

# CHEST Physician®



Note: Survey was conducted Oct. 6, 2020, to Feb. 11, 2021, and included 17,903 respondents.

Source: Medscape Pulmonologist Compensation Report 2021

## Salary Survey 2020: Pulmonary medicine income slightly down

BY LEIGH PAGE

Physician compensation plummeted in the opening weeks of the COVID-19 pandemic in March and April 2020, but earnings had rebounded for many physicians by the end of the year, according to the Medscape Physician Compensation Report 2021: The Recovery Begins. Pulmonologists reported slight decreases in overall income, but their job satisfaction remained high.

Almost 18,000 physicians in more than 29 specialties told Medscape about their income, hours worked, greatest challenges, and the unexpected impact of COVID-19 on their compensation.

### How many physicians avoided massive losses

When the pandemic started around March 2020, “a great many physicians saw reductions in volume at first,” says Robert Pearl, MD, former CEO of the Permanente Medical Group and a professor at Stanford (Calif.) University.

Medscape’s survey report shows that a staggering 44% saw a 1%-25% reduction in patient volume, and 9% saw a 26%-50% decline. “That is indeed breathtaking,” Dr. Pearl says.

Several key factors saved many practices from hemorrhaging money, says Michael Belkin, JD, divisional vice president at Merritt Hawkins and Associates in Dallas. “Many physicians used the

**INCOME 2020** // continued on page 7

## Reassuring data on impact of mild COVID-19 on the heart

BY MEGAN BROOKS

Six months after mild SARS-CoV-2 infection in a representative health care workforce, no long-term cardiovascular sequelae were detected, compared with a matched SARS-CoV-2 seronegative group.

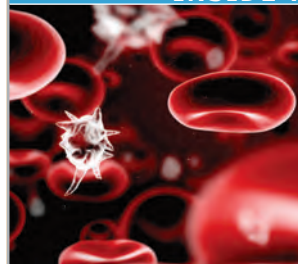
“Mild COVID-19 left no measurable cardiovascular impact on [left ventricular] structure, function, scar burden, aortic stiffness, or serum biomarkers,” the researchers reported in an article published online May 8 in *JACC: Cardiovascular Imaging* (2021. doi: 10.1016/j.jcmg.2021.04.011).

“We provide societal reassurance and support for the position that screening in asymptomatic individuals following mild disease is not indicated,” first author George Joy, MBBS, University College London, said in presenting the results at EuroCMR, the annual CMR congress of the European Association of Cardiovascular Imaging.

Briefing comoderator Leyla Elif Sade, MD, University of Baskent, Ankara, Turkey, said, “This is the hot topic of our time because of obvious reasons and I think [this] study is quite important to avoid unnecessary further testing, surveillance

**COVID-19 HEART** // continued on page 4

### INSIDE HIGHLIGHT



#### NEWS FROM CHEST Dealing with sepsis

Looking to the latest in resuscitation in septic shock. See page 10.

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## COVID-19 heart // continued from page 1

testing, and to avoid a significant burden of health care costs.”

### ‘Alarming’ early data

Early cardiac magnetic resonance (CMR) studies in patients who recovered from mild COVID-19

were “alarming,” Dr. Joy said.

As previously reported, one study showed cardiac abnormalities after mild COVID-19 in up to 78% of patients, with evidence of ongoing myocardial inflammation in 60%. The CMR findings correlated

with elevations in troponin T by high-sensitivity assay (hs-TnT).

To investigate further, Dr. Joy and colleagues did a nested case-control study within the COVIDsortium, a prospective study of 731 health care workers from three London hospitals

who underwent weekly symptom, polymerase chain reaction, and serology assessment over 4 months during the first wave of the pandemic.

A total of 157 (21.5%) participants seroconverted during the study period.

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Six months after infection, 74 seropositive (median age, 39; 62% women) and 75 age-, sex-, and ethnicity-matched seronegative controls underwent cardiovascular phenotyping (comprehensive phantom-calibrated CMR and blood biomarkers). The analysis was blinded, using objective artificial intelligence

analytics when available.

The results showed no statistically significant differences between seropositive and seronegative participants in cardiac structure (left ventricular volumes, mass, atrial area), function (ejection fraction, global longitudinal shortening, aortic distensibility), tissue characteri-

zation (T1, T2, extracellular volume fraction mapping, late gadolinium enhancement) or biomarkers (troponin, N-terminal pro-B-type natriuretic peptide).

Cardiovascular abnormalities were no more common in seropositive than seronegative otherwise healthy health care workers 6 months post

mild SARS-CoV-2 infection. Measured abnormalities were “evenly distributed between both groups,” Dr. Joy said.

Therefore, it’s “important to reassure patients with mild SARS-CoV-2 infection regarding its cardiovascular effects,” Dr. Joy and colleagues concluded.

### Limitations and caveats

They caution, however, that the study provides insight only into the short- to medium-term sequelae of patients aged 18-69 with mild COVID-19 who did not require hospitalization and had low numbers of comorbidities.

The study does not address the cardiovascular effects after severe COVID-19 infection requiring hospitalization or in those with multiple comorbid conditions, they noted. It also does not prove that apparently mild SARS-CoV-2 never causes chronic myocarditis.

“The study design would not distinguish between people who had sustained completely healed myocarditis and pericarditis and those in whom the heart had never been affected,” the researchers noted.

They pointed to a recent cross-sectional study of athletes 1-month post mild COVID-19 that found significant pericardial involvement (late enhancement and/or pericardial effusion), although no baseline pre-COVID-19 imaging was performed. In the current study at 6 months post infection the pericardium was normal (JACC Cardiovasc Imaging. 2021;14:541-55).

The coauthors of a linked editorial say this study provides “welcome, reassuring information that in healthy individuals who experience mild infection with COVID-19, persisting evidence of cardiovascular complications is very uncommon. The results do not support cardiovascular screening in individuals with mild or asymptomatic infection with COVID-19.”

Colin Berry, PhD, and Kenneth Mangion, PhD, both from University of Glasgow, cautioned that the population is restricted to health care workers; therefore, the findings may not necessarily be generalized to a community population (J Am Coll Cardiol Img. 2021 May 08. doi: 10.1016/j.jcmg.2021.04.022).

“Healthcare workers do not reflect the population of individuals most clinically affected by COVID-19 illness. The severity of acute COVID-19 infection is greatest in older individuals and those with pre-existing health problems. Healthcare

*Continued on following page*

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# First data show efficacy of SARS-CoV-2 vaccine booster against variants

BY DAMIAN MCNAMARA

The Moderna SARS-CoV-2 vaccine booster developed specifically with variant B.1.351 in mind shows efficacy against that strain and the P.1 variant among people already vaccinated for COVID-19, according to early results. Furthermore, data from the company's ongoing phase 2 study show the variant-specific booster, known as mRNA-1273.351, achieved higher antibody titers against the B.1.351 variant than did a booster with the original Moderna vaccine.

"We are encouraged by these new data, which reinforce our confidence that our booster strategy should be protective against these newly detected variants. The strong and rapid boost in titers to levels above primary vaccination also clearly demonstrates the ability of mRNA-1273 to induce immune memory," Stéphane Bancel, CEO of Moderna, said in a statement.

The phase 2 study researchers also are evaluating a multivalent booster that is a 50/50 mix of mRNA-1273.351 and mRNA-1273, the initial vaccine given Food and Drug Administration emergency use authorization, in a single vial. The boosters are administered in a single dose.

The trial participants received a booster 6-8 months after primary vaccination. Titers to the wild-type SARS-CoV-2 virus remained high and detectable in 37 out of 40 participants. However, prior to the booster, titers against the two variants of

concern, B.1.351 and P.1, were lower, with about half of participants showing undetectable levels.

In contrast, 2 weeks after a booster with the original vaccine or the B.1.351 strain-specific product, pseudovirus neutralizing titers were boosted in all participants and all variants tested. "Following [the] boost, geometric mean titers against the wild-type, B.1.351, and P.1 variants increased to levels similar to or higher than the previously reported peak titers against the ancestral (D614G) strain following primary vaccination," the company stated.

