized COVID-19 patients, and one is testing the use of a 10-day course of ARBs after a positive SARS-CoV-2 test to prevent hospitalization.

#### **New meta-analysis**

The new meta-analysis of all data so far available on ACE inhibitor and ARB use for patients with

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COVID-19 was published online in *Annals of Internal Medicine* on May 15 (doi: 10.7326/M20-1515).

The analysis is a living, systematic review with ongoing literature surveillance and critical appraisal, which will be updated as new data become available. It included 14 observational studies.

The authors, led by Katherine M.

Mackey, MD, VA Portland (Ore.) Health Care System, concluded: “High-certainty evidence suggests that ACE-inhibitor or ARB use is not associated with more severe COVID-19 disease, and moderate certainty evidence suggested no association between use of these medications and positive SARS-CoV-2 test results among symptomatic patients. Wheth-

er these medications increase the risk for mild or asymptomatic disease or are beneficial in COVID-19 treatment remains uncertain.”

In an accompanying editorial, William G. Kussmaul III, MD, Drexel University, Philadelphia, said that initial fears that these drugs may be harmful for patients with COVID-19 now seem to have been unfounded

(doi: 10.7326/M20-3047).

“We now have reasonable reassurance that drugs that alter the renin-angiotensin system do not pose substantial threats as either COVID-19 risk factors or severity multipliers,” he wrote.

*A version of this article originally appeared on Medscape.com.*

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# Experts publish imaging guide for pediatric COVID-19

BY CALEB RANS, PHARM.D  
*MDedge News*

**A** team of pulmonologists has synthesized the clinical and imaging characteristics of

COVID-19 in children, and has devised recommendations for ordering imaging studies in suspected cases of the infection.

The review also included useful radiographic findings to help

in the differential diagnosis of COVID-19 pneumonia from other respiratory infections. Alexandra M. Foust, DO, of Boston Children's Hospital, and colleagues reported the summary of findings

and recommendations in *Pediatric Pulmonology*.

"Pediatricians face numerous challenges created by increasing reports of severe COVID-19-related findings in affected children," said

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Mary Cataletto, MD, FCCP, of NYU Langone Health in Mineola, N.Y. “[The current review] represents a multinational collaboration to provide up-to-date information and key imaging findings to guide chest physicians caring for children with pneumonia symptoms during the COVID-19 pandemic.”

### Clinical presentation in children

In general, pediatric patients infected with the virus show milder symptoms compared with adults, and based on the limited evidence reported to date, the most common clinical symptoms of COVID-19 in children are rhinorrhea and/or nasal congestion, fever and cough with sore throat,

fatigue or dyspnea, and diarrhea.

As with other viral pneumonias in children, the laboratory parameters are usually nonspecific; however, while the complete blood count is often normal, lymphopenia, thrombocytopenia, and neutropenia have been reported in some cases of pediatric COVID-19, the authors noted.

The current Centers for Disease Control and Prevention recommendation for initial diagnosis of SARS-CoV-2 is obtaining a nasopharyngeal swab, followed by reverse transcription polymerase chain reaction (RT-PCR) testing, they explained.

### Role of imaging in diagnosis

The researchers reported that current recommendations from the American College of Radiology do not include chest computed tomography (CT) or chest radiography (CXR) as an upfront test to diagnose pediatric COVID-19, but they may still have a role in clinical monitoring, especially in patients with a moderate to severe disease course.

The potential benefits of utilizing radiologic evaluation, such as estab-

*“The step-by-step algorithm addresses the selection, sequence, and timing of imaging studies with multiple images illustrating key findings of COVID-19 pneumonia in the pediatric age group.”*

lishing a baseline for monitoring disease progression, must be balanced with potential drawbacks, which include radiation exposure, and reduced availability of imaging resources owing to necessary cleaning and air turnover time.

### Recommendations for ordering imaging studies

Based on the most recent international guidelines for pediatric COVID-19 patient management, the authors developed an algorithm for performing imaging studies in suspected cases of COVID-19 pneumonia.

The purpose of the tool is to support clinical decision-making around the utilization of CXR and CT to evaluate pediatric COVID-19 pneumonia.

“The step-by-step algorithm addresses the selection, sequence,

and timing of imaging studies with multiple images illustrating key findings of COVID-19 pneumonia in the pediatric age group,” said Dr.



Dr. Cataletto

Cataletto. “By synthesizing the available imaging case series and guidelines, this primer provides a useful tool for the practicing pulmonologist,” she explained.

### Key recommendations: CXR

“For pediatric patients with suspected or known COVID-19 infection with moderate to severe clinical symptoms requiring hospitalization (i.e., hypoxia, moderate or severe dyspnea, signs of sepsis, shock, cardiovascular compromise, altered mentation), CXR is usually indicated to establish an imaging baseline and to assess for an alternative diagnosis,” they recommended.

“Sequential CXRs may be helpful to assess pediatric patients with COVID-19 who demonstrate worsening clinical symptoms or to assess response to supportive therapy,” they wrote.

### Key recommendations: CT

“Due to the increased radiation sensitivity of pediatric patients, chest CT is not recommended as an initial diagnostic test for pediatric patients with known or suspected COVID-19 pneumonia,” they explained.

The guide also included several considerations around the differential diagnosis of COVID-19 pneumonia from other pediatric lung disorders, including immune-related conditions, infectious etiologies, hematological dyscrasias, and inhalation-related lung injury.

The investigators concluded, “In the future, studies evaluating the correlation between specific imaging findings, clinical severity, and disease outcomes (i.e. improvement, progression, mortality) will help improve management of these pediatric patients. Furthermore, as no long-term data is yet available, future studies investigating post-recovery sequelae of disease including alterations of pulmonary function tests and risk for development of permanent lung injury such as pulmonary fibrosis will be important.

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**SOURCE:** Foust AM et al. *Pediatr Pulmonol.* 2020 May 28. doi: 10.1002/ppul.24870.

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# Immunoglobulin used for heart failure in MIS-C

BY DOUG BRUNK

MDedge News

According to a study of a cluster of patients in France and Switzerland, children may experience an acute cardiac decompensation from the severe inflammatory state following SARS-CoV-2 infection, termed multisystem inflammatory syndrome in children (MIS-C). Treatment with immunoglobulin appears to be associated with recovery of left ventricular systolic function.

“The pediatric and cardiology communities should be acutely aware of this new disease probably related to SARS-CoV-2 infection (MIS-C), that shares similarities with Kawasaki disease but has specificities in its presentation,” researchers led by Zahra Belhadj, MD, of Necker-Enfants Malades Hospital in Paris, wrote in a case-series report published online in *Circulation*. “Early diagnosis and management appear to lead to favorable outcome using classical therapies. Elucidating the immune mechanisms of this disease will afford further insights for treatment and potential global prevention of severe forms.”

Over a 2-month period that coincided with the SARS-CoV-2 pandemic in France and Switzerland, the researchers retrospectively collected clinical, biological, therapeutic, and early-outcomes data in 35 children who were admitted to pediatric ICUs in 13 centers for cardiogenic shock, left ventricular dysfunction, and severe inflammatory state. Their median age was 10 years, all presented with a fever, 80% had gastrointestinal symptoms of abdominal pain, vomiting, or diarrhea, and 28% had comorbidities that included overweight (17%), asthma (8.5%), and lupus (3%). Only 17% presented with chest pain.

The researchers observed that left ventricular ejection fraction was less than 30% (10 of 35 patients), and 80% required inotropic support with 28% treated with extracorporeal membrane oxygenation (ECMO).

All patients presented with a severe inflammatory state evidenced by elevated C-reactive protein and D-dimer. Interleukin-6 was elevated to a median of 135 pg/mL in 13 of the patients. Elevation of troponin I was constant but mild to



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moderate, and NT-proBNP or BNP elevation was present in all children.

Nearly 90% patients tested positive for SARS-CoV-2 infection by polymerase chain reaction of nasopharyngeal swab or serology. Most patients (80%) received IV inotropic support, 71% received first-line IV immunoglobulin, 65% received anticoagulation with heparin, 34% received IV steroids having been considered high-risk patients with symptoms similar to an incomplete form of Kawasaki disease, and 8% received treatment with an interleukin-1 receptor antagonist because of a persistent severe inflammatory state. Left ventricular function was restored in 71% of those discharged from the intensive care unit. No patient died, and all patients treated with ECMO were successfully weaned after a median of 4.5 days.

“Some aspects of this emerging pediatric disease (MIS-C) are similar to those of Kawasaki disease: prolonged fever, multisystem inflammation with skin rash, lymphadenopathy, diarrhea, meningism, and high levels of inflammatory biomarkers,” the researchers wrote. “But differences are important and raise the question as to whether this syndrome is Kawasaki disease with SARS-CoV-2 as the triggering agent, or represents a different syndrome (MIS-C). Kawasaki disease predominantly affects young children younger than 5 years, whereas the median age in

our series is 10 years. Incomplete forms of Kawasaki disease occur in infants who may have fever as the sole clinical finding, whereas older patients are more prone to exhibit the complete form.”

