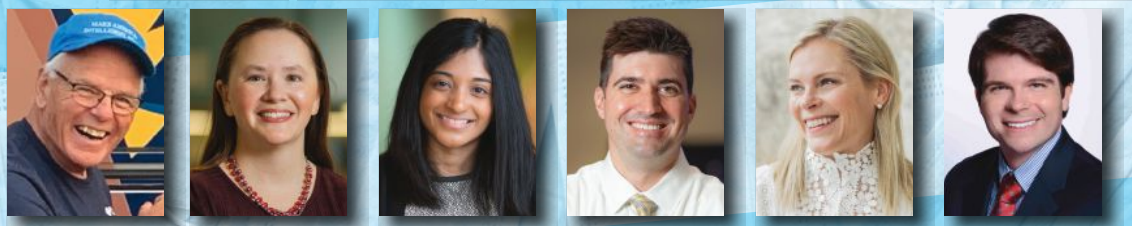
THE JOURNAL OF THE MINNESOTA MEDICAL ASSOCIATION

# MINNESOTA MEDICINE

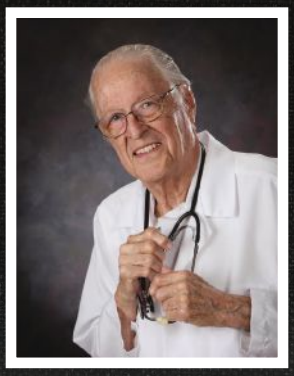
NOV/DEC 2021 • $9.99

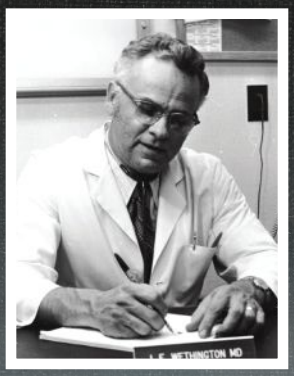


# COVID-19 changed everything

REFLECTIONS ON WHERE WE'VE BEEN, WHERE WE ARE—AND WHAT COMES NEXT

PAGE 8





*Lost to COVID*

Richard Salk, MD, and Joseph Wethington, MD, PhD

**ALSO**



Minnesota Medical Association

Minnesota Monthly.

The Perfect Gift from Minnesota!
MinnesotaMonthly/GiftBox.com

# BEST OF MINNESOTA GIFT BOX

*Minnesota Monthly* magazine's Best of Minnesota Gift Box features the best products, tickets, and gifts from Minnesota's best-known brands and your favorite local artisans. Order a Best of Minnesota Gift Box for a colleague, friend, family member, or yourself in time for the holidays. Only 500 Gift Boxes are available.

$115 per box
*free shipping*

## PURCHASE TODAY
## AT MINNESOTAMONTHLY.COM/GIFTBOX

EACH BOX WILL INCLUDE $250 IN VALUE!

IN PARTNERSHIP WITH

YOU BETCHA! BOX

JOHNNIE WALKER HIGH RYE BLENDED SCOTCH WHISKY

openarms

# Women in Medicine

## An Evening of Conversation and Action

**NOV. 11**
**7-8:30PM**

*Join your peers for a collaborative conversation to share your experiences and be heard.*

Each participant will have the opportunity to engage in moderated small groups, which will include:

- Networking with your peers
- Proposing future events and activities aimed at helping women in medicine succeed
- Discussing emerging issues, determining policy and advocacy needs, and identifying opportunities for programming to support gender equity in medicine.

*This event is open to MMA members.*

**Ready to register?**

**Questions?**

eanderson@mnmed.org

Minnesota Medical Association

# CONTENTS

*Nov/Dec 2021* | VOLUME 104 | ISSUE 6

## COVID-19

### IN THIS ISSUE

*Living and working through a pandemic—a pandemic still hugely present—has changed physicians' lives and practices. This issue of* Minnesota Medicine *focuses almost exclusively on COVID-19 and how it has impacted physicians. We aren't done with the coronavirus, unfortunately, but it's a good time to look at what we've experienced so far and what the future may look like.*


# COVID-19 *changed* everything

REFLECTIONS ON WHERE WE'VE BEEN, WHERE WE ARE—AND WHAT COMES NEXT.



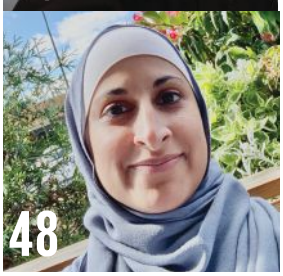


# DEPARTMENTS











MINNESOTA MEDICINE

**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

**CHIEF MEDICAL EDITOR**
Zeke McKinney, MD, MHI, MPH

**DIRECTOR OF COMMUNICATIONS**
Dan Hauser

**ART DIRECTOR**
Kathryn Forss

**CIRCULATION/WEB CONTENT**
Mary Canada





**COPYRIGHT AND POST OFFICE ENTRY**
*Minnesota Medicine* (ISSN 0026-556X) is published bi-monthly by the Minnesota Medical Association, 3433 Broadway Street NE, Suite 187; Minneapolis, Minnesota 55413-2199. Copyright 2021. Permission to reproduce editorial material in this magazine must be obtained from *Minnesota Medicine.* Periodicals postage paid at St. Paul, Minnesota, and additional mailing offices. POSTMASTER: send address changes to *Minnesota Medicine,* 3433 Broadway Street NE, Suite 187; Minneapolis, Minnesota 55413-2199.

**SUBSCRIPTIONS**
Annual subscription: $45 (U.S.) and $80 (all international)

**MISSING ISSUES AND BACK ISSUES**
Missing issues will be replaced for paid subscribers at no additional charge if notification is received within six months of the publication date. Replacement of any issues more than six months old will be charged the appropriate single back issue price. Single back issues of *Minnesota Medicine* can be purchased for $25 (U.S.) and $30 (Canada, Mexico, and other international). Send a copy of your mailing label and orders to Mary Canada, 3433 Broadway Street NE, Suite 187; Minneapolis, Minnesota 55413-2199 or fax it to 612-378-3875.

Like us on Facebook  Follow us on Twitter @MNMedMag




*Minnesota Medicine* is intended to serve as a credible forum for presenting information and ideas affecting Minnesota physicians and their practices. The content of articles and the opinions expressed in *Minnesota Medicine* do not represent the official policy of the Minnesota Medical Association unless this is specified. The publication of an advertisement does not imply MMA endorsement or sponsorship.

**To submit an article**
Contact the editor at lpicone@mnmed.org.

The editors reserve the right to reject editorial, scientific or advertising material submitted for publication in *Minnesota Medicine.* The views expressed in this journal do not necessarily represent those of the Minnesota Medical Association, its editors or any of its constituents.

Zeke J. McKinney, MD, MHI, MPH

# Toward the quadruple aim: caring for oneself

This is the first time in my life that I have not been able to get everything done. And it's overwhelming. Every day is characterized by me asking myself, "What's the thing most on fire today?" And then letting everything else fall to the wayside.

Even though I'm famously bad about accepting too many responsibilities, historically that's a tightrope I don't mind balancing on, but COVID-19 has made it immensely worse for all of us.

I remember everyone asking themselves early on what they could do to help with the pandemic, with people outside of healthcare feeling the most helpless. As a clinician—and particularly a Black man in Minneapolis—following George Floyd's murder, it seemed to be more relevant than ever to reiterate my daily mantra: "Have I done everything I could to beat or mitigate this disease?"

For me, this has added not only a new volume of responsibilities, but also the challenge of tasks that arise and change faster than I can anticipate and organize. The vaccine trial I'm involved with continues to have waxing and waning numbers of ill patients who need evaluation, employers and schools pivot from less to more restrictive risk mitigation policies, increasing visibility with community outreach means increased requests to be more visible.

Unfortunately, all of this came on top of my full-time job and family responsibilities, which seemed busy enough even before the pandemic. This is probably a common experience for physicians.

Is this how burnout feels? I don't think so. Burnout means feeling exhausted, detached and cynical about one's work. But that's not how I'm feeling. All this work on COVID and health equity are necessary—and fulfilling. There's just too much of it and I'm a bit anxious about what isn't getting done.

The cynicism is there, though. It's not about what I'm doing, but that too many of the general public could be doing more—staying home, wearing masks, getting vaccinated—and just don't, thus prolonging the pandemic and increasing its impact.

Our colleagues are seeing the same in the hospitals, where volumes at capacity can mean patients being triaged and admitted into ambulance bays, transferred to other institutions (when possible) and precluded from appropriate care when beds aren't available at all. All of these scenarios likely result in worse patient outcomes.

This suffocating cynicism embodies burnout as moral injury: not being able to provide the care we want to provide because of systemic barriers.

These issues are all the more critical in context of the historic barrier to physicians in Minnesota seeking mental health treatment; the licensing application asks about a diagnosis of any mental health condition. Physicians have appropriately feared that an affirmative answer may jeopardize their license. A recent vote by the Minnesota Board of Medical Practice unanimously supported changing that question, starting January 1, 2022, to ask instead whether a physician has an untreated condition. This opens the door for physicians to lead the way in reducing mental health stigma by seeking treatment ourselves when we need it, even as a preventative.

We all should now feel comfortable making that important first step toward taking care of ourselves. For me, personally, that means adding one more thing to my plate—scheduling an initial psychologist evaluation in January. Because taking care of myself is one of the things most on fire today. **MM**

Zeke J. McKinney, MD, MHI, MPH, is the chief medical editor of *Minnesota Medicine*.

COVID FATIGUE IS REAL

# The uncertain end of the pandemic makes it harder to cope

BY LINDA PICONE

How are physicians feeling about the COVID-19 pandemic now, approaching a year since it first appeared in the United States? "Just like every other human being in the world, we are ready to move on," says Liselotte (Lotte) Dyrbye, MD, MHPE, co-director of the Mayo Clinic Department of Medicine Physician Well-Being Program.

COVID fatigue is real, says Dyrbye—she feels it herself. "For all of us, it's like cabin fever in September," she says. "We're asking, 'When can I get out of here?'"

The fact that the end of the pandemic—and what that might look like—is uncertain adds to stress. "You can handle a lot stress for periods of time. You know this is going to be really hard for the shift that you're assigned or the month that you're on, but this is just not letting go. People have enormous capacity, but are running out of reserves," she says. "I worry a lot that, although we are doing well in Minnesota, people are running out of reserves. That is going to put them at risk for moving into a distress zone. I hope that people who are nearing that are willing to seek help."

Women physicians and healthcare providers, in particular, may face increased stress if there are more school or daycare closures or returns to online or hybrid education, which can make it difficult to work as they're used to—and want to. "It's really hard, and there are many people who very much love their job and love their kids and are having to make very difficult decisions," Dyrbye says. The American Medical Women's Association (AMWA) is trying to respond to what it says is "an unprecedented exodus of women from the medical workforce" with a campaign, "Give Her a Reason to Stay in Healthcare" (https://www.amwa-doc.org/our-work/initiatives/gender-equity-task-force/give-her-a-reason-to-stay-in-healthcare/). The AMWA points out that women in medicine were the majority of frontline health workers during the pandemic, but continue to have more responsibilities at home for their children and other family members.

For Dyrbye, the pandemic has meant doing some of her non-patient care work from home, a change she expects to continue. "I have a good set-up now," she says. "It's good for the environment, I can get a lot of work done, I stay connected with my team. It's lowered some of my stress in that I can just go into the kitchen and get a cup of coffee." She says she doesn't want to work from home every day because that doesn't suit her personality or her style of work—"and it wouldn't work for taking care of patients"—but she would like to do it several days a week. A large portion of the Mayo workforce is likely to be working remotely into the future, with the challenges of staying connected, building culture and building loyalty that come with that.

Like everyone, Dyrbye says, "I certainly look forward to this chapter being done." Her personal strategies for relaxing have been helpful to maintaining her mental health. She lives on a wooded property where she can go for walks.

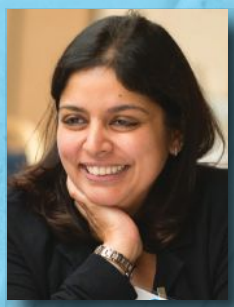
Lotte Dyrbye, MD, MHPE

As a researcher and expert in how to avoid and recover from burnout, what would she say to a fatigued physician, who loves their work and their patients but is just tired of coping with the necessary restrictions or workload of the pandemic and wants it to be over?

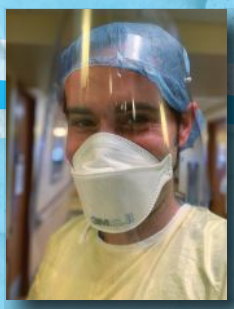
> "I think we can get far on gratitude, taking a minute to reflect on the things we're grateful for."
>
> Lotte Dyrbye, MD, MHPE

"That's a hard one. I'd want to give you a hug," says Dyrbye. "I think we can get far on gratitude, just taking a minute to reflect on the things we're grateful for. Here in Minnesota, we don't do well at patting ourselves on the back, that's not who we are. But this is a time when we need to say, 'I'm making a difference and what I do matters—and this is hard.' We need to be grateful not only for the things that are going well at work and at home for the ability we have to make such a difference in people's lives, to be powerful role models in society." **MM**

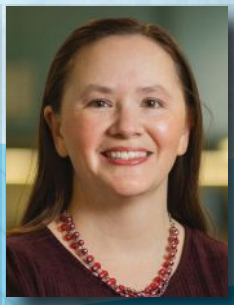
Linda Picone is editor of *Minnesota Medicine*.

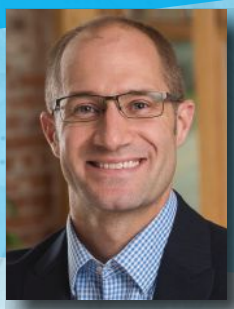










# COVID-19 changed everything

## REFLECTIONS ON WHERE WE'VE BEEN, WHERE WE ARE—AND WHAT COMES NEXT

It has been nearly two years since the appearance of the novel coronavirus SARS-CoV-2 and the disease it causes, COVID-19, in the United States. On February 20, 2020, the CDC confirmed the first person to die of COVID-19 in the United States. By March 2020, the WHO declared COVID-19 a pandemic. On March 13, 2020, the United States declared an emergency and it seemed that everything shut down, a lockdown that continues in many significant ways today.

Although we knew a lot about respiratory viruses, this one was different. Responses by health experts sometimes seemed to be fumbled or even contradictory. Masks? No, not helpful. Masks? Absolutely. Washing hands for two rounds of "Happy Birthday" was crucial. And then not particularly important. So-called social distancing meant we dodged around each other on the street, turned over chairs in the waiting room, kept patients' families out of the hospital. What was the "safe" distance? Six feet? Three feet? Ten feet?

Overnight, physicians learned how to use telemedicine—often very effectively. Street clothes gave way to scrubs and double masking, even in the clinic setting. "Non-essential" surgeries were halted for months, endangering the health of some patients who didn't have COVID but did have serious medical needs. Many physicians, whether in private practice or with large health systems, lost income.

A year ago, trials by Pfizer and Moderna showed that their mRNA vaccines were effective in preventing COVID. The Pfizer vaccine was approved at the end of 2020, Moderna and Johnson & Johnson vaccines also were given approval for emergency use in the United States.

Effective vaccines brought hope. Now we could begin moving back to what we used to think of as normal, pre-COVID times. Then the Delta variant appeared, with increased transmissibility and a rise in cases in some countries—including the United States.

We thought COVID would be in our past by today, that we'd be moving forward, but that is not the case. In fact, COVID may always be with us in some form. The changes that COVID has brought—some of them positive—may always be with us as well.

As *Minnesota Medicine* talked with physicians about their professional and personal experiences with COVID for this issue, we heard the pride in their voices about how they rallied to find ways to help patients and to develop protocols that made sense. But we also heard their frustration at not being able to help many of their patients—and their fears about what an increasing antipathy towards science and medicine may mean. The pandemic may well have been contained by now, with infection, hospitalization and death rates lower than we currently face. But politics, misinformation and a distrust of expertise have kept us from turning that corner.

Minnesota physicians are tired and frustrated, but they are also hopeful about the future, whenever it fully arrives. Here are their voices.

—*Linda Picone, editor of* Minnesota Medicine

# Ben Trappey, MD

## A follow-up visit with an early COVID physician

When the pandemic hit Minnesota in March 2020, Ben Trappey, MD, admitted the first patient to Bethesda Hospital, a COVID-only facility run by M Health Fairview in St. Paul until late that year. He spent many weeks caring for COVID patients there before returning to his regular responsibilities as an internal medicine-pediatric hospitalist at M Health Fairview University of Minnesota Medical Center and Masonic Children's Hospital in Minneapolis.

Trappey and his wife were expecting their first child that summer, adding to the stress of the moment. To cope with his tumultuous days, Trappey turned to reflective writing. Besides his medical practice, he helps other physicians process their emotions and experiences as associate director of the Center for the Art of Medicine at the University of Minnesota Medical School, where he is an assistant professor of Medicine and Pediatrics.

In September, Trappey spoke with *Minnesota Medicine* about his life as a physician, new father and writer in the age of COVID.

***What is work like for you today?***

Things are very different now. After my son was born at the end of August [2020], I went back to doing regular hospital medicine work. I was seeing COVID patients but not to the degree of concentration that I had before. You'd have a few on your service and at times none—particularly on peds. It's been really frustrating as we've entered the fourth wave. Early last summer, I had started writing a reflective piece called "When This is All Over" about what we were going to do when the pandemic is over. In our strategic operations center, when they accept patients to the University they are looking to see where they could go, like Bethesda or St. Joe's [Hospital in St. Paul]. At times there were 300 people in the system, when COVID was worse. One day, there were 15 to 20 people on our list of COVID patients. And I had a feeling like, it looks like this is over. It's hard to imagine that, considering where we are now.

In terms of COVID numbers, we're not at the peak of where we were last year with hospitalizations, but it's really quite alarming just how full the hospitals are now around the state. And it seems like now there are other respiratory illnesses going around. Before the surge, Minnesota was at maximum capacity for a while. Now bringing COVID back in the mix—it's frustrating and alarming.

***How are you doing with all of this?***

Not great. I wrote this piece that was published in *JAMA* in September 2020 about the fatigue I was feeling then as I anticipated my son being born. If I reread that piece now, it's almost laughable that I was burned out. Not burned out overall—but the way the public had responded to COVID then. Now we have a safe and effective vaccine, and that wasn't an issue in September. Then, it was the lack of masking we were dealing with. This could be over and it's not, because of the way people are responding. It's super frustrating. I almost don't allow myself to think about it very much because you put your head down and do the work and try not to dwell on it too much.

***What is work like these days?***

I feel quite lucky because through good leadership in our hospital medical group, we have been able to build contingencies into our system. When things get really busy, we all feel a little bit of pain but no one person or group feels too much pain. It's busier than it's ever been in my career, but it's still at a manageable level because of good planning. We're working more than usual. It's partly because we had to add extra teams to build capacity, and we're not fully staffed for that yet. We all have to pick up extra shifts to make that work and to make everyone's lives better on a day-to-day basis.

***How busy are you now?***

On a normal day, it's not like when I was at Bethesda and we were only seeing COVID patients. I just finished a week on service, and we would have two to three COVID patients at a time. Not everyone has COVID. The truth is, at the University we're busier than we've ever been, but it's COVID *on top of* busier than we've ever been. We have a lot of sick people for various reasons that we don't fully understand. Whether it's a backlog of things that weren't being seen because of COVID, or other respiratory infections going around, or the kids are back in school and daycare and spreading things around—there are definitely more kids with COVID. That's a function of Delta seeming to hit kids harder than previous variants.

***What have you experienced as the parent of a newborn during COVID?***

With parenting, there is so much uncertainty. He's unvaccinated because he's only a year old. Knowing how to protect him while still having two working parents is really hard. Once everyone in our family was vaccinated—my in-laws as well, who help us—we thought that because COVID numbers were low that he could go to daycare. He started at 8 months and loved it, and our lives were finally at the point where we could work full time again. It was great. And now, with the surge, it's become untenable because there are other respiratory infections. He was sick all the time and then he was exposed to COVID. The Minnesota Department of Health–recommended policy is that if there is an exposure, then kids are out of daycare for 14 days regardless of testing. So, there was a two-week period where we couldn't work, and we were without childcare. We knew that even after that two-week time, he could go back two days later and then have another exposure. So, we found a great nanny who just started, which has been a godsend to have someone that we can trust and not have these exposures. Obviously, it's an incredible privilege to be able to afford that. We're feeling much more at peace and able to protect him.

***How has COVID impacted your view of being a physician?***

It has made me question things I never thought I would question. I love being a doctor and I love practicing medicine. I don't think this will force me to consider another job because I don't think there is a job I would like more. But it's very frustrating to be pouring your heart into this and be vilified at times. And beyond that, one of the hardest things about being at the University are the people who are chronically ill and transplant patients who were vaccinated but got COVID anyway from other people's recklessness. It's hard to wrap your brain around. They were vaccinated and then they got really sick. That's hard to come to terms with.

***How do you cope with that?***

Primarily through my work with writing and things like that, I have pretty good coping mechanisms for keeping things in perspective. I'm very worried about the morale and resilience of the healthcare workforce in general. Looking at Twitter, most of the people I follow are medical professionals, and I'm observing that there is a shortage of providers right now in a major way. Everyone is really struggling to find respiratory therapists and nurses, and I think that should be a warning sign for us all that you can't keep up this level of stress for this long without hurting people.

***How has teaching medical students and residents changed during COVID?***

Most of the time when I'm on service, I'm working with learners. With the medical students, it's a lot different with their rotations over the last year and a half. The third-year and fourth-years are doing a lot of rotations virtually that used to be in person. But when I'm with them, it's the same. Some rotations are shorter, and they have people making up for last year. In the hospital, the training is very similar. Up until recently, med students couldn't see COVID patients and now they are allowed to.

The way the team is structured at the University, they are kind of protected from the increased patient load. They have caps on the number of patients they can see in one day, but they feel the downstream effects of the system being stressed. Their attendings might not have as much time to spend with them or they are in the stressful milieu of the hospital. If everyone is more stressed then they feel that. There is more turnover in the hospital and pressure to open up beds for people who are waiting in the ER, so they feel that. But the medicine is still the same—there is just more of it.

***Have you been writing these days?***

When I'm not on service, I'm spending time with my son, so my time to do other things has been diminished. I'm super lucky to be in leadership at the Center for the Art of Medicine. Part of that is knowing that creativity and reflection are protective and help build resilience. Even though I haven't had as much time myself to write, I have been working on other things and teaching and research, particularly about how storytelling and reflective writing is protective. Thinking about these things has been protective for me, even if I don't have as much time to write myself.

