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NEWS OF THE TEXAS MEDICAL CENTER — VOL. 7 / NO. 4 — JULY 2020

PANDEMIC

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WILLIAM F. McKEON

President and Chief Executive Officer, Texas Medical Center

As I write this President's Perspective in late June, COVID-19 infection rates are climbing in Houston and other cities around the world.

Especially now, months into this global crisis, we cannot let our guard down. We must continue to wear masks. We must continue to practice social distancing to keep the health and safety of all citizens front and center.

Leaders of the Texas Medical Center have been working closely with Texas Gov. Greg Abbott, Houston Mayor Sylvester Turner, Harris County Judge Lina Hidalgo and city and county public health professionals since the outbreak of the novel coronavirus in China.

At the same time, Texas Medical Center leaders have been meeting every morning to share information and insights related to COVID-19. Even before the pandemic arrived in Houston, we created a war room—all of the CEOs assembled to face the pandemic, to share best practices and to organize the acquisition of essential supplies for our institutions to fight the virus. In the early days of the pandemic, gathering personal protective equipment was challenging. But over the past few months, we have created a supply chain that will keep our hospitals prepared for whatever comes.

The Texas Medical Center has also launched a comprehensive digital data dashboard to provide daily updates on the availability of ICU beds, ventilators and personal protective equipment across our member institutions, as well as to share infection rates and trends across the Greater Houston area. Visit tmc.edu to access this data.

Every member of our community plays a significant role in the fight to end the spread of COVID-19. The lives of Texans are in our hands. Together, we must do everything humanly possible to protect our patients, our families, our region and ourselves.

Houstonians have always united to face formidable challenges, and we will persevere in the days ahead. We must stand apart and work together.

A handwritten signature in black ink that reads "William F. McKeon". The signature is fluid and cursive, with a long horizontal stroke at the end.

TMC | PULSE

Vol. 7 No. 4

July 2020

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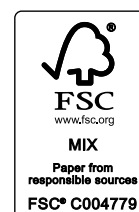
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A MESSAGE TO READERS

TMC Pulse did not publish in April, May or June, due to the coronavirus pandemic. We would like to take this opportunity to welcome you back.



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ON THIS PAGE: Employees on the former Memorial Hermann Life Flight helipad take photos of the Blue Angels, the U.S. Navy's precision flight demonstration squadron that flew over the medical center on May 6, 2020, to honor COVID-19 workers.

ON THE COVER: Kwame Bennam, a respiratory therapist at Memorial Hermann-TMC, stands in an operating room theater.

Crunching COVID-19 Data

The TMC's daily dashboard offers statistics from institutions operating across nine counties

BY MAGGIE GALEHOUSE

Early in 2020, before the pandemic had arrived in Houston, medical leaders began to meet regularly to talk strategy and share information about COVID-19.

"Every morning starts at 7 a.m.," Texas Medical Center CEO and President Bill McKeon said at a March 20 press conference with Mayor Sylvester Turner and city health leaders. "All of the CEOs come together and meet on COVID-19. It has been a tight alliance of all of us, sharing best practices and ideas, sharing the cases and how we're approaching them and actually planning for the future. ... Our incredible institutions have been ramping up their own labs."

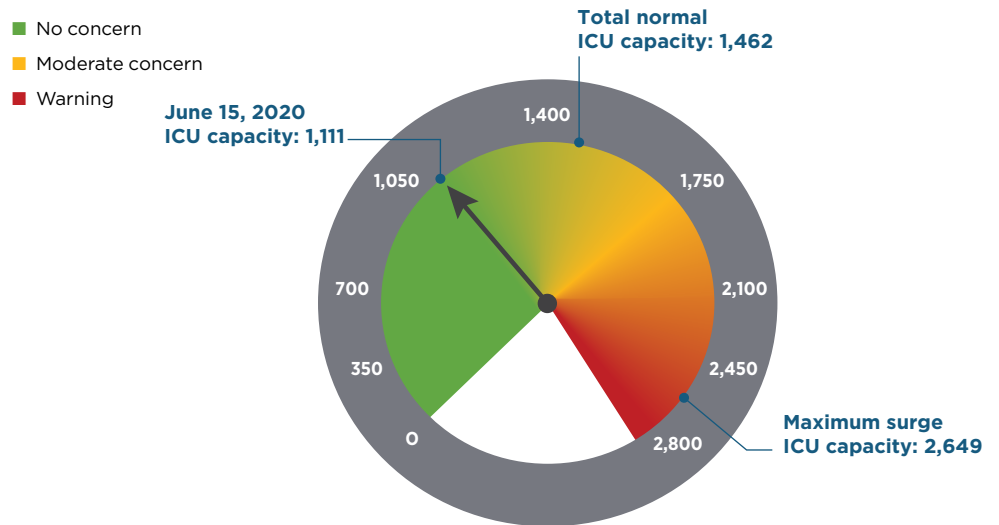
From those frequent meetings and other conversations came a desire to gather and share Texas Medical Center (TMC) data about COVID-19 caseloads, medical supplies and equipment needed to treat patients, testing capabilities and more.

"Really, it's about the importance of public health—of working together across institutions to understand where we are in terms of the coronavirus and where we could be headed," TMC Vice President of Strategy Ashley McPhail said.

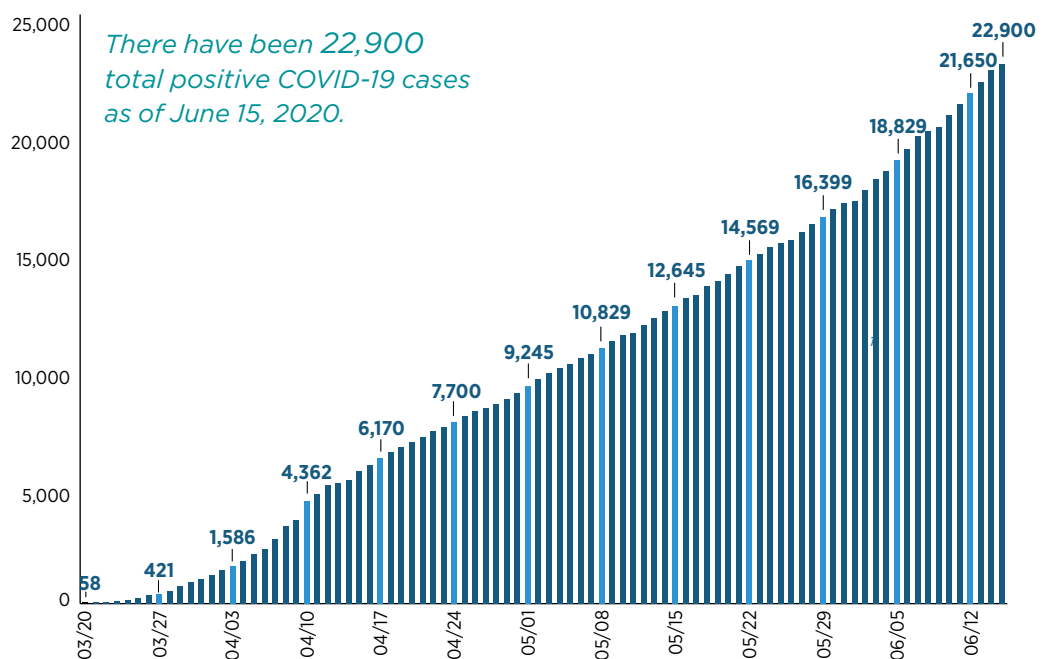
In April, the TMC launched a data dashboard to provide up-to-date information on infection rates and COVID-19 case growth trends across the greater Houston area, as well as to monitor the availability of ICU beds, ventilators, personal protective equipment and other items at TMC-affiliated institutions operating across nine Houston-area counties. Those TMC affiliates are CHI St. Luke's, Harris Health System, Houston Methodist, MD Anderson Cancer Center, Memorial Hermann, Texas Children's Hospital and The University of Texas Medical Branch at Galveston. Facilities operating under other brands are not included in the TMC data.

"We are trying to help people understand what's currently happening in our TMC hospitals, especially in terms of the number of new COVID-19 cases and the impact on hospital beds," McPhail said. "Not overwhelming the hospitals is very important. Since these data trends show that we're still in the middle of the pandemic, we will continue to provide this information for the foreseeable future." ■

TMC¹ TOTAL ICU BED OCCUPANCY, as of June 15, 2020 Greater Houston Area²



INFECTION RATE, as of June 15, 2020 Confirmed Positive COVID-19 Cases in the Greater Houston Area³



¹ "TMC" refers to the group of individual hospitals and institutions that make up the Texas Medical Center
² Austin, Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery and Waller Counties
³ Infection Rate Source: USAFacts.org (<https://usafacts.org/visualizations/coronavirus-covid-19-spread-map/>)
 • This data is solely intended to share insights and best practices rather than specific recommendations. Individual institution data is shown as reported and has not been independently verified.

The TMC data dashboard, which is updated daily, can be found at tmc.edu, the TMC's corporate website.

COVID-19 Crisis Catalog: A Glossary

A compilation of terms related to the global pandemic

BY ALEXANDRA BECKER

As a novel coronavirus has created a global crisis unprecedented in our lifetimes, language has undergone a minor upheaval, as well.

TMC Pulse has compiled a list of terms that are essential to understanding COVID-19, and we're not alone in our efforts to define and differentiate. Merriam-Webster also made updates to its dictionary in response to the pandemic. A selection of those words appear in shaded boxes below.



Community spread: the spread of a contagious disease in a geographic area in which there is no knowledge of how someone contracted the disease. In other words, no known contact can be traced to other infected individuals.

Contact tracing: identifying and monitoring people who may have come into contact with an infectious person.

Contactless: without contact; for example, "contactless delivery" would include leaving purchased items at the entryway of a home rather than handing them directly to a person.

Containment area: a geographical zone with limited access in or out in an effort to contain an outbreak.

Coronavirus: a family of viruses that includes SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2), SARS (severe acute respiratory syndrome), MERS (Middle East respiratory syndrome) as well as other respiratory illnesses. A coronavirus, also known as a CoV, is typically spread between animals and humans and takes its name from the Latin word for crown (corona), which refers to the shape of the virus when observed microscopically.

COVID-19: the illness caused by the virus SARS-CoV-2. COVID-19 stands for novel coronavirus disease 2019, the year of its initial detection.

Epidemic: a widespread occurrence of an infectious disease in a community or geographic area.

Essential businesses: those businesses that serve a critical purpose, such as grocery stores, pharmacies, waste collection, health care providers, gas stations, banks, transportation and agriculture services.

Flattening the curve: an attempt to create a more gradual uptick of cases in a health crisis, rather than a steep rise, in an effort to avoid overburdening the health care system all at once. "Flattening the curve" does not necessarily decrease the projected number of cases, but spreads them out over a period of time.

Herd immunity: the reduction in risk of infection within a population, often because of previous exposure or vaccination.

Incubation period: the time between an individual's first exposure to an infectious disease and the appearance of symptoms. A person's level of contagion before symptoms arise is not known for COVID 19, though most experts believe people are most contagious after they begin exhibiting symptoms.

Lockdown: an emergency measure in which individuals are restricted from certain areas in an attempt to control exposure or transmission of disease. In a lockdown during an epidemic, individuals are encouraged to stay home.

Novel coronavirus: a new strain of coronavirus, or nCoV, that has never been detected in humans.

Pandemic: worldwide spread of an infectious disease, with larger reach than an epidemic. Until COVID-19, the last pandemic was the H1N1 influenza outbreak in 2009.

Physical distancing: the practice of maintaining greater space between oneself and others and/or avoiding direct contact with other people. ➡

PPE: personal protective equipment, or PPE, refers to specialized clothing and other items used as safeguards against health hazards, including exposure to infectious diseases through physical contact or airborne particles. PPE is designed to protect parts of the body typically exposed in normal attire, including the nose, mouth, eyes, hands and feet.

Presumptive positive case: an individual who has tested positive for a disease such as COVID-19 by a local public health lab, but whose results are awaiting confirmation from the CDC.

PUI: a person/patient under investigation, or a PUI, is an individual suspected of having an infection, such as COVID-19.

Remdesivir: an investigational antiviral drug that is administered intravenously and inhibits viral replication. It is a promising drug for the treatment of COVID-19 and was first developed to treat Ebola.

SARS-CoV-2: the virus fully defined as “severe acute respiratory syndrome coronavirus 2” causes the disease COVID-19.

Screening: the act of verifying symptoms and potential exposure before testing for a virus.