They went on to note that the overlapping features between MIS-C and Kawasaki disease “may be due to similar pathophysiology. The etiologic agent of Kawasaki disease is unknown but likely to be ubiquitous, causing asymptomatic childhood infection but triggering the immunologic cascade of Kawasaki disease in genetically susceptible individuals. Please note that infection with a novel RNA virus that enters through the upper respiratory tract has been proposed to be the cause of the disease (see *PLoS One*. 2008 Feb 13;3:e1582 and *J Infect Dis*. 2011 Apr 1;203:1021-30).”

Based on the work of the authors, it appears that a high index of suspicion for MIS-C is important for children who develop Kawasaki-like symptoms, David J. Goldberg, MD, said in an interview. “Although children have largely been spared from the acute respiratory presentation of the SARS-CoV-2 pandemic, the recognition and understanding of what appears to be a postviral inflammatory response is a critical first step in developing treatment algorithms for this disease process,” said Dr. Goldberg, a board-certified attending cardiologist in the cardiac center and fetal heart program at Children’s Hospital of Philadelphia. “If inflammatory markers are elevated, particularly if there are accompanying gastrointestinal symptoms, the possibility of cardiac involvement suggests the utility of screening echocardiography. Given the potential need for inotropic or mechanical circulatory support, the presence of myocardial dysfunction dictates care in an intensive care unit capable of providing advanced therapies. While the evidence from Dr. Belhadj’s cohort suggests that full recovery is probable, there is still much to be learned about this unique inflammatory syndrome and the alarm has rightly been sounded.”

The researchers and Dr. Goldberg reported having no disclosures.

dbrunk@mdedge.com

**SOURCE:** Belhadj Z et al. *Circulation*. 2020 May 17. doi: 10.1161/circulationaha.120.048360.

## Lung ultrasound has benefits for children with COVID-19

BY CHRISTOPHER PALMER

MDedge News

Lung ultrasound has “high concordance” with radiologic findings in children with COVID-19, researchers wrote in *Pediatrics*.

They also noted the benefits that modality provides over other imaging techniques.

Marco Denina, MD, and colleagues from the pediatric infectious diseases unit at Regina Margherita Children’s Hospital in Turin, Italy,

performed an observational study of eight children aged 0-17 years who were admitted to the hospital for COVID-19 between March 8 and 26, 2020. In seven of eight patients, the findings were concordant between imaging modalities; in the remaining patient, lung ultrasound (LUS) found an interstitial B-lines pattern that was not seen on radiography. In seven patients with pathologic ultrasound findings at baseline, the improvement or resolution of the subpleural consol-

idations or interstitial patterns was consistent with concomitant radiologic findings.

The authors cited the benefits of using point-of-care ultrasound instead of other modalities, such as CT. “First, it may reduce the number of radiologic examinations, lowering the radiation exposure of the patients,” they wrote. “Secondly, when performed at the bedside, LUS allows for the reduction of the patient’s movement within the hospital; thus, it lowers the number of

health care workers and medical devices exposed to [SARS-CoV-2].”

One limitation of the study is the small sample size; however, the researchers felt the high concordance still suggests LUS is a reasonable method for COVID-19 patients.

There was no external funding for this study and the investigators had no relevant financial disclosures.

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**SOURCE:** Denina M et al. *Pediatrics*. 2020 Jun. doi: 10.1542/peds.2020-1157.

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# Rapid changes to health system spurred by COVID might be here to stay

BY JULIE ROVNER

Kaiser Health News

The U.S. health care system is famously resistant to government-imposed change. It took decades to create Medicare and Medicaid, mostly because of opposition from the medical-industrial complex. Then it was nearly another half-century before the passage of the Affordable Care Act.

But the COVID-19 pandemic has done what no president or social movement or venture capitalist could have dreamed of: It forced sudden major changes to the nation's health care system that are unlikely to be reversed.

"Health care is never going back to the way it was before," said Gail Wilensky, a health economist who ran the Medicare and Medicaid programs for President George H.W. Bush in the early 1990s.

Ms. Wilensky is far from the only longtime observer of the American health care system to marvel at the speed of some long-sought changes. But experts warn that the breakthroughs may not all make the health system work better or make it less expensive.

That said, here are three trends that seem likely to continue.

## Telehealth for all

Telehealth is not new; medical professionals have used it to reach patients in rural or remote settings since the late 1980s (Evolution and Current Applications of Telemedicine, in "Telemedicine: A Guide to Assessing Telecommunications in Health Care." [Washington: National Academies Press, 1996]).

But even while technology has made video visits easier, it has failed to reach critical mass, largely because of political fights. Licensing has been one main obstacle – determining how a doctor in one state can legally treat a patient in a state where the doctor is not licensed.

The other obstacle, not surprisingly, is payment. Should a video visit be reimbursed at the same rate as an in-person visit? Will making it easier for doctors and other medical professionals to use telehealth encourage unnecessary care, thus driving up the nation's \$3.6 trillion health tab even more? Or could it replace care once provided free by phone?

Still, the pandemic has pushed aside those sticking points. Almost overnight, by necessity, every health care provider who can is delivering telemedicine. A new survey from Gallup ("Use of Low-Contact Commerce Climbs in U.S. During Pandemic" Gallup, 2020 May 26) found the number of patients reporting "virtual" medical visits more than doubled, from 12% to 27%, from late March to mid-May. That is attributable, at least in part, to Medicare having made it easier for doctors to bill for virtual visits ("Medicare Telemedicine Health Care Provider Fact Sheet" CMS, 2020 May 17).

It's easy to see why many patients like video visits – there's no parking to find and pay for, and it takes far less time out of a workday than going to an office.

Doctors and other practitioners seem more ambivalent. On one hand, it can be harder to examine a patient over video and some services just can't be done via a digital connection. On the other hand, they can see more patients in the same amount of time and may need less support staff and possibly smaller offices if more visits are conducted virtually.

Of course, telemedicine doesn't work for everyone. Many areas and patients don't have reliable or robust broadband connections that make video visits work. And some patients, particularly the oldest seniors, lack the technological skills needed to connect.

## Primary care doctors in peril

Another trend that has suddenly accelerated is worry over the nation's dwindling supply of primary care doctors. The exodus of practitioners performing primary care has been a concern over the past several years, as baby boomer doctors retire and others have grown weary of more and more bureaucracy from government and private payers. Having faced a difficult financial crisis during the pandemic, more family physicians may move into retirement or seek other professional options.

At the same time, fewer current medical students are choosing specialties in primary care.

"I've been trying to raise the alarm about the kind of perilous future of primary care," said Farzad Mostashari, MD, a top Department of Health & Human Services official in the Obama administration. Dr. Mostashari runs Aledade, a company that helps primary care doctors make the transition from fee-for-service medicine to new payment models.

The American Academy of Family Physicians reports that 70% of primary care physicians are reporting declines in patient volume of 50% or more since March, and 40% have laid off or furloughed staff. The AAFP has joined other primary care and insurance groups in asking HHS for an infusion of cash.

"This is absolutely essential to effectively treat patients today and to maintain their ongoing operations until we overcome this public health emergency," the groups wrote.

One easy way to help keep primary care doctors afloat would be to pay them not according to what they do, but in a lump sum to keep patients healthy. This move from fee-for-service to what's known as capitation or value-based care has unfolded gradually and was championed in the Affordable Care Act.

But some experts argue it needs to happen more quickly and they predict that the coronavirus pandemic could finally mark the beginning of the end for doctors who still charge for each service individually. Dr. Mostashari, who spends his time helping doctors make the transition,

said in times like these, it would make more sense for primary care doctors to have "a steady monthly revenue stream, and [the doctor] can decide the best way to deliver that care: unlimited texts, phone calls, video calls. The goal is to give you satisfactory outcomes and a great patient experience."

Still, many physicians, particularly those in solo or small practices, worry about the potential financial risk – especially the possibility of getting paid less if they don't meet certain benchmarks that the doctors may not be able to directly control.

But with many practices now ground to a halt, or just starting to reopen, those physicians who get paid per patient rather than per service are in a much better position to stay afloat. That model may gain traction as doctors ponder the next pandemic, or the next wave of this one.

## Hospitals on the decline?

The pandemic also might lead to less emphasis on hospital-based care. While hospitals in many parts of the country have obviously been full of very sick COVID patients, they have closed down other nonemergency services to preserve supplies and resources to fight the pandemic. People with other ailments have stayed away in droves even when services were available, for fear of catching something worse than what they already have.

Many experts predict that care won't just snap back when the current emergency wanes. Mark Smith, MD, former president of the California Health Care Foundation, said among consumers, a switch has been flipped. "Overnight it seems we've gone from high-touch to no-touch."

Which is not great for hospitals that have spent millions trying to attract patients to their labor-and-delivery units, orthopedic centers, and other parts of the facility that once generated lots of income.

Even more concerning is that hospitals' ability to weather the current financial shock varies widely. Those most in danger of closing are in rural and underserved areas, where patients could wind up with even less access to care that is scarce already (JAMA, 2020 May 4, doi: 10.1001/jama.2020.6269).

