

TMC | PULSE

NEWS OF THE TEXAS MEDICAL CENTER — VOL. 4 / NO. 5 — JUNE 2017

Bracing for **MEASLES**

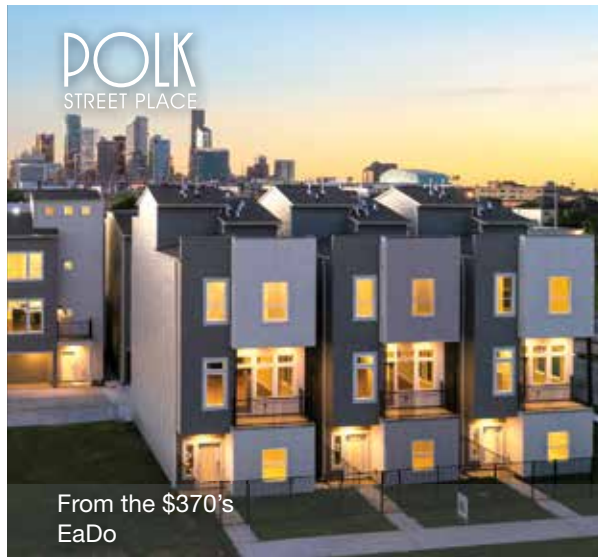
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WILLIAM F. McKEON
*President and Chief Executive Officer,
Texas Medical Center*

Public attitude toward certain diseases and conditions can be perplexing, as this month's cover story on measles suggests. Over the course of my own life, I have noticed this most acutely in regard to mental illness. While I have observed some progression of society's understanding and support of mental illness, we've got a long way to go.

During my formative years, mental illness carried a social stigma of shame. It was never discussed. I remember two classmates of mine who were clearly suffering from mental illness and then suddenly disappeared from school, never to return. Treatment alternatives at the time were extremely crude, often involving isolation, heavy sedation and/or rudimentary shock therapy. I often wonder if my classmates were ever able to recover and return to productive lives.

Over the past decades, though, we have begun to address the stigma attached to mental illness. Today, adolescents are certainly more open to seeking help and discussing mental health issues. While progress has been made in developing therapeutics that are more refined in addressing symptoms, the time spent and side-effects endured when finding the optimal drug can be daunting. New technologies utilizing DNA sequencing and analysis, however, offer new hope in determining the ideal drug for each patient.

Finally, legislation in recent years is attempting to bring parity to reimbursement for mental illness treatment to match that of physical illness. This is long overdue and an important step forward in addressing the multiple layers of shame and discrimination associated with mental illness.

There is no vaccine for depression, for bipolar disorder, for an eating disorder. Thousands of years ago, we understood the essential connection between our mental and physical health. Perhaps we need to look back to move forward.

A handwritten signature in black ink that reads "William F. McKeon". The signature is fluid and cursive, with the first name being the most prominent.

TMC | PULSE

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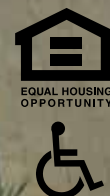


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A Bath and a Shower

Experts offer summer food safety tips

BY BRITNI N. RILEY

Summer means backyard barbecues and picnics in the park. But as temperatures rise in Houston, bacteria blooms in the summer foods we love.

“As much fun as it is to cook during the summertime, it is important to remember that food is a main way that disease can be spread,” said Richard Bradley, M.D., professor of emergency medicine at McGovern Medical School at The University of Texas Health Science Center at Houston (UTHealth). “The risk can be easily managed if we follow sound steps to make sure that we maximize our safety.”

The Centers for Disease Control and Prevention estimates that 48 million cases of foodborne illness, or food poisoning, occur in the United States each year. These cases come in the form of well-known pathogens, including salmonella, norovirus and E. coli, in addition to several caused by “unspecified agents”—a group of less understood bacteria that can cause severe stomach sickness.

Bacteria on food grows faster in warmer temperatures, and the conditions under which most people cook and eat outdoors are not always favorable. So it’s a double whammy.

Herbert L. DuPont, M.D., director of the Center for Infectious Diseases at UTHealth School of Public Health, said the best way to avoid food-related illness this summer is to take precautions with every step of the food preparation process.

