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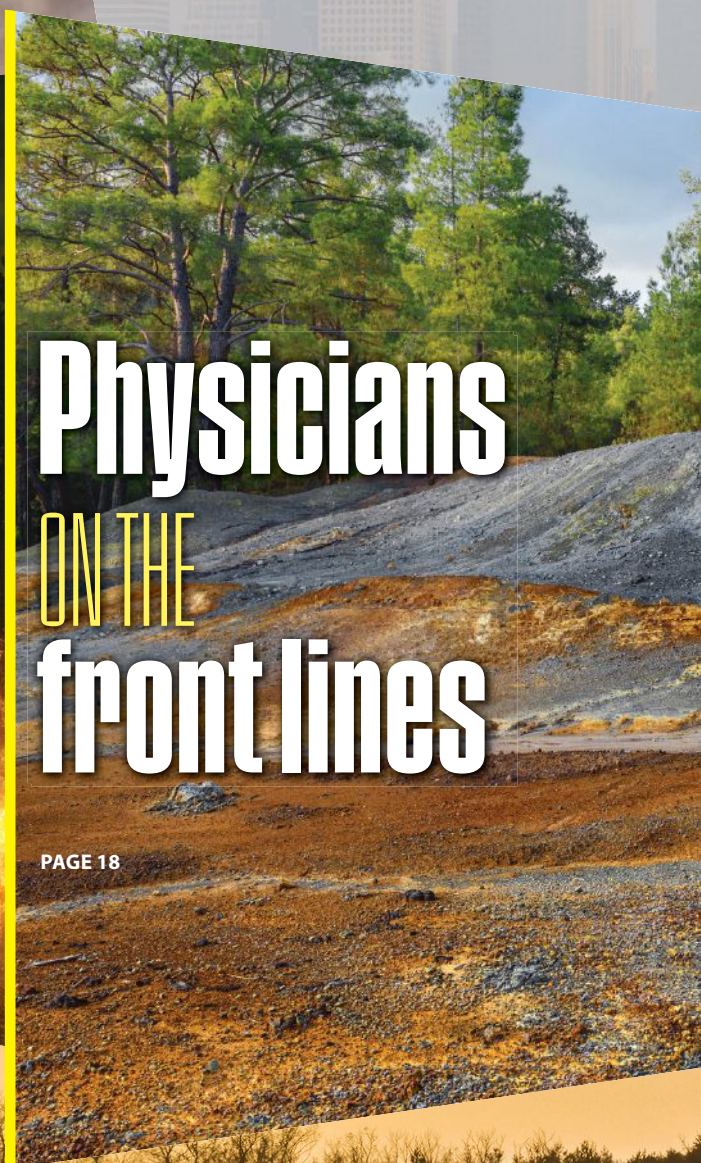
Climate change AND health



Physicians ON THE front lines

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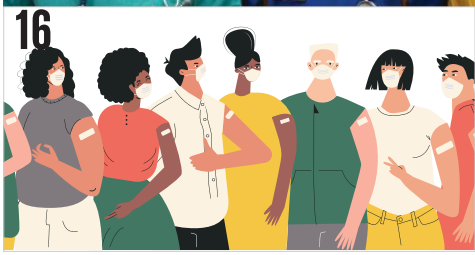

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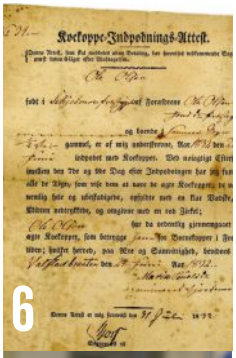

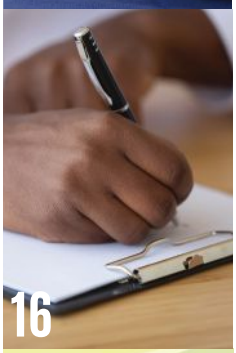

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CONTACT US
Minnesota Medicine
3433 Broadway Street NE, Suite 187
Minneapolis, Minnesota 55413-2199
PHONE: 612-378-1875 or 800-DIAL-MMA
EMAIL: mm@mnmed.org
WEB AND DIGITAL EDITION: mnmed.org

OWNER AND PUBLISHER
Minnesota Medical Association

EDITOR
Linda Picone

DIRECTOR OF COMMUNICATIONS
Dan Hauser

ART DIRECTOR
Kathryn Forss

CIRCULATION/WEB CONTENT
Mary Canada

MEDICAL EDITORS
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Minnesota Medicine editing team

Editors and advisors will help shape coverage

Minnesota Medicine now has a team of three physicians serving as medical editors for the magazine: Rahel Nardos, MD; Chris Wenner, MD; and Colin West, MD, PhD.

Minnesota Medicine has been published for more than 100 years and, at least within the last quarter century or more, there has been one physician serving as the chief medical advisor to the publication. The field of medicine has changed significantly during those 100 years, and involving more physicians will help the magazine reflect the increased diversity of the profession today, in type of practice, geography, gender, interests and personal background

Rahel Nardos, MD, is an OB/GYN specializing in reconstructive surgery and female pelvic medicine at M Health Fairview, and an associate professor, Department of Obstetrics, Gynecology and Women's Health, University of Minnesota. She is also director of Global Women's Health, Center for Global Health and Social Responsibility, University of Minnesota.

Christopher Wenner, MD, took the unusual—at least today—step of opening a small independent family practice in Cold Spring in 2009, after working for healthcare systems. Christopher J. Wenner, MD, PA, has grown, but is still a small practice that serves its community in a very personal way.

Colin West, MD, PhD, is a quantitative health sciences researcher at Mayo Clinic, whose work focuses on physician well-being, evidence-based medicine and biostatistics and medical education. He has been co-director of the Program on Physician Well-Being at Mayo Clinic.

Each medical editor will write two columns/year and help shape the content of the magazine by offering suggestions for topics and expert sources. Wenner's column in this issue is the first.

Instead of an advisory board, *Minnesota Medicine* will call upon a group of medical advisors, each representing a kind of practice/specialty and/or interests. This group of advisors may grow and change as seems appropriate; the important thing is having engaged, interested and interesting physicians helping with magazine content.

The medical advisors currently are:

- **Veda Bellamkonda, MD**, pediatrician, Partners in Pediatrics.
- **Grant Botker, MD**, family practitioner, Ortonville Area Health Services.
- **Devon Callahan, MD**, surgeon and trauma medical director, Abbott Northwestern Hospital.
- **Derrick Lewis**, medical student, Mayo Clinic Alix School of Medicine.
- **Charles Meyer, MD**, internal medical specialist, retired, who served as editor of *Minnesota Medicine* for 25 years.

We are excited about what this new team brings to the magazine but, as always, we welcome ideas, articles and comments from all readers.

Linda Picone, editor
lpicone@mnmed.org or 612-669-0623

Christopher Wenner, MD

We need a diverse medical marketplace—with more independent physicians

Minnesota needs more independent physicians. Although the exact numbers are not entirely clear, a 2018 Minnesota Department of Health Survey indicated that only 15% of Minnesota's physicians owned their practices.

Employed physicians cover all corners of the state, provide safety-net care, teach and innovate while diagnosing, treating and preventing. Employed physicians provide excellent care and I in no way, shape or form mean to disparage their care. I simply assert that the ratio of employed physicians to independent physicians in our state is unhealthy.

The trend across the country, accentuated in Minnesota, has been a shift from independent physicians to employed physicians for myriad reasons, some more germane than others. However, relinquishing ownership—and authority—is not without costs.

Financial costs are significant. Diminished competition (monopolies in some areas), enhanced Medicare reimbursement (outpatient facility fees) and leverage over commercial payers (due to anachronistic anti-trust laws) have led to a marked run-up of medical costs where health systems dominate the marketplace. As physicians, we are charged not only with providing excellent care, but affordable, equitable care. Healthcare expenditures in our country are now

at 20% of GDP. Granted, there are many other drivers in this sector of our economy, but perpetuating an arms race of fee inflation makes us equally culpable. High medical costs do not beget high-quality healthcare.

Personal costs need to be recognized. Physician burnout is endemic. Loss of clinical autonomy is a well-documented driver of burnout. We are decision-makers by nature and nurture. Underutilizing this cultivated talent creates a void that is often filled with less meaningful duties (read: EMR documentation). Delegation of tasks and ceding of control are not fungible concepts. Unfortunately, this becomes easily confused as systems multiply and are imbued with many layers of administration. Physicians, via regular patient contact, are the best suited entity to direct care, in a fashion that does not undermine our profession, but rather strengthens it—and us.

The costs to patients in large system-based medicine are real too. Anecdotes abound: byzantine phone trees, next available appointments for an established patient with a primary care provider in six months (!) and fragmented care. Certainly, some independent physician practices are guilty of similar transgressions, however, when a patient (consumer) is treated poorly in a competitive marketplace, they are able to take their business elsewhere. In a monopoly, that same consumer (patient—in need of healthcare) languishes.

Less choice for patients and less choice for physicians puts our profession in very real jeopardy. Big tech and big-box retailers are eyeing medicine and its one-fifth of the economy from a proximate position, threatening dispersive medicine. A moderate dose of this may be healthy, but woe for the patient who is forced to deal with a health crisis via a computer screen. Although large and powerful regionally, our hospital systems are Lilliputian in comparison to corporate America. Any number of Wall Street companies (indifferent healthcare providers, I might add) could flood the market with subsidized care—upending the current medical model. A diverse medical marketplace is the only reasonable defensive tactic as corporations seek out a much larger piece of the healthcare pie. Some practices may indeed fail—but not all. A homogenous medical system is far less resilient than one of diverse construct.

Less choice for patients and less choice for physicians puts our profession in very real jeopardy.

If Minnesota healthcare is to remain low-cost and high-quality, a counter-lever is needed to large medical system hegemony. Independent medicine is well suited to that task and a value proposition that the state should embrace. **MM**

Christopher J. Wenner, MD, is the founder of Christopher J. Wenner, MD, PA, an independent family medicine practice in Cold Spring. He is one of three medical editors for *Minnesota Medicine*.

Vaccine hesitancy is not new

Decisions about health are not completely rational

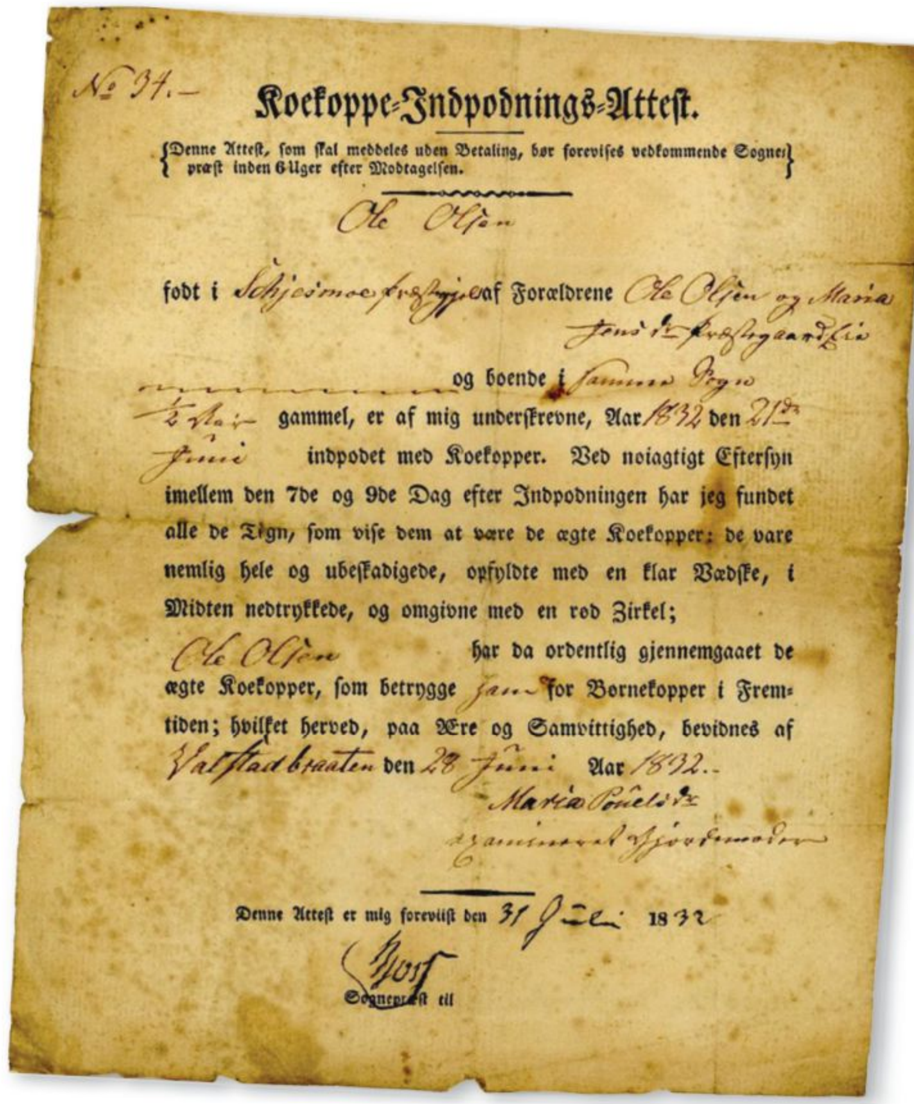
BY RANDY OLSON, MD

Healthcare professionals had high hopes that rapid vaccination of our entire U.S. population would slow COVID-19 transmission and stem the disproportionately high death count in the United States. We also hoped to avoid more concerning mutations that are inevitable when viruses multiply unchecked.

I lost my mother to COVID-19 in November 2020, less than two months before the vaccine became available. Last spring, I checked in with my mother's youngest brother in Oregon. He had questions about the new vaccines that kept him from getting vaccinated. I tried to reassure him about the history, safety and effectiveness of each of the vaccines. I described my own positive experience getting a two-shot vaccination as part of the early rollout to healthcare workers. However, he preferred to do some more investigating before committing to vaccination.

Despite impressive data on the safety and efficacy of COVID-19 vaccinations, only 63% of the U.S. population is fully vaccinated and a smaller percentage has been boosted. A year after the vaccine rollout, we find ourselves in the midst of the highest COVID-19 transmission rates and hospitalization numbers since the start of the pandemic. Vaccine hesitancy rates are still as high as 25% in certain regions of the country.

This past September, I got a 6am call from Oregon and was numb as my uncle informed me that he and my aunt had contracted COVID and had just transferred to hospital beds from the Emergency Department.


Koekoppe-Indpodnings-Attest.

{Denne Attest, som skal meddeles uden Betaling, bør forevises vedkommende Sognepræst inden 6 Uger efter Modtagelsen.}

Ole Olsen

født i ... af Forældrene Ole Olsen og Maria ...

og boende i Samme Sogn

½ Aar gammel, er af mig underskrevne, Aar 1832 den 21de Juni indpodet med Koekopper. Ved nøiagtigt Eftersyn imellem den 7de og 9de Dag efter Indpodningen har jeg fundet alle de Tegn, som vise dem at være de ægte Koekopper: de vare nemlig hele og ubeskadigede, opfyldte med en klar Vædske, i Midten nedtrykkede, og omgivne med en rød Zirkel; Ole Olsen har da ordentlig gjennemgaaet de ægte Koekopper, som betrygge ham for Børnekopper i Fremtiden; hvilket herved, paa Ære og Samvittighed, bevidnes af Vatstadbraaten den 28 Juni Aar 1832.

Maria Pouelsdr

examineret Jordemoder

Denne Attest er mig forevist den 31 Juli 1832

Sognepræst til

A cowpox vaccine certificate issued to Ole Olsen, the great-great-grandfather of the author, in Norway in 1832.

He apologized for his muffled voice as he talked to me through a breathing machine and reported his oxygen saturation was just 45% when he arrived in the ED. He joked and asked if I might be willing to come to Oregon for a house call. My aunt was able to return home on oxygen after a few days in the hospital but, four days after that phone call, my uncle was gone.

I wept when my aunt called me with the news.

Vaccine hesitancy is not new. It has been around for as long as there have been vaccines. It is born out of the most basic and rational thought one can have about life and health: "Do the benefits outweigh the risks? Will this vaccine help me or my loved ones survive?"

However, we know that decisions we make about our health aren't purely rational. We smoke and drink too much. We eat too much and spend too much time idle, all the while knowing these decisions are at odds with good sense and our health.

We are easy prey to fear and emotional arguments that distract us from data and smear the character or personality of vaccines as if they were persons to be debated or despised instead of a 225-year-old proven tool of survival.

The first vaccine was found through observation of a natural process. In the late

1700s in England where smallpox was the greatest cause of untimely death, Edward Jenner, FRS, FRCPE, saw that milkmaids previously infected with cowpox were immune to smallpox.

Trading the discomfort of a mild illness and a few cowpox on an arm proved much safer than getting smallpox. Before that first vaccination existed, about a quarter of all children died before their first birthdays, many from infectious diseases that are now preventable. No country had a life expectancy of more than 40 years old. Since then, the average human lifespan has doubled, largely thanks to vaccines.

In 1796, as Jenner distributed his cowpox vaccination, the rational question of improved survival was answered, but distractions from this answer had just begun. Some argued political and religious calamities would ensue; others proclaimed that half-cow babies would be the inevitable result. Amid all the loud angry distractions and emotional outrage expressed against smallpox vaccination, the reality was that it saved lives and kept infected people from easily causing new outbreaks.

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We continue to live in a world where emotion and fear distract our rational inclination to survive. A world where organizations and individuals without any medical, legal or financial responsibility for outcomes use fear and emotion to detract millions from using an effective survival tool. Contagious diseases like the coronavirus don't hesitate. They don't care about the arguments that keep us from getting useful vaccines. They just keep looking for easy targets, hosts that can't fight them. People who allow viruses to use their bodies to multiply and spread to the next person.

In 1812, the Swedish government (which also ruled Norway) mandated smallpox vaccination due to the overwhelming evidence of improved survival. Proof of vaccination was soon required for travel, passage on ships and emigration to America. In 1832, my great-great-grandfather Ole S. Olson was vaccinated against smallpox at 6 months old, thankfully preserving my lineage.

We can keep each other safe and survive this latest omicron variant and the inevitable variants to follow if we take steps that we know work:

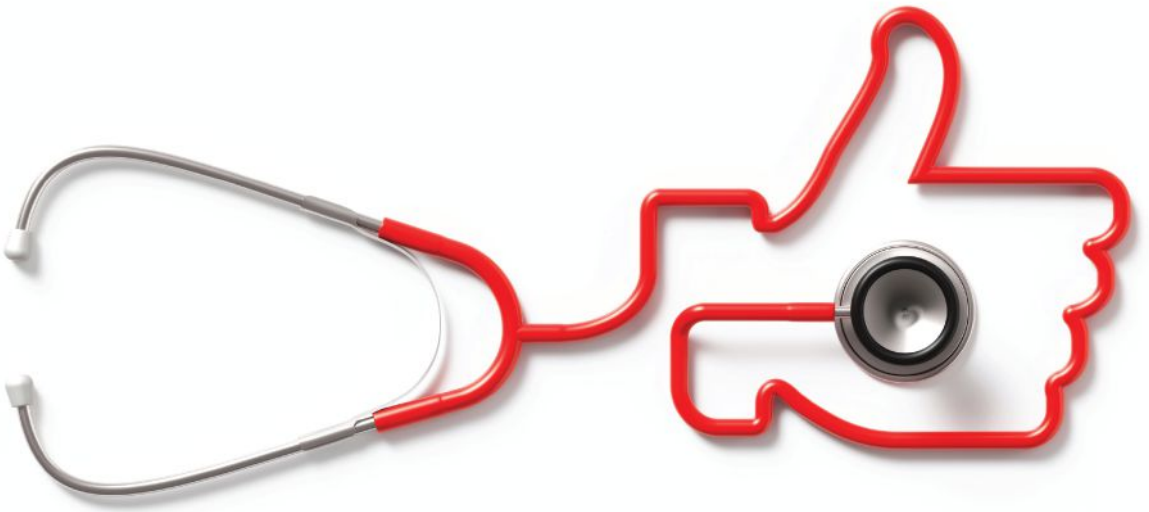
- Social distancing and wearing masks in crowds decreases viral transmission by over 50%.
- Quarantine after exposure and isolation if you've gotten sick or test positive can break the cycle of rapid viral transmission.
- Getting vaccinated with a booster can mean the difference between a mild illness versus a hospital stay or death. Over 8 billion COVID-19 vaccinations have been given worldwide with amazing safety and, while not perfect, they do help us survive.

Our hospitals are bursting with COVID-19 infections in people who have hesitated to get vaccinated.

Please don't let distractions keep you and your loved ones from using or getting protection we know works to improve survival for everyone. **MM**

Randy Olson, MD, is an emergency care physician at Grand Itasca Clinic & Hospital and volunteer physician at Project Care Free Clinic in Grand Rapids.

This commentary originally appeared on *Minnesota Reformer* minnesotareformer.com on January 21, 2022.



Physicians and social media

Should you express your opinions for patients to see?

BY COLT WILLIAMS, MD

Professional ethics in medicine has grown to encompass more than pre-procedural informed consent or ensuring the integrity of data obtained through research. Our patients have ever-increasing access to us and, as a result, our professional lives extend far beyond the walls of our offices.

When assessing how our online activity may constitute an ethical breach, we must consider several key concepts. First, are we acting justly? In this case, how do we apply procedural justice, the type of justice that ensures all parties are treated fairly and respectfully, to our online presence? Secondly, how do we balance our duty to put our patients' needs first against the need to protect our own individual rights of liberty and autonomy? Finally, can activities conducted within the public domain be considered evidence for our lack of impartiality when treating patients? I attempt to tackle both sides of the argument.

YES

Physicians are entitled to free speech

We may be physicians, but we are still sovereign citizens of this country, entitled to all the rights and privileges therein. The freedom of speech, protected under the First Amendment, was a guiding principle for the founding of our country. If we are not

NO

Physicians' words have more weight

The workings of human interaction are nearly unrecognizable from what they were 20 years ago. Our world is one of ever-increasing interconnectedness, globalization and instantaneous access. What isn't on the internet yet will be in the blink of an eye.

YES *(continued)*

free to speak what we believe to be true and right—even if it is unpopular—how soon will it be before we are no longer allowed to say what we believe? As academic institutions and health mega-corporations vie to control more and more aspects of our lives, we must fight to retain our autonomy as individuals. Posting to public social media is no different than attending a gun rights rally or gay pride parade, and no one would dare restrict our attendance at public gatherings. What we choose to say and do outside of the exam room is firmly up to us and no one else.

We are more than robots; we lead complex and deeply personal lives outside of our clinical practice. Our moral compasses make us who we are and, by extension, define our practice. Without our firmly-rooted beliefs, we would not have the ability to navigate our day-to-day decisions through a landscape of moral sinkholes. Our training and the care we have given to previous patients have made it clear that we are able to fairly treat patients regardless of their beliefs or our own. The discomfort a patient may feel by seeing that our beliefs are opposed to their own pales in comparison to the experience of any physician whose patient denied their care based on the physician's religion, race or creed.

By becoming physicians, we agreed to be held to a higher level of responsibility than other citizens. We agreed to put the benefit of our patients before our own. If we believe we have thoughts of value, then as leaders of our community we should view it not only as our privilege, but our duty, to post our thoughts to social media.