Self-quarantine: the act of refraining from any contact with other individuals for a period of time—in the case of COVID-19, two weeks—to observe whether any symptoms of a disease will arise after potential exposure.

Shelter-in-place: an edict, typically issued by local government, that asks residents to remain at home and leave only to perform duties deemed essential in order to slow transmission of and exposure to a virus.

Social distancing: the act of remaining physically apart in an effort to stem transmission of disease, including COVID-19.

Spanish flu: also known as the 1918 influenza pandemic, this was the most severe pandemic in recent history according to the Centers for Disease Control and Prevention (CDC), with an estimated 500 million infections and 50 million deaths worldwide.

Super-spreader: a highly contagious individual who can spread an infectious disease to a large number of uninfected people through a network of contacts.

Vaccine: a biological preparation of organisms that provides immunity to a particular infectious disease.

Ventilator: a machine designed to move air in and out of the lungs for a patient who is physically unable to breathe or who is not breathing well.

WFH: an abbreviation of “working from home” or “work from home.”

Visit tmcnews.org for a more comprehensive glossary of pandemic terms.



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Rice University engineers design DIY ventilation unit

As news of ventilator shortages in areas hit hard by COVID-19 grew, a team at Rice University's Oshman Engineering Design Kitchen (OEDK), together with global health design firm Metric Technologies, worked to refine an easy-to-assemble ventilation unit originally created by undergraduate engineering students.

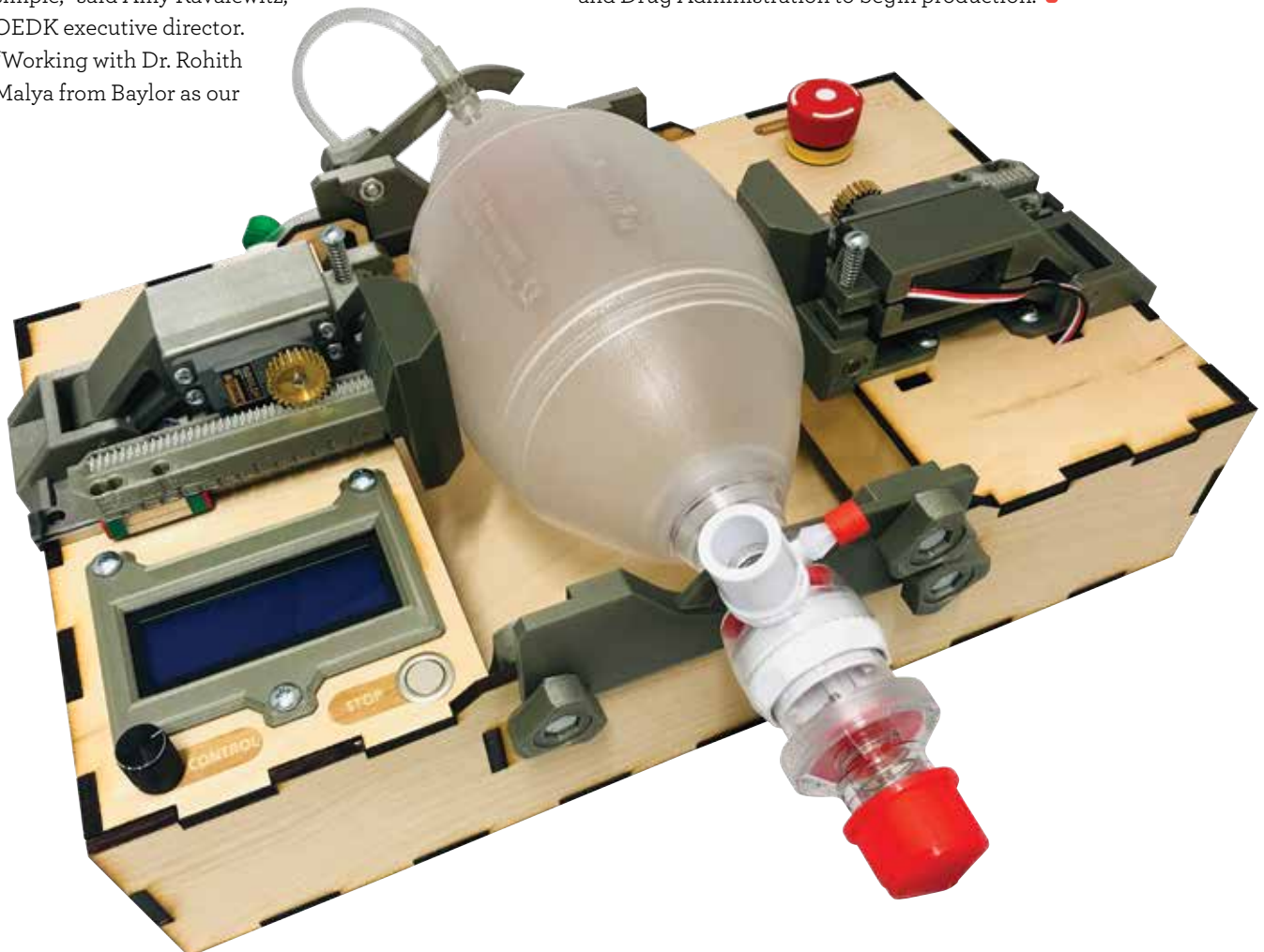
The ApolloBVM (BVM stands for bag valve mask) is not intended to be used in place of a ventilator when one is available, but rather as a bridge device. While typical bag valve masks pump air into the lungs by hand, this device is automated, making it highly desirable for patients in need of continuous support. The unit is made from easy-to-acquire materials and features adult, child and pediatric settings.

"Our technicians got together with one whiz-kid student and decided to redesign it and make it super simple," said Amy Kavalewitz, OEDK executive director. "Working with Dr. Rohith Malya from Baylor as our

advisor, they redesigned it in a way where, if you had the tools and you had the equipment and you had some basic knowledge of how to build a device, you could put one of these together."

Malya, an assistant professor of emergency medicine at Baylor College of Medicine, an adjunct assistant professor of bioengineering at Rice and a principal at Metric Technologies, worked closely with Danny Blacker, OEDK's engineering design supervisor, and Rice University then-senior "whiz-kid" Thomas Herring.

In early April, the team published instructions for the unit online for anyone who wished to build one. Cost for parts is less than \$300. Since then, the team has contracted with Houston-based Stewart & Stevenson to manufacture the device, and they are working on emergency approval from the U.S. Food and Drug Administration to begin production. ■



Donating Plasma to the Critically Ill

COVID-19 survivor Daniel Knight explains his role in convalescent serum therapy

BY SHANLEY PIERCE

From the moment Daniel Knight felt the first symptoms of COVID-19 to the day he donated lifesaving plasma to help critically ill patients, only four weeks had passed. But to him, it felt like an eternity.

Local health officials first reported community spread of COVID-19 in the second week of March. The Houston Livestock Show and Rodeo shut down March 11 and then, on Friday the 13th, schools announced closures.

That weekend, Knight, a 41-year-old attorney, spent the day in his back yard gardening, laying 25 bags of cedar mulch over the flower beds. Although he developed congestion in his lungs and a cough shortly afterward, he chalked up those ailments to the cedar and other outdoor allergens.

"It came on so suddenly that we just thought it was a really bad sinus infection or something like that," Knight's wife, Lyndsey, recalled.

Lyndsey Knight, 40, suffers from rheumatoid arthritis and is on a regimen of an immunosuppressant drug, tocilizumab. The immunosuppressant induces a condition, called secondary immunodeficiency, in which her body is unable to produce the necessary antibodies to fight off infections. As a result, she relies on plasma donations for intravenous immunoglobulin treatments to manage her diminished immune function.

On Monday, March 16, Daniel Knight's law firm, Chamberlain Hrdlicka, sent home all at-risk employees and those with at-risk household members. Knight wasn't going to take any chances exposing family, especially his wife.

That same afternoon, he came down with a fever.

Knight immediately called his doctor, who prescribed antibiotics to treat the symptoms. On Wednesday, March 18, he went to get tested for COVID-19. By then, Knight's symptoms had worsened. He was experiencing fatigue, body aches, chills and shortness of breath—all the tell-tale signs of COVID-19.

"The physical aspect of it was bad. It was like a really bad case of the flu," Knight recalled.

His resting heart rate, which normally sits between 65 and 70 beats per minutes (bpm), shot up to 100 bpm, and his coughing spells lasted for a minute or two at a time.

Without the test results to confirm whether it was COVID-19 or the flu, the Knights could only



Daniel Knight, a COVID-19 survivor, donates plasma at Houston Methodist Hospital.

speculate, but they weren't taking any chances. Daniel Knight grabbed his clothes and moved into the garage apartment of his home to start Day 1 of isolation.

So close yet so far

Knight's symptoms resolved six days after he was tested, but it wasn't until March 31—nearly two weeks after his test—that he finally received his results: COVID-19 positive.

"I don't think I could have changed anything to avoid it," he said. "I think that's part of what the frightening reality of this is—that it's out there and a lot of people are going to get it."

Studies have shown that individuals who test positive for COVID-19 often carry a high viral load shortly before and after symptoms appear, suggesting that people are more likely to transmit the virus to others while they're pre-symptomatic and soon after they begin to show signs of sickness. With up to 50 percent of cases being asymptomatic, according to National Institute of Allergy and Infectious Diseases director Anthony Fauci, M.D., people may be unwittingly spreading the coronavirus to others.

These silent spreaders are one of the reasons

COVID-19 has been so difficult to contain. On top of that, the virus is highly contagious.

The seasonal flu has an R_0 value of 1.3, the basic reproduction number that indicates how contagious a virus is. By comparison, the SARS-CoV-2 virus has an R_0 of 5.7. In other words, one person infected with COVID-19 can transmit the disease to 5.7 other people.

"When you're told that you're positive and you've actually been transmitting it up to a week before your symptoms—I just felt awful," Knight said. "There's no way I could have known, but I felt terrible because of how many people I exposed. ... It's something you have to be able to work through mentally, otherwise, it could just eat you alive."

Although he no longer exhibited any symptoms, his second COVID-19 test came back positive on April 3. For nearly a month, he kept his distance from his wife and kids.

"Even when we're in quarantine staying at home, most folks are still around a partner, a husband or a wife, or some other civil arrangement," he said. "You can still hug them on the couch or snuggle while you stream a show. But when you're in isolation, you have no physical



Knight looks out onto the back yard of his Houston home.

contact with anybody.”

Knight entered the main house for food, water or clothes. He washed his hands and face each time he entered, using a Clorox wipe to open doors and clean any surfaces he touched.

While his wife, 10-year-old daughter and 7-year-old son gathered at the dining table for dinner, Knight ate at the kitchen counter 12 feet away from his family.

Even though he was close by, he felt far away.

“It was really awful. You’d be looking at the kids. They’d be looking at you and they want to come over and hug you, but they can’t,” he said. “It just kills you. ... It was a matter of being alone.”

Finally, on Monday, April 13, Knight’s third test came back negative.

“When I was finally out, my son and my daughter grabbed onto me for five minutes,” he said. “Then, 15 minutes later, they’re trying to beat each other up—but for those five minutes, it was a very nice moment.”

Plasma therapy

With no approved vaccine for COVID-19, the global scientific community has been racing for a cure.

Scientists are investigating an array of existing drugs as potential treatments—including remdesivir and tocilizumab—but another promising avenue is convalescent plasma therapy.

Plasma, the translucent, straw-colored component of blood, is often called “the gift of life.” In addition to glucose, clotting factors and electrolytes, plasma is rich in antibodies that are produced by the immune system to seek and destroy foreign substances in the body, such as bacteria and viruses.

Patients who have fully recovered from COVID-19 carry antibodies in their plasma that their immune system produced to attack the virus. Transfusing that plasma into patients still suffering from the disease may arm them with the COVID-19-fighting antibodies they need to recover.

On March 28, Houston Methodist received approval from the U.S. Food and Drug Administration to become the first academic medical center in the nation to transfuse donated plasma from a recovered COVID-19 patient into two critically ill patients. Since then, the hospital has recruited 100 plasma donors.

“What makes these donors special is that they

have a documented history of COVID-19 infections, so we anticipate, based on the literature that’s been done, that we’re going to have a brisk antibody response in them,” said James Musser M.D., Ph.D., chair of the department of pathology and genomic medicine at Houston Methodist Research Institute.

More than a century old, convalescent serum therapy was used to treat patients during the Spanish flu pandemic of 1918, the diphtheria epidemic in the United States in the 1920s, a flesh-eating bacteria outbreak in the 1930s and the Ebola outbreak in 2014.