“The number one cause of foodborne infection in the U.S. at the present time is produce—spinach and lettuce,” DuPont said. “You need to not assume that lettuce and spinach has been cleaned... even if it says ‘three times washed’ ... We have cultured those lettuce leaves and they are very contaminated.”

TIPS FOR SUMMER COOKING

- | | | | |
|---|--|---|--|
| • Hot food must stay hot and cold food must stay cold | • Don’t cross-contaminate raw and cooked foods | • Wash hands with warm water and soap for at least 15 seconds after touching raw meat, chicken and fish | • Keep food refrigerated until it is ready to be eaten |
|---|--|---|--|

“The number one cause of foodborne infection in the U.S. at the present time is produce—spinach and lettuce.”

— HERBERT L. DUPONT, M.D.
Director of the Center for Infectious Diseases at
UTHealth School of Public Health

Because of this, DuPont recommends giving raw produce a “bath and a shower” before serving it to guests.

“You take the lettuce, spinach or carrots or whatever you are going to eat, you put them in a sink with water, mix them all up, and then you put them in a colander and let water run through them,” DuPont said. “And with that, you will render all of these food items safe. You should be doing the same thing with berries and grapes—give them a bath and a shower, let them dry out, and it will be a big factor in reducing disease.”

When it comes to preparing raw fish and meats, such as sushi or beef carpaccio, using extra caution is the key to avoiding illness. “Any time you serve raw meat

or fish, you are going to increase the risk of foodborne illness,” Bradley said. “To manage that risk, it is best to make sure the meat comes from a reliable source ... Make sure it is prepared the exact way it is supposed to be prepared and minimize the amount of time it sits at room temperature.”

Both doctors also recommend taking extra care when barbecuing anything from chicken to cheeseburgers.

“There is an E. coli pathogen that produces a very severe disease called Shiga toxin-producing E. coli—and that is found in beef,” DuPont said. “When you grind up the beef, you’re putting the surface of the beef in the middle of the patty. For that reason, if you have a hamburger, it’s got to be cooked all the way through. I wouldn’t eat a hamburger that had a pink center because of the danger of picking up this E. coli bug.”

Both doctors agree that the risk of food poisoning is greatly reduced by cooking meat at the proper temperature, not leaving it out at room temperature for long periods of time and not placing cooked meat where raw meat has been without cleaning the area properly.

Foodborne illnesses can result in nausea, vomiting, abdominal cramps, diarrhea and, occasionally, fever. Symptoms can last anywhere from four to 24 hours, and sometimes longer.

“If you have tried some Imodium or another over-the-counter medication and that has not helped and you are beginning to feel light-headed, pale, sweaty, confused and dehydrated, that is certainly a good time to call your health care provider,” Bradley said. ■



Powering the TMC

TECO cools and heats the Texas Medical Center

BY SHANLEY CHIEN



Located at 1615 Braeswood Blvd., TECO's central plant includes an 8.8 million-gallon thermal storage tank and a modified jet engine that can power a Boeing 747. Facing page: TECO's East Chiller Building contains four 8,000-ton chillers. At 120,000 tons of generating capacity, TECO is the largest district cooling system in North America.

Behind a brown brick façade decorated with black and white double helixes—an homage to the district it serves—the Thermal Energy Corporation (TECO) is busy cooling and heating the Texas Medical Center.

"In reality, we're a big part of the med center, but we're a quiet part," said Charlie Michalak, maintenance manager and long-time TECO employee. "Two hundred thousand people come in and out of this place every day. You would think they would know a little bit about us, but we don't make a lot of noise. We just stay back to the side and do what we've got to do and make sure

the medical center gets 24/7 coverage."

Much like the heart supplying blood to the body through the veins, TECO pumps chilled water and steam to the medical center through a vast network of pipes. Thirty-six miles of steel pipe turn and wind below the TMC campus. How far below? The equivalent of a five-story building.

Sometimes, that massive underground infrastructure requires a disruption above ground. Recently, TECO construction crews have been hard at work outside the John P. McGovern Texas Medical Center Commons on Bertner Avenue, and up the street on

E. Cullen in front of Baylor College of Medicine, occasionally delaying and rerouting traffic, to the frustration of medical center employees.

