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.

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.
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.

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.

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.

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.
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.

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.

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.

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 every-one 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.”

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.
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.
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 102.6°F.

“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 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.”

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.”

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.”

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

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.

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 Coventor, 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 creating 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 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.

“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.”

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?”

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 others.

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.”
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-
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
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.
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.”

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 became 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.”

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.”