Both mRNA-1273.351 and mRNA-1273 booster doses were generally well tolerated, the company reported. Safety and tolerability were generally comparable to those reported after the second dose of the original vaccine. Most adverse events were mild to moderate, with injection-site pain most common in both groups. Participants also reported fatigue, headache, myalgia, and arthralgia.

The company plans to release data shortly on the booster efficacy at additional time points beyond 2 weeks for mRNA-1273.351, a lower-dose booster with mRNA-1272/351, as well as data on the multivalent mRNA vaccine booster.

The National Institute of Allergy and Infectious Diseases is conducting a separate phase 1 study of mRNA-1273.351.

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

*Continued from previous page*

workers are not representative of the wider, unselected, at-risk, community population," they pointed out.

Cardiovascular risk factors and concomitant health problems (heart and respiratory disease) may be more common in the community than in health care workers, and prior studies have highlighted their potential impact for disease pathogenesis in COVID-19.

Dr. Berry and Dr. Mangion also noted that women made up nearly two-thirds of the seropositive group. This may reflect a selection bias or may naturally reflect the fact that proportionately more women are

asymptomatic or have milder forms of illness, whereas severe SARS-CoV-2 infection requiring hospitalization affects men to a greater degree.

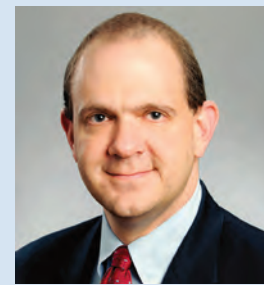
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*A version of this article first appeared on Medscape.com.*

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federal Paycheck Protection Program [PPP] to help keep themselves afloat,” he says. “A large percentage reduced their staff, which reduced their expenses, and many got some of their volume back by transitioning to telemedicine.”



**Dr. Pearl**

In a 2020 survey for the Physicians Foundation, conducted by Merritt Hawkins, 48% of physicians said their practice had received PPP support, and most of those said the

support was enough to allow them to stay open without reducing staff. Only 6% of practices that received PPP support did not stay open.

**Pulmonology survives**

For pulmonologists, income was slightly down, with their average earnings at \$330,000, with 59% reporting that they were compensated fairly. Of those surveyed, 93% reported that decreases in income were due to the COVID-19 pandemic.

A permanent reduction in patient volume due to the pandemic was reported by 61%, with 55% estimated their volume loss between 1% and 25%, and 6% estimated their losses at 26%-50%.

Despite income issues, 86% indicated that they would choose medicine again as a career, with 83% indicating that they would choose to specialize in pulmonology again. A total of 31% reported that the most rewarding aspect of their job was “knowing I’m making the world a better place (i.e., helping others),” followed by 27% indicating that they found “being very good at what I do/finding answers, diagnoses,” the most rewarding. However, dissatisfactions remained, including “having so many rules and regulations” (22% of respondents), “having to work long hours” (20%), and “working with an EHR system” (12%).

**Telemedicine helped many practices**

Early in the pandemic, Medicare reimbursements for telemedicine were equal with those for face-to-face visits. “Since telemedicine takes a third less time than an inpatient visit, doctors could see more patients,” Dr. Pearl says.

The switch was almost instantaneous in some practices. Within 3 days, a 200-provider multispecialty

practice in Wilmington, N.C., went from not using telehealth to its being used by all physicians, the Medical Group Management Association reported. By late April, the practice was already back up to about 70% of normal overall production.

However, telemedicine could not help every specialty equally. “Generally, allergists can’t do their allergy testing virtually, and patients with mild problems probably put off visits,” Dr. Pearl says. Allergists experienced a large percentage decline in compensation, according to Medscape’s survey. For some, income fell from \$301,000 the prior year to \$274,000 this year.

**Primary care struggled**

Primary care physicians posted lower compensation than they did the prior year, but most rebounded to some degree. A study released in June 2020 projected that, even with telemedicine, primary care physicians would lose an average of \$67,774 for the year.

However, Medscape’s survey found that internists’ average compensation declined from \$251,000 in the prior year to \$248,000, and average family physicians’ compensation actually rose from \$234,000.

Pediatricians had a harder slog. Their average compensation sank from \$232,000 to \$221,000, according to the report. Even with telemedicine, parents of young children were not contacting the doctor. In May 2020, visits by children aged 3-5 years were down by 56%.

**Many proceduralists recovered**

Procedure-oriented specialties were particularly hard-hit at first, because many hospitals and some states

banned all elective surgeries at the beginning of the pandemic.

Medscape’s survey shows that, by year’s end, compensation was about the same as the year before for orthopedic surgeons (\$511,000 in both the 2020 and 2021 reports); cardiologists actually did better (\$438,000 in our 2020 report and \$459,000 in 2021).

Some other proceduralists, however, did not do as well. Otolaryngologists’ compensation fell to \$417,000, the second-biggest percentage drop. “This may be because otolaryngologists’ chief procedures are tonsillectomies, sinus surgery, and nasal surgery, which can be put off,” Dr. Pearl says.

Anesthesiologists, who depend on surgical volume, also did not earn as much in 2020. Their compensation declined from \$398,000 in our 2020 report to \$378,000 in Medscape’s 2021 report.

“Not only has 70% of our revenue disappeared, but our physicians are still working every day,” an independent anesthesiology practice in Alabama told the MGMA early in the pandemic.

**Plastic surgeons top earners**

The biggest increase in compensation by far was made by plastic surgeons, whose income rose 9.8% over the year before, to \$526,000. This put them at the top of the list

Dr. Pearl adds that plastic surgeons can perform their procedures in their offices, rather than in a hospital, where elective surgeries were often canceled.

**Other specialties earned more**

In Medscape’s survey, several specialties actually earned more during the pandemic than in 2019. Some specialties, such as

critical care and public health, were integral in managing COVID patients and the pandemic.

However, some specialties involved in COVID care did not see an increase. Compensation for infectious disease specialists (at \$245,000) and emergency medicine specialists (at \$354,000) remained basically unchanged from the prior year.

Emergency departments reported decreases in volume of 40% or more early in the pandemic, according to the American College of Emergency Physicians. It was reported that patients were avoiding EDs for fear of contracting COVID, and car accidents were down because people ventured out less.

In this year’s report, psychiatrists saw a modest rise in compensation, to \$275,000. “There has been an increase in mental health visits in the pandemic,” Dr. Pearl says. In 2020, about 4 in 10 adults in the United States reported symptoms of anxiety or depressive disorder, up from 1 in 10 adults the prior year.

Oncologists saw a rise in compensation, from \$377,000 to \$403,000. “Volume likely did not fall because cancer patients would go through with their chemotherapy in spite of the pandemic,” Dr. Pearl says. “The increase in income might have to do with the usual inflation in the cost of chemotherapy drugs.” Dr. Pinto saw the same trend for retinal surgeons, whose care also cannot be delayed.

Medscape’s survey also reports increases in compensation for rheumatologists, endocrinologists, and neurologists, but it reports small declines among dermatologists, radiologists, and gastroenterologists.

**Gender-based pay gap**

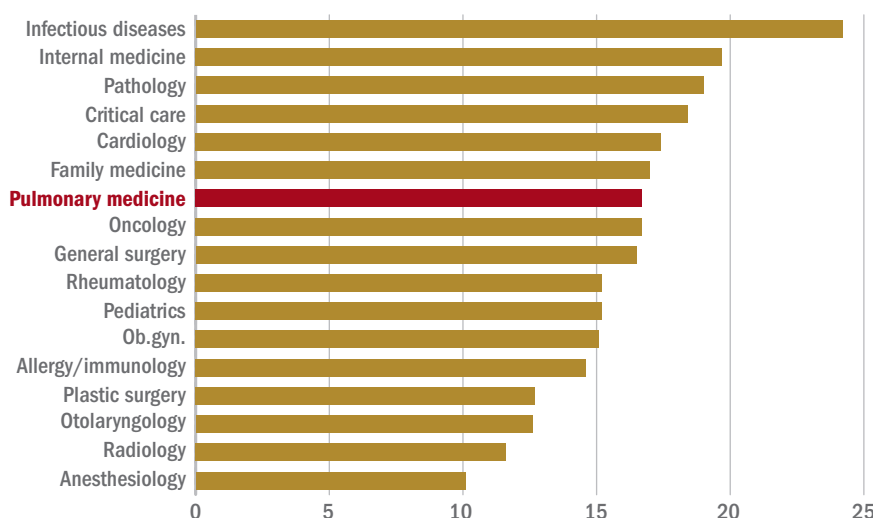
The gender-based pay gap in this year’s report is similar to that seen in Medscape’s report for the prior year. Men earned 27% more than women in 2021, compared with 25% more the year before. Some physicians commented that more women physicians maintained flexible or shorter work schedules to help with children who could not go into school.