But as TECO's CEO Steve Swinson said: "If we don't do what we do, then they don't do what they do."

TECO's state-of-the-art central plant, which sits on six acres between Pressler Street and Brays Bayou, houses a district energy and combined heat and power (CHP) system that produces chilled water, steam and hot water that is piped out to 46 buildings in the medical center. The not-for-profit also holds bragging rights as the largest

producer of chilled water in North America, housing 27 chillers (including four 8,000-ton chillers) and a 150-foot tall thermal energy storage tank that holds nearly nine million gallons of water. There's even a jet engine—strong enough to power a Boeing 747—that can generate backup electricity in the event of an electrical blackout.

TECO's services play an important role in medicine, patient care and research. Chilled water provides air conditioning to keep buildings cool. Not only does this give patients and employees respite from the oppressive heat and humidity during Houston

“In reality, we’re a big part of the med center, but we’re a quiet part.”

— CHARLIE MICHALAK

Maintenance manager and long-time employee of TECO



summers, but researchers gain environmental control in their laboratories. Maintaining a comfortable interior temperature allows equipment to function properly and ensures that research and experiments aren’t compromised.

“A lot of the research specimens and a lot of experiments have evolved so that the environment is much more sensitive to them than it would normally be,” Swinson said. “A small change in temperature, a small change in humidity, a small change in light intensity can adversely affect that.”

In addition to heating buildings, pressurized steam is used to sterilize laboratory, medical and surgical instruments and waste materials (including pathogenic hospital waste) in autoclaves—industrial pressure chambers. The moist heat from pressurized steam causes the proteins in various microorganisms to denature and coagulate, effectively destroying the cell membranes and cooking the microorganisms to death.

This sterilization process is especially important to prevent patients from contracting diseases and infections caused by bacteria on medical

or surgical instruments. At the Texas Medical Center, a place that hosts more than 10 million patient visits, delivers more than 25,000 babies and performs 180,000 surgeries every year, sterilized tools and instruments are paramount to patient safety and healthy outcomes.

“When somebody goes home from the medical center, I know they don’t tell their family, ‘If it weren’t for the doctors and TECO, I wouldn’t be here,’” Swinson said. “But we do kind of know it—not in an arrogant way. It is really personally fulfilling to do what we’re doing.”

Since it was established in 1969, TECO has focused on efficiency and reliability. Standard power plants typically use one-third of the fuel they produce, with the rest going unused. TECO’s system reuses and recycles electricity and waste heat produced from the plant, reducing emissions by 32,700 tons of carbon dioxide annually.

Despite the grand scale of TECO’s work, every tunnel in its infrastructure is dug by hand, an old-fashioned method that would seem to contradict the state-of-the-art technology and scientific advancements being made across the campus. *(continued)*



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“Today, TECO is one of the most efficient, reliable plants in North America. We really are to district energy what Texas Children’s is to pediatrics, what Texas Heart Institute is to cardiovascular disease, what MD Anderson is to cancer.”

— STEVE SWINSON
CEO of TECO

TECO’s combined heat and power system includes a jet engine that generates 48 mW of electricity. The heat-recovery steam generator captures heat from the turbine’s exhaust and turns it into steam.



TECO CEO Steve Swinson.

But Swinson said excavating tunnels by hand is the cheapest and most effective way to install large distribution lines that range from 6 to 60 inches for chilled water pipes and 2 to 16 inches for steam pipes.

“Because of the size of the pipe, it’s not possible to dig open ditches,” Swinson said. “They would be so large, they would totally disrupt the flow of traffic and pedestrians in the area.”

The tunneling process begins by digging three 5-foot-by-5-foot square tunnels—one for chilled-water supply, the second for chilled-water return

and the third for steam supply and condensate return. Construction crews install oak boards to the inside perimeter of the tunnels every 6 inches, then lay down a set of tracks. Once pipe casings have been installed in each tunnel, the chilled water and steam pipes are connected to existing distribution pipes.

Because TECO serves the vast majority of buildings in the Texas Medical Center, individual institutions do not have to house, manage and operate their own cumbersome heating and cooling equipment in large mechanical rooms. Not only is this a more cost-effective and efficient system, but institutions are able to save valuable real estate for other things.