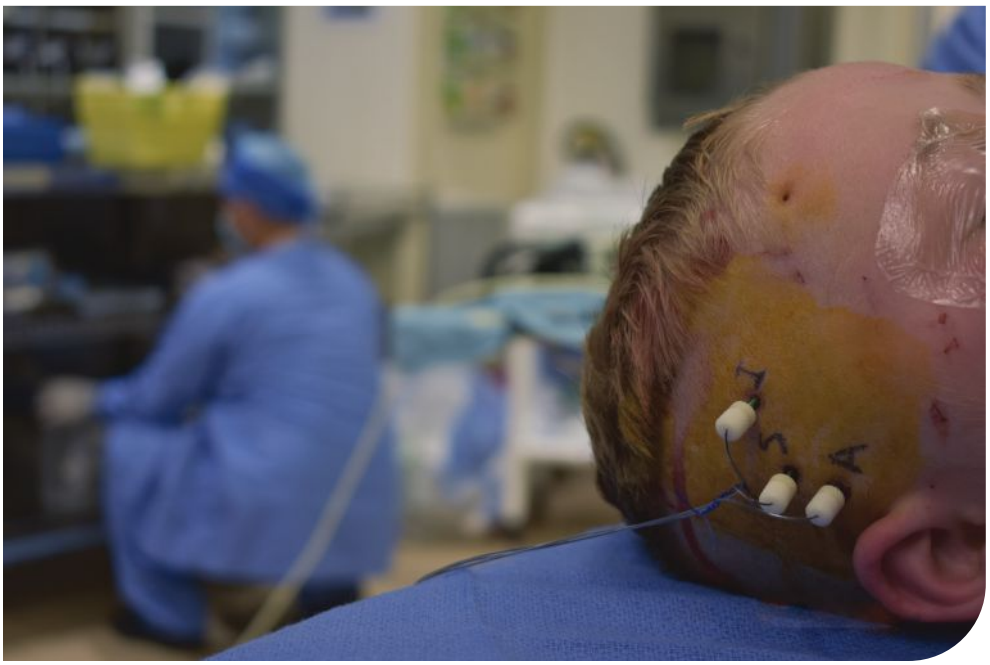
NO *(continued)*

Posting on social media is no different than shouting from atop a hospital cafeteria table or plastering the posts to your office walls. Take a moment and think: do you really want your patient to know these things about you? More importantly, should your patients have to worry about whether you will provide them with adequate care because of your beliefs?

Name any one of the politicians or celebrities whose controversial or inflammatory posts have been unearthed and I can tell you their fate: jobless, discredited and disavowed by their organizations—at least for a time. Becoming an online social commentator isn't only career suicide, it's unethical. While we all vowed to treat our patients equitably, our actions speak louder than our words. Imagine being one of the 3,000 Syrian refugees currently living in Minnesota, having fled your country seeking political and physical asylum. Imagine you seek care from a physician who has made it abundantly clear that they disagree with your presence here. How could the evidence possibly lead to any conclusion other than that you will be treated poorly? As physicians, our voices carry farther and our words have more weight than those of others. We must ensure that we don't conflate our role as experts in health as that of experts in other matters.

We voluntarily narrowed our freedom of speech when we became physicians. In today's world, the separation between personal life and work is no longer distinguishable and, whether we like it or not, the white coat never comes off. In whatever we do, we will always be physicians. Our commitment to put our patients before ourselves should never waver. **MM**

Colt Williams, MD, is a Hematology/Oncology and Biomedical Ethics Fellow at Mayo Clinic.



Treatments for epilepsy

FOR SOME PATIENTS, SURGERY CAN MAKE A DIFFERENCE

BY LINDA PICONE

Epilepsy, a brain disorder leading to recurring seizures, has been around for at least 4,000 years. According to the CDC, there were about 3 million adults and 470,000 children—about 1.2% of the population—with active epilepsy in the United States in 2015. In Minnesota, 53,700 people had epilepsy, 7,400 of them children.

Although Hippocrates attributed epilepsy to the brain, it was widely accepted in ancient Greece and for hundreds of years after—including for some cultures today—that epilepsy was caused by spirits. Treatments once were as drastic as bloodletting or skull trephination or medicinal herbs—and generally were ineffective. Hippocrates' ideas about epilepsy being a brain disorder finally began to take hold in Europe in the 17th century.

Today, there are many options for patients with epilepsy, from pharmaceuticals to surgery, with research—and progress—continuing.

Surgical options for epilepsy have improved over the last five years, says Brett Spark, executive director of the Minnesota Epilepsy Group (MEG). "There are a lot of cases where the outcomes are exciting," he says. "Patients can go from 10 to 20 seizures a day to not having any."

Although treatment overall for epilepsy has improved, and is continuing to improve, surgery currently is the only way to eliminate the root cause of epilepsy, if identified appropriately, says Palak Shah, MD, neurologist.

Many surgery options are available for patients with refractory epilepsy and three of the major ones are:

- Resection (cutting out) of the lesion (brain abnormality) causing seizures.
- Laser ablation of the lesion (brain abnormality) causing seizures.
- Neuromodulation devices such as VNS (vagal nerve stimulator), RNS (responsive neurostimulator) and DBS (deep brain stimulator) when resection or laser ablation are not possible or desired.

"Surgeries have always been a big part of our practice, and part of what sets us apart from our colleagues," says Heidi Currier, MD, pediatric neurologist. "We are one of only three centers in Minnesota (Mayo Clinic and University of Minnesota are the others) that does invasive monitoring followed by surgery and one of the largest regional centers in the country."

MEG partners with neurosurgeons for surgery. MEG physicians are involved in the process throughout, monitoring patients before surgery, being in the operating room as surgery is being performed and monitoring patients after surgery.

The process leading up to surgery for epilepsy has many steps, Spark says. "We prior-authorize for patients on the front end and they are covered as a surgical procedure. It's just a very hands-on process—and the outcomes are phenomenal.

Shah says the protocol is to first define if a patient has refractory epilepsy—a sustained seizure after an adequate trial of seizure medication. "Once a person meets that criterion, we look at the type of epilepsy they have and at options for neuromodulation. We define the area of the brain that is affected and whether removing or resecting that part of the brain would cure that epilepsy or not. Not all patients qualify for that; some have generalized epilepsy."

Before deciding which kind of surgery is an option for a particular patient, there is an extensive presurgical work up at MEG's center with help of team of experts which includes recording the patient's seizures while connected to the video electroencephalogram (EEG/brain wave study) as well as multiple imaging studies such as MRI, PET scan, Magnetoencephalogram, SPECT scan etc. The patient also gets neuropsychometric testing and a psychology evaluation during the evaluation.

After this phase 1 evaluation, many of the patients need sEEG (steroelectroencephalography) which is the most advanced technique being used at this time to pinpoint the area of brain abnormality causing seizures, Shah says.

sEEG is a minimally-invasive surgery in which electrodes are placed directly in the patient's brain to monitor exactly where seizures arise. Spark says only a few neurosurgeons know how to do sEEG, which uses a robot to place the electrodes. MEG partners with Children's Hospital and Abbott-Northwestern Hospital in Minnesota for this kind of procedure and monitoring. With this surgery, the patient stays in the hospital for about seven to 10 days, Spark says. "No other procedure compares to the accuracy of sEEG to show exactly where the seizure arises in the brain."

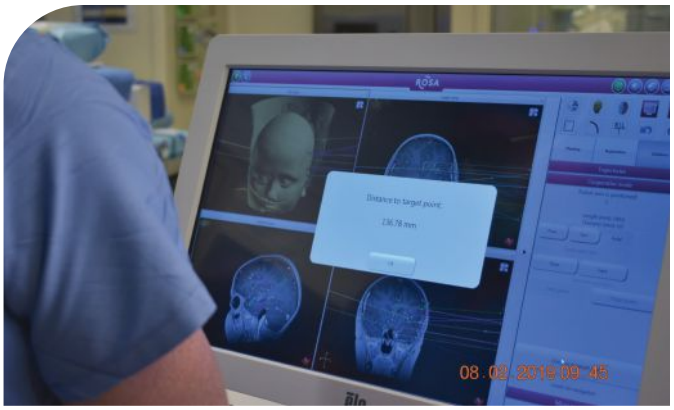
When the brain abnormality causing seizures is removed, results may be phenomenal. Spark says, "There are many treatments out there that can then be applied to reduce or stop seizures, which can change someone's lifestyle from being a person who can't drive or work to getting back to a more normal routine."

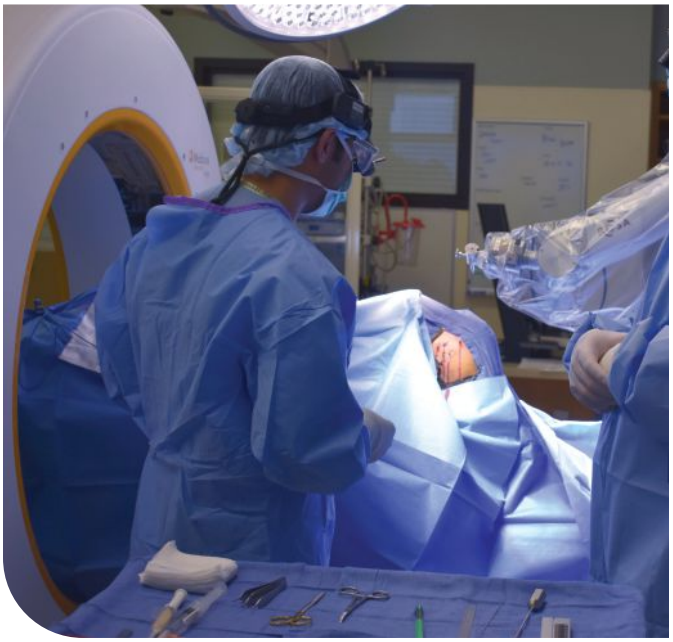
The success of the surgery is very high for many cases, but it also depends on several things, including location of the area in the brain and possibility of complications, Shah says. "We sometimes go to neuro-modulation devices because the area is non-resective," she says. "For example, if the seizure-producing area of the brain is close to the language-producing area of the brain, even if we've identified it, we can't remove it."

"Whether surgery is 100 percent or not, that's another story," says Shah. "After surgery, the person will not be medicine-free. Depending on where the seizures are coming from, the success rate could be different."

Currier says MEG has one or two pediatric patients each month who are receiving an invasive workup and then surgery. Shah says the number is similar for adult patients, who come not only from Minnesota but from surrounding states and as far away as Illinois. Some patients simply prefer the smaller private group, "where the doctors may seem more approachable."

Even if a patient is not a surgical candidate, Spark says, MEG has many options for treatment. "Whenever we consider a patient for surgical, invasive testing or neuro-modulation, we all sit down and review the case and give our opinions," says Shah. "Surgery conference, which is an integral part of our process, is a way to review such cases in presence of the entire epilepsy group (10-12 epileptologists), neurosurgeons, neuroradiologist, neuropsychologists, psychologists etc.) This ensures that the patient gets a thorough review of their case from all aspects before brain surgery is considered. The patient gets not one doctor's opinion but 10 or 12 doctors' opinions."





Future options

Shah says a great deal of progress has been made in using minimally-invasive procedures to put electrodes in the brain with the help of a robot. "It's very precise insertion of electrodes inside the brain," she says. "What I'm looking at is more automatic machines to improve the placement of the electrodes and our decisions."

Other new machine options include stronger magnets for imaging studies and improved neuromodulation devices using standardized targets. "We have a lot of work to do on how we use them and how we collect data," Shah says of the new options.

Shah says one more modality, trans-magnetic stimulation, is in the pipeline, but not ready yet. "They are still producing models, but are using it in some other disease processes."

Currier says everyone in the group tries to stay current on surgical and pharmaceutical options for treating epilepsy through seminars and conferences. MEG also participates in research studies, primarily of drug trials. **MM**

Linda Picone is editor of *Minnesota Medicine*.

A Real Doctor

BY HARRISON H. FARLEY, MD

I have written about this middle-aged Scandinavian patient before but telling her story several times over is not too many. She was a patient of my former surgical partner, John Linner, MD. He had performed a radical mastectomy (the surgery of choice at that time) and then he and his wife Evodia left for a long planned trip to Sweden. With Dr. John gone, it was up to me to see that his patients were well cared for and I did my best.

The patient came into the office on several occasions during her postoperative recovery. I aspirated a small seroma, removed sutures and discussed problems of rehabilitation that would invariably come up following that traumatic procedure, but they were just routine visits to help her back to her daily routines. At first, she seemed to have a particularly "flat" personality but in talking with her, I learned that her family had gone through a lot during WWII and as we talked I learned more of these trials. However my big surprise came after she spoke well of Linner and his ability as a surgeon, which I agreed with wholeheartedly.

"He was also first in his medical school class at Minnesota, you know!" I offered.

"Well, I certainly think well of him as a surgeon—but I wouldn't call him a real doctor like his father," she responded.

That really got my attention. As far as I was concerned, my partner by training and practice was top of his class in every way. He was a fellow of the American Board of Surgery, had written a book on his experiences in WWII and was in the forefront of the developing field of gastric bypass surgery to treat morbid obesity.

"Would you please explain what you mean by 'real doctor?'" I asked.

I never knew John's father, H.P. Linner, MD, except by reputation. He was a GP surgeon with some surgical training, but had never gone through the rigors of a formal surgical program to make him board-eligible. Nevertheless, he was well thought of at Swedish Hospital, where he had practiced general medicine and surgery. He and his wife had four children, two of them boys who became doctors. John went into surgery; his younger brother Paul, chose general medicine.

"I'll share my story with you, Doctor," John's patient said.

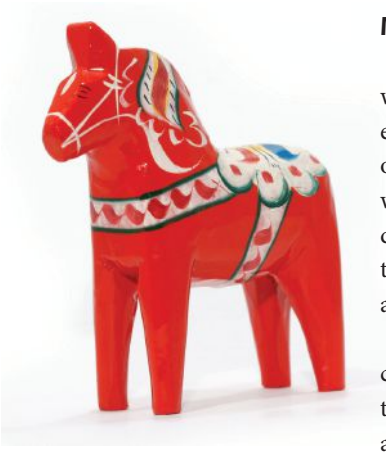
When I was a young mother having my second child, a problem developed that caused undue vaginal bleeding, so much so that they thought I would not make it. I can remember still that awful feeling of panic. It remains as clear as could be. I completely went to pieces in Swedish. I was hysterical. When the hemorrhage would not stop, I consented to a hysterectomy, yet my own doctor seemed so unsure of himself. I felt helpless and afraid. I lay in the operating room screaming bloody murder while they pumped in multiple blood transfusions. Everyone in the room seemed to be talking loud and moving about in a chaotic manner and then I heard someone say, "Dr. Linner is in the building and will be there momentarily!" With that, things quieted down. The door to the scrub room opened and Dr. H.P. Linner entered the room. He was in his "blues" but not as yet scrubbed in. Stepping quickly to my side, he grasped my free hand with both of his and they felt warm and reassuring. There seemed to be no hesitation on his part. He squeezed my hand and said who he was, that he'd been asked to help and was that all right with me.

I answered "Yes, do what's necessary!"

He then stood straight and in a very clear voice spoke to everyone in the room:

"Quiet please, I'd like to say a short prayer!"

You could have heard a pin drop in the operating room. As he said his brief prayer, I felt at peace for the first time that day. It's not only that he saved my life by his surgery but also his very action had calmed me. I was praying myself but when he asked God for help—well, that did it. In my mind I think of him even to this day as a "real doctor."



The patient opened her purse and handed me a small package. Inside was a small painted orange horse, the likes of which I was not familiar with at the time.

"This is a Dala Horse and it was made in Sweden. It is a token of esteem and it stands for dignity, wisdom and strength. I would like you to have it," she said.

I thanked her for the gift and her very touching story of the real doctor.

I told all this to Linner when he returned from his trip to Sweden, not knowing how he would react. He enjoyed it very much; needless to say, he had great respect and admiration himself for his late father.

I have seen many fine technical surgeons who could perform with aplomb at the operating table, could mesmerize an audience from the podium and by wit and wisdom hold an audience of skilled men and women in the palm of his (or her) hand—but would these phenoms of the surgical world be classified as a "real doctor" in Linner's patient's book? You would have to know if they, too, treated the whole patient, not just the surgical problem at hand.

My Perspective

I have seen many fine technical surgeons who could perform with aplomb at the operating table, could mesmerize an audience from the podium and by wit and wisdom hold an audience of skilled men and women in the palm of his (or her) hand—but would these phenoms of the surgical world be classified as a "real doctor" in Linner's patient's book? You would have to know if they, too, treated the whole patient, not just the surgical problem at hand.

Richard Fruehoff, a former GP surgeon from Superior, Wisconsin, would qualify for the title. He didn't hesitate to ask a better trained surgeon from Duluth to cross the bridge to Superior and come help him on a difficult case in his time—but that simply shows good judgment. When a patient with a placenta previa nearly bled out and the blood bank was out of her type of blood, he acted beyond the call of duty. He directed the blood technician to draw off two pints of his own Type O blood there in the operating room and give it to his patient. Then he finished the hysterectomy safely. That qualifies.

A "real doctor" has the whole patient in mind. Yes, it's critical to correct the medical problem at hand but that problem can have trappings that overwhelm the patient. This is when a "real doctor" can make the difference between success and failure.

In a different instance, Fruehoff did just that. The hierarchy of the Church, the family and the social set of a young pregnant mother were all waiting outside the delivery room, prepared to chastise a very sensitive 18-year-old who was seven months married and about to deliver a full-term child. She had broken down in Fruhoff's presence before the delivery and touched his heart with her story. He had seen other mothers suffer in such situations and was determined to help if he could.

"What could you do, Dick?" I asked.

"I called for an incubator for the big chubby baby, then went out into the hall to face her priest, four parents and a hospital social worker. They seemed ready to pounce on the new mother for having sex before marriage. I told them that the 'early' child needed more O^2 and time to adjust. There were some raised eyebrows with this explanation but no more was said. By the time the next issue of *News from the Church* and the local paper listed the child's true weight at 9 pounds, the whole issue had dissipated."

Real doctors? Frank Glenn, MD, of New York Hospital and Owen Wangensteen, MD, of the University of Minnesota would certainly qualify, as would others like the great Charles Mayo, but a lot of highly skilled, innovative surgeons would not. **MM**

Harrison H. Farley, MD, FACS, member of ASH&N surgeons, and former clinical professor of Surgery, University of Minnesota, is still trying at age 92 to qualify for admission to the very exclusive circle of real doctors.

STORIES, ESSAYS, POETRY AND MEMOIR

Putting words on the page can help physicians heal themselves

BY JACK EL-HAI

Several years ago, I received a phone call the night before a creative writing workshop I was leading for physicians. The concerned caller warned me that one of the workshop participants had been behaving erratically and might disrupt our class the next day. My workshop sponsor raised the possibility of postponing the class, but I decided not to. When the student I had been warned about arrived the next morning for the workshop, her anxiety was obvious. She appeared worked up and jittery. We quickly began some in-class writing and exercises. She became engrossed in her work and the class discussion and her anxiety eased. The workshop finished without a disruption.

That episode convinced me of the power of creative writing to relieve stress and emotional turmoil. In the 14 years I have coached and led writing workshops for physicians and other healthcare professionals, I have often heard physicians comment that this expressive outlet has reduced the burnout, disconnection and strain they feel from their daily work. Their sense of purpose is heightened. Writing has helped them become better listeners and observers, better colleagues and better physicians.

My path to working on writing with physicians was unintended. In 2005, I published *The Lobotomist*, a nonfiction book that plunged into a dark and intriguing episode of psychiatric medicine. Speaking at medical conferences and in grand rounds presentations to promote the book, I certainly expected questions from the physicians in attendance. But I did not expect many of the questions I heard. There was something important on the minds of many of these doctors that I did not predict—and it was writing.

Wherever I spoke, physicians would approach me at the end of my presentation to talk about their own writing. They spoke quietly and furtively, as if they were not sure they wished their colleagues to overhear. These physicians were writing essays, nonfiction books, novels, short stories, poetry and screenplays. They wanted to know how to persist and improve as writers, find time for writing, judge what they wrote, revise and publish. The available guidance for physician-writers is limited, and those not affiliated with medical schools have even less. Hearing their questions about writing hinted at the need of many physicians to express themselves. As I addressed medical audiences, it gradually dawned on me—and I would have been a blockhead not to notice it—that many physicians want to write and would benefit from guidance from a professional writer.

Soon, I began leading in-person writing workshops for physicians and other healthcare professionals through the Medical Humanities Department of the Mayo Clinic and the University of Minnesota's Continuing Education programs. These classes opened my eyes to the distinctive concerns and preoccupations of doctors engaged in writing. Physicians wondered about the ethical quandaries of writing about patients and colleagues, whether their colleagues would judge them harshly for writing about medicine for nonmedical readers, whether their specialties would even be interesting to general readers, how writing fiction and poetry would

affect their professional image—and how to find time to write when their working schedules were already full almost beyond endurance.

Why do physicians make good writers?

My experience with physicians convinced me that nearly every one could learn to write creatively and reap the benefits. After years of teaching creative writing at the Loft Literary Center and in the MFA program in creative writing at Augsburg University, I've recently focused my attention on serving as a writing coach for individual physicians, many of whom lack institutional affiliations and support. I help physicians feel comfortable about writing creatively in whatever genres interest them, give them inspiring models and guide them in producing work that can serve as starting points for future writing. My clients have ranged from people early in their careers to retirees.

Many of us are familiar with the acclaimed physician-writers of the past, including Anton Chekhov; Sir Arthur Conan Doyle; Oliver Wendell Holmes, Sr.; W. Somerset Maugham; and William Carlos Williams. New generations of prominent writers—Danielle Ofri, Atul Gawande, Nawal El Saadawi, Rafael Campo, Siddhartha Mukherjee, Perri Klass, John Collee, Rivka Galchen and Vincent Lamb, among many others—have enriched the list. The *Belleview Literary Review* is one of many journals that specializes in regularly publishing the writing of physicians.

Physicians have a deep well of experiences to draw from in their writing. They witness dramatic episodes of heroism, cures and failures. They see unforgettable scenes, hear devastating words, make difficult decisions and witness the responses of people at important moments in their lives. They often encounter high-stakes situations. Most importantly, they continually think about cause and effect—one action produces a resulting action—which are building blocks of fiction and nonfiction narratives. Intriguing fiction, nonfiction, poetry or performed works come out of these experiences.

In addition, physicians can learn to write in the same way they've learned to practice medicine: absorbing from others with more experience, practicing and repeating the same exercise many times.

Physicians have a deep well of experiences to draw from in their writing. They witness dramatic episodes of heroism, cures and failures. They see unforgettable scenes, hear devastating words, make difficult decisions and witness the responses of people at important moments in their lives … Intriguing fiction, nonfiction, poetry or performed works come out of these experiences.

There's a venerable tradition of mastering writing using those same approaches.

Benefits specific to physicians

Whether wanting to publish or not, anyone who writes creatively benefits from exploring thoughts and feelings, better understanding life and its experiences, sharing discoveries and observations, having fun and feeling satisfaction. But physician-writers gain from a special set of benefits that can improve their practice of medicine. (For decades, researchers publishing in peer-reviewed medical journals have found evidence of the benefits of writing and other creative activities for physicians.) For the 60-plus% of physicians who now report to be suffering from career burnout (according to a 2021 survey by the Physicians Foundation), writing provides a contemplative focus simply not possible during the working day. It can heighten awareness and bring a renewed excitement about working with patients and understanding their inner lives.

Working in any of the genres of creative writing leads physicians to think and observe beyond their immediate concerns, carrying them into the realms of behavior, culture, relationships and feelings. Venturing outside accustomed paths of thought brings new perspectives. Being able to write about feelings, motivation and decisions triggers reflections that can make physicians better at communicating with their patients and colleagues. Good writing is often about ethical dilemmas, and physician-writers can grow better at appreciating the difficult decisions unfolding all around them in their practices. Through writing exercises and discussions, I help physicians I coach uncover their own concerns, conflicts and dilemmas that can evolve into stories.