All of which underscores the point that not all these changes will necessarily be good for the health system or society. Financial pressures could end up driving more consolidation, which could push up prices as large groups of hospitals and doctors gain more bargaining clout.

But the changes are definitely happening at a pace few have ever seen, said Ms. Wilensky, "When you're forced to find different ways of doing things, and you find out they are easier and more efficient, it's going to be hard to go back to the old way."

*A version of this article originally appeared on Kaiser Health News, which is a nonprofit national health policy news service. It is an editorially independent program of the Henry J. Kaiser Family Foundation that is not affiliated with Kaiser Permanente.*

# ED visits for serious conditions have plummeted

BY RICHARD FRANKI

MDedge News

**E**mergency department visits for myocardial infarction, stroke, and hyperglycemic crisis dropped substantially in the 10 weeks after COVID-19 was declared a national emergency on March 13, according to the Centers for Disease Control and Prevention.

Compared with the 10-week period from Jan. 5 to March 14, ED visits were down by 23% for MI, 20% for stroke, and 10% for hyperglycemic crisis from March 15 to May 23, Samantha J. Lange, MPH, and associates reported in the Morbidity and Mortality Weekly Report.

“A short-term decline of this magnitude ... is biologically implausible for MI and stroke, especially for older adults, and unlikely for hyperglycemic crisis, and the finding suggests that patients with these conditions either could not access care or were delaying or avoiding seeking care during the early pandemic period,” they wrote.

The largest decreases in the actual number of visits for MI occurred among both men (down by 2,114, -24%) and women (down by 1,459, -25%) aged 65-74 years. For stroke, men aged 65-74 years had 1,406 (-19%) fewer visits to the ED and women 75-84 years had 1,642 (-23%) fewer visits, the CDC said.

For hypoglycemic crisis, the largest declines during the early pandemic period occurred among younger adults: ED visits for men and women aged 18-44 years were down, respectively, by 419 (-8%) and 775 (-16%), they reported based on data from the National Syndromic Surveillance Program.

“Decreases in ED visits for hyperglycemic crisis might be less striking because patient recognition of this crisis is typically augmented by home glucose monitoring and not reliant upon symptoms alone, as is the case for MI and stroke,” Ms. Lange and her associates noted.

Charting weekly visit numbers showed that the drop for all three conditions actually started the week before the emergency was declared and reached its nadir the week after (March 22) for MI and 2 weeks later (March 29) for stroke and hypoglycemic crisis.

Visits for hypoglycemic crisis have largely returned to normal since those low points, but MI and stroke visits “remain below prepandemic

levels” despite gradual increases through April and May.

It has been reported that “deaths not associated with confirmed or probable COVID-19 might have been

directly or indirectly attributed to the pandemic. The striking decline in ED visits for acute life-threatening conditions might partially explain observed excess mortality not associated with

COVID-19,” the investigators wrote.

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**SOURCE:** Lange SJ et al. MWR. 2020 Jun 26;69(25):795-800.

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# New Health Policy and Advocacy Committee (HPAC)

BY JOHN STUDDARD, MD, FCCP

What a privilege it has been over the last several months to participate as staff support along with Jenny Nemkovich and Michelle Kosobucki to CHEST's new Health Policy and Advocacy Committee (HPAC). The opportunity to serve on a committee of CHEST from the perspective of staff rather than in a volunteer/leadership role has been very enlightening and clearly a learning experience.

## Background

As most know, CHEST in the summer of 2019 made the decision to proactively strengthen our position in the areas of public policy, both advocacy and the regulatory space.

This decision will provide CHEST with the mechanism to have greater control over determining and influencing the pulmonary, critical care, and sleep agenda that directly impacts our members and our patients. Adding this piece to the CHEST portfolio is particularly fortuitous in light of the increased advocacy needs in this COVID-19 environment. Having recently completed the acquisition of NAMDRRC, CHEST has jump-started our return to this space. While this acquisition does not represent a single source solution, it does represent a key component to a comprehensive approach to policy and advocacy. The rich experience of our new colleagues from NAMDRRC brings incredible value and insights to our efforts.

## Health policy and advocacy committee

The initial composition of the HPAC is made up of equal numbers of members drawn from the NAM-

DRC leadership pool, as well as members of both the CHEST Foundation Board of Trustees and the Board of Regents of the College. This group represents a very energetic, talented, and diverse group. Experience in the space of policy and advocacy in areas such as home ventilation, oxygen issues, telemedicine, and pulmonary rehab reimbursement is blended with presidential leadership of both the CHEST Foundation and CHEST, as well as talent in areas such as coding and reimbursement, social media applications, and also leadership representing our NetWorks.



Dr. Studdard

## Policy priorities

Having had three virtual meetings, the HPAC has initially been focusing on developing and discussing an initial group of policy priorities. These topics are being vetted and held to a rigorous discussion, including what success looks like in these areas, potential barriers or obstacles to making an impact, and who could represent important collaborative partners in these areas. These priorities will be coupled with an effort to define short-term and longer term performance indicators to help try to assess meaningful impact. Once these are better defined, we plan to reach out to our CHEST NetWorks, partners in Industry, sister societies, and friends in patient advocacy groups to get their input and, when appropriate, their collaboration. The BOR will be kept informed and eventually comment and hopefully endorse these policy priorities.

## Member engagement

In my opinion, our approach in this area of policy and advocacy is somewhat unique in the associational arena. Rather than policy staff driv-

ing the agenda, we are following the example of other committees at CHEST in having volunteers and leadership developing the "what" and staff creating the "how." At that point, a team of leadership/staff will deliver the product. I feel that this somewhat "bottom up" approach will lead to much more productive and effective member engagement and a growing group of advocacy aware and committed members.

## Washington watchline

To complement the work of HPAC and better communicate important issues related to policy and advocacy, our Publications team, led by Nicki Augustyn, has taken over the production of what was NAMDRRC's valuable periodical, the Washington Watchline. Under the editorship for many years of past CHEST President, Jim Mathers, MD, FCCP, this resource has been a valuable and respected source of information for NAMDRRC membership. The June edition has recently been published.

## Spring meeting, 2021

The HPAC's Chair and Vice-Chair, Drs. Neil Freedman and Jim Lamberti, are serving as the Program Directors for our first meeting that will blend the NAMDRRC perspective and experience in a program around policy and advocacy with the traditional expertise in education delivery of CHEST. This meeting will be in conjunction with our Spring Leadership meetings in Sonoma, California. Save the date, as this promises to be a great meeting, with unique educational opportunities and policy and advocacy insights.

Thanks again to the members of HPAC and to Bob Musacchio for giving me an opportunity to provide staff assistance in this exciting new endeavor for CHEST.

# COVID-19: Medicare data show long hospital stays, disparities

BY RICHARD FRANKI

MDedge News

Half of all COVID-19 hospitalizations among Medicare beneficiaries last 8 days or longer, according to a new analysis by the Centers for Medicare & Medicaid Services.

CMS encounter and claims data show almost 110,000 hospital stays for COVID-19 from Jan. 1 to May 16, 2020. Of the longer admissions, 18% were 8-10 days, 16% were 11-15 days, and another 16% were 16 days or longer, the CMS reported in a preliminary data snapshot released June 22.

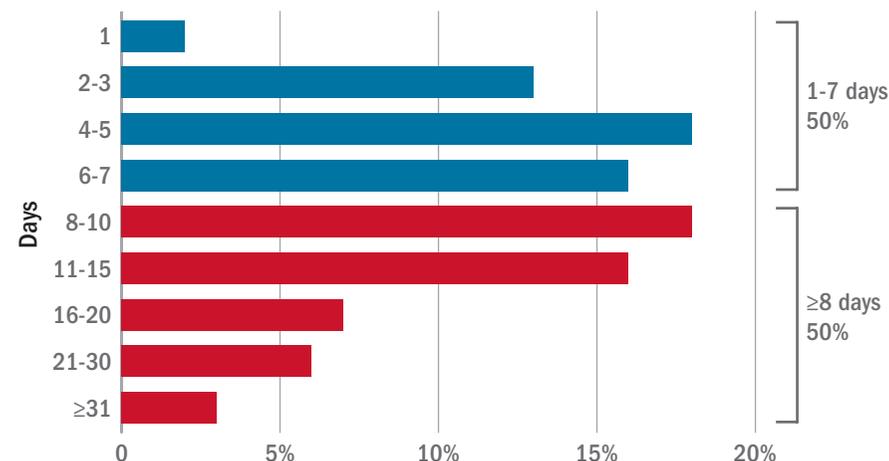
The hospitalization rate for the Medicare population was 175 per 100,000, but the CMS data show a number of disparities involving race/ethnicity and other demographic characteristics were uncovered, such as the following:

- Black patients were hospitalized for COVID-19 at a much higher rate, at 465 per 100,000 beneficiaries, than were Hispanics (258), Asians (187), and whites (123).
- Residents of urban/suburban areas had a much higher hospitalization rate than did those living in rural areas: 205 versus 57 per 100,000.
- Beneficiaries enrolled in both Medicare and Medicaid had 473 hospitalizations per 100,000, but the rate for those with Medicare only was 112.