Knight, who was familiar with Houston Methodist’s groundbreaking work in convalescent plasma therapy, signed up to become a donor immediately after he received a clean bill of health.

His wife, who relies on plasma donations, understands firsthand the importance of her husband’s contribution. She had been encouraging him to donate blood and plasma for years, but it took a pandemic for him to overcome his aversion to needles.

“Even though he had the virus, at least something good was coming out of it,” Lyndsey Knight said.

Daniel Knight donated a quart of plasma for the first time on April 14 and again three days later.

“Those of us who [have recovered], we have a unique opportunity to help,” he said. “You have a chance to potentially save a life ... [by] letting doctors and scientists try to find an effective treatment for people who are way sicker than I was. If we can do that together, then that’s how we’re going to get back to as close to normal as we were before.”

Since April, Daniel Knight has donated his plasma more than 10 times and plans to continue donating for as long as he has the antibodies in his system and as long as Houston Methodist will take his donations.

“You can turn toward darkness and despair and feel like it’s never going to be the same, or you can look through a lens of hope and say, ‘This stinks. It sucks. It’s awful, but we’re going to overcome it together,’” Knight said. “Me doing the plasma donation is just a small part of that, but I feel as though I have to do what I can.” ●

Baptism By Pandemic

Harris Health System's new leader, Esmaeil Porsa, stepped into his role at the onset of the COVID-19 crisis

BY CINDY GEORGE

In early March, just as COVID-19 was emerging in Houston, Esmaeil Porsa, M.D., MPH, MBA, began his tenure as the first physician to lead Harris Health System. The former executive vice president and chief strategy and integration officer at Parkland Health and Hospital System in Dallas assumed his new post at the start of a global health emergency that has had a disproportionate impact on Harris Health's Ben Taub and Lyndon B. Johnson hospitals. Yet Porsa's decades-long experience serving patients in safety-net health care settings has energized his commitment to underserved populations during the global pandemic.

PULSE | Why were you interested in the CEO job at Harris Health?

PORSA | My entire life has been devoted to public health and, even more than that, population health. It was just the right fit at the right time. In my interviews, when they asked me why I wanted to come to Harris Health, the honest answer then and now is: I think I can help.

PULSE | You've spent some time professionally in Houston before. Tell me about that.

PORSA | I did my training in internal medicine at The University of Texas Health Science Center at Houston. I actually spent most of my training at LBJ Hospital. After that, I worked for one year as an ER attending at LBJ and, in 1998, I started working as UT faculty inside the Harris County Jail. I provided primary care inside the jail and also ran their infirmary for several years while I was teaching epidemiology and statistics at McGovern Medical School.

PULSE | Why did you leave Houston?

PORSA | In 2007, I was recruited to Parkland Hospital in Dallas to become the medical director for the Dallas County Jail. I did that for

about six years and then I was promoted to senior vice president for medical affairs. During the move to the new Parkland Hospital, I became the interim chief medical officer to ensure the successful transition. About four years ago, I became the chief strategy and integration officer for Parkland Hospital and held that title until I came back to Houston.

PULSE | What's your analysis of the elevated importance of public health amid COVID-19?

PORSA | The impact of COVID-19 on the segment of the population that the Harris Health System cares for is so much more significant. The percentage of the patients in my hospitals who are COVID-19-positive is more than twice the proportion of patients who are COVID-19-positive in any other hospital in this area. Think about this segment of the population: They are racial minorities, they are underinsured, they are uninsured. They are those who have chronically suffered from not just social disparities but also health disparities—and they are now being more severely impacted by COVID-19. I think COVID-19 is shedding a light on the impact of a pandemic on a community that has chronically had a lack of access to adequate care.

PULSE | Can you elaborate on the inequities, the special purpose of Harris Health and, respectfully, the greater burden?

PORSA | It is a burden. I was talking to another reporter the other day who asked if we were suffering a higher burden because of the number of patients. The answer is no. While the rest of the hospitals in this area have basically been empty until recently when they opened their doors again to elective procedures, the hospitals in Harris Health have been full. Several weeks ago, one of my hospitals was over 100 percent capacity. We were basically creating rooms in the emergency room to take care of our ICU patients. The proportion of ICU patients with COVID-19 has come up to 14 to 15 percent across the TMC, but 44 percent of ICU patients at LBJ Hospital are COVID-19-positive [as of early June]. That's almost half of all ICU patients at LBJ. The percentage is less at Ben Taub just because it's a larger facility. The burden is not so much the number. The burden is the fact that a much higher proportion of the patients are COVID-19-positive and they are just more difficult to care for in a regular inpatient or ICU bed.

PULSE | How do you approach your job under these inequities in the era of COVID-19?

PORSA | I am relying on my education and training in public health. My hospitals have been full, they will continue to be full and that is just a constant struggle. It is our mission to care for the segment of the population who don't have access to care otherwise. That's who we are. That's what we do. We will never use that as an excuse to provide anything less than the highest quality care for our patients, because they deserve it. As we do that, we should also be cognizant of the fact that if we are going to fulfill our mission to improve the health of the community, we also have to pay special attention to not just managing disease and treating patients, but think upstream to do what we can in disease prevention and health promotion. Why are our patients so sick? That goes back to the chronic lack of access to health care and the social disparities that exist. We have to address those things.

PULSE | Are you able to work on prevention during this pandemic?

PORSA | We are doing probably 2 percent of what really needs to happen. All hands are on deck trying to address COVID-19. We started testing the homeless for COVID-19 because that could become the next hot spot if we have homeless people in close proximity who are chronically ill or in poor health.

PULSE | If Harris Health System is doing well with population health and health promotion, what does that look like?

PORSA | We prevent disease onset. It would be ideal if we could prevent hypertension and diabetes,

but what if we could do something to postpone the onset of hypertension and diabetes by five years, by a decade, by two decades? Both the financial impact and the health impact of that on our community would be immeasurable. Those are the types of things I'm excited about and what I want Harris Health to become known for.

PULSE | Finally, can you provide more details about the conversion of Quentin Mease, the former hospital in Third Ward that is transitioning to an outpatient facility focused on dialysis and HIV care?

PORSA | Dialysis is one of my passions. It's going to expand our dialysis program with a focus on peritoneal dialysis [blood purification during a process in the lining of a person's abdomen] and not so much hemodialysis [blood pumped and purified through an artificial kidney machine], even though that program is going to expand. I want to be well known in this community and nationally for doing peritoneal dialysis well. The difference in overall costs and mortality is huge. There's less mortality and morbidity—infections and things of that sort—with peritoneal dialysis, as well as the ability to perform the dialysis at home and to travel and to work. But how do we treat the diabetes and hypertension that cause people to end up in end stage renal disease? The best thing would be to never get to the point of end stage renal disease and that goes back to upstream thinking and prevention. ●

This interview has been edited for clarity and length.



Cancer Patient Beats COVID-19

Patsy Clapp credits Houston Health Department epidemiology specialists with her recovery

BY CINDY GEORGE



In early March, Patsy Clapp drove to Tyler, Texas, to visit a brother who has Parkinson's disease. She left on March 5, spent three days in Dallas and returned to Houston on March 8.

By then, COVID-19 cases related to international travel had been confirmed in Houston and concern was growing about the health status of individuals who had made domestic trips. SXSW in Austin, one of the largest music, film and media festivals in the world, had been canceled and "social distancing" had entered the general lexicon.

The global pandemic was no longer an international news item. The coronavirus was here.

Clapp, a 74-year-old bone marrow cancer patient who beat breast cancer two decades ago, prepared to stay close to home for a while. She visited Cornelius Nursery on Voss Rd. to buy oakleaf hydrangeas, begonias and caladiums for her townhouse courtyard so that she could have some fresh color around her bubbling fountain and late-blooming azaleas.

"I learned how to do home delivery from H-E-B and got my groceries ordered in," Clapp said. "I purposely did not see my children or my grandchildren."

The longtime antiques dealer also got her hair done.

Those would be the last of her usual activities for weeks.

Clapp started feeling ill on Tuesday, March 17. Her symptoms began with a fever, a bad headache and fatigue. She stopped eating because of nausea and other gastrointestinal issues, but she didn't have the signature COVID-19 cough.

"I lost my appetite to even drink water for five days," she said.

But the fatigue hit her the hardest.

"I am usually very high energy," Clapp said. "I had friends and family checking on me all the time and I didn't even have the energy to return texts or emails. I just was zapped. My body ached. ... I felt as bad as I have felt since I delivered my twins au naturel."

On Friday, March 20, she called her internist's office. The voicemail message advised her to go to the emergency room.

"But, of course, that was 180 [degrees] from what the TV was telling us to do. They were saying to stay away from the emergency room," Clapp recalled.

Patsy Clapp poses in the yard of her Houston home.

The weekend passed with no improvement in her symptoms. By then, Clapp was exceedingly dehydrated. Her internist called on Monday morning and sent her to the Houston Methodist Emergency Care Center at Kirby Dr. and U.S. 59. She was tested for COVID-19.

"They were going to put me in the hospital, which I was not pleased about, but I stayed five hours and they determined I could go home," she said.

She left the ER with an IV and a few bags of saline. On her way home, she went to a CVS drive-through to fill a prescription for anti-nausea medication and bought a store-brand bottle of acetaminophen because the Tylenol was sold out.

A COVID-19 diagnosis

The next morning, someone from Houston Methodist called to tell Clapp she had tested positive for COVID-19.

She notified her hematologist and was advised to cut her doses of oral chemotherapy in half. The medication reduces the white blood cells her immune system needed to fully fight the coronavirus. She also contacted her relatives and her hairdresser about the diagnosis.

Her internist declined to prescribe hydroxychloroquine, a medication that initially received

emergency use authorization as a COVID-19 treatment from the U.S. Food and Drug Administration, though that authorization was revoked in mid-June.

"She said: 'No, I'm not going to give that to you. We're just going to wear it out,'" Clapp recalled.

As a high-risk, older patient, Clapp needed to be monitored. She received a call or text almost daily from Houston Health Department (HHD) epidemiologist Tahani Hamdan.

"I had this illness that's sweeping the nation and killing everybody, particularly the elderly," Clapp said. "The only thing that scared me is that all of these people were dying. That's all you heard on the TV. What do you do when you're lying in bed listening to the TV?"

She found comfort in conversations with Hamdan and during at-home testing visits with HHD senior public health investigator Teresa Garcia.

"They were loving, gracious, compassionate and concerned," Clapp said. "I have been so cared for ... by these two city servants who went so far above and beyond."

The human factor

The Houston Health Department receives

COVID-19 infection reports from hospitals and labs. That data is tracked by the agency's informatics team.

Hamdan and other city health department epidemiologists are responsible for the follow-up investigations that wrap flesh and emotion around the numbers. Every "person under investigation" or PUI who has been diagnosed is contacted directly or via caregivers or through the hospital. The epidemiologists are tasked with tracking those individuals until they recover, as well as others who have been exposed.

All of these duties during a pandemic have made the roles of public health professionals, namely contact tracers, more prominent.

"We have phone duty, so we talk with the doctors, we talk with the nurses and medical staff. We do a lot of investigations over the phone with the patients," said Hamdan, who previously followed up on Zika infections in pregnant women and children.

In many ways, Hamdan's job now is to calm uncertainty and clarify confusion for patients.

"These are people that matter. They are worried about their lives and their families," the epidemiologist said. "COVID-19 has taken a toll on a lot of people mentally, emotionally and physically. A lot of people are scared." ➡



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Hamdan, who has a master's degree in public health and worked her way up from agency intern to epidemiologist over the last four years, speaks with a soothing and assuring voice.

"Sometimes, we laugh with them. We cry with them. I would say we're here to serve, educate, investigate as well as comfort," she said. "I oftentimes have to find my strength to try to comfort the patients and at the same time I'm muffling my cries hoping they don't hear me because I don't want them to be more fearful because I know they're seeking guidance. It's just the human factor."

Multiple tests mark recovery

Clapp was tested for COVID-19 four times. The first was at the emergency center on March 23, which was confirmed on March 24.

Once she started to feel better, she needed to take another COVID-19 test to see if she had kicked the virus. Neighbors didn't know about her diagnosis and she didn't want someone showing up in head-to-toe gear to reveal her predicament. Still, Clapp left her gate open and Garcia slipped onto the property along the side of the house for that second test—the first from HHD. Garcia, who is also a nurse, was clad in personal protective equipment (PPE).

