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Exposure to wildfire smoke, lasting from a few days to a couple of weeks, has become a yearly occurrence in many towns and cities through the American West.

JINGXUAN JI/Getty Images

Wildfires' toxic air leaves damage long after the smoke clears

BY KATHERYN HOUGHTON
Kaiser Health News

When researchers arrived in Seeley Lake, Mont., a town tucked in the northern Rockies, 3 years ago, they could still smell the smoke a day after it cleared from devastating wildfires. Their plan was to chart how long it took for people to recover from living for 7 weeks surrounded by relentless smoke.

They still don't know, because most residents haven't recovered. In fact, they've gotten worse.

Forest fires had funneled hazardous air into Seeley Lake, a town of fewer than 2,000 people, for 49 days. The air quality was so bad that on some days the monitoring stations couldn't mea-

sure the extent of the pollution. The intensity of the smoke and the length of time residents had been trapped in it were unprecedented, prompting county officials to issue their first evacuation orders because of smoke, not fire risk.

Many people stayed. That made Seeley Lake an ideal place to track the long-term health of people inundated by wildfire pollution.

So far, researchers have found that people's lung capacity declined in the first 2 years after the smoke cleared. Chris Migliaccio, PhD, an immunologist with the University of Montana, Missoula, and associates found the percentage of residents whose lung function sank below normal thresholds more than doubled in the first year

WILDFIRES // continued on page 7

Pandemic hits doctors hard: Income drops, burnout spikes

BY MARCIA FRELICK

Responses from physicians in eight countries show profound effects from COVID-19 on their personal and professional lives, according to the results of a Medscape survey.

More than 7,500 physicians – nearly 5,000 in the United States, and others in Brazil, France, Germany, Mexico, Portugal, Spain, and the United Kingdom – responded to questions about their struggles to save patients and how the pandemic has changed their income and their lives at home and at work.

The pain was evident in this response from an emergency medicine physician in Spain: "It has been the worst time in my life ever, in both my personal and professional life."

Conversely, some reported positive effects.

An internist in Brazil wrote: "I feel more proud of my career than ever before."

One-quarter of U.S. physicians considering earlier retirement

Physicians in the United States were asked what career changes, if any, they were considering

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CDC playbook preps states for COVID-19 vax rollout

BY JAKE REMALY

States have begun preparing to distribute a COVID-19 vaccine if one is approved, a CDC

official said today.

The CDC released guidance for states on Sept. 16 titled COVID-19 Vaccination Program Interim Playbook for Jurisdiction Operations. The document discusses vaccine

ordering, storing, and handling and says that states should submit their plans for vaccine distribution to the agency by Oct. 16.

“Every jurisdiction is heavily involved right now in their plan devel-

opment,” CDC official Janell Routh, MD, told the Advisory Committee on Immunization Practices during its Sept. 22 meeting. “It was really impressive to me that, even though the playbook only went out last

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week, states and jurisdictions have been thinking about this for quite some time.”

However, one committee member suggested that setting a deadline before more safety, efficacy, and storage information is known may be premature.

“I cannot imagine that we will actually know the final storage

requirements for this vaccine by Oct. 16, which makes me a little concerned about finalizing state plans,” said Helen “Keipp” Talbot, MD, MPH, associate professor of medicine at Vanderbilt University Medical Center in Nashville, Tenn. “We also don’t know the best populations yet when it comes to efficacy and safety.”

Dr. Routh said the CDC is asking states to plan on the basis of assumptions. “We know those plans will constantly be improving, changing, as we learn more information,” Dr. Routh said. States agreed to return a plan 30 days after the playbook was released, which is how the Oct. 16 deadline was established, she said.

States are encouraged to think broadly. Plans may include contingencies for a product that requires ultracold storage or for distributing more than one vaccine product, Dr. Routh said.

“One goal is to be ready on the first day that we can actually distribute vaccine,” Nancy Messonnier, MD, director of the National Center for Immunization and Respiratory Diseases, said during the meeting. “Our colleagues in Operation Warp Speed say that they expect there will be vaccine as early as November,

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and therefore we need to be ready so there is no delay in distributing that vaccine. And that phase, that early phase, is really close upon us.”

Many states have already developed plans, and the CDC is providing technical assistance as needed to monitor the plans regularly, Dr. Routh said.

Key issues identified

From holding pilot meetings with five jurisdictions, officials learned that public confidence in the vaccine is among states’ greatest concerns, Dr. Routh said. In addition, distribution is resource intensive, and social distancing adds logistical complexity.

Specific guidance on whom to vaccinate in the early stages will smooth the process, officials suggested during the pilot meetings. For the first several weeks, vaccine doses may be limited to priority populations, such as health care workers.

“This interim playbook is a living document,” Dr. Routh emphasized. “We definitely plan to update the content regularly as we learn more information about what vaccines and when they will be released.”

During the early stages of COVID-19 vaccination, officials plan to implement an enhanced monitoring program in which vaccine recipients would complete surveys about adverse events, in addition to the traditional vaccine safety monitoring programs that already exist, officials said.

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

COVID-19 crisis is ramping up burnout rates

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in light of their experience with COVID-19. Although a little more than half (51%) said they were not planning any changes, 25% answered, “retiring earlier than previously planned,” and 12% answered, “a career change away from medicine.”

The number of physicians reporting an income drop was highest in Brazil (63% reported a drop), followed by the United States (62%), Mexico (56%), Portugal (49%), Germany (42%), France (41%), and Spain (31%). The question was not asked in the United Kingdom survey.

In the United States, the size of the drop has been substantial: 9% lost 76%-100% of their income; 14% lost 51%-75%; 28% lost 26%-50%; 33% lost 11%-25%; and 15% lost 1%-10%.

The U.S. specialists with the largest drop in income were ophthalmologists, who lost 51%, followed by allergists (46%), plastic surgeons (46%), and otolaryngologists (45%).

“I’m looking for a new profession due to economic impact,” an otolaryngologist in the United States said. “We are at risk while essentially using our private savings to keep our practice solvent.”

More than half of U.S. physicians (54%) have personally treated patients with COVID-19. Percentages were higher in France, Spain, and the United Kingdom (percentages ranged from 60% to 68%).

The United States led all eight countries in treating patients with COVID-19 via telemedicine, at 26%. Germany had the lowest telemedicine percentage, at 10%.

Burnout intensifies

About two-thirds of U.S. physicians (64%) said that burnout had intensified during the crisis (70% of female physicians and 61% of male physicians said it had).

Many factors are feeding the burnout.

A critical care physician in the United States responded, “It is terrible to see people arriving at their rooms and assuming they were going to die soon; to see people saying goodbye to their families before dying or before being intubated.”

In all eight countries, a substantial percentage of physicians reported they “sometimes, often, or always” treated patients with COVID-19 without the proper personal protective equipment. Spain had by far the largest percentage who answered that way (67%), followed by France (45%), Mexico (40%), the United Kingdom (34%), Brazil and Germany (28% each), and the United States and Portugal (23% each). A U.S. rheumatologist wrote: “The fact that we were sent to take care of infectious patients without proper protection equipment made me feel we were betrayed in this fight.”

Sense of duty to volunteer to treat COVID-19 patients varied substantially among countries, from 69% who felt that way in Spain to 40% in Brazil. Half (50%) in the United States felt that way.

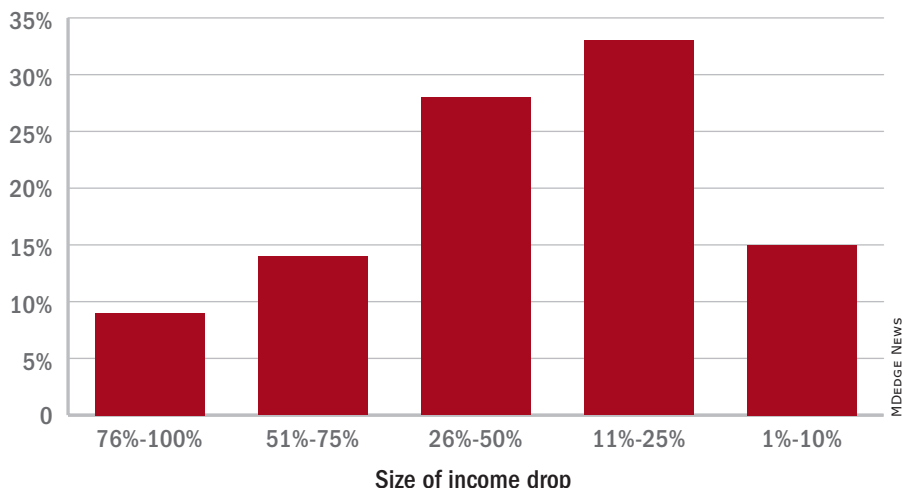
“Altruism must take second place where a real and present threat exists to my own personal existence,” one U.S. internist wrote.

Numbers personally infected

One-fifth of physicians in Spain and

Continued on following page

Physicians who reported income loss by size of decline



Note: Based on data from 5,005 U.S. physicians surveyed between June 9 and July 20, 2020.

Source: Medscape

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Perennial wildfires raise questions about long-term impact of smoke exposure // continued from page 1

after the fire and remained low a year after that.

“There’s something wrong there,” Dr. Migliaccio said. While it’s long been known that smoke can be dangerous when in the thick of it – triggering asthma attacks, cardiac arrests, hospitalizations, and more – the Seeley Lake research confirmed what public health experts feared: Wildfire haze can have consequences long after it’s gone.

That doesn’t bode well for the 78 million people in the western United States now confronting historic wildfires.

Toxic air from fires blanketed California and the Pacific Northwest during the summer of 2020, causing some of the world’s worst air quality. California fires have burned roughly 2.3 million acres so far this year, and the wildfire season isn’t over yet. Oregon estimates 500,000 people in the state have been under a notice to either prepare to evacuate or leave. Smoke from the West Coast blazes has drifted as far away as Europe.

Extreme wildfires are predicted to become a regular occurrence because of climate change. And, as more people increasingly settle in fire-prone places, the risks increase. That’s shifted wildfires from being a perennial reality for rural mountain towns to becoming an annual threat for areas across the West.

Perry Hystad, PhD, an associate professor at Oregon State University, Corvallis, said the Seeley Lake research offers unique insights into wildfire smoke’s impact, which until recently had largely been unexplored. He said similar studies are likely to follow because of this fire season.

“This is the question that everybody is asking,” Dr. Hystad said. “I’ve been sitting in smoke for 2 weeks: How concerned should I be?”

Dr. Migliaccio wants to know whether the lung damage he saw in Seeley Lake is reversible – or even treatable. (Think of an inhaler for

asthma or other medication that prevents swollen airways.)

Dr. Migliaccio said more research is needed on whether wildfire smoke damages organs besides the lungs, and whether routine exposure makes people more susceptible to diseases.