In addition, “men dominate some specialties that seem to have seen a smaller drop in volume in the pandemic, such as emergency medicine, infectious disease, pulmonology, and oncology,” says Halee Fischer-Wright, MD, CEO of MGMA.

**Sharing their employers’ pain**

Employed physicians, who typically work at hospitals, shared the

**Time spent on paperwork and administration, hours per week**

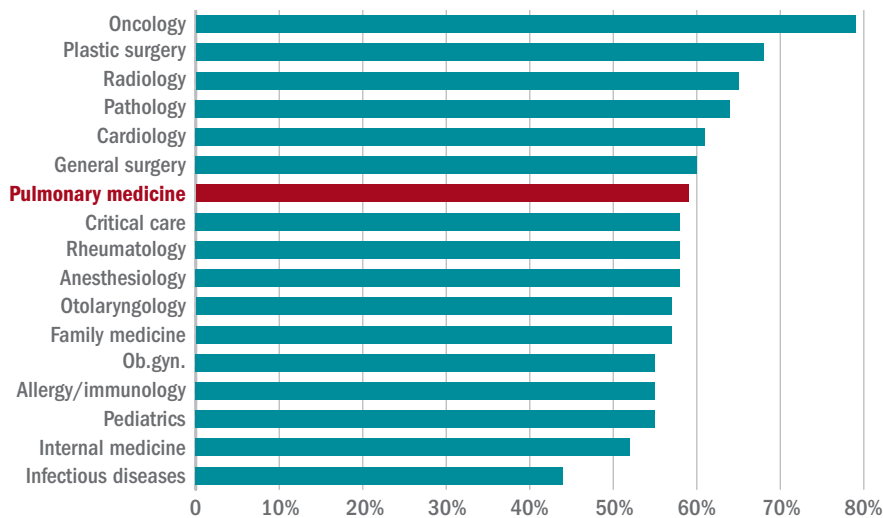


Note: Survey was conducted Oct. 6, 2020, to Feb. 11, 2021, and included 17,903 respondents.

Source: Medscape Pulmonologist Compensation Report 2021

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## Physicians who feel fairly compensated by specialty



Note: Survey was conducted Oct. 6, 2020, to Feb. 11, 2021, and included 17,903 respondents.  
Source: Medscape Pediatrician Compensation Report 2021

Continued from previous page

financial pains of their institutions, particularly in the early stages of the pandemic. In April, hospital admissions were 34.1% below prepandemic levels, according to a study published in *Health Affairs*. That figure had risen by June, but it was still 8.3% below prepandemic volume.

By the end of the year, many hospitals and hospital systems were in the black, thanks in large part to generous federal subsidies, but actual operations still lost money for the year. Altogether, 42% of them posted an operational loss in 2020, up from the 23% in 2019, according to a survey by Moody's Investors Service.

Medscape's report shows that many employed physicians lost pay in 2020, and for many, pay had not returned to pre-COVID levels. Only 28% of primary care physicians and 32% of specialists who lost pay have seen it restored, according to the report. In addition, 15% of surveyed physicians did not receive an annual raise.

Many employed doctors are paid on the basis of relative value units (RVUs), which is a measure of the value of their work. In many cases, there was not enough work to reach RVU thresholds. Would hospitals and other employers lower RVU targets to meet the problem? "I haven't seen our clients make concessions to providers along those lines," Mr. Belkin says.

### Working longer hours

The Medscape report also found that in 2020 physicians saw fewer patients because each visit took longer.

"With the threat of COVID, in-person visits take more time than before," Mr. Belkin says. "Physicians and staff have to prepare the exam room after each visit, and doctors must spend more time answering

patients' questions about COVID."

"The new protocols to keep everyone safe add time between patients, and physicians have to answer patients' questions about the pandemic and vaccines," Dr. Fischer-Wright says. "You might see a 20% increase in time spent just on these non-revenue-generating COVID activities."

### Still liking their specialty

Although 2020 was a challenging year for physicians, the percentage of those who were satisfied with their specialty choice generally did not slip from the year before. It actually rose for several specialties – most notably, rheumatology, pulmonology, physical medicine and rehabilitation, and nephrology.

One specialty saw a decline in satisfaction with their specialty choice, and that was public health and preventive medicine, which plummeted 16 percentage points to 67% – putting it at the bottom of the list.

### Conclusion

Although 2020 was a wild ride for many physicians, many came out of it with only minor reductions in overall compensation, and some saw increases. Still, some specialties and many individuals experienced terrible financial stress and had to make changes in their lives and their spending in order to stay afloat.

"The biggest inhibitor to getting back to normal had to do with doctors who did not want to return because they did not want to risk getting COVID," Dr. Pinto reports. But he notes that by February 2021 most doctors were completely vaccinated and could feel safe again.

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

# You can help those in need

In 2020, the world was rocked by a global pandemic; our response was to provide COVID-19 community service grants to some of the most vulnerable populations.

The CHEST Foundation, with support from donors and the Feldman Family Foundation, was able to provide \$120,000 to support communities in need of essential items. Personal protective equipment, cleaning supplies, emergency food purchases, and more were purchased with these grants to aid communities disproportionately affected by the pandemic.

Without you, these grants would not have been possible. CHEST's NetWorks worked to raise funds to make a tangible impact on at-risk communities in the wake of the pandemic. We're counting on you again to help us raise money this year for more community service grants.

The NetWorks Challenge 2021 will fund community-based projects focused on health disparities and disproportionately underserved communities. Get ready to compete in the challenge to directly make an impact on those who could otherwise not afford access to health care.

This offering, dubbed Rita's Fund, will award \$2,500 to \$10,000 to community-based projects provid-

ing resources to individuals to drastically change their quality of life. Medical equipment, transportation, and technology access will be provided to those who need it most.

Rita's Fund originated after hearing the story of Rita Castro during the virtual Listening Tour and our initiative to listen and identify



barriers to trust, access, and equity in our most underserved communities. The CHEST Foundation was inspired by her story, as she was fighting a rapidly progressing lung condition with no support. Through donations she was able to receive the care she needed, and her diagnosis improved.

Your work during the NetWorks Challenge will help fund grants through Rita's Fund and travel grants to attend this year's CHEST Annual Meeting. We need your help to ensure individuals like Rita have access to better health and resources they can trust.

To learn more about this initiative and this year's NetWorks Challenge, visit the CHEST Foundation's website at <https://foundation.chestnet.org>.

## This month in the journal *CHEST*<sup>®</sup>

### Editor's picks

BY PETER J. MAZZONE,  
MD, MPH, FCCP

Editor in Chief

1. POINT: Is It Ethically Permissible to Unilaterally Withdraw Life-Sustaining Treatments During Crisis Standards of Care? Yes By Dr. J. Bishop and Dr. J. Eberl

2. COUNTERPOINT: Is It Ethically Permissible to Unilaterally Withdraw Life-Sustaining Treatments for Reallocation During Crisis Standards of Care? No By Dr. D. Sulmasy and Dr. F. Maldonado

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# Post-ICU Experience.