"I stepped out in the courtyard and she

swabbed my nose," Clapp said. "She undressed and put all the things in the plastic bag, and she left and I got the plastic bag and put it in my trash. That's what she did for me three times."

Clapp's second test on April 1 was still positive. Flunking the first test after COVID-19 symptoms abate isn't unusual because patients with compromised immune systems take longer to slough off the virus. That result also meant a delayed return to full doses of chemo.

Clapp was tested at home again on April 8 and got a negative result on April 9. A fourth test on April 10 returned another negative on April 11.

"I was clear," she said, adding that she immediately resumed her full doses of chemo to treat her bone marrow cancer. "I am so appreciative for what Tahani and Teresa did to expedite getting me two negatives."

In an email to the HHD, Clapp commended Hamdan and Garcia for the attention and care she received:

"I want you to know what exceptional public servants you have with employees Tahani Hamdan and Teresa Garcia. ... Tahani has called or texted almost daily. Her attentive and sincere manner has sustained me. Nurse Teresa Garcia has courageously come to my patio twice to retest me with such a gracious and loving spirit. I am 74 years old and a cancer patient, yet seldom have

I felt such devotion and compassion. These ladies are a tremendous asset to the City of Houston Health Department. I remain so grateful for their care."

Lingering effects

During the illness, Clapp lost her sense of smell.

"It is returning now. I think it's probably about 30 percent, but that's an interesting complication of this illness," she said, adding that she also lost a few pounds.

"That's the only way I could ever lose it, I think," she laughed. "I essentially fasted for five or six days until they gave me some anti-nausea medication."

Now, Clapp says she feels "great" as she reclaims her life, reflects on the ordeal and hopes to explore whether her blood contains antibodies that could help treat other COVID-19 patients.

Although she understands that most people with the virus recover, she is grateful that she survived without spending several days in the hospital.

"It's usually people like me who have an underlying condition ... that don't make it," she said. "My faith really sustained me. It's always been important in my life and I feel like I had God's hand on my shoulder the whole time." ■



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VITALS

Trending topics in health, science and medicine

By Shanley Pierce

Unpacking the mystery of MIS-C

A troubling rise in a severe inflammatory illness related to COVID-19 in children and young adults has doctors in the United States and abroad searching for answers.

The condition, known as multisystem inflammatory syndrome in children (MIS-C), causes swelling and pain in various organs, such as the heart, lungs, kidneys, brain, skin, eyes, esophagus, stomach and intestines. The Centers for Disease Control and Prevention (CDC) first issued a health advisory on May 14, 2020, cautioning doctors to be on the lookout for a constellation of symptoms that include fever, abdominal pain, vomiting, diarrhea, neck pain, rash, bloodshot eyes and lethargy.

"This is truly a new type of syndrome that was unpredicted," said Daniel Penny, M.D., Ph.D., chief of pediatric cardiology at Texas Children's Hospital, who has treated several patients with MIS-C in his clinic.

Symptoms associated with MIS-C

were initially reported by clinicians in the United Kingdom in late April and have since been identified in other European countries and the United States.

Although the exact cause of MIS-C is still unknown, many children diagnosed with the syndrome had been infected by or previously exposed to SARS-CoV-2, the virus that causes COVID-19.

"This lag between the primary infection and the inflammatory response is what is interesting," Penny said. "What it appears to indicate is that this is not a manifestation of the primary infection with SARS-CoV-2 itself, but rather the body's inflammatory response to the infection."

Essentially, the immune system of MIS-C patients goes haywire in places it shouldn't.

"What we think is happening is that, at some point in the recent past, the child was exposed to COVID-19. They might have had a mild infection, and

the immune system responded to that infection appropriately, at first, but it ... got into a positive feedback loop and couldn't turn itself off," said Michael Chang, M.D., a pediatric infectious disease specialist at Children's Memorial Hermann Hospital who has treated several patients with MIS-C in the hospital.

Most children recover from MIS-C after being treated with immunoglobulins to reset the immune system, steroids and immunosuppressive drugs, such as anakinra and tocilizumab; however, in rare cases, the illness can lead to death.

Early on, doctors suspected the cases were driven by Kawasaki disease, a rare pediatric condition in which blood vessels become inflamed. Many of the features of MIS-C are similar to those of Kawasaki disease, the leading cause of acquired heart disease in children. In both, the inflammation can damage coronary arteries, which supply blood to the heart. These arteries can become abnormally dilated and develop aneurysms that could potentially trigger a heart attack.

Yet there are significant differences between Kawasaki disease and MIS-C.

"It may be that the genetic reasons for this abnormal inflammatory response are somewhat different if the primary infection is with SARS-CoV-2 rather than whatever the primary initiating factors for classic Kawasaki disease are," Penny explained.

In addition, Kawasaki disease often affects children five years of age and younger, while MIS-C has been diagnosed in teenagers and young adults.

Parents can take comfort in the fact that MIS-C is not common and the "risk of a child developing MIS-C is quite low," Chang said. At the same time, he added, it's important for parents to "stay up to date and don't be frustrated by advice or expert opinion that changes ... and understand that providers are also learning about this at the same time." ■

“They might have had a mild infection, and the immune system responded to that infection appropriately, at first, but it ... got into a positive feedback loop and couldn't turn itself off.”

— MICHAEL CHANG, M.D.
*Pediatric infectious disease specialist at
Children's Memorial Hermann Hospital*

How COVID-19 Impacted Organ Transplants

Organ donations and transplants declined early in the pandemic

BY CINDY GEORGE



French physicians, who removed part of a liver from a living donor, prepare to transport the graft in an insulated container.

In the early days of COVID-19, the illness slowed the transfer of vital organs for transplants and added new precautions to the transplant process.

Testing for the disease caused by the novel coronavirus now extends to deceased persons who receive the same nasal swabs that make living patients flinch.

In addition, the public's limited movement in the early pandemic period, thanks to stay-at-home orders and social distancing, meant fewer of the accidents and other traumatic events that generate organ donation. Some people anticipating transplants were inactivated, temporarily, from the national waitlist because of the coronavirus crisis.

Despite the dwindling supply of organs available, surgeons also declined organs from coronavirus hot spots. In addition, concern about the availability of personal protective equipment halted live donor transplants at Houston-area transplant centers.

"We are not recovering organs and transplant

centers are not transplanting organs from donors who have positive tests for COVID-19," said Kevin Myer, president and CEO of LifeGift, a Houston-based organ procurement organization that serves 109 Texas counties and more than 200 hospitals, including transplant centers in the Texas Medical Center. "Depending on where you are in the country—obviously in New York and Seattle and in other places—transplantation slowed down, but it didn't stop."

New procurement protocol

As part of the new pandemic procedure, a potential donor's next-of-kin is questioned about the person's travel history as well as exposure to various diseases and infections, including the novel coronavirus.

"We are recovering a sample, a nasal swab, for COVID-19 testing," Myer said, adding that the additional process with test results in about 24 hours began in mid-March. "If we get a positive test back, we would stop the case."

Other adjustments in the acquisition of organs include restricting travel. Typically, a LifeGift perfusionist and transplant surgeons recover an organ in person. Now, operating surgeons depend on their capable counterparts to match an organ in one place to a patient in another.

The shift affected LifeGift's donor and transplant tallies, which dropped by about half from February to March.

"For March, we recovered 31 organ donors and transplanted 97 organs. For us, that's a little bit lower than what we typically do in a month, but we did not experience the massive drop some other areas have had," Myer said, adding that February was LifeGift's busiest month ever. "We recovered 54 organ donors and transplanted about 186 organs in February."

Transplant centers adjust

After attending a late-February transplant conference in Phoenix where a Canadian colleague left early because of his country's public health emergency, J. Steve Bynon, M.D., chief of abdominal transplantation at Memorial Hermann-Texas Medical Center, returned to Houston and assembled his team to discuss COVID-19.

"I said: 'This is going to be a major problem. We need to not expose our patients. We don't know who has it and who doesn't; that's one of the problems without extensive testing. We need to cancel all of our post-transplant clinics because those people are immunosuppressed and we don't want to expose them, potentially, to other people who have it,'" Bynon recalled.

The hospital turned to telemedicine options for recently discharged transplant patients. Live transplants were canceled to save personal protective equipment and ventilators.

"When you have a health care crisis like this, you have to change gears very quickly and conserve resources," said Bynon, a professor of surgery at The University of Texas Health Science Center at Houston (UTHealth) McGovern Medical School. "We decided we would not take organs from areas of the country that had high incidences of COVID. We would not take any organs from donors that we thought would be high risk from their method of death, such as

Credit: Phanie / APHP-St. Antoine-GARO, Medical Images.com

unknown respiratory illness. Now, every donor is tested for COVID. Between those three criteria, we make a decision about whether we would accept those organs or not.”

Transplant candidates are also screened with nasal swabs. Both donors and recipients also may receive a bronchoscopy, an endoscopic visualization of the airways, as well as a chest CT scan that might reveal COVID-19 characteristics in those who are asymptomatic.

Bynon participates in conference calls to share ideas with other TMC surgeons, including Osama Gaber, M.D., director of the J.C. Walter Jr. Transplant Center at Houston Methodist; John Goss, M.D., director of liver transplantation at Baylor St. Luke’s Medical Center; and Christine O’Mahony, M.D., surgical director of kidney transplantation at Baylor St. Luke’s and

the Michael E. DeBakey VA Medical Center. Goss and O’Mahony are also on the transplant teams at Texas Children’s Hospital.

Bynon has been tethered to an international online discussion of “fascinating” threads, he said, from transplant surgeons around the world. Early on, he was particularly intrigued by comments from colleagues in Italy and China. He’s up at 5:30 every morning reading their dispatches and advice, then jumps back online after dinner.

“That kind of ready access to information is vital for your patients,” he said. “We have a lot of unknowns.”

LifeGift expecting new normal

Donors and transplants reached all-time highs in 2019, according to the United Network for Organ Sharing (UNOS), the nonprofit that manages the

country’s organ transplant system under contract from the U.S. government.

In 2020, transplants nationwide declined in mid-March and began to fall behind last year’s record trajectory in early April.

While the number of weekly transplants nationwide hovered around 800 for the first two months of 2020, that number dipped to between 400 and 600 per week by the middle of March. It took until the first week of June for the nation’s weekly transplants to exceed 800 again.

In that vein, operations also have picked up in LifeGift’s operating region.

“Transplant centers are increasing transplants again in our area and specifically in the TMC,” Myer said. “We think, by July, we will be back to a new normal.” ■

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IN THEIR OWN WORDS

Voices from the front lines of the pandemic

CEDRIC DARK, M.D., MPH, assistant professor of emergency medicine at Baylor College of Medicine, spoke to *TMC Pulse* on May 11, 2020.

The biggest problem we have with COVID-19 is that it can be transmitted asymptotically by people. You don't know who has it. You don't know if you have it or not. When you're out and about around people, you need to wear a mask so you don't unwittingly spread it to somebody else.

My advice is the same thing Batman told John Blake in 'The Dark Knight Rises': 'The mask is not for you; it's to protect the people you care about.'

We've got to realize we're in this entire thing together, and we're going to be in this for years. Until people start behaving like it, more and more people are going to die from this disease. Every time someone goes walking around town, enjoying life as they used to without making any kind of modifications, they're potentially killing someone else down the road—whether it is someone's elderly parent, grandparent or a health care worker. That's what happens when you have arrogant people doing things and setting poor examples for others.

This is the new normal. I've been saying that for a while now. Our old normal can't function anymore until we get a vaccine. That's going to take one to two years to happen, so we're really talking

2022 before we get back to normal life. By then, after two years of living like this, it's not going to be normal. It's going to feel different.

At the hospital, patient volumes will pick up again, but COVID-19 is going to be in the background of all this for a long time. The idea that I can go on a shift without an N95 mask all day is pretty much done until we have a vaccine. I honestly think that every single ER doctor and ER nurse around this country is probably going to walk around with a mask on all day long for the foreseeable future because you can't walk around and know who has the coronavirus and who doesn't.

Our most valuable resource in health care is our human resource. That's one of the most important things we have to protect. Because once your doctors and nurses are dead, then what do you do?

People only notice public health during times like this, but the real work happens when nothing is going wrong. This is why you have people in one administration create a pandemic office to address these kinds of threats, and then the next administration gets rid of it because they forget what is happening in the background.