The combination of the fire season and the pandemic has spurred other questions as well, like whether heavy smoke exposure could lead to more COVID-19 deaths. A recent study showed a spike in influenza cases following major fire seasons.

“It’s like lead; there’s no safe level, but still we have a safety measure for what’s allowable,” Dr. Lu Hu, an atmospheric chemist with the University of Montana said. “Some things kill you fast and some things kill you slowly.”

A case study

Seeley Lake has long known smoke. It sits in a narrow valley between vast stretches of thick forests.

On a recent September day, Boyd Gossard stood on his back porch and pointed toward the mountains that were ablaze in 2017.

Mr. Gossard, 80, expects to have some summer days veiled in haze. But that year, he said, he could hardly see his neighbor’s house a few hundred feet away.

“I’ve seen a lot of smoke in my career,” said Mr. Gossard, who worked in timber management and served as a wildland firefighter. “But having to just live in it like this was very different. It got to you after a while.”

When Missoula County health officials urged people to leave town and flee the hazardous smoke, many residents stayed close to home. Some said their jobs wouldn’t let them leave. Others didn’t have a place to go

– or the money to get there.

Health officials warned those who stayed to avoid exercising and breathing too hard, to remain inside, and to follow steps to make their homes as smoke free as possible. The health department also worked to get air filters to those who needed them most.

But when flames got too close, some people had to sleep outside in campsites on the other side of town.

Understanding the science of smoke

One of the known dangers of smoke is particulate matter. Smaller than the width of a human hair, it can bypass a body’s defenses, lodging deep into lungs. Lu Hu, PhD, an atmospheric chemist with the University of Montana, said air quality reports are based on how much of that pollution is in the air.

“It’s like lead; there’s no safe level, but still we have a safety measure for what’s allowable,” Dr. Hu said. “Some things kill you fast and some things kill you slowly.”

While air quality measurements can gauge the overall amount of pollution, they can’t assess which specific toxins people are inhaling. Dr. Hu is collaborating with other scientists to better predict how smoke travels and what pollutants people actually breathe.

He said smoke’s chemistry changes based on how far it travels and what’s burning, among other factors.

Over the past few years, teams of researchers drove trucks along fire lines to collect smoke samples. Other scientists boarded cargo planes and flew into smoke plumes to take samples right from a fire’s source. Still others stationed at a mountain lookout captured smoke drifting in from nearby fires. And ground-level machines at a Missoula site logged data over 2 summers.

Bob Yokelson, PhD, a longtime smoke researcher with the University of Montana, said scientists are getting

closer to understanding its contents. And, he said, “it’s not all bad news.”

Temperature and sunlight can change some pollutants over time. Some dangerous particles seem to disappear. But others, such as ozone, can increase as smoke ages.

Dr. Yokelson said scientists are still a long way from determining a safe level of exposure to the hundred-odd pollutants in smoke.

“We can complete the circle by measuring not only what’s in smoke, but measuring what’s happening to the people who breathe it,” he said. “That’s where the future of health research on smoke is going to go.”

Coping with nowhere to flee

In the meantime, those studying wildland smoke hope what they’ve learned so far can better prepare people to live in the haze when evacuation isn’t an option.

Joan Wollan, 82, was one of the Seeley Lake study participants. She stayed put during the 2017 fire because her house at the time sat on a border of the evacuation zone. The air made her eyes burn and her husband cough. She ordered air filters to create cleaner air inside her home, which helped.

On a recent day, the air in Mrs. Wollan’s new neighborhood in Missoula turned that familiar gray-orange as traces of fires from elsewhere appeared. Local health officials warned that western Montana could get hit by some of the worst air quality the state had seen since those 2017 fires.

If it got bad enough, Mrs. Wollan said, she’d get the filters out of storage or look for a way to get to cleaner air – “if there is someplace in Montana that isn’t smoky.”

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the United Kingdom had personally been infected with the virus. Brazil, France, and Mexico had the next highest numbers, with 13%-15% of physicians infected; 5%-6% in the United States, Germany, and Portugal said they had been infected.

The percentage of physicians who reported that immediate family members had been infected ranged from 25% in Spain to 6% in Portugal. Among U.S. physicians, 9% reported that family members had been diagnosed with COVID-19.

In the United States, 44% of respondents who had family living with them at home during the

pandemic reported that relationships at home were more stressed because of stay-at-home guidelines and social distancing. Almost half (47%) said there had been no change, and 9% said relationships were less stressed.

Eating is coping mechanism of choice

Physicians were asked what they were doing more of during the pandemic, and food seemed to be the top source of comfort in all eight countries.

Loneliness reports differ across globe

Portugal had the highest percentage (51%) of

physicians reporting increased loneliness. Next were Brazil (48%), the United States (46%), the United Kingdom (42%), France (41%), Spain and Mexico (40% each), and Germany (32%).

All eight countries lacked workplace activities to help physicians with grief. More than half (55%) of U.K. physicians reported having such activities available at their workplace, whereas only 25% of physicians in Germany did; 12%-24% of respondents across the countries were unsure about the offerings.

A version of this article first appeared on Medscape.com.

COVID-19 noninvasive ventilation: Options, cautions

BY DOUG BRUNK

MDedge News

Early on in the COVID-19 pandemic, clinicians intubated many patients with respiratory insufficiency because of concern for aerosolization with other methods.

“We were concerned that, if we put them on high-flow nasal cannula or a noninvasive

ventilation, that we would create aerosols that would then be a risk to clinicians,” Meghan Lane-Fall, MD, MSHP, FCCM, said at a Society for Critical

Care Medicine virtual meeting called COVID-19: What’s Next.



Dr. Lane-Fall

Respiratory support options

According to Dr. Lane-Fall, an associate professor of anesthesiology and critical care at the University of Pennsylvania, Philadelphia, there are two basic types of respiratory support in patients with moderate, severe, or critical COVID-19: noninvasive and invasive. Noninvasive options include CPAP or BiPAP which can be delivered through nasal pillows, masks, and helmets, as well as high-flow nasal oxygen. Invasive options include endotracheal intubation, tracheostomy, and extracorporeal membrane oxygenation (ECMO), usually the veno-venous (VV) form. “But it’s uncommon to need VV ECMO, even in patients who have critical COVID-19,” she said.

Factors that favor noninvasive ventilation include stably high oxygen requirements, normal mental status, ward location of care, and moderate to severe COVID-19. Factors that favor invasive ventilation include someone who’s deteriorating rapidly, “whose oxygen requirements aren’t stable or who is cardiopulmonary compromised,” said Dr. Lane-Fall, who is also co-medical director of the Trauma Surgery Intensive Care Unit at Penn Presbyterian Medical Center, also in Philadelphia. Other factors include the need for other invasive procedures such as surgery or if they have severe to critical COVID-19, “not just pneumonia, but [illness that’s] progressing into [acute respiratory distress syndrome],” she said.

Indications for urgent endotracheal intubation as opposed to giving a trial of noninvasive ventilation or high-flow nasal oxygen include altered mental status, inability to protect airway, copious amounts of secretions, a Glasgow Coma Scale score of less than 8, severe respiratory acidosis, hypopnea or apnea, shock, or an inability to tolerate noninvasive support.”

Safety precautions

Aerosolizing procedures require attention to location, personnel, and equipment, including personal protective equipment (PPE), said Dr. Lane-Fall, who is an anesthesiologist by training. “When you are intubating someone, whether they have COVID-19 or not, you are sort of in the belly of the beast,” she said. “You are very exposed to secretions that occur at the time of endotracheal intubation. That’s why it’s important for us to have PPE and barriers to protect ourselves from potential exposure to aerosols during the care of patients with COVID-19.”

In February 2020, the not-for-profit Anesthesia Patient Safety Foundation published recommendations for airway management in patients with suspected COVID-19. A separate guidance was published in the British Journal of Anaesthesiology based on emergency tracheal intubation in 202 patients with COVID-19 in Wuhan, China (2020;125[1]:e28-37). “The idea here is that you want to intubate under controlled conditions,” said Dr. Lane-Fall, who is an author of the guidance. “You want to use the most experienced operator. You want to have full PPE, including an N95 mask, or something more protective like a powered air purifying respirator or an N95 mask with a face shield. You want the eyes, nose, and mouth of the operator covered completely.”

CPR, another aerosolizing procedure, requires vigilant safety precautions as well. “We struggled with this a little bit at our institution, because our inclination as intensivists when someone is pulseless is to run into the room and start chest compressions and to start resuscitation,” Dr. Lane-Fall said. “But the act of chest compression itself can create aerosols that can present risk to clinicians. We had to tell our clinicians that they have to put on PPE before they do CPR. The buzz phrase here is that there is no emergency in a pandemic. The idea here

is that the good of that one patient is outweighed by the good of all the other patients that you could care for if you didn’t have COVID-19 as a clinician.”

Risks during extubation

Extubation of COVID-19 patients is also an aerosolizing procedure not just because you’re pulling an endotracheal tube out of the airway but because coughing is a normal part of extubation. “We’ve had to be careful with how we approach extubation in COVID-19 patients,” Dr. Lane-Fall said. “Ideally you’re doing this in a negative-pressure environment.”

Reintubation of COVID-19 patients is not uncommon. She and her colleagues at Penn Medicine created procedures for having intubators at the ready outside the room in case the patient were to decompensate clinically. “Another thing we learned is that it’s useful to do a leak test prior to extubation, because there may be airway edema related to prolonged intubation in these patients,” Dr. Lane-Fall said. “We found that, if a leak is absent on checking the cuff leak, the use of steroids for a day or 2 may help decrease airway edema. That improves the chances of extubation success.”

Strategies for aerosol containment

Dr. Lane-Fall concluded her remarks by reviewing airway control adjuncts and clinician safety. This includes physically isolating COVID-19 patients in negative-pressure rooms and avoiding and minimizing aerosols, including the use of rapid intubation, “where we induce anesthesia for intubation but we don’t bag-mask the patient because that creates aerosols,” she said. The Anesthesia Patient Safety Foundation guidelines advocate for the use of video laryngoscopy so that you can visualize the glottis easily “and make sure that you successfully intubate the glottis and not the esophagus,” she said.

A smart strategy for aerosol containment is to use the most experienced laryngoscopist available. Dr. Lane-Fall said, “This is not the space for an inexperienced learner.”

Another way to make intubation faster and easier in COVID-19 patients is to use an intubation box, which features a plexiglass shield that enables the intubator to use their hands to get in the patient’s airway while being protected from

viral droplets generated during intubation. The box can be cleaned after each use.