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## Critical Care Commentary

# Looking to the future of physiologically informed sepsis resuscitation: The role of dynamic fluid-responsive measurement

BY IVOR S. DOUGLAS, MD;  
JENNIFER A. SAHATJIAN,  
PSYD; DOUGLAS M. HANSELL,  
MD

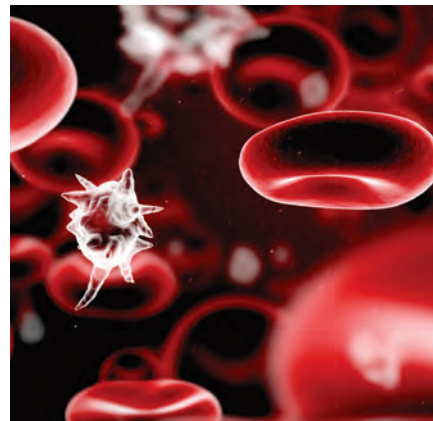
Current guideline recommendations for fluid resuscitation in sepsis patients calls for an initial crystalloid fluid bolus of at least 30 mL/kg (Rhodes, et al. *Intensive Care Med.* 2017;43[3]:304-77) For fluid management beyond this initial bolus, recommendations had previously called for using early goal-directed therapy (EGDT) with central venous pressure (CVP) and central venous oxygen saturation to guide the use of IV fluids, vasopressors, transfusions, and dobutamine, based on the results of one single-center study that found an improvement in mortality using EGDT as compared with standard therapy.

## The triad of sepsis studies

In the following years, multiple concerns were raised regarding the generalizability of this study. Three large multicenter trials were conducted in multiple countries to test the recommendations for EGDT.

**PROMISE:** ProMiSe was a 1,260-patient randomized trial comparing the impact of EGDT vs usual care on 90-day all-cause mortality in patients with early septic shock at 56 hospitals in England. There was no significant difference in the primary study endpoint with 90-day mortality rates of 29.5% and 29.2% (RR: 1.01, 95% CI: 0.85-1.20,  $P = .90$ ) (Mouncey, et al. *N Engl J Med.* 2015;372[14]:1301-11).

**PROCESS:** ProCESS was a 1,351-patient randomized trial comparing the impact of protocol-based EGDT, protocol-based standard of care, and usual care



CESS Investigators, et al. *N Engl J Med.* 2014;370[18]:1683-93).

**ARISE:** ARISE was a 1,600-patient randomized trial comparing the impact of EGDT vs usual care on 90-day all-cause mortality in patients with early septic shock at 51 hospitals in New Zealand and Australia. There was no significant difference in the primary study endpoint with 90-day mortality rates of 18.6% and 18.8% (RR: 0.98, 95% CI: 0.80-1.21,  $P = .90$ ). There were also no significant differences in 28-day or in-hospital mortality, duration of organ support, or length of hospital stay (ARISE Investigators, et al. *N Engl J Med.* 2014;371[16]:1496-506).

In summary, all three “triad” trials found no improvement with EGDT over usual care (Rowan, et al. *N Engl J Med.* 2017;376[23]:2223-34) calling into question the recommended methods of universally

on 60 day in-hospital mortality in patients with early septic shock at 31 hospitals in the United States. There was no significant difference in the primary study endpoint with 60-day mortality rates of 21.0%, 18.2%, and 18.9% ( $P = .83$ ) or in the secondary outcome of 90-day mortality with rates of 31.9%, 30.8%, and 33.7% ( $P = .66$ ) (Pro-

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## Selected ongoing randomized trials of fluid and pressor resuscitation in septic shock

protocolized approaches to fluid and pressor resuscitation. Probable reasons for why structured EGDT was ineffective at improving outcomes over usual care in the “triad” trials was that (a) liberal fluid volume administration was the “usual care” in most enrolled patients and (b) that macrocirculatory hemodynamics, such as BP, and static intravascular pressures such as CVP and pulmonary arterial wedge pressure are poor correlates and predictors of effective circulatory volumes and the presence of fluid responsiveness.

Counterintuitively, in situations of central hypovolemia, peripheral sympathetic activity remains high in many patients while stroke volume decreases. This provides insight into why some patients appear not to benefit from fluid administration as peripheral arterial pressure may be maintained despite low central filling pressure (Convertino VA, et al. *Auton Neurosci*. 2004;111[2]:127-34). Many patients with sepsis and septic shock initially present in an undifferentiated state and empiric treatment decisions regarding fluid and pressor treatments are then misaligned to functional physiological status.

Novel methods and approaches are needed to differentiate these patients and provide appropriate, physiologically guided fluid resuscitation. Dynamic measurement of stroke volume (SV) after a passive leg raise (PLR) or a small IV fluid challenge is an emerging method for determining fluid responsiveness. Evidence suggests that the use of SV-guided resuscitation can reduce net fluid balance, ICU length of stay, risk of mechanical ventilation, time on vasopressors, and risk of renal replacement therapy. (Latham HE, et al. *J Crit Care*. 2017;42:42-6).

In addition to the lack of efficacy from administering fluid to nonfluid responsive patients, there remains a risk of over-resuscitation from excessive fluid administration. Excessive fluid administration causes hypervolemia and is associated with a variety of negative patient outcomes including tissue edema, organ dysfunction, increased ICU length of stay, prolonged ventilator dependence, and higher mortality rates (Tigabu BM, et al. *J Crit Care*. 2018;48:153-9). Further, unnecessary initial fluid administration necessitates a “de-resuscitative” phase that can prolong hospital stay and is associated with amplification of sepsis-associated organ failures. Specifically, a 2017 analysis of hos-

Study	Interventions	Primary outcome	Enrolled population	Progress	Reference
The Australasian Resuscitation In Sepsis Evaluation: FLUID or Vasopressors In Emergency Department Sepsis (ARISE FLUIDS). Australian and New Zealand Intensive Care Research Centre (ANZIC-RC)	Restricted fluids and vasopressors vs. larger initial fluid volume followed by vasopressors if needed	Number of days alive and out of hospital at 90-days post randomization	1,000 patients Multicenter RCT	Enrolling 2021-2025	<a href="https://clinicaltrials.gov/ct2/show/NCT04569942">https://clinicaltrials.gov/ct2/show/NCT04569942</a>
Crystalloid Liberal or Vasopressors Early Resuscitation in Sepsis (CLOVERS). US NHLBI Prevention and Early Treatment of Acute Lung Injury (PETAL) Network Investigators	Restrictive vs. liberal fluid strategies during the first 24 hours of resuscitation	90-day in-hospital mortality	2,350 patients Multicenter RCT	Enrolling 2019-2022	<a href="https://ClinicalTrials.gov/show/NCT03434028">https://ClinicalTrials.gov/show/NCT03434028</a> <a href="http://www.petalnet.org">www.petalnet.org</a>
Conservative vs Liberal Approach to Fluid Therapy of Septic Shock in Intensive Care Trial (CLASSIC). Scandinavian Critical Care Trials Group	Restrictive fluids strategy vs. standard care during the first 24 hours of resuscitation	90-day mortality post randomization	1,554 patients Multicenter RCT	Enrolling 2018-2021	<a href="https://clinicaltrials.gov/ct2/show/NCT03668236">https://clinicaltrials.gov/ct2/show/NCT03668236</a> <a href="http://www.cric.nu/classic/">http://www.cric.nu/classic/</a>
Early Vasopressor in Sepsis (EVIS). Sepsis Research FEAT (Fiona Elizabeth Agnew Trust)*	TBD	Mortality end point	~3,000 patients	2021-2025	<a href="https://sepsisresearch.org.uk/evis/">https://sepsisresearch.org.uk/evis/</a>

\*Protocol details of the EVIS trial will be released after final funding decision by the UK National Institute for Health Research (personal communication, Dr. A. Corfield, principal investigator).

Source: Dr. Douglas, Dr. Sahatjian, Dr. Hansell

pital discharge data found that large volume fluid resuscitation in sepsis patients during the first 24 hours of care was associated with higher rates of hospital mortality than was predicted for patients' disease severity (Mansoori JN, et al. *Crit Care*. 2020;24[1]:25).