How many times has your house caught on fire? Should we get rid of the fire department? It's the

“We've got to realize we're in this entire thing together, and we're going to be in this for years. Until people start behaving like it, more and more people are going to die from this disease.”



exact same thing with public health. Just because your house doesn't catch fire, doesn't mean you don't need the fire department. Just because you haven't had to call the police for any reason, doesn't mean you don't need a police department. We need public health just as much as these other departments because we're taking care of things that range from water purity to mosquito-borne illnesses to human-borne illnesses being spread from person to person. That is not something that is easy to do. ■

—Cedric Dark, M.D., MPH,
as told to *TMC Pulse* writer and columnist Shanley Pierce



“We’ve been able to allow family members to visit their dying loved one when hospitals couldn’t.”

GABRIELLE STATEN, RN, BSN, an associate patient care manager for the inpatient unit at Houston Hospice, spoke to *TMC Pulse* on April 22, 2020.

We had to implement restrictions because of COVID-19, which included an age limit on visitors. Right now, patients can only have two visitors at a time, and they have to be 13 or older. We had to put some kind of limitation on it for the safety of our patients and staff, but we wanted to make sure patients still got to be with their family members. We had the option of saying ‘No visitors,’ but we couldn’t do that.

We have a patient in his mid-40s who has three children, and one of them is only 10. But we don’t want to prevent children, especially, from seeing their parents prior to their passing. So, our social worker went to our director of clinical services and our CEO and got permission for the young boy to go into the garden and see his dad through a window. We put the son through the same screening everyone goes through and brought him through a side entrance and into the garden. Because the boy was going to be masked and the dad was going to be masked, I said that the boy could go ahead and go out into the garden with the dad, because our gardens are set up for beds to go out there. So, instead of just seeing each other through the window, they were actually able to hug on each other and spend some time together.

Just seeing that little boy with his dad—it took me back. I lost my mom when I was young and letting him have that moment, it means everything.

It’s not something we can do for every patient. Like any exception, it was on a case-by-case basis, but in a time like this I’m so thankful we can allow visitors at all. We’ve been able to allow family members to visit their dying loved one when hospitals couldn’t.

Just the fact that we were able to do something that makes a huge difference in a person’s life—it was wonderful. How can you describe a moment like that? ■

—Gabrielle Staten, RN, BSN,
as told to *TMC Pulse* senior writer Alexandra Becker



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RICARDO NUILA, M.D., is a hospitalist and teaching attending physician affiliated with Ben Taub Hospital and Baylor College of Medicine. He spoke to *TMC Pulse* on April 13, 2020.

As a clinician, you feel the tremors of COVID. It's not a linear course, like what you expect when giving antibiotics to a patient for an infection. With COVID, the oxygen level goes down a bit and then you don't know where it's going to go from there. The patient gets a little bit better one day and you have hope. Then the next day things regress and you think, 'Wait a minute. No.'

The first COVID patient I saw must have been three or four weeks ago on a night shift.

One of the particularities of hospital medicine and hospitalists is that we admit patients from the emergency room and we're the people responsible for those patients up until they require a ventilator. I think the stats show that for every person who goes to the ICU [intensive care unit] there are two or three patients who are managed by hospitalists on the floors. So it's really one of those situations where you want to be the only doctor a patient sees, because if that patient sees other doctors it's usually ICU doctors and that means that things have taken a turn for the worse.

And here's the thing: The doctor is in a privileged position. The doctor sees the patient and then writes orders and those orders are implemented by other people. So the doctor manages how much exposure there is to COVID in the

hospital. All orders engender more exposure, so you have to weigh all of your choices really carefully. COVID causes you to be as efficient a diagnostician as possible.

There was one patient at Ben Taub, she had a week of sudden onset cough and she was clearly short of breath—oxygen levels low. The COVID test came back negative, but we know there are false negatives and you just have to reckon with that. Are you going to push for a different diagnosis? There came a point where I had to say, 'Let's look for something else.' We did find something else and it was an even worse diagnosis than COVID. Those are the difficulties we face.

This pandemic has put a premium on patience. We don't have any known therapy against COVID, and I think there's an inclination in all doctors to feel unsettled by not giving certain treatments or by not actively trying to solve an illness. Patients can be on oxygen in the hospital for a while and you can't bring them off of the oxygen. This illness can just linger. I think physicians need to ask themselves: Can I be patient? Is the breathing getting better or is the breathing getting worse? Can we wait another day before sending the patient to the ICU, where they may need to be put on a ventilator? If we're not worsening, can we just continue to keep doing the same thing?

Ordinarily, the health care environment is about getting things done and getting things done quickly. With COVID, you have to train yourself to do less and observe more. It's an era of uncertainty and that has made being a doctor very difficult.

After Hurricane Harvey, I went to care for some of the displaced at the George R. Brown Convention Center pretty early on, when we just didn't know how many people would be coming in. You saw people who were shivering. You saw people who were still wet from being rescued from the water. At that point, before we had a plan to get people medications and tell them where to go, the best you could do was reassure them, to say, 'You're OK without your blood thinners for one day.'

In that way, COVID is similar. One of my COVID patients told me he always felt good when we spoke. That made my day because, other than the oxygen, the most that I could give that person was my attention and my words. But that's also the case with everybody in the hospital right now because there are no visitors. Even with

“As a clinician, you feel the tremors of COVID. ... You have to train yourself to do less and observe more.”





“Even though there’s a terrible thing going on, I have enjoyed having this interaction with patients outside.”

non-COVID patients, you have to be aware that they are alone. I had a patient who was elderly and awaiting major surgery and she’s there, alone, without her family. She’s a non-COVID patient, but it’s the same. So your job expands. I’ve always felt like this was part of the job, but I feel like it’s all the more important right now to focus on making the patient feel like they have an ally within the hospital walls because they can’t have the physical contact with people they love and rely on for decisions.

Another surprising thing is just how differently different doctors and nurses interpret new information. It feels like everything is confirmation bias right now. Let’s say a new COVID study comes out and it doesn’t clearly point in one direction or another. Somebody thinks about it and says, ‘Well that reinforces what I previously thought about COVID.’ Everything is so scattershot that people are just using whatever is written out there to confirm their own preconceived ideas about illness and philosophies of medicine. Science takes time and we’re forcing science to produce answers too quickly.

That’s why I really believe we should be focusing on the person in front of us as much as possible, because if you start to think about all of what’s written right now, you’ll just go crazy.

It’s an interesting time to be a doctor at a safety net hospital because there’s a clear message with COVID, which is: Save as many patients as possible. Save them all. America does not usually send that message clearly. In a health care environment with so many uninsured people, there are conflicting messages and questions, such as: Should people be receiving health care if they’re not insured? There’s something relieving about treating COVID patients because you know your job is just to do the best that you can. ■

—Ricardo Nuila, M.D.,
as told to TMC Pulse editor Maggie Galehouse

STELLA E. CALLEGARI, BSN, RN, a nurse at the Michael E. DeBakey VA Medical Center, was reassigned as an outside COVID-19 screener during the pandemic. She spoke to TMC Pulse on May 16, 2020.

Before this, I was working in physical medicine and rehabilitation on the second floor, where people would come in for their spine clinic or musculoskeletal appointments, acupuncture or the chiropractor. But now, I have shifted outside along with the other nurse from the department because the clinics aren’t running like they were before.

I had been wearing a face shield, but honestly, the plastic on it had gotten cloudy. I can’t see through it like I had been because I’ve wiped it down with alcohol so much. Now, I wear some kind of goggles. Sometimes I will just wear glasses. I always try to have something.

Now that people are wearing masks, I’m not so concerned that something is going to fly out of their mouths.

When the patients come in, I’m pretty much the first person they see with these other nurses who are out there on computers. We get it all. They’re either complaining of diarrhea or having some kind of cough or this or that. We have to shift them over to the COVID provider who is out there—either a doctor or PA [physician assistant]—near the building. We will walk the patient over to an area where there is a vital sign machine and hand off a report and find out what their vitals are, especially if they’re having hypoxia [deficient oxygen supply to the body] or a high fever. The provider out there will decide what to do. Sometimes, they go off to the ER where they do a rapid COVID screening.

Sometimes, patients don’t realize their appointment has been converted to a telephone appointment or by Zoom. We have to explain to them what’s going on and what we’re doing with the social distancing to help prevent people from spreading COVID. We make sure that the phone numbers in the computer are up to date so that when the provider calls them, they are able to reach them. Pharmacy and mental health are outside with us. Some of these patients have to go in for their methadone or for injections for schizophrenia, so they have to go upstairs to do that. If they have pharmacy refills they need, they can go directly to talk to them.

I’m at the very front where the Metro bus comes in under this overhang. There are a couple of tents. I’m not under one of those, so when it rains, that roof thing kind of leaks. We have to keep shifting our computers. Sometimes, the shade goes away and the sun is right at me, so I have to keep using the computer in a place not right under the sun. It’s interesting because I usually work in a department where there are no windows. So, when I come in, it could be one way and when I go out, it could be cold or hot. I just never know. And now I’m out there all the time. It’s been cold, hot and humid, rainy, windy—just everything.

It’s been an interesting experience also because I am working alongside nurses from the primary care clinic that I’d never met before. I feel like we’ve come together. Sometimes, we have patients who come for chemotherapy and radiation. They have to come on a schedule every day for those treatments, so you start to learn who they are and what they’re there for. They get used to seeing you. When they finish their treatments, we applaud them. They give us their certificates and we sign our names and write ‘God bless you.’ Even though there’s a terrible thing going on, I have enjoyed having this interaction with patients outside.

I am honored to serve our veterans. ■

—Stella E. Callegari, BSN, RN,
as told to TMC Pulse assistant editor Cindy George

COLLEEN KIMBALL, APRN, FNP-C,

a family nurse practitioner, manages the Hogg Clinic, one of 10 clinics in the Memorial Hermann Health Centers for Schools program. She spoke with *TMC Pulse* on April 13, 2020.

Our clinic, located at Hogg Middle School in the Heights, is designed to be a comprehensive medical home for uninsured and underinsured children.

We're a super small team: I'm the nurse practitioner and the clinic manager, and then we have Celia Ramos, a licensed vocational nurse; Janet Morales, our office assistant; Ecenthia Burnett, who is our social worker; and Adabelle Franco, our navigator and also a dietitian. That's it! We're a little portable unit and we have a full pharmacy where I can give over-the-counter medications, antibiotics, vaccines—everything free to the families. We also have our own on-site lab.

It's been challenging with the Stay-at-Home Order. A lot of our patients think we're closed because HISD [Houston Independent School District] is closed, and we also have a large number of patients who are immigrants. We found out that there has been a lot of fear spread throughout that community. People were being told that if they were caught out during the Stay-at-Home Order, or if they were found to have COVID-19, they were at risk for being deported. It's awful. Our numbers dropped significantly because of fear. But we knew they needed us, so we thought: How can we let them know we're here? We started calling them until they would pick up, and our office assistant would explain to them that the rumors were not true and that even people who are here illegally have a right to free care.

Then we thought: What else can we do? We were following the HISD food sites that kept closing and our social worker had the idea that maybe we could supplement that for our families who might need it. We do a food insecurity evaluation on all of our patients and families, and that basically tells us if they are at risk. We pulled that list and decided to go from there. We started out with 10 families and what we found is that if you tell people you have toilet paper and paper towels and food, they will come.

We went to the Houston Food Bank's website and found the closest distributor, a little church around the corner called St. Joseph's Catholic Church in the Sixth Ward. When we went over there, we found a little note on the door, and so we called the phone number and the ladies there said absolutely they'd help. There are literally two women doing all this work—they are operating on



“We knew they needed us, so we thought: How can we let them know we're here?”

donations and running out and still helping us. They made 10 big bags for us with things like frozen chicken, orange juice and nonperishables, and then we pooled our own money and supplemented and got all kinds of stuff. When our resources ran low, our medical director at the Hogg Clinic, Dr. Steven Alley, helped us purchase the remainder

of what we needed, and he plans to continue that contribution each week as needed.

We called the families and they came one by one—separated by time slots. We screened everyone over the phone first for any symptoms of COVID-19, and then every single person who shows up at our door has to be screened with a series of questions and also has their temperature taken. We're also wearing masks and gloves all day.

We were able to do an intake on each family and go through their kids' charts and see what they needed and if they had any illnesses. I also gave them a little bit of a COVID-19 education, and our social worker was able to do the consent form for telehealth because we just so happened to pull people that also had kids who were engaging in some sort of mental health services. We were also able to schedule appointments the following week for anything else they might need, like immunizations or other kinds of health care issues. They could just see that it was safe, that we're here if they need us, and that we're not closed, which is so essential. If we're not serving those uninsured or underinsured people, then they're going to go to the ER and then the ER is going to be overcrowded.