Expert view on aerosol containment in COVID-19

“While there is a dearth of evidence from controlled trials, recommendations mentioned in this story are based on the best available evidence and are in agreement with guidelines from several expert groups,” said David L. Bowton, MD, FCCP, FCCM, of the department of anesthesiology at Wake Forest Baptist Health in Winston-Salem, N.C. “The recommendation of Dr. Lane-Fall’s that is perhaps most controversial is the use of an intubation box. Multiple designs for these intubation/aerosol containment devices have been proposed, and the data supporting their ease of use and efficacy has been mixed [see *Anaesthesia*. 2020;75(8):1014-21 and *Anaesthesia*. 2020. doi: 10.1111/anae.15188]. While bag valve mask ventilation should be avoided if possible, it may be a valuable rescue tool in the severely hypoxemic patient when used with two-person technique to achieve a tight seal and a PEEP valve and an HME over the exhalation port to minimize aerosol spread.

“It cannot be stressed enough that the most skilled individual should be tasked with intubating the patient and as few providers as possible [usually three] should be in the room and have donned full PPE. Negative-pressure rooms should be used whenever feasible. Noninvasive ventilation appears safer from an infection control standpoint than initially feared and its use has become more widespread. However, noninvasive ventilation is not without its hazards, and Dr. Lane-Fall’s enumeration of the patient characteristics applicable to the selection of patients for



Dr. Bowton

noninvasive ventilation is extremely important. At our institution, the use of noninvasive ventilation and especially high-flow oxygen therapy has increased. Staff have become more comfortable with the donning and doffing of PPE.”

Dr. Lane-Fall reported having no financial disclosures.

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COVID-19 patients with kidney injury at higher risk

BY PAM HARRISON

More evidence indicates that the development of acute kidney injury (AKI) in patients hospitalized with COVID-19 is

associated with dramatically higher than usual mortality rates. In addition, a significant proportion of patients with AKI do not recover kidney function by the time they are discharged. “This ... is the first

study in the United States to report the persistence of kidney dysfunction (lack of recovery) in survivors of COVID-19–associated AKI [and] this is in marked contrast to other forms of AKI where over 80% of pa-

tients recover their renal function by 10 days,” Lili Chan, MD, of the Icahn School of Medicine at Mount Sinai, New York, and colleagues observed.

The research is a retrospective, observational cohort study published online in the *Journal of the American Society of Nephrology*. “We may be facing an epidemic of post–COVID-19 kidney disease and that, in turn, could mean much greater numbers of patients who require kidney dialysis and even transplants,” said senior author Girish Nadkarni, MD, a nephrologist, in a statement from Mount Sinai.

After adjusting for demographics, comorbidities, and laboratory values, the aOR for death was 11.4 times higher for ICU patients with AKI, compared with ICU patients without AKI.

Nephrologists will need to prepare for a significant uptick in patients with chronic kidney disease as a result of exposure to the SARS-CoV-2 virus that causes COVID-19, the researchers warned.

“These findings may help centers with resource planning and preparing for the increased load resulting from survivors of COVID-19–associated AKI who do not experience recovery of kidney function,” they added.

Analysis of patients from February to end of May 2020

“AKI among hospitalized patients with COVID-19 in the United States is not well described,” they noted in their article.

And so they analyzed data from five major hospitals in the Mount Sinai Health System between Feb. 27 and May 30 of this year, during which 3,993 patients were hospitalized within the system for COVID-19. The MSHS has a patient population of racially and ethnically diverse citizens from New York.

AKI was defined using Kidney Disease: Improving Global Outcomes (KDIGO) criteria. AKI occurred in 46% of the overall cohort of patients, 19% of whom required dialysis.

However, among those patients who required admission to the ICU, over three-quarters (76%) developed AKI and almost one-third of ICU patients required dialysis, the investigators said.

“The median time from hospital admission until AKI diagnoses was

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1 day and the median time from AKI diagnosis to dialysis was 3 days,” they explain.

The proportion of patients with stages 1, 2, or 3 AKI among those admitted to hospital were 39%, 19%, and 42%, respectively. In patients requiring admission to ICU, 28% had stage 1 AKI, 17% had stage 2, and 56% had stage 3.

And among those who required dialysis for AKI, the median peak serum creatinine was 8.2 mg/dL, compared with 2.2 mg/dL for those who did not require dialysis.

Predictors of AKI

Almost two-thirds of patients (65%) had recovered from their kidney injury by the time they left the hospital but 35% had acute kidney disease. Of this latter group, on follow-up, 36% had recovered from it, the investigators noted.

Conversely, of those patients who had recovered from AKI by hospital discharge, 14% went on to develop acute kidney disease at the time of follow-up.

And 30% of patients who had required dialysis at some point during their hospital care required dialysis again within 72 hours of being discharged, the investigators noted.

Predictors of severe AKI included male sex (adjusted odds ratio, 1.46), potassium levels on admission (aOR, 1.7), and preexisting chronic kidney disease (CKD) (aOR, 2.8).

Most compellingly, “in-hospital mortality in patients who experienced AKI was 50% [versus] 8% in patients without AKI ($P < .001$),” Dr. Nadkarni and colleagues reported.

Among those who required ICU care, 42% of patients with AKI died, compared with 7% of those in ICU who did not develop AKI, while in patients cared for outside of ICU, 62% with AKI died compared with only 13% of those who did not develop AKI.

And after adjusting for demographics, comorbidities, and laboratory values, the aOR for death was 11.4 times higher for ICU patients with AKI, compared with ICU patients without AKI, the authors emphasize.

In all patients who developed AKI, the aOR for mortality was 9.2, compared with patients who did not develop AKI, they added.

Perhaps predictably, the risk of death rose with increasing stage of AKI, and patients with stage 3 AKI who required dialysis were at highest risk of death, the authors observe.

Unprecedented number of AKI cases

“The sheer number of AKI cases

and the overwhelming need for dialysis that we are seeing in the context of COVID-19 is unprecedented,” Dr. Nadkarni said.

“These findings bring clinical evidence to the hypothesis of lingering organ dysfunction among patients recovering from COVID-19 and serve as a reminder to hospitals around the country to be very stra-

tegic in the allocation of resources to care for patients who experience AKI,” he cautioned.

“We are grappling with a great deal of uncertainty as to how the virus will impact the kidneys in the long haul,” Dr. Nadkarni added.

“We may be facing an epidemic of post-COVID-19 kidney disease, and that, in turn, could mean much

greater numbers of patients who require kidney dialysis and even transplants.”

Dr. Nadkarni reported serving as a consultant and advisory board member for RenalytixAI and owns equity in the company.

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Trial studied use of ACEIs, ARBs in COVID-19 patients

BY SUE HUGHES

The first randomized study to compare continuing versus stopping ACE inhibitors or angiotensin receptor blockers (ARBs) for patients with COVID-19 has shown no difference in key outcomes between the two approaches.

The BRACE CORONA trial – conducted in patients who had been taking an ACE inhibitor or an ARB on a long-term basis and who were subsequently hospitalized with COVID-19 – showed no difference in the primary endpoint of number of days alive and out of hospital among those whose medication was suspended for 30 days and those who continued undergoing treatment with these agents.

“Because these data indicate that there is no clinical benefit from routinely interrupting these medications in hospitalized patients with mild to moderate COVID-19, they should generally be continued for those with an indication,” principal investigator Renato Lopes, MD, of Duke Clinical Research Institute, Durham, N.C., concluded.

The BRACE CORONA trial was presented at the European Society of Cardiology Congress 2020 on Sept. 1. Dr. Lopes explained that there are two conflicting hypotheses about the role of ACE inhibitors and ARBs in COVID-19.

Study hypotheses

One hypothesis suggests that use of these drugs could be harmful by increasing the expression of ACE2 receptors (which the SARS-CoV-2 virus uses to gain entry into cells), thus potentially enhancing viral binding and viral entry. The other suggests that ACE inhibitors and ARBs could be protective by reducing production of angiotensin II and enhancing the generation of angiotensin 1-7, which attenuates inflammation and fibrosis and therefore could attenuate lung injury.

The BRACE CORONA trial was an academic-led randomized study that tested two strategies: temporarily stopping the ACE inhibitor/ARB for 30 days or continuing these drugs for patients who had been taking these medications on a long-term basis and were hospitalized with a confirmed diagnosis of COVID-19.

The primary outcome was the number of days alive and out of hospital at 30 days. Patients who were using more than three antihypertensive drugs or sacubitril/valsartan

or who were hemodynamically unstable at presentation were excluded from the study.

The trial enrolled 659 patients from 29 sites in Brazil. The mean age of patients was 56 years, 40% were women, and 52% were obese. ACE inhibitors were being taken by 15% of the trial participants; ARBs were being taken by 85%. The median duration of ACE inhibitor/ARB treatment was 5 years.

Patients were a median of 6 days from COVID-19 symptom onset. For 30% of the patients, oxygen saturation was below 94% at entry. In terms of COVID-19 symptoms, 57% were classified as mild, and 43% as moderate.

Those with severe COVID-19 symptoms who needed intubation or vasoactive drugs were excluded. Antihypertensive therapy would generally be discontinued in these



Dr. Lopes

patients anyway, Dr. Lopes said.

Results showed that the average number of days alive and out of hospital was 21.9 days for patients who stopped taking ACE inhibitors/ARBs and 22.9

days for patients who continued taking these medications. The average difference between groups was –1.1 days.

The average ratio of days alive and out of hospital between the suspending and continuing groups was 0.95 (95% CI, 0.90-1.01; $P = .09$).

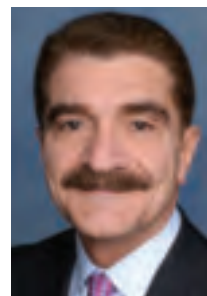
The proportion of patients alive and out of hospital by the end of 30 days in the suspending ACE inhibitor/ARB group was 91.8% versus 95% in the continuing group.

A similar 30-day mortality rate was seen for patients who continued and those who suspended ACE inhibitor/ARB therapy, at 2.8% and 2.7%, respectively (hazard ratio, 0.97). The median number of days that patients were alive and out of hospital was 25 in both groups.

Dr. Lopes said that there was no difference between the two groups with regard to many other secondary outcomes. These included COVID-19 disease progression (need for intubation, ventilation, vasoactive drugs, or imaging results) and cardiovascular endpoints (MI, stroke, thromboembolic events, worsening heart failure, myocarditis, or hypertensive crisis).

VIEW ON THE NEWS

G. Hossein Almassi, MD, FCCP, comments: The findings of this randomized trial answer an important question that surfaced early in the COVID pandemic, namely, the role of ACE inhibitors and ARBs in COVID patients. Within the study limitations such as a short 30-days endpoint for the clinical results, the findings are significant and reassuring for the clinicians treating these patients.



“Our results endorse with reliable and more definitive data what most medical and cardiovascular societies are recommending – that patients do not stop ACE inhibitor or ARB medication. This has been based on observational data so far, but BRACE CORONA now provides randomized data to support this recommendation,” Dr. Lopes concluded.