### The FRESH trial

The Fluid Response Evaluation in Sepsis Hypotension and Shock (FRESH) trial was a prospective, randomized clinical trial in adults with septic shock comparing PLR-guided SV responsiveness (intervention) as a guide for fluid management with usual care. Patients presented to the ER with sepsis-associated hypotension and anticipated ICU admission. In the intervention arm, patients were assessed for fluid responsiveness (FR) before any clinically driven fluid bolus or increase in vasopressors. If a patient's stroke volume increased by  $\geq 10\%$  in response to a PLR, they were considered fluid responsive and fluid was recommended as the first therapy. If a patient's stroke volume increased by  $< 10\%$  then the patient was considered not to be FR and vasopressors were recommended as first-line therapy. The control arm received usual care. The primary end point was the difference in positive fluid balance at the first of either 72 hours or ICU discharge. Patients had received  $\sim 2.3$  L of crystalloid fluid prior to randomization ( $\sim 3.5$  h from initial presentation), in keeping with 30 mL/kg recommen-

dations. Patients treated with the PLR-guided fluid and pressor protocol had a significant lower net fluid balance (1.37 L (95% CI: 2.53-0.21,  $P = .021$ ) at 72 hours or ICU discharge. In addition, the intervention group experienced significantly less frequent requirement for renal replacement therapy with a difference of 12.4% (95% CI: 27%-1%,  $P = .042$ ) as well as a decreased requirement for ventilator use with a difference of 16.42% (95% CI: 33%-0%,  $P = .044$ ) (Douglas IS, et al. *Chest*. 2020;158[4]:1431-45).

FRESH demonstrated that PLR-guided FR drove lower fluid balance in patients with septic shock who present to the ER with sepsis and creates a paradigm for future management of fluid and pressor resuscitation beyond the initial 30 mL/kg bolus. Functional evaluation for lack of FR adequately identifies a group of patients with sepsis-associated hypotension who are unlikely to benefit from additional IV fluids to establish hemodynamically stability. It facilitated physiologically informed treatment decisions for the individual patient at a specific moment in their course of treatment as opposed to relying on static measurements and goals that may ultimately not be indicative of fluid responsiveness and circulatory effectiveness. This could reduce the likelihood of fluid overload and associated organ failure and, thus, improve patient outcomes.

Microcirculatory function is significantly impacted by sepsis with

a decline in capillary density and inappropriate vasodilation/constriction resulting in insufficient tissue and organ perfusion and increased oxidative stress. Such dysfunction has been found to be associated with worsened patient outcomes, including mortality. However, microcirculatory function does not correlate well with traditionally used macrohemodynamic assessments and treating to improve macrohemodynamic values does not ensure that microcirculation will improve (Charlton M, et al. *J Intensive Care Soc*. 2017;18(3):221-7).

Ongoing studies are exploring if dynamic fluid-guided resuscitation has the potential to improve survival in sepsis by providing insight into whether the administration of fluid will impact the microcirculation and subsequent organ perfusion of the patient.

Future directions include expanding the dynamic treatment algorithm into other settings, such as rapid response calls, or other patient populations, including those initially presenting with undifferentiated hypotension. While FRESH was not sufficiently powered to detect differences in mortality, there are currently multiple large studies being conducted aimed at determining the impact of a restricted fluid and early vasopressor strategy as compared with a large initial IV fluid bolus on mortality. The results of these studies could be used to determine if the results of FRESH will translate into patient survival outcomes.

# CHEST 2021 safety efforts – everyone has a role

Over the past year, you've had to adapt to Zoom calls and socially distanced learning. It's time to come back together, face-to-face, for our top-tier learning event in sunny Orlando, Florida.

Grab your sunscreen and book your flights – we're ready to welcome you back to CHEST 2021 with team-focused learning sessions, immersive gaming opportunities, expert-led faculty presentations, and more. We are making the meeting as safe as possible so you can attend in person.

*Attendees will be required to wear a mask covering the mouth and nose at all times during the meeting. There will be masks on-site.*

After careful planning, we are excited to be able at the Orange County Convention Center (OCCC) for CHEST 2021. Health and safety are our biggest concerns for the meeting, which is why we chose this location. The convention center features the extra square footage we needed to design a meeting space with ample room for social distancing.

We are committed to create a meeting experience where you can safely and effectively conduct business, network with colleagues, and experience high-quality education. With your feedback, we have implemented COVID-19 safety measures similar to what is used in your hospitals and facilities. To ensure your health and safety, there will be a few requirements asked of in-person attendees.

## Preparing for CHEST 2021

As the pandemic continues and vaccines are more readily available, we are requiring all attendees – participants, vendors, and staff – to be vaccinated to attend in person in Orlando, Florida. Your second vaccination shot should take place at least 2 weeks prior to the conference start. When you complete your registration information, you will be asked to attest that you have or will have completed an FDA-approved vaccination for COVID-19 by October 17, 2021.

We also suggest scheduling extra time at your arrival to the conference site. Realize that registration, lunch lines, hotel check-in, etc, may

take longer as we navigate a new way to meet in person. This year, registration will be contactless. Have your digital or print confirmation ready when you arrive – the more

prepared you are, the faster registration will be.

While the venue will regularly sanitize all high touch points in the public space throughout the day,

remember to pack any personal supplies you may need for individual use, especially masks. Attendees will be required to wear a mask covering the mouth and nose at all times

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during the meeting. There will be masks on-site in case you forget or misplace your own.

Before making your way to Orlando, complete one last health self-assessment. Are you symptom free? Consider what advice you would give your patient if they felt the way you

do in that moment. When in doubt, stay home and join us online. That's one of the benefits of CHEST 2021.

### Keeping safe while experiencing CHEST 2021

Any time you are in the conference center and the Hilton Hotel,

the no-contact policy is applicable. Greet your colleagues and new friends using elbow bumps, waves, and any other form of contactless gestures. We will save our handshakes and hugs for CHEST 2022!

By attending in person, you are also agreeing to perform a health

status self-check every day for any onset of COVID symptoms as defined by the CDC (<https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>). If you are feeling ill, immediately notify the first aid office at the meeting.

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Help us deliver a high-quality experience with the lowest reasonable risk in a manner that protects us all by complying to these health and safety measures. In addition, the layout and schedule of the conference is being designed to allow

time for cleaning spaces between sessions. This means more time to get to your next location, visit the exhibit hall, or spend with your colleagues.

**Our commitment to your safety**  
CHEST is taking extra precautions

to keep you safe too – it's not just on you! Daily temperature screenings will be conducted upon entry to the convention center and Hilton Orlando for everyone.

During the meeting, floor graphics will be used to outline 6-ft social distancing. In the concession

areas, seating will be properly distanced and transparent shields will be in place. The exhibit hall will have extra wide aisles, which are not only safe, but easier to move through.

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Environmental Services. They conduct sanitizing tasks within the restroom banks throughout the day and a thorough cleaning overnight. They also regularly sanitize all high touch points in the public space throughout the day as well; ie, door handles, ATMs, escalator handrails,

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tomer service and information accessibility to all in-person attendees. Medical personnel will

also be present on site and available to help individuals who are feeling unwell.

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# Are we there yet? Current lung cancer screening

BY JUSTIN STOWELL, MD;  
AND SUSHILKUMAR  
SONAVANE, MD

Lung cancer is the second-most

common cancer and one of the leading causes of mortality in the United States among both men and women. It accounts for almost 25% of all cancer deaths, and every year

more people die of lung cancer than colon, breast, and prostate cancers combined. The American Cancer Society estimates about 235,760 new lung cancer cases and about 131,880

deaths from lung cancer in 2021. Smoking and increasing age are the two most important risk factors for lung cancer. Lung cancer has a higher incidence among Black

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men than White men, and among White women compared with Black women. These differences are likely related to smoking exposure. Early diagnosis of lung cancer can improve survival, and hence screening for lung cancer in high-risk populations is desired. Among the available

cancer screening tests, radiology is primarily involved in breast and lung cancer screening (LCS). In

*The decision to undergo LCS is inherently complex, and primary care and pulmonary physicians play a pivotal role.*

2011, the National Lung Screening Trial (NLST) showed a benefit of annual low-dose chest CT for LCS,

with about 20% reduction in lung cancer-related mortality in high-risk participants compared with chest radiographs (Aberle DR, et al. N Engl J Med. 2011 Aug 4;365[5]:395-409).