"The disparities in the data reflect longstanding challenges facing minority communities and low-income older adults, many of whom face structural challenges to their health that go far beyond what is traditionally considered 'medical.' Now more than ever, it is clear that our fee-for-service system is insufficient for the most vulnerable Americans because it

MEDICARE BENEFICIARIES

## Distribution of COVID-19 hospitalizations by length of stay



Note: Based on data for 109,607 hospitalizations from Jan. 1 to May 16, 2020.

Source: Centers for Medicare & Medicaid Services

limits payment to what goes on inside a doctor's office. The transition to a value-based system has never been so

urgent" CMS Administrator Seema Verma said in a separate statement.

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## SLEEP STRATEGIES

## COVID-19: Future of telehealth for sleep medicine

BY DENNIS HWANG, MD

On March 18, 2020, the doors to our sleep center were physically closed. Two potential exposures to COVID-19 within a few hours, the palpable anxiety of our team, and a poor grasp of the virus and the growing pandemic moved us to make this decision. Up to that point, we could not help but feel we were playing “catch up” with our evolving set of safety measures to the escalating risk. Like so many other sleep centers around the country, a complete transition to virtual care was needed to ensure the safety of our patients and our team. It was perhaps that moment that we felt the emotional impact that our world had changed, altering both our personal lives and sleep medicine practice as we knew it. This event, while unfortunate, also provided a transformative opportunity to reimagine our identity, accelerating the efforts to bring the future of sleep medicine into the present.

Our team’s clinical evolution and innovation efforts have been guided by efforts to reconsider sleep medicine paradigms. Innovation progress was deliberate with incremental implementations that typically required repeat business cases with multiple approving parties and budgetary access. Those barriers largely dissolved once COVID-19 intensified, and a

large portion of the strategies on our roadmap were put into production.

In a matter of a couple weeks, our services completely transitioned to remote and virtual care, while most of the team of 55 persons were moved to “work-from-home.” A suite of technologies (automated questionnaires, automated and two-way text messaging templates, consumer wearable technologies, and population management dashboards) were put on the table (Somnoware, Inc.), and each of our longitudinal care teams (eg, adult obstructive sleep apnea, pediatrics, chronic respiratory failure, commercial driver, insomnia programs, etc) worked to embed them into new care pathways. This effort further consolidated technology as the backbone of our work and the enabler of remote virtual collaboration between sleep center personnel (respiratory case managers, medical assistants and nursing team, and physician and leadership personnel) to enhance our team-based approach. Moreover, we felt this point in time was ripe to swallow the proverbial “red pill” and approach patient care with shifted



Dr. Hwang

paradigms. We discuss three areas of active effort to leverage technology in this COVID-19 environment to accelerate a transition toward how we envision the future of sleep medicine.

**Reimagined sleep diagnostics**

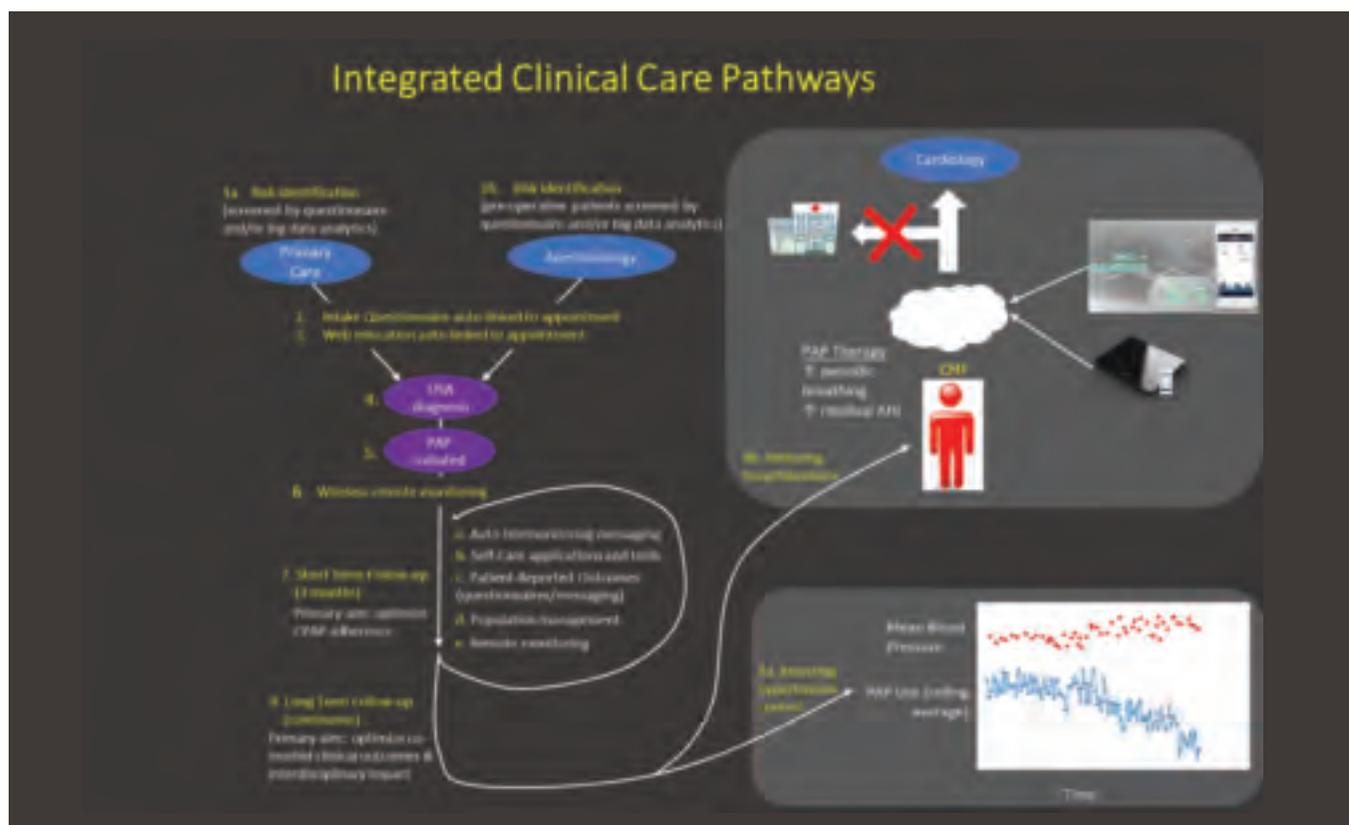
Our virtual obstructive sleep apnea (OSA) diagnostic process includes utilizing a disposable home sleep apnea test (HSAT) device with wireless data transfer (WatchPAT ONE, Itamar Medical) while HSAT and PAP (positive airway pressure) setups are supported by information sheets, online videos (YouTube), automated interactive platforms (Emmi Solutions; Hwang D. *Am J Respir Crit Care Med.* 2018 Jan 1;197[1]:117), and synchronous provider video visits. Our more radical shift, however, is in approaching OSA diagnosis based principally on symptoms and secondarily supported by physiologic measurements and response to therapy. This “clinical diagnosis” approach reduces our reliance on traditional sleep testing and allows patient wearables to provide supportive physiologic data (eg, oximetry) to help determine OSA severity and phenotype. Its immediate impact is in limiting the need to send and retrieve potentially contaminated equipment. Broader clinical advantages include overcoming the imprecise nature of the apnea-hypopnea index (which

often has dramatic night-to-night variability) through data collection over extended durations, improving disease assessment due to availability of complementary sleep/activity data in the person’s usual setting, and tracking changes after therapy initiation.

Our post-COVID-19 re-opening of polysomnography (PSG) services, after a temporary shutdown, introduces home PSG (Type II) for approximately half our patients without suspected complex breathing conditions while reserving attended PSG (Type I) for those who may require noninvasive ventilation. The immediate incentive is in reducing viral exposure by limiting patient traffic and risk of PAP trial aerosolization while also improving access to accommodate the backlog of patients requiring PSG. This approach furthers the paradigm shift to emphasizing care in the home setting. Testing in the patient’s usual environment and enabling multiple night/day testing may be clinically advantageous.