Dr. Lopes noted that several subgroups had been prespecified for analysis. Factors included age, obesity, difference between ACE inhibitors/ARBs, difference in oxygen saturation at presentation, time since COVID-19 symptom onset, degree of lung involvement on CT, and symptom severity on presentation.

“We saw very consistent effects of our main findings across all these subgroups, and we plan to report more details of these in the near future,” he said.

Protective for older patients?

The discussant of the study at the ESC Hotline session, Gianfranco Parati, MD, University of Milan-Bicocca and San Luca Hospital, Milan, congratulated Lopes and his team for conducting this important trial at such a difficult time.

He pointed out that patients in the BRACE CORONA trial were quite young (average age, 56 years) and that observational data so far suggest that ACE inhibitors and ARBs have a stronger protective effect in older COVID-19 patients.

He also noted that the percentage of patients alive and out of hospital at 30 days was higher for the patients who continued on treatment in this study (95% vs. 91.8%), which suggested an advantage in maintaining the medication.

Dr. Lopes replied that one-quarter of the population in the BRACE CORONA trial was older than 65 years, which he said was a “reasonable number.”

“Subgroup analysis by age did not show a significant interaction, but the effect of continuing treatment

does seem to be more favorable in older patients and also in those who were sicker and had more comorbidities,” he added.

Dr. Parati also suggested that it would have been difficult to discern differences between ACE inhibitors and ARBs in the BRACE CORONA trial, because so few patients were taking ACE inhibitors; the follow-up period of 30 days was relatively short, inasmuch as these drugs may have long-term effects; and it would have been difficult to show differences in the main outcomes used in the study – mortality and time out of hospital – in these patients with mild to moderate disease.

Some questions not addressed

Franz H. Messerli, MD, and Christoph Gräni, MD, University of Bern (Switzerland), said in a joint statement: “The BRACE CORONA trial provides answers to what we know from retrospective studies: if you have already COVID, don’t stop renin-angiotensin system blocker medication.”

They added, however, that the study does not answer the question about the risk/benefit of ACE inhibitors or ARBs with regard to possible enhanced viral entry through the ACE2 receptor. “What about all those on these drugs who are not infected with COVID? Do they need to stop them? We simply don’t know yet,” they said.

Dr. Messerli and Dr. Gräni added that they would like to see a study that compared patients before SARS-CoV-2 infection who were without hypertension, patients with hypertension who were taking ACE inhibitors or ARBs, and patients with hypertension taking other antihypertensive drugs.

The BRACE CORONA trial was sponsored by D’Or Institute for Research and Education and the Brazilian Clinical Research Institute. Dr. Lopes has disclosed no relevant financial relationships.

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



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PAP therapy lowered risk of Alzheimer's disease

BY CHRISTINE KILGORE

MDedge News

Obststructive sleep apnea (OSA) treatment with positive airway pressure (PAP) therapy was associated with a lower odds of incident Alzheimer's disease and other dementia in a large retrospective cohort study of Medicare patients with the sleep disorder.

The study builds on research linking OSA to poor cognitive outcomes and dementia syndromes. With use of a 5% random sample of Medicare beneficiaries (more than 2.7 million) and their claims data, investigators identified approximately 53,000 who had an OSA diagnosis prior to 2011.

Of these Medicare beneficiaries, 78% with OSA were identified as "PAP-treated" based on having at least one durable medical equipment claim for PAP equipment. And of those treated, 74% were identified as "PAP adherent" based on having more than two PAP equipment claims separated by at least a month, said Galit Levi Dunitz, PhD, MPH, at the virtual annual meeting of the Associated Professional Sleep Societies.

Dr. Dunitz and her coinvestiga-

tors used logistic regression to examine the associations between PAP treatment and PAP treatment adherence, and incident ICD-9 diagnoses of Alzheimer's disease (AD), mild cognitive impairment (MCI), and dementia not otherwise specified (DNOS) over the period 2011-2013.

After adjustments for potential confounders (age, sex, race, stroke, hypertension, cardiovascular disease, and depression), OSA treatment was associated with a significantly lower odds of a diagnosis of AD (odds ratio, 0.78; 95% confidence interval 0.69-0.89) or DNOS (OR, 0.69; 95% CI, 0.55-0.85), as well as nonsignificantly lower odds of MCI diagnosis (OR, 0.82; 95% CI, 0.66-1.02).

"People who are treated for OSA have a 22% reduced odds of being diagnosed with AD and a 31% reduced odds of getting DNOS," said Dr. Dunitz, from the University of Michigan in Ann Arbor, in an interview after the meeting. "The 18% reduced odds of mild cognitive disorder is not really significant because the upper bound is 1.02, but we consider it approaching significance."

Adherence to treatment was sig-

nificantly associated with lower odds of AD, but not with significantly lower odds of DNOS or MCI, she said. OSA was confirmed by ICD-9 diagnosis codes plus the presence of relevant polysomnography current procedural terminology code.

All told, the findings "suggest that PAP therapy for OSA may lower short-term risk for dementia in older persons," Dr. Dunitz and her co-investigators said in their poster presentation. "If a causal pathway exists between OSA and dementia, treatment of OSA may offer new opportunities to improve cognitive outcomes in older adults with OSA."

Andrew W. Varga, MD, of the division of pulmonary, critical care, and sleep medicine at the Icahn School of Medicine at Mount Sinai and the Mount Sinai Integrative Sleep Center, both in New York, said that cognitive impairment is now a recognized clinical consequence of OSA and that OSA treatment could be a target for the prevention of cognitive impairment and Alzheimer's disease in particular.

"I absolutely bring it up with patients in their 60s and 70s. I'm honest – I say, there seems to be

more and more evidence for links between apnea and Alzheimer's in particular. I tell them we don't know 100% whether PAP reverses any of this, but it stands to reason that it does," said Dr. Varga, who was asked to comment on the study and related research.

An analysis published several years ago in *Neurology* (2015;84[19]:1964-71) from the Alzheimer's Disease Neuroimaging Initiative cohort found that patients with self-reported sleep apnea had a younger age of MCI or AD onset (about 10 years) and that patients who used continuous positive airway pressure had a delayed age of onset. "Those who had a subjective diagnosis of sleep apnea and who also reported using CPAP as treatment seemed to go in the opposite direction," said Dr. Varga, a coauthor of that study. "They had an onset of AD that looked just like people who had no sleep apnea."

Dr. Dunitz's study was supported by the American Academy of Sleep Medicine Foundation. She reported having no disclosures. Dr. Varga said he has no relevant disclosures.

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Sleep disorders: Silent harbingers of hypertension

BY KERRY DOOLEY YOUNG

MDedge News

Sleep disorders may be precursors of cardiometabolic disease among U.S. Latinos, said authors of a newly published study.

Xiaoyu Li, ScD, and Susan Redline, MD, MPH, of Harvard Medical School and Brigham and Women's Hospital, Boston, and coauthors conducted a study of people who self-identified as Latino, who had baseline sleeping disorders, and who developed hypertension and diabetes over time. The study was published in the *American Journal of Respiratory and Critical Care Medicine*.

The findings suggested that sleep disorders preceded the development of hypertension and diabetes. Examining records from a major multiyear federal project, the Hispanic Community Health Study/Study of Latinos, Dr. Li, Dr. Redline, and coauthors found sleep-disordered breathing (SDB) was associated with a 1.54 higher adjusted odds of incident hypertension (95% confidence interval, 1.18-2.00) and 1.33 higher odds of incident diabetes (95% CI, 1.05-1.67), compared with no SDB. Insomnia was associated with incident hypertension (odds ratio, 1.37; 95% CI, 1.11-1.69), but not diabetes. The association between insomnia and incident hypertension was stronger among men than women, they reported.

"We now need large-scale rigorous trials to evaluate the impact of early treatment of sleep disordered breathing and insomnia on preventing the development of hypertension and diabetes," Dr. Redline said in an interview.

Implications for public health strategies

The study results may have implications for health strategies and policies aimed at addressing health differentials among ethnic and economic groups in the United States.

Suboptimal sleep health may be an important fundamental but understudied contributor to health disparities, Chandra L. Jackson, PhD, MS, of the National Institute of Environmental Health Sciences, Research Triangle, N.C., said in an interview. Dr. Jackson is the lead author for a report published in August on a 2018 National Institutes of Health workshop regarding the importance of studying sleep health disparities (*Sleep*. 2020 Mar 10. doi: 10.1093/sleep/zsaa037). The

NIH workshop emphasized how little research has been done on the prevalence, incidence, morbidity, or mortality of sleep deficiencies of racial and ethnic minority populations, even though members of these groups are generally more



Dr. Jackson



Dr. Li

likely to experience sleep disorders. The report urged "a nuanced integration between health disparity causal pathways and sleep and circadian-related mechanisms" tailored for these groups, with attention paid to sociocultural context.

Dr. Jackson said the study by Dr. Li and colleagues fits nicely with the strategies recommended in this report. She added: "Prospective design is particularly important for establishing temporality or that the SDB and insomnia symptoms occurred before the outcomes of hypertension and diabetes."

In commenting on the Xi/Redline paper, Krishna M. Sundar, MD, FCCP, medical director of the Sleep-Wake Center at the University of Utah, Salt Lake City, commended the study and noted that one of the challenges in sleep research is the long time period over which the effects of disordered breathing become clear, he said.

"Things don't happen immediately. It takes months, years for the effects to develop," Dr. Sundar said. "To try to piece together the relationships, you need very well-planned studies."

Study design: Participants and exclusions

Latinos currently make up 17.8%, or 57.5 million, of the U.S. population, and this group is expected to double within the next 4 decades, the investigators wrote. A few prior studies on the roles of sleep disorders in the cardiometabolic health of Latinos, though suggestive, were limited by

cross-sectional designs, relatively small samples, and underrepresentation of various Latino heritage groups.

The investigators on this new study worked with data from the federal Hispanic Community Health Study/Study of Latinos (HCHS/SOL) in which more than 16,000 people participated.

This multiyear federal study drew people who self-identified with different heritage groups, including Cuban, Dominican, Mexican, Central American, South American, and Puerto Rican. Participants initially aged 18-74 years underwent a first round of exams and assessments between 2008 and 2011 to determine what risk factors they had at the start of the study. In the second phase, which took place from 2013 to 2018, participants had a second set of exams. The National Heart, Lung, and Blood Institute and the National Institute of Diabetes and Digestive and Kidney Diseases funded the HCHS/SOL.

The investigators initially had a potential data pool of 11,623 participants in the HCHS/SOL. About 1 of 8 in this group, or 1,424 participants (12.3%), did not undergo a sleep study or did not have sufficient sleep data for analyses. Another 93 (0.8%) participants were excluded for missing data on covariates.

For incident hypertension analyses, participants who had prevalent hypertension at the first screening in the HCHS/SOL ($n = 3,139$) or had missing data on hypertension ($n = 2$) were excluded. That resulted in an analytic sample of 6,965 for hypertension questions.