In 2013, the United States Preventative Services Task Force

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(USPSTF) issued a grade B recommendation in support of annual LCS by CT scan for individuals between the ages of 55-80 years with smoking history of 30 or more pack-years who are current smokers or had quit smoking in the last

15 years. Many other professional societies followed with their own recommendations with minor differences. In 2015, after the Centers for Medicare and Medicaid (CMS) decision of coverage, millions of Americans at high risk became eligible for CT LCS with no copay-

ment or cost sharing by the patient.

The results from the European NELSON trial in 2020 augmented the NLST data showing a 24% decrease in lung cancer mortality. Nodules were measured using volume and volume doubling time rather than bidimensional

axial measurements, reducing the false-positive results to 56% compared with 96% in NLST. With growing evidence of the benefits from LCS, recently USPSTF summarized with moderate certainty that annual LCS CT has moderate net benefit in people at high risk for lung cancer based on age, cumulative smoking exposure, and years since quitting smoking.

In March 2021, USPSTF has issued new recommendations with a decrease in the screening age to 50 years, and the smoking history that triggers screening to 20 pack-years (Screening for Lung Cancer: USPSTF Statement. JAMA. 2021 Mar 9;325[10]:962-70. doi: 10.1001/jama.2021.1117). These expanded eligibility criteria are projected to double the number of eligible candidates of LCS in the United States, reduce annual deaths by up to 50%, and benefit minorities and women. By widening the screening criteria to include younger individuals and who have smoked less tobacco, more lives will be saved by early detection of lung cancer. Since the NLST and NELSON trials enrolled relatively healthy people, USPSTF recommends discontinuation of screening once the person has not smoked for 15 years and in persons with any health problem that severely limits the life expectancy or the ability or willingness to undergo surgery. All screening programs must incorporate smoking cessation counseling and interventions for all the enrolled individuals who are current smokers. The USPSTF has also made recommendations on interventions to prevent the initiation of tobacco use in children and adolescents, including counseling and pharmacotherapy.

The decision to undergo LCS is inherently complex, and primary care and pulmonary physicians play a pivotal role by identifying the eligible patients, participating in shared decision-making (SDM), offering smoking cessation, ordering the CT, and managing follow-up. SDM between the patient and clinician includes a discussion of the benefits, risks, limitations, and potential harms of screening. The potential harms of screening include overdiagnosis, false-positive results, incidental findings, and the anxiety leading to further testing or follow-up. The risk of radiation exposure is markedly reduced using low-dose CT protocols compared with conventional chest CT. SDM visit also emphasizes the importance of adherence to annual screening

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and patient willingness and ability to undergo treatment if required. In 2015, CMS approved the addition of LCS counseling and SDM visits that are performed by physicians or qualified nonphysician practitioners (physician assistant, nurse practitioner, or clinical nurse specialist).



Dr. Stowell



Dr. Sonavane

Studies have shown that these visits improve the screening uptake rate.

To minimize the variations in the evaluation and management of screen-detected lung nodules, the American College of Radiology (ACR) developed the Lung Imaging Reporting and Data System (Lung-RADS) to be used in LCS CT reports.

The latest revised version 1.1 of Lung-RADS was released in 2019 (<https://www.acr.org/Clinical-Resources/Reporting-and-Data-Systems/Lung-Rads>). The Lung-RADS defines a positive screen and provides accepted nodule care pathways depending on their size, characteristics, and additional findings, and has been shown to decrease the rate of false-positive results in LCS. To be a designated LCS center, the department of radiology must comply with stringent requirements of technical and facility specification, with radiologist qualification, and with reporting and communication as outlined by the ACR. In addition, participation in the National LCS Registry to meet CMS quality reporting requirements is mandatory for facilities to be reimbursed by CMS.

After more than 10 years since its inception, the participation in LCS has been low. Out of 8 million eligible Americans, less than 4% have been screened (American Cancer Society, NSCLC statistics 2020) compared with breast cancer (up to 75%) (Breast Cancer: Facts and Figures 2019-2020) (<https://tinyurl.com/467phf3b>). Adherence to annual LCS between 1-3 years in the United States is only about 55%. Non-White patients, current smokers, those aged 65-73 years, and those who lack a college education are most likely to be less adherent to follow-up screening. There are

hurdles at multiple levels including but not limited to patient and physician awareness, patient enrollment, adherence, follow-up, and insurance coverage. Expanding the reach of LCS in socially and economically disadvantaged, racial and ethnic minorities, and women has been even more challenging.

Significant differences exist in opinions and practices between primary care physicians (PCPs) and pulmonologists regarding referral for LCS and its benefits. Educational intervention at the PCP level aimed at awareness of USPSTF guidelines may improve utilization and adherence to screening. Increasing lung cancer awareness by community outreach programs, promoting related discussions, and providing information about available screening services to eligible population is crucial to derive the maximum benefits of LCS. Presenting decision aid tools on smartphones and online has shown to improve the participants' knowledge of LCS, to reduce the decisional conflict, and to be acceptable among patients and providers. Implementation strategies such as involving a nonphysician provider, keeping the training on these tools brief and simple, and providing it to participants prior to the clinical encounter might be effective. Electronic medical record systems can be optimized to simplify the ordering procedure to ensure the eligibility criteria are met, to provide results to the physicians, and to direct further management of positive screen results. Most LCS programs have a nonphysician program coordinator to convey the results to the patients and physician, to send out reminders for scheduled follow up appointment, and to maintain the registry data.

In the future, newer imaging technology, and molecular biomarkers or other technologies to differentiate lung cancer more accurately from a benign nodule, and to determine its aggressiveness, will supplement the LCS to decrease false positive results. Better risk prediction models will influence screening eligibility and prognostication in a screen-detected cancer. Robust data collection from ongoing clinical programs will determine if the benefits of LCS seen in clinical trials are comparable when applied to diverse community settings.

*Dr. Stowell and Dr. Sonavane are with the Mayo Clinic in Jacksonville, Fla.*



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## NETWORKS

# Evolution of ECMO. COVID-19 and pulmonary aspergillus. Lung cancer screening. Food as medicine. Air pollution.

## Cardiovascular medicine and surgery

### Evolution of ECMO as a result of COVID

A year and a half ago, the enormity of this pandemic was only beginning to be realized. Likewise, we have never before been so well-equipped to communicate, investigate, and collaborate through modern innovations. Despite our monumental progress with diagnostics and expedited vaccine production, there remain significant challenges with management of infected individuals suffering from severe sequelae after infection such as respiratory failure. Pharmacologic therapies with steroids, antivirals, and targeted immune modulators have demonstrated modest results at best thus far.

Early intubation unsurprisingly resulted in poor outcomes and a return to other established methods using high-flow nasal cannula and noninvasive positive-pressure ventilation (NIPPV) with a goal of avoiding mechanical ventilation are again the standard of care (Rola P, et al. *Clin Exp Emerg Med.* 2020 Jun 10. doi: 10.15441/ceem.20.043). Furthermore, limited resources encouraged utilization of established and probably previously underutilized techniques, such as proning with expected improvements in outcomes.

When conventional lung protective mechanical ventilation strategies have been unsuccessful, we have seen improved survival with the incorporation of extracorporeal membrane oxygenation (ECMO), especially when cannulated earlier (Giraud R, et al. 2021. *Phys Rep*). Many centers now offer ECMO support with considerable expertise and trends toward earlier ECMO cannulation, which permit ultraprotective lung ventilation (Schmidt M, et al. *Am J Respir Crit Care Med.* 2019 Oct 15;200[8]:1002-12). With benefits that parallel early tracheostomy, early ECMO may permit decreased sedation and earlier mobilization, which contribute to improved outcomes (Levin NM, et al. *J Clin Med.* 2021 Jan 12;10[2]:25). We may be approaching a paradigm shift where ECMO is performed in lieu

of mechanical ventilation (Kurihara C, et al. 2018. *Crit Care Med.* 2018 Nov;46[11]:e1070-e1073). Future randomized clinical trials will need to be designed to answer this question.