The stresses of the COVID pandemic only intensified the need of physicians to have a creative outlet. There is more to medicine than science, and physicians who try creative writing can feel their doctoring strengthen as they explore on the page what it means to be observant, compassionate and curious. When I coach physicians in writing, I ask them what they want writing to look or feel like in their lives, which skills and techniques they want to work on and what they want writing to do for them. With an awakened imagination, they see their own lives and the experiences of others in a new light. They regain their original purpose in pursuing medicine as a career. Complementing their grounding in science, they reclaim their grounding in humanity. **MM**

Jack El-Hai is a Twin Cities freelance writer and author of the medical popular-history books *The Lobotomist* and *The Nazi and the Psychiatrist.*

CONVERSATIONS ABOUT vaccination

Show patients you understand and care

BY DAWN ELLISON, MD, CPC

Physicians rarely get angry with patients. We've been selected and trained to feel compassion … but that's changing. Patients we've taken care of for decades are now ignoring our advice to get vaccinated. We sympathize when patients don't follow diet or exercise recommendations; habits are hard to change. This is different. Patients refuse effective, safe, free vaccines while more than 5 million people globally have died of COVID, our healthcare system is overwhelmed, our economy is damaged and our democracy is frayed.

When patients choose to take the advice of cable news celebrities, Facebook friends and politicians over that of physicians, who have studied medicine most of our adult lives, we feel disrespected. When we attempt to discuss the evidence and are immediately shut down, we're puzzled. As physicians, we want to make sure that our patients base their healthcare decisions on sound research as well as their own values. When they make decisions based on attractive misinformation or disinformation, we are frustrated and eventually angry.

How might we approach a conversation with our patients about getting a vaccine? It's useful to consider just why patients might prefer to believe what they hear from others about the vaccines. They may find a sense of belonging with people who believe that the government can't be trusted, or they may believe that God will take care of them because He has chosen them. Being immortal or a nonconformist may be attractive narratives to someone who grew up in the country that is the "home of the free and land of the brave." Consider their lived experience and how it may differ from yours before judging their motives for believing the people that "get them."

Consider the idea that patients "don't care how much you know until they know how much you care" as you work on your therapeutic relationship with them. As an emergency medicine doctor, I needed to establish rapport with patients quickly. These are techniques I built into my approach to patients that may help you in a discussion about the vaccine:

- **Partner**. Use phrases like, "*We* will figure this out together and find a treatment plan that works for you."
- **Empathize**. Use phrases like, "That sounds hard."
- **Respect their values**. Use phrases like, "You are a great father. It sounds like you value your time with your family."
- **Validate their efforts**. Use phrases like, "Despite all these challenges, you persevere," or "It's admirable that you are the one to take care of your mom."
- **Legitimize their feelings**. Use phrases like, "Anyone going through this would feel exhausted. You are not alone in that."

Be clear about the intent of the conversation you want to have with them about the vaccine. A cognitive inoculation like, "People are going to try to tell you that the vaccine isn't safe" may help them reconsider disinformation. Try something like, "I am sharing what I know about the vaccine with all of my patients. I want to help you make the best decision about whether or not to get vaccinated. It is my obligation to inform you of the latest research-supported information. People are going to try to convince you that I would mislead you. I hope you know I have your best interest in mind."

Then share some of the facts:

- More than 9.4 billion COVID vaccinations have been administered across the world with 3.9 billion people fully vaccinated (January 5, 2022).
- There have been more than 5.5 million COVID deaths around the world (January 11, 2022).
- Only rare complications have been seen with any COVID vaccine. It is one of the safest vaccines ever produced. The mRNA technique has been in development since SARS COV1 in 2003.
- All versions of the vaccine are very effective at preventing severe cases of COVID.
- In early January 2022, the CDC reported more COVID-19 hospitalizations than the peak in 2021 when the vaccines were not widely available. This was when Omicron was rampant and considered more mild.
- Some 98% of people hospitalized in the United States with COVID are unvaccinated (October 2021).
- You are much less likely to spread the coronavirus if you are vaccinated
- The Omicron variant appears to be very contagious.

Next, share your story about why it is important for them personally to be vaccinated. Connect this with their values. It might sound something like this:

- "I know the safety of your family and friends matters to you and that you want to get back together with them."
- "We can all resume our activities safely and get back to normal when all of us get vaccinated."
- "You are more at risk for severe COVID because of (insert any pertinent medical problems here)."

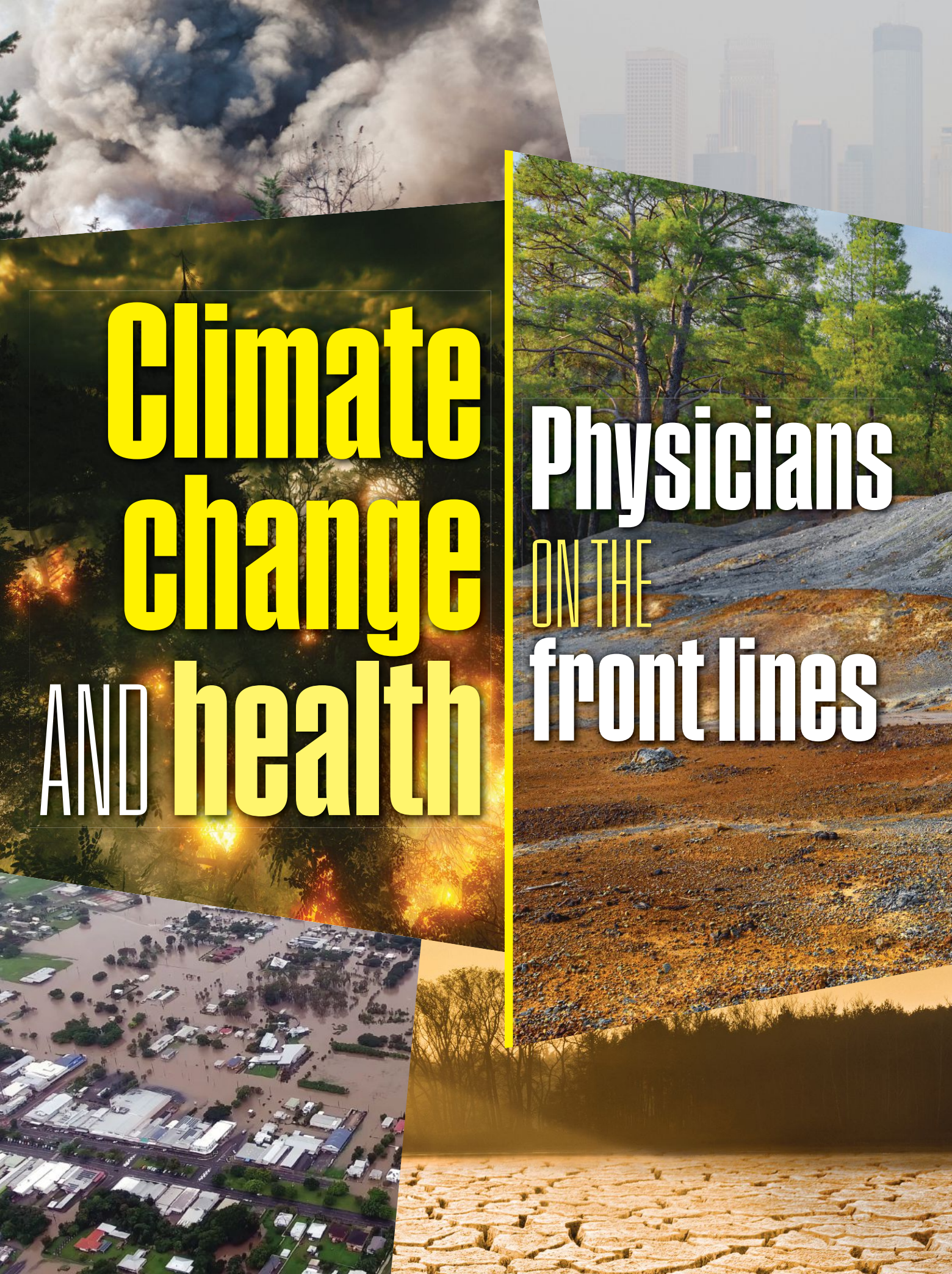
Now, you want to hear from them.

Asking "Do you have any questions?" is less effective than, "What questions/concerns do you have about the vaccine?" The preferred question assumes they have questions/concerns and invites sharing them with you.

While the facts are important, your connection with your patients and the story you tell that connects with their values is critical.

Celebrate when you are successful. Our brain loves to perseverate when we aren't successful and we *do* make a difference! **MM**

Dawn Ellison, MD, CPC, CRT is an emergency physician, professional coach, resilience trainer, facilitator and corporate consultant with Influencing Healthcare, LLC at dawnellisonmd.com.



Climate change AND health

Physicians ON THE front lines

CONCERN LEADS TO ACTIVISM

Physicians have an important role to play in dealing with climate change

BY LINDA PICONE

The evidence of climate change in Minnesota is everywhere. Wildfire, flooding, drought, changes in wildlife habitat ... Physicians, like everyone else, see the changes—and the impact those changes have on their patients' health.

While dealing with individual patient concerns, everything from Lyme disease to heatstroke to exacerbation of asthma, some physicians conclude that they need to do more, to try to educate and alert government and private leaders and to effect change.

In Minnesota, Health Professionals for a Healthy Climate, formed in 2015, brings together physicians, nurses and allied healthcare providers to add their voices to the public debate on clean energy and climate change. The thrust of the organization's work is "education and activation," says Brenna Doheny, PhD, MPH, executive director.

Several physicians, including the co-founders of the organization, share their thoughts on climate change and health—and the urgency of involvement.

"For health professionals, sometimes the passion exceeds the time."

Brenna Doheny, PhD, MPH

Board chair and executive director, Health Professionals for a Healthy Climate

I came to Minnesota in 2016, after I finished my doctorate. I decided to go back to school and get an MPH. One of the requirements for that was field experience, so I started working with HPHC to create some education materials. I've been the volunteer executive director for the past couple of years, working to build our capacity. It's a labor of love for all of us who are involved.

Major climate issues in Minnesota ...

In Minnesota, what's brought up a lot is the increased range of infectious disease, which is already very significant. It's very important for physicians to be aware that they may be seeing things they haven't seen before.

Erratic weather patterns are a significant health impact. At last estimate, we now have five more hot and humid days in the summer (in Minnesota) and five fewer cold days in the winter. With longer increased summer temperatures, there's a risk of anything related to extreme heat.

We're seeing erratic changes in terms of ice cover—and an increase in slip-and-fall accidents. It's just a real practical thing to be aware of.

Populations are going to be shifting with climate change, and some parts of the globe are going to be less habitable with climate change. That may mean we're seeing diseases and health conditions that we didn't used to see in this part of the world.

Climate change is severely impacting mental health. Sostalgia is nostalgia for things that are still here, but have changed so much. That's what's happening with climate. We're all experiencing climate grief, whether we're aware of it or not. Add to that the pandemic and political and social changes.

Frustrations and/or successes ...

We have to be thinking more big picture. We need to look at upstream causes. Physicians have been thinking more upstream, we just need to include environmental health in that as well. Can we engage in mitigation strategies? Can we also find adaptations? The healthcare sector has a huge role to play.

All too often, climate change is seen as an environmental issue and it's pitted against economic issues. It creates a stalemate and divisiveness. We think it's really important that health is always brought to bear.

What physicians can do ...

All of these issues with climate change are important for physicians to know. The awareness among patients may not be there yet, so physicians need to have that awareness. For patient-facing physicians, that allows them to help deal with issues as they arise, but also to help prevent them. We hope they can have better conversations with patients.

"In medicine, we're trying to save people, trying to save ourselves. We work for our legacies … and it's all going to be washed away like coastal real estate, unless we take action now."

Bruce Snyder, MD, FAAN

Clinical professor of Neurology, retired
Co-founder, Health Professionals for a Healthy Climate

Back in the '90s, I saw *An Inconvenient Truth*, the movie by Al Gore. It got my interest and my concern. I was busy, I was in practice, but I began to read more about climate change on my own. The more I read, the more concerned I got. I began volunteering with organizations like the Sierra Club, Citizens Climate Lobby (CCL) and the MN Environmental Partnership.

At a CCL regional meeting, I met other physicians and nurses who were worried about the health aspects of climate change. We felt that it would be important to spread the word among health professionals and get them involved.

In 2017, the Minnesota Pollution Control Agency held hearings on the issue of permits for Enbridge Pipeline 3. I testified about the health impacts of the pipeline and the highly toxic material it carried.

Major climate issues in Minnesota …

In recent years, political gridlock at the federal and state levels has seriously slowed action on climate and energy issues. For example, I feel the reluctance of the Walz administration to deny approvals for Line 3 goes back to the fraught situation in the Minnesota Legislature. Unfortunately, for now, many members of the Republican Party have largely chosen to block sound climate action.

Frustrations and/or successes …

A lot of research is going on and scientific and technological advances will help stabilize the climate crisis.

The COVID epidemic has amply demonstrated what rapid surges in care demands can mean. Climate-related disasters and fossil fuel-related pollution are causing more physical and mental illness, more injuries and more damage to our facilities. Care systems and providers are taking this to heart and working for climate solutions.

Six or seven years ago, climate change was rarely discussed outside of environmental circles. Now it's an issue in political campaigns at every level and a daily topic in the news.

However, time is short. Every year, every season, climate events are taking a larger financial and human toll. Our leaders, corporate and political, must take urgent action. If you're a corporate exec and you're only looking at your next fiscal year, then maintaining your business plan regardless of the environment makes sense. But if you take a longer perspective, then dealing now with climate change makes sense.

What physicians can do …

Those of us in healthcare have a solemn responsibility to protect the health of our patients and communities. We have considerable political and financial influence and a position of authority. Our institutional leaders could take important action such as reevaluating political allegiances in order to advance sound climate policies. We understand what's going on. The question is, will we take bold action now before it is too late?

"Physicians do have a respected voice in the community and they need to become more advocates with their community leaders and at the state level. They need to be speaking out."

Mike Menzel, MD

Anesthesiologist, retired
Co-founder, Health Professionals for a Healthy Climate

I think the first thing that alarmed me was when James Hanson reported in 1988 that the greenhouse effect had been detected and it was changing the climate now. That alarmed me, and I've been concerned ever since.

There are also a couple of personal events related to climate change: My grandson, who lives in St. Paul and has a history of asthma, really was affected by the western and northern wildfire smoke that settled in the Twin Cities in 2014. He had an exacerbation of his asthma that required hospitalization. Also, a good friend of mine died of a heatstroke while working outdoors in northern Minnesota on a very hot humid day.

Major climate issues in Minnesota …

Here in Minnesota, that means higher mean temperatures with resultant heat stress, drought, mega-rains, air pollution. Also, vector-borne diseases like Lyme and West Nile are being reported much more frequently and these vectors are moving farther north due to warmer temperatures. When I was a medical student in the '70s, vector-borne illness was an uncommon disease but now it's being reported in every Minnesota county.

I have my own personal climate grief, which I share with my wife, for three hobbies we enjoy: fly fishing, where we're seeing

some Western fisheries are being closed mid-summer because of drought and heat; cross-country skiing, where there's definitely a lack of reliable snow in Minnesota—January temperatures have risen 9 degrees in the last 40 years; and birdwatching, where the numbers of virtually all species of birds are declining rapidly due to habitat loss and climate change.

Frustrations and/or successes ...

The bulk of my energy around health and climate change is with Health Professionals for a Healthy Climate. Our vision is to protect and improve human health by addressing climate health. We also are also razor-focused on health equity by recognizing the disproportionate climate change effects on the BIPOC community.

We do advocacy work at the state Capitol by meeting with legislators when they're in session and testifying at committee hearings. We encourage them to support bills that are centered around clean energy and sustainability. We've had some successes in the Minnesota House, which has passed several important bills such as 100% renewable energy by 2030. Unfortunately, many of these bills didn't even get a hearing in the Senate last year, but we remain optimistic that significant climate legislation will pass this session.

What physicians can do ...

Talk to their patients about how they are being affected by climate change. I believe almost everyone has a climate story to share.

"We're trained to use evidence and facts and data, but that is not as compelling to legislators. Stories can change hearts and minds."

Rep. Kelly Morrison, MD

OB/GYN

Assistant majority leader, Minnesota House, representing Chanhassen, Deephaven, Mound and Excelsior

One of the reasons I ran for office in the first place is that I have been so concerned about the growing skepticism about science and expertise in our politics and in our culture in general. I didn't know how to address that other than trying to debunk things in one-on-one discussions with my patients.

I requested to be on the Health and Human Services committees and Environment and Natural Resources committees with those ideas in mind. I serve on the Climate Action Caucus in the House, which is a group of legislators very concerned about climate change. Minnesota is one of the fastest-warming states in the country, so we have to address it urgently.

I am the only physician in the House currently; I need to be a voice for public health. The big neglected part of the discussion of climate change is the public health impact.

Major climate issues in Minnesota ...

Here we sit on this wealth of clean water—Lake Superior has 11% of the world's fresh water—and we are living in a time of accelerated climate change and we are already seeing and will continue to see more water scarcity. I think we need a state water policy. We need to be protecting that water resource.

The idea of doing copper-sulfide mining in our state is a big threat to our water supply. We have never done that kind of mining in our state before. We already know that 10% of babies born on the North Shore have unhealthy levels of mercury in their blood when they're born. One of the effects of this kind of mining is leaching heavy metals into the water, so we will only make that situation worse.

Frustrations and/or successes ...

We have had extreme weather events over the last couple of years with fires and flooding and extreme heat. People are starting to feel it in their daily lives in a way that makes it more real and palpable and understandable.

Unfortunately, the whole subject has been politicized. I wish we could get away from that so we could just have fact-based conversations so we could come up with the best solutions, resilience and mitigation strategies to handle this future that is here and accelerating.

I do feel hopeful. There's a lot of evidence that even people who used to be very skeptical about the existence of climate change are accepting that it is happening and are starting to be more open to talking about solutions.

We're seeing medical students being more involved in public advocacy. We have these unbelievable young people training to become physicians at the University of Minnesota and they get it, they understand that they have to advocate outside of the four walls of the exam room or the operating room.

CODE BLUE FOR PATIENT EARTH: Pathways to Resilience

Health Professionals for a Healthy Climate and the University of Minnesota School of Nursing are hosting a conference on climate change and health, April 22-23. The evening of April 22 will include general overviews and an invitation for attendees to come together. On April 23, there will be focused sessions on climate justice, climate-smart healthcare and mental health in the climate crisis.

For more information and registration, https://hpforhc.org/codeblue/.

What physicians can do ...

In the era of COVID, I think there's been a strange shift away from the wellspring of trust that we have traditionally had as a profession, but I still think that physicians' voices are very well respected. It's important for physicians to reach out to their legislators and amplify their concerns about climate change and its impact on public health. Stories are very powerful. If they can share very tangible, specific stories, that is really impactful.

"Physicians are really uniquely placed in society in the sense that people have very personal conversations with us and in general they trust us."

Nyasha Spears, MD

Family medicine specialist, St. Luke's Hospital, Duluth

I was not really an environmental activist kind of person; my advocacy was always with social justice issues. Then, in 2016, after the election, there were a lot of things that felt like they were shifting and it was distressing to me. There was a call from our local Minnesota Academy of Family Physicians chapter asking for someone to draft a resolution about climate change. I was in a mode where I would say "yes" to anything.

So I started thinking about it and then I thought about it and thought about it. What are the ways physicians can talk about climate change with patients about day-to-day choices people can make? Turn off your lights? Go buy an electric car? Those are not really the things physicians should be talking about.

I happened to be in the car listening to a snippet on the radio from the United Nations Climate Summit about the most important things that individuals could do to affect climate change. One of the most important was to eat less meat. I had this lightbulb moment: I'm trying to get people to eat less meat all the time for their heart disease, their diabetes, their colon cancer risk, their breast cancer risk. Whatever it is, I'm trying to get people to eat a different kind of diet. I feel like we're in the business of habit change, that's our jam. At a fundamental level, this is what we do, trying to affect people's habits, either getting rid of negative habits or starting positive habits.

Major climate issues in Minnesota ...

We do have knowledge about how air pollution, for example, negatively affects our health. We see increased levels of tick-borne disease, asthma. We had fires up here in Duluth ... amazing how many people had respiratory symptoms.

Frustrations and/or successes ...

I'm frustrated with the lack of large policy change. We are not going to win this war without massive policy change. That is going to take coordination at the federal level, the state level and individuals making changes in their own lives.

When people are engaged in individual changes, they are more likely to care. If people are making their own sacrifices, they're more likely to hold their legislators' feet to the fire.

What physicians can do ...

There is no discipline in medicine where habit change isn't part of what we do, especially family physicians. What are the ways physicians can talk about climate change with patients on day-to-day choices that people make? The four most important things individuals can do are:

- Avoid airplane travel, especially transcontinental travel.
- Have one less child.
- Live car-free.
- Eat less meat.

When I look at those four things, three are clearly in the purview of my day-to-day conversations with patients.

- Airplane travel doesn't feel like it's so much my business.
- Preventing unplanned pregnancy is a really important thing.
- I don't necessarily tell people they should live without a car, but I talk about active transport—taking a bicycle, walking to the bus stop. This comes up all the time, encouraging people to use their bodies to move rather than cars.
- Diet comes up almost every single hour of every single day. The way I talk about that is to pepper it into conversations, just connect the dots about choices we make that help us personally—but also help the environment. If you eat less meat, the risk of breast cancer or colon cancer goes down. Boom, move on.

I find that people are more likely to make a change if there is benefit to them *and* benefit to others. We're all used to making bad choices for ourselves. We're more likely to be motivated to make good choices if it affects somebody else. If it's good to quit smoking because it's good for you—*and* it's also going to help your grandkids be less likely to smoke.

It's the same thing with diet. I often use Meatless Mondays because it's a great entry point. I have definitely seen more people make that change. If people make a change on Monday and say, "That was pretty good," they might repeat it later in the week. It's good for me—and I'm doing this right thing for the environment.

In a broader way, physicians should be standing up at city council meetings, environmental review boards, getting involved in public conversations. It just makes sense. **MM**

Linda Picone is editor, *MInnesota Medicine.*

CHANGING CLIMATE, CHANGING HEALTH

MDH is deeply engaged IN studying how climate change affects health—AND HOW we can prepare and respond

BY SUZY FRISCH

From recent droughts and wildfires to more pollen and longer growing seasons, it has become apparent that Minnesota's climate is getting warmer. But how does this affect our health?

Committed staff at the Minnesota Department of Health (MDH) monitors, analyzes and identifies current and future health impacts from climate change. Its small Minnesota Climate and Health Program and a group of epidemiologists, environmental health specialists, data analysts and other experts lead the charge.

"It's super important because climate change impacts all aspects of our health—our water quality, air quality, food systems and our physical and mental health," says Kristin Raab, MLA, MPH, director of the Minnesota Climate and Health Program. "When we started this work in 2009, people wondered what climate change had to do with health."

Turns out that it's plenty. Working with partners inside and outside MDH, the department's team focuses on research, education, tool and product development, policy analysis and technical assistance. Here, six MDH employees share their work in the climate change and health universe.

Climate and health/heat events

Kristin Raab, MLA, MPH

Director, Minnesota Climate and Health Program

Raab earned a master's degree in epidemiology and first worked in infectious disease and community health at MDH. Intending to shift gears, she returned to school for a master's degree in landscape architecture. She came back to MDH to work on climate change and health and has now been at MDH for 18 years.

The challenges

We've had several years where parts of the state are under a flood emergency declaration as well as a drought declaration at the same time. We're seeing these drastic changes, these extreme, heavily localized precipitation events. Our growing season is increasing and winters are not as cold as they used to be. This has implications for the kinds of pests and other insects that can live in Minnesota. If we have extreme precipitation, we have homes that get flooded and there can be mold growth. That can exacerbate issues with asthma and allergies.

Another big thing besides air pollution from wildfires is the increase in overnight heat and overnight lows. We will have warmer evenings and if we have heat events, it doesn't cool off as much at night. In addition to heat-related illnesses, there are mental health impacts. People are acknowledging that the climate is changing, and it can be anxiety-producing and depressing.

Tribes in Minnesota have been monitoring these changes for a long time and they see changes in the species they rely on. It has impacts on their traditions, especially those related to medicine and food—and it gets harder to find these species.