**Shift in emphasis to care management**

The emphasis of sleep medicine has traditionally focused on diagnostics through performing PSG and HSAT. Our field has invested tremendous effort in developing guidelines for processing sleep studies, but the scoring and interpretation of those studies is extremely labor intensive. Reimagining the diagnostic approach reduces the need to manually process studies—wearable data are produced automatically, HSAT can be auto-scored, and artificial intelligence platforms can score PSGs (Goldstein CA. *J Clin Sleep Med.* 2020 Apr 15;16[4]:609), which allows a shift in resources and emphasis to follow-up care. A comprehensive discussion of technology-based tools to enhance care management is beyond the purview of this editorial. However, an overview of our current efforts includes: (1) utilizing population management dashboards to automatically risk stratify different cohorts of patients (eg, adult OSA, pediatrics, commercial drivers, chronic respiratory failure, etc) to identify patients “at-risk” (eg, based on OSA severity, symptoms, co-morbidities, and PAP adherence); (2) applying enhanced patient-provider interchange tools that include automated and “intelli-



Care pathway example integrating various healthcare technologies

Continued on page 32

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gent” electronic questionnaires, automated personalized text messaging/emails, and two-way messaging to deliver care; (3) utilizing remote patient monitoring to enhance holistic, personalized management, such as with remote activity/sleep trackers, blood pressure monitors, glucometers, and weight scales. We are engaged with efforts to validate the impact of these data to provide more personalized feedback, directly impact clinical outcomes, facilitate interdisciplinary collaboration, and identify acutely ill patients. Furthermore, a holistic approach beyond a narrow focus on PAP may create a positive collateral effect on adherence by targeting engagement with broader areas of health; and (4) implementing machine learning tools to directly support providers and patients (examples discussed in the next section.) Each of our teams has created workflows embedding these strategies throughout new care pathways.

Generally, our emphasis during the first 3 months after PAP initiation focuses on achieving therapy adherence, and the post-3-month period broadens the efforts to target clinical outcomes. Recent trials with low PAP usage that failed to confirm the

benefit of PAP on cardiovascular outcomes (McEvoy DR, et al. *N Engl J Med.* 2016;375:919) strongly suggest greater investment in cost-effective long-term strategies is imperative to increase our field’s relevance.

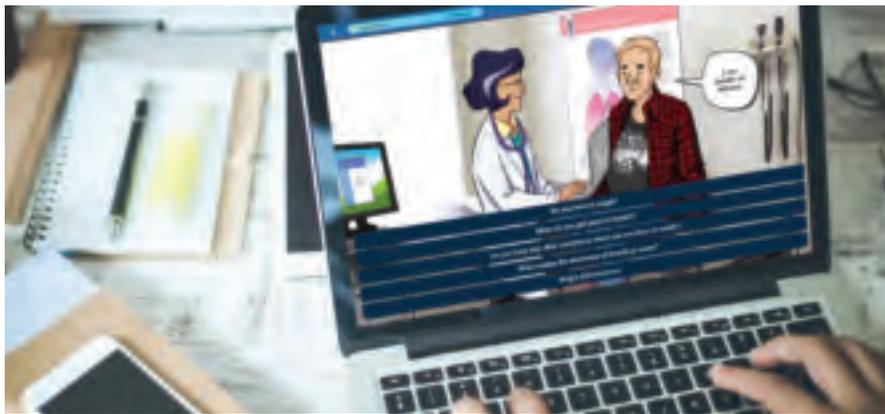
### Application of artificial intelligence

We describe current efforts to apply artificial intelligence (AI) into clinical care: (1) We are implementing machine learning (ML) PSG scoring, which can potentially improve both the consistency and efficiency of scoring, further enabling greater investment in follow-up care. The future of sleep study processing, however, will likely depend on computer vision to “view” details inaccessible to the human eye and produce novel metrics that better inform clinical phenotypes (eg, cardiovascular risk, response to alternative therapies, etc). For example, “brain age” has been derived from EEG tracings that could reflect the degree of impact of sleep disorders on neurocognitive function (Fernandez C, unpublished data); (2) Machine learning clinical decision tools are in development to predict PAP adherence and timing of discontinuation, predict timing of

cardiovascular disease onset and hospitalization, personalizing adherence targets, automating triaging of patients to home or PSG testing, and innumerable other predictions at clinical decision inflection points. Prediction outputs may be presented as risk profiles embedded in each patient’s “chart,” as personalized alerts, and in gamification strategies. For example, machine learning personalized cardiovascular risk scores can be regularly updated based on degree of PAP use to incentivize adherence; (3) Artificial providers may provide consistent, personalized, and holistic supplementary care. Many people rely on AI-bots for social support and cognitive-behavioral therapy (CBT) for depression. A sleep wellness bot, currently in planning stages, is intended to be the primary interface for many of the strategies described above that enhance engagement with PAP and therapies for comorbid conditions, provide CBT and lifestyle accountability, and collect patient reported data. This artificial provider would be a constant companion providing interactive, personalized, and continuous management to complement traditional intermittent live-person care.

The current health-care environment embodies the principle to “never let a serious crisis go to waste.” COVID-19 has accelerated the progression into the future by fostering an opening to embrace novel application of technologies to support changes in paradigms. Furthermore, health-care infrastructures that typically progress deliberately changed seemingly in a single moment. The Center for Medicare Services issued broad authorization to reimburse for telemedicine in response to COVID-19. Continued evolution in infrastructures will dictate progress with innovation, and a greater transition to outcomes-based incentives may be necessary to accommodate many of the strategies described above that rely on nonsynchronous care. But, we may be experiencing the moment when health care starts to catch up with the world in its embrace of technology. Sleep and pulmonary medicine can be a leader by providing a successful template for other specialties in optimizing chronic disease management.

*Dr. Hwang is Medical Director, Kaiser Permanente SBC Sleep Center, and co-chair, Sleep Medicine, Kaiser Permanente Southern California.*



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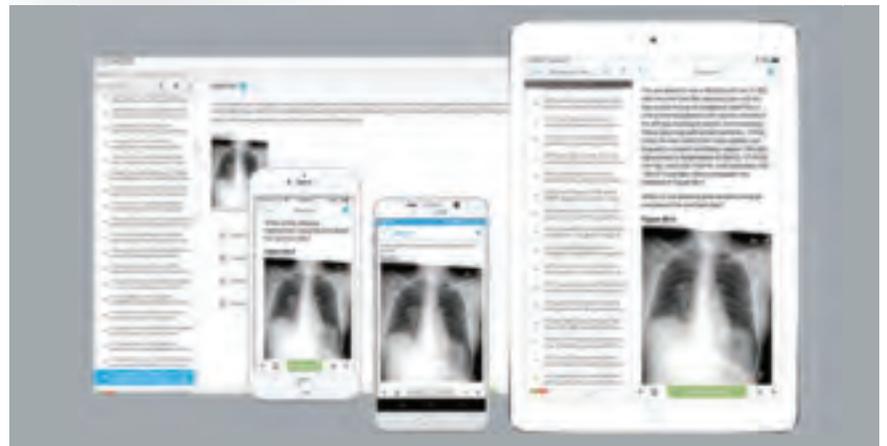
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# Reflections on a virtual happy hour

BY CAROLYN D'AMBROSIO, MD, FCCP

*Women and Pulmonary Advisory Board*

On a Wednesday night in April, CHEST Women and Pulmonary Advisory Board hosted a virtual happy hour that was not just a webinar but also on Facebook Live, entitled Wellness Wednesday.

During the 2-hour event, the hosts of the happy hour exchanged experiences during the pandemic, thoughts, hopes, and some very practical ideas on how to stay well in the midst of the pandemic. I was thrilled to co-host this event with Drs. Aneesa Das, Doreen Adrizzo-Harris, Margaret Pisani, Michelle Cao, and Rachel Quaney.

We started off toasting with whatever drink people chose to have and each member shared what she was doing during the pandemic. There were many amazing stories of how these women adapted to the changing environment. Dr. Adrizzo-Harris told us how she and her husband literally split their apartment in half since they work in different hospitals and did not want to risk infecting not just one another but also their respective patients. Both she and her husband were working long shifts and most days of the week in the hospital and had not really seen each other since the lockdown started in New York. She also gave us an update on the pandemic and response in New York and reiterated her appreciation for health-care providers who came from elsewhere to help. Drs. Das and Quaney made a point to say that Ohio had done a great job planning for and preventing an onslaught of infected patients and that they were quite thankful to be able to do virtual visits and keep up with their patients.

With regards to work, a few panelists described not only the change in the hospital census and environment but also the impact on education for everyone. We shared ideas for keeping up with pulmonary and critical care that were not related to COVID-19 and ways to not feel overwhelmed by it. I mentioned

that we kept our weekly clinical case conference for non-COVID cases and that our fellows and faculty found it refreshing and reinvigorating. Dr. Quaney, who is still in training, mentioned the impact the pandemic had on her education but was also thankful for all that was being done to mitigate that.

While several of us were going into the hospitals and working with COVID-19 patients, others were working from home. It may seem like that would be low stress but

think about the challenges of doing virtual visits from home while young children are running around! Dr. Cao gave us a few stories about this and made us all laugh.

So much has changed in our lives and what we must do to care for ourselves, our families, and

our patients. On this topic, many of the panelists mentioned that self-care is imperative, as well as all the other things we do.

Many shared what they do to remain calm and to relieve stress, such as yoga, hiking, calls with friends and family, etc. Dr. Pisani in particular mentioned the importance of self-care while also lamenting that we have gone backwards with regard to delirium prevention in the ICU due to the isolation needed for COVID-19 patients.