*Robert Baeten, II, DSc, PA-C, FCCP  
NetWork Steering Committee  
Member*

## Chest infections

### COVID-19-associated pulmonary aspergillosis: A cause for concern?

Since the global spread of SARS-CoV-2 more than a year ago, reports of secondary infections with *Aspergillus* spp. have emerged. Like influenza, there has been speculation that severe COVID-19 pneumonia is a unique risk factor for invasive pulmonary aspergillosis (IPA). This entity has been dubbed CAPA, or COVID-associated pulmonary aspergillosis. While the reported incidence of CAPA has ranged from around 5% to 35% in critically ill patients, it has been difficult to distinguish reports of colonization from true infection as histopathologic evidence of disease has been limited. Using stringent diagnostic criteria, a retrospective review of 145 mechanically ventilated patients with COVID-19 found the incidence of CAPA to be 4.8% (Fekkar A, et al. *Am J Respir Crit Care Med.* 2021 Feb 1;203[3]:307-17) which is similar to other non-COVID ARDS series. The authors found solid organ transplant and prolonged steroid treatment to be risk factors. Like other studies, no comparator group was utilized, limiting the conclusions regarding COVID-19 as an independent risk factor for IPA. Diagnostic criteria have been adapted to assist clinicians and allow for future research: Proven infection requires temporal relation with COVID-19 ICU admission and histopathologic evidence of *Aspergillus* spp. invasion or positive culture from sterile sites (Koehler P, et al. *Lancet Infect Dis.* 2020 Dec 14;S1473-3099[20]30847-1).

*Aspergillus conidia* are ubiquitous in the environment, and the respiratory epithelium and associated cilia act as the first defense against IPA. Distinct from influenza pneumonia,

severe COVID-19 causes diffuse alveolar damage and does not appear to cause significant damage to the respiratory epithelium (Borczuk AC, et al. *Mod Pathol.* 2020;33[11]:2156-68). This coupled with the lack of histopathologic evidence of invasion in most reports of CAPA raises question regarding the extent of the association between COVID-19 and IPA. Nonetheless, immune perturbation caused by COVID-19 immunomodulating therapies, such as corticosteroids and IL-6 inhibitors, may ultimately leave patients susceptible to IPA and other opportunistic infections.

*Kelly M. Pennington, MD  
Charles S. Dela Cruz, MD  
Sebastian Kurz, MD  
NetWork Steering Committee  
Members*

## Clinical pulmonary medicine

### New USPSTF guidelines for lung cancer screening: A step forward

Despite lung cancer being the number one cause of cancer-related death in America, screening for lung cancer remains low, with only 2-16% eligible patients being offered screening since the US Preventive Services Task Force (USPSTF) recommendation in 2013. New guidelines published in *JAMA* (Krist AH, et al. *JAMA.* 2021;325[10]:962-970; Meza R, et al. *JAMA.* 2021;325[10]:988-97; Jonas DE, et al. *JAMA.* 2021;325[10]:971-87) have suggested broadening eligibility to those 50-80 years old, who are smokers or previously quit in the past 15 years and have a minimum 20 pack-year smoking history (Grade B recommendation). The change lowers the starting age to 50 and the smoking requirement from 30 to 20 pack-years. Based on Cancer Intervention and Surveillance Modeling Network (CISNET) modeling, utilized by the USPSTF, this change can result in 503 (vs. 381 in the prior guideline) cancer deaths averted for every 100,000 adults and an estimated 13% reduction in lung cancer mortality and 6,918 life-years gained.

This recommendation will dramatically increase the number of eligible adults for screening by 6.4

million people, an increase of 86% compared with the 2013 guidelines. Most importantly, the decrease in pack-year requirement to 20 is expected to increase eligibility for women and minimize racial disparities. African American men have a higher incidence of lung cancer with less smoke exposure compared with white men. Non-Hispanic Black, Hispanics, American Indian/Alaska Native persons are hoped to have significant benefit from these new recommendations. Original recommendations in the 2013 guideline mirrored the National Lung Screening Trial, in which 91% participants were White. Regardless of these updated recommendations, serious socioeconomic barriers may continue to limit racial/ethnic minorities from accessing high-quality lung cancer screening programs. Besides changing the screening criteria, barriers to access will need to be addressed to achieve maximal benefits of the lung cancer screening program.

*Munish Luthra, MD, FCCP  
Samantha D'Annunzio, MD  
Steering Committee Members*

## Interprofessional team

### Let food be thy medicine and medicine be thy food – Hippocrates

Recently an article published in *The Lancet* discussed malnutrition in the patient with COVID-19 infection requiring non-invasive ventilation (NIV) (Turner P, et al. *Lancet.* 2021 Apr 3;397[10281]:126). It is known that COVID-19 infection causes hyperinflammation and hypercatabolism, resulting in disruption of metabolic pathways leading to muscle wasting, including cardiac muscle dysfunction, muscle weakness, and prolonged fatigue (Singer PJ, et al. 2021. *Intensive Med.* In press).

Lipids, specifically DHA and EPA, are known to inhibit cyclooxygenase enzyme and may suppress prostaglandin production and block platelet-activating factor. Consumption of carbohydrates with high glycemic indexes can result in free radical synthesis (increasing inflammatory cytokines C reactive protein, tumor necrosis alpha and interleukin-6). Other nutrients known to have an

anti-inflammatory role include vitamins A & D, selenium, and copper. Vitamin A is known to enhance an antigen-specific immune response. Probiotics may also play a role in enhancing the immune response (Turner P, et al. 2021. *Lancet*. 2021 Apr 3;397[10281]:1261).

Patients requiring NIV encounter impaired tolerance to oral nutrition, and enteral nutrition (EN) is prescribed (Singer PJ, et al. 2021. *Intensive Med*. In press). Advantages of EN are maintenance of gut integrity and intestinal permeability as well as down regulation of the inflammatory response and insulin resistance. Furthermore, negative energy balance is associated with poor outcomes. Better focus on nutrition assessment practices is needed to overcome energy deficits during treatment of COVID-19 pneumonia. An interprofessional team approach increases use of nutritional scores and optimizes nutritional interventions.

If oral nutrition is feasible, prescribing small, frequent meals and high-protein, calorically dense foods can ensure adequate caloric intake. (Behrens S, et al. *Nutr Clin Pract*. 2021 Feb;36[1]:105-9). When EN is indicated, the Intensive Care Society

endorses the use of fine bore feeding tubes and NIV masks with special nasogastric tube adapters to reduce mask leak. Head-of-bed elevation and avoidance of bolus feeding improve EN tolerance (Pardo T, et al. 2021. *Anaesth Crit Care Pain Med*. 2020 Dec;39[6]:738-9).

\*Due to the novelty of this disease information is limited and further study is warranted.

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### Occupational and environmental health

#### Not just COVID in the air

Particulate matter (PM) is a specific type of air pollution referred to by its size in micrometers. A direct correlation has been shown between non-accidental death and PM<sub>2.5</sub> concentration with a 1.5% increase in daily mortality (Schwartz J, et al. *J Air Waste Manag Assoc*. 1996 Oct;46[10]:927-39). From 2000-2019, PM<sub>2.5</sub> concentrations have steadily decreased over 43% (Environmental Protection Agency). Significant decline in air pollution has occurred early in

the COVID-19 pandemic. PM<sub>2.5</sub> declined in counties from states instituting early non-essential business closures in the U.S. Additionally, NASA models revealed a nearly 20% drop in global nitrogen dioxide concentrations using a COVID-19-free 2020 model to compare with actual space and ground-based observations since February 2020 (NASA Model Reveals How Much COVID-related Pollution Levels Deviated from the Norm. 2020 Nov 17 (<https://tinyurl.com/xcw7tp79>)). The pandemic has shown that there is a significant human behavior-driven contribution to air pollution. The historic fire season of 2020 in the western states contributed to record high air pollution with attributable mortality (Liu X, et al. *medRxiv* 2020.09.20197921). Additionally, the COVID-19 pandemic impeded firefighting response (Burke M, et al. *PNAS*. 2021;11[2]:e2011048118).