*One day, there were 15 to 20 people on our list of COVID patients. And I had a feeling like, it looks like this is over. It's hard to imagine that, considering where we are now.*

***Tell us more about the Center for the Art of Medicine?***

The goal is to give people skills and outlets for creativity to get the protective effects and resilience that are associated with them. Through the pandemic, we've had three story slams, two for residents and fellows and faculty and one with the Metro Minnesota Council on Graduate Medical Education for med students. We're planning to have one in October and hope to do an in-person one in the spring. Story slams are people telling their stories about their practice and their lives. We've done research that shows that it's a really powerful means of promoting community, even virtually. [Trappey, along with Center associate director Maren Olson, MD, and others published this research in June 2021 in *Medical Education Online*.]

We were worried that the story slams wouldn't work virtually, but we had a positive response that it helped people reconnect to the profession and the community where we practice. That's been great. At the Center, we also do writing groups for residents and students and the Hippocrates Cafe with Twin Cities Public Television. We did a show about life in the pandemic and we're working on three more for the coming year. We've really created this incredible community of storytellers and we've had a dozen people publish in medical journals about life and practicing medicine.

Ben Trappey, MD, was interviewed by Suzy Frisch, a Twin Cities freelance writer.

# Jon Hallberg, MD

## The best of times and the worst of times

Recently, I had an interview with a second-year med student and she reminded me of this chemical term, energy of activation, which is the energy it takes for a chemical reaction to get going. It almost defines for me the problem I've been having.

At no other time in my life have I had such an issue with that, just getting going with things, and I absolutely think it's the prolonged course of the pandemic. It is metaphorically and physically taking some of the energy out of me. It's 18 months now. The influenza pandemic of 1918 was winding down at about this point, and I don't think that's happening today.

The amount of time I spend in clinic every day, problem-solving and thinking about COVID is just exhausting. I keep thinking, what did I do when I wasn't doing that? It's especially true with MyChart messaging: "I'm going to a wedding in California, I've got two little kids at home, my wife doesn't think it's a good idea, but here's my strategy, what do you think?" I'm thinking, do you really need to go? And if you do, good luck. I'm so tired of trying to custom-tailor people's desires.

*I'm really concerned about coming out of the 2016-2020 years, bridged by the COVID-19 pandemic. I've never seen such division in the United States. For some, it's a badge of courage to say "I'd rather die than have the tyranny of a mask." That kind of stance has shaken me.*

After George Floyd's murder, I also am so acutely aware of my privilege and the privilege of some of my patients, so when the questions come that smack of privilege, it gives me more pause than ever before. My eyes have been opened to injustice in a way that they weren't before—maybe academically before, but not seeing it as crystal clear as I do now.

All that being said, I have never been so creatively engaged as I have been during the pandemic. I've been really busy producing Hippocrates Cafe shows since 2009, and my last one was on Friday, March 13, 2020 for some colleagues—it was literally called "In the Time of Plague." We knew we were heading into lockdown, we knew we would not be together for a while, but we didn't know that would be the last show for months.

And yet, I got to create the Center for the Art of Medicine at the Medical School. We've been producing Artistic Antidotes as often as daily, now down to once or twice a week. I helped create a TPT/PBS Hippocrates Cafe show ("Reflections on the Pandemic") that's now being shown in 25 states across the country and has won a regional Emmy award. We've got the green light to produce three more shows with TPT/PBS. Our next show will be on anti-racism in medicine, then one on aging and age-friendly health systems, and the third show will be on disability.

It's been an unusual time of creativity, which I think these inflection points in history can do. In some ways it's a terrible, terrible time for so many reasons. On the other hand, it really has forced me and others to think about what's really important.

I have never felt so at home in clinic and I feel like that's the place I need to be right now. With my patients, one-on-one, providing care, providing some sense of continuity and normalcy and doing my best to prevent disease, to do my best to provide comfort and support to those who are suffering.

### *Looking to the future*

People who go to school, who go to concerts, who go to group events, are going to think in the future that if they are feeling sick, they should stay home. I think that mask-wearing will become the norm—for some. It's great not to have influenza or frequent colds.

I'm not an epidemiologist, but I wouldn't be surprised if the corona virus is here to stay. It already was, in a way, with a relatively common cold coronavirus that mutated in a certain way. I wouldn't be surprised if by next fall or maybe the fall after, we have a vaccination that's part flu and part COVID. And 30,000 to 60,000 people likely will die every year in the United States from coronavirus variants. Not to be pessimistic, but I think that's what history tells us.

I'm really concerned about coming out of the 2016-2020 years, bridged by the COVID-19 pandemic. I've never seen such division in the United States. For some, it's a badge of courage to say "I'd rather die than have the tyranny of a mask." That kind of stance has shaken me.

The arc, the thing that seems to be continuing, is that everyone is a scientist, everyone can share information through social media and everyone's an expert. It has been very clear how little people understand about science and the scientific process and how willing they are to accept lies.

Right now, I'm almost more sad than mad about what this says about our country. The unwillingness to say that "we" are more important than "I." I'm dumfounded by that. I thought we were more about doing this together, being a country that can be united. But I'm not very optimistic about that.

Jon Hallberg, MD, is medical director, University of Minnesota Physicians Mill City Clinic, and associate professor, Family Medicine, University of Minnesota Medical School.

# Derrick B. Lewis

## There's nothing quite like a handshake

Before COVID-19, I fancied myself pretty good at handshakes. From an early age, I learned that the handshake was vitally important. It could tell you a lot about a person, and tell them a lot about you. Weak grip? Untrustworthy. Strong grip? Let's be friends. Anything in-between? Who knows what that means. While the conventional wisdom on handshakes is probably nonsense, the act of offering a hand for a handshake is not insignificant. It can be a greeting. It can be a parting. It is often a sign of respect.

But the handshake has taken on a new meaning in the age of COVID-19. The hand has always been a vector of infection, but in the world of COVID it can feel like *the* vector of infection.

As a third-year medical student in clinical rotations, I am constantly meeting new people—many of whom are evaluating me for grades. We switch clinical teams from week to week and even day to day, so making a good first impression is paramount. After all, there isn't much time for recovery. In the past, I would have offered a firm handshake and strong eye contact. These days, you're more likely to see me offer a hodgepodge of fist bumps, elbow taps, half-hearted waves and over-smiling eyes. You never really know what someone is going to respond with. Sometimes, you find yourself playing this bizarre version of rock-paper-scissors where you never quite match up hand greetings. Fortunately, this awkward dance usually still ends in a smile, but it certainly doesn't earn anyone points for style.

*In the past, I would have offered a firm handshake and strong eye contact. These days, you're more likely to see me offer a hodgepodge of fist bumps, elbow taps, half-hearted waves and over-smiling eyes. You never really know what someone is going to respond with.*

Last year, I had a strong handshake to rely on. This year, I'm four months into my clinical rotations and I still have no idea how to greet people. Next year, I'm not sure whether we'll settle on fist bumps, elbow taps, half-hearted waves, over-smiling eyes or something different altogether. Maybe we'll return to the handshake. I certainly hope so. The handshake, like so many other things in time of COVID, is something we took for granted. It can be a salutation between friends, a covenant between acquaintances or even an intimacy between strangers. There's nothing quite like it.

# Veda Bellamkonda, MD

## COVID: The great balancing act

The COVID pandemic magnified the fact that opposing extremes of all kinds coexist together throughout life. Throughout the pandemic I have felt extreme negatives of anxiety and insecurity regarding the future, while simultaneously being overwhelmed with gratitude for all the joys of the present moment.

I feared for my health, the health and safety of my family and the future of my practice. I felt insecure about my future both due to COVID and the rapidly evolving climate crisis.

As a person of color, the weight of systemic racism, especially following the murder of George Floyd, added to feelings of despair. I feared for the safety of my brother, a man of color who was a victim of police brutality as a teenager; for my sister-in-law, a woman of East Asian descent victimized by racist rhetoric during the pandemic; and for the future of my nephews, growing up as young men of color in a society that hasn't fully dealt with its racist roots.

Some of the hardest times for me were not being able to see my family in person when case numbers became too high, and the fear of losing my 7-year-old nephew as he underwent open heart surgery during the pandemic. Conversely, I became extremely grateful for all the blessings of life which I previously took for granted: my health, a steady income, a stable job, relative financial security and living with my boyfriend and not alone as I had for many years prior. I appreciated everyday joys that I had previously overlooked, like the rustling of leaves in the wind, the flight of birds, the beauty of clouds and the music of insects. I became a proud plant mom, marveling each time my pink polka dot plant sprouted a new leaf and reveling at the growth of my spider's plants messy curls.

Netflix (aka *Schitt's Creek* on repeat), take-out food (can't beat Bawarchi Biryani's paneer tikka dosa!) and virtual gatherings with friends and family helped provide me with a sense of comfort and normalcy during the pandemic. Because I couldn't pursue my normal recreational activities, such as travel and dining, I engaged in other interests. I exercised more (I can now finally hold a decent plank!), read more, studied more and prayed more, all of which helped me maintain my mental health.

Our practice saw extreme fluctuations in patient volume. For months, our numbers would be so low that we would worry about the longevity and viability of the practice. This would be followed by seemingly endless weeks of unprecedentedly high patient volumes, prompting concerns of burn-out and fatigue and resulting in loss of staff.

My heart goes out to all the families who suffered through the loss of their loved ones from a disease that might have been prevented if our society had fully embraced scientific recommendations, as well as to the vaccine-hesitant families who feel they have lost bodily autonomy under the societal pressure to vaccinate.

I now stand in moments of continued tension—hopeful that with increased vaccination rates we can make it through the pandemic and resume relatively normal lives, but fearing that the anti-science movement and vaccine hesitancy will continue to impede any return to normalcy; hopeful that our society's racial reckoning can result in a more egalitarian future, but fearful that the grip of systemic racism will never be fully loosened; hopeful that our society can address the climate crisis in time, but fearful that my future may not exist if we fail to do so.

*As a person of color, the weight of systemic racism, especially following the murder of George Floyd, added to feelings of despair. I feared for the safety of my brother, a man of color who was a victim of police brutality as a teenager; for my sister-in-law, a woman of East Asian descent victimized by racist rhetoric during the pandemic; and for the future of my nephews, growing up as young men of color in a society that hasn't fully dealt with its racist roots.*

COVID, the climate crisis and the continued effects of systemic racism have created a time of challenge, but also of hope—a great balancing act.

Veda Bellamkonda, MD, (Vedavathi Bellamkonda-Athmaram, MD) is a pediatrician with Partners in Pediatrics, Brooklyn Park.

# Fatima Jiwa, MD

## Urging—and giving—vaccinations

Fatima Jiwa, MD, a pediatrician, has faced COVID as both a professional and a mother.

Recently, her 13-year-old daughter, who had been vaccinated, tested positive for COVID, with a fever and nasal congestion. She apparently had been exposed to the virus within a week of school starting—a school where masking was voluntary, not required. She had to be isolated in their home, her unvaccinated younger sister had to be quarantined for 10 days and Jiwa was keeping a close eye on her mother-in-law, who lives with the family and is vaccinated, but immunosuppressed.

It's the kind of situation many families are coping with—and a situation that doesn't have to happen, or at least not as frequently as it seems to.

"There is no debate about wearing masks," Jiwa says, with some frustration.

In April, Jiwa signed up through the MMA to volunteer at Community Care Clinics of Minnesota, a family medicine practice in North Minneapolis, doing vaccinations. A team made up of regular staff and volunteers checked people in, drew up the vaccines and did the injections. "It was a real team effort," she says.

Jiwa was giving Pfizer vaccinations (the clinic also had Moderna vaccine). "Adults were lining up around the corner," she says. "It was so heartwarming. They were all so eager and excited to get it." One man in a wheelchair told her he had driven in from central Minnesota because he thought he couldn't get vaccinated near his home.

Because a good number of healthcare providers signed up to vaccinate, Jiwa says she only got to do it one day, but it was an important day for her. "This was people rolling up their sleeves, wanting the shot, thanking us for giving the shot. It was total affirmation," she says. "In pediatric clinic, when we give vaccines, our kids cry."

She was buoyed by seeing the variety of people who came to the vaccination clinic, from around the neighborhood and from other parts of the city, all ages, all walks of life. "I would do this again in a heartbeat," she says. "When I retire, this is what I'd love to do."

By April, the mRNA vaccines were in good supply in Minnesota and quite a few people had already gotten vaccinated. Jiwa says the day she volunteered, they were able to take care of everyone lined up before 1pm. A few weeks earlier, the vaccine clinics went all day because so many people were eager to get vaccinated.

So, she is struggling to understand why some people don't—or emphatically won't—get vaccinated. "We've all had a high school education at least, we've all learned something about the scientific process," she says. "But we're not all using our critical thinking skills. That's what I tell my older patients, who are young adults. Can you please use your critical thinking skills to determine if the vaccine is something you should get? Don't just listen to what people around you are saying."

Vaccination, not just COVID vaccination, is important, Jiwa says, and she is impatient with the idea that it goes against religion. "I'm a religious person, and my kids get the HPV vaccination because I want to prevent cervical cancer. They will also be taught abstinence theory, they will be taught not to have sex or to have protected sex when they are ready for that. I'm not going to simply say they won't get HPV because it's not in our family. No, it's not in our family, but I want to protect them.

"You believe you shouldn't mess with your body because it was blessed by God? What do you think you're doing with processed foods, and the tattoos we're putting on our bodies and the piercings we're doing? All of that is changing our bodies."

*We've all had a high school education at least, we've all learned something about the scientific process, but we're not all using our critical thinking skills. That's what I tell my older patients, who are young adults. Can you please use your critical thinking skills to determine if the vaccine is something you should get? Don't just listen to what people around you are saying.*

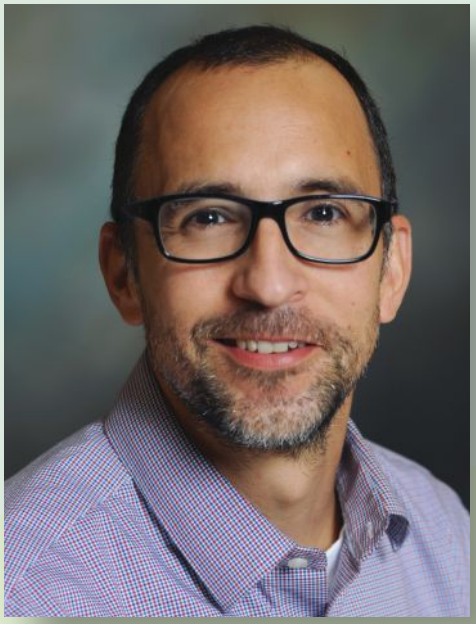
Jiwa urges the parents of the patients she sees in clinic to get vaccinated, but "unfortunately, I have not been able to convince any families that have already decided they are not going to get it. I just let them know we have it in our clinic, that I'm happy to give it if they change their minds."

One bright spot, Jiwa says: Some families who don't normally get the flu vaccine have done so this year because their children are too young for the COVID vaccine at this point and they want to protect them as much as they can.

# Dmitri Drekonja, MD, MS

## Our health system is not well

The COVID-19 pandemic has brutally exposed weaknesses in our healthcare system. They were present pre-COVID, and many pages have been devoted to pointing them out and educating the public about them. When I entered medical school in 1998, it was still common to have public officials from both major political parties declare that the U.S. healthcare system was "the best in the world." Yes, there was hand-wringing about the uninsured, and some talked about the fact that our costs exceeded those of any other country, but the prevailing sentiment was that the United States had the best hospitals, doctors, researchers and public health systems in the world. A sick world leader? Flown to the Mayo Clinic. Nobel prizes in medicine? Seventeen of the 25 Nobel laureates from 1988-98 were from the United States. Outbreak of a novel infection? CDC experts were soon on-site. What country could be more prepared for the worst pandemic in a century?



*The current wave of infections, now almost exclusively caused by the Delta variant, has exposed the final weakness in our healthcare system, which is that far too many Americans do not trust medical professionals.*

The sad answer is: many. Today, one in 500 Americans has died of COVID-19; no other country has reached such a high ratio. Two states, Alaska and Idaho, have recently announced that they are implementing crisis standards of care—meaning that scarce resources like intensive care unit (ICU) beds and dialysis would be allocated to those most likely to survive. Those deemed unlikely to survive would be cared for as best able. In other states, including Minnesota, we have become used to searching for the few remaining ICU beds in the state to transfer patients to, and have deferred elective procedures (some not truly "elective"). This ultimate "hard outcome" has shown us that we need to revisit what our health systems are capable of.

Those of us in medicine understand that a lack of beds is not really about the beds; it's about the skilled team needed to treat the *people* in the beds. For years, demographers and health economists wrote about the aging workforce in medicine and how soon the retirement of experienced nurses, respiratory therapists and other vital members of the healthcare team would lead to a staffing crunch. Few predicted that the timing of this would coincide with a pandemic. At the onset of the pandemic, I witnessed people returning to medicine from retirement. Critical care and infectious disease colleagues returned and took on the burden of clinical care, despite quickly realizing that COVID was particularly deadly for those in their age cohort. Nursing colleagues relayed similar stories—people came together to face a crisis. With the emergence of effective COVID-19 vaccines in December 2020, it seemed like we had weathered a terrible storm and, as cases abated in the spring of 2021, most of these colleagues happily returned to retirement, joined by many new retirees who were only too happy to retire after a grueling year of COVID-19. We now recognize that we are not staffed to face our current health crisis—or the next one, if it comes soon.

The current wave of infections, now almost exclusively caused by the Delta variant, has exposed the final weakness in our healthcare system, which is that far too many Americans do not trust medical professionals. The signs of this were present early in the pandemic, when record numbers of public health professionals resigned in the face of hostility from communities unwilling to follow guidance designed to limit the spread of infection. This distrust has spilled into emergency departments and medical wards, as families of unvaccinated patients demand the treatment *du jour* forwarded to them. Hydroxychloroquine! Zinc! Vitamin C! Ivermectin! Clinicians now spend hours explaining that none of these "treatments" have shown benefit in well-conducted trials to patients and families who have repeatedly refused vaccination with incredibly effective vaccines. Arguments such "less than 1 percent of people die" are triumphantly presented to clinicians by people fully vaccinated against poliovirus—which causes the feared paralysis in one of 200 infected people.

How do we cure our health system? As with most things, there is no quick fix. What caused our poor outcomes? A strong case can be made that underinvestment in public health—those charged with tracking and preventing the spread of disease—is

a major contributor. Re-invigorating these systems will take time. Training and hiring new healthcare workers will also take time—assuming that enough still want to enter a field where they are jeered and heckled. Finally, we have serious rebuilding to do: Trust. Scientific literacy. Community. A willingness to be inconvenienced for others. How these can be rebuilt is not a question I can answer. But it's something we need to answer as a society, because this pandemic has shown us that our system is not up to the challenge.

Dimitri Drekonja, MD, MS, is chief, Infectious Disease Section, Minneapolis VA Health Care System, and associate professor of Medicine, University of Minnesota.

# Krista Olsen, MD

## When COVID hit home

Krista Olsen, MD, started feeling ill in mid-March 2020, just after she and her husband, R.J. Kern, a professional photographer, came back from a brief vacation. A family member who had been staying with their 4- and 5-year-old children while they were gone seemed to be ill and said she had a sinus infection. Both children were rosy-cheeked and a bit hot. Two days later, Olsen kept waking up in the middle of the night. "I felt like I'd been hit by a truck," she says. The next morning, her temperature was 102.6F.

PHOTO BY R.J. KERN

"I tried to get tested, but even though I was a healthcare provider, they wouldn't test me," she says. "At that time, there weren't enough tests. I was sick for about three days of fever and body aches, then the fever went away. On Day 5 of being sick, I completely lost my senses of taste and smell. That next morning, I was able to get in and get a test. Now, when I look back at it, I was sicker than I understood."

Her test came back positive for COVID-19. Although her husband and children were not tested at that time, Olsen is certain that they, also, had COVID-19.

When she was confirmed as positive, Olsen says, the Centers for Disease Control (CDC) and Minnesota Department of Health guidelines were that anyone who had—or suspected they had—COVID-19 needed to stay quarantined until seven days after their first symptoms and/or three days after symptoms resolved. She could have gone back to work eight days after becoming ill, but her group, ObGyn Specialists of Edina and Burnsville, decided to wait at least 16 days before she did any kind of patient care.

Although she wasn't seeing patients in person, Olsen was still working. She did some leadership and social media activities for her group from home and she began doing virtual office visits with patients.

Olsen was a leader in her group in figuring out just how to do virtual visits, almost overnight. She is certified as a life coach and had already been working with women all over the country for more than a year, using Zoom to connect with them. She was able to put that experience to use in helping set up safe Zoom visits for patients. "Because of the national emergency, some of the barriers we had in the past to virtual visits were loosened," she says. "We were able to get safe access to Zoom and we set up private 'meeting rooms' for each physician using password-protected links."

*Besides doing virtual visits as part of her clinic, she is very careful about what she does between work and home. "We don't know that the kids had COVID-19 or, even if they did, that antibodies will protect them," she says. "And I'm still working in a hospital and then coming home."*

Olsen has been back at work for more than a year but she has made a number of changes in the way she works. Besides doing virtual visits as part of her clinic, she is very careful about what she does between work and home. "We don't know that the kids had COVID-19 or, even if they did, that antibodies will protect them," she says. "And I'm still working in a hospital and then coming home." She changes clothes when she leaves the hospital and leaves her shoes outside the door when she gets home. Her group has gone to wearing a white coat over washable scrubs, even in clinic—no more personal style statements through clothing—to minimize any possible transfer of the virus.

# Stephen Richardson, MD

## From an idea to a team effort to a low-cost ventilator

Stephen Richardson, MD, a cardiac anesthesiologist with the University of Minnesota Medical School and M Health Fairview, is nothing if not prepared.

After a lecture in medical school almost 10 years ago, where the lecturer warned that when the next big pandemic came there would not be enough ventilators or masks, he bought a box of 20 N95 masks at Home Depot.

In January 2020, when the first information about a new coronavirus was coming out of China, Richardson was on a trip with some friends. "I told them, when we get home, go buy some N95s because pretty soon you won't be able to get them at all." He bought a couple of respirators for $30 each.

"In the back of my mind was, 'Are we going to have enough ventilators?' That was a huge concern early on," he says. "I wasn't really thinking, 'Okay, well how can I fix this problem?'"

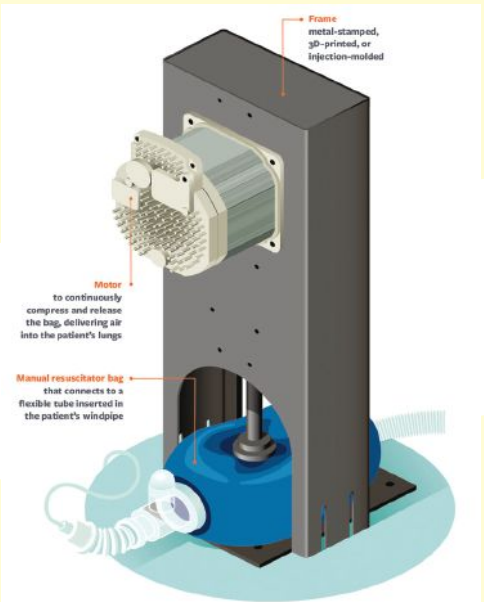



IMAGE USED COURTESY OF ILLUSTRATOR LISA HAINES AND THE UNIVERSITY OF MINNESOTA FOUNDATION'S *LEGACY* MAGAZINE

Richardson was reading a Harvard Business Review article about creativity and innovation, and had just seen information about $15,000 rapid-response grants for COVID-19 projects and remembered that during the polio epidemic in the 1950s, medical students hand-ventilated patients round the clock. "That was the only time there's been a mass experience with hand-ventilating in the developed world," he says. "I thought, 'Well, how could I do this?'" And he thought he had a way.