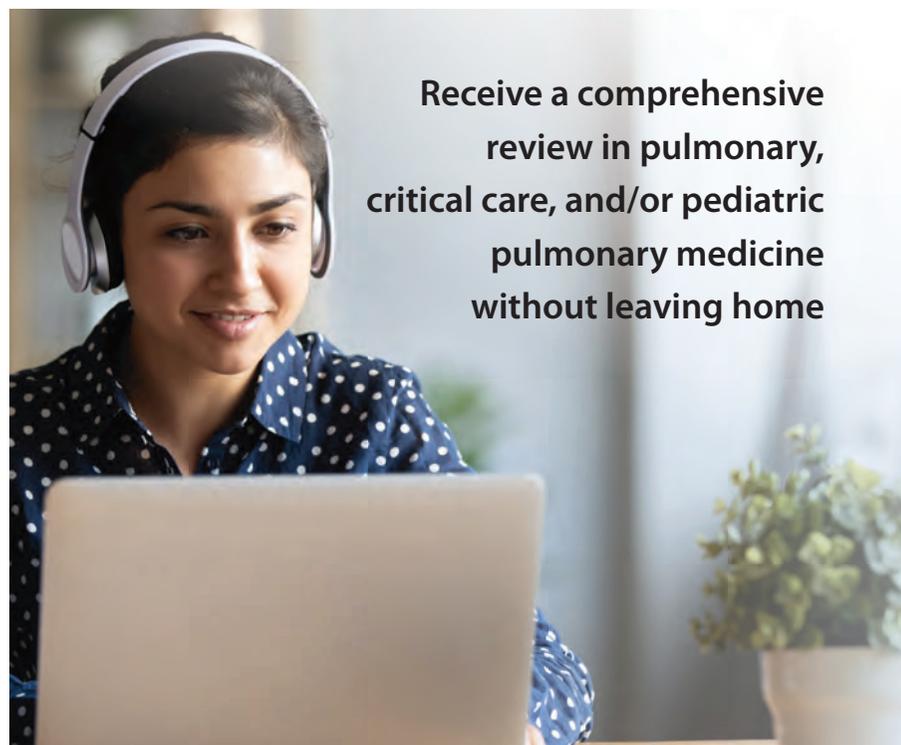
The laughter and camaraderie amongst the panelists extended to the online participants. We had over 2,400 viewers either on Facebook live or via the webinar link! Many people who joined us asked questions or shared stories of how they were coping and what they miss about the pre-pandemic life. Most agreed that the lack of interpersonal interaction, especially with friends and family, was difficult and that something as simple as this virtual happy hour was a welcome addition to all the other online meetings and patient visits.

After the event, many online participants reached out personally and via social media to express how much they enjoyed it and hopes that we continue something like this going forward. I believe we all agreed at least a quarterly Wednesday Wellness event would be great, so stay tuned and stay well!



Dr. D'Ambrosio

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## PERIOPERATIVE SLEEP MEDICINE

## The Society of Anesthesia and Sleep Medicine

BY DENNIS AUCKLEY, MD, FCCP

Obstructive sleep apnea (OSA) has been recognized to increase the risk of adverse cardiopulmonary perioperative outcomes for some time now.<sup>1</sup> An ever growing body of literature supports this finding,<sup>2</sup> including a large prospective study published in 2019 highlighting the significant risk of poor cardiac-related postoperative outcomes in patients with unrecognized OSA.<sup>3</sup> As the majority of patients presenting for elective surgery with OSA will not be diagnosed at the time of presentation,<sup>3,4</sup> many centers have developed preoperative screening programs to identify these patients, though the practice is not universal and a desire for better guidance is needed.<sup>5</sup> In addition, best practices for patients with suspected or known OSA undergoing surgery have been a matter of debate. Out of these concerns, the Society of Anesthesia and Sleep Medicine (SASM) was formed over 10 years ago to promote interdisciplinary communication, education, and research into matters common to anesthesia and sleep.

Pulmonary and sleep medicine providers are often asked to provide preoperative clearance and recommendations for patients with suspected or known OSA. Recognizing the need for guidance in this area,

a task force assembled by SASM obtained input from experts in anesthesiology, sleep medicine, and perioperative medicine to develop and publish an evidence-based / expert consensus guideline on the preoperative assessment and best practices for patients with suspected or known OSA.<sup>6</sup> While specifics regarding logistics of preoperative screening and optimization of patients will vary based on each medical center's infrastructure and organization, the recommendations presented should be able to be adapted by most, if not all, institutions. Preoperative evaluation and management is only part of the overall perioperative journey however, and SASM thus followed this document with guidelines for the intraoperative management of patients with OSA.<sup>7</sup> To complete this set of recommendations, guidelines for the postoperative care of these patients are being planned. Guidelines for pediatric and obstetric perioperative OSA management are also currently being developed by SASM task forces to address these unique areas.

OSA is not the only sleep disorder where the perioperative environment may pose problems for our patients. Sleep disorders such as the hypersomnias and sleep-related movement disorders (including restless legs syndrome) may both impact and be impacted by the perioperative environment and may

create safety concerns for some patients.<sup>8,9</sup> These issues are also under active investigation by SASM. In addition, understanding the basic mechanisms determining unconsciousness in both anesthesia and sleep, as well as examination of the interrelationships between sleep disturbance, sedation and their effects on clinical outcomes, are areas of interest that have implications beyond the perioperative arena.

SASM is currently planning to host its 10th anniversary conference in Washington DC on October 1-2, public health issues permitting. The meeting has consistently enlisted expert speakers from anesthesia, sleep medicine, and other relevant fields, and this year will be no different. Given the host city, discussions on important healthcare policy issues will be included, as well. Registration for the meeting, as well as meeting updates, are on the SASM website ([sasmhq.org](http://sasmhq.org)).

*Dr. Auckley is with the Division of Pulmonary, Critical Care and Sleep Medicine, MetroHealth Medical Center, Professor of Medicine, Case Western Reserve University, Cleveland, OH. He is the current president of the Society of Anesthesia and Sleep Medicine.*

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## Patient communication: Tips for a successful and open dialogue

BY ASHLEY M. EGAN, MD, AND KELLY M. PENNINGTON, MD

Effective communication with patients and their family members is an essential skill for physicians. Just as gaining proficiency with central line placement or bronchoscopy requires technical supervision and repetition, learning to be a good communicator entails intention, practice, and introspection. Think about this: Nearly one-half of American adults (90 million people) have difficulty understanding and using basic health information (Osborne H, Willard A. *Private Practice Success.* 2007;5(8):2-4).

According to a report by The Joint Commission, communication failure

is associated with more than 70% of serious adverse health outcomes in hospitals (The Joint Commission on Accreditation of Healthcare Organizations. National patient safety goals. [shorturl.at/grZ08](http://shorturl.at/grZ08) Accessed May 27, 2020).

Although much of our training is devoted to learning the technical or scientific aspects of medicine, the way we present ourselves to patients through our words, body language, and writing has a profound impact on patient care.

Continue reading this blog at <https://www.chestnet.org/News/Blogs/CHEST-Thought-Leaders/2020/06/Patient-Communication-Tips-for-a-Successful-and-Open-Dialogue>.

## This month in the journal CHEST®: Editor's picks

BY PETER J. MAZZONE, MD, MPH, FCCP

Editor in Chief

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**Effect of intermittent or continuous feed on muscle wasting in critical illness a phase II clinical trial.**

By Dr. A. McNelly, et al.



**Triage of scarce critical care resources in COVID-19: An implementation guide for regional allocation: A CHEST and Task Force for Mass Critical Care Expert Panel Report.**

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# Post-Intensive Care.

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## GUEST COMMENTARY

# Virtual visits for patients with neuromuscular respiratory failure in the time of COVID-19

BY JOSHUA O. BENDITT, MD, FCCP

On March 17, 2020, I entered my patients electronic medical record and hit the “Connect with Zoom” button in her Epic (Epic Systems Corporation) chart. About 20 seconds later, the face of my 28-year-old patient with advanced spinal muscular atrophy type 2 (SMA-2) appeared virtually and not live for the first time since I had met her some 10 years previously. She appeared well and her history supported that. We spent most of the time reviewing recent events and surveying her home ventilation equipment. She felt well and sleep was of good quality. She was performing her normal activities without dyspnea. Her mechanical insufflator-exsufflator was working fine, although she used it only as needed, and she was performing lung volume recruitment maneuvers with a resuscitator bag three times a day with assistance. Her mask for nocturnal NPPV was getting old, and she showed me where the straps were fraying. We noted that her bilevel device was now 8 years old and that she needed a new one. We concluded our conversation in 20 minutes and she blurted out: “Wow, that was easy. Thanks, Dr. Benditt.” I got off the phone and put in the order for a new mask and bilevel device with our clinic respiratory therapist. She received the equipment 48 hours later and sent an electronic message through her chart to let me know it had arrived. A total of five in-person visits including me and other providers had been cancelled and replaced by virtual visits. She has made one visit to the hospital in the last 3 months for an intrathecal nusinersen (Spinraza) injection that was done with a COVID-19 prescreening and full PPE.