For incident diabetes analyses, participants who had prevalent diabetes at the first screening ($n = 2,062$) or had missing data on diabetes ($n = 21$) were excluded, yielding an analytic sample of 8,023.

Incident hypertension was defined as participants not having hypertension at baseline and having hypertension, defined as having a systolic blood pressure 140 mm Hg or greater, diastolic blood pressure 90 mm Hg or greater, or receiving antihypertensive medication within 4 weeks, at the second round of screening.

Cardiometabolic disease definitions

The researchers did not discriminate between type 1 and type 2 diabetes. They used the American Diabetes Association definition as a fasting plasma glucose 126 mg/dL or greater, 2-hour, postload plasma glucose

200 mg/dL or greater, or hemoglobin A1c 6.5% or greater, with an additional criterion on self-reported use of antidiabetic medication within 4 weeks before the visit.

In line with previous research, the investigators controlled for potential confounders measured at baseline including sociodemographic factors, health behaviors, and adiposity, which are considered important risk factors for both sleep disorders and incident metabolic diseases. These factors include education level, age, gender, and body mass index and whether participants had ever been smokers or users of alcohol.

Study limitations

Limitations of the study include use of a home sleep apnea test device that did not allow evaluation of arousal or sleep architecture. The researchers said this may have led to an underestimation of disease severity both due to overestimation of sleep time and underrecognition of hypopneas unassociated with desaturation. In addition, prior research has suggested that minority populations might underreport sleep disturbances, possibly "due to social desirability (a tendency not to encode a negative event), stress, stereotype threat, acculturation, attitudes, etc." The participants were recruited mostly from urban areas, and the results might not be generalized to rural populations. In addition, 41% of study participants were of Mexican heritage, compared with 63% of the Hispanic population being of Mexican heritage in the United States.

Another researcher in the field of health disparities, Julia Roncoroni, PhD, assistant professor of psychology at the University of Denver, also noted this slight underrepresentation of Hispanics of Mexican origin and an overrepresentation of urban individuals in the HCHS/SOL.

"However, using data from HCHS/SOL, which is the largest multicenter epidemiological study of cardiovascular risk factors and sleep traits in U.S. Hispanics/Latinx, allows researchers to answer a high-impact question that would otherwise be prohibitively expensive and time consuming," wrote Dr. Roncoroni.

Dr. Redline was partially supported by NIH grant R35 HL135818.

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SOURCE: Li X et al. *Am J Respir Crit Care Med*. 2020 Aug 6. doi: 10.1164/rccm.201912-2330OC.

Distinguishing COVID-19 from flu in children remains challenging

BY RICKI LEWIS, PHD

For children with COVID-19, rates of hospitalization, ICU admission, and ventilator use were similar to those of children with influenza, but rates differed in other respects, according to results of a study published online Sept. 11 in JAMA Network Open (doi: 10.1001/jamanetworkopen.2020.20495).

As winter approaches, distinguishing patients with COVID-19 from those with influenza will become a problem. To assist with that, Xiaoyan Song, PhD, director of the office of infection control and epidemiology

Among patients hospitalized with COVID-19, 65% had at least one underlying medical condition, compared with 42% of those hospitalized for either type of influenza.

at Children's National Hospital in Washington, and colleagues investigated commonalities and differences between the clinical symptoms of COVID-19 and influenza in children.

"Distinguishing COVID-19 from flu and other respiratory viral infections remains a challenge to clinicians. Although our study showed that patients with COVID-19 were more likely than patients with flu to report fever, gastrointestinal, and other clinical symptoms at the time of diagnosis, the two groups do have many overlapping clinical symptoms," Dr. Song said. "Until future data show us otherwise, clinicians need to prepare for managing coinfections of COVID-19 with flu and/or other respiratory viral infections in the upcoming flu season."

The retrospective cohort study included 315 children diagnosed with laboratory-confirmed COVID-19 between March 25 and May 15, 2020, and 1,402 children diagnosed with laboratory-confirmed seasonal influenza A or influenza B between Oct. 1, 2019, and June 6, 2020, at Children's National Hospital. The investigation excluded asymptomatic patients who tested positive for COVID-19.

Patients with COVID-19 and patients with influenza were similar with respect to rates of hospitaliza-

tion (17% vs. 21%; odds ratio, 0.8; 95% confidence interval, 0.6-1.1; $P = .15$), admission to the ICU (6% vs. 7%; OR, 0.8; 95% CI, 0.5-1.3; $P = .42$), and use of mechanical ventilation (3% vs. 2%; OR, 1.5; 95% CI, 0.9-2.6; $P = .17$).

The difference in the duration of ventilation for the two groups was not statistically significant. None of the patients who had COVID-19 or influenza B died, but two patients with influenza A did.

No patients had coinfections, which the researchers attribute to the mid-March shutdown of many schools, which they believe limited the spread of seasonal influenza.

Patients who were hospitalized with COVID-19 were older (median age, 9.7 years; range, 0.06-23.2 years) than those hospitalized with either type of influenza (median age, 4.2 years; range, 0.04-23.1). Patients older than 15 years made up 37% of patients with COVID-19 but only 6% of those with influenza.

Among patients hospitalized with COVID-19, 65% had at least one underlying medical condition, compared with 42% of those hospitalized for either type of influenza (OR, 2.6; 95% CI, 1.4-4.7; $P = .002$).

The most common underlying condition was neurologic problems from global developmental delay or seizures, identified in 11 patients (20%) hospitalized with COVID-19 and in 24 patients (8%) hospitalized with influenza (OR, 2.8; 95% CI, 1.3-6.2; $P = .002$). There was no significant difference between the two groups with respect to a history of asthma, cardiac disease, hematologic disease, and cancer.

For both groups, fever and cough were the most frequently reported symptoms at the time of diagnosis. However, more patients hospitalized with COVID-19 reported fever (76% vs. 55%; OR, 2.6; 95% CI, 1.4-5.1; $P = .01$), diarrhea or vomiting (26% vs. 12%; OR, 2.5; 95% CI, 1.2-5.0; $P = .01$), headache (11% vs. 3%; OR, 3.9; 95% CI, 1.3-11.5; $P = .01$), myalgia (22% vs. 7%; OR, 3.9; 95% CI, 1.8-8.5; $P = .001$), or chest pain (11% vs. 3%; OR, 3.9; 95% CI, 1.3-11.5; $P = .01$).

The researchers found no statistically significant differences between the two groups in rates of cough, congestion, sore throat, or shortness of breath.

Comparison of the symptom



DRPNKCP/THINKSTOCK

spectrum between COVID-19 and flu differed with respect to influenza type. More patients with COVID-19 reported fever, cough, diarrhea and vomiting, and myalgia than patients hospitalized with influenza A. But rates of fever, cough, diarrhea or vomiting, headache, or chest pain didn't differ significantly in patients with COVID-19 and those with influenza B.

Larry K. Kocielek, MD, medical director of infection prevention and control at Ann and Robert H. Lurie

Rates of fever, cough, diarrhea or vomiting, headache, or chest pain didn't differ significantly in patients with COVID-19 and those with influenza B.

Children's Hospital of Chicago, noted the lower age of patients with flu. "Differentiating the two infections, which is difficult if not impossible based on symptoms alone, may have prognostic implications, depending on the age of the child. Because this study was performed outside peak influenza season, when coinfections would be less likely to occur, we must be vigilant about the potential clinical implications of influenza and SARS-CoV-2 coinfection this fall and winter."

Clinicians will still have to use a combination of symptoms, examinations, and testing to distinguish the

two diseases, said Aimee Sznewajs, MD, medical director of the pediatric hospital medicine department at Children's Minnesota, Minneapolis. "We will continue to test for influenza and COVID-19 prior to hospitalizations and make decisions about whether to hospitalize based on other clinical factors, such as dehydration, oxygen requirement, and vital sign changes."

Dr. Sznewajs stressed the importance of maintaining public health strategies, including "ensuring all children get the flu vaccine, encouraging mask wearing and hand hygiene, adequate testing to determine which virus is present, and other mitigation measures if the prevalence of COVID-19 is increasing in the community."

Dr. Song reiterated those points, noting that clinicians need to make the most of the options they have. "Clinicians already have many great tools on hand. It is extremely important to get the flu vaccine now, especially for kids with underlying medical conditions. Diagnostic tests are available for both COVID-19 and flu. Antiviral treatment for flu is available. Judicious use of these tools will protect the health of providers, kids, and well-being at large."

The authors noted several limitations for the study, including its retrospective design, that the data came from a single center, and that different platforms were used to detect the viruses.

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

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Fewer health care visits lead to drop in ID diagnoses

BY CHRISTINE KILGORE

MDedge News

Diagnoses of 12 common pediatric infectious diseases in a large pediatric primary care network declined significantly in the weeks after COVID-19 social distancing (SD) was enacted in Massachusetts, compared with the same time period in 2019, an analysis of EHR data has shown.

While declines in infectious disease transmission with SD are not surprising, “these data demonstrate the extent to which transmission of common pediatric infections can be altered when close contact with other children is eliminated,” Jonathan Hatoun, MD, MPH, of the Pediatric Physicians’ Organization at Children’s in Brookline, Mass., and coauthors wrote in *Pediatrics*. “Notably, three of the studied diseases, namely, influenza, croup, and bronchiolitis, essentially disappeared with [social distancing].”

The researchers analyzed the weekly incidence of each diagnosis for similar calendar periods in 2019

“Social distancing appears to have had a dramatic impact on the transmission of common childhood infectious diseases, especially other respiratory viral pathogens.”

and 2020. A pre-SD period was defined as week 1-9, starting on Jan. 1, and a post-SD period was defined as week 13-18. (The several-week gap represented an implementation period as social distancing was enacted in the state earlier in 2020, from a declared statewide state of emergency through school closures and stay-at-home advisories.)

To isolate the effect of widespread SD, they performed a “difference-in-differences regression analysis, with diagnosis count as a function of calendar year, time period (pre-SD versus post-SD) and the interaction between the two.” The Massachusetts pediatric network provides care for approximately 375,000 children in 100 locations around the state.

In their research brief, Dr. Hatoun and coauthors presented weekly rates expressed as diagnoses per 100,000 patients per day. The rate of bronchi-

olitis, for instance, was 18 and 8 in the pre- and post-SD-equivalent weeks of 2019, respectively, and 20 and 0.6 in the pre- and post-SD weeks of 2020. Their analysis showed the rate in the 2020 post-SD period to be 10 diagnoses per 100,000 patients per day lower than they would have expected based on the 2019 trend.

Rates of pneumonia, acute otitis media, and streptococcal pharyngitis were similarly 14, 85, and 31 diagnoses per 100,000 patients per day lower, respectively. The prevalence of each of the other conditions analyzed – the common cold, croup, gastroenteritis, nonstreptococcal pharyngitis, sinusitis, skin and soft-tissue infections, and urinary tract infection (UTI) – also was significantly lower in the 2020 post-SD period than would be expected based on 2019 data ($P < .001$ for all diagnoses).