The idea was to modify a mechanical-assist LUCAS device that does chest compressions to create a simple-to-use, low-cost ventilator. "If you could make that smaller, you could put an Ambu bag underneath that and have the most basic ventilator," Richardson says.

*The idea was to modify a mechanical-assist LUCAS device that does chest compressions to create a simple-to-use, low-cost ventilator. "If you could make that smaller, you could put an Ambu bag underneath that and have the most basic ventilator."*

He slept on his thoughts, then woke up the next morning and called a friend, Jim McGurran, a biomedical engineer, who said, "Let me make a call."

And they were off. "Seven hours later, we had our first working prototype," Richardson says. "And then it just went 1,000 miles per hour from there."

From 2am on a Monday morning, when Richardson emailed Art Erdman, the medical devices director at the University of Minnesota, with his idea, to production of the first 3,000 by Boston Scientific to FDA emergency approval took just a little over two months. The majority of the devices, called the Coventor, went to India, Richardson says, during its COVID surge.

"It has deranged my sense of what is possible," Richardson says. "In the best way, it was a life-deranging experience."

The team Richardson pulled together included people from the University of Minnesota, Medtronic, Boston Scientific and United Health Group. "As one of our pediatric surgeons likes to say, "If you get in trouble in the middle of the night, load the boat,'" he says. "That's what we did. We got all the smartest people we could find to get on our team."

At one of the final team meetings, he says, they went around the room to talk about each person's experience. "Everyone said this is the most effective team I've ever been a part of," Richardson says. "When you have something like this to unify the mission, you can accomplish amazing things. People were literally working around the clock, seven days a week, and no one was looking to get anything out of it except to solve the problem."

Others came up with similar concepts to the Coventer, Richardson says, but they tended to be more complicated. "We kept ours incredibly simple," he says. "People have this temptation to want to offer all these complicated things, which are nearly im-

possible to scale and essentially deceiving to an end-user and potentially make it less safe. But no one was ever able to build them at scale. One group that did ended up created something that cost $5,000."

Questions Richardson has taken away from his experience include:

- How do we promote more team-based science?
- How do we promote getting projects completed faster?
- How do we free up dedicated time to let people do sprints at problem-solving?
- How can we streamline regulations, both governmental and inside institutions, to do rapid testing in times of crisis?

"Simply setting up the research protocols to get the Coventor tested almost extended into the timeframe where the initial projections said we would run out of ventilators," Richardson says. "We are potentially facing a future where you have to both build and test something simultaneously, which brings up ethical concerns."

During a crisis, he says, the sophisticated equipment, completely tested over time, may not be available. New options may not have had all the testing that would be best, "but we might be forced into a situation where don't have that anymore. Our other option may be nothing, offering just comfort care."

After the rush—emotional and physical—of developing the Coventor in record time, Richardson says it's been an experience just transitioning back to life as physician, colleague, husband, father, homeowner.

He recalls, happily, the best lesson. "You know they say that if you want to go fast, go alone, and if you want to go far, go together," he says. "We went fast and far with a whole lot of people."

# Alexis del Vecchio, MD

## A year of joy, a year of loss

It has been an absolute privilege practicing medicine during this pandemic. Our volumes, like those of most emergency centers, have been breaking records, and the acuity has never been higher. What is remarkably satisfying about emergency medicine is that providing care and support to the sickest patient who needs to be acutely resuscitated is just as satisfying as talking with the mildly depressed patient who is looking for a listening ear and wishes to get started on the right medicine. We see the full spectrum of human experience, from the highest highs to the lowest lows. For that, I am eternally grateful.

COVID has put a strain on all of us. I see it among my peers and our consultants: the glazed looks, the short fuse … almost everyone is truly burned out. Compassion fatigue is real. We are tired of having conversations with family members of critically ill unvaccinated patients. Is it even worth engaging?

I believe that it is. The root of doctor is *docere*—to teach. And we have this deluge of social media against us. But most patients I have met, if you are willing to engage them in a rational, respectful conversation, are open to having their minds changed. We share a common ethos—to do what's best for our loved ones, to care for them, to alleviate their suffering. Even under the direst circumstances, I found myself empathizing with someone whose views are diametrically opposed to mine and we were able to find common ground.

I implore you. Take care of yourselves, fellow healthcare heroes. Reach out to your loved ones. Don't live isolated on an island. Have a middle-of-the-night-failure buddy you can lean on. As one of my mentors once said, "Have the grace for yourself that you have for your patients." They need you. We need you. Our care for our patients will only be what it should be when practitioners feel cared for themselves.

We've got your back. We are here for you. We are your fellow healers in the trenches, supporting you every step of the way.

Alexis Del Vecchio is a second-year resident, Department of Emergency Medicine, Mayo Clinic.

*Even under the direst circumstances, I found myself empathizing with someone whose views are diametrically opposed to mine and we were able to find common ground.*

# Amy Karger, MD, PhD

## Even the Energizer Bunny gets tired

Amy Karger, MD, PhD, is an associate professor in the Department of Laboratory Medicine and Pathology, University of Minnesota Medical School. Since March 2020, COVID-19 has changed the direction of her research, the kind of work she's doing and, to some degree, her family life.

"When the pandemic first took off in March 2020, faculty from my department were pulled in quickly, especially because PCR and antibody tests for COVID weren't readily available," she says. "That has cascaded to this full thing for me of being involved in COVID work."

Initially, her team was developing an antibody test, with another team doing PCR testing. The two teams worked together in developing and then implementing tests for COVID PCR and antibodies for patient care. Karger started as the medical director of the antibody testing, then, about six months later, she was medical director for the PCR testing as well.

*"When the vaccines rolled out, I thought maybe we'll be done with all of this by the summer," she says. "I was using that as my hopeful landmark for the future. Then the Delta variant happened and it was a punch in the gut for a lot of us that we now had to deal with a lot of this all over again."*

"Our teams, with the Mayo Clinic, were called upon by the state to provide PCR testing," she says. "So I got pulled into the state testing command center group, in terms of helping to provide a lot of test volume, particularly for health systems that didn't have enough capacity."

Her involvement with COVID testing started out of necessity for clinical care, she says, then led to further research opportunities. Today, her team is working on a subcontract from the NCI Serological Sciences Network (SeroNet) to research vaccine immunity in immunocompromised populations.

"One thing this pandemic has done is make my career take a completely different direction than I ever predicted or anticipated," Karger says. "My research interests before COVID were directing clinical lab testing for research studies, but largely focused on non-infectious diseases like chronic kidney disease, diabetes, cardiovascular disease."

She was—and is—involved with clinical lab testing for patient care, which provided relevant and practical experience she could bring to her COVID-related research. She continues to direct clinical lab testing at the M Health Fairview Masonic Children's Hospital and directs point-of-care testing for several lab areas. But, she says, while she continues to be involved in other areas of testing, "a big portion of my time is related to COVID research. In general, it is a very fruitful and rewarding experience to be involved in this cutting-edge research."

It has also been a challenge, professionally and personally.

"I've been busier than I've ever been in my life over the last year and a half," Karger says. "The work hours have not been ideal. I'm normally someone who is a bit of an Energizer Bunny, but even I am finding times when I'm burned out and ready to be done. It's a challenge to keep up the energy, to keep up the motivation, when there's so much work to be done."

She and her husband, an ophthalmologist, have four children. In the spring of 2020, her oldest was a senior in high school and the youngest in kindergarten. "We had all kinds of issues, ranging from virtual kindergarten to trying to manage my kids needs and make sure they were okay. It has required them to be a bit more flexible and independent."

Her husband's work was impacted by COVID, like that of any physician, but not to the same degree as Karger's. Still, she says, he had to pick up more of the home and family needs because she was so busy—even when she didn't have to go in to the laboratory. "While I was grateful for the opportunity to do a lot of virtual work, I just found that work bled into all hours of the day and night," she says. "I was often hiding in my closet on a weekend at 7 o'clock at night doing meetings."

The work energizes Karger, but she isn't sure how long she and her colleagues can continue to stay at the level they've been at for what is now approaching two years. "When the vaccines rolled out, I thought maybe we'll be done with all of this by the summer," she says. "I was using that as my hopeful landmark for the future. Then the Delta variant happened and it was a punch in the gut for a lot of us that we now had to deal with a lot of this all over again."

She tries to work at focusing on one day at a time—and at setting boundaries for her time at home, so she can be there for her family. Although everyone she works with is piling up vacation days because they can't find time to use them—and they aren't really traveling—she forces herself to take a day here or there if she feels herself getting burned out.

Karger knows she's not alone. "I see it in my coworkers and my colleagues, doing the same thing I've been doing, which is just nonstop work and stress. Not only do I worry about myself and how long I can keep sustaining this level of work and how long I can keep going, I worry about them."

# Robert Christensen, MD

## Out of retirement and onto the vaccination bus

Although Robert Christensen, MD, has been retired for more than 15 years, he has continued to contribute to the community in various ways as a volunteer. But the pandemic shut down the kinds of face-to-face volunteer efforts he was involved with.

Early in the pandemic, the Minnesota Medical Association Foundation (MMAF) helped recruit physicians to sign up for the Minnesota Responds Medical Reserve Corps, a nationwide initiative to preregister, manage and mobilize volunteers to help their communities respond to disasters. Christensen signed up—"I took some online classes and got a certificate"—and helped out giving temperature checks to staff at the Hennepin County jail

*Christensen signed up for a number of "tours" on buses that had been retrofitted by Metro Transit to become mobile vaccine clinics, staffed by physicians, pharmacists, nurses and Minnesota Blue Cross Blue Shield employees.*

In April 2021, however, a new opportunity presented itself. COVID vaccines were available and Christensen and his wife had been vaccinated as soon as they could be. MMAF was looking for physicians who would help vaccinate people at homeless shelters and other temporary facilities.

Christensen signed up for a number of "tours" on buses that had been retrofitted by Metro Transit to become mobile vaccine clinics, staffed by physicians, pharmacists, nurses and Minnesota Blue Cross Blue Shield employees. "This was a very worthwhile experience," he says of the teams he worked with. "I enjoyed meeting the people I did; we were a team and it was really fun to be part of the work. Most of these people were half my age."

Christensen gives special praise to Blue Cross Blue Shield, which paid its employees to take part: "They had so many sign up that none of them could do it more than once."

On a good day, Christensen says, he might see 50–60 people vaccinated; other days the number was closer to 20–30.

Although Christensen is a senior and so considered more at risk to COVID, he was not worried. "I was vaccinated and I'm very careful to wear the mask," he says. "I just took care to keep myself safe, so I really wasn't worried that I was going to be exposed. As a surgeon in the 1980s, when AIDS and HIV arrived, we all learned that universal precautions worked."

The experience was meaningful on several levels, he says. "You always get when you're giving." Plus, "I enjoy people—and it was good just to get more vaccines into more arms. I always felt energized when I was done."

Christensen says he is thinking about what comes next in for his community service. "I personally have been chemically dependent and in recovery for 43 years as of October," he says. "Maybe I will do some outreach, be a volunteer in Physicians Serving Physicians," a peer program for physicians and their families affected by addiction.

What's clear is that Christensen will be doing something to contribute, not just for the benefit of the community but for his own well-being. "You've got to get out and stay active in some way, physically and intellectually."

# Christopher Tignanelli, MD, MS, FACS, FAMIA

## Creating a learning health system

COVID-19 pushed M Health Fairview into creating something new for its patients and care teams: a learning health system.

That is, says Christopher Tignanelli, MD, MS, "a cyclical process in which we deploy interventions to improve healthcare, get real-time data to monitor these interventions, analyze that data, learn from that data, then take the learnings and use them to optimize what is deployed."

Tignanelli, an acute care surgeon with M Health Fairview and assistant professor at the University of Minnesota Medical School, is the new scientific director of the Program for Clinical Artificial Intelligence, one of the units within the U of M's new Center for Learning Health Systems Sciences (CLHSS). He was on the frontline using data and developing algorithms as part of a team to help support decisions for physicians, nurses and patients. "We now have a large amount of data on COVID patients, and the more patients we treat, the more data that gets generated," he says. "The question is, how do we use our historic data to deliver data-driven and equitable healthcare going forward?"

*When COVID hit, he says, the M Health Fairview system built in real-time access to data. "We needed to learn as much as we could about this disease: who gets it, who has severe disease. What medications patients might be on at baseline that are protecting them."*

As data was collected early in the pandemic, Tignanelli says, one project led by Monica Lupei, MD, in the U of M Medical School's Department of Anesthesiology, used data to build predictive algorithms that could help discern if a patient who showed up in the Emergency Department with COVID might end up in the ICU or on a ventilator or even die.

"That's helpful information, because then we can sit down with the patient and tell them, 'You have a lot of risk factors; our algorithms tell us you have a high chance of going into the ICU or on a ventilator, and this is why.' It could be because of their age or BMI or heart disease history."

He has had those kinds of discussions with patients and their families, he says. "We call it shared decision-making." The physician, patients and their families engage in data-driven discussions regarding prognosis, treatment and monitoring that are based on evidence-based practices, including the data collected and analyzed.

One important aspect of care at M Health Fairview, Tignanelli says, was the use of "cohorting" COVID patients in several hospitals—and early in the pandemic, at Bethesda Hospital (converted to a COVID-only hospital) and certain units within St. Joseph's Hospital. "We wanted to use those hospitals and dedicated units for patients who had a high likelihood of being there for more than three days, of being ventilated, and so on," he says. "These predictive algorithms helped us to understand who's at higher risk and to explain to the patient why we are recommending transfer was important."

The data-driven approach to healthcare has been going on for 10 years or more, Tignanelli says, but "with COVID, it skyrocketed. It's not only going to persist post-COVID but become ubiquitous."

When COVID hit, he says, the M Health Fairview system built in real-time access to data. "We needed to learn as much as we could about this disease: who gets it, who has severe disease. What medications patients might be on at baseline that are protecting them." Early on in the pandemic, that information informed the development of clinical trials led by the U of M Medical School, which, by the end of 2020, was the lead site for multiple randomized controlled trials across the country testing drugs, such as hydroxychloroquine, losartan, metformin, fluvoxamine and ivermectin.

The learning health system is a cutting-edge concept in healthcare, Tignanelli says, and something the U of M Medical School had been striving to develop for a few years. "With COVID, we said 'Now's the time, all hands on deck, let's build this.' So we built it and M Health Fairview operationalized multiple aspects of it." The team creating a learning health system was made up of more than 100 people, including those from IT, computer science, health informatics, the U of M Medical School, School of Public

Health and Fairview. As a result of these efforts, the deans of the U of M Medical School and School of Public Health jointly developed the new CLHSS, which is led by Genevieve Melton-Meaux, MD, PhD, and Timothy Beebe, PhD.

"It's a living, learning approach," Tignanelli says. "It sounds pretty obvious, but hasn't occurred historically in healthcare."

It actually takes a big team and a lot of expertise to maintain a learning health system, he says. "The reality of the current situation in healthcare is that it takes 17 years for 14 percent of evidence-based practices to make it into routine clinical practice. Health-care systems may implement a guideline or a best practice, based on published data or medical society recommendations. To maintain that though, you have to have people that are reading that literature and remain up-to-date in case best practice changes in response to a new study. You have a process to determine when you update your practice based on any new studies that are published. You have to have a process to monitor the implemented guideline and ensure it is actually providing better care, is deployed equitably and performs equitably. That's the process of living real time."

Being part of the team that is not only treating COVID patients but collecting and analyzing data is challenging and powerful, but also very hard, Tignanelli says. "Last year, after working COVID ICU shifts, I would have to sequester in a hotel for 14 days and couldn't see my family. I must have spent a total of three months in a hotel, not allowed to leave, with things delivered at the door."

That isolation—some of his colleagues would drive by their homes, just to see their families—also helped with the research, however. "Essentially, this is all we were doing last year," he says. "When you're living in a hotel, you do your day shift and then you get back to the hotel and there's really not much to do—except you have this huge database, so why not look at it and do research? People were scheduling Zoom meetings from their hotel rooms at 8, 9 or 10 at night."

Today, Tignanelli's life is closer to what it was before COVID, but his role has changed somewhat. "I have transitioned as a result of COVID from a lone researcher to more of a leader or project manager of multiple different research teams," he says. "As learning health system frameworks become increasingly important to health systems and the University of Minnesota, the CLHSS represents an outstanding opportunity for M Health Fairview and other health systems in Minnesota. This is an area I had a lot of expertise in, so I've been able to take leadership in its continual development."

# Todd Archbold, LSW, MBA

## Piloting a hot air balloon through a pandemic

I have been working with kids and families in mental health care for nearly 20 years. I began my career as a school counselor, where I met my wife, who is an elementary special education teacher. In 2006, I transitioned my work to healthcare, a time when we grew our family and our careers. After proving myself as an instrumental player in growth and innovation at PrairieCare, I was promoted to chief executive officer on January 1, 2020, a position that I was well-prepared for. Without wasting any time, I led our executive team in creating a new strategy plan focused on refinement and excellence and we began building a roadmap for diversity, equity and inclusion. We tried to build more formal partnerships in the community, innovate services through advancements in technology and become a premier organization for education and training.

But only 10 weeks after I took on the role of CEO, a state of national emergency was announced and the whole world changed. My entire attention at work shifted from big-picture strategy to looking inward and caring for our workforce and culture. If we did not create safety and security for our workforce, our mission would perish and we would not be able to care for any patients at all. I was stretched finding my place as a calm and decisive leader, while tending to changing family needs as a nurturing father and husband.

While the terror and devastation of COVID-19 ravaged vulnerable populations, pushed hospitals to capacity and took its toll on the global economy, everyone's mental health struggled. Medical facili-

*"If we did not create safety and security for our workforce, our mission would perish and we would not be able to care for any patients at all."*

## Todd Archbold, LSW, MBA

*(continued)*

ties and staff faced exhaustion with increasing infections and mortality. At PrairieCare, we were facing the emotional impact that everyone was grappling with, including the fallout of those caring for patients with COVID-19. Together, we were dealing with the physical anguish and emotional pain of our communities. This was a time when more people than ever needed mental health care—and there were more barriers than ever trying to access it.

I could never have imagined this kind of event in my lifetime, much less 10 weeks into the most important position I have ever held. I was responsible for hundreds of jobs and tens of thousands of patients and their families, which weighed heavy on my shoulders.

I've often used the metaphor of piloting a hot air balloon to describe effective executive leadership:

A good executive is like an attentive hot air balloon pilot sensing the subtle changes in pressure and wind speed and strategically moving to higher and lower altitudes to gently change direction. An astute pilot carefully monitors activity on the ground and intuitively scans the horizon. The vastness of the sky represents opportunity and organizational vision and the beautiful landscape and activity below illustrating the mission at work. On certain occasions, they land their hot air balloons in specific locations to become immersed in details and decision-making. They offer encouragement and direction while maintaining a view of the surroundings.

The impact of the pandemic forced hot air balloons to rise and fall quickly with unpredictable winds causing sudden shifts in direction. Many baskets dragged across the landscape while pilots struggled to find their bearings and connect with crew members. Our ability to tend to the landscape while watching the horizon was impaired as our balloons became tattered and running low on ropes and tethers. Pilots were needed just as badly on the ground as in the sky.

During the most intense periods of the pandemic, leaders (i.e. pilots) had to be both in the sky and on the ground. Previously, too much time in the sky meant a disconnect with reality and the mission, and too much time on the ground meant losing sight of strategy and undermining staff actions. I found myself subsumed in ground-level conversations about masks and cleaning protocols that normally would have been managed by infection control and environmental services. I was simultaneously participating in high-level strategy in evening phone calls with state and federal officials regarding shelter-in-place orders and emergency relief funding. Many days felt like crisis whack-a-mole, dealing with the butterfly impact of rapid changes to policies, the kinks in our transition to telehealth and all the way to the nuances of the vaccination rollout. Our decision making was often guided by the quote from Albert Einstein, "What is *right* is not always *popular,* and what is *popular* is not always *right*."

I found that the unforgiving external forces of the pandemic caused unpredictable internal organizational dynamics, for which historical business-case examples did not exist. The individual problems facing businesses were fundamental in nature, yet the collective weight and interconnectedness of them all were overbearing. The campaign to flatten the curve through necessary but unrelenting messages of masking and social distancing led to an insidious umbrage, seeping through the cracks of attrition and the weariness of quarantine. Through this we discovered there is no universal definition of common sense; social animosity and dissent slowly emerged. The pandemic itself turned into just one face of the multifaceted and ever-changing crisis. The latent racial and socioeconomic inequities in healthcare became another damning layer of complexity for leaders to finally acknowledge.

My skills as a social worker became more valuable than my business acumen. Navigating the sudden changes in society and the magnified uncertainty within healthcare required far more interpersonal connection with the people around me. I found courage through the amazing people around me at PrairieCare and comfort from leaders in other health systems facing the same challenges. I learned that whether you had been CEO for 10 weeks or 10 years, we were all in this together. As stressful and enduring as things have been, it has never an option to stop doing one thing in favor of doing another. While strategy and innovation remain important, the most valuable use of my time continues to be connecting with our workforce. We launched numerous staff appreciation campaigns ranging from treat carts, coffee bars and handwritten cards to clinical supervision, staff development programs and recognition awards. We had to become far more in tune with the various workplace languages of appreciation and leaders had to be more visible than ever, in spite of wearing masks, endless video meetings and social distancing. Personally, the emotional responsibility I felt for caring for my family at home now extended to our 800 employees and even the few scared and lonely strangers I saw in the grocery store or at the gas pump. We are all in this together. When so many things become uncertain, the few things that are most important become clear.

This was never how I imagined the role, but I found myself grateful that I was in this position at this particular time. We focused a lot of our attention as a leadership team on maintaining proper form, being courageous and articulating models on how to focus our time at work so we could be in solidarity within one another (our "70/20/10 Mindset": https://www.headheartleadership.com/702010-mindset.html). The boundaries between being at home and being at work were blurred more than ever—the emotional investment became equal yet overflowing for both, and the physical boundaries of my home and work offices became irrelevant.

Despite the volatility and challenges, since the onset of the pandemic we had some unforeseen victories. We increased our workforce numbers by 8 percent and overall patient visits by more than 10 percent. We successfully completed a Joint Commission reaccreditation survey and revamped our operational model into new service lines. Due to the increased demand for care, we were able to receive legislative approval to expand our hospital capacity.