One week prior to our virtual visit, my university hospital had reduced in-person clinic visits to those deemed absolutely necessary due to the COVID-19 pandemic. Visits considered absolutely necessary included such patients as postoperative transplant visits and preoperative evaluations for urgent surgeries. All other patient visits were canceled with plans to reschedule them once the COVID-19 pandemic was controlled. As the breadth and depth of the pandemic became apparent, a very rapid ramp-up of “virtual visits” via telemedicine capacity was rolled out. I had not previously used telemedicine, and the learning curve was steep, although once in place, the technology was straightforward from the provider perspective.

The telemedicine visits for our hospital for the entire year of 2019 totaled about 800. In the month of April of 2020 we engaged in 40,000 telemedicine visits. This explosive growth of telemedicine implementation has occurred

around the country and world during the COVID-19 pandemic (Olayiwola JN, et al. *JMIR Public Health Surveill.* 2020, May 29. doi: 10.2196/19045). This recent growth of telemedicine in the US has been fueled by the need for social distancing and quarantine, the lack of universal testing and COVID-19 case tracking, and the realization by CMS that coverage of telemedicine services had to be expanded rapidly to allow for continued patient care in the setting of stay-at-home orders.



Dr. Benditt

A rapid roll out of application technology support and online training classes for health-care providers was undertaken. Privileges for telemedicine virtual visits were approved when providers completed the informational online modules and set up their HIPPA compliant Zoom accounts (Zoom Video Communications, San Jose, CA). All of us had minor stumbles initially with the equipment, software, and getting the patients connected online. After four or five visits, the process started to click and has become rather routine. Many providers and patients found this quite a positive development in terms of patient-provider visits but a question arose almost immediately: “Will this continue to be supported by insurers and allow us to integrate this practice into our outpatient clinic setting once the pandemic was controlled?” Time will tell, but an opportunity has presented itself.

For patients with neuromuscular disease and respiratory failure, telemedicine is a technology that may be particularly attractive for a number of reasons. First, patients with neuromuscular respiratory failure are likely at a particularly high risk of death if they develop full-blown COVID-19 infection. Development of acute respiratory distress syndrome (ARDS) on top of underlying neuromuscular respiratory failure is likely to be particularly deadly, although, very fortunately, there are no published reports of widespread infections in patients with neuromuscular respiratory disease.

We have known for many decades that pneumonia is the leading cause of death for these patients. Second, patients with neuromuscular respiratory failure often find it quite difficult to come to the hospital for clinic visits. Mobilizing equipment, caregivers, and transportation can take days to arrange. For this reason, many neuromuscular clinics provide a multidisciplinary/multi-provider half-day visit to reduce the need to come into the hospital for multiple separate visits. Lastly, there are relatively few respiratory health-care providers in the United States and around the world who focus on patients with neuromuscular respiratory disease. Many neuromuscular clinics and providers will, therefore, have a very wide patient catchment area. For

instance, my practice, based in Seattle, Washington, includes patients from Alaska, Montana, Idaho, and Wyoming. In-person hospital visits more than once per year may be virtually impossible.

Telemedicine is a methodology that has long been considered helpful in the arena of home ventilation and, in fact, we have been using some telemedicine technologies for some time (Casavant DW, et al. *J Telemed Telecare.* 2014;20[8]:441). Telemedicine (telehealth) includes the use of electronic information and communications technologies to provide and support health care when distance separates the participants. For instance, monitoring of nocturnal ventilation via downloads from Internet-connected noninvasive or invasive ventilation devices, overnight oximetry, and even phone calls from durable medical equipment providers during a home visit would be considered telemedicine. Many of us have been using these methods for many years. It is really the face-to-face “virtual visit” frequency that the COVID-19 pandemic has accelerated.

This is a crucial advance in the process of telehealth because we may be able to reduce visits to our clinics from once every 3 to 6 months to perhaps once per year if support for virtual visits by insurers continues and if home monitoring can expand to include accurate home measurement of patient CO<sub>2</sub> levels by either end-tidal CO<sub>2</sub>, transcutaneous CO<sub>2</sub>, or point of care arterial or capillary blood gases, as well as home pulmonary function monitoring.

Measurement of CO<sub>2</sub> levels and pulmonary function has generally been done at the hospital or in the clinic although there is no reason that with home visit support from appropriate services (that might even include durable medical equipment companies) that this could not be accomplished.

This is not to say that there are not hurdles to the application of telehealth in the neuromuscular disease and home ventilation population. Not all patients have the equipment or technology savvy to participate in virtual visits, and not all insurers cover these visits even now during COVID-19. However, I imagine a future where a significant number of visits for patients with neuromuscular respiratory disease and home ventilation needs could be performed virtually. I envision that this would reduce patient and home caregiver travel burdens, make more efficient use of health-care provider time, expand the number of patients that a neuromuscular respiratory disease practitioner could serve, and perhaps reduce health-care expenditures per patient. This may be a real health-care bright spot in the huge difficulties of COVID-19. Fingers crossed.

*Dr. Benditt is Medical Director of Respiratory Care Services and Professor of Medicine, University of Washington Medical Center, Seattle, Washington.*

## CHEST NETWORKS

# COVID-19 and asthma. Remdesivir for COVID-19. Burnout in unprecedented times. Advances in molecular imaging in pulmonary fibrosis.

## Airways

### COVID-19 and asthma: Much remains unknown

Viral-induced asthma exacerbations are common, but there has yet to be a published data set showing worse outcomes among asthmatics with COVID-19.

It is possible that inhaled corticosteroids (ICS) may provide some protection from viral infection. A 2014 study showed that ICS may reduce exacerbations by modulating inflammation and reducing airway viral receptors (Yamaya, et



Dr. Conroy



Dr. Adrish

al. *Respir Investig.* 2014;52[4]:251). Analysis from the SARP-3 database showed ICS use associated with reduced expression of both ACE2 and transmembrane protease serine 2 (TMPRSS2), two receptors used by SARS-CoV-2 (Peters, et al. *Am J Respir Crit Care Med.* 2020 Jun 1; doi: 10.1164/rccm.201909-1813OC). Another study reported a similar effect of ICS on the seasonal coronavirus strain HCoV-229E (Yamaya M, et al. *Respir Investig.* 2020;58[3]:155), and one study reported decreased ACE2 expression in allergic asthma (Jackson, et al. *J Allergy Clin Immunol.*

2020 Apr 22:S0091-6749(20)30551-0. doi: 10.1016/j.jaci.2020.04.009). While these findings could support a hypothesis of reduced risk for COVID-19 infection among asthmatics using ICS, one would generally expect those with underlying lung disease, such as asthma, to be at higher risk for more severe infection.

Despite physiologic hypotheses of protective mechanisms, clinical outcomes may suffer as clinical operations and the American economy are impacted by this pandemic. Reduced access to or utilization of outpatient care, loss of employment, loss of health insurance, or a new difficulty in affording or accessing medications may all result in worsening asthma control for patients. Poorly controlled asthmatics are at higher risk for a more severe exacerbation of disease triggered by viral infection. Current recommendations are for patients to continue all controller medications; the use of systemic corticosteroids in treatment of COVID pneumonia is controversial, but their use in treating a COVID-associated asthma exacerbation should be based on individual assessment. As we care for asthma patients through this pandemic, much remains unknown but may be elucidated by further study.

Megan Conroy, MD  
Fellow-in-Training Member  
Muhammad Adrish, MD, FCCP  
Steering Committee Member

### Clinical Research and Quality Improvement Remdesivir for COVID-19: A ray of hope?

The year 2020 witnessed a pandemic of unprecedented proportions, caused by a novel coronavirus strain (SARS-CoV2). Across the globe, there have been more than 6.5 million positive cases of COVID-19 and more than 380,000 deaths. (WHO COVID-19 Dashboard [https://covid19.who.int]). Multiple therapeutic



Dr. Menon

agents are currently being studied as potential treatment options for this novel disease. With negative trials so far on lopinavir-ritonavir and hydroxychloroquine, the only candidate drug showing benefit is remdesivir.

Results of the randomized double-blind placebo controlled Adaptive COVID-19 Treatment Trial (ACTT-1) trial (Beigel, J et al. *N Engl J Med.* 2020 May 22; doi: 10.1056/NEJMoa2007764) shows remdesivir improved recovery time in COVID-19 patients as compared with control subjects. Remdesivir is an inhibitor of viral RNA polymerase that has been shown to inhibit coronaviruses in animal models and SARS-CoV2 in-vitro. The ACTT-1 trial enrolled 1,063 patients with 541 assigned to the remdesivir arm and 522 to the placebo group. Primary outcome measure was time to recovery. Mortality at 14 and 28 days and incidence of ad-

verse events were also evaluated.

As interim analysis showed positive results, the data safety and monitoring board recommended early termination of the trial. Patients in the remdesivir group had a shorter time to recovery, with median recovery time of 11 days as compared with 15 days in placebo group (95% CI:1.12-1.55;  $P < .001$ ). Hospitalized patients requiring supplemental oxygen (but not high-flow, mechanical ventilation or ECMO) derived the maximum benefit with a rate ratio of recovery being 1.47(95% CI:1.17-1.84). Thus, early drug administration may be beneficial. The difference in mortality at 14 days was not statistically significant and data on mortality difference at 28 days were not available at the time of publication.