I will say that the biggest blessing for me is that from the time I was small, I wanted to do some type of mission work. And my life took a huge turn. I went from being an opera singer and then working as a school nurse and then working in cancer, and I feel like I've come back full circle and I'm doing mission work right here in my own community. How lucky am I? ■

—Colleen Kimball, APRN, FNP-C,
as told to *TMC Pulse* senior writer Alexandra Becker

KWAME BENNAM, RCP, RRT, is a respiratory therapist at Memorial Hermann-Texas Medical Center. He spoke with *TMC Pulse* on April 15, 2020.

I'm the guy they call on if there's any respiratory issue. I am the clinical practice leader that is in charge of the neuroscience service line. We have all these service lines, and I am the advanced practice person that is the liaison between the doctors and the bedside therapist. Any high level, advanced vent settings that a regular therapist usually is struggling with, I'm the guy they contact.

We go into the patient's room when they are a person under investigation [PUI] for COVID-19, then we swab them and walk the whole sample to the lab. It's been challenging—I'll be frank. There was so much uncertainty surrounding COVID-19. The reason is, when it came out, we all didn't know what we would be dealing with. Everybody's like, 'It's not going to be in Texas. Everything is going to blow over.' When we found out that the respiratory team was going to be the one actually doing the testing, I thought, 'Whoa, wait a minute. We're going to be put on the front line?' ➡

“A patient may not be a COVID-19 patient one day, but you come back the next day and the patient is a PUI. That was the problem.”



But it's a respiratory disease. Our boss put that responsibility on us, knowing what we're capable of. We are able to go deep into the patient's nostrils and get the sample, and not be scared of it because we deal with that every day. On a regular basis, we go into a patient's nose, get samples, get sputum and send it to the lab for testing.

My wife and I watch the news a lot. It was what happened in New York that woke me up. And I'm asking myself, 'What if this happened in Houston?'

Then on March 24, there was a patient in a bed in the neuro ICU. He came to the hospital three days before, but he was not a COVID-19 patient. All of a sudden, when I came back Monday, the patient was in isolation as a PUI. I'm thinking, 'What happened? How?'

A patient may not be a COVID-19 patient one day, but you come back the next day and the patient is a PUI. That was the problem.

Knowing that I took this patient to get a CT scan, stayed with this patient without a gown, mask or anything and to find out that the patient is a PUI, it was really challenging. That's when I realized, 'Wow, we're really dealing with something that is very strange.'

Everybody could be a PUI.

You start to think, 'Who are the patients that I've seen in the past that could be PUI?' Everybody is concerned. You go to every unit and everybody is talking about COVID-19.

It really makes you panic, and it brings a lot of depression and uncertainty. But at the same time, just knowing that I work for Memorial Hermann and knowing all that they've done to help stabilize and neutralize the situation, gives me that hope to wake up every day and go to work. ■

—Kwame Bennam, RCP, RRT,
as told to TMC Pulse writer and columnist Shanley Pierce

SARMA VELAMURI, M.D., is CEO of Luminare, a Houston-based digital platform company that directed 5.5 million people to COVID-19 testing sites in just 21 days. He posted a version of this essay on LinkedIn on May 5, 2020.

Six years ago, my friend's daughter died of sepsis. It's a story I have told more than a thousand times, to anyone who has spent any amount of time in the same room with me and asked me why I do what I do.

That death compelled Marcus Rydberg and me to launch Luminare in my garage, with the mission to stop 250,000 people annually from dying of sepsis in United States hospitals.

Over the past five years, we did a few funding rounds (including the one where I mortgaged the house and broke the 401K and retirement funds), navigated the regulatory world and finally moved from a garage office with IKEA furniture to a state-of-the-art space in the TMC Innovation Institute—part of the Texas Medical Center, the world's largest medical city.

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“We realized that we could leverage our sepsis platform to build an online web tool that would drive COVID-19 self-assessment and testing.”

Close to \$1 billion in start-up funding has funneled through the TMC Innovation Institute over the past four years. Thousands of companies have applied to partner with the institute, but only a few are chosen.

Luminare went from a team of two to a team of 11 dedicated to working on software to help eliminate sepsis as the most common cause of death in U.S. hospitals.

In late 2019 and the beginning of 2020, we were working with the Centers for Disease Control and Prevention (CDC) on the “Stopping Sepsis Through Early Detection” showcase at the annual Healthcare Information and Management Systems Society (HIMSS) conference, slated for March 2020 in Orlando, Florida. Some 13,000 people were expected to visit the showcase to see a demonstration of our software product, Sagitta, and how it worked alongside technologies from other companies, including Cerner, Philips, Baxter, Halo Health, Redox and also the Washington Department of Health.

Then COVID-19 hit.

Our biggest marketing opportunity of the decade had just evaporated with the cancellation of the HIMSS conference.

But as we were talking to the CDC about COVID-19, we realized that we could leverage our sepsis platform to build an online web tool that would drive COVID-19 self-assessment and testing based on ZIP codes. This could help reduce unnecessary hospital visits, thereby containing the spread of the disease among medical professionals and freeing up hospital beds for the sick.

If we threw in self-reported location, we

realized, we would have the country’s first syndromic surveillance system.

Almost at the same time, Alex Fernandez on our team got a call from a hospital CFO, asking if we had any way of predicting which patients were at high risk for COVID-19 before they walked into the emergency room.

We decided to build the solution.

On March 13th, we deployed Quickscreen in a hospital just north of Little Rock, Arkansas. The COVID-19 self-assessment platform pre-screens for COVID-19 in at-risk populations, helps people understand their symptoms and gives communities a way of gathering epidemiological data to pinpoint the severity of the disease in specific locations.

Fortuitously, I had recently been introduced to Frank Denbow, a startup advocate with Microsoft for Startups. While Frank was visiting with Luminare in Houston, our team received a call from Harris County Public Health (HCPH) to discuss Quickscreen. That was a Friday. The HCPH team asked us how long it would take to deploy a version tailored to the county’s needs. We said, ‘Monday.’

Frank and Team Microsoft were on board. We reached out to Cognitect, a company that connects information systems with software applications in the process of software development, and secured project manager Naoko Higashide and developers Jeb Beich and Jarrod Taylor. They all rolled up their sleeves alongside Luminare.

Soon enough, HCPH had its own version of Luminare’s Quickscreen to roll out to Harris County. The platform funneled 5.5 million people

to testing sites over a 1,600-square-mile area, based on ZIP code or volunteered geolocation. Within 10 days, they had on-site COVID testing figured out. By then, our team had implemented ZIP code-based triage—type in your ZIP code and it will point you to the right resources.

We got volunteer load-testing with the team at loadster.app, autonomous functional user interface testing via testrigor.com and continuous feedback from the Microsoft FastTrack group.

Within three weeks, Luminare went from having a great idea to creating and deploying software directing millions of people to testing resources in Texas’ most populated county and its most populous city.

We had help from all over the world and continue to have help. We spoke with the chief medical officer of Microsoft, the White House’s technology office and many others.

We are now able to use Quickscreen to help reopen the economy, serving food processing plants, hospitals, universities, the armed forces and others. Employee self-assessment and real-time analytics is key.

Real work continues to happen in hospitals and clinics across the country. We count ourselves blessed to know the people we know and the tens of thousands of people who have used—and will continue to use—our software. ■

—Sarma Velamuri, M.D.,
was a resident physician at Baylor College of Medicine
before working as a hospitalist at CHI St. Luke’s Health-
Baylor St. Luke’s Medical Center.

This essay was edited by TMC Pulse editor
Maggie Galehouse

TOGETHER APART

A COVID-19 PHOTO ESSAY BY CODY DUTY



A

A | Robert L. Prater, Ed.D., a former dean at Texas Southern University, waves to family and friends as they celebrate his 90th birthday with a car parade at Memorial Hermann University Place, a senior community.

B | Residents of St. Dominic Village, a senior care community, wave to friends and family in cars during a celebration for the residents.



B



C



D



E



F

C | A thermal scanner captures the body temperature of a person entering the hospital at Memorial Hermann-Texas Medical Center.

D | Officials test for COVID-19 at a drive-thru testing site at United Memorial Medical Center.

E | Event space Goodnight Charlie's left a message to customers on its "Goodnight Montrose" sign in March.

F | A construction worker walks by a boarded up restaurant in Montrose.

Are Expecting Mothers at Greater Risk for COVID-19?

A new study hopes to answer questions related to maternal and newborn health

BY ALEXANDRA BECKER

When COVID-19 started to spread across the United States in early March, experts scrambled to better understand the disease and its risk to certain populations, including pregnant women. Even now, little is definitively known about whether expecting mothers are more susceptible to COVID-19, if those infected are more likely to become seriously ill or what long-term effects the virus can visit upon newborns.

That lack of information has led to contradictory messaging, with some health experts advising caution and others offering reassurance.

But a multi-institutional study funded by the National Institutes of Health (NIH) hopes to provide some answers to patients and providers by comparing outcomes of pregnancies during the pandemic to data collected before the SARS-CoV-2 virus began to circulate.

"The study is basically almost two studies in one," said George Saade, M.D., who will lead research at The University of Texas Medical Branch at Galveston (UTMB), one of the institutions participating in the national study. "We're going to look at the outcome of pregnant women with COVID infections—do they have a preterm birth, do they have a normal birth and normal pregnancies, are there any complications, how many of them are asymptomatic, as well as what happens to the babies. The second part is to look at the impact of the pandemic on everybody, on all pregnant women, to see if the pandemic has affected care."

He explained that the second part of the study is important because many pregnant women may be avoiding routine prenatal care for fear of being exposed to the virus in a health care setting—something he urged patients not to do.

"Things in pregnancy can deteriorate very quickly, so the risk of staying away from the health system is worse than catching an infection or worrying about an infection," said Saade, the Jennie Sealy Smith Distinguished Chair in the department of obstetrics and gynecology and chief of obstetrics and maternal fetal medicine at UTMB. "In the end, it's still safer in the hospital than anywhere else."



Credit: Sipa via AP Images

A pregnant woman stands in her home wearing a protective mask during the coronavirus epidemic.

Current federal messaging around pregnant women and COVID-19 is limited.

According to a Centers for Disease Control and Prevention (CDC) statement on COVID-19 and pregnancy, "pregnant people appear to have the same risk of COVID-19 as adults who are not pregnant."

However, the CDC's statement acknowledges that when pregnant, a woman's body undergoes physiological changes that pose an increased risk for some infections, including those from viruses in the same family as COVID-19 and other viral respiratory illnesses, such as influenza.

Although there are many unanswered questions about COVID-19 and pregnancy, history indicates that pregnant women may be at an increased risk for serious infection, said Kjersti Aagaard, M.D., Ph.D., a maternal-fetal medicine specialist at Texas Children's Pavilion for Women.

"We know pregnancy is a higher-risk state, so if you take a 35-year-old woman with no significant medical complications and no chronic illnesses, and you compare that 35-year-old pregnant woman to a 35-year-old non-pregnant woman ... the pregnant woman is going to

be more vulnerable for severe disease and death," said Aagaard, the Henry and Emma Meyer Chair in Obstetrics and Gynecology at Baylor College of Medicine. "Why COVID-19 would be any different is as yet unclear. That didn't hold true in the SARS epidemic, it didn't hold true in the MERS epidemic, it didn't hold true in the H1N1 pandemic, and it hasn't held true with annual influenza outbreaks. With every one of those instances, pregnant women are at a greater risk for severe respiratory morbidity and mortality."

Aagaard's point is echoed in a statement from the American College of Obstetricians and Gynecologists (ACOG). The organization notes that while currently available data does not indicate that pregnant women are at increased risk for COVID-19, pregnant women are known to be at greater risk of severe morbidity and mortality from other respiratory infections.

Yet Saade is approaching the NIH-funded study with optimism.

"Whatever we thought we knew two months ago has changed, and probably will change in two, three months. But right now, I can tell you that the

initial gloomy picture that we saw from China and maybe from New York regarding pregnancy has not been replicated in experiences elsewhere,” Saade said. “Now, that’s not to say that pregnant women can’t get very sick—we’ve seen cases here and there where pregnant women were intubated or ventilated and even some died—but I think it’s not as dire as we thought it would be. We’re seeing a lot more pregnant women who are asymptomatic, who don’t show any signs or symptoms or may have some mild symptoms, and they’re positive and they do very well.”