Putting things in perspective

“This study puts numbers to the sense that we have all had in pediatrics – that social distancing appears to have had a dramatic impact on the transmission of common childhood infectious diseases, especially other respiratory viral pathogens,” Audrey R. John, MD, PhD, chief of the division of pediatric infectious disease at Children’s Hospital of Philadelphia, said in an interview.

The authors acknowledged the possible role of families not seeking care, but said that a smaller decrease in diagnoses of UTI – generally not a contagious disease – “suggests that changes in care-seeking behavior had a relatively modest effect on the other observed declines.” (The rate of UTI for the pre- and post-SD periods was 3.3 and 3.7 per 100,000 patients per day in 2019, and 3.4 and 2.4 in 2020, for a difference in differences of -1.5 .)

In an accompanying editorial, David W. Kimberlin, MD, and Erica C. Bjornstad, MD, PhD, MPH, of the University of Alabama at Birmingham, called the report “provocative” and wrote that similar observations of infections dropping during periods of isolation – namely, dramatic declines in influenza and other respiratory viruses in Seattle after a record snowstorm in 2019 – combined with findings from other modeling studies “suggest that the decline [reported in Boston] is indeed real” (*Pediatrics*. 2020. doi: 10.1542/peds.2020-019232).



ARTMARIE/GETTY IMAGES

However, “we also now know that immunization rates for American children have plummeted since the onset of the SARS-CoV-2 pandemic [because of a] dramatic decrease in the use of health care during the first months of the pandemic,” they wrote. “Viewed through this lens,” the declines reported in Boston may reflect infections going “undiagnosed and untreated.”

Ultimately, Dr. Kimberlin and Dr. Bjornstad said, “the verdict remains out.”

Dr. John said that she and others are “concerned about children not seeking care in a timely manner, and [concerned] that reductions in reported infections might be due to a lack of recognition rather than a lack of transmission.”

In Philadelphia, however, declines in admissions for asthma exacerbations, “which are often caused by respiratory viral infections, suggests that this may not be the case,” said Dr. John, who was asked to comment on the study.

In addition, she said, the Massachusetts data showing that UTI diagnoses “are nearly as common this year as in 2019” are “reassuring.”

Are there lessons for the future?

Coauthor Louis Vernacchio, MD, MSc, chief medical officer of the Pediatric Physicians’ Organization at Children’s network, said in an interview that, beyond the pandemic, it’s likely that “more careful attention to

proven infection control practices in daycares and schools could reduce the burden of common infectious diseases in children.”

Dr. John similarly sees a long-term value of quantifying the impact of social distancing. “We’ve always known [for instance] that bronchiolitis is the result of viral infection.” Findings like

“Immunization rates for American children have plummeted since the onset of the SARS-CoV-2 pandemic [because of a] ... dramatic decrease in the use of health care during the first months of the pandemic.”

the Massachusetts data “will help us advise families who might be trying to protect their premature infants (at risk for severe bronchiolitis) through social distancing.”

The analysis covered both in-person and telemedicine encounters occurring on weekdays.

The authors of the research brief indicated they have no relevant financial disclosures and there was no external funding. The authors of the commentary also reported they have no relevant financial disclosures, and Dr. John said she had no relevant financial disclosures.

chestphysiciannews@chestnet.org

SOURCE: Hatoun J et al. *Pediatrics*. 2020. doi: 10.1542/peds.2020-006460.

Sustaining high performance during COVID-19

BY ALEXANDER S. NIVEN,
MD, FCCP

Last week, I was working in our COVID ICU. Today, I had a day to catch up, and sat down at my desk to start answering patient phone calls and work on my overflowing e-mail inbox. On the top was a message reminding me that my mandatory online training requirements are overdue.

Many of my overdue tasks date back to somewhere between early March and mid-May, at a time when the United States was feeling the first real effects of the global COVID-19 pandemic. The radical disruption to our personal and professional lives was palpable.



Dr. Niven

As physicians practicing chest medicine, we and our interprofessional teams faced the unknown every day as we cared for patients suffering from an illness we had never seen. Change was everywhere, and keeping up with new policy, practice protocols, and the reports and speculation that emanated from every corner of our society became an impossible proposition. We tried, though, because our patients and hospitals needed us – because people were dying. As physicians, we felt our moral responsibility to care for our patients to the best of our ability, and to keep ourselves and our team members – not to mention our family – safe and healthy.

Since that time, life has remained far from normal, but oddly a new routine has started to emerge. I'm getting used to wearing a mask outside of my house, and my skills with virtual meeting software have increased exponentially. As the months passed, my social media feed started to display images of families taking summer vacations – often in areas of the United States known for wide open spaces – while riots over racial inequality raged in our major cities, and a second wave of COVID-19 cases hit many states across our country.

As highly trained professionals engaged on the front line of this pandemic, we have faced the challenges of COVID-19 with hard work and innovation. The countless

extra hours have paid off, and what appeared to be a bizarre dichotomy, my social media feed I think reflected a real and appropriate need for us to take time to recover from

the stresses of the spring and summer. Now fall is upon us, and with it the threat of another wave of new COVID cases. There is much more work that needs to be done.

Highly trained athletes understand the importance of a deliberate approach to their daily activities. A balance between stress and recovery

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is necessary to both sustain high performance and avoid injuries from overuse. Similarly, chronic excessive demands without adequate time to recover can create a state psychologists call “nonfunctional overreaching” – a short-term reduction in

performance that only returns to normal after a period of sustained rest. Although most of this work has been done in the sports psychology literature, it does not take a vivid imagination to extend these concepts into the health-care environment. As time goes on, we won’t be able to de-

liver the best care we can to our patients or family unless we take time to take care of ourselves.

In July, CHEST launched a new initiative to offer our members a series of monthly webinars to discuss the science of sustaining high performance and practical approaches

to support individual, team, and organizational wellness during these challenging times.

We have recruited nationally recognized experts from both within and outside of our subspecialty for this initiative and have partnered with the American Association of

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Critical-Care Nurses, the American Association for Respiratory Care, and The National Board for Respiratory Care to support all members of our interprofessional team.

Our efforts over the first 6 months of this initiative are focused on the science of high performance, includ-

ing the latest tips for sleep, nutrition, and exercise, and are available in the new CHEST Wellness Resource Center (<https://www.chestnet.org/Guidelines-and-Resources/Resources/Wellness-Resources>) to help you recover at the end of an exhausting day at work and help keep

you at your best for tomorrow. Recognizing the tremendous toll that the first wave of the pandemic took on many members of our community, we have also identified resources to help recognize and provide timely assistance to those who need it the most.

Our initiative also includes opportunities to express gratitude to our nursing and respiratory therapy colleagues for the sacrifices they make every day and to celebrate the things that put a smile on our faces and make the work day a little easier.

Physicians are resilient people, instilled through their training and the nature of their practice every day – but they are still people.

CHEST launched a new initiative to offer our members a series of monthly webinars to discuss the science of sustaining high performance and practical approaches to support individual, team, and organizational wellness during these challenging times.

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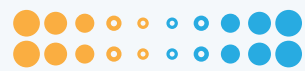
The epidemic of burnout among health-care providers was well documented prior to the current pandemic, and without intervention, the ongoing pandemic will only increase the risk of deteriorating performance, errors, and injury to ourselves and members of our health-care team.

It is important to emphasize that this wellness initiative is only the first step in our journey. Our health-care system was far from perfect before this pandemic, and with this challenge comes an opportunity for a paradigm shift – a chance for us to shape our practice environment in new and innovative ways to better serve our patients and support the teams who care for them.

Our talented community of CHEST members are the individuals best suited to drive these practice improvements, both now and in the future. To do this effectively in this unprecedented time, however, is going to require members of our discipline to be more deliberate than ever in their approach to caring for themselves, their families, and their health-care teams as part of their everyday practice ... because those e-mails are not going to take care of themselves, and neither are the patients who will continue to turn to us for help in the months and years to come.

I would like to acknowledge and thank Dr. Steve Simpson and Dr. Tim Murgu for their thoughtful feedback and contributions to this article.

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CRITICAL CARE COMMENTARY

What will be the future of American medicine?

BY JAMES T. WILLIAMS, MD

For at least the last 6 months, and what seems like much longer, the United States has been in a period of great upheaval unseen for decades. Thanks in part to a novel coronavirus that quickly spread globally, along with social and racial tensions reaching a boiling point after nationwide economic uncertainty and the deaths of George Floyd and Breonna Taylor at the hands of law enforcement. In the year of a presidential election, leaders both elected and running are looking for solutions. Medicine has also been scrambling for answers as hospitals deal with ever growing censuses and dwindling resources, which have placed a strain on budgets, employees, and communities. Through these difficult times, there appears to be a resolve to investigate how we arrived here, where do we want to go, and what will take us there. As industries look to foster more inclusive and diverse environments, health care also looks to lead this philosophical shift toward a more equitable system. In the meantime, minorities, particularly African Americans, are dying at alarming rates.

With state government shutdowns, school closures, and a transition to work from home, Americans have been increasingly cognizant of issues that are more likely to be drowned out by the routine of previously "normal" life. As the staggering coronavirus infection numbers and deaths began to be published, undeniable trends were laid bare for the country to see. While the pandemic has been a deadly scare for the entire nation, the risk of serious complications or death for others was undeniable or even likely. For many Americans of underrepresented groups, but for Black people in general, 2020 has been another checkpoint in a long straight path, as centuries of systemic injustices and racist policies enacted through legislation health policy have left these communities far behind

and incredibly unprepared for this latest challenge.

For millions of Black Americans, although there is never acceptance of it, living with inequality has become a way of life. Much is known about the eventually desegregated lunch counters and public transportation, but health care also facilitated disparities that have manifested themselves in the disparate outcomes we see today. Although *Brown v Board of Education* eliminated the legal precedent of segregated public spaces, enforcement was not immediately unanimous. In the paper *The Politics of Racial Disparities* (Smith D. *Milbank Q.* 2005 Jun; 83[2]: 247-269), author David Smith describes the segregation in the state hospital in the state capital of Mississippi. Accounts detailed the dismay of White patients who traveled in the same elevators as Black patients, separate floors new and expectant Black mothers were admitted to, and even policies that discouraged Black and White children from utilizing play areas at the same time. All of these policies and the resistance to change were occurring in the 1960s as the larger national appetite toward overt discrimination began to sour. Although the deep south has historically held the reputation of outdated values, this was not solely a regional problem.

Nationwide, African Americans, as well as other minorities, are very aware of the health pitfalls that await them once leaving the hospital as newborns. According to CDC data, they are more likely than non-Hispanic White adults to be diagnosed with diabetes and hypertension. Eighty percent of African American women are overweight or obese compared with 65% of non-Hispanic White women. These comorbidities have been especially telling this year as they account for a large proportion of comorbid conditions listed on deceased COVID-19 patients' death certificates.