In summary, this trial along with previous publications shows that remdesivir is a potential therapeutic option for COVID-19. The Food and Drug Administration (FDA) approved remdesivir under Emergency Use Authorization (EUA) for COVID-19 and larger trials are currently underway to study the full effect of this agent.

Aravind Menon, MD  
Fellow-in-Training Member

## Critical Care

### Burnout in unprecedented times

Even in typical times, intensivists have a significantly higher rate of burnout compared with other medical specialties. We fight for lives,

*Continued on following page*

## In Memoriam

CHEST has been informed of the following deaths of CHEST members. We extend our sincere condolences.

John Murray, MD, FCCP  
(2020)

Stephan Kamholz, MD, FCCP  
(2020)

Larry C. Casey, MD, PhD  
(2020)

## Give a gift today

These last few months have been something that none of us has ever experienced. As many of you have witnessed firsthand, life is full of uncertainty and, as many of us try to get back to the “new normal,” we know that much of this uncertainty will persist. We are now not only dealing with a pandemic and caring for our patients but also addressing civil unrest and taking the time to grow and understand the importance of human life, no matter what race, ethnicity, or gender. In response, the CHEST Foundation has made efforts to further research in COVID-19 and increase our efforts in diversity and inclusion.

While we all race for solutions, we cannot overlook the immediate need in our local communities. The



Dr. Addrizzo-Harris



CHEST Foundation, along with partners across the nation, is taking a stand to deliver new resources and support now.

I proudly support the CHEST Foundation and am asking for your support, as well. Give a gift today, and together we can effect change for the better in our communities:

foundation.chestnet.org

Warmest regards,  
Doreen J. Addrizzo-Harris, MD, FCCP  
Immediate Past President & Trustee

The image shows a desktop monitor and a smartphone displaying the CHEST Foundation website. The website features a header with the CHEST logo and navigation links. The main content area includes a large banner with the text "Take A Breath. Help Is Here." and a sub-header "Better Lung Health Starts Now". Below this, there is a section titled "Most-viewed lung health topics" with links for "Acute Bronchitis", "Chronic Obstructive Pulmonary Disease (COPD)", and "Lung Cancer". The background of the website is a light blue with a subtle pattern of lung cells.

## CHEST Foundation COVID-19 Patient Resources

If your patients suffer from COPD, ILD, severe asthma, lung disease, or compromised lungs, they may feel plagued on a daily basis with concerns for their health during this pandemic. As COVID-19 continues to impact every aspect of our daily lives, it's important that those who are considered "at-risk" but not infected have access to the information they need. If that applies to your patients, we want them to know that the CHEST Foundation is here to help.

As part of the CHEST Foundation's mission to provide access and empowerment to the people who need it most, several COVID-19 educational resources have been created to ensure that no one is left to suffer in silence.

**ACCESS THE RESOURCES**  
[chestfoundation.org/covid](http://chestfoundation.org/covid)



*Continued from previous page*

dealing with death, dying, and tragedy on a daily basis. Regrettably, we are no longer in 'typical' times. This is a prodigious and uncharted era.

The COVID-19 pandemic has created all new hardships. Added to the complex world of critical care, we undertake lack of appropriate medical equipment and PPE, the possibility of becoming ill or infecting our families, potential financial struggles, and the unpredictability of the future. Additionally, in our efforts to care for patients, we face increasing moral distress when placed in situations in which we cannot do what we feel is right. And we carry the burdens and guilt of patients' families who cannot be with loved ones during this process, even during death.

What does burnout look like in this new era? Burnout is a continuum and can manifest differently depending on the individual. Even a typical day in the ICU may be cause for the symptoms of burnout including frustration, anger, anxiety, or sadness which can progress to feelings of powerlessness, self-doubt or depersonalization.

This crisis is a test of endurance. But we don't have to face it alone. The ICU is a team environment, and we can help each other make it to the end. Consider beginning the shift with a group morale boosting activity. Perhaps debrief after the end of each shift to discuss ways of combating these stressful times. Have a virtual happy hour with colleagues after work. Call on leadership for support. Watch each other's back. Together we will get through these unprecedented times.

*John P Gaillard, MD  
Steering Committee Member*

Resources for confronting burnout:  
<http://ccsconline.org/optimizing-the-workforce/burnout>  
<https://www.ama-assn.org/topics/physician-burnout>  
<https://www.ahrq.gov/prevention/clinician/ahrq-works/burnout/index.html>

### Interstitial and Diffuse Lung Disease

#### Advances in molecular imaging in pulmonary fibrosis

Fibrotic interstitial lung diseases (ILD), including idiopathic pul-

monary fibrosis (IPF), have poor prognosis with marked heterogeneity in the clinical course. Treatment options, including antifibrotic drugs and immunosuppressants, are fairly limited for either conditions, and there is wide variability in drug responsiveness. Biomarkers that predict disease course and enable patient stratification to assess responsiveness to specific therapies play a crucial role in management of this fatal disease.

Molecular imaging has the ability to noninvasively provide both structural details, as well as functional/molecular information at the cellular level; it has thus developed into a powerful tool for several inflammatory and malignant disease processes. Probes that specifically target fibrosis-specific pathways utilizing positron emission tomography (PET) or magnetic resonance (MR)



**Dr. Kulkarni**

imaging have gained traction recently.

The most commonly used radiopharmaceutical for PET, 18F-FDG, is significantly increased in areas of estab-

lished fibrosis in patients with IPF and autoimmune ILDs (Win, et al. *Eur J Nucl Med Mol Imaging*. 2018 May;45[5]:806; Uehara, et al. *Mod Rheumatol*. 2016;26[1]:121-7), as well as areas with seemingly normal morphologic appearance on HRCT scan (Win, et al. *Eur J Nucl Med Mol Imaging*. 2014 Feb;41[2]:337). While this probe was shown to have some potential for prognostication, there has been concern regarding the specificity of FDG uptake in fibrotic lung diseases. Hence, other probes that target specific fibrosis-related cellular mechanisms such as macrophages (Withana, et al. *Nature Scientific Reports*. 2016;6 [Jan 22]:19755, and John, et al. *J Nucl Med*. 2013;54[12]:2146) and matrix proteins (Montesi, et al. *Am J Respir Crit Care Med*. 2019 Jul 15;200[2]:258) have been developed in preclinical fibrosis/lung injury models and are being translated to human subjects.

With the ability to capture early fibrogenesis and target engagement, molecular imaging has the potential to prognosticate patients, provide earlier evaluation of treatment responsiveness and have a promising application in clinical trial design for fibrotic lung diseases.

*Tejaswini Kulkarni, MD  
Steering Committee Member*

## Home-Based Mechanical Ventilation and Neuromuscular Disease

### Use of modified RADs

Investigators have begun exploring ways to convert devices typically used to treat sleep-disordered breathing (respiratory assist device, RAD), with modifications to minimize risk of aerosolization of pathogen in the COVID-19 pandemic. These devices are presently not considered an effective means of treating acute respiratory distress syndrome (ARDS). In an emergency, however, it is reasonable to consider all the options available with a healthy respect for inherent device limitations.

A RAD could be converted from an open ventilation single-limb respiratory circuit to a closed ventilation circuit with a passive exhalation valve. This circuit could provide adequate minute ventilation and allow for adequate exhalation of CO<sub>2</sub> to prevent re-breathing. Strategic placement of the passive exhalation valve proximal to a virucidal filter would allow the device to be used with either an endotracheal tube or a nonvented oronasal mask (Figure). These devices by design are pressure-regulated, and a backup rate would be necessary to control minute ventilation. Close monitoring would be necessary given lack of alarm capability for a critically ill patient and the need to ensure adequate oxygen bleed-in.

The primary limitation to these devices is the inability to achieve adequate mean airway pressure for ARDS. While such a converted device is not ready for prime time, it could be considered for patients who

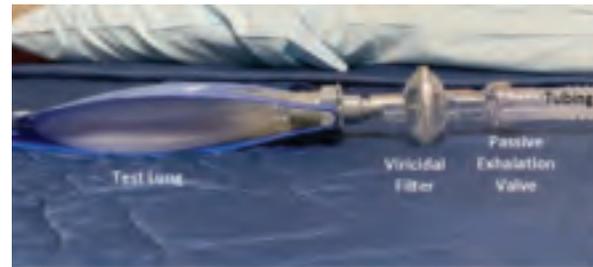
are close to weaning from conventional mechanical ventilation (i.e., freeing up a ventilator for a sicker patient) or temporizing a patient early in disease to stave off invasive ventilation.

MAJ Brian E. Foster, MC, USA

Fellow-in-Training Member

COL Jacob F. Collen MC, FCCP, USA

Steering Committee Member



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Associate Program Director,  
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Susan Gregory MD, FACP, FCCP

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