The work

Our work initiated from a grant from the Association of State and Territorial Health Officials to look at climate and health. One of

the main tasks was to develop a strategic plan. The first thing we did was gather people from different divisions in the Health Department to talk about climate change and the impacts on population health and individual health. Then we had a CDC grant from 2010 to 2021. We did planning and assessments looking at where our vulnerabilities are, identifying the climate impacts in Minnesota and the populations that are more sensitive to them.

The focus of our program that continues is working with climatologists and people in public health on how changes in climate and weather impact our health. We have good data from the State of Minnesota to better understand our increase in extreme precipitation and increases in heat at night. Now we're seeing real issues with air quality, especially with the wildfires, and changes in our ecosystems because the growing season is lasting longer. We're seeing a longer pollen season in Minnesota and having more flooding and, on average, more precipitation than in the past. The precipitation is coming in heavy downpours so that some parts of the state get way too much water and other parts are in drought.

The objectives

We're really trying to embed a climate change lens throughout all of the activities that MDH does. We have had a bottom-up peer group for several years and we've provided a lot of education and tools so that group members can think about how climate change impacts the area they work in and how they can make a difference. There are a lot of different ways that health departments touch people's lives. The way forward is to embed our work in everything so that everyone is a climate change champion, not just us.

Beyond educating people and doing research, we do a lot of work on tools people can use for planning for extreme events. For example, we have a heat-related toolkit. It's really anything that a city or county or local public health department can use to plan for extreme heat events. There are tip sheets on how to stay cool, information on who might be more vulnerable, information on things we can do to prevent extreme heat events. We developed draft communications that can go to the media, sample press releases and information on how to do GIS mapping in your community.

We developed the Heat Vulnerability in Minnesota tool. We developed the online tool with the University of Minnesota to look at the variables that might make you more sensitive to climate change as well as the areas with excessive heat warnings and advisories. It has climate projection data, too, about what we might expect in the future.

In the field

We have some ongoing research where we survey healthcare providers. We're asking physicians and nurses what they are seeing with their patients in relation to climate change. Are you seeing more people come in with asthma, or heat-related illness, or vector-borne diseases? We're working on publishing it in a peer-reviewed journal.

They are seeing changes, in some areas more than others. What was striking was that most of them think it's really important for nurses and physicians to be engaged in this work. A few of them are, but there are barriers. That's one great thing about this is research: we are understanding what's happening on the ground and we can develop interventions to help overcome those barriers.

Air quality

Jim Kelly, MS

Manager, Environmental Surveillance and Assessment Section, including the Air Quality and Health Initiative

Kelly has an undergraduate degree in environmental public health and a master's degree in environmental health. He has spent his career in environmental health, initially for the Minnesota Pollution Control Agency (MPCA). Kelly has worked for MDH since 1999, with a focus on environmental and public health.

The challenges

Last summer was a shock to me with the wildfire smoke—I have never seen anything like this before. That's the biggest effect of climate change on air quality that we've dealt with. There were days when I was contacted by my counterparts from MPCA forecasting that air quality would be record poor in large parts of the state. At first, we weren't sure how to react. We put together messages that if it reaches a certain point, people with asthma should stay indoors. If it gets worse, everyone should avoid activity outdoors. It's concerning because we know from literature that these events could contribute to premature deaths if people are not taking proper precautions.

Another one that comes to mind is having longer growing seasons. Spring starts sooner and fall lasts longer. We've seen an increase in pollen counts in certain areas and that can exacerbate respiratory diseases. We haven't seen to a great degree heat

increasing in the summer. In Minnesota, the signal of climate change is the winters warming faster than the summers.

The work

It's raising awareness of the public health impacts from a changing climate and poor air quality. We want to help people understand and better prepare for it. It's letting communities know where their vulnerabilities might lie and how to take action to address them. We have done some reports on where vulnerable populations exist in Minnesota and where different potential climate change–related risks might be more prevalent.

If communities have a big proportion of seniors or people who can't afford air conditioning, they might need to be prepared with cooling centers if they get a lot of hot days over an extended time period. They will need to contemplate poor-air-quality events, especially on hot days. If people want to open their windows, that might not be the right thing. They will want cooling centers where the air can be filtered and people aren't exposed to poor air quality.

The objectives

We're continuing to expand our efforts to educate the public and identify vulnerable areas geographically and within the population. Ideally, this gives local governments information to help them plan and prepare for a changing climate. They can identify their vulnerabilities on a community-by-community basis so they can determine whether they are at the most risk of flooding, heat, poor air quality—and take actions that matter in their communities.

Our role is to help people understand how their actions can both contribute to climate change and help people prepare and adapt to what could be coming in the future. Having some funding available to help communities do planning or fund a position or hire a consultant would be really helpful. Minneapolis and St. Paul have all sorts of staff dedicated to these things and have done a great job with preparations and response plans. But if you live in a poor community or a rural community, that's a different story. We're helping those communities understand the issues and take action. People are more receptive to preparing but they need resources to take action.

Drinking water protection

Steve Robertson, MS

Supervisor, Source Water Protection and Drinking Water Protection Programs

Tannie Eshenaur, MPH

Water policy manager

A hydrologist, Robertson started his career in environmental consulting and has worked in water protection at MDH for 20 years. Eshenaur first used her degree in international relations and a master's in public health in rural villages in East Africa, where she spent 13 years working on water supply and sanitation. She has worked at MDH for 20 years in clean water protection.

The challenges

ESHENAUR: From climate change, there will be challenges in water quality and quantity and in the infrastructure that we build for wells and treatment systems, and for private well owners. We will need to provide technical support. On the financial side, do we have the dollars to help public water systems cope with these challenges so that they can address the risks and be resilient?

ROBERTSON: Drought—we experienced that last summer. Every time we experience a drought, the severity varies across the state, and we learn where drought conditions put stresses on our capability of producing water for drinking. We need to be able to anticipate these conditions and build redundancy and capability to draw water from multiple sources and have excess capacity to weather the droughts when they occur.

ESHENAUR: Drought leads to increases in irrigation, and that can change the water quality that is available for wells. Drought also can increase pollution concentration. There are things we can do in land-use planning to proactively look at drought.

Another area where we have more harms from climate change is with harmful algal blooms as water temperatures increase. We think of Minnesota as a groundwater state for our water supply, but we have 23 community water systems that take their water from rivers like the Mississippi and lakes like Superior. We need to know what factors contribute to harmful algal blooms so that we can head off toxins that carry a threat to drinking water.

The work

ROBERTSON: We aim to identify and assess sources of drinking water like aquifers, rivers and lakes and implement safeguards to make sure that they remain sustainable for current and future users. As our climate begins to change, those resources will be impacted.

Multiple factors come into how we try to protect those water resources. We need to think about where and how much water is being used, the land uses that affect those water resources, weather and climate conditions, existing water quality and the

overall capacity of the infrastructure. They need to be understood and managed in a way that is protective of public health.

ESHENAUR: Water is complex and multiple agencies manage water resources. We each have an area of specialization and a role when it comes to climate change adaptation and mitigation. The governor has established a special subcabinet to proactively address climate change, and we participate in that. Our contribution is determining what we need to do to protect drinking water and strategies to do that.

We also partner with the Minnesota section of the American Water Works Association and the Minnesota Rural Water Association. We work with them to help the smaller systems in greater Minnesota develop asset-management plans. For example, what are the ages of the water mains and when might they need to be repaired?

We're evaluating the infrastructure from a climate change perspective. Sometimes it's as simple as seeing if they have a back-up supply of power in case of a power outage during an extreme climate event. Do they have a back-up well if their well is vulnerable to flooding? Climate change is an all-hands-on-deck scenario where every level of government and nongovernmental partners have been working together to address the changes we anticipate.

The objectives

ESHENAUR: Our biggest one is that drinking water is safe for everyone, everywhere. Our goals are to be able to anticipate threats from climate change and address them before they rise to a level of threatening our drinking water systems, public and private. We're going to have to be flexible and we need to keep up with the national and international science on climate change, and then we're going to need to interpret that and apply it to our Minnesota context.

ROBERTSON: We will have a sea change in how we do our work. Historically, scientists and engineers look to characterize the natural environment based on the historic record for rainfall, flooding events, drought. We know with climate change, looking at the historical record won't be enough.

We need to figure out new ways that are prospective so that we can build in adaptability to drinking water resources. We need to develop new data sources looking at forecasting, and we need to develop new tools like computer modeling capabilities that allow us to forecast future conditions in a more accurate and appropriate manner. We're taking steps to build out our capacity to do computer modeling work in our program.

Environmental public health tracking

Jessie Shmool, MPH, PhD

Unit supervisor, Environmental Epidemiology, including biomonitoring and environmental public health tracking

Jessie Shmool began her career in environmental health and climate change advocacy. She returned to school for a master's degree in public health and a doctorate in environmental health,

aiming to focus on the health impacts of climate change. Shmool joined MDH in 2016.

The work

We work with partners across MDH and external partners. MDH is a data-rich agency, and we've got enforcement data and hospital data and claims data. Our job is to really use an environmental health and surveillance lens to make those data usable and then accessible for partners.

It doesn't help local public health or other community members to know that there are 14 violations in some given county. They need to know how that compares over the years and to other counties. We provide the data that allow us to look at trends over space and time. We have a public data portal that has more than 26 topic areas. We bring our expertise in data and analysis and data visualization. We work with the folks in Climate and Health and ask what they need to know. Then we work to develop the data and make them accessible.

For climate-related data, we have many years of emergency department visits for heat stress, and we've recently added emergency visits for cold-related illnesses. We're trying to understand how changes in the climate might affect cold-related illness. We also track pollen. We have one pollen monitor in Minneapolis, and we would love statewide data and to show over time the changes we're seeing in things like the length of the pollen season or the number of high-pollen days.

We monitor air quality, of course, ozone and particulate matter, and the heat index across months and years as well. There are some things we track like asthma, Lyme disease and West Nile that have a climate relationship. We begin to see very quickly when looking at these data that there is a climate-related component.

We do special projects. A few years ago, we partnered with Wisconsin to try to understand heat stress and vulnerability factors. It's still rare, even though it's an important one we think about for climate change. Through that work, we were able to see that the young adult group, ages 15-34, are a higher-risk group. We have been developing some risk messaging for clinicians and for public awareness around the idea that young people aren't invincible when they are outdoors or doing sports in the heat.

The tracking

The asthma program wants us to put out information about pollen so that people can include that in their asthma action plans. We develop the metrics to track the length of the pollen season over the years, and then we'll look at hospitalization data or we work with standard definitions like case codes. Our work with data is around transforming them to make something that is trackable, where we can see patterns.

We also are tracking disparities. When we use all of these data on an annual basis, we look each year and do stratifications by race and ethnicity, by age and gender, by region, and we are looking to see if there are differences and if they are getting bigger or staying the same. In Minnesota, you really do have to look. Having it as part of the routine analysis is a best practice.

We would like to develop data around drinking water and vulnerability to flood. We'd also like to be working to better understand cold-related illness and injury. With COVID, we really had to ramp up our near-real-time data and dramatically expand our ability to bring in data and do syndromic surveillance. We're looking to be able to say if something looks different in a more timely way and put out prevention messages.

The objectives

We're always working with multiple partners to put the data out there and in a way that's actionable. We want to show Minnesotans what their government is doing, what resources are there for them and that there is routine surveillance. We want to make sure partners have what they need.

We want the data to be used in decision-making. That may take different forms. Sometimes we will work with local public health, and they are doing health impact assessments or community needs assessments. We will provide data for their county or specific zip codes that will be updated every year. We have the data on our public portal. Groups use the data to apply for grants and to advocate for policy changes.

Tick and mosquito-borne diseases

Elizabeth Schiffman, MA, MPH

Epidemiologist supervisor, Vectorborne Diseases Unit

Schiffman began working in the Minnesota Department of Health as a student while earning her master's in public health. She started out in the Vectorborne Diseases Section in 2011 and got so engaged in the work that she stuck around. She also has a master's in international studies and has worked in community health.

The challenges

Climate change is definitely an issue that's relevant to us in the Vectorborne Unit. The challenge is that the relationship isn't quite straightforward. We have data now and know how it all fits together. We have seen impacts over the years. From monitoring,

we have seen an expansion and change in where we see ticks and tick-borne disease.

In the early 1990s and earlier, the prime risk area was the Brainerd Lakes area and north-central Minnesota. Now we've seen it expand, over to the northwest corner of the state and into southeastern Minnesota. We do think climate change plays a role in that. Ticks and mosquitos are susceptible to weather and temperature conditions, and they are also adaptable. Warmer weather means more ticks and mosquitos.

Mosquitos are a concern because our winters are not quite as cold and harsh for quite as long. We see traditionally southern species able to make their way north. The danger is that they introduce things like Zika. We're monitoring where we might find mosquitos here that might transmit Zika. There also are seasonal transmissions, like those from container-bred mosquitos that are brought here in recycled tires. They are not hardy enough to handle our winters compared to our local species. If conditions get warmer, we might see these introductions become an established population. If there's a new species, it can transmit new diseases, compound an already endemic disease or out-compete an existing disease and create a perfect storm.

We have seven tick-borne diseases that we monitor, including Lyme, anaplasmosis and babesiosis, all transmitted by the black-legged tick. It can cause acute illness and be very harmful to people if they are older and have suppressed immune systems. We might have more hospitalizations and severe outcomes with the disease [because of climate change]. Powassan virus is transmitted by ticks. It's much more rare, but it's potentially much more severe.

On the mosquito side, we have West Nile virus, which was introduced in 2003. Sometimes we don't see hardly any and some years are epidemic years, but still with fewer cases than we see with tick-borne diseases. There's also La Crosse encephalitis and the Jamestown Canyon virus, with more found in the northern half of the state. The cases we hear about are on the more severe end of the spectrum.

The work

Our primary focus is disease surveillance and keeping an eye on what is happening in Minnesota and where it is happening. We

work on big-data collection, analysis and reporting. We're following up on disease reports and generating data from that. We have a field component where we try to get out every summer and collect ticks and monitor conditions. Then we have special studies to look at new cases of the less common diseases, and we do site investigations to collect ticks and mosquitos.

Another big part of the program is our research on Lyme disease. These studies often are collaborative projects with the CDC and other states where we use the same methodology or ask the same survey questions. I also work on special projects with our CDC partners. We extensively surveyed Minnesota to see where the ticks are located. We did a survey on whether people would take a Lyme disease vaccine if it was available and research around costs associated with Lyme disease.

The objectives

Most people in public health would say you're always trying to work your way out of a job. In vector-borne disease, we want people to know their risks and learn how to enjoy the outdoors safely. We're getting the message out there about prevention. People might have a fatalist attitude about mosquitos and ticks—they are always there and if it happens, it happens. We do have some prevention measures that work. And we're trying to find broader solutions like a new pesticide or a repellant that's super effective.

From our surveillance in the last 20 to 30 years, we have a good idea of the state of tick-borne disease in Minnesota. If you do surveillance a long time, eventually it stops telling you new things and you have to figure out what to do in the next phase. What can we do to reduce the numbers and get people to listen to the health messages? They all have a behavior-change focus. Humans are so stubborn, and that's true with ticks and mosquitos. We have an emphasis on evaluating the messages, measuring the outcomes, and getting the materials out to the public. **MM**

Suzy Frisch is a Twin Cities freelance writer.

What CAN I do about climate change?

AN ANSWER—AND A DARING CHALLENGE—FOR PHYSICIANS

BY D. BRENDAN JOHNSON; JACK INGLIS, MD; MICHAEL WESTERHAUS, MD; AND FEDERICO ROSSI, MD

David Wallace-Wells opens his 2019 book *The Uninhabitable Earth* with harsh words: "It is worse, much worse, than you think."

When people hear about the climate emergency, they often feel paralyzed, wanting to shut down and turn away. In this essay, we offer an antidote to this demoralization and demobilization by providing constructive, hopeful actions that health workers can take—and that do not involve committee meetings. The things we propose are not normally part of what most physicians are trained in, but are in perfect alignment with our professional—and human—ideals. But in order to take action, we need first to reckon with the dire state of our climate.

Globally, the past five years have been the hottest on record. International agreements have attempted to keep us at or below 1.5°C above pre-industrial levels, but we're already at 1.2°C. If our cumulative "carbon budget" were a pie, we've already eaten five of the six pieces (the United States ate one by itself) and now are squabbling over the rest.

A famous environmental organization names itself 350.org, referring to the safe upper limit of carbon dioxide in parts per million (ppm); we're currently at 415ppm with no signs of slowing. Furthermore, carbon dioxide in the atmosphere has a built-in lag effect, so the atmospheric heating we're already experiencing is from carbon burned years and even decades back. Two of the authors of this paper haven't yet turned 30 years old and over 40% of total carbon ever burned by humankind has been since their birth. The weather we've had up to this point is the most normal you'll see for the rest of your life. On our current trajectory, we are ripe to exceed the 1.5ºC limit, but the effects are exponentially worse the greater the deviation from the homeostatic norm.

If these numbers still feel abstract, consider the fact that unchecked climate change will cause widespread devastation of entire agricultural regions, leading to warfare and hundreds of millions of climate refugees who will join those fleeing large coastal cities being flooded. Populous regions will become too hot to be inhabitable. There is always the risk of positive feedback loops: melting arctic oceans increasing their absorption of solar energy; permafrost-locked methane (a much stronger greenhouse gas than CO^2) released with tundra thawing and leading to a "methane bomb"; or increased temperatures leading to enormous fires releasing ever more CO^2. If these positive feedback loops take effect, the result could be far worse than the predictions. Of course, the richer you are (either as an American or as a wealthy person elsewhere in the world), the more carbon you have emitted. It is no wonder that the World Health Organization has deemed this the "single biggest health threat facing humanity." In September 2021, more than 200 medical journal editors (including the *NEJM*, *BMJ*, *The Lancet* and *Plos Medicine*) published a group editorial in the *NEJM* that ran concurrently in each of their journals, "Call for Emergency Action to Limit Global Temperature Increases, Restore Biodiversity, and Protect Health." We already know that climate changes will worsen pulmonary disease; increase cardiovascular disease, as well as certain forms of cancer; and bring direct effects like excess deaths from heatwaves. The problem is larger and far more unstable than any of these relatively forecastable risks indicate. The next century, if action remains on par with what is happening now, will be one of mass famine, violence, war and disease—you will experience it, and it will define your children's lives.

Minor modifications like encouraging hybrids, changing light bulbs, going vegetarian, climate education or even "green hospital" initiatives, while important, are not enough. Mainstream political approaches, like electing Democrats and hoping for climate-friendly policy, or international agreements like COP26 or the Paris Climate Accords, also have not met the challenge. Part of this is due to the profound polarization and gridlock of American politics (and its effects on our international relations), but part of it also is due to the distorting effects of money in politics after Citizens United and the the so-called "regulatory capture" by which industry actors have defanged the very agencies created to oversee them. Finally, international accords, by the very fact of their deliberative and consensus-based process, are slow and conservative. Again, time is what we do not have. Linear solutions like these will not meet the exponential nature of the challenge.

Despite the incredible importance of action on climate change, we quickly run into a problem: our collective response so far indicates that we physicians don't really know how to adequately respond. Or, rather, the wisdom on change-making that does actually exist—in Indigenous, minority and activist communities, especially—exists outside of the imagination of many in medicine. Although we have more and more knowledge about the existential and exponential nature of this threat (and more and more understanding of our own responsibility), our responses so far to are not up to the task. Fundamentally, this is a question of imagination. If we can no longer start with slight modifications to the status quo, we need to start with the high bar of adequate action and work backwards from there; anything less is unacceptable.

As practicing physicians and young physicians-in-training, we want to start to imagine a new way our profession can respond, especially in solidarity and alignment with the leadership of the most affected groups. New approaches are required. If individual-level changes will not meaningfully change the "structuring structures" in which we all live and make decisions, perhaps we need non-linear mass movement approaches that can exert collective pressure all at once. The question for our moment is how to build—and how to use—collective power. We seek to draw on visionary wisdom and imagine ways of engaging people in our communities in order to exert the kind of pressure that can cause change.

Collective power in medicine already functions at multiple levels. At a minimum, it means organized medicine groups like the American Medical Association (AMA), its state-level affiliates like the Minnesota Medical Association and professional societies becoming engaged in this struggle and encouraging their individual members who are. If this necessary work also is

too slow, should physicians be leading protests in the streets? We certainly are not against this. Physicians are one of the most respected groups in America and protests can build group cohesion and power in the right direction. In Minnesota, for example, the White Coats for Black Lives group at the University of Minnesota Twin Cities campus engaged in protests at the Capitol in the summer of 2020 wearing white coats or scrubs and holding homemade signs. The example of the 2020 unrest after the murder of George Floyd is perhaps instructive; while protests against racism in policing happened across the United States (and even the world), these protests did not achieve any national police reform. Protests are a necessary part of social movements, but they alone are not sufficient. At their best, they build power and energy but, if disconnected from a strategic movement to capitalize on the moment and press the issue with concrete demands, they can be a way to vent energy and allow people to feel like they have "done something," which may weaken momentum.

In light of these challenges, and in addition to everything we've already considered, we propose nonviolent direct action (NVDA) by physicians. As a form of civil disobedience or resistance, the DNA of this is scrupulously ethical nonviolence in combination with forceful action, often outside of the law or status quo and in service of a higher morality. In the American context, Rosa Parks' NVDA on the bus in Montgomery, a well-planned and tactical action in explicit connection to a larger movement, served to force the issue of segregation in the South. (There were many others who were arrested before she was, using the same tactic, but when her action took off, a huge political motion was there to capitalize on it and start the Montgomery Bus Boycott.) NVDA is often conspicuously visible and baits the response of authorities in order to highlight the unchallenged and immoral status

quo; it combines activities of resistance with a desire to practice living into the world we want to see. Rosa Parks did not wait for desegregation, she built power with others and desegregated the Montgomery bus system directly.

Even in medicine, there is a tradition of NVDA, including the famous AIDS Coalition to Unleash Power (ACT UP) group out of 1980s and '90s New York City, which brought urgent attention to AIDS deaths and the foot-dragging of the powers that be. In one of their actions, "Seize Control of the FDA," the group publicly laid siege to the Food and Drug Administration to speed access to life-saving drugs that had been bureaucratically stalled. During its day, ACT UP was enormously effective in increasing research dollars for HIV/AIDS, increasing access and shifting definitions and priorities in the face of enormous stigma and a life-threatening disease. In South Africa, the Treatment Action Campaign (TAC) forced a reluctant government to provide antiretroviral drugs to all who needed it.

A contemporary movement out of the United Kingdom, Extinction Rebellion (XR), has been a proponent of NVDA, specifically casting themselves as rebelling against the ongoing environmental extinction event. They have engaged in highly public actions like pouring fake blood and gluing themselves en masse to the front doors of fossil fuel companies and the financial institutions which support them, or by blocking bridges in downtown London to hold a simultaneous lament, protest and dance party (and hand out apology cookies to the people they were inconveniencing). XR activists have been tried for their actions in British courts, but by and large, juries have found them not guilty, in some cases explicitly because juries believed the climate crisis requires radical action.

German environmentalists have taken it upon themselves to gather in large groups and simply walk into coal mines and disable the equipment, their sheer numbers overwhelming the police. A Doctors for XR group in the United Kingdom has engaged in civil resistance; its message has been supported by the editor-in-chief of *The Lancet* and the director general of the World Health Organization (WHO). Some of the group's actions have included putting 20,000 health warning stickers (modeled after cigarette label warnings) on gas pumps around the country, getting many national medical associations to publicly divest from fossil fuels and the creation of a "climate corpses" demonstration at Parliament Square.

What could this look like in Minnesota? We could certainly recreate the warning-label idea, with state-level medical associations mailing stickers to their members with a "doctors against fossil fuels" message. This could whet appetites for larger actions and send a message to people all across the state. Perhaps there could be targeted demonstrations against local financial institutions like US Bank (headquartered in Minneapolis) or the local Wells Fargo headquarters downtown for their financial support of the fossil fuel industry, including fake blood and white coats (with planned press coverage), with some contingent deciding not to leave unless arrested or their requests met. New groups are probably required to coordinate these actions outside of the traditional structures of organized medicine, and our actions will need to be in solidarity and alignment with the leadership of the most affected groups already engaged in the struggle.