Despite the pandemic related reduction, racial-ethnic disparities continue to exist in consumption of PM<sub>2.5</sub>. In a model looking at production of PM<sub>2.5</sub>, defined as consumption by the consumer and exposure as where the product or service originated, African Ameri-

can and Hispanic individuals have up to 12-21% greater pollution exposure within the United States (Tessum CW, et al. *Proc Natl Acad Sci USA*. 2019 Mar 26;116[13]:6001-6). PM pollution increased the risk of asthma attacks corresponding to zip codes with higher poverty levels and eligibility to Medicaid (O'Leary CR, et al. *Epidemiol Community Health*. 2017 Feb;71[2]:129-36). Other studies have shown people with a lower socioeconomic position, have less education, live nearer to major sources of pollution, greater reliance on public transportation and unemployment are at higher risk from effects of PM pollution (American Lung Association. Disparities in the impact of air pollution ([lung.org/clean-air/outdoors/who-is-at-risk/disparities](http://lung.org/clean-air/outdoors/who-is-at-risk/disparities))).

Disclaimer: The views expressed in this article are those of the author(s) and do not reflect the official policy of the Department of Army/Navy/Air Force, Department of Defense, or US government.

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# CHEST HPAC weighs in on the FDA's ban on menthol in tobacco products

BY LAURA E. CROTTY  
ALEXANDER, MD

The recently announced ruling by the FDA to ban menthol in tobacco products is a large step forward toward abolishing tobacco-related disease and death. It is also a big step forward to abolishing the institutional racism of the tobacco industry, which has targeted Black communities with menthol cigarettes for decades, and a step toward improving health equity. Although tobacco use across the United States has decreased from 45% of adults smoking in the 1950s to only 14% smoking today, tobacco continues to be the leading cause of preventable disease and death. Critically, some populations have not seen reductions in tobacco use that benefited others, namely communities of color, low-income populations and LGBTQ+ individuals. A key to this health disparity is the preference for menthol-flavored tobacco products by these groups. Menthol within cigarettes and cigars masks the unpleasant smell of tobacco and numbs the airways to irritation caused by tobacco smoke, while amplifying the effects of nicotine. Eighteen million people smoke menthol cigarettes, with 85% of Black smokers using menthol cigarettes – tobacco ends 45,000 Black lives every year, and menthol is the primary driver of over 38,000 of these Black deaths.

The data supporting a menthol ban has been strong for years. It is well known that flavors, like menthol, increase the appeal of tobacco and increase initiation of tobacco use by women, children, young adults, people of color, low-income, and LGBTQ+ communities. Menthol in particular increases the addictive potential of tobacco and makes it harder for menthol smokers to quit. The evidence behind banning menthol across tobacco products and flavored cigars to protect our children and young adults is also strong. Half of adolescents who try tobacco choose menthol-flavored products; 74% of teenagers aged 14-17 who smoke cigars say they do so because they enjoy the flavors.

There are many reasons why we as pulmonary and critical care medicine physicians are excited about

this recent FDA ruling. The most important of which is that this rule is an important step toward advancing health equity in our country. Banning menthol-flavored tobacco products will save lives, including those of thousands of Black Americans. Banning menthol will reduce tobacco addiction, diminish youth experimentation and youth initiation of tobacco use, and increase the ability of tobacco smokers to successfully quit.

While celebrating this incredible win against the racist institution that is Big Tobacco, we must acknowledge the hard work of those who made it happen: the African American Tobacco Control Leadership Council, Center for Black Health & Equity, Campaign for Tobacco-Free Kids, American Medical Association, and many others. It is extremely exciting that menthol cigarettes, which are responsible for 10,000 deaths per year and >265,000 new smokers per year since 1980 (Le TT and Mendez D, *Tob Control*. 2021 Feb 25. doi: 10.1136/tobaccocontrol-2020-056256) will be a thing of the past.

Next on the CHEST Health Policy and Advocacy Committee (HPAC) to-do list? Ensuring that the menthol ban is extended to e-cigarettes, another tobacco product that targets Americans of all kinds. Finally, we must continue the fight to end tobacco-related disease and death across the country and across the world by helping our patients with smoking cessation efforts and by working to prevent initiation of tobacco use (including e-cigarettes and other vaping devices) by children, at-risk individuals, and communities of all kinds.

*Dr. Alexander is with UC San Diego and the VA San Diego Healthcare System.*

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## PROFESSIONAL OPPORTUNITIES

### The Opportunity

Baylor University Medical Center (BUMC) in Dallas, Texas, as part of Baylor Scott and White Health (BSWH), the largest healthcare provider in the State of Texas, is seeking a transformational, visionary, and collaborative pulmonary leader with a strong clinical and academic foundation as the Chief of Pulmonary and Critical Care Medicine.

BUMC is consistently ranked one of the best hospitals in the US by US News and World Reports. BUMC is a 1,000 bed Level 1 trauma facility with cutting edge cardiovascular surgery, neurosurgery, orthopedic surgery, transplant surgery (including bone marrow, kidney, liver, heart, lung, and more), and excellent medical subspecialty support. BUMC also is affiliated with Texas A&M's Medical School and as such teaching opportunities are readily available. BUMC is also home to the T. Boone Pickens Cancer Center, the #1 inpatient cancer center in North Texas.



### Summary of the Position:

As the leader of pulmonary and critical care medicine at Baylor University Medical Center (BUMC), the Chief will set a vision through the advancement of clinical programs, research and education. He/she will guide the transformation of care delivery in pulmonary and critical care medicine on behalf of the patients we serve, simultaneously promoting exemplary outcome performance in nationally recognized domains and under the perpetual goal of Zero Harm.

The Chief will provide direction and leadership in the Pulmonary Center of Excellence mission and strategic objectives to support the pulmonary and critical care service line growth at BUMC and identify opportunities for expansion of the system's comprehensive pulmonary service line.

The successful candidate should be a modern leader with a demonstrated ability to create a vision and effectively inspire, manage, mentor and develop a preeminent pulmonary and critical care service line. The Chief will be an individual who has a passion to improve processes and systems that lead to cutting-edge clinical research and the delivery of high quality care.

The Chief will report to the President of BUMC, the Chief Medical Officer at BUMC, the Vice President Chief Operating Officer of Oncology and Transplantation and will maintain a close relationship to the Chief of Internal Medicine and other key stakeholders.

### Candidate Qualifications

- Board certified and practicing in a pulmonary critical care medicine field complementary to current offerings and needs at BUMC
- Leadership experience as a Chair, Chief, Service Line Director or similar position in pulmonary and critical care medicine
- A minimum of five years clinical operations, research and management experience at a major pulmonary center or a large health system
- Scholarly activity in an academic environment with a national reputation of excellence in research, education and clinical care, gained within an advanced and highly complex market
- A creative individual with an entrepreneurial spirit and willingness to innovate and to inspire/align staff to embrace change
- Demonstrated interest and understanding of importance of the role of philanthropy in sustaining and funding the research and educational programs in critical care
- A charismatic leader, who demonstrates effective communication, interpersonal and persuasive skills, to be applied toward building relationships with an emphasis on listening

Please note: a comprehensive list of duties and position summary will be provided upon further screening and conversation with each candidate

Procedure for Candidacy: Nominations and applications, including a CV and letter of interest, can be sent in confidence to Megan Davis at [Megan.Davis@BSWHealth.org](mailto:Megan.Davis@BSWHealth.org) or phone 214.865.2689.

*Baylor Scott & White Health is an equal opportunity employer.*

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**Megan Davis, Physician Recruiter**  
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