At home, we helped our kids with distance learning and found safe activities to keep them busy and socially engaged. Our young

daughters (ages 4 and 6) were more easily entertained with building pillow forts, playing with Legos and doing crafts. Our 13-year-old son struggled to limit screen time, but enjoyed summer camping trips and found deep purpose in being a big brother. My wife and I found ourselves having amazing and meaningful conversations about life, afforded to us by contemplating this disorienting and uncomfortable epoch. We also talked with our son about racial discrimination and equality, learning just as much from him as he did from us. In whatever spare time we had, we cooked better meals, read books and took turns doing virtual workouts in the basement. Our family remained healthy, socially connected and financially secure—something that we don't take for granted.

We continue to fight each day to beat the pandemic and some days we are more successful than others. The ongoing social divide and polarization of viewpoints remains one of the biggest threats as the virus continues to find opportunities to mutate and become more lethal. While hosting listening sessions with staff, I find the social worker in me taking control and gushing with equal amounts of empathy and compassion as I connect with individual stories and the re-humanizing of our work together. I've gotten to know people in far different ways than I expected through candor and raw vulnerability.

Robin Williams famously said, "Everyone you meet is fighting a battle you know nothing about. Be kind. Always."

I hope that future generations never have to experience a crisis like the COVID-19 pandemic. If we do, I hope that we will have built the necessary infrastructure and contingencies to prevent further discord and respond in unity. We have all been deeply moved and forever shaped by the pandemic. For many, our experiences resulted in trauma, loss and heartache. Others have developed new perspectives and redefined resiliency.

The three things that I have learned from the pandemic—so far:

- Nothing is permanent, and things can change quickly.
- Life is about relationships.
- The person we have the most to learn about, is ourself.

Todd Archbold, LSW, MBA, is CEO of PrairieCare.

# Ruth Baker

## My first patient

I spent June through September 2020 in online medical school. In-person instruction was put on hold shortly before the end of my second year. After spending what felt like a lifetime agonizing over Step 1 of the boards, I finally made it to the long-awaited transition from didactic to clinical instruction, only to find myself once again in front of a computer screen instead of a patient. COVID meant that clinical rotations were delayed, and I was back in my childhood bedroom in a house full of five adults, all adjusting to the new work-from-home reality. My remote learning continued amidst the constant background hum of various family members' work-related phone conversations. Friends I caught up with from a distance openly guffawed when I told them I was learning surgery on the internet. This experience is one I imagine medical students across the country can relate to, but because I was so isolated from my peers, the pandemic's restrictions on medical education felt to me like a very personal struggle. I wondered whether any additional minute I spent outside the four walls of a hospital or clinic offered even an ounce of utility in my preparation to become a physician.

While I was frustrated with remote learning, I was also concerned with a few other, more universal challenges posed by the pandemic. I worried about my mom who was working as a physician on the front lines, about my sister living in New York City where infection numbers quickly climbed and about my near 100-year-old grandparents who had become isolated to their living facility (one of whom eventually succumbed to the virus).

I also spent time thinking about my would-be patients, those who I was meant to be getting to know, advocating for and learning from as a third-year medical student. Mostly, I considered how many of those patients might be affected directly by

*Because I was so isolated from my peers, the pandemic's restrictions on medical education felt to me like a very personal struggle. I wondered whether any additional minute I spent outside the four walls of a hospital or clinic offered even an ounce of utility in my preparation to become a physician.*

## Ruth Baker

*(continued)*

COVID—what symptoms they were experiencing, what treatments they might be offered, and how their comorbidities would impact their likelihood of survival. I didn't spend much time thinking about the indirect impacts the virus might be having on their health.

When I was finally allowed into the hospital for in-person rotations in October, I started on the internal medicine service. On my first day on the wards, I was asked to follow a patient admitted a couple of days earlier. I spent the better part of an hour reading about her before feeling like I had wrapped my head around the story well enough to introduce myself and ask some questions.

The patient was a middle-aged woman. She had presented to the emergency department septic and confused. Her initial exam revealed a likely source of infection: a large fungating mass in her axilla. I reviewed photos in her chart multiple times—I had never seen a wound like this. Based on its size, it must have been growing for many months. After breaking through the skin, it served as a portal for bacteria to enter her bloodstream. A few days after we first met, her breast cancer diagnosis was confirmed.

We learn a lot about cancer in the first two years of medical school, mostly on the cellular level. Eventually we graduate to learning about screening guidelines and treatment options. Despite the time we commit to memorizing the adenoma-carcinoma sequence and the frequency with which certain populations ought to have a mammogram or colonoscopy, we delve little into the ways cancer might present if allowed to grow unchecked for extended periods of time. Maybe this is because these presentations each look different, or because the outcomes are easy to assume. It was for this reason that I read about this patient for so long before I felt ready to say hello; none of my multiple-choice board prep questions had tested my knowledge of cancer aggressive and unbridled enough to forge its way from some internal structure all the way to the skin, leaving a path of destruction in its wake. Nor did these questions help me understand why, when that cancer is making itself so visibly known to the host, that person might be slow to seek medical help at the first, second or even third sign that something was wrong.

I spent a good portion of every day that I followed this patient reading about her presentation, reviewing recommendations from her multiple consultants, updating her family via phone (due to pandemic visitor restrictions in the hospital) and spending time at her bedside. I heard stories about her dog, her children and her work. I came to know that even on days when she wasn't up to eating much, she wanted to be sure that the paper cup full of jelly beans on the bedside table was within reach, especially as moving became more difficult for her. I enjoyed spending time in her room, even just to be a sounding board for her grievances. The progression of the cancer made her body susceptible to a variety of complications, each of which added new stress to an anxious patient in an already unimaginable situation and offered a new learning opportunity for me. This was my first exposure to splinter hemorrhages and other skin findings of infective endocarditis. After she developed pericardial and pleural effusions, I did my first bedside ultrasound to assess her volume status. When I relayed new information about additional diagnoses and treatment plans to the patient and her family, I came to know it even better myself. This was the kind of relationship-building and learning that can truly only take place at the bedside. The challenge of walking with a patient through a new cancer diagnosis or the feeling of being humbled by an aggressive disease cannot easily be imparted over the internet.

It was easy at first to assume the circumstances that may have shaped this patient's decision to stay at home for as long as she did. I figured that like many of the patients treated at the safety-net hospital, she might be uninsured or fearful about the costs of seeking care. As I have learned quickly in medicine, it does little good to assume much about a patient's home life or decision-making processes. The explanations I created in my head were, as you can probably predict, quickly debunked. This patient had stable employment, good health insurance and solid family support. So why did it take her so long to come in?

Despite following her for more than a week, until she required a transfer to the ICU with difficulty breathing, I never asked her straight out why she waited so long to come in. I think I refrained because I felt like the only purpose it would serve was to satisfy my own interest. The insight I got ultimately came from the patient's daughter. She suggested that the patient's pandemic-related fear of leaving the house, along with the idea that she would be knowingly exposed to ill individuals at a hospital, likely exacerbated an existing tendency to avoid doctoring unless absolutely necessary. The same pandemic that had kept me from the hospital for more than six months also dissuaded this patient—and probably countless others—from seeking medical care. Of all the invaluable things I learned from my first patient, this lesson in recognizing another hidden barrier to healthcare access has stuck with me the most. I wonder how many more patients are currently refraining from going to a hospital or clinic because of their fear of contracting the virus, even knowing that their symptoms could be a sign of serious disease. This fear-driven avoidance is one of the innumerable, indirect effects of COVID—the cost of which cannot easily be measured.

Ruth Baker is now a fourth-year medical student at the University of Minnesota Medical School.

# Susan Kline, MD, MPH

## COVID meant a new direction for research

Although the Pfizer, Moderna and Johnson & Johnson vaccines for COVID-19 have been available in the United States since the beginning of 2021, research continues on other potential vaccines, including Novavax.

Susan Kline, MD, MPH, professor of medicine and infectious disease physician with the University of Minnesota Medical School and M Health Fairview, is the lead investigator for the Novavax trial at the U of M Medical School. "It will be beneficial in this country," to have another vaccine available, she says, "but worldwide, we still have huge numbers of people to vaccinate. Having more options available to get to more people will help."

*Kline is the lead investigator for the Novavax trial at the U of M Medical School. "It will be beneficial in this country," to have another vaccine available, she says, "but worldwide, we still have huge numbers of people to vaccinate. Having more options available to get to more people will help."*

Participants in the Novavax trial are still being followed and, Kline says, plans are underway to offer current participants a booster dose. She expects the results from trials that ended in June to go to the FDA sometime soon. "I think we have to see the more recent data; data that came out in June was from late spring," she says. "Vaccination efficacy about 90 percent."

As seen with the Pfizer and Moderna vaccines, Kline expects that the Novavax vaccine may show some waning immunity over time and that a booster dose might help prevent later cases of COVID-19 from developing.

Although she had been involved in a vaccine trial before, COVID-19 changed both her professional focus and her personal life. "My research focus took a new road, not one I had anticipated," she says. "I had never been as deeply involved in vaccine trials as I have been this past year, but I wanted to get involved and do my part."

She was also involved in clinical trials on whether remdesivir was an effective treatment—in fact, it was through that trial that she got involved with the Novavax vaccine trials. Her prior research focus was largely on infection prevention and control, rather than treatment, but she brought her research skills to the task.

"I have enjoyed being involved in these large-scale clinical trials," Kline says, "But there was a lot of time pressure due to the need for better therapeutic agents and vaccines right away. That has taken some focus away from personal time."

Family connections help sustain her, she says. Her son lives in California and her parents in Colorado, so there was an extended period of not being able to see each other in person. "We made efforts to connect, and to try to do it safely."

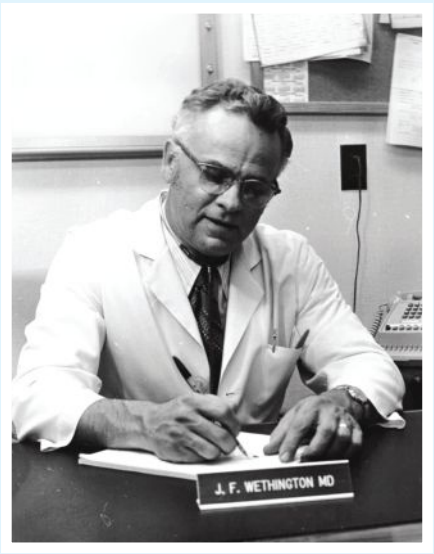
As a researcher, she was able to work from home—and the work was intense. "It becamse harder and harder as time went on to just work from home," Kline says. "Professionally, with my patients, with my work colleagues, my family, my friends. Zoom meetings wear thin after a while. Humans need ongoing in-person contact with other humans to thrive." **MM**

# Those we've lost

BY SUZY FRISCH

Among the long list of Minnesotans who died from Covid-19 (nearly 8,000 as of mid-September) are physicians who spent decades working and leading in medicine.

As of mid-September, the Minnesota Department of Health (MDH) reported more than 46,000 cases of COVID-19 among healthcare workers since the beginning of the pandemic, with 40 deaths. There is no separate tally of physician cases or deaths. Exposure to COVID through patients or coworkers is a small percentage of healthcare worker cases; in most cases, especially before vaccines became available, the source of exposure for healthcare workers was household or social contact.




## *Joseph Wethington, MD, PhD*

### The dedicated community physician and leader

Joseph Wethington, MD, PhD, lived and breathed medicine, making it his life's work to treat patients and ensure that people had access to services in all stages of their lives. A family medicine physician, Wethington enjoyed a varied career that included serving as Anoka County medical examiner, establishing and growing medical clinics and programs, leading medical practices and staffing emergency rooms—all on top of his own clinical practice.

After retiring from clinic work in the early 1990s, Wethington stayed active in medicine by serving as medical director of a nursing home and volunteering his services at a free clinic in Minneapolis. He stayed curious about medicine well into his 90s, relishing conversations with granddaughter Anna Wethington, MD, about what she was learning in medical school and her internal medicine residency. He wanted to know more about everything from cytokines to cancer treatments.

"Somehow every discussion we had went back to medicine and what he loved about it and missed about it. He was always wanting to learn more about medicine," says Anna Wethington, who recently started her first job at the Park Nicollet Clinic in Minneapolis. The last conversation she had with her grandfather was about COVID. He wanted to know what she thought and read about the disease and what healthcare facilities should be doing.

Wethington, 93, contracted COVID and died in April 2020. Born in 1926 in Huntington, West Virginia, and raised on a dairy farm, he earned a doctorate in anatomy from the University of Minnesota before embarking on medical school at the University of Ottawa. Wethington taught anatomy while attending medical school. Returning to Minneapolis, Wethington completed his residency at St. Mary's Hospital, where he met two physicians, Matthew Plasha, MD, and James Sipe, MD, and joined them in their growing practice in Coon Rapidsin 1961.

He was instrumental in growing the clinic into a multispecialty practice called Comprehensive Medical Care with 47 physicians and seven locations. Eventually it became part of the Allina Health system. In parallel, he served as the Anoka County medical examiner for 26 years. His daughter, Margaret Arnold, recalls being in the car with her siblings when Wethington would get summoned over the radio to the scene of an accident. It seemed normal.

So did Wethington's long hours working at the clinic and in the emergency rooms at Mercy and United hospitals, where he was a charter member. Long interested in geriatrics, Wethington helped establish the Anoka County Well Senior Clinic and the Mercy/Unity hospice program.

Wethington and his wife, Ellen, joined efforts at their church to open and support a medical clinic in San Lucas Toliman, Guatemala. For his many contributions to medicine, the Minnesota Medical Association gave Wethington its 1990 Physicians Award for Community Service.

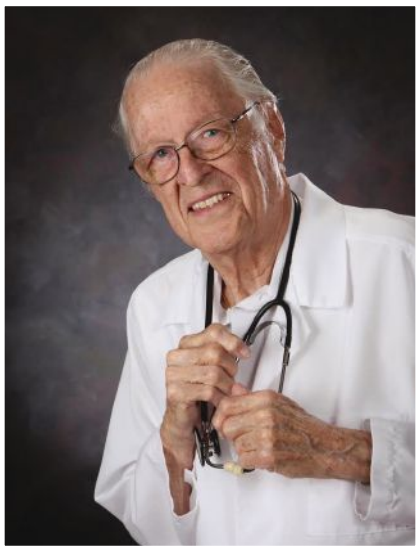
"He worked harder than anyone I know, longer than anyone I know, and put his

six kids through college. He had a lot of energy and was always go, go, go," Anna Wethington says, noting that her grandfather's constant work shaped her approach to being a doctor, including incorporating more work-life balance. "His four loves were medicine, family, gardening and travel—and he could talk about them all day long every day in whatever order."

Wethington threw himself into many passions, including gardening and agriculture, reading voraciously and writing. He was on a first-name basis with the medical librarian at Abbott Northwestern Hospital, where Wethington would pore over medical literature.

"He was passionate about bringing together not only the patient care, but also solving medical problems," Arnold says. "He really wanted to understand the science behind what was happening and be current."

Wethington also was the life of the party, who loved to gather with his large extended family, including 14 grandchildren. With Anna, two other grandchildren followed Wethington's footsteps into healthcare: Claire Arnold is finishing her final year of medical school and Ellen Arnold is pursuing a degree in pharmacy, both at the University of Minnesota.



## *Richard Salk, MD*

### The classic small-town physician

During a 51-year career as a family medicine physician in Albany, Minnesota, Richard Salk, MD, served as a pillar of the community who was there for people no matter what. He made it a practice to see patients seven days a week, delivering more than 3,000 babies and treating all manner of ailments, illnesses and farm and car accidents in central Minnesota.

Then, after long days seeing patients, Salk made time to serve for decades on the local school, nursing home and hospital boards. He also helped establish the Albany Medical Center, Albany Community Hospital, and Mother of Mercy Nursing Home and directed the men's choir at church. He never complained about his lengthy days with patients, says his son Greg Salk.

When Greg Salk asked his father about his deep commitment to work, Salk replied: "I really love the science of medicine, I love helping people and I never view it as a job. In my mind, I never worked a day in my life."

Born in Sauk Rapids in 1925, Salk died of COVID in November 2020 at age 95. He already was in declining health at that point, but likely would have found it noteworthy that it was the virus of the century that took him out, Greg Salk says.

Salk's potential shone bright and early, when he completed medical school at the University of Minnesota and became a fully licensed physician at age 23. Salk enlisted in the U.S. Navy during World War II and completed his education at the Navy's behest, ultimately serving in the U.S. Air Force as a physician during the Korean War. (Most of that service involved delivering babies on base in Cheyenne, Wyoming.)

Salk thoroughly enjoyed his patients and being a steady, consistent family physician through the generations. As a prototypical small-town physician, Salk would see patients at the nursing home and hospital in the morning, treat others at the clinic during the day and then finish his work by doing rounds again with patients at the hospital and nursing home. He also made regular house calls when needed.

"One of Dad's peers told me, 'I've never known anyone who worked harder than he did. And more importantly, I've never known a more compassionate doctor in my life,'" Greg Salk says. "He was always fighting for those who were underserved."

As Salk aged and moved into the nursing home he helped establish, Greg Salk noticed the impeccable care his dad received. He commented to a nurse that he was very impressed with the staff's stellar treatment for his father. She responded that Salk served for years as the family doctor for many staff members; they wanted to provide him the same compassion and care he showed them. Salk frequently completed quiet acts of charity, including paying for a patient's specialty care and for a promising student's medical education.

The father of 12 children, Salk and his wife, Jean, demonstrated a strong work ethic, commitment to serving others and deep compassion, his son says. Though none of their children pursued medicine, Greg Salk's daughter, Hannah Salk-Elsenpeter, MD, recently completed her family medicine residency and started practicing at Cuyuna Regional Medical Center in Crosby. She had other opportunities, but Salk-Elsenpeter wanted to follow in her grandfather's footsteps of serving families and the community with personal, continuous care, Greg Salk says.

Over the years, Salk made a giant impact on his community. He leaves a legacy of quiet service, expert medical care, the love of a good joke and the ability to connect with anyone and everyone. "He had an intrigue for the science of medicine. He was a compassionate man and he loved to help people," Greg Salk says. "It was the perfect marriage of the God-given gift of a brilliant mind and a generous soul." MM

Suzy Frisch is a Twin Cities freelance writer.

Kris Ehresmann, RN, MPH, and Ruth Lynfield, MD

# IN THE public health hot seat

*Ruth Lynfield, MD*

*Kris Ehresmann, RN, MPH*

Since the start of the COVID-19 pandemic, Kris Ehresmann, RN, MPH and Ruth Lynfield, MD, have become two of the most prominent faces of public health in Minnesota. Both are veteran public health leaders in the Minnesota Department of Health (MDH). Lynfield, a pediatric infectious disease physician, serves as state epidemiologist and medical director, while Ehresmann, is director of the Infectious Disease Epidemiology, Prevention, and Control Division.

During the nearly two-year crisis—and counting—Ehresmann and Lynfield have played central roles at countless news conferences and public forums about the state's pandemic response. They are called on regularly to dispense information about COVID, transmission, infection prevention, masking, vaccines, variants, and more to health care audiences and the public. In an interview with Minnesota Medicine this fall, they discussed being thrust in the spotlight, restoring public trust, lessons learned from the pandemic and how it might end.

***In looking at the state's pandemic response, what strategies have been most effective?***

**EHRESMANN:** Our work on case investigation and contract tracing, looking for outbreaks and the whole genome sequencing done by our public health laboratory, the data that we've been able to collect, share, and use for decision-making—in those areas we have been successful. The vaccination roll-out and the work that has been done to make sure that vaccines are widely available has been amazing. What has been a challenge has been that the landscape has really changed over the last year. We're in a very different place with the public. The public view of the pandemic, the politicization of the pandemic, those things have made what we need to do really difficult.

**LYNFIELD:** In terms of success, we have been working for many years with partners in the clinical community and the local public health community. Those relationships and partnerships have been so important over the course of the pandemic. Working with MMA, MHA and the infectious disease and other clinicians and infection preventionists—it's been critical to have those partnerships and those with local public health, especially when we have a brand-new disease with a lot of unknowns and recommendations that are evolving. It has been so important to work together and be able to refine our guidance, refine our approaches and be in very close touch with those who are on the ground.

***When have those partnerships been especially important?***

**LYNFIELD:** When the pandemic first started and there were outbreaks in long-term care, we had to have a good understanding of what was happening there, their access to PPE and their understanding of infection prevention. It's one thing to put out guidance but it's another to understand where people are at, and what tools they have. So, we did work really closely with partners in long-term care to learn what was happening. We got a better

understanding of transmission occurring when people were pre-symptomatic and how quickly it can spread in that setting. We got a better understanding of the need to help people with PPE and donning and doffing and getting access to appropriate PPE. We also had an understanding of the trauma that people working in long-term care were experiencing, and that the residents and their families were experiencing. When Kris was talking about the politicization of the response, that's why it's so hard because we really do need the whole community to work together and to be going forward in the same direction.

### *How do you overcome this politicization?*

**EHRESMANN:** It is difficult. Ruth and I are career scientists with MDH and are dedicated to working for the public's health. It has been agonizing to watch how politics have played into the public health response with this pandemic, and the vitriol that has emerged. Neither of us is in a politically appointed position. We have tried to emphasize that, and we've tried to lead with the data and the science.

**LYNFIELD:** MDH is all about partnerships, partnering with people in the community to get the messages out and have staff ensure that they are connecting with trusted leaders in the community to be sure they understand the information. We really try to get out there in the community. Kris does multiple media calls and makes herself totally available to explain things and to be sure that the information and recommendations can get out there and be understood. But it is very hard. As Kris was articulating, we are in a polarized environment, people are traumatized, they are tired and there are many people who have been impacted by this in so many ways. I think we have lost some of the cohesiveness of our communities and we still have a lot to do to get people back together.

### *How has this pandemic been different from other disease outbreaks?*

**EHRESMANN:** In a meeting last week, Mike Osterholm was asked about the Mankato meningitis outbreak [in 1995] and what we can learn from that experience that we could translate to the current day. He said "absolutely nothing." The world is so different, and there is a lack of community cohesiveness and support for the pandemic response. Then, there was unity and the community came together.

One of the things we've been asked about is COVID-19 disease in schools and the lack of implementation of public health guidance by districts. MDH has the isolation and quarantine statute that can be used to enforce certain public health guidelines, but we have never used it in my 32 years with the agency. We never had to. In the past, if we had a measles outbreak in a school, or tuberculosis, we worked with the school. We would say, "This is the public health guidance. This is what needs to happen." We worked with the schools on what should be done, and they would follow our guidance. Now, not only are they not following guidance, many are actively not cooperating. The schools are the most vigorous embodiment of what's happened with COVID. Never have we had so much public pushback or outcry for things we've had to do. To be fair, we never shut down the state quite like happened in this situation. In the past, there was never that level of anger or animosity on the part of the public like we've seen now.