Dr. Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases, and member of the White House coronavirus task force, is particularly concerned

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Dr. Williams

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about these trends. He stated in a recent interview (<https://www.ajmc.com/view/dr-anthony-fauci-on-health-disparities-affecting-people-of-color>) that the virus is, “shedding another bright light on a systemic problem that has been with us for a very long period of time.” While he does not explicitly state what the systemic problem is, you could assume it relates to racial injustice. He also goes on to say, “... social determinants of health put people of color in a position—because of employment, socioeconomic status, availability of jobs—that makes it more likely for them to be in contact with an infected person and not be able to separate themselves.”

When these statistics are quoted, discussions of personal responsibility are often discussed; however, these arguments do not stand up against the long documented, intentional exclusion of minorities, in particular Black people, from the health systems and economic opportunities the country has to offer. Lacking any significant economic power, these communities have no buffer against a pandemic, no option but to show up for work. Additionally, these jobs cannot be done in the comfort of one’s living room. Large cities, such as New York City, served as a harbinger to what could happen when masks and social distancing were ignored, as well as a tendency to blame overcrowding.

More investigation unearths that the true culprit in major metropolitan areas is not the size but its effects on resident social habits. Dr. Mary Bassett explains in *The New York Times*, “The answer is simple: the high cost of housing” (<https://www.nytimes.com/2020/05/15/opinion/sunday/coronavirus-cities-density.html>). Multigenerational

The elimination of race as an indirect determinant of health is a worthwhile goal that, if achieved, would be near the top of the list of this country’s achievements.

households are more prevalent among minority communities, explaining the rapid spread through these epicenters.

The historical legacy of redlining and other laws that were exclusionary and hostile to racial equality have made systems much more difficult to change, even when the parties involved are willing to take a more active role in change. The question is will it be enough to have merely stopped these practices or will a more active role in reversal of policies and their intended effects be needed?

Medicine is grappling with its role in the larger context of how

to provide better access and better care. The Affordable Care Act, signed into law by President Barack Obama in 2010, aimed to begin that journey. When the mandate for individual states to opt in was struck down in 2012, state legislators were able to decide whether to opt into a Medicaid agreement with the government, providing basic care to all citizens of their state. Twelve states currently have not opted into the Medicaid expansion, leaving a significant portion of their residents uninsured. Of those states, a majority have minority populations represented at levels greater than the national average.

Medicine should use this opportunity to position itself as an ally in the fight for equality. The American dream story has always been structured around innovation and discovery. The medical field shares in this delight when coincidence, discovery, and problem solving intersect. This country prides itself on its abilities to problem solve and has sold this branding to the rest of the world. America loves winning, our current President repeatedly says so. What greater win would equal care and elimination of racial disparities in chronic diseases. As our health leaders assemble solutions for a multifactorial problem, the public must become more engaged to assist in creating solutions, maintain dedication and focus on the goals, and continue to

hold leaders and elected officials accountable.

Increased diversity in health-care spaces both on the ground and in leadership will help ensure less represented voices are heard. We must invest in our education system to broaden the representation of minority physicians who often do not represent their population’s share. Changes must also go beyond direct patient care and population health measures but must also address the social determinants of health, such as a livable wage, fair and affordable housing, and wealth inequality.

With federal support for biomedical research becoming more difficult, the path for the next big innovation becomes increasingly expensive and never guaranteed. We hope to create a safe and effective COVID-19 vaccine. The elimination of race as an indirect determinant of health is a worthwhile goal that, if achieved, would be near the top of the list of this country’s achievements. With 1.2 trillion spent on health care in 2019 (<https://www.brookings.edu/research/estimating-potential-spending-on-covid-19-care/>), we cannot afford not to.

Dr. Williams is Affiliate Professor, Division of Pulmonary, Critical Care, and Sleep Medicine, University of Mississippi; and the G.V. (Sonny) Montgomery VA Medical Center, Jackson, Mississippi.

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Women & Pulmonary Event – Sunday, October 18 at 11:00 AM – 12:30 PM CT

Connect with key thought leaders and participants to support the advancement of women in the fields of pulmonary, critical care, sleep medicine, and in leadership. The event includes a pan-

el discussion on How to remain in control during a pandemic: family, career, and mental wellness, RSVPs are necessary to attend this event.

Virtual Comedy Hour Sunday, October 18 at 6:30 PM CT

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CHEST Foundation Poker Tournament Sunday, October 18 at 7:30 PM CT

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Wine Tasting With Bob Musacchio, PhD, Sunday, October 18 at 7:30 PM CT

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Young Professionals Reception – Monday, October 19 at 5:30 PM CT – Invite Only

Join your colleagues for a fun evening of trivia, prizes, and celebration! Let the Foundation show some appreciation for your commitment to chest medicine, and come learn more about our work! Contact Andrew Gillen (agillen@chestnet.org) for more details.

2021 Grant Funding – Tuesday, October 20 at 11:30 AM – 12:00 PM

Robert De Marco, MD, FCCP and Konstandina Dulu, MA, Senior Grants Specialist. Members from the CHEST grants team and Foundation Awards Committee will be present to give an overview of 2021 grant opportunities and conduct a live Q&A.

*Events are subject to change.

PULMONARY PERSPECTIVES®

Bronchoscopy and tracheostomy in the COVID-19 era

BY CATHERINE L. OBERG, MD;
JASON A. BEATTIE, MD; AND
ERIK E. FOLCH, MD, MSC

The coronavirus disease 2019 (COVID-19) pandemic has changed the way we deliver healthcare for the foreseeable future. Not only have we had to rapidly learn how to evaluate, diagnose, and treat this new disease, we have also had to shift how we screen, triage, and care for other patients for both their safety and ours. As the virus is primarily spread via respiratory droplets, aerosol-generating procedures (AGP), such as bronchoscopy and tracheostomy, are high-risk for viral transmission. We have therefore had to reassess the risk/benefit ratio of performing these procedures – what is the risk to the patient by procedure postponement vs the risk to the health-care personnel (HCP) involved by moving ahead with the procedure? And, if proceeding, how should we protect ourselves? How do we screen patients to help us stratify risk? In order to answer these questions, we generally divide patients into three categories: the asymptomatic outpatient, the symptomatic patient, and the critically ill patient.

The asymptomatic outpatient

Early in the pandemic as cases began to spike in the US, many hospitals decided to postpone all elective procedures and surgeries. Guidelines quickly emerged stratifying bronchoscopic procedures into emergent, urgent, acute, subacute, and truly elective with recommendations on the subsequent timing of those procedures (Pritchett MA, et al. *J Thorac Dis*. 2020 May;12[5]:1781-1798). As we have obtained further data and our infrastructure has been bolstered, many physicians have begun performing more routine procedures. Preprocedural screening, both with symptom questionnaires and nasopharyngeal swabs, has been enacted as a measure to prevent inadvertent exposure to infected patients. While there are limited data regarding the reliability of this measure, emerging data have shown good concordance between nasopharyngeal SARS-CoV-2 polymerase chain reaction (PCR) swabs and bronchoalveolar lavage (BAL) samples in low-risk patients (Oberg, et al. Personal communication, Sept 2020). Emergency procedures, such as foreign body aspiration, critical

airway obstruction, and massive hemoptysis, were generally performed without delay throughout the pandemic. More recently, emphasis has been placed on prioritizing procedures for acute clinical diagnoses, such as biopsies for concerning lung nodules or masses in potentially early-stage patients, in those where staging is needed and in those where disease progression is suspected. Subacute procedures, such as inspection bronchoscopy for cough, minor hemoptysis, or airway stent surveillance, have generally been reintroduced while elective procedures, such as bronchial thermoplasty and bronchoscopic lung volume reduction, are considered elective, and their frequency and timing is determined mostly by the number of new cases of COVID-19 in the local community.

For all procedures, general modifications have been made. High-efficiency particulate air (HEPA) filters should be placed on all ventilatory circuits. When equivalent, flexible bronchoscopy is preferred over rigid bronchoscopy due to the closed circuit. Enhanced personal protective equipment (PPE) for all procedures is recommended – this typically includes a gown, gloves, hair bonnet, N-95 mask, and a face shield. Strict adherence to the Centers for Disease Control and Prevention (CDC) guidelines for postprocedure cleaning and sterilization is strongly recommended. In some cases, single-use bronchoscopes are being preferentially used, though no strong recommendations exist for this.

The symptomatic COVID-19 patient

In patients who have been diagnosed with SARS-CoV-2, we generally recommend postponing all procedures other than for life-threatening indications. For outpatients, we generally wait for two negative nasopharyngeal swabs prior to performing any nonemergent procedure. In inpatients, similar recommendations exist. Potential inpatient indications for bronchoscopy include diagnostic evaluation for alternate or coinfections, and therapeutic aspiration of clinically



Dr. Oberg



Dr. Beattie



Dr. Folch

significant secretions. These should be carefully considered and performed only if deemed absolutely necessary. If bronchoscopy is needed in a patient with suspected or confirmed COVID-19, at a minimum, gown, gloves, head cover, face shield, and an N-95 mask should be worn. A powered air purifying respirator (PAPR) can be used and may provide increased protection.

Aerosol-generating procedures are high-risk for viral transmission. We have had to reassess the risk/benefit ratio of performing these procedures.

Proper donning and doffing techniques should be reviewed prior to any procedure. Personnel involved in the case should be limited to the minimum required. The procedure should be performed by experienced operators and limited in length. Removal and reinsertion of the bronchoscope should be minimized.

The critically ill COVID-19 patient

While the majority of patients infected with SARS-CoV-2 will have only mild symptoms, we know that a subset of patients will develop respiratory failure. Of those, a small but significant number will require prolonged mechanical ventilation during their clinical course. Thus, the consideration for tracheostomy comes into play.

Multiple issues arise when discussing tracheostomy placement in the COVID-19 world. Should it be done at all? If yes, what is the best technique and who should do it? When and where should it be done? Importantly – how do we care for patients once it is in place to facilitate recovery and, hopefully, decannulation?

Tracheostomy tubes are used in the ICU for patients who require prolonged mechanical ventilation

for many reasons – patient comfort, decreased need for sedation, and to facilitate transfer out of the ICU to less acute care areas. These reasons are just as important in patients afflicted with respiratory failure from COVID-19, if not more so. As the patient volumes surge, health-care systems can quickly become overwhelmed. The ability to safely move patients out of the ICU frees up those resources for others who are more acutely ill.