Another approach could target the recently-completed Enbridge's Line 3 pipeline in northern Minnesota, built against the

wishes and treaty rights of local Indigenous groups, and which transports the equivalent carbon to 50 coal fired plants (more carbon emissions than the entire state of Minnesota produces). Others, including Indigenous groups and the Catholic Worker movement, have already engaged in direct action against pipelines as a way to "stall or stop or make intolerably costly the objectionable endeavor," including temporarily disabling equipment. Standing in alignment with minority and especially Indigenous leadership is essential, especially in light of environmental racism and the fact that small numbers of sovereign Indigenous groups live in (and protect) the areas of most profound biodiversity.

How can physicians be involved in similar ways here? For Line 3, for example, should earlier efforts be unsuccessful, we could organize a public sit-in at the Army Corps of Engineers. If this were to fail, we need a next-step escalation strategy. Should that be necessary, we could imagine an action where a few dozen health professionals in their scrubs and white coats, surrounded by other supporters, crank shut a Line 3 terminal to block oil flow. This is certainly illegal, but would be done out of the ideals of justice, love, peace and health for all. Media would be invited to ensure widespread coverage and a few members would prepare to spend the evening in a local jail, with others serving in supporting roles. Legal support would be required to shepherd cases through the judicial system, should they be prosecuted.

What about the use of our specific medical roles? We could procure IV equipment and do a coordinated action in front of US Bank and Wells Fargo, where volunteers would have fake "blood" drawn and then throw 100-200 mL of it on the front of the buildings, while others hold signs and have an open microphone for people to speak their minds. (A clean-up event would be held a few days later). This is reminiscent of ACT UP's dramatic action of spreading the cremation ashes of people who had died of AIDS on the White House lawn. Further raising the stakes, we could run trainings in how to medically support hunger strikes and serve in support capacities for people choosing to do this tactic in other environmental organizations. Some of these events could be coordinated in advance and wait for big climate catastrophe events like the wildfires in July 2021 to launch, to maximize public support; they would also need to be planned in a escalating staged strategy with specific demands.

It is crucial to be in collaboration with other environmental groups to collectively build power, to have clear tactical targets and demands (like divestment, stopping infrastructure or net-zero carbon promises), to plan publicity and to take actions that are bold and symbolic. If we are in an emergency, have privilege and the public trusts us, it is our time to step up. These kind of actions only take an afternoon or a weekend, are relatively low risk, build collective power and are an antidote to the despair of these times. If you are a retired physician with relative health, have some savings or own your own home, there is almost no risk to you and we young people plead especially for you to get involved in a radical and self-sacrificial way. If you have money, please give it generously. If you are in a position of power, take a stand and make the necessary changes for environmental justice.

As an example, we know a health worker on the East Coast who, with a local XR group, glued herself to a chained-down boat that had been brought downtown to a public location that will be under sea level by 2050. She is a gentle grandmother and gardener who says she was driven to take such dramatic action out of love for her grandson and grief for what he will experience during his lifetime. Others, more locally, have chained themselves in groups to the bulldozers and heavy machinery that was used to construct Line 3. People in Minnesota, and people in healthcare, are already getting engaged in NVDA.

This kind of activism works. Bill McKibben, a prominent environmental thinker, has promoted targeting financial institutions as key linchpins in the political economy of fossil fuels (i.e. without insurance and loans, the fossil fuel companies cannot do business). Based on this approach, a string of universities, under a decade of activism by students, have agreed to divest billions of dollars from fossil fuels.

Honor the Earth, a local organization, has targeted several financial institutions in its campaigns: US Bank, which announced it would pull $1.3 billion from Enbridge credit facilities; AXA Insurance, which announced it was divesting $3.5 billion from the tar sands industry that produces the oil in the pipelines; and BNP Paribas, which pulled $1.24 billion in Enbridge funding as part of its announcement to end funding tar sands, arctic drilling and fracking. Even if fossil fuel infrastructure gets built, these kind of actions increase the cost of doing business—and so incentivize green momentum. This divestment must come with a corresponding investment in jobs and infrastructure for clean energy so as to support the people currently working in the fossil fuel industry. Even sociologists of political movements, such as Erica Chenoweth, say that nonviolent collective resistance is the most successful way of causing major political paradigm shifts across the world. Fundamentally, the question is our theory of change. Is education and polite lobbying enough?

Barriers to non-violent direct action

What are the barriers to non-violent direct action? A big one is fear, including the fear of losing one's license to practice or not matching into residency. Anecdotally, based on the few Minnesota physicians and trainees we have been able to find who have been arrested for this work, this seems not to be the case, but much work remains to be done to have transparency from the medical establishment on such questions. For example, the primary criteria for licensing—a physician's competency to practice medicine—would not seem threatened by a history of activism or arrests, but licensing boards and the AAMC should make this more clear if this is fact what they believe. It certainly makes sense

not to want to jeopardize our many years of education (and hundreds of thousands of dollars of tuition). While direct action is not without some risks, they are probably smaller than we imagine, and conscientious physicians in positions of influence can contribute by removing as many barriers as they can.

Two more barriers we foresee: First, the simple individualism encouraged in our profession. Nurses, for example, seem to have much more professional solidarity and a long history of labor organizing to draw back on for political action, whereas physicians have mostly avoided this. There is a long tradition of physicians, however, who have engaged in collective activist work, including contemporary Americans like Fitzhugh Mullan. We will need to learn how to exert collective power for the common good—it is truly impossible to do this work alone. Finally, the last barrier we see is the dispositional conservatism of American medicine. Collectively, and even with all the problems of American medicine considered, we have it pretty good: high public respect, high salaries and meaningful work. That makes American physicians less likely to want to challenge the status quo. When physicians have worked together organizationally, it has often been to protect the interests of the profession, rather than patient health (including the AMA on multiple occasions blocking expansion of health coverage).

As with many hierarchical professions, such as the law or military, medicine tends towards conformity, not rocking the boat and chasing the gold stars it takes to advance to the next level. Part of this is surely good, for we have the privilege of being a self-regulating profession with a moral code that is not reducible to law or policy, and this takes a certain cohesion. However, when this privilege is used to avoid complicity with professional or social malfeasance, it is necessary and even "professional" to become a dissenter to the status quo. This is actually what most young doctors believe their professional ideals call them to, even though they think medical professionalism can trend towards conformity. As an example: Doctors for XR quote the British Good Medical Practice Guidelines, which state that "You must take prompt action if you think that patient safety, dignity or comfort may be compromised … You must make sure that your conduct justifies your patients' trust in you and the public's trust in the profession." All of us—especially the younger readers of this piece—will have a future defined by climate collapse; it behooves us to act with the moral clarity that the situation demands.

This last barrier, our own impulses towards conformity and not rocking the boat, can only be overcome by collective courage, in which courage is passed contagiously from one person to the next. It also means, however, that we each must do the work to prepare to engage in direct action. For some of us, this may mean engaging in actions this summer. For others, this article may be a seed planted for actions five years from now. Others will be inspired to plan these actions, although our expectation for most readers would be participation and support. What we are tentatively grasping towards here is intimidating and scary; none of the four writers, all of whom were raised in contexts of racial, gender and professional privilege and who have been the beneficiaries of the status quo, were formed in families or cultures that encouraged such action. Even as recently as a few years ago we could not have imagined writing what we have proposed here. The organizations needed to enact this locally also do not yet exist. We are attempting to build courage for what lies ahead, but we know that we must take our lead from others who have been at this work for far longer, and to do so in community. Perhaps all this seems extreme, but it is much less extreme than the threat we are facing; top voices in our field have called for "emergency action" and that is what are proposing here. We hope that this is only the beginning of the conversation, but realize that questions of imagination and collective action are the soil from which resistance and new life emerges. In an era of climate collapse and enormous threat to human and biospheric health, the time has come to collectively expand our imagination and build the courage to live it out.

In a famous ACT UP speech, "Why We Fight," Vito Russell said, "All we have is love right now; what we don't have is time." **MM**

D. Brendan Johnson is a third-year medical student, University of Minnesota Medical School, and co-founder of the podcast "Social Medicine on Air." Jack Inglis, MD, is a resident in internal medicine, Hennepin County Medical Center; former co-chair, Health Students for a Healthy Climate. Michael Westerhaus, MD, is assistant professor, Global Medicine, leadership committee, EqualHealth; and program director, The Bridge to Residency for Immigrant International Doctor Graduates through clinical Experience, University of Minnesota. Federico Rossi, MD, is a gastroenterologist, M Health Fairview and MNGI.

For more information

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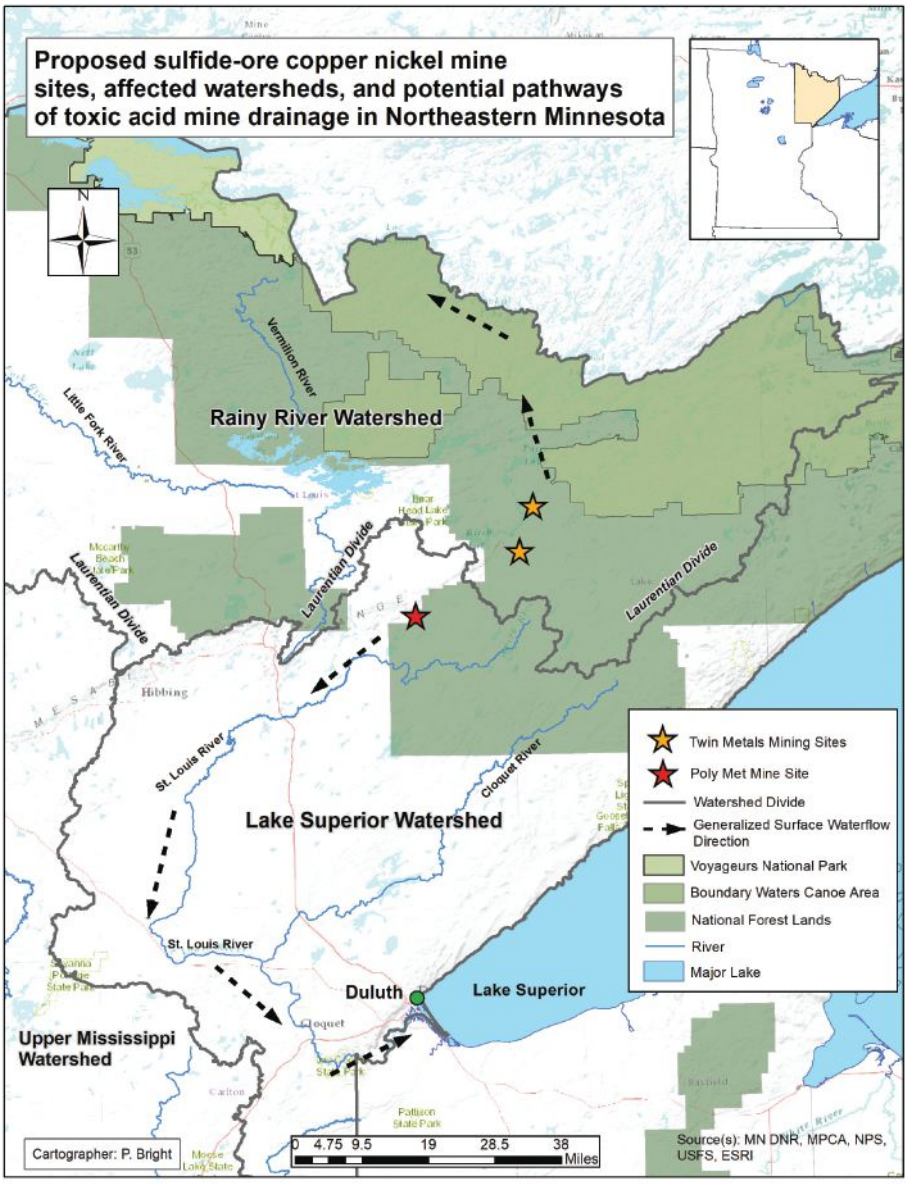
Sulfide-ore mining AND human health in Minnesota

WHERE ARE WE NOW?

BY JENNIFER PEARSON, MD; DEB ALLERT, MD; JOHN IPSEN, MD, PHD; MARGARET SARACINO, MD; STEVE SUTHERLAND, MD; KRIS WEGERSON, MD; AND EMILY ONELLO, MD

For many years, Minnesotans have been reading headlines regarding the prospecting, permitting and potential for sulfide-ore copper nickel (sulfide-ore) hardrock mining in Minnesota. Although the debate is not a new one, the landscape surrounding decisions regarding this type of mining within Minnesota's borders is dynamic and constantly changing. As 2021 was ushered in, so were new legislative and legal efforts affecting sulfide-ore mining. Amid state and federal legislation and lawsuits, healthcare providers in Minnesota have continued to stay abreast and weigh in on the potential human health effects of these decisions. Given the shifting landscape, it is timely to understand where we are right now and why concerns for human health remain at the forefront of this issue.



Background

The Duluth Complex, a geological formation in northeastern Minnesota, contains metals that are sought for many modern-day uses, including copper, nickel and platinum group metals. These metals are naturally bound to sulfides in the ore body and millions of tons of rock are excavated to obtain a fractional amount of the desired product. At both the mine site and in tailings and waste rock piles, exposure of this excavated ore to air and water triggers a chemical reaction that causes the sulfides to oxidize; this reaction creating sulfuric

acid, sulfate and toxic metals—acid mine drainage—that then leaches into surface and ground water.

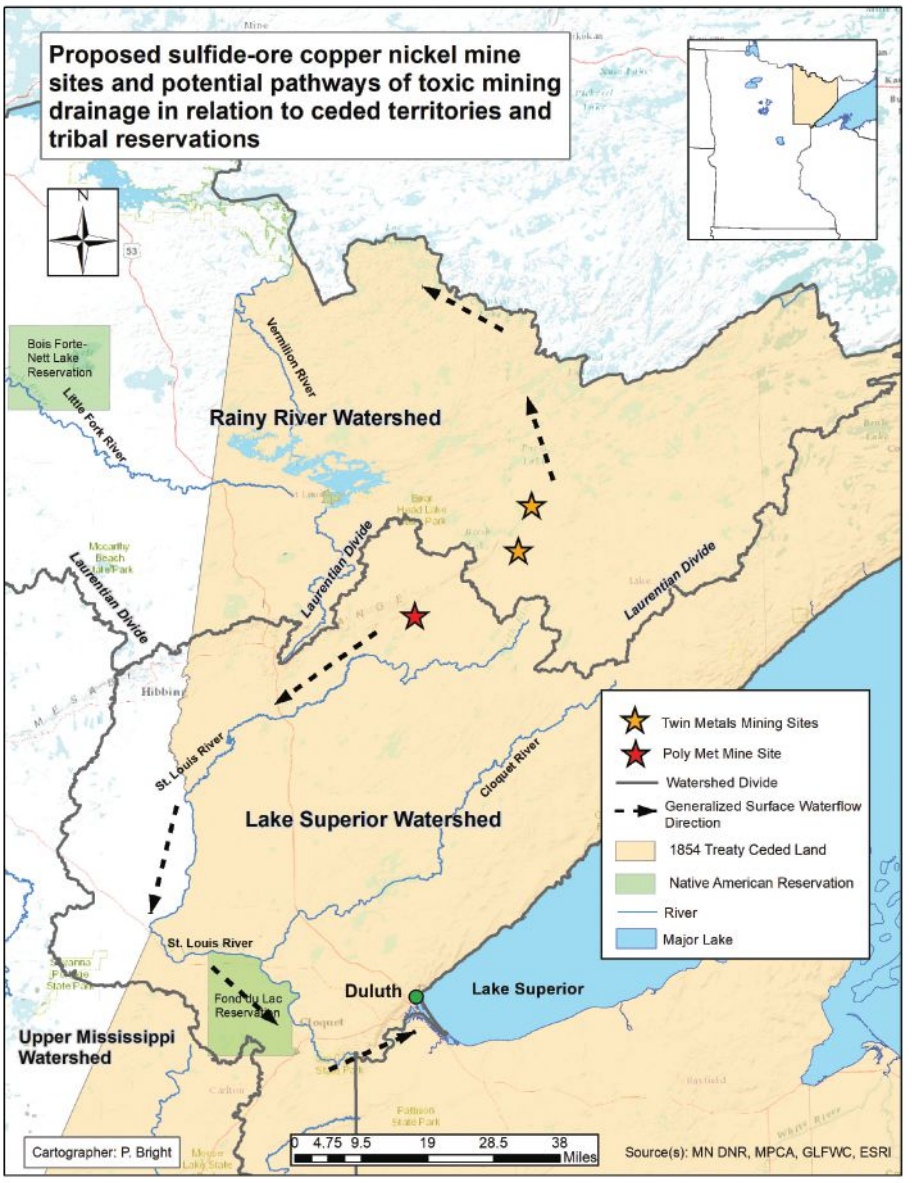
Proponents of sulfide-ore mining argue that we need these metals in our lives and that they can be extracted safely within the state regulatory guidelines. Opponents of sulfide-ore question whether industry can extract these metals safely without irreversible harm to the surrounding ecosystem and beyond, particularly in water-rich environments. They argue that some places are too valuable to expose to the risks of sulfide-ore mining within the same watershed. Many advocate for recycling metals that have already been mined, which would consume less fossil fuel energy, have less climate impact and not put water resources at risk.

Given the inextricable connection between ecosystem health, animal health and human health articulated by the One Health movement, and the toxic track record of sulfide-ore mining elsewhere, concern for human health must be part of the public dialogue. The World Health Organization has concluded that environmental risks account for a large fraction of the global disease burden. Across the total population, 23% of all deaths worldwide are attributable to the environment, with greatest adverse effects to those younger than 5 years or older than 50. The WHO also lists 10 environmental toxins with the greatest concern to human health, and sulfide-ore mining has the potential to release six of these including mercury, lead, arsenic, cadmium, asbestos and particulate air pollution.

Sulfide-ore mining also releases sulfates that promote methylation of elemental mercury already present in wetlands and sediments. These sulfates interact with sulfate-reducing bacteria to produce the more bio-toxic form of mercury, methylmercury, a known neurodevelopmental toxin. Methylmercury and other released toxins (e.g., lead and arsenic) all have known harmful effects to human health, including neurodevelopmental disorders, cancers and heart and lung disease. Some of these toxins injure the developing brains of fetuses, infants and young children and so contribute to the rise of neurodevelopmental disabilities including autism, attention-hyperactivity disorder dyslexia and other cognitive impairments that affect millions of children worldwide. The medical literature has produced expanding scientific evidence that connects environmental heavy-metal toxins with harmful human health effects.

These concerns add to problems that already exist in Minnesota; a 2011 Minnesota Department of Health study showed that 10% of newborns in the Minnesota portion of the Lake Superior basin had elevated blood-mercury levels, with some exceeding the EPA toxic level. The *Journal of Pediatrics* reported that 10.3% of Minnesota children under 6 years of age had elevated blood lead levels, an alarming statistic given that there are no safe levels of lead. Many Minnesota physicians have voiced concern about adding to this existing toxic metal burden.

Given the geology and chemistry involved with sulfide ore and the sulfide mineral oxidation that occurs as part of the sulfide-ore mining process, leaching of sulfate and toxic metals from mine ore and waste rock will continue for centuries. Sulfate and toxic metals will inevitably make their way into surrounding water, soil, fish, birds and mammals, increasing the already existing toxic burden. Threats to fresh water from sulfide-ore mining could have devastating effects on our region. The example of Mount Polley's



catastrophic tailings dam failure in British Columbia serves as a sobering example of that reality. The U.S. Government Accountability Office produced a report in March 2020 that found that the Forest Service, Bureau of Land Management, National Park Service, Environmental Protection Agency and Interior's office of Surface Mining Reclamation and Enforcement spent, on average, about $287 million annually to address physical safety and environmental hazards at abandoned hardrock mines from fiscal years 2008 through 2017, for a total of about $2.9 billion. Billions more are estimated for future costs of ongoing cleanup.

The environmental review process for sulfide-ore mining projects has been shown to fail repeatedly. The definitive study, "Comparisons of Predicted and Actual Water Quality at Hardrock Mines: The Reliability of Predictions in Environmental Impact Statements," looked at Environmental Impact Statements conducted on proposed mining projects and found they consistently failed to predict the groundwater and surface-water contamination created by the mines. The factor most closely associated with mine pollution failures is proximity to groundwater and to surface water. Earthworks studied 14 copper mines that had been in operation for more than five years, representing 89% of the United States copper production in 2010. Pipeline spills or other accidental releases were seen in 100% of these mines, with water collection and treatment system failures resulting in water impairment and acid mine drainage (AMD) occurring in 92%. The author concluded that these findings occurred within mines in the arid Southwest; significantly worse impacts can be expected at mines in wetter climates.

The voices of healthcare professionals

Because of the likelihood of harmful effects to human health, many healthcare professionals have individually and collectively voiced concern in relation to sulfide-ore mining within Minnesota's water-rich borders. The Minnesota Medical Association, Minnesota Academy of Family Physicians, Minnesota Nurses Association, Minnesota Public Health Organization along with dozens of individual providers, and non-profit groups with ties to human health all submitted letters in response to the Environmental Impact Statement prepared for Minnesota's first proposed sulfide-ore mine. The consensus of these groups representing tens of thousands of healthcare professionals was that a comprehensive Health Risk Assessment and Health Impact Assessment should be mandated as part of an Environmental Impact Statement necessary for decisions regarding sulfide-ore mining. The Minnesota Academy of Family Physicians (AAFP), the largest medical specialty organization in Minnesota, passed a resolution that was brought to the Minnesota Environmental Quality Board as a petition for rulemaking to require that a Health Impact Assessment be completed for all future sulfide-ore mining projects in Minnesota. This petition has not yet been voted on by the Minnesota Environmental Quality Board.

In 2019, the American Academy of Family Physicians adopted "Health in All Policies." This collaborative approach aimed to improve the health of all people by incorporating health considerations into decision-making across all sectors and policy areas. The AAFP supported the recommendation that Health in All Policies can be best accomplished by using Health Impact Assessments in the federal review of environmental impact statements and environmental assessments. For years now, Minnesota's collective medical voice, along with those of physicians from across the country, have been asking for a regulatory process that engages sound and independent scientific evaluation of a toxic industry such as sulfide-ore mining.

The Laurentian Divide: Recognizing risks on both sides

The Laurentian divide runs through northern Minnesota and serves as a geographic boundary between surface watersheds. Simplistically, surface water north of the Laurentian eventually makes its way to Hudson Bay and water south of the Laurentian eventually flows into the Gulf of Mexico or the Atlantic Ocean. This geographical feature divides the Rainy River watershed toward the north and the Lake Superior watershed toward the south, although groundwater does not always reflect surface flow. There are substantial risks and efforts to mitigate the potential toxic effects of sulfide-ore mining in watersheds on both sides of the Divide.

Northern Minnesota encompasses the federally designated Boundary Waters Canoe Area Wilderness (BWCAW), Voyageurs National Park, the Superior National Forest and shared border-waters with Canada. Because of this, there are several federal laws that pertain to the protection of this region. Current mining proposals for north of the Laurentian Divide are primarily to mine federal minerals that are governed by the Federal Land Policy and Management Act. In watersheds south of the Laurentian Divide, mining proposals primarily involve Minnesota state-owned minerals and surface lands that may be owned by the federal or state government or by private parties. Mining of state-owned minerals is governed by state regulatory provisions, and the primary constraint is the degree to which these state regulations are or are not protective or enforced.

Sulfide-ore mines proposed in either the Rainy River Basin and/or the Lake Superior Basin would be located in Tribal Ceded Territories. Under the Treaty of 1854, when the Lake Superior bands of Chippewa ceded lands to the United States government, they retained usufructuary rights to hunt, fish and gather plants throughout this land. Sulfide-ore mining likely would contaminate tribal food sources and so create potential abrogation of treaty rights.