TECO received the U.S. Environmental Protection Agency’s 2015 Energy Star CHP Award and was named a participant in the United Nations Environment Program Global District Energy in Cities Initiative for its reputation in efficiency and sustainable, renewable energy.

The TECO plant has had only one significant outage in 40 years.

As the Texas Medical Center continues to grow and add new facilities, TECO is also continually expanding. The cooperative is currently extending its network of pipelines to three buildings: Memorial Hermann-TMC’s Hermann Pavilion 2, Houston Methodist Hospital North Tower and Ben Taub Hospital. In addition TECO crews have already completed the construction of distribution lines

around what will be the TMC³ translational research campus, scheduled to open south of the medical center in 2022.

“Today, TECO is one of the most efficient, reliable plants in North America,” Swinson said. “We really are to district energy what Texas Children’s is to pediatrics, what Texas Heart Institute is to cardiovascular disease, what MD Anderson is to cancer.” ■



A TECO employee walks the roof of the plant. Massive fans help cool chillers that are used to generate chilled water and keep temperatures comfortable in more than 20.3 million square feet of building space on the TMC campus.



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DENISE CASTILLO-RHODES, executive vice president and chief financial officer of the Texas Medical Center, spoke with *Pulse* about growing up in El Paso, saying yes to professional challenges, volunteering in Ghana and Guatemala, and getting her motorcycle license.

Q | *Did you always dream of a career in finance?*

A | Growing up in El Paso, I thought I wanted to be a math teacher. My sophomore year in high school, I got a job working at Baskin-Robbins and worked there through most of my college years. Eventually, the owner let me run one of his three stores, which was what inspired me to aim for a career in business. While at Baskin-Robbins I not only learned the ropes of the art of scooping ice cream, but, more importantly, the business side of the operations. When I graduated from high school I enrolled at The University of Texas at El Paso (UTEP) and declared business management as my major. I later changed my course of study when my accounting professor pulled me aside to encourage me to consider accounting as my major after I scored a perfect 100 on my very first accounting exam.

Q | *What was it like growing up in El Paso?*

A | Life was simple and easy. I was blessed with two loving and wonderfully supportive parents, an older sister and two younger brothers. Neither one of my parents had a college education, however. From a very early age they instilled in us that we would attend college.

When I attended UTEP, which is located on the west side of town about 20 miles from my parents' home, I could easily see the cardboard shacks that were just across the border in Juárez, Mexico. The only thing separating those shacks from where I stood was a trace of a very shallow Rio Grande. I remember watching little boys and girls playing outside their shacks or swimming in the river. I felt so sorry for these young children, but as time went on I came to realize how happy these children seemed. This experience certainly played a role in my interest in humanitarian efforts.

Q | What brought you to Houston?

A | I graduated from college with a degree in accounting and a desire to work in the tax department of one of the Big 8 firms—Big 4 these days.

Unfortunately, they only hired people with graduate degrees, which is why I signed up for the Master of Taxation program at UTEP. A few months into the program, the IRS came knocking at my door—not because I was delinquent on my taxes, but because they were looking to recruit recent graduates into a new program they just started in Houston. I was torn because I always prefer to finish what I start. Ultimately, I finished my first semester and packed my bags to move to Houston. I figured that the experience I'd gain in the IRS program in one year would take me two years to learn in the classroom. I was right; the training I received was phenomenal. At the end of the program I was selected as one of the top three trainees. I sent my resume to two of the Big 8 accounting firms. I received offers from both firms and chose Ernst & Whinney—Ernst & Young or EY today—where I worked for about four-and-a-half years.

Q | Was it challenging to raise your son, Jeff, in the midst of a demanding career?

A | Jeff was born when I was at Ernst & Whinney. I took a few months off and when I went back to work it became very challenging for me to meet the demands of my clients, the firm and my family. I remember spending my lunch and dinner hours driving home to breast feed my baby, grabbing a quick bite and then rushing back to the office. Back then there were no lactation rooms for mothers to pump milk. My insensitive boss would tell me, 'There are 24 hours in a day, Denise.'