### *Have there been other differences during COVID?*

**LYNFIELD:** What also has been different is the impact of social media. People are not necessarily turning to us or to the CDC or traditional places for public health information, and that has been a challenge. Also, there have been reports in the media on the toll the pandemic has taken on healthcare workers and on public health workers. There was a survey published in July for the MMWR [*Morbidity and Mortality Report* issued by the CDC] on public health workers at the state and local level in the United States. There were approximately 26,000 people who responded and they had very high rates of post-traumatic stress disorder as well as depression and anxiety. This response has been different. We get angry messages left on our voicemail and angry emails. There have been news reports about public health leaders who have had people protesting outside their house or who are pushing them to resign. This extent of this rage has been unheard of for public health workers during our careers. The person who goes into public health typically wants to be off the radar and is just trying to make a difference in improving the health of people and communities, so the public anger has been quite traumatic for many people.

**EHRESMANN:** When you think about what the pandemic has represented in terms of workload and decision-making and all that goes into responding to the pandemic itself, that's overwhelming and exhausting. And then you add to that people questioning you, saying that you're "evil" for doing the best you can in your job. That is difficult. You do the right thing to the best of your ability, and you're vilified by the public. That is what leads to what Ruth is saying about depression and PTSD. It's been a really, really tough year.

### *What has that been like for you personally?*

**EHRESMANN:** I can say that it's been a very interesting experience. On the one hand, I've gotten just hideous hate mail from people that I don't even know. It's awful. On the other hand, I've gotten kind thank-you notes from people that I don't know, which has been so wonderfully encouraging! I can understand sometimes when people who don't know me—I'm just a face on a screen, a bureaucrat— decide they don't like what I have to say and don't trust me. But the hardest for me has been when people close to me don't believe in COVID or don't want to get vaccinated. They know my integrity, but they don't trust me.

*What has kept you going during this time?*

**EHRESMANN:** Not to be Pollyanna, but there have been some really good things that have come out of the pandemic. Both Ruth and I would say that when we look at the team and the amazing work they have done and how they just keep coming back, despite how hard it is, that's quite inspirational. When everything started and we needed more and more staff, we brought in staff from across the agency. It has really been a blessing to get to know these people who joined the team—they been phenomenal. Those things are really heartening and really positive.

**LYNFIELD:** If you just look at the amount of science and knowledge that has been gained over the last 18-plus months—it has been amazing. It hasn't even been two years since the virus was identified and we have safe and effective vaccines. We have learned a lot about treatment of these patients. We have learned a lot about prevention. A lot of people globally have come together and worked on this. And, we are so inspired by the dedication of colleagues across the department and the dedication of our partners.

*How do you get respite from the stress?*

**EHRESMANN:** I will say my family, husband and dog have all been really significant supports. It is hard to get respite because COVID never lets up. We only stopped doing daily reports in mid-July, and every day is a long, long day. Weekends are better now, but the demands have not necessarily slowed down. And I moved in the middle of this. We sold a house, built one—things we had committed to before the pandemic. I wouldn't have committed to that had I known what was coming.

**LYNFIELD:** My family and co-workers. We really hold each other up. Particularly as the pandemic kept going, we found it was so important for people's morale and their ability to keep working if they could have a little bit of protected time off. That has become very important, and we encourage people to take time off here and there to be able to recharge. I find it's very therapeutic to go out in nature, take a walk, get a little perspective. I've got a wonderful family that has been enormously supportive—and we got a puppy last year. He is a great distraction!

*What are some lessons you have learned from this pandemic that might apply to future public health crises?*

**LYNFIELD:** As a general approach, to understand that it could go on for a long time. Learning to pace yourself and your colleagues and to be patient. And to communicate better in the beginning, that we're not going to know everything about how things are going to unfold, and that we are going to learn more along the way about how to respond. I wish we had communicated more of that to the public. I think that public health in general had some credibility hits when we did learn more things and adjusted how we approached things and adjusted recommendations. And really, a very critical awareness is the awareness of partnerships. I keep bringing that up but in such a massive response, you really need to engage your partners and work together.

**EHRESMANN:** In the past, many of the diseases and outbreaks we have dealt with have been diseases that we have known about for decades or centuries. [Communicating] the idea that science evolves and that we're going to continue to learn new things is an important way to frame up a situation like we are in. This isn't measles and we have hundreds of years of experience with it—and can speak with conviction on what to expect. We are continuing to learn about COVID-19. I think we took public trust for granted because we had always had it. But in the absence of public trust, public health can't be effective. You can't do public health without the public. I think that's been one of the biggest challenges of the response.

*What can public health experts do to restore that trust, especially when others are spreading misinformation?*

**LYNFIELD:** It's a lesson that we need to think hard about. We have to come up with effective strategies. A lot of it is listening to people and understanding where they are coming from, and just being able to address their concerns and their questions. What is hard is reaching people. You don't always have access or the same access as other messengers that are trying to reach people. I'm optimistic. I'm sure there are some strategies evolving and I know people are researching ways to combat misinformation

*What will be key to ending the pandemic?*

**EHRESMANN:** We don't have a magic number for herd immunity by any stretch, but we know that we have to get our vaccination rates way up to end the pandemic. We have a long way to go. Mandates may help. I saw something the other day that people protest mandates and threaten quitting, but fewer people actually take that action. There are some people that it doesn't matter what you do, they won't get vaccinated. And we have to accept that. We also need continued, layered mitigation on top of that foundation of vaccination to keep the virus under control.

*What will the state of our health/public health look like in the aftermath of COVID?*

**LYNFIELD:** This outbreak has certainly shined a very bright light on health disparities. Everyone knew that there were disparities, but we have a lot more work to do when we see how this virus has impacted people so differently. It's very important that we really understand the factors that are involved in disparities and what we can do to move the needle on that. There have been a lot of mental issues that have arisen because of the pandemic and the impact it has had on people. We're only getting a sense of long COVID and what is involved in that and the effect it has had on previously healthy young, vigorous people. And,

unfortunately, we have put a lot of things on hold while our attention is on responding to COVID. All of us had full-time jobs before, and there are a lot of public health issues we're going to have to return to. And there are some very challenging issues, we have not been able to fully address. One heartbreaking example out of many is congenital syphilis. We should not be having congenital syphilis in 2021 in the United States.

**EHRESMANN:** It is hard because we have a lot of other public health work, we haven't been able to do. We have dozens of grants, special projects and—we don't call it research—we call it public health practice. All that has been on hold. For instance, we have a team working on the HIV outbreak, but that can't be number one because COVID is number one. We're going into flu season now, foodborne outbreaks are at pre-COVID levels and antibiotic stewardship and antibiotic resistance remain important issues. Among our "normal" infectious disease work there is so much to do.

***Any final thoughts you would want to share with physicians reading this?***

**LYNFIELD:** I really want to thank physicians for their partnership as we've been talking about. We've needed everyone. And physicians have been working so hard. They have been out on the frontlines, and they have been taking care of these very sick patients. Their work is so appreciated and they have been putting in really long hours. It is really hard, and I know that healthcare workers have been stressed and traumatized by this pandemic too. But we are going to get out of this. We are in much better shape today in terms of having tools in our toolbox to control this virus than we ever have been. It is just going to take a little time. **MM**

Kris Ehresmann, RN, MPH, and Ruth Lynfield, MD, were interviewed by Suzy Frisch, a Twin Cities freelance writer.

THE AGE OF THE VARIANT

# COVID of today is not the virus that first emerged

BY LINDA PICONE

Michael Osterholm, PhD, MPH, has been talking about the potential for a pandemic for a long time: His 2017 book (with Mark Olshaker) was titled *Deadliest Enemy: Our War Against Killer Germs*. Even before its 2020 updates to incorporate COVID-19, the book reinforced a message Osterholm has been saying for decades: We—the world, the United States—were not and still are not prepared for a widespread infectious disease outbreak.

Osterholm is director of the Center for Infectious Disease Research and Policy at the University of Minnesota, which on January 20, 2020, stated that COVID-19 would cause a pandemic, based on the transmission characteristics of the virus.

He says he had started following the virus in late December 2019. By the time he taught his first graduate class of the semester in January, "I said to my students that we would not finish the semester together, that we likely would be closing down the school and that this was going to take off. I think the vast majority of those grad students thought I was a wingnut." Of course, he was right. On a Joe Rogan podcast in early March 2020, he predicted at least 480,000 deaths in the next 18 months. He was wrong: after 18 months, there were 600,000 deaths.

Osterholm is in demand across the globe, but he talked with *Minnesota Medicine* in September about the coronavirus and where we are today. The comments here are taken from that interview.

## *Variant strains of coronavirus*

The virus we saw emerge with the opening days of the pandemic is not the virus we see today. The old 1960s Fifth Dimension song, "This is the Dawning of the Age of Aquarius," keeps playing in my head over and over again. I keep hearing, "This is the dawning of the age of the variants." These variants have fundamentally changed the game.

Most of the world is still unvaccinated, and yet not having been infected. Every time there's a new infection, it gives rise to the potential for a new variant to develop. As bad as the Delta virus is in terms of transmissibility, the question becomes: What does this mean in terms of its immune escape? Will we have one that's more highly transmissible? Will we have one that can avoid immune protection? We still have a ways to go with this virus.

## *Children in school*

If you look at data from a year ago, we couldn't explain exactly why, it was no more severe for children than influenza in terms of illness and deaths. We had a series of recommendations of what schools could do to reduce even that risk.

When the Alpha variant came along, that was the first shock here in Minnesota. Last April, we saw widespread transmission we hadn't seen before among youth sports. Then, when the Delta variant emerged in May and June, it changed things much more dramatically. Kids were transmitting to each other and to others and adults were able to transmit the virus to kids.

Delta will find every school. It's not a function of *if* but of *when*. What you can do is minimize the risk of Delta transmission in schools. We have unfortunately not realized how to do that. It's unfortunately come down to mask or no mask which is an artificially created issue that is so politically charged.

## Hierarchy of controls

The most effective thing you can do to reduce transmission is to make sure every room your child is in has five to six air exchanges per hour. HEPA filters deployed in a room are very effective in helping scrub out the virus in those rooms.

Next, there's testing, making sure that if someone wants a test, they can get one. We have unfortunately adopted a policy of one test per week. There's no data that one test per week makes a difference; it's just gotten to be a convenient policy. You have to talk about testing many days per week, if not every day. There are already bars and restaurants around the country that test all of their staff every day.

Then it's about density, about how many people are in a room and how close together. If you want to know how this virus can move, put a smoker in the room and see how far you have to get from them to not smell smoke. If you put a smoker 3 feet in front of a child and say they won't smell it, who's going to believe that? Unfortunately, 3 feet is the CDC recommendation. Even if you can't get rid of the smoke smell, how can you minimize it, how can you reduce it? Outdoor air does that, so hold school outdoors when you can.

The final piece is where masking comes in.

## Mask effectiveness

NIOSH did a study on mask leakage for different kinds of respiratory protection pre-Delta variant. The timeframes they found would be even shorter with Delta.

If I'm not wearing a mask and you're not wearing a mask and I'm infected, it's very possible that you could inhale an infectious dose of the virus within 15 minutes. With Delta, it could be as short as a 2-minute elevator ride.

If you have a cloth face covering on, you extend the time to 20 minutes. With a surgical mask, 30 minutes. With an N95 respirator that's not fitted, 2-1/2 hours. With a fitted N95, you're now getting about 25 hours of protection.

People sometimes think I'm against masking. That's absolutely not the case. What I'm for is quality masking.

## Vaccination

With the vaccines, we have two "bucket" issues: One is the bucket of safety, the second is the bucket of how to make the vaccines work best.

The bucket of safety we've answered over and over. These are highly, highly safe vaccines and the benefits of receiving the vaccine outweigh any potential negative implications of the vaccine.

How best to use the vaccine, we're still trying to figure out. The third shot is not really a booster; it means this is a three-dose-prime vaccine. We should have all along considered that might be the case. The three- to four-week wait before a second dose was all based on trying to get results as quickly as possible, not necessarily the optimum timeframe. We still have questions, including what are the right doses for kids.

## What could have been done differently

We'll always being able to go back and look at our history and say there are things we could have done better. We were dealing with the data we had at the time. We didn't have vaccines in that first year. In the meantime, we saw a country that was so politically charged. Who would have thought a vaccination or whether you were using respiratory protection would become a political issue?

I challenged the notion of lockdowns in an article last spring. I think we went into a national lockdown and as a result, there were a number of areas not impacted by the virus, but impacted negatively by the lockdown. We lost goodwill to effectively use lockdowns in a regional way.

We never in this country established what is our goal. Is it zero transmission? Is it some level of transmission? I believe we really deferred without ever clarifying it. Letting the healthcare system bend, but not break was our challenge, and of course now we see healthcare systems around the country breaking

We did declare victory far too early. I strongly opposed the July 4 "independence from COVID." I got hit pretty hard for saying the worst could still be ahead of us. What we're seeing right now is that people got over COVID, they just wanted to be done with it, and now it's hard to bring them back. That's what I was concerned would happen.

## The future

We're never going to be done with it. Hopefully, we can move it into something that becomes more like a seasonal flu, where it comes and goes. One of the big challenges now is how long protection lasts. We don't know that yet; we're still learning.

Once we get all of the questions figured out and once we can supply vaccine to the world, then we may be able to put a major dent in this virus.

## Personal impact

Depending on which time zone a call is coming from, I may be on the phone with someone about COVID as early as 4am or late at night. I have my family and my friends, but I don't socialize, really. It's partly COVID and partly just the time of dealing with COVID. So, it's a challenge. **MM**

## REGAINING LOST GROUND

# What we know about *healthcare quality in Minnesota* during the COVID-19 pandemic and how we move forward

BY JULIE J. SONIER, MPA

In March 2020, as it became evident that the COVID-19 pandemic would disrupt just about every aspect of healthcare, several important questions emerged about healthcare quality:

- How would the pandemic affect access, utilization and quality of care?
- Would it have disproportionate impacts on groups of people who already experience significant disparities in outcomes, such as Minnesotans of color and people who are insured through state public programs?
- Given the situation, was it still feasible and safe to collect data about healthcare quality?
- Should quality measures be changed to reflect the new realities of how care was being delivered during the pandemic?
- Should quality measures continue to be publicly reported for 2020?

These conversations began immediately at MN Community Measurement (MNCM), a nonprofit that convenes stakeholders, including healthcare providers, health plans, state government, employers and consumers to decide on common priorities for measurement of healthcare quality, cost and equity and to guide its vision of empowering healthcare decision makers with meaningful data to drive improvement. As a trusted source of objective data, MNCM plays a unique role in gathering and disseminating information about healthcare quality, cost and equity in Minnesota. This information is widely used to inform strategies for improving health outcomes and reducing disparities.

### Data collection

Typically, data collection for healthcare quality measures happens in the first few months of the year, for care provided in the previous year. For example, data about quality metrics for 2019 were collected in the early part of 2020. MNCM collects data for quality measures from two main sources: direct submission of clinical data from medical groups and health plans or third-party chart audits for Healthcare Effectiveness Data and Information Set (HEDIS) measures.

In March 2020, as the pandemic began to disrupt business operations everywhere, MNCM was wrapping up its collection of clinical data for 2019 quality metrics related to optimal care of asthma, diabetes and vascular disease, as well as depression care outcomes, adolescent mental health screening and colorectal cancer screening. Data collection for these measures was not substantially impacted by the pandemic. For several HEDIS measures that require data to be extracted from medical charts, some health plans had to suspend data collection due to concerns about placing extra burden on providers and concerns about the safety of workers who in some cases would need to visit medical group offices in person to collect the relevant data. As a result, many HEDIS measures for 2019 were unable to be reported. For care provided in 2020, data collection was able to take place in early 2021 using normal procedures and timelines for measures collected directly by MNCM and for HEDIS measures.

### Changes to quality measures

Beginning in March 2020, there was a rapid shift of many patient visits that would have previously been in-person office visits to telehealth. Because of this shift, two changes to healthcare quality measures were needed: inclusion of telehealth visit codes in the definitions of measure denominators, to ensure that the measures continue to capture the full relevant population of patients; and adjustment to some measure definitions to allow use of patient-reported home blood pressure readings, if taken using a digital device. Both changes were implemented for measurement of care provided in 2020 and future years, and are in alignment with changes made at the national level by the National Committee for Quality Assurance (NCQA).

### Public reporting

MNCM collected input on how and whether to continue public reporting of quality measures for 2020 in two ways: consultation with its Measurement and Reporting Committee (MARC), which includes people representing the perspectives of healthcare providers, health plans, state government, employers, consumers and public health agencies; and gathering public input via a community survey during the summer of 2020. Both the stakeholder conversations and the survey responses were also used to better understand the factors affecting care delivery and care quality during the pandemic.

Stakeholders made it clear that, for ongoing measurement, standards of quality should not be lowered because of the pandemic. While it was considered likely that Minnesota would see declines in overall performance for many if not most measures, stakeholders believed it was important to continue data collection and measurement to understand the impacts of the pandemic and use these insights to regain momentum toward quality improvement.

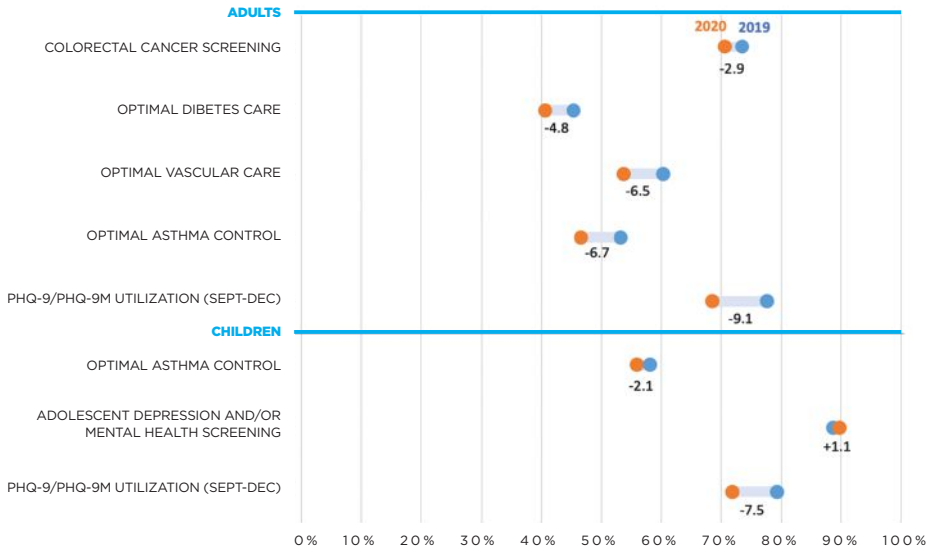
MNCM's public survey consisted of three questions, addressing:

- Opinions about whether and how quality measures for 2020 should be publicly reported.

FIGURE 1

**CHANGE IN QUALITY MEASURES, 2019 TO 2020**

(statewide averages)




- Issues related to virtual care delivery that could affect quality measurement (e.g., missing data for labs and vital signs).
- Any other concerns related to quality measurement and reporting for 2020 dates of service.

A total of 121 people responded to the survey, and the survey results formed the basis for MARC discussion in fall of 2020 of options for public reporting. Based on the survey results, there was strong support for continued public reporting of quality, including reporting of results by medical group and clinic location. Given the fact that some care systems shifted care to different locations and/or closed clinics in response to the pandemic, MARC recommended to MNCM's Board of Directors that public reporting for 2020 be at the medical group level and not include results for individual clinic locations.

## Quality results for 2020

Not surprisingly, statewide results for nearly all quality measures declined in 2020, as shown in **Figure 1**. For adults, measures for diabetes, vascular disease and asthma declined by about 5 to 7 percentage points, while the percentage of adults who were up-to-date on colorectal cancer screening declined by nearly 3 percentage points. Of particular note, a process measure for whether adults who had previously been diagnosed with depression were reassessed during subsequent encounters declined by over 9 percentage points between September and December 2020 compared to the same period in 2019. (Depression outcome measures are also included in a recent summary report published by MNCM but are excluded here since the most recent outcome measures primarily pertain to care delivered in 2019, prior to the pandemic.)

For children, declines in results for quality measures were less than those for adults, and the percentage of adolescents who received depression/mental health screening increased. Like adults, the percentage of children previously diagnosed with depression who were reassessed using the PHQ-9/PHQ-9M during a subsequent visit fell substantially, from 79 percent to just under 72 percent.

It is important to understand the 2020 quality measure results in the context of overall changes in utilization of care. Using the example of adolescent mental health screening, even though the *percentage* of adolescents who received screening at a well-child visit increased, the overall *number* of such visits fell dramatically—with the result that fewer adolescents overall were screened.

**Figure 2** illustrates notable changes in the numbers of people included in the denominator for most measures, reflecting shifts in healthcare utilization patterns. For most measures, inclusion is triggered by having a healthcare visit during the year. A decline in the number of people included in the optimal diabetes care measure, for example, means that fewer people with diabetes had any provider visits (either in-person or via telehealth) during the year. This is concerning because it indicates a gap in providers' knowledge of how well these patients are doing in managing their condition. Measures for children showed especially large declines in the denominators, ranging from a 16 percent decline for asthma control to 27 percent for utilization of the PHQ-9/PHQ-9M for patients previously diagnosed with depression. Declines in the number of patients included in each measure were generally broad-based, affecting people of all ages, genders, health insurance coverage types, socioeconomic status, races, and Hispanic/non-Hispanic ethnicity.

Minnesota has wide and longstanding disparities in quality measures by race, Hispanic ethnicity and other factors; a priority concern has been whether these disparities would grow because of the pandemic. The data for 2020 show that existing disparities by race and Hispanic ethnicity did not grow wider in 2020 with some exceptions (disparities compared to statewide averages grew in optimal diabetes care for Black patients, colorectal cancer screening for Black and Hispanic/Latinx adults and optimal asthma control for Indigenous/Native children).

Based on insights provided by MNCM stakeholders, there are three main factors specific to COVID-19 that likely influenced the results of quality measures in 2020. These include patient barriers, provider staffing and capacity and changes in care delivery.

**Patient barriers.** Many patients made the decision to defer healthcare, out of

concern for safety, for financial reasons or because other priorities were more important. Other types of patient barriers included barriers to accessing care via telehealth due to lack of familiarity with technology, difficulty accessing devices or broadband connections or language barriers. There is anecdotal evidence, however, that the availability of telehealth served as an *enabling* factor for some patients, by removing transportation and distance barriers.