North of the Laurentian Divide

Twin Metals Mining Company, a wholly owned subsidiary of the large Chilean-based conglomerate Antofagasta, has prospected and developed a plan of operations for mining public lands and minerals in a portion of the Superior National Forest within the Rainy River Watershed and in the headwaters of the BWCAW.

Mining operations would cause acid mine drainage, toxic metal-rich runoff that would flow directly into the heart of the BWCAW and into the border waters between the United States and Canada. Tom Myers, PhD, an environmental hydrologist studying the surface and groundwater flow through the Rainy River watershed near the current proposed mining site stated: "If mineral deposits in the Rainy Headwaters are developed, it is not a question of whether, but when a leak will occur that will have major impacts on the water quality of the Boundary Waters Canoe Area Wilderness." This impact would also then flow north into Canadian waters.

The BWCAW is a national treasure. It is the most frequently visited wilderness in the United States and is a unique freshwater ecosystem. Along with the Superior National Forest, this region contains 20% of all the freshwater in the entire National Forest System. Wilderness experiences for users from all backgrounds provide an immeasurable source of physical, emotional and spiritual well-being. This region also provides critical habitat to wildlife as well as a local and regional economy that relies on the preservation of a pristine wilderness. Proponents of this mine argue that it will provide economic stimulus to the region. A 2020 analysis by Harvard University economists, however, concluded that "introducing mining in the Superior National Forest is very likely to have a negative effect on the regional economy."

In response to the threat that opponents perceive sulfide-ore mining poses to this irreplaceable wilderness, several lawsuits and legislative efforts are underway. If successful, these efforts would ultimately aim to:

- Terminate two current federal mineral leases that were reinstated in 2018 and cover nearly 5,000 acres; the Biden administration announced cancellation of these leases in January 2022.
- Impose an administrative federal mineral withdrawal under the Federal Land Policy and Management Act.
- Pass permanent protection bills in Congress and in the Minnesota Legislature.
- Revise Minnesota's nonferrous mining rules to ban sulfide-ore mining in the watershed of the BWCAW. In addition, efforts are being made to utilize sound science for scrutiny of a proposed mine plan.

In October 2021, the Biden Administration announced that it was re-starting a process that could lead to a 20-year ban on new mining activity. The United States Forest Service filed an application for mineral withdrawal of 225,378 acres of Superior National Forest lands and minerals with the Bureau of Land Management. A 90-day public comment period followed, with comments being considered in addition to further study by the Forest Service of the potential environmental and socioeconomic impacts of sulfide-ore mining in the area. Once complete, Interior Secretary Deb Haaland could direct an administrative ban on sulfide-ore mining for up to 20 years.

In January 2020, Minnesota U.S. Congresswoman Betty McCollum introduced The Boundary Waters Wilderness Protection and Pollution Prevention Act, which permanently bans sulfide-ore mining on Superior National Forest lands located in the watershed of the Boundary Waters Canoe Area Wilderness. This bill was reintroduced in April 2021. If recently canceled federal mineral leases hold up against any litigative appeals by Twin Metals, an administrative mineral withdrawal under the Federal Land Policy and Management Act and passage of McCollum's bill by Congress would protect all federal lands and minerals in the Boundary Waters watershed.

In 2021, the companion Boundary Waters Permanent Protection bills were introduced in the Minnesota Legislature; they would ban sulfide-ore on state-owned land in the watershed of the BWCAW and prohibit the issuance of mining permits throughout the watershed. As a result of a state lawsuit challenging the adequacy of Minnesota's nonferrous mining rules to protect the BWCAW from sulfide-ore mining, the Minnesota Department of Natural Resources recently provided a 30-day comment period. The DNR's decision on the adequacy of the state mining rules will be delivered to the state district court overseeing the challenge by September 2022. If the rules are deemed inadequate, state rulemaking to amend the nonferrous mining rules will begin.

South of the Laurentian Divide

In February 2005, the PolyMet company, now majority controlled by the Swiss mining giant Glencore, submitted a proposal to the DNR for Minnesota's first proposed copper-nickel sulfide-ore mine; the NorthMet Project. The proposed mining operation would create an open pit sulfide-ore mine located between Babbitt and Hoyt Lakes in northeastern Minnesota, positioned at the headwaters of the St. Louis River, the largest United States tributary to Lake Superior. Acid mine drainage and pollution from mine pits and waste storage would eventually flow into Lake Superior, northern Minnesota's Great Lake, holding 10% of the world's surface fresh water. There is also potential for some flow north to the Rainy River watershed.

Proposed mining operations would blast and excavate more than 500 million tons of waste rock and ore from the earth over 20 years, the proposed mine operation duration. The waste tailings would be stored on top of an existing and unlined pile of old tailings from a shuttered iron mine. Tailings exposed to rain, snow and oxygen would trigger the geochemical process for acid mine drainage containing sulfuric acid along with heavy metal toxins. Drainage seeping into surface and ground water could flow through natural habitats and vital communities including the reservation lands of the Fond du Lac Band of Lake Superior Chippewa as well the City of Duluth and multiple adjacent communities.

The NorthMet Project environmental review process that began in 2005 was lengthy and controversial. Despite multiple comments from healthcare organizations and individuals requesting that a Health Risk Assessment and a Health Impact Assessment be mandated as part of this process, neither was included. Since November 2018, when the first Minnesota

Department of Natural Resources permit was granted, PolyMet has procured additional permits from the Minnesota Pollution Control Agency, and the U.S. Army Corps of Engineers. Many concerns for safety, process, compliance and validity of the permits have persisted, resulting in legal challenges that have embroiled the courts. Legal decisions to date have not upheld the NorthMet permits. The Environmental Protection Agency Office of Inspector General has found that the EPA failed to follow its standard procedures in oversight of the NorthMet water pollution permit. A district court also found that the MPCA's grant of the NorthMet water pollution permit was subject to "irregularities of procedure," including destruction of communications with the EPA. In April 2021, Minnesota's Supreme Court upheld the Court of Appeals' decision and reversed the critical permit to mine due to its indefinite term and the lack of substantial evidence supporting its plan to control acid mine drainage during closure. At the time of this writing, the NorthMet Project remains highly controversial and is still on hold as litigation continues.

The Fond du Lac Band of Lake Superior Chippewa (tribal lands shown on page 34) proceeded with its own Health Impact Assessment for the NorthMet Project in an effort to determine how the loss of lake-harvested wild rice (manoomin) would impact the mental, physical, spiritual and economic health of tribal members. Naturally occurring stands of manoomin are threatened by a host of environmental perturbations, including the sulfate-containing discharges from current and proposed mining operations. Such sulfate discharges are detrimental to the growth and vitality of wild rice. This first-of-its-kind Health Impact Assessment concluded that the persistent health disparities for tribal communities in Minnesota are directly related to the involuntary loss of traditional lands, subsequent disruption of traditional lifeways and the loss of traditional, health-sustaining foods such as manoomin. Access to sustainable stands of wild rice is critical for tribal health.

In response to the mounting concerns about the risks of sulfide-ore mining in Minnesota, members of both the Minnesota House and Senate introduced "Prove It First" legislation in January 2021. If passed into law, it would require that the Minnesota Pollution Control Agency and the Minnesota Department of Natural Resources to affirm that a similar mine had successfully operated and closed without environmental contamination for 10 years before any sulfide-ore mining permit on Minnesota soil was granted. At the time of this writing, the legislation does not have bipartisan support. It does, however, reflect an expanding skepticism given the track record of environmental impact of sulfide-ore mines elsewhere and the serious concerns regarding human and ecological health.

Given THE geology and chemistry involved with sulfide-ore AND THE sulfide mineral oxidation that occurs as part OF THE sulfide-ore mining process, leaching of sulfate AND toxic metals from mine ore AND waste rock will continue FOR centuries. Sulfate AND toxic metals will inevitably make their way INTO surrounding water, soil, fish, birds AND mammals, increasing THE already existing toxic burden. Threats TO fresh water FROM sulfide-ore mining could have devastating effects ON OUR region.

Overall health concerns

Given the toxic nature of sulfide-ore mining, and in an effort to include human health concerns within the broader regulatory and litigative debates, healthcare providers have expressed the need for independent scientific scrutiny regarding:

- Direct toxic effects resulting from acid mine drainage to:
  - Those living in downstream communities.
  - Fetuses, infants and children most vulnerable to toxic methylmercury, lead and arsenic effects.
  - Low-income and tribal communities that rely on hunting, fishing and wild rice gathering for subsistence.
  - People experiencing the BWCAW and surrounding wilderness who drink unfiltered water straight out of the lakes.
- Additional health risks, including airborne and noise pollution resulting from mining activities that would affect the surrounding regions.
- Broader long-term impacts to the social determinants of health of the region, including:
  - Interference with the exercise of usufructuary rights for the Lake Superior Bands of Chippewa, guaranteed by the Treaty of 1854, with resulting adverse impacts of economic, social, cultural and spiritual well-being.
  - The overall climate impacts of these heavily fossil fuel-dependent mining operations and the destruction of thousands of acres of wetlands that sequester carbon.
  - The cost of potential loss of the pristine wilderness that serves as a source of mental and spiritual health for individuals from across our state and nation.
  - The cost of potential erosion of the pristine wilderness that has sustained an outdoor recreation industry in Minnesota that contributes to a stable tax base, jobs in a range of sectors and the retention of talent and wealth in Minnesota.
  - The cost of healthcare, special education and loss of productivity resulting from potential human health impairments from toxic acid mine drainage.
  - The cost of ecosystem damage to the St. Louis River headwaters, the St. Louis River and its estuary and the freshwater of Lake Superior.

  - The cost and capability of increasing mental health providers to meet increasing needs in a region that currently has an inadequate number of mental health professionals and facilities to meet even the current needs.

Healthcare professionals concerned about potential harmful effects to human health from sulfide-ore mining on both sides of the Laurentian Divide have voiced ongoing need for:

- Upholding the mandate of the National Environmental Policy Act by ensuring that human health effects are addressed. This would be accomplished by completing broadly scoped and scientifically robust Health Risk Assessments and Health Impact Assessments for toxic industries such as sulfide-ore mining anywhere within our U.S. borders, so that science is used to scrutinize potential harmful effects to human health and the environment before irreversible damage is incurred.
- A Federal Land Policy and Management Act administrative mineral withdrawal of 225,378 acres of Superior National Forest lands from the federal mining program in the BWCAW watershed.
- Legislation pending in Congress that would permanently ban sulfide-ore mining on federal public lands in the watershed of the BWCAW.
- Legislation pending in the Minnesota Legislature that would permanently ban sulfide-ore mining on state public lands in the watershed of the BWCAW and would prohibit the issuance of mining permits in the BWCAW watershed.
- Revisions of Minnesota's nonferrous mining rules to prohibit the siting of sulfide-ore mining in the watershed of the Boundary Waters.
- "Prove It First" legislation in the Minnesota House and Senate that would prevent sulfide-ore mining unless it can be proved that a similar mine operated and closed for 10 years without pollution.
- Opposition to mining that adversely impacts treaty rights and downstream communities, including reservations.
- Reverse of recent rollbacks to the Clean Water Act by reinstating protections that allow state pollution regulators to help protect drinking water, people, rivers, streams and wildlife.
- Substantial financial support for programs that promote metal recycling and reuse rather than furthering the toxic sulfide-ore extractive industry in water-rich regions such as Minnesota.
- Needed economic stimulus to northern Minnesota in ways that are not primarily dependent on mining.

What is needed now?

We recognize that the siloed thinking of past decades reveals an inexplicable connectedness between industry and ecological and human health, which must be addressed and reoriented. Minnesota contains and borders on a substantial portion of the world's fresh water. This geographic reality, amid an expanding crisis for adequate fresh water in multiple places around the planet, requires that we scrutinize the long-term risks and costs of damaging this life-sustaining resource in an effort to extract sulfide-ore, especially given the potential to adversely affect human health. As healthcare professionals, we operate daily with a risk and benefit lens through which we care for patients. For many of us, weighing in on industry has not historically been part of our daily work. Yet, within our interconnected world, the broader public health impacts of certain types of toxic industry on our patients and broader communities, including our Indigenous communities, have become more and more apparent.

The challenge for healthcare professionals thus becomes: How do we effectively advocate for policies and a regulatory process that prioritize human health, and how do we support new alternatives to risky toxic industries, thereby strengthening economic security without trading this security for long term risks and costs to future generations? As healthcare professionals, we are drawn to serve our patients and communities by promoting their health and well-being. The ultimate challenge is to raise our collective voices beyond the various clinic and hospital walls within which we work to promote human health in all policies and to fulfill our oath to "first, do no harm." The health of future generations is at stake. **MM**

Jennifer Pearson, MD, and Emily Onello, MD, are faculty, University of Minnesota Medical School Duluth campus. Deb Allert, MD, is a retired family medicine physician who practiced in Two Harbors for many years. Margaret Saracino, MD, and Steve Sutherland, MD, are child and adolescent psychiatrists in Duluth. Kris Wegerson, MD, and John Ipsen, MD, PhD, practiced family medicine for over 20 years in Duluth. Wegerson now practices in Hayward, Wisconsin; Ipsen is retired.

The views in this article are the opinions of the authors; they are not intended to represent the view of their employers.

ACKNOWLEDGEMENTS

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MMA leaders continue battling pandemic in healthcare settings and via the media

During the past few months, the physician members of the MMA have continued to battle the COVID-19 pandemic in hospitals and clinics as well as in the media and at the state Capitol.

In early December, the Minneapolis *Star Tribune* editorial board called upon healthcare leaders in the state to step up more to fight the virus. MMA leaders took exception to this and, as a response, MMA President Randy Rice, MD, fired off a letter to the editor pushing back and calling for political, business and community leaders to step up to help fight the COVID-19 pandemic in an op-ed published in the December 7 edition of the paper. "The difficult and uncomfortable truth is that those of us in healthcare—from nurses, doctors, therapists, custodial staff, to executives—have been giving all that we've got since this pandemic began," he wrote.

The following week, as the holidays approached and hospitals across the state neared capacity, a group of physicians used a press conference to implore their fellow Minnesotans to help stop the spread of COVID-19 by getting vaccinated. Several physicians and healthcare workers took part in the conference held in downtown Minneapolis to share their stories of life on the front lines of battling the COVID-19 pandemic.

"Everyone has to do their part to slow the spread of this virus," said Laurel Ries, MD, representing the MMA. "The best way to fight this is for more people to get vaccinated. Healthcare workers will continue to do their jobs, but we are struggling and we need help. If you haven't gotten vaccinated yet, please do so, and then mask up and stay socially distant."

"Our patients with and without COVID are suffering and dying because of the lack of access to hospitals," said Alice Mann, MD, MPH, representing the Minnesota Academy of Family Physicians. "Part of our training as family physicians is to help patients avoid illness through preventive care. The crushing reality is that the large majority of the hospitalized COVID patients could have been prevented with vaccinations."

> "Everyone has to do their part to slow the spread of this virus."
>
> Laurel Ries, MD
> Family medicine physician
> St. Paul

Two days later, Ries appeared on *Almanac*, the public affairs show on public television, to once again urge Minnesotans to do their part and get vaccinated and boosted.

Following the holidays, MMA leaders continued to urge their fellow citizens to help stop the spread of the virus. In early January, the MMA released a statement supporting the reinstituted mask mandates in Minneapolis and St. Paul. Meanwhile, MMA members in St. Cloud urged city leaders there and in surrounding communities to enact mask mandates. The lawmakers refused to pass ordinances but did urge citizens to wear masks in public places.

A week later, the MMA released a statement in support of requiring patrons of Minneapolis and St. Paul restaurants, concerts, and other public venues that serve food and beverages to show proof of vaccination or negative test results. Leadership in Minneapolis and St. Paul announced the measure in mid-January. (It was lifted three weeks later).

The MMA also took its message to the Legislature.

Several MMA members provided real-life stories of dealing with COVID-19 on the front lines before a House Health Finance and Policy Committee meeting in mid-January, via Zoom.

"As MMA president, I have heard from many colleagues across the state that the challenges and stresses with COVID are real and continue," Rice told the committee. He then went on to describe the challenges he faces as a family medicine physician in rural Moose Lake. He informed the committee about the impact COVID-19 is having on the physical and mental well-being of physicians, nurses and other staff. He also shared the challenges of treating patients who question physician recommendations because of misinformation they are receiving through social media or elsewhere.

MMA Secretary/Treasurer Carolyn McClain, MD, an emergency physician in the west Metro and in several rural Minnesota communities, walked the committee through a day in the emergency department during the COVID-19 era. "One of the hardest pieces [during the pandemic] is the lack of trust patients have toward the [care team.]"

"Though Omicron appears to be a milder strain, it is still a very serious illness," said MMA member Craig Daniels, MD, a pulmonologist and critical care specialist at Mayo Clinic. "There is a hard limit at how much we can push our systems and ourselves." He made a plea for Minnesotans to get vaccinated, mask up, stay home when sick and be kind. "We are not directing you, we are asking you."

Committee Chair Rep. Tina Liebling (DFL-Rochester) said these stories are ones that the public needs to hear. "I can't recall a hearing that has had as much impact [on members] as this one," she said.

Committees in the House and Senate met pre-session to assess the state of the pandemic in Minnesota. The House hearing focused on real stories from frontline healthcare workers to inform policymakers about the effect of the pandemic on hospitals and clinics, and the need to continue encouraging vaccinations, masking and social distancing. **MM**

News Briefs

Board approves policy proposal on racism and policing

The MMA Board of Trustees approved a policy proposal in December from the MMA Public Health committee on the issue of racism and policing.

The proposal was presented to members for their input via The Pulse in late October.

Among other things, the proposal recommends that the MMA call on policymakers and the healthcare community to work to address institutional, structural and systemic racial barriers, and to do what is needed to eliminate the health inequities that disproportionately affect Black, Indigenous and other people of color.

It also recommends that the MMA call on policymakers and the healthcare community to: recognize the detrimental effects that racism and violence have on the mental, physical and economic health of Black, Indigenous, and other people of color, particularly members of our community who are Black and Indigenous; advocate for racial justice and criminal justice reform; and put in place systems to address the adverse health outcomes that occur as a result of police brutality and negative police interactions.

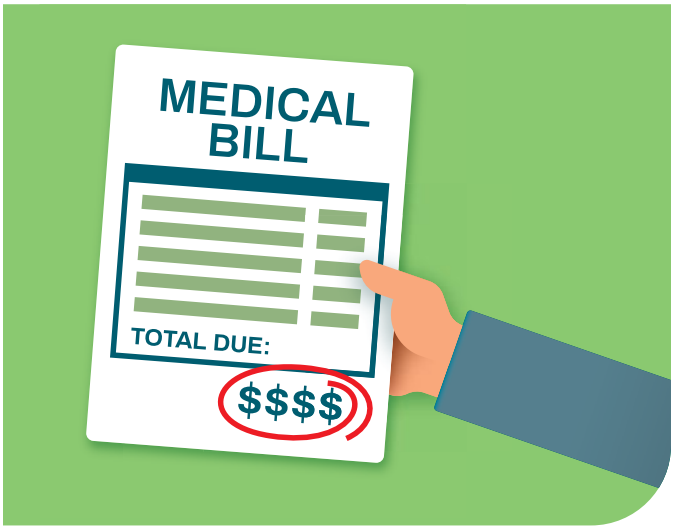
Plus, it recommends that the MMA:

- Advocate for the creation of an ICD-10 code for experiencing racism, a code that will provide physicians with the tools necessary to address racism within the clinical encounter and capture the data needed to provide more effective patient care.
- Advocate for a change to the standard death certificate to include a check box that would categorize deaths in criminal justice custody and that would create a new statistical grouping with explanations of the range of causes within the spectrum of criminal justice custody.
- Advocate for research to be conducted that examines the public health consequences of negative police interactions.
- Advocate for law enforcement to be trained on implicit bias and structural racism.
- Develop a toolkit/set of best practices for practicing physicians to assist them in having conversations with their patients about racism and the trauma that has resulted from negative police interactions.

- Urge medical schools and residency programs in Minnesota to include education in their curriculums about implicit bias and structural racism, how to identify and confront racism and police brutality and past incidents and examples of how the medical profession has (mis)treated Black, Indigenous and other people of color, and how this has led to a mistrust of the medical profession.
- Urge clinics, hospitals and other healthcare systems and providers to review and reconsider their policies and their relationships with law enforcement that may increase harm to patients and our communities.

Pulse feedback on the proposal prior to the Board's action showed 74% of those voting in support, 20% opposed, and 6% uncertain. Given the useful comments submitted, the Board has asked the Public Health Committee to review the feedback as part of implementation steps and with respect to any future policy proposals. Feedback from members on the Board's final action will open next week.

The Pulse, available only to MMA members, can be used to submit policy proposals for MMA consideration, vote on policy proposals prior to MMA Board action and provide feedback on decisions made by the MMA Board.



No Surprises Act resources available for Minnesota physicians

As of January 1, Minnesota physicians and healthcare facilities must comply with both Minnesota's surprise billing law and the federal "No Surprises Act" passed by Congress. The MMA has created two resources to assist in navigating this change:

- View the surprise billing FAQ (www.mnmed.org/MMA/media/Hidden-Documents/FAQ_SurpriseBilling_Final.pdf) to see answers to commonly asked questions about Minnesota's surprise billing law, the Federal law and how to determine which law to follow.
- View the surprise billing guide (www.mnmed.org/MMA/media/Hidden-Documents/SurpriseBilling_InterimFinalRules.pdf) for a more extensive look at the federal law and how to comply with its requirements.

Please reach out to MMA's Policy Counsel Steph Lindgren (slindgren@mnmed.org) with additional questions.

State's infectious disease director steps down

Minnesota Department of Health (MDH) Infectious Disease Director Kris Ehresmann retired from her highly visible position February 2.

Along with her leadership on the state's COVID-19 response, Ehresmann played leading roles in many public health issues in recent years, including Minnesota's measles outbreak in 2017, Ebola preparedness in 2014, the fungal meningitis investigation and response of 2012, H1N1 pandemic response in 2009, post-9/11 readiness work in the early 2000s and dozens of other high-profile public health issues.

"On behalf of the MMA, I want to thank Kris for her incredible career dedicated to the health of Minnesotans," said Janet Silversmith, MMA CEO. "An extremely eloquent and effective communicator, Kris has been an invaluable partner to the MMA in our shared goal of reducing vaccine-preventable illness. Minnesotans were very well served by her leadership throughout the pandemic, and we wish her all the best in a well-deserved retirement."

Ehresmann has added a Minnesota perspective to many national partnerships, including the National Vaccine Advisory Committee, the Association of State and Territorial Health Offices Infectious Disease Policy Committee and the Advisory Committee on Immunization Practices (ACIP). At the time of her ACIP appointment, she was only the second nurse ever named to that advisory panel of the U.S. Centers for Disease Control and Prevention.

Emily Emerson, the current assistant director of the Infectious Disease Epidemiology, Prevention and Control Division, will assume the role of interim director. MDH launched a national search for a new director.

Alert: Scam artists preying on physicians in other states

Although the MMA has not heard of Minnesota physicians being targeted, we have received word that elsewhere in the United States, physicians and other licensed health professionals are the target of scammers who impersonate federal and state law enforcement officers.

The scammers use the name of real law enforcement personnel, speak with confidence and authority and have sophisticated technology that allows them to display the telephone numbers of

actual local or government law enforcement facilities when calling a healthcare provider.

The scammers may convincingly explain that a healthcare provider:

- Is the subject of an investigation because a prescription they wrote was found at a crime scene.
- Missed a court appearance for which a warrant was issued or that is rescheduled in the near future.
- Was appointed to serve pro bono as an expert (by a state or federal judge) as part of a rotating system.
- Is somehow otherwise involved in a legal process.

The calls often come late in the week or over the weekend, when it is more difficult to verify the information. Nevertheless, the names and phone numbers used by the scammers will appear valid through a basic computer search and correspond with actual law enforcement personnel and facilities. To reinforce credibility, the caller may ask a provider to call them back at a number that checks out when looked up. They will then ask to call back due to a "spotty" connection.