After months of this very hectic schedule, my husband and I decided it was better for me to stay home with our son. I truly loved being home with my son, but after eight months I became somewhat bored with my routine. I could only play tennis so many times a week, go to the zoo and ride the train, etc.

One day, my husband received a call from a headhunter. My husband was not interested in changing jobs, but he said: 'My wife is really bored at home and driving me crazy. Do you have any jobs for accountants?' As luck would have it, he did. At Nabisco. The timing was perfect because Jeff was attending a Montessori school and loved it. I took the job at Nabisco, where I found a better work-life balance which allowed me to spend more time with my family.

Q | You received an MBA from the University of St. Thomas. Why was that such an important decision for you?

A | Having a young son and a full-time job made getting my master's degree very challenging. But I knew that if I wanted to advance my career, I needed a better

“For me, balance includes self-care, so that my body, mind and soul are being refreshed daily. I do this by making deliberate choices about which opportunities to pursue and which to decline ...”

understanding of all facets of the business world. The University of St. Thomas gave that to me.

By this time, my son was almost four. Our family routine became rather hectic again and, unfortunately, two semesters into the MBA program my husband and I divorced. I could have dropped the program altogether, but I recognized that this MBA would be our path to greater opportunities down the road. So I forged ahead, but it was not without short-term sacrifices including, at times, missing my son's activities, and always being the first parent to drop off my son at school and the last parent to pick him up after school. There was a lot of emotional guilt. This guilt was worse than the Catholic guilt I felt for missing church on Sundays.

Q | In 2015 you were named one of the most influential women in Houston by Houston Woman Magazine. In 2016 you won one of the Houston Business Journal's Women Who Mean Business Awards. This year, you were one of eight Outstanding Women in Banking and Finance honorees by the Women's Resource of Greater Houston. What helps you excel, professionally and personally?

A | For me, balance includes self-care, so that my body, mind and soul are being refreshed daily. I do this by making deliberate choices about which opportunities to pursue and which to decline; recognizing that at times home takes priority over work and vice versa but, at the end of the day, it all balances out; and forming a strong network of behind-the-scenes emotional supporters.

Q | You worked with Nabisco until they closed the Houston plant. Since then, you have been with the Texas Medical Center. Can you describe that shift in your life?

A | I have been fortunate to serve as CFO at the Texas Medical Center (TMC) since 2004. When I first arrived, TMC was in the middle of diversifying its assets. TMC purchased the Nabisco cookie factory, where I was the controller for 12 years until the factory was sold to TMC. TMC's CEO asked me to send him my resume. A few days later he called me and said, 'Kiddo, I'd like you to come work for me.' I thanked him and asked him what I would be doing if I accepted. I asked this question because I knew they already had a controller and a CFO.

He said, 'I don't know, kiddo, just come on board and we'll figure it out.'

Here I am a single mom and this job offer is, 'we'll figure it out?' Then, a few days later I received a call from TMC to offer me a job as Business Manager, a position that was created just for me. This new job took me completely outside of my area of expertise into three areas that I had absolutely no experience in, including commercial leasing, marketing and business development. I accepted with some trepidation but I realized this was an opportunity to try something new. By being willing to learn a completely new side of business, it allowed me to get my foot in the door at the greatest medical center in the world.

Q | You have such a strong commitment to community outreach and charity. Where does that come from?

A | When I was a student at UTEP and I saw what I saw across the border, I thought to myself: when I finally have the time to be able to do more for society, I'm definitely going to do it. Once Jeff went to college and I had a little bit more flexibility at the office and started meeting new people, I just made the time for it. You just have to decide it is time, and you just do it. It's like brushing your teeth or working out.

(continued)



Castillo-Rhodes speaks at the 2017 Wrapped in Red Luncheon, benefiting the American Red Cross. She co-chaired the event.

I volunteer for several organizations, including The Post Oak School, Medical Bridges, Greater Houston Women's Chamber of Commerce, the University of St. Thomas, St. Thomas High School and the American Red Cross.

Q | Can you share a volunteer experience that was particularly rewarding?

A | I traveled to Ghana with a group of women executives, where we equipped a small clinic in a remote village with medical supplies. On another trip to Guatemala with a Methodist church in Denton, we helped build a medical clinic in a small village that—before our visit—had no dedicated medical facility at all.