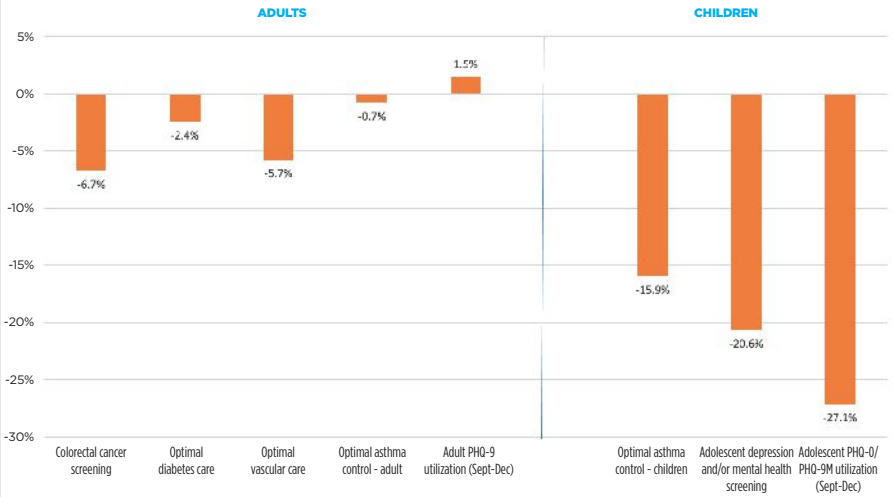
**Provider staffing and capacity.** Factors related to provider staffing and capacity that likely influenced quality measures included staff furloughs, burnout, turnover and diversion to higher priority needs; some clinic locations being repurposed or closed; some services being restricted or shut down (e.g., colonoscopies); shortages of testing supplies and/or lab capacity; and capacity restrictions in clinics for safety reasons.

**Care delivery.** Other factors that disrupted the way that care was delivered presented barriers to gathering data that is used in measuring quality outcomes. These included the fact that with patients being less likely to access care, providers had fewer opportunities to use visits to deliver preventive services and manage chronic conditions. In addition, providers reported some difficulty adjusting workflows to gather patient-reported outcome (PRO) survey tools via telehealth and difficulty getting patients to complete PRO tools outside of the office setting. Finally, providers also noted a higher likelihood of missing lab tests and blood pressures for care delivered via telehealth.

Although these declines in healthcare quality performance measures in 2020 are not unexpected, they are concerning because they mean that either patients are not getting the care they need to achieve the best outcomes and/or that providers are missing key information that they need to help patients manage chronic conditions like asthma, diabetes and vascular disease.

FIGURE 2

**2019-20 CHANGE IN NUMBER OF PEOPLE INCLUDED IN MEASURE DENOMINATOR**




## Looking forward

Avoiding long-term health impacts requires proactively addressing the gaps in care that have occurred because of the pandemic. Doing this effectively will involve three key strategies:

- Outreach to patients who "fell off the radar" in 2020, especially children and people with chronic disease.
- Similarly, for those who did receive care but have gaps in key pieces of information—like hemoglobin A1c, blood pressure, or patient-reported outcome tools—filling these gaps is essential to ensure that patients have the best opportunity for optimal outcomes.
- Finally, it is more important than ever to communicate with patients to ensure they receive preventive care like cancer screenings to catch disease at earlier stages when it is more treatable.

Although healthcare providers must play a leading role in "righting the ship" and regaining momentum toward higher quality and better outcomes for patients, other stakeholders have important roles to play as well. Health plans and employers have roles to play in outreach and education and in making sure that financial incentives reward both quality improvement and disparities reduction.

Most observers agree that telehealth has important potential for innovation in how healthcare is delivered and will remain an important part of the landscape, but it also has potential pitfalls. We must ensure that we set the same expectations of quality and outcomes for care delivered via telehealth as for in-person care. Based on the data for 2020 and insights provided by MNCM stakeholders about gaps in information that clinicians have available to them when delivering care via telehealth, it seems clear that we still have many lessons to learn about how best to integrate telehealth into the overall healthcare delivery system and how to ensure that we reap the potential benefits of telehealth while avoiding the pitfalls. **MM**

Julie Sonier is president and CEO, MN Community Measurement.

**REFERENCES**

Donovan J, Nelson G, Sonier J. Spotlight report: Summary of health care quality measures for 2020. MN Community Measurement: August 2021. https://mncmsecure.org/website/Reports/Spotlight%20Reports/2020%20MY%20Spotlight%20Report%20-%20Summary.pdf

Donovan J, Nelson G. Minnesota health care disparities by race, Hispanic ethnicity, language, and country of origin. MN Community Measurement: May 2021. https://mncmsecure.org/website/Reports/Community%20Reports/Disparities%20by%20RELC/2020%20Disparities%20by%20RELC%20Chartbook%20-%20FINAL.pdf

Herzer KR, Pronovost PJ. Ensuring quality in the era of virtual care. JAMA. 2021; 325(5):429-430. doi:10.1001/jama.2020.24955.

Author Harriet A. Washington (top left) finished the conference with a talk on health equity. Here she answers questions from Dionne Hart, MD, MMA board member, and Immediate past-MMA President Marilyn Peitso, MD.

# Annual Conference zeroes in on COVID-19, health equity

Because of the ongoing pandemic, the MMA held its Annual Conference online again this year on September 24, focusing on the COVID-19 pandemic and health equity.

Infectious disease expert Michael T. Osterholm, PhD, MPH, kicked off the event with "The COVID Pandemic: The Evolving Reality." In the session, he discussed the state, federal and global response to COVID-19; the role of vaccines; the effect of variants in the fight against COVID-19; and where we go next, as a global community.

Osterholm's address was followed by three concurrent sessions on the role medicine can play in policing, microaggressions and the impact the COVID-19 pandemic has had on the mental health of physicians.

- "What Role Can Medicine Play on Issues Related to Policing?" featured Erika Kaske, David J. Satin, MD, and Joel T. Wu, JD, MPH, MD, HEC-C. It was moderated by MMA Secretary/Treasurer Carolyn McClain, MD.
- "Mitigating Microaggressions from Patients, Promoting Relationship-Centered Care" featured Taj Mustapha, MD, and was moderated by MMA member Nathan Chomilo, MD.
- "The Compounding Impact of the COVID-19 Pandemic on the Mental Health of Physicians" featured Jessi Gold, MD, MS, and was moderated by MMA member Natalia Dorf-Biderman, MD.

Harriet A. Washington, a prolific science writer, editor and ethicist, closed out the conference.

As part of the Annual Conference, MMA leadership reported to the membership about the current status of the association. Watch the 2021 Business Meeting video here: www.mnmed.org/education-and-events/Annual-Conference/Agenda.

Also leading up to the conference via video, the MMA handed out its annual awards to four physicians, two physicians-in-training, a state commissioner and a mental health advocacy organization. Each year, the MMA honors those in medicine for going above and beyond.

*Distinguished Service Award*

**Kathryn Lombardo**, MD, received the MMA's highest honor, the Distinguished Service Award, for her years of service to the association and to medicine.

*President's Awards*

**Jill Amsberry**, DO, and **Nathan Chomilo**, MD, received the MMA's President's Award, which recognizes those who have given much of their free time to help improve the association

*Medical Student Leadership Award*

**Dominique Earland** received the MMA's Student Leadership Award, which recognizes medical students who demonstrate exemplary leadership in service to fellow medical students, the profession of medicine and the broader community.

*Residents and Fellows Leadership Award*

**J.P. Janowski** received the inaugural MMA's Resident and Fellow Leadership Award, which recognizes residents/fellows who demonstrate exemplary leadership in service to their peers, the profession of medicine and the broader community.

*James H. Sova Memorial Award for Advocacy*

James H. Sova was the chief lobbyist for the MMA from 1968 until the time of his death in December 1981. This award is given to a person who has made a significant contribution to the advancement of public policy, medical sciences, medical education, medical care or the socioeconomics of medical practice. Health Commissioner **Jan Malcolm** was this year's recipient.

*Eric C. Dick Memorial Health Policy Partner Award*

This new award is given to an individual, group of individuals, a project or an organization that demonstrates commitment to pursuing sound public policy, building coalitions and creating and/or strengthening partnerships with the goal of improving the health of Minnesotans or the practice of medicine in Minnesota. Dick was the MMA's manager of state legislative affairs from 2010 until his death in January 2021.This year's recipient was Minnesota's **National Alliance on Mental Illness** (NAMI).

*COPIC/MMA Foundation Humanitarian Award*

**Matt Bernard**, MD, received the COPIC/MMA Foundation Humanitarian Award, which recognizes MMA members who go above and beyond to help address the healthcare needs of underserved populations in Minnesota.

### Thank you, sponsors

The MMA would like to thank the sponsors of this year's conference: Platform sponsor–COPIC; Premier sponsor–AstraZeneca; Platinum sponsor–UCare; Gold sponsors–Greenwald Wealth Management, Green Goods and Advance Brain + Body Clinic; and Bronze sponsor–Skills Autism Therapy and Parent Enrichment.

# News Briefs

### BMP agrees to amend licensure language

In September, the Minnesota Board of Medical Practice (BMP) unanimously voted to amend the licensure application language requiring disclosure of past and current health conditions to 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?"

"This action is a significant step forward in supporting the health of Minnesota's physicians by encouraging physicians to ask for help when needed," says immediate past-MMA President Marilyn Peitso, MD. "The change ensures that adequate treatment of a condition does not need to be disclosed."

This vote comes after months of work by the MMA and others such as Twin Cities Medical Society, Zumbro Valley Medical Society, Physicians Serving Physicians, NAMI Minnesota, Mayo Clinic, Allina Health and the Minnesota Psychiatric Society, as well as individual physicians.

The change to the initial and renewal application will take effect on January 1, 2022.

### Moose Lake family medicine physician takes over as MMA president

Randy Rice, MD, (pictured above), a family medicine physician in Moose Lake, was inaugurated as the 155th president of the MMA at the association's virtual Annual Conference on September 24. He officially began his one-year term on October 1.

Other MMA officers for 2022 include: Will Nicholson, MD, a family medicine physician and hospitalist in Maplewood, who was elected president-elect. Marilyn Peitso, MD, a pediatric hospitalist in St. Cloud, assumes the role of immediate past-president. Carolyn McClain, MD, an emergency department physician in the Twin Cities, continues as secretary-treasurer. Edwin Bogonko, MD, a hospitalist in Shakopee, continues to serve as board chair.

Other newly elected leaders include:

- Saam Dilmaghani, MD, MPH, was elected as the resident/fellow trustee; Amrit Singh, MBBS, an oncologist from Mankato, was re-elected as a trustee.
- John P. Abenstein, MSEE, MD, FASA, was re-elected to serve as an AMA delegate for the MMA. C. Dennis O'Hare, MD, and Laurel Ries, MD, were both re-elected to serve as AMA alternate delegates. AMA delegates and alternate delegates take office beginning January 1, 2022.

### Save the date: Day at the Capitol scheduled for March 1, 2022

The MMA is planning to return to the state Capitol in-person in March for its annual Day at the Capitol event. Stay tuned to *MMA News Now* for updates.


### MMA offers resource to battle COVID-19 vaccine misinformation

Physicians are a trusted source of expertise and knowledge. Patients, and perhaps even friends, neighbors and acquaintances, look to you for the straight scoop. Yet breaking through the misinformation on social media and the internet can be challenging. To help, the MMA has compiled some of the common COVID-19 vaccine questions and concerns you may be asked. This new PDF is designed to support you in your efforts to educate your patients and address their fears and concerns. Find it here: https://www.mnmed.org/advocacy/Key-Issues/Coronavirus-Disease

### Report shows use of telehealth is increasing significantly

A new AMA report shows physicians significantly increased their use of telehealth between September 2018 and September 2020. During this time, the share of physicians in practices that used

videoconferencing to provide patient visits increased from 14.3 percent to 70.3 percent. The report also shows that telehealth was used to treat a diverse set of patients with a variety of needs. In 2020, 58 percent of physicians said their practices used telehealth to diagnose or treat patients, 59.2 percent to manage patients with chronic disease and 50.4 percent to provide care to patients with acute disease.

### Practicing medicine in uncivil times

Immediate past-MMA President Marilyn Peitso, MD, discussed practicing medicine in uncivil times in the latest edition of *Insights*. "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 writes. Read the entire piece here: www.mnmed.org/news-and-publications/insights-archive/September-2021/Practicing-Medicine-in-Uncivil-Times.

### Mayo student wins top prize in business innovation contest

Mayo Clinic Alix School of Medicine student and MMA member Allisa Song and her startup company won the Minnesota Cup on September 20. The annual contest, run by the University of Minnesota's Carlson School of Management, recognizes innovative businesses in the state. Song's company, Nanodropper, Inc., makes a device that reduces the size of eyedrops. Song won the $50,000 grand prize and the $25,000 student division prize.

### Women In Medicine event set for November 11

In an effort to support gender equity in medicine, the MMA will host "Women in Medicine—An Evening of Conversation and Action" on November 11, 7–8:30 p.m.

Each participant will have the opportunity to engage in moderated small groups, which will include:

- Networking with peers.
- Identifying future event and activities possibilities aimed at helping women in medicine succeed.
- Determining policy and advocacy needs.

To sign up, go to: https://ebiz.mnmed.org/DNN/Events/MMA-Events-Calendar.

United States Postal Service

**Statement of Ownership, Management and Circulation**

**(All Periodicals Publications Except Requester Publications)**

| 1. Publication Title | 2. Publication Number | 3. Filing Date |
|---|---|---|
| MINNESOTA MEDICAL ASSOCIATION/ MINNESOTA MEDICINE | 3 5 1 9 0 0 | 09/23/2021 |
| 4. Issue Frequency | 5. Number of Issues Published Annually | 6. Annual Subscription Price |
| BI-MONTHLY | 6 | $45.00 |

7. Complete Mailing Address of Known Office of Publication (Not printer) (Street, city, county, state, and ZIP+4)
3433 BROADWAY STREET NE STE 187
MINNEAPOLIS, MN 55413-1810

Contact Person: LINDA PICONE
Telephone: 612-362-3758

8. Complete Mailing Address of Headquarters or General Business Office of Publisher (Not Printer)
3433 BROADWAY STREET NE STE 187
MINNEAPOLIS, MN 55413-1810

9. Full Names and Complete Mailing Addresses of Publisher, Editor and Managing Editor (do not leave blank)

Publisher (Name and complete mailing address)
MINNESOTA MEDICAL ASSOCIATION
3433 BROADWAY STREET NE STE 187
MINNEAPOLIS, MN 55413-1810

Editor (Name and complete mailing address)
ZEKE MCKINNEY, MD
3433 BROADWAY STREET NE STE 187
MINNEAPOLIS, MN 55413-1810

Managing Editor (Name and complete mailing address)
LINDA PICONE
3433 BROADWAY STREET NE STE 187
MINNEAPOLIS, MN 55413-1810

10. Owner (Do not leave blank. If the publication is owned by a corporation, give the name and address of the corporation immediately followed by the names and addresses of all stockholders owning or holding 1 Percent or more of the total amount of stock. If not owned by a corporation, give the names and addresses of the individual owners. If owned by a partnership or other unincorporated firm, give its name and address as well as those of each individual owner. If the publication is published by a nonprofit organization, give its name and address.)

| Full Name | Complete Mailing Address |
|---|---|
| MINNESOTA MEDICAL ASSOCIATION | 3433 BROADWAY STREET NE STE 187, MINNEAPOLIS, MN 55413 |

11. Known Bondholders, Mortgagees and Other Security Holders Owning or Holding 1 Percent or more of Total Amount of Bonds, Mortgages, or Other Securities. If none, check box → [X]

| Full Name | Complete Mailing Address |
|---|---|

12. Tax Status (For completion by nonprofit organizations authorized to mail at nonprofit rates) (Check one)
The purpose, function, and nonprofit status of this organization and the exempt status for federal income tax purposes:
[X] Has Not Changed During Preceding 12 Months
[ ] Has Changed During Preceding 12 Months (Publisher must submit explanation of change with this statement below)

PS Form 3526, July 2014

| 13. Publication Title: MINNESOTA MEDICAL ASSOCIATION/MINNESOTA M | 14. Issue Date for Circulation Data Below: 09/01/2021 | |
|---|---|---|
| 15. Extent and Nature of Circulation | Average No. Copies Each Issue During Preceding 12 Months | No. Copies of Single Issue Published Nearest to filing Date |
| a. Total Number of Copies (Net press run) | 3,571 | 3,213 |
| b. Paid and/or Requested Circulation (1) Mailed Outside-County Paid Subscriptions Stated on PS Form 3541 (Include paid distribution above nominal rate, advertiser's proof copies, and exchange copies) | 3,136 | 2,845 |
| (2) Mailed In-County Paid Subscriptions Stated on PS Form 3541 (Include paid distribution above nominal rate, advertiser's proof copies, and exchange copies) | 0 | 0 |
| (3) Paid Distribution Outside the Mails Including Sales Through Dealers and Carriers, Street Vendors, Counter Sales, and Other Paid Distribution Outside USPS | 0 | 0 |
| (4) Paid Distribution by Other Classes of Mail Through the USPS (e.g. First-Class Mail) | 0 | 0 |
| c. Total Paid Distribution (Sum of 15b. (1), (2), (3), and (4)) ▶ | 3,136 | 2,845 |
| d. Free or Nominal Rate Distribution (By Mail and Outside the Mail) (1) Free or Nominal Rate Outside-County Copies Included on PS Form 3541 | 75 | 75 |
| (2) Free or Nominal Rate In-County Copies Included on PS Form 3541 | 0 | 0 |
| (3) Free or Nominal Rate Copies Mailed at Other Classes Through the USPS (e.g. First-Class Mail) | 0 | 0 |
| (4) Free or Nominal Rate Distribution Outside the Mail (Carriers or other means) | 117 | 92 |
| e. Total Free or Nominal Rate Distribution (Sum of 15d. (1), (2), (3) and (4)) ▶ | 192 | 167 |
| f. Total Distribution (Sum of 15c. and 15e.) ▶ | 3,328 | 3,012 |
| g. Copies not Distributed (See Instructions to Publishers #4 (page #3)) | | |
| h. Total (Sum of 15f. and g.) ▶ | 3,328 | 3,012 |
| i. Percent Paid (15c. Divided by 15f. Times 100) ▶ | 94.23% | 94.46% |

* If you are claiming electronic copies, go to line 16 on page 3. If you are not claiming electronic copies, skip to line 17 on page 3.

| 16. Electronic copy Circulation | | |
|---|---|---|
| If present, check box → | | X |
| a. Paid Electronic Copies | 0 | 0 |
| b. Total Paid Print Copies (Line 15c) + Paid Electronic Copies (Line 16a) ▶ | 3,136 | 2,845 |
| c. Total Print Distribution (Line 15F) + Paid Electronic Copies (Line 16a) ▶ | 3,328 | 3,012 |
| d. Percentage Paid (Both Print & Electronic Copies (16b divided bt 16c x 100) ▶ | 94.23% | 94.46% |

[ ] I certify that 50% of all my distribution copies (electronic and Print) are paid above a nominal price

17. Publication of Statement of Ownership
[X] Publication required. Will be printed in the 11/01/2021 issue of this publication. [ ] Publication not required

| 18. Signature and Title of Editor, Publisher, Business Manager, or Owner | Title | Date |
|---|---|---|
| Linda Picone | MANAGING EDITOR | 09/22/2021 |

I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including civil penalties).

PS Form 3526, July 2014

# FROM THE CEO

## *Changes in MMA's local-state structure*

Approximately 20 years ago, the MMA had 33 component (or county) medical societies across the state. These local societies were chartered by the MMA to operate in a defined geographic area; facilitate local physician engagement, education and support; provide leadership opportunities to local physicians; and elect delegates to attend the MMA's annual House of Delegates (HOD) meeting. Membership was, and still is, unified—meaning that members join both organizations.

On January 1, 2022, there will be three remaining MMA component medical societies—Steele County, Wright County and Zumbro Valley Medical Society. So, what happened and why?

Certainly, some of the change in component societies can be attributed to the parallel changes in how and where physicians practice medicine. As larger practices and integrated care systems have expanded, both in size and geography, many medical practices have shifted to more regional models. For some component societies, their defined geographies increasingly bore little resemblance to how and where local physicians worked or lived. On a practical level, most component societies relied exclusively on physician volunteers to manage their governance and finances and, over time, several struggled to identify enough new volunteers willing to assume the workload.

Changes at the MMA level also had an impact. In 2013, in response to shrinking attendance and growing frustration with bureaucratic processes, the MMA adopted changes to its governance that eventually led to the sunsetting of the HOD in 2018. These governance changes also expanded member involvement with the adoption of member-wide elections and creation of a new Policy Council. The shift away from the HOD meant that local society delegates were no longer needed. New MMA member-engagement strategies, such as listening sessions and dedicated outreach staff, further blurred the lines between local and state society activities. With new technology—expanded dramatically during the pandemic—the MMA has created ways for physicians to directly influence MMA policy 24/7/365 (The Pulse) and to virtually convene physicians in direct dialogue and education.

Among the recent component society changes of note was the April 2021 decision by Twin Cities Medical Society (TCMS) leadership to separate from the MMA and end its role as an MMA component society. Although the implications of this decision are not yet fully known, one immediate result is that MMA dues for physicians from the seven-county Twin Cities metro area (Anoka, Carver, Dakota, Hennepin, Ramsey, Scott and Washington) will decrease by $280 (or $272 for three-year members). Importantly, the TCMS decision does not affect the benefits and value of MMA membership.

There are fewer component medical societies than in the past, but those that remain continue to serve a valued and a valuable role in supporting the local needs and interests of physicians. Steele County Medical Society, for example, provides social events and supports local organizations serving their community. Zumbro Valley Medical Society, which has full-time staff, has built strong alliances with many Rochester organizations to support local policy change, health improvement and education. For members who no longer have a local society, the MMA is committed to continuing to develop new opportunities for local gatherings and work; your membership continues to allow you to engage in all MMA activities that are of interest to you.

The work of the MMA is always evolving to meet the needs of Minnesota physicians and physicians-in-training. Changes in MMA's structure to deliver efficient and valuable benefits is part of that evolution, but our mission to be the leading voice of medicine to make Minnesota the healthiest state and the best place to practice remains steadfast. **MM**

Janet Silversmith
JSilversmith@mnmed.org

VIEWPOINT

# A much-needed victory for mental health

Randy Rice, MD
MMA Board Chair

For many of us, the past two years have been angst-ridden. The pandemic, racial injustice, the deepening political divide between neighbors, tumultuous climate change and patients no longer trusting the decisions that we make based on the latest science.

So much is weighing us down mentally. We are tired and many of us are struggling. Numerous surveys and studies report physicians experience burnout at rates of 60 percent. In addition to its toll on clinicians, physician burnout alone costs the healthcare industry more than $4.6 billion per year, according to a 2019 study published in the *Annals of Internal Medicine*.

We need to be encouraging each other to seek help when needed rather than continue to further stigmatize mental health. That's why the Board of Medical Practice's (BMP) decision in September to amend its licensure application language was such a huge victory for all of us.

Prior to that decision, the application language asked about an applicant's mental and physical health conditions within the past five years that if untreated could impair their ability to practice safely. This 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. This stigma has only grown during the COVID-19 pandemic, in which we have expected our physicians to remain on the front lines battling the virus and treating patients, while at the same time neglecting to support and/or encourage them to seek help if they need it.