These observed outcomes are at odds with what was seen during the H1N1 pandemic and with influenza outbreaks, he added, all of which resulted in more sickness and mortality in women who were pregnant. But, if COVID-19 ends up being less of a respiratory virus and affects the vasculature or immune response more—something experts are currently hypothesizing—then Saade said he could see pregnancy offering some protection from COVID-19.

“If it’s not a lung function issue, if it’s a vascular and immune response, maybe pregnancy actually protects against this,” Saade said. “We know pregnancy is an immune-tolerant state, because the body doesn’t want to reject

the fetus. Whether that makes the pregnant woman have less of a cytokine storm with an infection or not, that is still to be determined. We also know that the vessels of pregnant women respond less to constricting agents, and whether that protects the pregnant woman from the consequences of the virus, that’s also to be determined.”

Still, with so many unknowns surrounding COVID-19 and pregnancy, both Saade and Aagaard urged expecting mothers to take recommended precautions while also maintaining routine prenatal care.

“What I tell [my patients] is exactly this: I wish I could give you all the answers. I wish I could give you a number and make you feel better, make you feel less alarmed, but I can’t—and I wouldn’t be doing my job if I did. I have to tell you the hardest thing to say, which is ‘I don’t know,’” Aagaard said. “In the absence of really good, strong evidence suggesting the contrary, I would urge you to heed carefully the CDC recommendations. Err on the side of caution, practice common sense, wash your hands, stay out of risky situations and the moment you’re not feeling well, with a chronic dry cough, a fever, chills, call us. We’re here and we’re ready to take care of you.” ■



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Recovery, Rehab and a High School Graduation

For Phil Eaton and other survivors of severe cases of COVID-19, rehabilitation is key

BY MAGGIE GALEHOUSE

When Phil Eaton first came out of sedation after a lengthy battle with COVID-19, doctors asked him a question that should have been easy.

Who is the president?

"I couldn't answer it," said Eaton, principal of Lake Creek High School in Montgomery County, Texas.

The second question also gave him pause: *Is it 2020, or some other year?*

"It took me some time," Eaton

recalled. "Finally I said '2020,' and they looked at me kind of quizzically. For a second, I wanted to change my answer, but I didn't."

Eaton, 63, is one of the lucky ones. He survived COVID-19, but regaining consciousness was hardly the end of his journey. Rather, it was the beginning of rehabilitation for both his body and his mind.

"When I first got to TIRR Memorial Hermann The Woodlands, I couldn't stand up for

more than three to five seconds at a time. My default was: *I'm alive. I'm not going to be upset or depressed about anything,*" said Eaton, who is 6 feet 4 inches tall and lost more than 50 pounds during his illness. "But at the same time I'm thinking: *Is this going to be my life?*"

Patients who recover from severe cases of COVID-19 do not simply rest a few days and resume their regular lives.

"This virus affects each and every organ system in the body," said Gerard Francisco, M.D., chief medical officer for TIRR Memorial Hermann, a top-ranked Houston rehabilitation hospital with several satellite facilities around the metropolitan area. "Some people have reported problems with memory, with thinking. Some of them describe themselves as being slower to function. ... Right now we're not sure if it's the virus alone that's causing this, or was it because of other medications or medical conditions that occurred while these patients were recovering?"

TIRR leaders knew soon after the start of the pandemic that critically ill COVID-19 survivors would need rehabilitation, thanks to early reports from China that described severe debilities in patients including stroke-like symptoms. Francisco and some of his colleagues have written a paper about what rehabilitation specialists should expect, forthcoming in *The Journal of the International Society for Physical and Rehabilitation Medicine*.

"On the physical side, I anticipate we will have a lot of reconditioning, strengthening and building up to do," said Francisco, chairman and professor in the department of physical medicine and rehabilitation at McGovern Medical

School at The University of Texas Health Science Center at Houston (UTHealth). "We will be assessing speech and swallowing, because I anticipate that many COVID-19 patients had breathing tubes that affected their vocal cords and their ability to swallow safely."

On the mental side, TIRR teams will assess cognition.

"It is a well-known fact that those who have a severe form of respiratory failure are more likely to have some cognitive problems, as well, because of a relative lack of oxygen going to the brain," Francisco said.

Eaton first started feeling poorly around March 9. He had a slight fever, so he took a few days off from work. On March 12, Montgomery Independent School District closed schools due to concerns about the spread of the coronavirus—one of the first districts in the Houston area to do so.

On March 16, Eaton ended up at the emergency room at Memorial Hermann The Woodlands. Initially, he believed he had a sinus infection, but, ultimately, he was diagnosed with COVID-19, the illness caused by the virus SARS-CoV-2. Two days later, doctors put him on a ventilator, where he remained for "20-and-a-half" days.

His physical condition was grim. "Doctors cleaned out my lungs and then the lungs filled up again," Eaton said. "I guess they're hitting you with every kind of medication they can think of. Then my kidneys started to struggle. I was on dialysis a couple of times."

During that period, family, friends, co-workers, students and parents braced for the worst. Eaton's daughter, Erika, who lives in Baton Rouge, Louisiana, with her husband and their 15-month-old baby,

Lake Creek High School principal Phil Eaton, who survived a rough battle with COVID-19, hosted the 2020 graduation ceremony at his school in Montgomery County, Texas.



received daily updates on her dad from doctors, which she shared on social media. Because of COVID-19, she was not allowed to visit.

Although Eaton was taken off the ventilator on April 4, he was still somewhat sedated for another nine days. He remembers nothing from the time he was intubated and only bits and pieces from the days when he was regaining consciousness.

“At some point, I guess, I realized I was in the hospital,” Eaton said. “And when I woke up, it’s not like they give you a playbook as to what took place. I’m still learning about things that happened during that time.”

On April 13, Eaton was admitted to TIRR in The Woodlands. He stayed for 16 days.

“I was so weak,” he recalled. “My arms and legs were so much skinnier. ... I knew that, physically, I had work to do, but I had zero understanding that they were also concerned about my cognition. When they started talking about speech therapy and neuropsych

kinds of stuff, I was a bit defensive. ... I was completely confused as to why I was looking at puzzles and doing paperwork.”

Early on, Eaton was asked to draw a clock and insert the correct time. Therapists also timed him moving blocks from one side of a backgammon-like box to another. He took tests that asked him to read different passages and identify words that started with certain letters.

Meanwhile, occupational therapists focused on getting him ready to go home.

“They want to know: Can you brush your teeth? Can you take a shower? Can you put your socks on?” Eaton said.

TIRR does not yet have many COVID-19 patients in rehabilitation, but the number of individuals in Texas diagnosed with the illness continues to climb. As of mid-June, more than 96,000 cases have been



Gerard Francisco, M.D., is chief medical officer for TIRR Memorial Hermann and chairman and professor in the department of physical medicine and rehabilitation at McGovern Medical School at UTHealth.

reported across the state, along with more than 2,000 fatalities, according to the Texas Department of State Health Services.

“It seems like the need is going to be pretty extensive, not only in the short-term but even in the long-term,” Francisco said.

For instance, an early report TIRR received from medical experts in New York indicated that some patients with relatively mild COVID-19 symptoms—people who were seen in the emergency room and then sent home—ended up having strokes. ➡

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“Who could have predicted that?” Francisco said. “So now we’re understanding through inference that one of the unusual things about COVID is that the virus affects the blood-clotting mechanism of the body. The blood becomes thicker. ... That’s why some people end up with kidney failure, others have the COVID purple toes, others have heart involvement. That’s why even some teenagers have heart failure—because of the involvement of the blood vessels of the heart.”

Francisco and his colleagues estimate that close to 15 percent of individuals who fought COVID-19 will need rehabilitation to help restore physical and cognitive function. That number is based on the percentage of patients who end up in the ICU while being treated for sepsis—a potentially deadly condition in which the body has an out-sized response to infection, leading to tissue damage and organ failure.

For recovering COVID-19 patients, the length of time in

inpatient or outpatient rehabilitation will vary from person to person.

“Our goal is to bring these people back to the community—bring them back to the workforce,” Francisco said.

Phil Eaton was discharged from TIRR on May 5, a full 51 days after being admitted to Memorial Hermann The Woodlands. During his exit test, he had a chance to look at the clock he drew in his early days of rehabilitation.

“It looked like a lima bean,” Eaton said.

Cognitively and physically, he has come a long way.

Today, Eaton is an outpatient at TIRR, working towards resuming all facets of his ordinary life.

“I still can’t drive,” he said, explaining that part of his occupational therapy includes tests related to his judgment and reasoning behind the wheel. “I’m going to say

that March 14 is the last time I drove. In fact, the tank of gas that’s in my truck right now—I think we fueled up on March 14. A couple of times I’ve just gone out there and sat in my truck and started it.”

Another ongoing challenge for Eaton is his left foot, which started aching a couple of days into rehabilitation. He is now seeing a podiatrist who is trying to determine the cause of the pain. For the time being, that foot is in a boot.

“If my left foot was OK, I might be able to run,” Eaton said.

His main goal is to get back to work. Many people who don’t work in education assume that everyone takes the summer off and heads back to school in August, Eaton said, which is not the case. He takes off maybe 10 days a year.

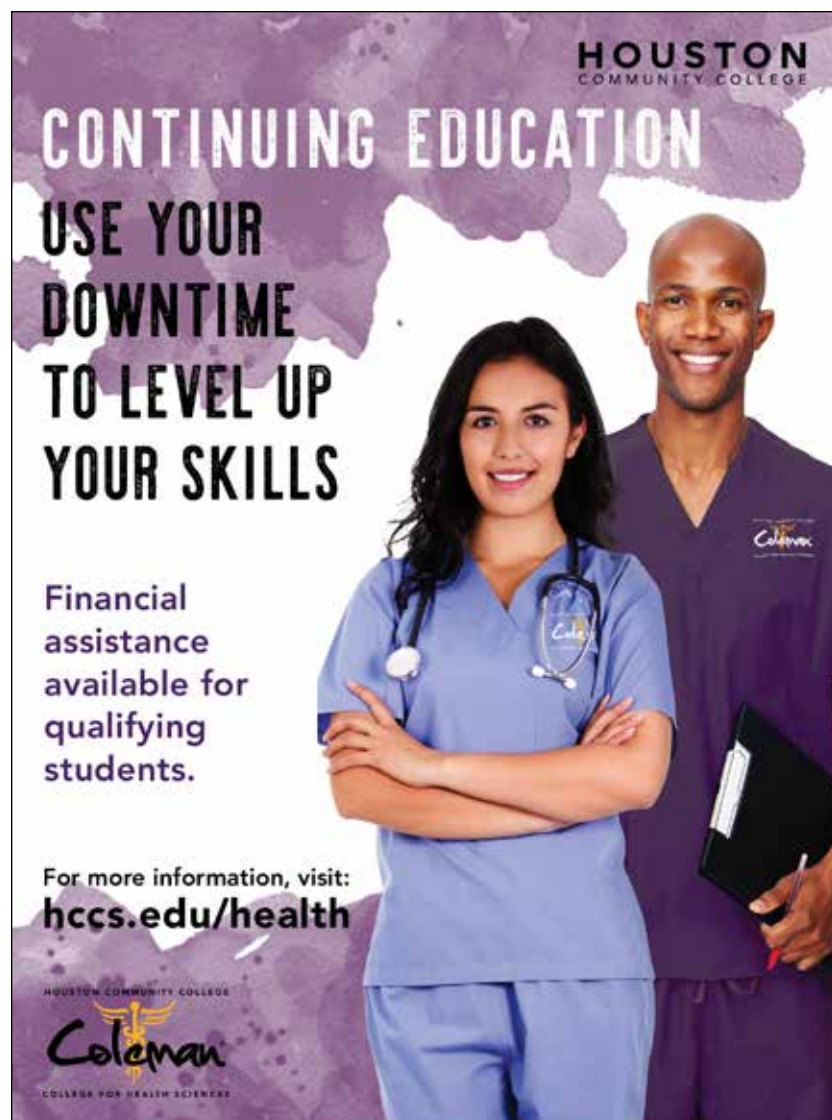
But doctors did clear him for one special event on Thursday, June 4—the first-ever graduation ceremony at Lake Creek High School, which opened in August 2018. As principal, Eaton hosted the ceremony,

speaking directly to the graduating seniors spread out across the football field in chairs set 6 feet apart. The state had only recently lifted social distancing guidelines, which allowed for an in-person commencement ceremony.

“Four weeks ago, having a graduation like this was not possible,” Eaton said to the students and teachers assembled. “Our world responded to the global pandemic with our nation in quarantine and in great uncertainty. Even me, I found myself in a battle with COVID-19.”