Because there is significant publicly available information about medical professionals, scammers come armed with detailed information that makes them appear legitimate. This includes medical license, DEA registration and NPI numbers, as well as personal and professional contact information, educational background and practice specialty. They may specifically look at providers with a history of a prior lawsuit or discipline, to target those who have experience that may make them more inclined to avoid investigations or legal proceedings.

Scammers may tell a provider that they cannot give information or details because a matter is "sealed" or is part of an "ongoing investigation." The scammers will attempt to obtain additional personal information to use in identity theft scams or convince the licensed professional that they need to pay a fine due to a missed appearance or inability to serve as appointed.

What to do if you receive a call

- Do not provide any information. If you receive any call that you are involved in a legal matter or investigation, do not provide any information. Take a name and call-back number and let the caller know that you will need to speak with your lawyer. They may push back and tell you that "this is your only opportunity" to address the matter before some adverse consequence. Be firm and repeat that you will need to coordinate with your legal counsel. Absent a search warrant, there is never a requirement that you respond on the spot.
- Call legal counsel. An attorney can evaluate whether there is an actual legal matter pending to which a response is required.
- Report the incident. If there is no actual legal matter pending and you have been the target of a scam call, you can report to law enforcement agencies or the state agency/office that manages consumer fraud issues. If the caller is impersonating a federal law enforcement officer, it may also be reported to the U.S. Attorney's office and the FBI.

MN docs in state cannabis program say they're satisfied with program

Nearly 85% of healthcare practitioners involved in Minnesota's medical cannabis program reported that they were very satisfied or somewhat satisfied with the program, according to a survey released in late November 2021 by Minnesota's Office of Medical Cannabis.

The survey was sent out to 1,894 healthcare practitioners involved in the state's program in August 2021. After two months in the field, 252 surveys were completed.

Other result findings include:

- 46.2% of the survey respondents learned about the Minnesota Medical Cannabis Program from a colleague.
- 94.4% found the process to register as a healthcare practitioner who can certify patients very easy or somewhat easy.
- 73.1% rated Continuing Medical Education courses about medical cannabis as the most useful resource among several listed.
- 78.9% rated increased communication among pharmacists, providers and patients as a somewhat important or very important program improvement.
- 38.6% said that practitioners should be allowed to use telemedicine to certify patients, including the patient's initial visit to get certified.
- 63.1% said they did not want to be on a public list of practitioners who certify patients. **MM**

FROM THE CEO

An open invitation to get involved

The old adage that "the world is run by those who show up" rings true to me. It applies to democracies, civic groups, youth sports/clubs and the MMA. As a membership organization, the MMA relies on physicians to "show up" in many ways—to become a member and pay dues, to share expertise, to shape policy development, to provide governance and leadership, to mentor students/trainees and more.

Although the MMA is fortunate to have many dedicated and passionate volunteers, our goal is to involve many more of you in our work to make Minnesota the healthiest state and best place to practice medicine. Broad and diverse physician involvement strengthens the MMA's policies, decisions and impact. We also know that those who volunteer stick—that is, their support for the organization grows and they continue to renew their memberships. Through research conducted in the summer of 2021, we confirmed that the main reason physicians are unlikely to volunteer with the MMA is a lack of time. But nearly 50 percent of respondents noted a lack of awareness of MMA offerings, including volunteer opportunities. That is a problem, and we need to do better.

As in physics, the field of behavioral economics tells us that friction is a powerful force that creates a drag on or sets up barriers to one's actions. Friction, of course, is common in healthcare and is often a source of considerable frustration—consider the impact of prior authorization processes, the complexity of healthcare billing or the usability of electronic medical records. As the MMA works to expand opportunities for you to get involved, we know they need to be easy, flexible and apparent; they need to be as frictionless as possible.

Frictionless involvement is particularly important to MMA's advocacy efforts, where your voice and experiences are essential. For the MMA's annual Day at the Capitol event, the MMA will schedule meetings for you with your legislators, we will give you tips for success for those meetings and we will provide you with talking points. Through MMA Action Alerts, we make it easy for you to send a message to your legislator on urgent action affecting your practice and your patients. And through The Pulse, the MMA's electronic policy-development and polling tool, every member can have a voice in shaping MMA policy.

Of course, one of the best and easiest ways to increase member involvement is by personal invitation. Please consider this my standing invitation to all of you to join our work. If you have or currently are serving the MMA, please invite one of your colleagues to get involved. The MMA Nominating & Leadership Development Committee is tasked with identifying and nurturing physicians for MMA leadership positions. Elections are held each August via electronic ballot. Nominations are currently open for the 2022 election cycle, but the process of identifying future leaders is ongoing. If you or someone you know may be interested in leadership, please contact me at any time.

Successful membership organizations exist to meet the needs of their members. The MMA is working hard to make it easier than ever for you to get involved. The door is wide open, please join us! **MM**

Janet Silversmith
JSilversmith@mnmed.org

VIEWPOINT

A challenging job gets more challenging

Randy Rice, MD
MMA Board Chair

On most days, I have one of the greatest jobs in the world. As a small-town family medicine physician, I make a real impact on people's lives. Moose Lake, where I practice, has about 3,000 residents. So, my patients are my neighbors in the community. I see them at the grocery store, at the coffee shop or just driving down Arrowhead Lane. They come into the clinic concerned about some pain they've been experiencing or with a nagging cough. And I send them home with a care plan to get better so they can return to their regular routine as soon as possible.

How many other professions allow you to say that you are actually improving people's lives every day? If you're lucky, you have a similar experience to mine practicing medicine.

But lately, this impactful, satisfying job has become more challenging and it's not just because we are entering Year Three of the pandemic. Physicians face more and more interference from insurers, regulators, employers and disruptive patients. These interferences are causing many of our peers to question if they even want to continue practicing medicine. In the past, we'd see many of our colleagues practice well into their 70s, but now, more physicians are considering early retirement.

I don't like to use the word "burnout" because it makes me think of a burned-out match, something that is no longer of use. I prefer to use the word "fatigue" because with the right changes we can pump energy back into the profession and get back to practicing passionately like when we were just out of school.

Physicians get fatigued when their decisions, based on their education and data, get questioned by insurers. Based on financial formulas, insurers deny a certain medication, which you have found is the most effective for a patient. This happens too frequently and can often lead to us feeling demoralized.

Physicians get fatigued when the organization for which they work limits what treatments physicians think will be best for their patients. For us, it's about the patient, not the bottom line. We realize it's a business, but it needs to be run with compassion.

Physicians get fatigued when a patient questions their expertise based on misinformation they have gathered from Facebook or elsewhere online. This is especially disheartening when it's a patient you've known for years, who used to listen to you but now subscribes to conspiracy theories when it comes to healthcare.

This is a noble and fulfilling profession when we get to help our patients, our neighbors, our community. It becomes fatiguing when administrative burdens turn us into clerks, pencil pushers and bookkeepers.

That's why we need to continue advocating on behalf of our colleagues so that non-physicians cannot dictate how we practice. Physicians need to be at the table when legislation is debated or our challenging profession will become too challenging to spark joy. **MM**

Physicians face more and more interference from insurers, regulators, employers and disruptive patients. These interferences are causing many of our peers to question if they even want to continue practicing medicine.

Minnesota Medical Association

Annual Report

2021

The battle continues

Progress amid a persistent pandemic

It is once again my privilege to share with you the MMA Annual Report for 2021. This is an important opportunity for us to briefly recap the scope and impact of our work over the past 12 months.

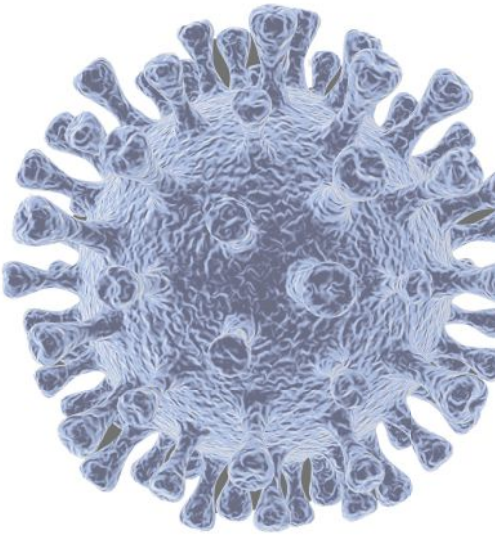
The year was, of course, memorable for the lingering COVID-19 pandemic, which continued to challenge you and your colleagues in ways few ever experienced or imagined. The fear and uncertainty that was common in 2020 was replaced in 2021 with misinformation, incivility and preventable loss and suffering. Workforce shortages increased, misinformation raged, and a Delta-fueled surge wore on and on. In mid-December, Minnesota recorded its 10,000th COVID-19 death. That is a number roughly equivalent to the entire 2020 population of several Minnesota cities, including Hermantown, Arden Hills, Detroit Lakes and Cambridge.

Despite ongoing and new challenges, physicians continued to answer the call — you delivered care in hospitals at capacity, you advocated for safe schools by urging universal masking, you spoke up for disadvantaged communities to ensure vaccines were equitably allocated and administered, you explained the importance of vaccination to countless uncertain patients and families, you urged legislators to preserve telehealth policies that enable critical access to care, you paid attention to the health and well-being of your colleagues, and so much more.

The MMA is honored to be your trusted partner as the collective voice of medicine for patient health, for prevention, and for science. The following pages highlight the change and impact we made together this past year.

I am proud of the progress we made in 2021 and excited about our plans for 2022. Thanks to your support, the MMA will continue the important work of making Minnesota the healthiest state and the best place to practice.

Janet L. Silversmith, CEO



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(JANUARY THROUGH SEPTEMBER 2021)

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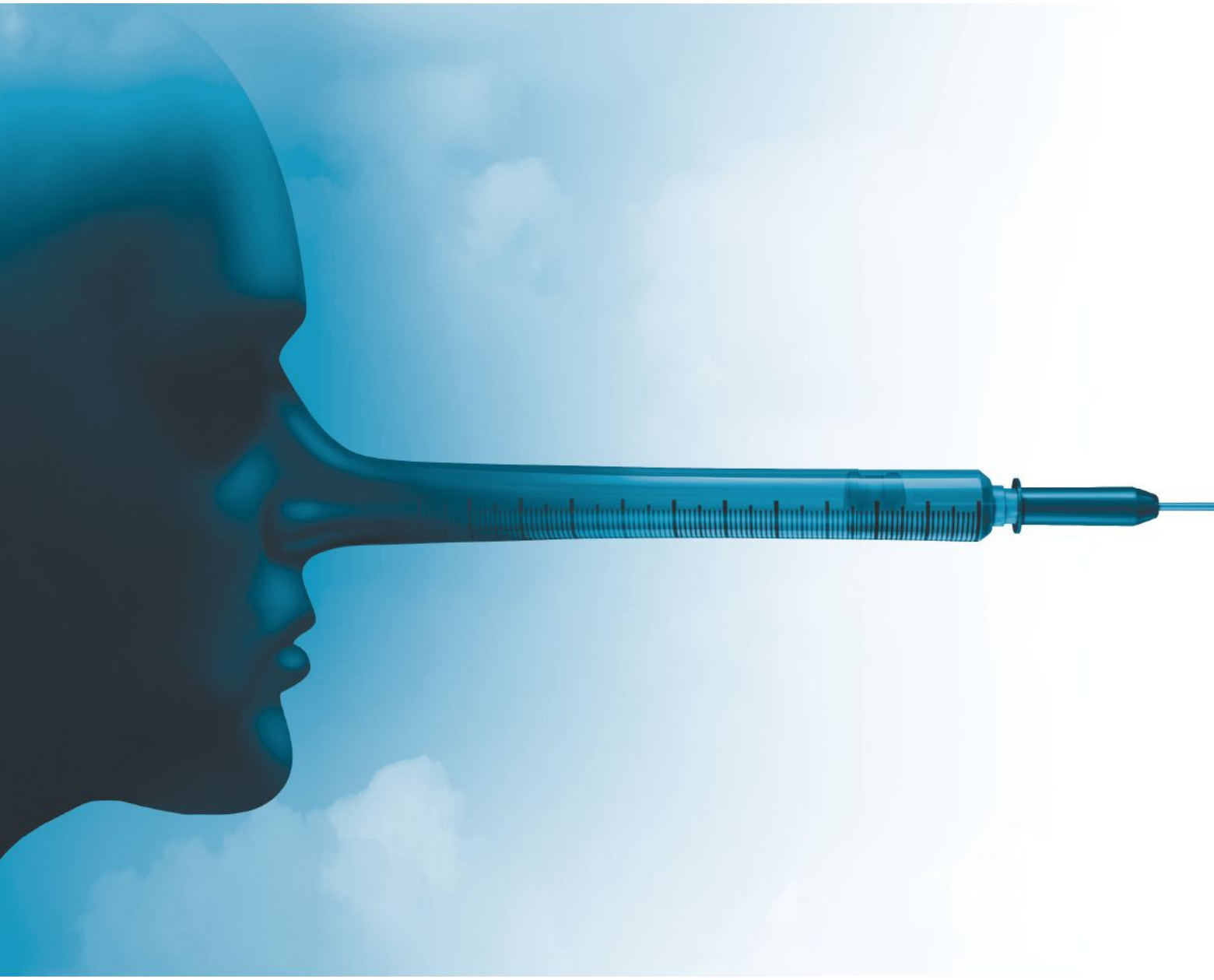
Chair: William Nicholson, MD, Maplewood



COVID-19 CONTINUES

Battling the Virus and Misinformation

Few people in healthcare expected the COVID-19 pandemic to last just one year but when effective vaccines received initial approval under Emergency Use Authorization from the U.S. Food and Drug Administration in late 2020, many became cautiously optimistic. If we could get enough shots into arms by the Fourth of July of 2021, the pandemic stood a chance of being contained, we were told.

MMA members began the push to the other side of the pandemic by fervently promoting and providing vaccinations, but then had to pivot to fight a tsunami of misinformation.

From the outset, the MMA advocated for physicians and their patients. In January, the MMA worked to improve the state's communication and processes regarding COVID-19 vaccine distribution for and to physicians, particularly those who were in non-hospital settings. The MMA heard the frustrations and confusion from physicians and medical groups who struggled to access specific information on vaccine access or timing for their staff and for their practices.

The MMA also advocated for equity in COVID-19 vaccine distribution, noting the gap in vaccination rates among Minnesota's historically underserved communities. We launched resources and education to help physicians address vaccine hesitancy among their patients and in their communities. We released a video on social media featuring MMA members urging all Minnesotans to get the COVID-19 vaccine when they get a chance.

Along with promoting the new vaccines, the MMA continued its campaign to encourage Minnesotans to Practice Good Health by continuing the other preventive measures — washing their hands, keeping their distance when out in public, getting tested, reporting any symptoms they experienced and wearing masks. MMA President Marilyn Peitso, MD, testified before the House Health Finance and Policy Committee in February, in strong support of legislation that would strengthen the state's mask mandate.

In April, the MMA Foundation helped bring more person power to the vaccine effort. In partnership with the Minnesota Department of Health and Blue Cross Blue Shield Minnesota, the Foundation recruited physician volunteers to serve on mobile vaccination units and help administer COVID-19 vaccinations to underserved communities across the state.

In mid-June, the MMA distributed a press release to media across the state urging Minnesotans to get

vaccinated by July 1. Gov. Tim Walz had set that date as the goal for 70% of Minnesotans 12 years and up to get at least one dose of the COVID-19 vaccine. The goal was partially reached on July 4, when Minnesota hit the 70% threshold for those 18 and over.

In early July, as a result of legislative negotiations and vaccine optimism, the governor ended the state's peacetime emergency, and the MMA released a statement from Peitso thanking state leadership, public health professionals, essential workers and all healthcare workers for their work and dedication during the COVID-19 crisis. A week later, the Delta variant became the dominant strain of COVID-19.

While Delta led to an increase in infections and hospitalizations, another insidious foe wreaked havoc — the spread of misinformation. In mid-July U.S. Surgeon General Vivek Murthy, MD, MBA, issued a warning to the American public regarding the threat of health misinformation. "Health misinformation is an urgent threat to public health. It can cause confusion, sow mistrust, and undermine public health efforts, including our ongoing work to end the COVID-19 pandemic," he said.

In September, the MMA compiled some of the common COVID-19 vaccine questions and concerns physicians were being asked. The FAQ resource garnered positive response and was supported by physicians in their efforts to educate patients and address their fears and concerns.

Medical groups and other healthcare organizations worked to lead the way in vaccinating their own staff and encountered resistance among a vocal minority. In late July, the AMA and 56 other groups representing physicians, nurses, pharmacists and other healthcare workers, released a joint statement calling for mandatory COVID-19 vaccinations for all U.S. healthcare workers. With broad and overwhelming member support, the MMA Board of Trustees followed suit and publicly called for all Minnesota healthcare organizations to adopt vaccination requirements for their staff.

Undeterred, in late September, a group of nearly 200 healthcare workers across Minnesota filed a federal lawsuit that would prohibit their employers from requiring them to get vaccinated for COVID-19. Incoming President Randy Rice, MD, spoke with the media on the issue, reiterating the association's support for universal healthcare worker vaccination. The lawsuit was eventually withdrawn.

With the school year approaching and in the absence of a state peacetime emergency and uniform masking requirements, the MMA, the Minnesota Academy of Family Physicians and the Minnesota Chapter of the American Academy of Pediatrics in August contacted superintendents of all school districts urging them to embrace requirements for "all students, teachers, staff, and visitors in K-12 school buildings to wear masks indoors regardless of vaccination status." The MMA further asked members across the state to attend school board meetings to urge them to pass mask mandates to help fight the spread of COVID-19 among children.

A few months into the school year, the FDA gave approval of the vaccine for 5- to 11-year-olds. The health department worked with the MMA to help prepare healthcare workers to get kids vaccinated as soon as possible.

As in 2020, COVID-19 remained prominent in the association's event offerings. At least a dozen of the MMA's monthly noon-time Physician Forums focused on a variety of pandemic issues from enforcing vaccine mandates, exploring ethical considerations, understanding federal vaccination mandates, to contemplating new and potential variants. The MMA also kicked off its Annual Conference with a sobering address by leading COVID-19 expert, epidemiologist Michael T. Osterholm, PhD, MPH.

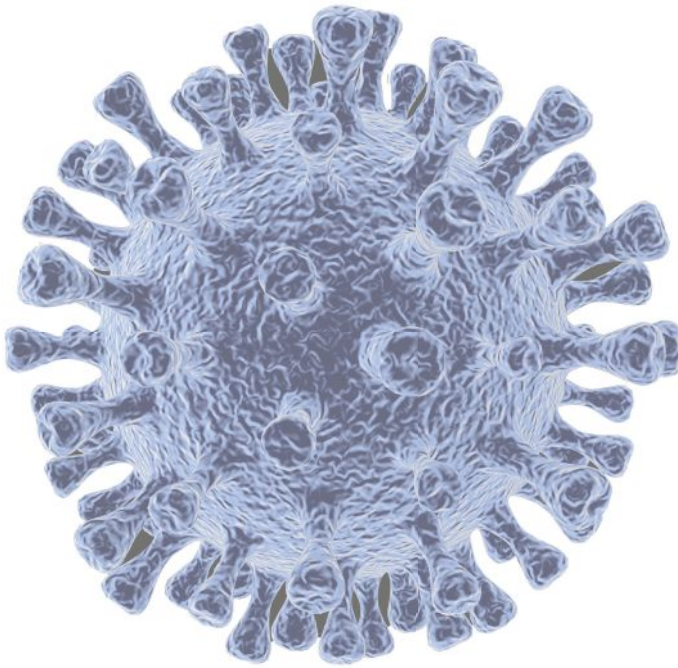
During the last quarter of the year, the MMA continued promoting vaccinations and then when they became readily available to Minnesotans, booster shots.

In mid-December, with hospitals near capacity, the MMA took part in a press conference in which a large group of physicians shared stories of what they've been dealing with during the pandemic and made personal pleas for their fellow Minnesotans to get vaccinated.

Before she left office, Peitso voiced the concerns of many physicians in an *Insights* article shared with membership. "Patients and family members are

rejecting our advice about COVID-19 vaccinations, rejecting the same expertise that may have carried them or their family member through a stroke, heart attack or difficult pregnancy in the not-too-distant past."

She ended the piece with encouraging words: "We are all frustrated and tired of this pandemic. The naysayers, the skeptics and the peddlers of misinformation will not succeed. Medicine and science are the keys to emerging from this pandemic — the times are uncivil, but your work is vital."



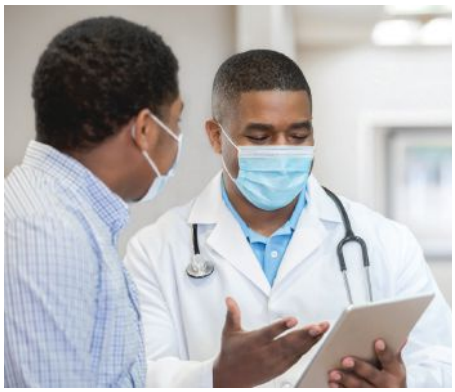
Patients and family members are rejecting our advice about COVID-19 vaccinations, rejecting the same expertise that may have carried them or their family member through a stroke, heart attack or difficult pregnancy in the not-too-distant past. We are all frustrated and tired of this pandemic. The naysayers, the skeptics and the peddlers of misinformation will not succeed. Medicine and science are the keys to emerging from this pandemic — the times are uncivil, but your work is vital.

— MARILYN PEITSO, MD

Health equity work continues with partnership, education

The MMA's strategic commitment to advancing health equity and confronting systemic racism progressed in 2021, with increased investments and energy.

The work is based off three primary areas of focus approved by the MMA Board of Trustees. They include: 1) diversifying the physician workforce; 2) alleviating social impediments to health; and 3) changing the culture of medicine.



Diversifying the workforce

In April, the MMA hosted an online discussion with the creators of a documentary titled, "Black Men in White Coats." More than 140 physicians, physicians-in-training, educators and other stakeholders gathered virtually to examine why only 2% of current American physicians are Black men, and to discuss strategies to develop a more diverse medical workforce. The film examines the systemic barriers preventing Black men from becoming physicians and the related health disparities in diverse communities. Its aim is to educate those involved in accepting, educating, training and supervising medical students, residents, fellows and health staff about the barriers to increasing the number of Black men in medicine.

In addition, the MMA is working to increase student exposures to careers in medicine. We continued to partner with Northwestern Health Sciences University in an effort to match mentors with pre-medical students from backgrounds that are under-represented in medicine. The MMA also provided shadowing opportunities to the Minority Association of Pre-Medical Students (MAPS) at the University of Minnesota, Twin Cities Campus. This is a pipeline program sponsored by the Student

National Medical Association, a national medical student organization. Its mission is to support current and future underrepresented minority medical students, to address the needs of underserved communities and to increase the number of clinically excellent, culturally competent and socially conscious physicians.

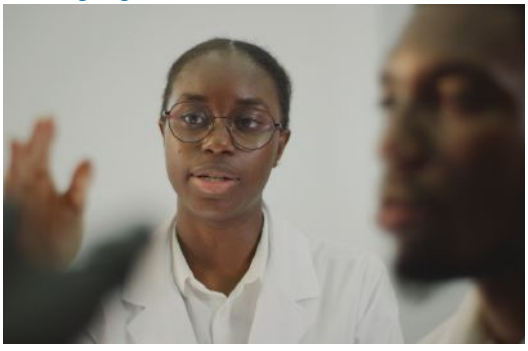
During 2021, the MMA also convened a task force to examine the barriers to workforce diversification in physician education, training and licensure. The task force is made up of 37 members, including leaders from Minnesota's medical schools and residency training programs, community physicians, residents, medical students and pre-med students. The task force intends to complete its work in 2022.