Thanks to the engagement of medical students and residents, the MMA and other advocacy groups, went to work. (We extend our gratitude to all who contributed to this effort—the Twin Cities Medical Society, Zumbro Valley Medical Society, Physicians Serving Physicians, NAMI Minnesota, Mayo Clinic, Allina Health, the Minnesota Psychiatric Society, as well as individual physicians.) It wasn't a slam dunk. In fact, early efforts to urge the BMP to make the changes were resisted. The burnout and challenges of the pandemic actually helped to breathe new life into the effort. The MMA helped coordinate the parties, lined up testifiers and alerted our members to contact the BMP directly. Many individual physicians attended online BMP meetings to share their own experiences with the deterring effect of the application language and the importance of this change. All made it clear that adequately treated conditions, as well as past conditions that do not currently impair one's ability to practice medicine, should not be disclosed

In the end, the BMP heard us and agreed with the advocates. The language now reads: "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 change to the initial and renewal application will take effect on January 1, 2022.

This is a huge victory for physicians in Minnesota. It's the kind of advocacy the MMA is proud to be part of and a change that will likely save lives. It's also an example of how individual members can make a difference. With your support, we will continue to work tirelessly to make Minnesota the best place to practice and the healthiest state. **MM**

We need to be encouraging each other to seek help when needed rather than continue to further stigmatize mental health.

# Testing PPE protocols for infectious outbreaks

BY DEEKSHA BORKAR, MD, MPH; VAISHALI JHA, MD; JENNIFER BOE, BSN; KAREN MATHIAS, MSN, APRN, PCNS-BC; ERNEST KRAUSE BS; ERINN VON REIN, PA-C; TROY REIHSEN; AND MANU MADHOK, MD, MPH

*The emergency department (ED) is a high-volume, dynamic healthcare environment. In 2017, in the United States, there were almost 138.9 million patient visits made to ED, out of which about 28.3 million were children under the age of 15 years. Nearly half of the inpatient admissions are done through the ED, making it a portal of entry into the inpatient system. Infection prevention remains a major challenge in the resource-limited and time-constrained environment of the ED. Healthcare workers (HCW) in the ED, remain the frontline of infection-prevention during epidemics and pandemics. Personal Protective Equipment (PPE) is used for infection prevention among HCWs, protecting against infectious bodily fluids, droplets, aerosols, etc. on a large scale.*

In 2014, the Ebola outbreak in West Africa was declared a public health emergency by the World Health Organization (WHO).


**Illustration 1:** CDC guidelines for donning and doffing of Personal Protective Equipment

HCWs were exposed to Ebola Virus Disease (EVD) during the outbreak due to inadequate patient triage and limited knowledge of proper donning and doffing techniques for PPE. Standardization of PPE protocol is a complex process. The Centers for Disease Control and Prevention (CDC) updates PPE protocols and emphasizes the importance of training, practice, competence and observation of HCWs, especially as to the appropriate donning and doffing of PPE.

Image 1: Evidence of Glo Germ™ gel residue on the participants' right hand after doffing PPE.

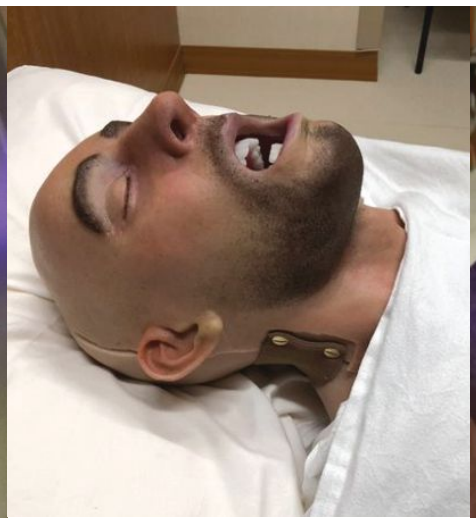
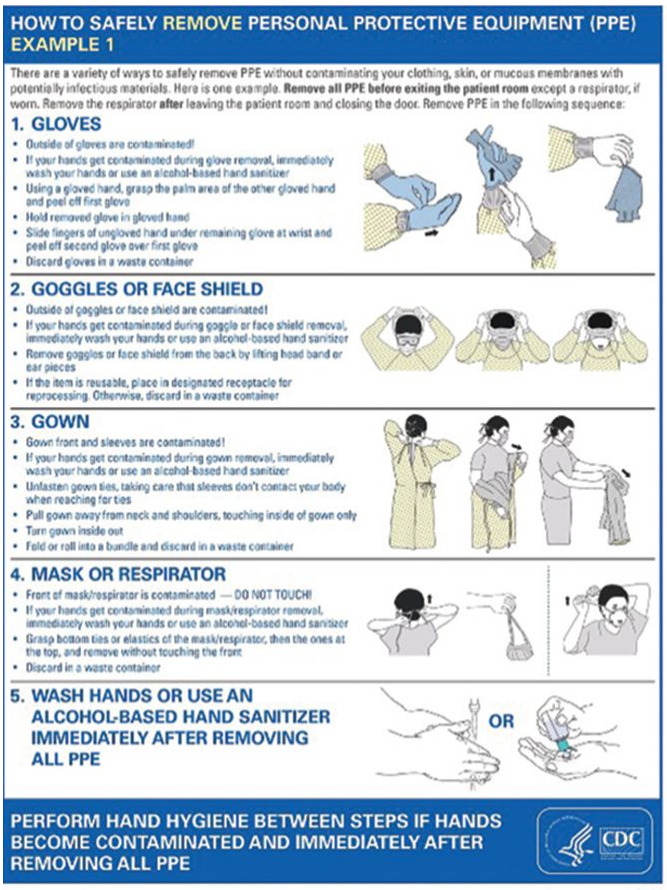
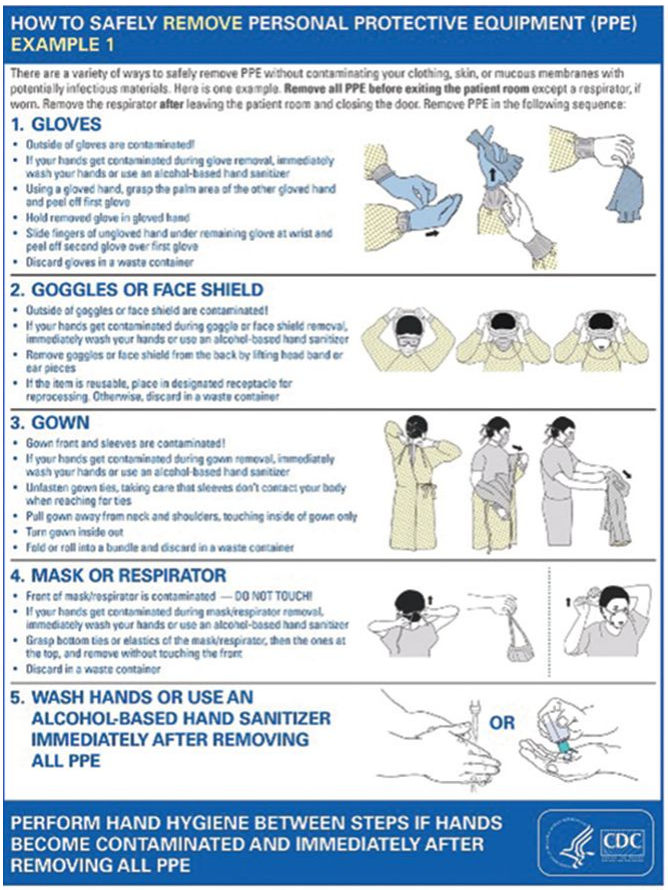


Image 2: Manikin used during the 7-SIGMA Simulation.

Image 3: Fluorescent gel observed in the nasal and oral secretions as seen under ultraviolet light.





HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE)
EXAMPLE 1
There are a variety of ways to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. Here is one example. Remove all PPE before exiting the patient room except a respirator, if worn. Remove the respirator after leaving the patient room and closing the door. Remove PPE in the following sequence:
1. GLOVES
Outside of gloves are contaminated!
If your hands get contaminated during glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
Using a gloved hand, grasp the palm area of the other gloved hand and peel off first glove
Hold removed glove in gloved hand
Slide fingers of ungloved hand under remaining glove at wrist and peel off second glove over first glove
Discard gloves in a waste container
2. GOGGLES OR FACE SHIELD
Outside of goggles or face shield are contaminated!
If your hands get contaminated during goggle or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
Remove goggles or face shield from the back by lifting head band or ear pieces
If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container
3. GOWN
Gown front and sleeves are contaminated!
If your hands get contaminated during gown removal, immediately wash your hands or use an alcohol-based hand sanitizer
Unfasten gown ties, taking care that sleeves don't contact your body when reaching for ties
Pull gown away from neck and shoulders, touching inside of gown only
Turn gown inside out
Fold or roll into a bundle and discard in a waste container
4. MASK OR RESPIRATOR
Front of mask/respirator is contaminated — DO NOT TOUCH!
If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
Grasp bottom ties or elastics of the mask/respirator, then the ones at the top, and remove without touching the front
Discard in a waste container
5. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE
OR
PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE
CDC

Our pilot study was designed to simulate a large exposure of an infectious agent and determine the effectiveness of PPE donning and doffing procedures in preventing transmission to pediatric emergency medicine (PEM) physicians.

## Methods

The observational study was performed at Children's Minnesota in the pediatric emergency medicine department. The physicians donned level 2 PPE consisting of an impermeable gown, two pairs of gloves, a head cover, face shield, mask and boots. A standardized amount of Glo Germ™ gel was applied to the participants' gloves, masks, gowns and boots, stimulating a large exposure or "worst case scenario," with the exception that Glo Germ™ should not obstruct a participant's vision. The donning and doffing process was noted by an independent observer and recorded as "completed correctly" or "completed with error." After the doffing process, the observer checked each participant again for residual Glo Germ™.

## Results

No errors in doffing procedure were noted by the coach, but one of the 12 participants was found to have fluorescent liquid of Glo Germ™ gel on their right hand after doffing. The likely cause of the contamination was that two gloves of the same length were used, a failure to follow protocol.

Gloving is an important component of PPE donning. In a comparison study conducted by Casanova et al among HCWs, self-contamination after doffing PPE with double gloves vs single gloves noted that although the double gloving process can reduce the risk of viral transfer, the viral marker (MS2) was still found on the hands of 23 percent of the HCWs after the doffing process.

## 7-SiGMA simulation

We conducted a simulation in association with 7-SIGMA Simulation Systems to simulate exposure to a droplet and aerosolizing infectious agent, using a clear fluorescent solution at Ridgeview Medical Center. The fluorescent gel was aerosolized in the airway and was noted in the nasal and oral secretions of the manikin as seen under ultraviolet light (Images 2, 3, 4). HCWs caring for the patient donned and doffed the appropriate PPE recommended by the CDC and institutional process instructions were followed. Post-simulation assessment was performed using a handheld ultraviolet backlight to identify the presence of fluorescent gel residue on the HCWs.

## Discussion

Our debriefing sessions brought to light several important points that promote infection prevention in healthcare settings, including:

- Prevention of exposure by early application of masks.
- Streamlining a virtual registration process.
- Training and availability of adequate PPE for HCWs.
- Weekly training with a coach regarding appropriate donning and doffing techniques.

- Providing respiratory support with minimization of aerosolizing patient secretions.
- Anticipating the need for an advanced airway.

Multiple studies have noted in the past that HCW infections and protocol deviations can be prevented by increased institutional training and the availability/accessibility of published donning and doffing protocols, regardless of the type of PPE. In a study conducted among 120 students, designed to compare conventional training programs and enhanced training programs for the use of PPE during the EVD epidemic, PPE doffing errors were noted even after a three-phase training program. The study concluded that students continued to remain at risk for EVD contamination regardless of training improvements.

During public health emergencies, such as the 2014–2015 Ebola virus disease epidemic and the current COVID-19 pandemic, focused training of HCWs working on the frontlines may be required.

Our results can be applied to multiple settings in terms of location and disease. During the COVID-19 pandemic, we used our experience to enhance infection control when evaluating patients with possible COVID-19 illness in the emergency department. **MM**

Deeksha Borkar, MD, MPH, is a resident in pediatric medicine, University of Minnesota. Vaishali Jha, MD, practices pediatric emergency care, Department of Emergency Medicine, Children's Minnesota. Jennifer Boe, BSN, is manager of infection prevention and control, Children's Minnesota. Karen Mathias, MSN, APRN, PCNS-BC, is director, Simulation Center, Critical Care Division, Children's Minnesota. Ernest Krause, BS, is a researcher, Research Institute, Children's Minnesota. Erinn Von Rein, PA-C, works in the Emergency Department, Ridgeview Medical Center, Waconia. Troy Reihsen is director, medical products, 7-SIGMA. Manu Madhok, MD, MPH, is a pediatric emergency medicine physician, Children's Minnesota.

Image 4: Healthcare worker wearing appropriate PPE during the simulation.

## REFERENCES

Casalino, Enrique, et al. "Personal protective equipment for the Ebola virus disease: A comparison of 2 training programs." American Journal of Infection Control 43.12 (2015): 1281-1287.

Casanova, Lisa M., et al. "Effect of single-versus double-gloving on virus transfer to health care workers' skin and clothing during removal of personal protective equipment." American journal of infection control 40.4 (2012): 369-374.

Centers for Disease Control and Prevention. Infection Control: Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html#train_educate. Published April 12, 2020. Accessed April 20, 2020.

Centers for Disease Control and Prevention. Guidance on Personal Protective Equipment (PPE). Centers for Disease Control and Prevention. https://www.cdc.gov/vhf/ebola/healthcare-us/ppe/guidance.html. Published August 30, 2018. Accessed April 20, 2020.

COVID-19 victim Airway TRAINER Containment KIT. https://7-s3.com/covid-19/. Accessed April 11, 2021.

Fischer, William A., Noreen A. Hynes, and Trish M. Perl. "Protecting health care workers from Ebola: personal protective equipment is critical but is not enough." Annals of internal medicine 161.10 (2014): 753-754.

Herlihey, Tracey A., et al. "Personal protective equipment for infectious disease preparedness: a human factors evaluation." infection control & hospital epidemiology 37.9 (2016): 1022-1028.

Hersi M, Stevens A, Quach P, et al. Effectiveness of Personal Protective Equipment for Healthcare Workers Caring for Patients with Filovirus Disease: A Rapid Review. PLoS One. 2015;10(10):e0140290. Published 2015 Oct 9. doi:10.1371/journal.pone.0140290

Hon, Chun-Yip, et al. "Personal protective equipment in health care: Can online infection control courses transfer knowledge and improve proper selection and use?." American journal of infection control 36.10 (2008): e33-e37.

Kalra S, Kelkar D, Galwankar SC, et al. The emergence of ebola as a global health security threat: from 'lessons learned' to coordinated multilateral containment efforts. J Glob Infect Dis. 2014;6(4):164–177. doi:10.4103/0974-777X.145247

Kwon JH, Burnham CD, Reske KA, et al. Assessment of Healthcare Worker Protocol Deviations and Self-Contamination During Personal Protective Equipment Donning and Doffing. Infect Control Hosp Epidemiol. 2017;38(9):1077–1083. doi:10.1017/ice.2017.121

Liang SY, Theodoro DL, Schuur JD, Marschall J. Infection prevention in the emergency department. Ann Emerg Med. 2014;64(3):299–313. doi:10.1016/j.annemergmed.2014.02.024

Markwel, Alexandra, et al. "Clinical and ethical challenges for emergency departments during communicable disease outbreaks: can lessons from Ebola Virus Disease be applied to the COVID-19 pandemic?." Emergency Medicine Australasia (2020).

Petti, Stefano, et al. "Ebola virus infection among western healthcare workers unable to recall the transmission route." BioMed research international 2016 (2016).

Poller B, Hall S, Bailey C, et al. 'VIOLET': a fluorescence-based simulation exercise for training healthcare workers in the use of personal protective equipment. J Hosp Infect. 2018;99(2):229-235. doi:10.1016/j.jhin.2018.01.021

Rui P, Kang K. National Hospital Ambulatory Medical Care Survey: 2017 emergency department summary tables. National Center for Health Statistics. Available from: https://www.cdc.gov/nchs/data/nhamcs/web_tables/2017_ed_web_tables-508.pdf.

Weber, David J., et al. "Emerging infectious diseases: Focus on infection control issues for novel coronaviruses (Severe Acute Respiratory Syndrome-CoV and Middle East Respiratory Syndrome-CoV), hemorrhagic fever viruses (Lassa and Ebola), and highly pathogenic avian influenza viruses, A (H5N1) and A (H7N9)." American journal of infection control 44.5 (2016): e91-e100.

Verbeek, Jos H., et al. "Personal protective equipment for preventing highly infectious diseases due to exposure to contaminated body fluids in healthcare staff." Cochrane Database of Systematic Reviews 4 (2020)

World Health Organization. Health worker Ebola infections in Guinea, Liberia and Sierra Leone: a preliminary report 21 May 2015. No. WHO/EVD/SDS/REPORT/2015.1. World Health Organization, 2015.

## CME credit

You can earn CME credit for reading this article.

To receive CME credit, complete and submit the online evaluation form https://mnmed.informz.net/survistapro/sn.asp?gid=CFAEF1B9-092D-41AD-B6AD-6C02A7994013. Upon successful completion, you will be emailed a certificate of completion within two weeks. You may contact the MMA with questions at cme@mnmed.org. Participants must complete all necessary activity components to be eligible to claim CME credit.

The Minnesota Medical Association (MMA) is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

*The Minnesota Medical Association designates this activity for a maximum of .25 AMA PRA Category 1 Credit(s)™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.*

# Digoxin toxicity after a second COVID-19 vaccination

## Side effects can create drug-related complications for some patients

BY ROBERT COLE PUERINGER, MD; ANNIE ARENS, MD; NATHAN M. KUNZLER, MD; ERIN BATDORFF, MD; JON B. COLE, MD; AND TRAVIS D. OLIVES, MD, MPH, MED


*Both mRNA SARS-CoV-19 vaccines now being used in the United States require two doses, separated by either 21 days (Pfizer) or 28 days (Moderna). Although there can be side effects after either dose, more have been documented with the second dose, including flu-like symptoms such as headaches, fatigue, myalgias, arthralgias and chills. The vaccine is generally well-tolerated, but the additive effects of insensible volume loss, gastrointestinal symptoms and decreased oral intake may create circumstances ripe for drug-related complications.*

In the case we describe, the second dose of an mRNA SARS-CoV-19 vaccine produced a viral-like syndrome resulting in renal insufficiency from anorexia and dehydration. Exacerbated by an ACE inhibitor (lisinopril) and a P-glycoprotein inhibitor (diltiazem), the illness culminated in the development of severe digoxin toxicity with hyperkalemia. Digoxin toxicity was diagnosed by medical toxicologists at the bedside when taking into account the patient's history, presenting symptoms and visual abnormalities, renal insufficiency, hyperkalemia and slow atrial fibrillation. Hyperkalemia was likely the result of digoxin toxicity, renal insufficiency, lisinopril use and a high-potassium diet.

In the midst of an unprecedented mass vaccination campaign, clinicians must remain vigilant for the development of toxicity among patients on digoxin therapy, especially in patients experiencing influenza-like symptoms after a second dose of mRNA COVID-19 vaccine. This is particularly important in those who are on ACE inhibitors, diuretics or P-glycoprotein inhibitors, many of which are used in combination with digoxin in patients with heart failure or rapid atrial fibrillation.

### The case

A 60-year-old man with a past medical history of hypertension and permanent atrial fibrillation came to the Emergency Department after two days of progressive fatigue, myalgias, lightheadedness, anorexia and blurry vision with "white flashes." He said he felt as if he had malaria. He had received the second dose of the mRNA-1273 SARS-CoV-2 vaccine four days earlier and was on medications that included digoxin, carvedilol, diltiazem, lisinopril and rivaroxaban. He had immigrated from Rwanda 10 years earlier.

The patient's initial vital signs were:

- Temperature 34.6°C
- Blood pressure 69/47 mmHg
- Pulse 39
- Respiratory rate 16
- Oxygen saturation 98 percent on room air

He was slightly diaphoretic, alert and oriented and his arms and legs were warm. An EKG showed slow atrial fibrillation, with peaked T-waves. His lab results showed potassium 8.0 mEq/dL, lactate 5.3 mEq/L, sodium 127 mEq/L, bicarbonate 21 mEq/L, creatinine 2.41 mg/dL and anion gap 8 mEq/L. His pH was 7.32 and pCO2 41 mmHg.

He was treated with 3 grams of calcium gluconate, intravenous insulin/dextrose, sodium bicarbonate and one vial of digoxin-specific Fab fragments for presumed digoxin toxicity. His serum digoxin concentration returned at 1.6 ng/mL (normal 0.8-2.0 ng/mL). He underwent emergent hemodialysis for hyperkalemia when his potassium levels failed to fall significantly despite aggressive medical measures. His heart rate and blood pressure normalized following the administration of Fab fragments and his potassium level normalized after hemodialysis.

As we talked further with the patient, we learned that he ate six bananas each day with varying amounts of beans and cassava—the nutritional staples of a common Rwandan diet.

Ultimately, no additional Fab fragments nor additional runs of hemodialysis were indicated. Digoxin and lisinopril were held at the time of discharge on hospital day three.

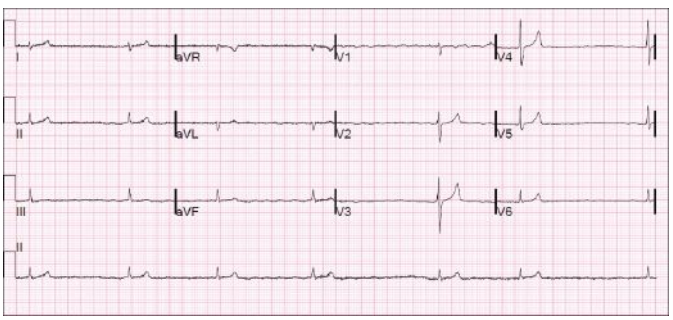
## Discussion

Digoxin is a cardioactive steroid that is used to increase cardiac contractility in heart failure and slow conduction in rapid atrial fibrillation. It is eliminated primarily unchanged by the kidneys. It inhibits membrane sodium-potassium–adenosine triphosphatase pumps (Na+/K+ ATPase), which decrease membrane potentials, and leads to increased cytosolic sodium and calcium (and increased extracellular potassium). In the myocardium, this causes increased cardiac contractility and automaticity, the latter of which can result in premature beats, escape rhythms and ventricular tachycardia. In the carotid sinus, increased baroreceptor firing boosts vagal tone, which can cause bradycardia, atrioventricular blocks, hypotension or nausea and vomiting. In skeletal muscle this leads to hyperkalemia due to the sheer number of Na+/K+ ATPase pumps.