The optimal technique for tracheostomy placement largely depends on the technological and human capital of each institution. Emphasis should be placed on procedural experience, efficiency, safety, and minimizing risk to HCP. While mortality rates do not differ between the surgical and percutaneous techniques, the percutaneous approach has been shown to require less procedural time (Iftikhar IH, et al. *Lung*. 2019[Jun];197[3]:267-275), an important infection control advantage in COVID-19 patients. Additionally, percutaneous tracheostomies are typically performed at the bedside, which offers the immediate benefit of minimizing patient transfer. This decreases exposure to multiple HCP, as well as contamination of other health-care areas. If performing a bronchoscopic-guided percutaneous tracheostomy, apnea should be maintained from insertion of the guiding catheter to tracheostomy insertion in order to minimize aerosolization. A novel technique involving placing the bronchoscope beside the endotracheal tube instead of through it has also been described (Angel L, et al. *Ann Thorac Surg*. 2020[Sep];110[3]:1006-1011).

Timing of tracheostomy placement in COVID-19 patients has varied widely. Initially, concern for the safety of HCP performing these procedures led to recommendations of waiting at least 21 days of intubation or until COVID-19 testing became negative. However, more recently, multiple recommendations have been made for tracheostomy placement after day 10 of intubation (McGrath, et al. *Lancet Respir Med*. 2020[Jul];8[7]:717-725).

Finally, once a tracheostomy tube has been placed, the care does not stop there. As patients are transitioned to rehabilitation centers or skilled

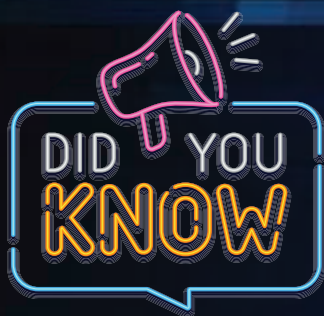
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This month in the journal *CHEST*[®]: Editor's picks

BY PETER J. MAZZONE, MD, MPH, FCCP

Editor in Chief

Individualizing risk prediction for positive COVID-19 testing: Results from 11,672 patients.

By Dr. Lara Jehi, et al.

Airway clearance techniques in bronchiectasis: Analysis from the United States Bronchiectasis and NTM research registry.

By Dr. Ashwin Basavaraj, et al.



Emotional experiences and coping strategies of family members of critically ill patients.

By Dr. Emily Harlan, et al.

Coronavirus disease and smoking: How and why we implemented a tobacco treatment campaign.

By Dr. Adam Lang, et al.

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nursing facilities and are assessed for weaning, downsizing, and decannulation, care should be taken to avoid virus aerosolization during key high-risk steps. Modifications such as performing spontaneous breathing trials using pressure support (a closed circuit) rather than tracheostomy mask, bypassing speaking valve trials in favor of direct tracheostomy capping, and avoiding routine tracheostomy downsizing are examples of simple steps that can be taken to facilitate patient progress while minimizing HCP risk (Divo, et al. *Respir Care*. 2020[Aug];5;respcare.08157).

What's ahead?

As we move forward, we will continue to balance caring for patients effectively and efficiently while min-

imizing risk to ourselves and others. Ultimately until a vaccine exists, we will have to focus on prevention of infection and spread; therefore, the core principles of hand hygiene, mask wearing, and social distancing have never been more important. We encourage continued study, scrutiny, and collaboration in order to optimize procedural techniques as more information becomes available.

Dr. Oberg is with the Section of Interventional Pulmonology, David Geffen School of Medicine at UCLA; Dr. Beatrice is with the Section of Interventional Pulmonology, Memorial Sloan-Kettering Cancer Center, New York; and Dr. Folch is with the Section of Interventional Pulmonology, Massachusetts General Hospital, Harvard Medical School.

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COVID-19 with non-advanced LC. Boxed warning for montelukast. Happy hypoxic. COVID-19 and pulmonary vasculature.

Interventional chest and diagnostic procedures

Impact of COVID-19 pandemic in patients with non-advanced LC

The COVID-19 pandemic has challenged the way we screen for, diagnose, and treat lung cancer.¹ Knowing that these patients are at higher risk of respiratory failure, and that COVID-19 causes poor outcomes in cancer patients,^{1,3,4} valid concerns regarding viral transmission to patients and health-care workers have hampered the expedited care this population needs.

In recent months, efforts to manage the pandemic have been herculean. With the goal of limiting transmission, expert panels have offered guidance including limiting access to medical facilities, decreasing aerosolizing procedures, and prioritizing curative treatments.^{2,5} In general, lung cancer screening should be delayed, and patients with highly suspicious localized pulmonary lesions could receive empiric regimens, surgery, or stereotactic radiotherapy.^{1,3-5}

The conundrum occurs when diagnostic bronchoscopy is required for staging, acquiring tissue for targeted therapy, or a moderate-risk pulmonary nodule with indeterminate PET-CT and/or high-risk for CT-guided biopsy. Thoughtful balancing of risks and benefits depends on patient comorbidities, hospital resources – such as preprocedural COVID screening, adequate protective personal equipment – and rate of local viral prevalence.^{6,7} Delaying diagnosis and staging could lead to progression of cancer and preclude curative or adjuvant therapy for appropriate candidates. Furthermore, we should not dismiss the appalling psychological impact of delayed care on our patients.

While the pandemic continues and challenges arise in the care of patients with lung cancer, the value of a multidisciplinary input and individualized care cannot be overstated, with focus on providing the best care possible while both minimizing transmission and increasing the chances of acceptable outcomes.

Jose De Cardenas MD, FCCP
Steering Committee Member

Abdul Hamid Alraiyes MD, FCCP
Steering Committee Member

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Pediatric chest medicine

FDA strengthens the boxed warning for montelukast

Early this year the Food and Drug Administration (FDA) updated the boxed warning for montelukast (Singulair), related to the potential for serious mental health side effects, such as agitation, aggressive behavior, depression, hallucinations, and suicidal thoughts and actions. Since its approval in 1998, montelukast is part of the therapeutic approach for persistent asthma in children age 1 year and older, allergic rhinitis from 6 months and older, and exercises induced bronchospasm in children age 6 years and older. In 2018, around 2.3 million children younger than 17 years received a prescription for montelukast.

The FDA reviewed data from their Sentinel System comparing children receiving montelukast vs inhaled corticosteroids, and this study failed to demonstrate significant increased risk of hospitalized depressive disorders, outpatient depressive disorders, self-harm, or suicide. However, a focused evaluation by the FDA of suicides identified 82 cases of completed suicides associated with montelukast, and 19 of these cases were in children younger than 17 years of age.

Post-marketing case reports sub-

mitted to the FDA, published observational and animal studies were evaluated along with the Sentinel System study that led to the new recommendations.

Finally, on March 4, 2020, the FDA updated the Singulair®/montelukast black box warning, focusing on the importance of advising patients and caregivers about the potential for serious neuropsychiatric side effects and advice to immediately discontinue use if symptoms occurred. The warning contains a strong recommendation to reserve use of Singulair®/montelukast to patients with allergic rhinitis who have an inadequate response or intolerance to alternate therapies.

Edy Dominguez Silveyra, MD
Fellow-in-Training Member

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Pulmonary physiology, function, and rehabilitation

The happy hypoxic

In early December 2019, the novel coronavirus disease 2019 (COVID-19) caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was identified. Over the ensuing months, SARS-CoV-2 would cause a wide range of pulmonary symptoms from cough and mild shortness of breath to acute respiratory distress syndrome (ARDS) with severe hypoxia that puzzled intensivists worldwide.

One such mystifying presentation was finding patients with critically low oxygen levels who did not appear to be short of breath. This concept was dubbed “happy or silent hypoxemia.” Novel mechanisms of the SARS-CoV-2 virus on the respiratory system have been proposed

to explain this paradox, but recent literature suggests that foundational pulmonary physiology concepts can explain most of these findings.¹

Breathing is centrally controlled by the respiratory center in the brain stem and is influenced mainly by dissolved carbon dioxide and pH.² Hypercapnia is, therefore, a powerful stimulus to breathe and increase minute ventilation. It can cause dyspnea if this demand is not met.³

Hypoxia, on the other hand, is less powerful and does not evoke dyspnea until the PaO₂ drops below 60 mm Hg.⁴ Hypercapnia potentiates this response: the higher the PaCO₂, the higher the hypoxic response. Patients with a PaCO₂ of 39 mm Hg or less may not experience dyspnea even when hypoxia is severe.¹

Other possible explanations for silent hypoxemia include the poor accuracy of the pulse oximeter for estimating oxygen saturation of less than 80%,¹ especially in the critically ill and the leftward shift of the oxygen dissociation curve due to fever, making the oxygen saturation lower for any given PaO₂.¹

In conclusion, the clinical management of COVID-19 pneumonia with a broad range of clinical features presents many unknowns, but it is reassuring to find an anchor in good old pulmonary physiology concepts.⁵

It is back to the basics for us all and that might be a good thing.

Oriade Adeoye, MD
Fellow-in-Training Member

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Pulmonary vascular disease

COVID-19 and pulmonary vasculature: an intriguing relationship

Hypoxemia is the cardinal symptom in patients with severe coronavirus disease-2019 (COVID-19). However, hypoxemia disproportionate to radiographic opacities has led to growing suspicion that involvement of pulmonary vasculature (PV), leading to shunt physiology, may be a driver of this marked hypoxemia.

The virus's affinity for PV is explained by presence of angiotensin-converting enzyme 2 receptor, which serves as the functional receptor for SARS-CoV-2, on pulmonary endothelium (Provencher, et al. *Pulm Circ.* 2020 Jun 10;10[3]:2045894020933088. doi: 10.1177/2045894020933088).

This increased affinity predisposes PV to pathologic effects of SARS-CoV-2, noted in COVID-19 patients' autopsies, which revealed pulmonary endothelial injury and abnormal vessel growth (intussusceptive angiogenesis). These changes, along with profound inflammatory response, further predispose the PV to thrombosis and microangiopathy in COVID-19 (Ackermann, et al. *N Engl J Med.* 2020 Jul 9;383[2]:120-128).

These autopsy results also explain the radiologic findings of PV in COVID-19. Dual energy CT

scanning, used to evaluate lung perfusion in these patients, has demonstrated PV thickening, mosaicism, and pulmonary vessel dilation; the latter likely occurring due to aberrations in physiologic hypoxic pulmonary vasoconstriction (Lang, et al. *Lancet.* 2020 Apr 30;S1473-3099[20]30367).

Despite PV's involvement, only few cases of COVID-19 have been reported in patients with pulmonary



Dr. Memon

arterial hypertension (PAH), leading to the hypothesis that pre-existing vascular changes may have a protective effect in PAH patients (Horn, et al. *Pulm Circ.* 2020;10(2):1-2).

The above discussion details the complex and multifaceted relationship between COVID-19 and PV which underscores the value of understanding this interaction further and may prove to be insightful for discovering potential therapeutic targets in COVID-19.

*Humna Abid Memon, MD
Fellow-in-Training Member*

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