Alleviating social impediments to health

The MMA has consistently worked to improve the conditions for health, whether taking aim at tobacco, safe driving or vaccination. A newer area of focus is housing, specifically people experiencing homelessness. A similar focus is shared by the Zumbro Valley Medical Society, which has launched a Street Medicine educational effort and created a new elective for Mayo medical students.

The MMA also recognized the critical role that high-quality early childhood care, education and paid parental leave plays in childhood health and success by adopting strengthened policy to inform legislative advocacy work.

Changing the culture of medicine



In listening sessions in 2020, physicians told the MMA that efforts to improve health equity required a change in the culture of medicine, both within the MMA and within medical groups and systems.

We took that feedback seriously. To start, MMA leadership recognized that we needed to better understand the MMA's history and its role in perpetuating discrimination and/or racism. With support from a doctoral student from the University of Minnesota's History of Science, Technology and Medicine program, we reviewed more than 100 years of our journal, *Minnesota Medicine*, the association's House of Delegates proceedings and MMA's policy compendium. The results of this analysis will be published in 2022 and are intended to stimulate further dialogue as we look to learn from our past and sustain a more inclusive and responsive organization into the future.

The MMA also established a "Health Equity Time Out" to embed a culture of health equity in all its policy and decision-making processes. At its board, Policy Council and committee meetings, the MMA now pauses to contemplate the health equity ramifications of policy proposals. The association urges consideration of this approach by other physician leaders as one way to establish a strong diversity, equity and inclusion foundation in the organizations or teams they lead.

In October 2021, MMA staff, the Board of Trustees and committee/task force chairs participated in an intensive, systemic racism training session. This valuable and foundational work is designed to help position MMA to internalize a culture of anti-racism.

We are extremely excited about the new two-year initiative we launched in 2021 to address implicit bias and support cross-organizational health equity work. This expanded work is thanks to new and generous support from UCare. Educational programming on microaggressions and implicit bias were held in 2021, with expanded offerings planned for 2022. We also convened a new Minnesota Health Equity Community of Practice (CoP) in August 2021 to bring together health system/clinic equity leaders and champions to share their work and define opportunities for collective action.

2021 brought loss, change and progress

New year begins with tragedy

The optimism many of us felt with newly approved COVID-19 vaccines and the start of a new year was unfortunately replaced quickly with sorrow. On January 5, the MMA learned that one of its staff members had passed away over the New Year's holiday break. Eric Dick, the MMA's manager of state legislative affairs, was found dead in his home at age 45. He worked at the MMA for 10 years, bringing a wealth of energy, humor, political acumen and insight to the association's efforts.

A few weeks later, on February 9, firearm violence became personal to everyone in healthcare in Minnesota when a disgruntled patient walked into the Allina Health Clinic in Buffalo, Minnesota, and shot and killed one person and injured four others. The MMA once again renewed calls at the Legislature for common-sense changes in Minnesota's gun laws, but the split Legislature failed to take action.

Component medical society changes

For the past several years, the role and function of component medical societies — local societies chartered by and part of the MMA — have evolved. The evolution is multifactorial but includes changes in how medicine is organized and practiced locally, improved methods of communicating and disseminating information, new technologies that bridge geography, increased demands on physician time and the challenges of recruiting sufficient local volunteer leadership. Over the past three years, 16 component societies made the decision to dissolve their local organizations, five of which occurred in 2021. MMA membership for physicians in those areas is unaffected. Relatedly, in April, Twin Cities Medical Society (TCMS) leadership announced that it would separate from the MMA at the end of 2021, resulting in the MMA Board of Trustees revoking its charter as of January 2022. In 2022, three components remain in place —Steele County, Wright County and Zumbro Valley medical societies.

Supporting physician health and well-being

The problem of physician burnout before COVID-19 has only spread and intensified during the pandemic. To combat burnout, the MMA continued its advocacy work to reduce administrative burdens overwhelming physicians. We led efforts during the 2021 legislative session to promote legislation that would limit unnecessary formulary changes that result in disruptive and dangerous medication changes for stabilized patients.

Expert resources and strategies to support physician health and well-being were also front and center in 2021, as the MMA hosted a virtual Reclaim the Joy of Medicine/5th annual Bounce Back clinician resilience conference in January.

During the summer of 2021, the MMA launched its Practice Well Collaboratory, an innovative and cooperative way to share, promote, and explore strategies and best practices to support individual physician health and well-being needs, to convene well-being leaders and champions from across the state and to examine systems change opportunities. An advisory committee was convened in 2021 and additional programming is planned for 2022.

After several years of work, real and tangible change to support physician health occurred in September when the Minnesota Board of Medical Practice voted unanimously to amend the licensure application language requiring disclosure of past and current health conditions that if untreated could impair physicians' ability to practice safely. There was broad agreement that this language had a chilling effect on physicians throughout the state. Some went so far as to refuse to address their mental health, in part because they feared having their medical license denied or limited. The change, effective January 1, 2022, will instead ask "do you currently have any condition that is not being appropriately treated which is likely to impair or adversely affect your ability to practice medicine with reasonable skill and safety in a competent, ethical and professional manner?" The MMA convened many partners to accomplish this change and applauds all involved for their commitment and collaboration.

Advocating on behalf of making Minnesota the best place to practice and healthiest state

During the 2021 legislative session, the MMA successfully advocated for expanded, ongoing coverage for telehealth and telephone services. This effort garnered bipartisan support to continue coverage for services from a patient's home and to include audio-only services. Legislators weren't completely comfortable with this large expansion, so they included a sunset for the audio-only coverage in 2023.

The MMA also successfully lobbied for legislation that expands Medical Assistance (MA) coverage for pregnant women to cover postpartum care for 12 months. The previous law only covered 60 days postpartum for some MA enrollees.

The MMA continued advocating in the court room as well, standing up for Edina's local ordinance prohibiting the sale of flavored tobacco; defending the constitutionality of the state's COVID-19 eviction moratorium as a way to acknowledge the importance of safe and stable housing for overall health, particularly during a pandemic; and cautioning the court that mental health care in Minnesota could be negatively impacted if physicians and other mental health providers can be held legally responsible for the behavior of any patient for whom they prescribe medications containing a black box warning.

Members making a difference

Practicing medicine is rarely a 9-to-5 endeavor. Instead, on most days it seems to be an around-the-clock profession. And yet, no matter how busy it is, there are physicians and physicians-in-training who put in more time and effort. These people go above and beyond the call of duty regularly and are truly making a difference in people's lives. We are proud to call them all MMA members.

Jill Amsberry, DO

Amsberry, a pediatrician, served as the MMA's representative to the Minnesota Department of Health's Minnesota COVID-19 Vaccine Allocation Advisory Group. She played a key role in ensuring that the voice of Minnesota physicians was heard when the state worked on plans for allocating the vaccine, and helped share information about the dissemination strategy with her fellow physicians and the public. She also serves as the medical director of the Pediatric and Adolescent Clinic at CentraCare and is a faculty member for the University of Minnesota St. Cloud Family Medicine Residency.

Juan Bowen, MD

As the president of the MMA's Foundation, Bowen has made a significant impact. He personally secured a $200,000 gift honoring the lifetime work of his long-time friend and mentor Barry Friedman, MD, and used it to establish a new enduring scholarship fund at the Foundation to spark interest in primary care and encourage the capabilities of medical students. During the first COVID-19 stay-at-home order, Bowen, along with his colleagues on the Board, mobilized the MMAF and created a Philanthropy in Practice campaign that raised nearly $30,000 in emergency funds for homeless shelters and foodbanks. Bowen is an assistant professor of medicine at the Mayo Clinic College of Medicine and Science, and a consultant in the Department of Internal Medicine and the Department of Cardiovascular Medicine.

Liselotte (Lotte) Dyrbye, MD

Dyrbye is a scholar and leading advocate for physician well-being in Minnesota. In 2021, she partnered with MMA and others to lead the fight for the state's Board of Medical Practice to amend its licensure application language to remove questions that discouraged physicians from seeking mental health care. This was a significant victory for medicine and well-being. She is an assistant dean of faculty development at the Mayo School of Graduate Medical Education; director, Academy of Educational Excellence; co-director, Program on Physician Well-Being; professor of medicine and medical education; and consultant, Division of Primary Care Internal Medicine.

PHOTO COURTESY MINNESOTA ACADEMY OF FAMILY PHYSICIANS

Andrew Slattengren, DO

Slattengren is one of those physicians who when asked to contribute always has his hand in the air. In 2020, he served as president of the Minnesota Academy of Family Physicians, and during the MMA's 2021 Advocacy Week he stepped up to help his peers by sharing some tips for how to use social media to effectively interact with legislators. He is a family physician and assistant professor at the University of Minnesota Medical School. He currently serves as the associate program director and director of osteopathic education for the University of Minnesota North Memorial Family Medicine Residency.

Rebecca Thomas, MD

Thomas, a current MMA Trustee, has been busy this year advancing her passion for gender equity in medicine. She spearheaded the MMA's new Women in Medicine convenings to provide a safe and validating space for women to share their experiences; network with peers; identify future programming; and determine policy and advocacy needs. The oncologist also served as host and facilitator for epidemiologist Michael T. Osterholm, PhD, MPH, at this year's Annual Conference. Along with her board duties, she has served on the Committee on Finance and Audit as well as the Physician Well-being Advisory Committee.

Verna Thornton, MD

Thornton is a co-chair of the MMA's Barriers to Workforce Diversification in Physician Education, Training and Licensure Task Force, which convened in 2021. This group is tasked with crafting recommendations to reduce or eliminate the policies, practices and structures in medical education, residency training and licensure that perpetuate racism and/or otherwise limit Minnesota physician workforce diversification. She is also a member of the MMA Foundation's board and has participated with the Health Committee of the Duluth branch of the NAACP. That group has been present throughout the greater Duluth area and has been instrumental in giving away thousands of face masks and hand sanitizer containers to the homeless, minority and underserved communities.

Making a difference at a local level

MMA's Component Medical Society leaders

GOODHUE COUNTY MEDICAL SOCIETY*
President: John Goeppinger, MD

HEART OF THE LAKES MEDICAL SOCIETY*
President: Robert Koshnick, Jr, MD
Secretary/Treasurer: Jerry Rogers, MD

STEELE COUNTY MEDICAL SOCIETY
President: Grant D. Heslep, MD

TWIN CITIES MEDICAL SOCIETY**
President: Sarah Traxler, MD
Interim CEO: Annie Krapeck

WRIGHT COUNTY MEDICAL SOCIETY
President: Robert G Milligan, MD, FAAFP

ZUMBRO VALLEY MEDICAL SOCIETY
Co-President: Dionne A. Hart, MD
Co-President: Ashok Patel, MD
Executive Director: Beth Kangas, PhD

* *Group dissolved in 2021*
** *Separated from and MMA charter revoked 1/1/2022*

Membership overview

Year	Total Members
2000	9,089
2001	9,162
2002	9,109
2003	9,116
2004	9,297
2005	10,858
2006	10,835
2007	10,909
2008	10,969
2009	11,330
2010	11,250
2011	10,106
2012	10,347
2013	9,998
2014	10,309
2015	10,257
2016	10,171
2017	10,260
2018	10, 637
2019	11,011
2020	12,017
2021	11,711

**Numbers as of Jan. 4, 2022*

Membership types

Member Type	2021 Count
Regular	4,384
Resident/Fellow	3,940
Retired	1,615
Student	1,772

TOTAL 11,711

2021 Membership Information

NORTH CENTRAL TRUSTEE DISTRICT 501

NORTHWEST TRUSTEE DISTRICT 67

NORTHEAST TRUSTEE DISTRICT 630

SOUTHEAST TRUSTEE DISTRICT 5,251

SOUTHWEST TRUSTEE DISTRICT.....557

TWIN CITIES TRUSTEE DISTRICT 4,705

TOTAL:.....**11,711**

Counts include: regular/active, retired, students, residents/fellows.

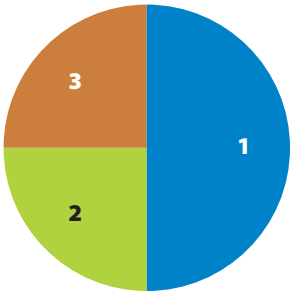
2021 Financial Highlights

TOTAL MMA REVENUE: $3.2M

1 DUES 50%

2 NON-DUES REVENUE 25%

3 SPENDING POLICY 25%



HOW YOUR DUES ARE USED

1 MEMBER ENGAGEMENT 19%
Member engagement, Annual Conference, Day at the Capitol, Doctors Lounge, Joy of Medicine Conference, other events, committees & taskforces, student & resident sections, component society services

2 ADVOCACY 23%
Legislative and regulatory lobbying, C-ASIC, CANDOR

3 COMMUNICATIONS 20%
Minnesota Medicine, MMA News Now, website, special reports, accreditation, joint providership, education

4 GOVERNANCE 16%
MMA Board, AMA delegation

5 INFRASTRUCTURE & OVERHEAD 22%
Infrastructure, finance & human resources, professional development, professional liability, partnerships & sponsorships

MINNESOTA MEDICAL ASSOCIATION

3433 Broadway Street NE, Suite 187; Mpls, MN 55413
PHONE: 612-378-1875 or 800-342-5662
FAX: 612-378-3875
EMAIL: mma@mnmed.org
WEB: mnmed.org
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Telehealth reflections

Lessons from interviews with medical students and preceptors

BY BAILA ELKIN, BS, AND KAYLA MURPHY, BS

The integration of telehealth was rapidly accelerated with the onset of the SARS-CoV-2 pandemic. For example, in the initial 10 weeks of the pandemic, United States VA healthcare outpatient facilities had 10,490,388 fewer in-person visits than the 10 weeks prior, with similar increases in telehealth visits in other large integrated healthcare organizations. From January to June 2020, 543 articles across 331 journals focused primarily on telehealth, emphasizing the role of telehealth in the future of healthcare, while also cautioning that we need more research to optimize practices and logistics.

Increased use of telehealth visits has significantly impacted medical education. Several studies point to student participation in telehealth as a way to increase clinical learning and enhance medical education in light of growing telehealth usage. Although models of integrating telehealth into medical curricula have been published, few studies have investigated best practices based on real-world experience from students and preceptors.

At the Minneapolis VA Medical Center, medical students participate in a VA Longitudinal Undergraduate Medical Education (VALUE) program. VALUE is a Longitudinal Integrated Clerkship offered to 10-12 third-year medical students at the University of Minnesota. Students spend the majority of their third year at the VA, completing multiple clerkships simultaneously, including internal medicine, general surgery, a surgical subspecialty, neurology, psychiatry, radiology and primary care. Due to the pandemic, VALUE students experienced increased participation in telehealth visits during the 2020-2021 academic year. Students and preceptor dyads worked together consistently and longitudinally over the course of eight months and developed their own approaches and solutions to integrate telehealth and medical learning. Our goal was to explore these experiences and create a list of best practices for students and preceptors working together in telehealth.

Ten third-year medical students and 10 preceptors participating in the VALUE program were interviewed by one of three VALUE student interviewers using standardized, open-ended questions on their experience working in telehealth. Interviews addressed:

- The setting and format of telehealth encounters.
- Attitudes about general and medical education—the specific pros and cons of telehealth.
- Formal preparation for telehealth.
- How student experiences could be improved and tips to enhance learning for both students and preceptors working in telehealth.

Interview notes were reviewed and analyzed for common themes. Based on themes that emerged from the interviews, we developed a list of best practices for our students and preceptors.

This project was a program-improvement initiative and not considered re-

search, so IRB approval was not required. Separate consent was obtained from all students and preceptors to participate in the project and to publish the data.

Evaluation

All 20 students and preceptors participated in telephone-based telehealth and seven students and eight preceptors participated in both telephone-based and virtual video conferencing. All 10 students participated in telehealth in psychiatry and nine also participated in telehealth in at least one other clerkship including primary care, surgery clinic or neurology. Among preceptors, four had students independently initiate the patient encounter, end the call and discuss with the preceptor and then call the patient back together. The other six preceptors initiated the patient encounter with the student, often allowing the student to start the interview. Additionally, due to the rapid integration of telehealth, both students and preceptors had little formal guidance from their institutions regarding best medical education practices in telehealth.

Students identified the following benefits to telehealth visits: increased access to care for patients, especially those in rural areas; greater convenience and efficiency for providers, such as being able to have patient information accessible and write notes in real time; and the ability for preceptors to directly observe students in telehealth visits without disrupting the patient interview.

Preceptors also appreciated the increased accessibility for patients and more efficient visits for those who do not require a full in-person evaluation. They also valued the ability to ingrain telehealth skills into trainees at an early stage and the ability to introduce management ideas or patient observations to students in real time over HIPAA compliant instant messaging software.

Despite significant benefits to telehealth, students and preceptors also noted disadvantages, particularly in regards to student learning. Students were unable to complete parts of the physical and mental status exams and were unable to observe body-language cues, particularly over audio-only visits, or use physical touch to display empathy. Multiple students emphasized a desire for autonomy in telehealth visits so they can learn to lead the discussion with fewer interruptions. Preceptors also described an inability to complete or teach the physical exam, inability to read verbal cues from patients or

TELEHEALTH LESSONS LEARNED

Best practices for students

FROM STUDENTS

- Prepare for telehealth visits just as thoroughly as any other, and collect what you'll need to practice telehealth. You'll need:
  - A quiet workspace
  - A good set of headphones
  - The ability to communicate in real time with your preceptor during the telehealth visit (via HIPAA-compliant instant message)
- Be flexible and have a plan for telehealth-specific difficulties:
  - When technical difficulties occur, or you have a poor connection
  - When you interrupt/talk over the patient or preceptor
- Be thorough since it may be difficult to call the patient back
- Engage with your preceptor. Set up a clear system of goals and expectations before visits, clarify what is working and what is not after visits.

FROM PRECEPTORS

- Set an agenda with your preceptor prior to starting the visit
  - Who will start the visit?
  - What you hope to discuss with the patient?
  - Overall expectations for the visit
- Clear communication with the patient is even more important since they often cannot see you
  - Create an agenda with the patient
  - Describe your role to help put them at ease
- Ask for feedback regularly

Best practices for preceptors

FROM STUDENTS

- Give your students space
  - Let students independently initiate telehealth visits
  - Try to avoid interrupting students or clearly communicate when you will lead during telehealth calls
- Set clear expectations
  - Make this a discussion with the students and elicit their perspective in what works best for them
- Check in with your students frequently about how things are going and what you can change

FROM PRECEPTORS

- Don't be afraid to use telehealth with your students. Look at it as an opportunity to learn
- Utilize the available technology in new and creative ways
  - Test the technology before starting the visit
  - Use instant messaging to communicate real-time
  - If you are working in different rooms, use video chats
- Do not let telehealth be a barrier to medical education
  - Demonstrate parts of the physical exam over video visits
- Be sure to give students their own physical space to participate in telehealth
- Clearly communicate what the student's role will be during the call

students and the informal nature of telehealth visits as potential downsides.

Based on these interviews, we developed a list of best practices for students and preceptors working in telehealth. Several common themes emerged, among them were the need to recognize and prepare for potential technical difficulties during telehealth visits, the need for clear communication regarding expectations, students stressing a desire for autonomy in telehealth visits, and preceptors emphasizing telehealth as a unique learning opportunity with similar potential as in-person visits to educate and empower students.

Implications

Although our students and preceptors noted a lack of formal preparation, research suggests that the necessary skills for telemedicine can be successfully taught in undergraduate medical education. One of the strongest themes that emerged from our interviews was students' desire for autonomy and the chance to interview patients uninterrupted. Most published studies don't go into the specific format for telehealth visits with students. However, a systematic review by Aikaterini Dedeilia and colleagues published in In Vivo in 2020 notes that published paradigms of telehealth visit formats had students begin the patient visit, with preceptors joining only after the learners had presented. In our study, six out of 10 preceptors entered telehealth visits simultaneously with students. One explanation for this may be that Dedeilia and colleagues looked at residents engaging with telehealth, who would be expected to have a greater degree of autonomy than medical students. In our interviews, students made repeated statements suggesting a desire for increased autonomy and a structure more like Dedeilia's published format during telehealth visits.

Several studies stress the importance of integrating telehealth education into medical curricula, but focus less on specific best practices. As part of a program improvement initiative, we have developed a list of specific practices pertinent to medical students and preceptors based on real-world experiences. This has provided multiple perspectives for our program's future students and preceptors, organically derived from this student-led initiative.

Some limitations of our work include a small sample size and limited sampling from other specialties outside of psychiatry. The visit formats may have been biased against student autonomy given the sensitive nature of many psychiatric appointments and preceptors wanting to provide more formal guidance in these more sensitive encounters. Future directions include more quantitative evaluations of the effectiveness of our proposed ideas. We should also gather feedback from our patients after they work with our student and preceptor dyads via telehealth to inform more patient-centered best practices. **MM**

Baila Elkin and Kayla Murphy are fourth-year medical students at the University of Minnesota Medical School, VA Health Care System.

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QUINN STROBLE, MD

- Chief medical examiner, Midwest Medical Examiner's Office, and adjunct professor, University of Minnesota Medical School-Duluth.
- MMA member since 2004.
- Born in Pennsylvania, graduated from Pennsylvania State University. Medical school at University of Pittsburgh School of Medicine, residency at University of Minnesota Laboratory Medicine and Pathology. Fellowship at Hennepin County Medical Examiner's Office.
- Lives with two large dogs, a 6-month-old husky-mastiff mix and a 4-year-old Dogue de Bordeaux, and a bearded dragon—for which she raises tropical roaches as food.

Became a physician because …

I was always drawn to science and the natural world, especially physiology. After working in a laboratory for two years, I realized I wanted more of a human connection to science and medicine was the best fit. I initially decided to specialize in family practice but I also loved trauma surgery. Forensic pathology is the perfect combination of the two specialties.

Greatest challenge facing medicine today …

Social media and the internet are profound obstacles for the medical profession today. These media provide unlimited access to dangerous "advice" and misinformation. For some people, social media and the internet have effectively eroded the confidence they once had in medical experts who've spent their lives studying, diagnosing and treating various medical conditions and diseases.

How I keep life balanced …

As chief medical examiner, I am always "on-call," but my schedule and wonderful colleagues allow me time for a personal life. In my time away from the office, I enjoy reading, exercising and anything that allows me to get outdoors.

If I weren't a physician …

I truly have no idea what I would be doing if I wasn't in the medical field. I am fortunate to love my career and have not had to wonder what else I could be doing!

CHERIE ZACHARY, MD, FACAAI, FAAAI

- Head, Allergy Division, Midwest Allergy & Asthma, Eagan and Woodbury.
- MMA member since 1998.
- Born and raised in Minneapolis. Graduate of Stanford University and Howard University College of Medicine. Residency in internal medicine, University of Minnesota Medical School. Fellowship, Children's Memorial Hospital and Northwestern University, Chicago. Has worked at Children's Memorial Hospital and Northwestern University, Fairview Health Systems and Minnesota Allergy & Asthma Consultants before joining Midwest Allergy & Asthma.

Became a physician because …

I had severe asthma as a child, with multiple emergency room visits and hospitalization three times. I also had food allergies and atopic dermatitis, all of which led me to want to understand how to advance medical treatment to improve the quality of life for patients. It was helpful that my allergist at the time happened to be a past president of the American College of Allergy, Asthma & Immunology. All the time I spent in his office helped to influence and cement my career choice.

Greatest challenge facing medicine today …

There are multiple challenges, including the cost of medications, equal access for diverse groups of patients, insurance costs/deductibles … to list just a few of my top contenders. In addition, maintaining work-life balance for physicians is key to enjoying what we do every day and avoiding burnout.

How I keep life balanced …

Nature walks, jazz music, friends and church. Additionally, I have learned to use a small word in the English language—NO. There are only 24 hours in the day and sometimes saying no to something allows you to focus time on the more important thing(s).

If I weren't a physician …

It is easier to answer this now that I am a physician. I confess I think of this question from that vantage point, however, I think I would do something between being an investment broker and a pianist—preferably a jazz pianist.

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