Acute toxicity manifests as nonspecific GI symptoms, neurologic symptoms (somnolence or lethargy, visual disturbances), hyperkalemia and variable bradydysrhythmias or tachydysrhythmias. Chronic toxicity has a more insidious onset and a higher mortality and is marked by variable serum potassium levels with tachydysrhythmias and other neurologic manifestations. Nearly any cardiac dysrhythmia or conduction block can be seen in toxicity, particularly unique rhythms such as slow atrial fibrillation or polymorphic and biventricular tachycardias. Serum digoxin levels, while useful in acute ingestions, often do not correlate with toxicity in chronic ingestions as digoxin has been redistributed from the serum into peripheral tissues.

Treatment relies upon supportive care and the rapid administration of digoxin-specific fragment antigen-binding (Fab) antibodies, the specific antidote for digoxin toxicity. The digoxin-Fab complexes are subsequently cleared renally. Although a number of dosing strategies exist, digoxin-specific Fab antibodies are commonly dosed based upon the patient's clinical condition and the chronicity of poisoning, with most patients needing only one vial (chronic poisoning) or two vials (acute poisoning) for adequate reversal of toxic effects. Hyperkalemia due to digoxin toxicity is also best treated with digoxin-specific Fab antibodies.

Acute-on-chronic digoxin toxicity is most frequently precipitated by renal insufficiency, often the result of acute illness, decreased oral intake and volume loss. In addition, drug-drug interactions, particularly with P-glycoprotein inhibitors, diuretics or ACE inhibitors, can lead to decreased clearance of digoxin or hypokalemia (in the case of diuretics), both of which potentiate the development of toxicity. **MM**



EKG showing slow atrial fibrillation

## CME credit

You can earn CME credit for reading this article.

To receive CME credit, complete and submit the online evaluation form https://mnmed.informz.net/survistapro/sn.asp?gid=CFAEF1B9-092D-41AD-B6AD-6C02A7994013. Upon successful completion, you will be emailed a certificate of completion within two weeks. You may contact the MMA with questions at cme@mnmed.org. Participants must complete all necessary activity components to be eligible to claim CME credit.

The Minnesota Medical Association (MMA) is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

*The Minnesota Medical Association designates this activity for a maximum of .25 AMA PRA Category 1 Credit(s)™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.*

Robert Cole Pueringer, MD, is a hospitalist, medical toxicologist and addiction medicine fellow, University of Minnesota Addiction Medicine Fellowship. Annie Arens, MD, practices emergency medicine and medical toxicology, Hennepin County Medical Center. Alexander Ulici, PharmD, is a clinical pharmacist, Minnesota Poison Control System. Nathan M. Kunzler, MD, and Erin Batdorff, MD, are medical toxicology fellows, HealthPartners Institute Medical Toxicology Fellowship. Jon B. Cole, MD, practices emergency medicine and medical toxicology and is the medical director of the Minnesota Poison Control System, Hennepin County Medical Center. Travis D. Olives, MD, MPH, MEd, practices emergency medicine and is program director, EMIM Residency Program, Hennepin Healthcare.

### REFERENCES

Baden LR, El Sahly HM, Essink B, et al. Efficacy and Safety of the mRNA-1273 SARS-CoV-2 Vaccine. N Engl J Med. 2021;384(5):403-416. doi:10.1056/NEJMoa2035389

Botelho AFM, Pierezan F, Soto-Blanco B, Melo MM. A review of cardiac glycosides: Structure, toxicokinetics, clinical signs, diagnosis and antineoplastic potential. Toxicon. 2019;158:63-68. doi:10.1016/j.toxicon.2018.11.429

Chan BS, Isbister GK, Page CB, et al. Clinical outcomes from early use of digoxin-specific antibodies versus observation in chronic digoxin poisoning (ATOM-4). Clin Toxicol . 2019;57(7):638-643. doi:10.1080/15563650.2018.1546010

Cole J. Cardiovascular Drugs. In: Walls R, Hockberger R, Marianne Gausche-Hill M D, eds. Rosen's Emergency Medicine: Concepts and Clinical Practice: Volume - 1&2, 9e. 9th ed. Elsevier; 2017. https://www.amazon.com/Rosens-Emergency-Medicine-Concepts-Clinical/dp/0323354793/ref=sr_1_1?crid=2CYZSU0HC8WA7&dchild=1&keywords=rosen+emergency+medicine&qid=1614184993&s=books&sprefix=rosens+emer%2Cstripbooks%2C165&sr=1-1

Gomes T, Mamdani MM, Juurlink DN. Macrolide-induced digoxin toxicity: a population-based study. Clin Pharmacol Ther. 2009;86(4):383-386. doi:10.1038/clpt.2009.127

Hack J. Cardioactive Steroids. In: Nelson L, Hoffman R, Howland MA, Lewin N, Goldfrank L, Smith SW, eds. Goldfrank's Toxicologic Emergencies, Eleventh Edition. 11th ed. McGraw-Hill Education / Medical; 2019. https://www.amazon.com/Goldfranks-Toxicologic-Emergencies-Eleventh-Nelson/dp/1259859614

Juurlink DN, Mamdani M, Kopp A, Laupacis A, Redelmeier DA. Drug-drug interactions among elderly patients hospitalized for drug toxicity. JAMA. 2003;289(13):1652-1658. doi:10.1001/jama.289.13.1652

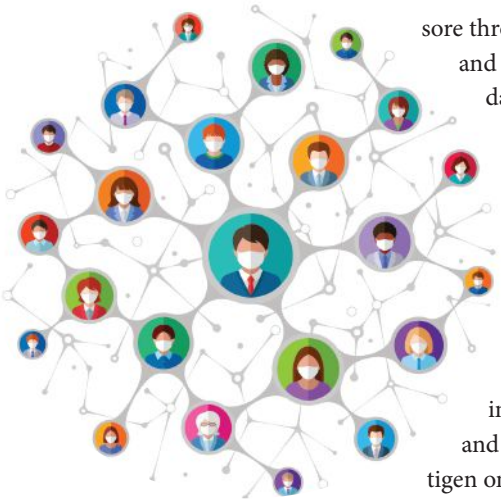
Juurlink DN, Mamdani MM, Kopp A, Herrmann N, Laupacis A. A population-based assessment of the potential interaction between serotonin-specific reuptake inhibitors and digoxin. Br J Clin Pharmacol. 2005;59(1):102-107. doi:10.1111/j.1365-2125.2005.02230.x

Polack FP, Thomas SJ, Kitchin N, et al. Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine. N Engl J Med. 2020;383(27):2603-2615. doi:10.1056/NEJMoa2034577

Quinn KL, Macdonald EM, Gomes T, et al. Macrolides, Digoxin Toxicity and the Risk of Sudden Death: A Population-Based Study. Drug Saf. 2017;40(9):835-840. doi:10.1007/s40264-017-0539-9

Roberts DM, Gallapatthy G, Dunuwille A, Chan BS. Pharmacological treatment of cardiac glycoside poisoning. Br J Clin Pharmacol. 2016;81(3):488-495. doi:10.1111/bcp.12814

# Evidence of symptomatic SARS-CoV-2 reinfection and subsequent transmission



BY NICHOLAS B. LEHNERTZ, MD, MPH, MHS; ELITZA S. THEEL, PHD; ALEXANDRA LORENTZ, APHL-CDC; VISHAL SHAH, MD; XIONG WANG, PHD; AND RUTH LYNFIELD, MD

*The first published case of reinfection with SARS-CoV-2, verified by whole genome sequencing (WGS), was reported on August 25, 2020. As of January 31, 2021, there had been more than 15 reports of COVID-19 reinfections that met CDC criteria and several more with evidence supporting reinfection. However, none of these cases reported evidence of transmission as a result of their reinfection, and none were in individuals who had received a dose of a COVID-19 vaccine.*

The case we examined was of symptomatic SARS-CoV-2 reinfection and subsequent transmission, 18 days after receiving the initial Pfizer BioNtech COVID-19 vaccine dose and 240 days after initial symptomatic infection.

The patient was a 40-year-old female healthcare worker (HCW) with a history of class III obesity (BMI 45.2) and hypothyroidism, who initially developed symptoms of myalgias, fatigue, chills, sore throat, sore neck and "feeling terrible" on May 11, 2020. A nasopharyngeal sample was collected on May 13, 2020 and tested positive for SARS-CoV-2 by RT-PCR. The patient did not report any known close contacts or travel and did not require hospitalization; acute symptoms resolved after approximately 10 days. She returned to work, with a negative SARS-CoV-2 RT-PCR test on September 28, 2020 and a negative antigen test on October 30, 2020.

The patient received an initial dose of the Pfizer-BioNtech COVID-19 vaccine on December 21, 2020, with no reported adverse reaction. On the evening of January 6, 2021, she developed acute symptoms consistent with COVID-19, including a cough, sore throat, congestion, fatigue, myalgias and headache. On January 8, 2021, 18 days after her first dose of vaccine, she tested positive for SARS-CoV-2 by RT-PCR. She said she had not had any contacts with COVID-19, travel or attendance at large social or holiday gatherings.

On January 11, she received a single infusion of bamlanivimab. That same day, a family member living in her home became symptomatic and tested positive for SARS-CoV-2 antigen on January 12. On January 13, another contact who lives 11 miles away and had last seen the patient on January 9, became symptomatic; that person tested positive for SARS-CoV-2 antigen on January 14. Two other household members developed symptoms of COVID-19 on January 14 and 16.

In order to identify the extent of household transmission, and to obtain samples for SARS-CoV-2 RT-PCR and WGS, anterior nares specimens were collected from the patient, her husband and two adolescent children in their home on January 15, and from her parents, who live about 11 miles away.

WGS was performed by the Minnesota Department of Health (MDH) Public Health Laboratory (PHL) on the five available SARS-CoV-2 RT-PCR positive specimens from the patient and her family members.

## Results

The patient had a positive SARS-CoV-2 RT-PCR (Ct value: 19.89) result from the sample obtained on January 8, 2021. The patient was RT-PCR negative on January 15, 2021. SARS-CoV-2 RT-PCR results from the four household contacts taken on January 15, 2021 returned positive. WGS was completed on all four samples. Three of the four samples had identical sequences to the patient sample from January 8, 2021. The fourth had a single nucleotide difference from the patient sequence, but was otherwise identical across the entire SARS-CoV-2 viral genome.

Serologic testing of the serum specimen obtained from the patient on January 21, 13 days after the second positive RT-PCR result, was positive for total antibodies against the viral RBD at a level beyond the reportable range of the assay and negative for total antibodies against the SARS-CoV-2 NC protein. Subsequent serologic analysis, 40 days after the second positive RT-PCR was again positive for total antibodies against the RBD at a level beyond the reportable range of the assay, and also positive for total antibodies against the SARS-CoV-2 NC protein.

## Discussion

Duration of immunity after initial SARS-CoV-2 infection, risk of reinfection and transmissibility of infectious virus after rein-

fection are all questions that remain under investigation. Some studies report evidence of extended humoral immunity past 90 days; others report waning antibody levels shortly after infection. A correlation between disease severity and an elevated antibody response has been documented, as has the importance of a strong cellular immune response. However, there is as of yet no defined correlate of protective immunity against re-infection. This patient was seronegative for antibodies to the nucleocapsid antigen, despite testing 15 days following the second onset of COVID-19 symptoms, and seroconverted to anti-nucleocapsid positive by 26 days later. The serologic evidence from this case supports reinfection 240 days after initial infection

This case provides the first molecular and epidemiologic evidence that reinfection can result in viral transmission to contacts, resulting in both positive SARS-CoV-2 RT-PCR and clinical disease.

Since the first WGS-confirmed patient of reinfection by To, et al on August 25, 2020, there have been more than 15 reported cases of reinfection. However, there are no reports of verified transmission from these cases of reinfection. This case provides the first molecular and epidemiologic evidence that reinfection can result in viral transmission to contacts, resulting in both positive SARS-CoV-2 RT-PCR and clinical disease. The patient and her family members did not report any known exposures, gatherings, travel or social events that they attended in the 14 days prior to January 6, the patient's date of symptom onset. She became symptomatic five days before one of her household contacts began developing symptoms and four days before one of her parents, who does not live in the same house. This is consistent with an incubation period of four to five days after exposure. The patient then tested negative by RT-PCR on January 15, the date when her four household contacts were both acutely symptomatic and RT-PCR positive. Finally, three of the four household contacts who tested positive all had identical sequences with the case, and the other sequence had one nucleotide difference.

A limitation on this study is the lack of a sample from the patient's initial infection, so reinfection can't be demonstrated through WGS, which is the only recognized standard of verifying a true reinfection event.

Further clarification on duration of immunity is needed, but this case highlights the need for caution with respect to both previous infection and single-dose administration of COVID-19 mRNA vaccines, and to the risk of subsequent infection. **MM**

Nicholas B. Lehnertz, MD, MPH, MHS, is a specialist in infectious disease epidemiology, Division of Infectious Disease Epidemiology, Prevention and Control, Minnesota Department of Health. Elitza S. Theel, PhD, is associate professor of Laboratory Medicine and program director, Division of Clinical Microbiology, Mayo Clinic. Alexandra Lorentz, APHL-CDC is a Bioinformatics Postdoctoral Fellow, Public Health Laboratory, Minnesota Department of Health. Vishal Shah, MD, is in the Division of Infectious Disease Epidemiology, Prevention and Control, Minnesota Department of Health. Xiong Wang, PhD, is supervisor, Sequencing and Bioinformatics, Public Health Laboratory, Minnesota Department of Health. Ruth Lynfield, MD, is state epidemiologist and medical director, Minnesota Department of Health.

**Funding**
This work was supported by Cooperative Agreement Number U60OE000104, funded by Centers of Disease Control and Prevention through the Association of Public Health Laboratories. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of Centers of Disease Control and Prevention or the Association of Public Health Laboratories study participants

**Conflicts of interest**
Elizta S. Theel is on the advisory board for Roche Diagnostics and Accelerate Diagnostics. The rest of the authors have no conflicts of interest to declare.

**Acknowledgements**
Richard Danila, Division of Infectious Disease Epidemiology, Prevention and Control, Minnesota Department of Health; Beth Theilen, MD, Division of Pediatric Infectious Diseases, Department of Pediatrics, University of Minnesota Medical School; and Tina Slusher, MD, Pediatric Critical Care Division, Department of Pediatrics, University of Minnesota.

**RESOURCES**

Cavanaugh AM, Thoroughman D, Miranda H, Spicer K. Suspected Recurrent SARS-CoV-2 Infections Among Residents of a Skilled Nursing Facility During a Second COVID-19 Outbreak - Kentucky, July-November 2020. ***MMWR Morb Mortal Wkly Rep***. 2021;70(8):273-277. Published 2021 Feb 26. doi:10.15585/mmwr.mm7008a3

Cohen JI, Burbelo PD. Reinfection with SARS-CoV-2: Implications for Vaccines [published online ahead of print, 2020 Dec 18]. ***Clin Infect Dis***. 2020;ciaa1866. doi:10.1093/cid/ciaa1866

Elbe S, Buckland-Merrett G. Data, disease and diplomacy: GISAID's innovative contribution to global health. Glob Chall. 2017 Jan 10;1(1):33-46. doi: 10.1002/gch2.1018. PMID: 31565258; PMCID: PMC6607375.

Gudbjartsson DF, Norddahl GL, Melsted P, et al. Humoral Immune Response to SARS-CoV-2 in Iceland. ***N Engl J Med***. 2020;383(18):1724-1734. doi:10.1056/NEJMoa2026116

Hadfield J, Megill C, Bell SM, Huddleston J, Potter B, Callender C, et al. Nextstrain: real-time tracking of pathogen evolution. Bioinformatics. 2018 Dec 1;34(23):4121-4123. doi: 10.1093/bioinformatics/bty407. PMID: 29790939; PMCID: PMC6247931.

Iyer AS, Jones FK, Nodoushani A, et al. Dynamics and significance of the antibody response to SARS-CoV-2 infection. Preprint. ***medRxiv***. 2020;2020.07.18.20155374. Published 2020 Jul 20. doi:10.1101/2020.07.18.20155374

Legros V, Denolly S, Vogrig M, et al. A longitudinal study of SARS-CoV-2-infected patients reveals a high correlation between neutralizing antibodies and COVID-19 severity. ***Cell Mol Immunol***. 2021;18(2):318-327. doi:10.1038/s41423-020-00588-2

Long QX, Tang XJ, Shi QL, et al. Clinical and immunological assessment of asymptomatic SARS-CoV-2 infections. ***Nat Med***. 2020;26(8):1200-1204. doi:10.1038/s41591-020-0965-6

Quick J. Artic amplicon sequencing protocol for MinION for nCoV-2019. dx.doi.org/10.17504/protocols.io.bbmuik6w.

To KK, Hung IF, Ip JD, et al. COVID-19 re-infection by a phylogenetically distinct SARS-coronavirus-2 strain confirmed by whole genome sequencing [published online ahead of print, 2020 Aug 25]. Clin Infect Dis. 2020;ciaa1275. doi:10.1093/cid/ciaa1275

Seow J, Graham C, Merrick B, et al. Longitudinal evaluation and decline of antibody responses in SARS-CoV-2 infection. medRxiv. 2020 Jul 11;2020.07.09.20148429.

Sevinsky J. SARS-CoV-2 Sequencing on Illumina MiSeq Using ARTIC Protocol: Part 2 - Illumina DNA Flex Protocol. dx.doi.org/10.17504/protocols.io.bffyjjpw

Tomassini S, Kotecha D, Bird PW, Folwell A, Biju S, Tang JW. Setting the criteria for SARS-CoV-2 reinfection - six possible cases. ***J Infect***. 2021;82(2):282-327. doi:10.1016/j.jinf.2020.08.011

## BRANDON NG, MD

- Family medicine, Entira Family Clinics, Inver Grove Heights.
- MMA member since 2012.
- Hometown is North Saint Paul. College and medical school at University of Minnesota Twin Cities. Residency with St. Joseph's Family Medicine Residency (now Woodwinds Family Medicine Residency).
- Family includes girlfriend and Scout the cat.

***Became a physician because …***

I had an idea that I wanted to be a doctor when I was in high school, but when my grandpa passed away, I took it quite hard emotionally and it kind of scared me away from being a doctor. I thought I was going to do cancer research in a lab until I was almost done with college. My research PI had me shadow one of her colleagues working in the Ped's Heme Onc unit at the University of Minnesota. It was eye-opening and shocking to see how resilient these kids are. Every day, faced with sometimes seemingly impossible odds, they always tried to smile. I thought to myself, "How can you be scared of helping someone for fear they may die when these kids who face the threat of death every day can put on a smile?" That's when I decided that my fear of death meant nothing compared to patients' need for a competent doctor. So, here I am now!

***Greatest challenge facing medicine today …***

Access to care is the greatest challenge. The current generation of doctors and other providers doesn't seem big enough to take care of current and future patient populations. As people live longer, their health complexity will almost always become greater. As we try to combat provider burnout by decreasing patient contact hours or having longer visits, we strain the moral line that brought many into this calling in the first place: helping patients. When we get call after call, day after day, asking for time to "fit in" one more patient, the burnout will only get worse. I think the solution is to increase residency slots and funding.

***Favorite fictional physician …***

JD from "Scrubs." I love how idealistic he is and how he learns to apply that idealism to a harsh world. Plus, he's a goofball in the hospital and never fails to get people to laugh and smile.

***If I weren't a physician …***

I think I'd be doing cancer research, which was my original life plan. If for some reason I couldn't be a physician anymore, I think I would be a high school biology teacher and make dumplings as a side gig while working on a dumpling-inspired Twitch gaming stream. When we were younger, my brother always joked about how he would start a dumpling shop in Minnesota. Since he's moved to New York City, that has now fallen on my shoulders. I'm a gamer and every stream needs to have a theme—unless you are actually good at gaming.

## AASFIA QAADIR, DO

- Child/adolescent psychiatrist. Clinical director, PrairieCare Maplewood, and clinical consultant to Diversity, Equity and Inclusion, PrairieCare.
- MMA member since 2016.
- From Chicago. Graduated from the University of Chicago and the Chicago College of Osteopathic Medicine. CAP Fellowship in psychiatry, Mayo Clinic. Has worked at PrairieCare since 2016.
- Family is "beautiful mixed Palestinian and Hyderabadi"—with feline furbabies.

***Became a physician because …***

My parents and extended family have always set examples of a sense of social responsibility. It's the idea that your purpose in life extends beyond your own enjoyment of success, that you must go back into the community to improve it, to create opportunities for others to succeed and to try to solve some of the problems that lead to suffering. For me, healthcare is social justice work. I also was attracted to medicine because of the diverse roles I could engage for clinical care, education, mentoring, public health initiatives and advocacy for policies that impact the health of communities. Working with children is compelling because of the fundamental trajectory that can be shifted to impact the rest of their lives. Children make progress even in a short span of time and it is amazing to watch them learn a new skill or learn how to communicate a need and problem-solve something for the first time.

***Greatest challenge facing medicine today …***

Lack of access to healthcare. We have the technological advancements within medicine and within fields of information technology/communications, but cannot seem to agree on the fundamental value that healthcare is a basic human right that should not be abrogated by any other interest. Even when patients can access healthcare physically, they must still contend with implicit bias and inefficiencies in healthcare delivery that are driven by a lack of understanding of the historical roots of healthcare inequities and a lack of training in racial trauma.

***Favorite fictional physician …***

Dr. Baker from "Little House on the Prairie," because that was one of the first depictions of a physician I recall as a child and what stood out was his relational connection in the community.

***If I weren't a physician …***

Something to do with theater and film—perhaps starting as a writer and then a director/producer. Narratives shape our perspectives on what is and also what could be. Our stories are part of our collective imagination—and we should dream big.

# Discover CE Courses That Just Click

**RELEVANT**
Commercial tobacco topics and trends

**QUICK**
Free and easy online courses

**ENGAGING**
Interactive and pausable modules

Created with busy healthcare professionals in mind, each free, engaging, accredited course covers a commercial tobacco-related topic that commonly arises in a clinical setting. See how we can help you provide the best care for your patients.

## Quick CE Courses

- Connecting the harms of commercial tobacco to chronic health conditions
- Cessation for behavioral health populations
- Vaping and e-cigarettes
- Quitline programs for specific populations (American Indian, youth, behavioral health, pregnancy)
- Minnesota Quitline 101
- Pharmacist prescriptive authority for nicotine replacement medications
- Ask, advise, connect

Explore these quick, relevent and free courses on
**CoursesThatClickMN.com**

DEPARTMENT OF HEALTH | quit partner™

Accreditation information found at CoursesThatClickMN.com

COPIC®

Better Medicine • Better Lives

CALLCOPIC.COM | 800.421.1834

# Why COPIC

COPIC connects you with expert guidance when you need it; with legal and HR helplines and a 24/7 risk management hotline.

**Trusted knowledge from an engaged partner.**
**That's why.**

COPIC is proud to be the endorsed carrier of the Minnesota Medical Association. MMA members are eligible for a 10% premium discount.