At this point, Eaton was interrupted by clapping and cheering from the crowd. But that was the one and only time he spoke of his personal struggle.

“Today you are here, graduating in a ceremony,” he continued, “and I’m here as your principal, honoring you, the Lake Creek High School class of 2020. Together, we have boldly roared down brick walls in our past. And now we move proudly into the future.” ■



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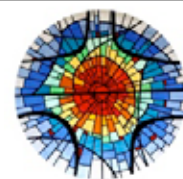
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Craving Touch in an Era of Social Distancing

Some COVID-19 guidelines present mental and physical health challenges

BY SHANLEY PIERCE

Positive human touch is an integral part of human interaction. Whether it's a warm embrace, a reassuring hand on the shoulder or one arm linked through another, physical contact is part of how we show concern and establish camaraderie with friends and loved ones.

But as we practice social distancing to prevent the community spread of COVID-19, platonic physical touch among friends and colleagues is off limits. Hugs, high-fives, friendly pats on the back or anything that breaches the six-foot rule are now taboo.

"Human beings are wired to touch and be touched. When a child is born, that is how they bond with their mother," said Asim Shah, M.D., professor and executive vice chair of the Menninger Department of Psychiatry at Baylor College of Medicine. "Our wiring system has touch everywhere, so it's difficult for us not to think about physical contact."

Touch starvation

When physical contact becomes limited, people can develop a condition called touch starvation or touch deprivation.

"When someone is [touch] starved, it's like someone who is starved for food," Shah said. "They want to eat, but they can't. Their psyche and their body want to touch someone, but they can't do it because of the fear associated with, in this case, the pandemic."

Touch starvation increases stress, depression and anxiety, triggering a cascade of negative physiological effects. The body releases the hormone cortisol as a response to stress, activating the body's "flight-or-fight" response. This can increase heart rate, blood pressure, respiration and muscle tension, and can suppress the digestive system and immune system—increasing the risk of infection.

People who are stressed or depressed, perhaps because of lack of touch, will have problems sleeping, Shah said.

"Every single medical disease, including heart attack, diabetes, hypertension, asthma—every single physical disease—is altered if you are more anxious, more depressed or if you have more mental health issues," he said.

Long term, he added, an extended period without positive physical touch could even lead to post-traumatic stress disorder.

Positive touch, positive health

Skin is the largest organ in the human body.

A 2018 study by scientists at the Medical College of Wisconsin in Milwaukee found that skin communicates positive and negative touch stimuli to our sensory neurons.

The outermost layer of our skin, called the epidermis, is made up mostly of billions of keratinocyte cells. The keratinocytes release a chemical called adenosine triphosphate, which activates receptors on the sensory nerve to convey the sensation of touch to the brain.

When we hug or feel a friendly touch on our skin, our brains release oxytocin, a neuropeptide involved in increasing positive, feel-good sensations of trust, emotional bonding and social connection, while decreasing fear and anxiety responses at the same time. For this reason, oxytocin is known as the "cuddle hormone."

Our desire for physical contact starts at birth.

"If a baby is born prematurely, the baby may be in the NICU, but the mother is still asked to go to the NICU a few times a day to hold the baby and put the baby on her chest, even if they're not breastfeeding," Shah explained. "We know that this

bonding, this human-to-human touch, is important for the growth of that child."

Even as adults, touch helps regulate our digestion and sleep, and even boosts our immune systems.

While nothing can wholly replace the benefits of positive human touch, virtual alternatives can help alleviate the effects of touch starvation.

"You can have almost the same element if you [connect] by video chat—whether it's FaceTime or Zoom or Webex," Shah said. "You may not be able to engage in physical touch, but you need to be able to see each other."

Video chatting, he said, is about 80 percent as effective as in-person contact. Online yoga and workout classes, singing and dancing are other activities that increase the release of oxytocin in the brain. Pets also help during stressful times.

The end of handshaking?

It's unclear when the COVID-19 outbreak will subside or how people will physically reconnect. But the

new normal of social distancing has erased customary nonverbal gestures, such as shaking hands and social hugging.

Even Anthony Fauci, M.D., director of the National Institute of Allergy and Infectious Diseases and the country's leading COVID-19 expert, admitted that he doesn't believe people should reintroduce the handshake.

"I don't think we should ever shake hands ever again, to be honest with you," Fauci said during a Wall Street Journal podcast. "Not only would it be good to prevent coronavirus disease, it probably would decrease instances of influenza dramatically in this country."

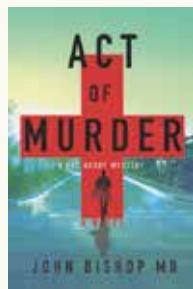
Although Shah said the "long-term impact of touch deprivation is devastating," he remains optimistic that people will overcome the stress and anxiety of physical distancing.

"Human beings are very resilient," he said. "We will learn the new level of intimacy. We will learn the new way of human connection—and we will learn to bring joy in different ways." ■

John Bishop, M.D.

Author of The Doc Brady Mystery Series

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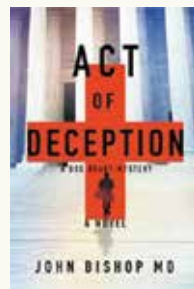


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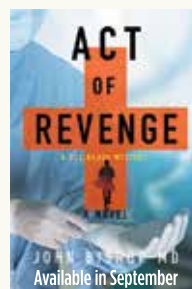


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Act of Revenge

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1 | GENE FRANTZ, MBA, a professor in the practice of electrical and computer engineering at Rice University's Brown School of Engineering, has been named to the National Academy of Engineers.

2 | REGINALD DesROCHES, PH.D., Rice University's new provost, has been named to the National Academy of Engineers.

3 | LT. CMDR. TIMOTHY SEHORN, M.D., a general surgeon at Houston Methodist Hospital, and **LT. EDUARDO LOPEZ**, a certified registered nurse anesthetist at Houston Methodist, worked on the U.S. Naval Ship Mercy offshore in Los Angeles, Calif., performing emergency surgeries to relieve local hospitals treating patients with COVID-19. Both are U.S. Navy Reserve members.

4 | THE UNIVERSITY OF TEXAS MD ANDERSON CANCER CENTER is now the official cancer center and jersey partner of the Houston Dash from the National Women's Soccer League.

5 | DAVID DOUPHRATE, PH.D., associate professor at The University of Texas Health Science Center at Houston (UTHealth) School of Public Health, has been named the *Journal of Agromedicine's* "Leader in the Field" for 2020.

6 | PETER VANDERSLICE, PH.D., director of biology at the Texas Heart Institute Molecular Cardiology Research Laboratories, has been elected a Senior Member of the National Academy of Inventors.

7 | Lien Ngo, center, was awarded 2019 Employee of the Year for **UT PHYSICIANS**, the clinical practice of McGovern Medical School at UTHealth. Ngo is flanked, on the left, by Jason L. Chavers, executive director of community-based clinics, and Andrew Casas, COO of UT Physicians and senior vice president of UTHealth. To Ngo's right are Fahad Kamal, community practice manager of UT Physicians Multispecialty - International District, and Jennifer Bradley, director of community-based clinics.

8 | HAMILTON HEALTH BOX provided two types of COVID-19 tests—a sputum test and a blood test—to **TEXAS MEDICAL CENTER** employees and affiliated service providers on April 17, 2020 at the TMC Innovation Institute.



1



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Credit: Nos. 1, 2, 3, 5, 6, 7, 9, 10, 12, courtesy photos; 4, Adolfo Chavez III; 11, Meghan Poort Inc



9

9 | TEXAS A&M UNIVERSITY will build a half-billion-dollar health sciences complex to expand its College Station, Texas-based brand in the Texas Medical Center. This complex will augment the current renovation of the Texas A&M University Engineering Medicine (EnMed) building at Holcombe Blvd. and Main St. with two new towers scheduled to include nearly 600 student housing units, medical offices and retail.



10



11



12

10 | Scott Greenberg, M.D., holds up a Micra AV before his first implantation of the device at **CHI ST. LUKE'S HEALTH - THE WOODLANDS HOSPITAL**, the first hospital in Greater Houston to adopt this new technology to treat patients with atrioventricular block, a type of heart block that interrupts the impulse transmissions between the chambers of the heart. Micra AV is considered the world's smallest pacemaker and is able to treat a broader group of patients than traditional pacemakers.

11 | ALAN J. GARBER, M.D., PH.D., passed away on April 9, 2020. Garber joined Baylor College of Medicine in 1974 as an assistant professor and investigator for the Howard Hughes Medical Institute and, since 1982, served as a professor in the departments of medicine, biochemistry and molecular biology, and molecular and cellular biology. He also served as chief of endocrinology, diabetes and metabolism at Methodist Hospital from 1993 to 2004.

12 | CLIONA ROONEY, PH.D., professor of pediatrics - hematology and oncology at Baylor College of Medicine, was honored as one of four 2020 Women Leaders in Science by BioHouston, a local organization seeking to position the city as a leader in life science and biotechnology commercialization.



13

13 | More than 1,000 **TEXAS MEDICAL CENTER** scientists, students, researchers and health care professionals gathered on June 9, 2020 for a walking vigil to support the black community and the eradication of police violence. As they walked a 30-minute loop around the Texas Medical Center, a private funeral for George Floyd—the Houston-raised black man whose May 25 death at the knee of a white police officer ignited global outrage—was being held at The Fountain of Praise church in Houston.

Do you have TMC photos you would like to share with *Pulse*?
Submit high-resolution images to: news@tmc.edu

CURATED

The Intersection of ARTS and MEDICINE

By Maggie Galehouse



Weeks before the CDC recommended face coverings to stem the spread of COVID-19, Houston fashion designer Chloe Dao was sewing masks.

“On March 18, I started making basic white, cotton masks,” said Dao, owner of Dao Chloe Dao boutique in Rice Village and winner of television’s “Project Runway” in 2006. “At first, I offered them to the public for free. I wasn’t thinking about the fashion component at all.”

Dao has donated more than 4,000 masks to front line workers. But once she started selling masks to the public, she began to tinker with different patterns and fabrics, moving through several iterations until arriving at designs that combine fashion and function. Among her most popular: a breathable box pleated mask with elastic ear loops and a pocket for a filter; and a neoprene antibacterial mask that repels water and blocks ultraviolet rays.

“I had to pivot to figure out what’s safe, what people need and what looks good,” said Dao, whose masks come in several sizes. “I consider myself a fabric engineer. At night, I watch YouTube videos about making masks.”

Proceeds from the masks she sells help fund her efforts to make and distribute free masks to health care professionals and people in need.

Another Houston-born artist, jewelry designer Billie Hilliard, took a step back from metalsmithing for a few months to focus exclusively on mask-making.

“It started when my mom asked if I could make masks for her and my sister,” said Hilliard, who is based in Atlanta.

Then she made masks for neighbors and a few teachers who worked with her sister.

“This all started on a Friday,” Hilliard said. “By the following Wednesday, I had 70 orders.”

Hilliard and her boyfriend, who is also an artist, spent four days perfecting a pattern.

“Everything I design—even jewelry—is unisex,” Hilliard explained. “I do classic designs and I never follow trends. I wanted the mask to be sleek and simple. ... I wanted to make sure it accentuated the eyes and wasn’t bulky looking. The profile has more of a curve than many other masks.”

Her favorite compliment so far? “A few people have said, ‘Oh my God! I feel like a ninja!’ when they put on one of my masks,” Hilliard said.

When she reached out to essential workers and hospital personnel on social media to let them know she’d supply them with masks free of charge, her business exploded.

“I couldn’t make all the masks myself, so I was able to employ four additional women—seamstresses doing couture stuff for brides,” she said.

Like Dao, Hilliard uses some proceeds from the masks she sells to produce additional masks to donate to health care workers.

As designers, both Hilliard and Dao are looking ahead to what types of masks consumers might want in the coming weeks and months.

Hilliard is working on a collection of couture masks made of raw silk.

Dao just introduced a new design with a hidden slot that allows the wearer to sip from a drink without removing the mask.

“The ‘Safely Sip’ mask is my baby,” she said. “I’m so proud of it.”

Dao also said she will probably start making dresses and other garments to go with her masks.

“No matter what, you want to look cute,” she said, “especially now that half your face is covered.” ■

Top left: A Billie Hilliard mask; for information, go to billiehilliard.com.

Middle left: A box pleated mask by Chloe Dao; for information, go to chloedao.com.

Bottom left: A mask by Houston-based Onyii & Co.; for information, go to onyiiandco.com.

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