Q | What are your favorite things to do outside of work?

A | I work out just about every day, twice a week with a trainer and cardio and Pilates other days. It is a great stress burner that allows me to decompress after a busy day at work. But my favorite thing to do is spend time with my husband, Bob Sergesketter, my recently-married son, Jeff, and his lovely bride, Elyse, and our goofy 115-pound Newfoundland, Wilson.

After a long week, Bob and I love watching sappy rom-coms at home. He'll kill me for sharing this with everyone. My favorite movie is *Sabrina* with Audrey Hepburn. But we also love to travel, so we take one long vacation overseas every year. We really enjoy visiting places that are a bit off the beaten path and



Castillo-Rhodes volunteering in Ghana.

that let us experience cultures that differ quite a bit from our everyday lives in Houston. Last year we went to the Balkans, visiting Northern Greece, Albania, and Macedonia. This year we will be exploring the Baltics—Estonia, Latvia, and Lithuania—and because we'll be in the neighborhood, we'll spend a couple of days in the small Russian seaport of Kaliningrad and then we'll wrap up the trip in Minsk, Belarus.

Q | What is something people would be surprised to learn about you?

A | I always like to finish what I start. Bob decided he wanted to buy a motorcycle and, before he bought it, he decided he wanted to take some riding lessons and he

encouraged me to take the classes with him. I agreed and, keep in mind, I had never driven a standard vehicle in my life, so I really didn't know how to mechanically operate a standard shifting vehicle.

The course was classroom training and training with an actual motorcycle. I was good in the classroom and horrible on the riding, but I am one of those people... I just don't give up. The instructor finally asked me 'Do you really want to do this?' and I said 'No, but I'm going to finish this course, dang-it!'

I managed to get through each of the obstacles they had given us, passed the written test with flying colors and on the riding portion of the test, I was the last one and I actually scored better than Bob, who was the best rider in the class, which was amazing because I was the worst rider in the class.

I didn't want to be out there, but I also didn't want to give up because I wanted to see this through. I now have my motorcycle license, but I have never ever driven a motorcycle since that day. ■

Denise Castillo-Rhodes was interviewed by Pulse reporter Britni N. Riley. This interview was edited for clarity and length.



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For Mothers and Babies, Safety First

A first-of-its-kind research center devoted to perinatal safety launches at the medical center

BY SHANLEY CHIEN

Children's Memorial Hermann Hospital and McGovern Medical School at The University of Texas Health Science Center at Houston recently partnered with the March of Dimes to establish the first research center in the country dedicated to improving maternal and infant safety and preventing unnecessary illness and death.

The March of Dimes Perinatal Safety Center is designed to identify sources of patient harm and develop techniques and training tools to minimize human error and close the gaps in health care through pregnancy, labor, delivery, postnatal care and the transition home. The institutions will use the information gathered to develop a blueprint for best practices that other hospitals around the country can implement.

The research initiative is funded by a three-year, \$2 million grant from the Gordon and Betty Moore Foundation and the Joe Kiani/Masimo Corporation to the March of Dimes. It will not occupy a designated space; rather, everyone involved will collaborate from their existing offices and facilities.

"We certainly know that a lot of hospitals, like Children's Memorial Hermann and many other hospitals, do a fantastic job of taking care of patients and babies when they're here, supporting the families that are here," March of Dimes president Stacey D. Stewart said. "But like a lot of other industries, everyone's always interested in how you can do better, how you can improve the outcomes and how you can make sure that every baby is as safe as possible. There's no room for error."

While it's important for hospitals to be highly reliable, "it's easier said than done," said the center's principal investigator, KuoJen Tsao, M.D., the Children's Fund, Inc. Distinguished Professor in Pediatric Surgery at McGovern Medical



Premature babies, including Addison Clark, above, born 1 lb. 4 oz. at 23 weeks, will benefit from the new March of Dimes Perinatal Safety Center.

School and co-director of The Fetal Center at Children's Memorial Hermann Hospital.

"Our ultimate goal is to really improve the culture of patient safety," Tsao said. "We think we are a safe organization. We think we do everything safely. But can we measure it so we identify the hot spots and how to make it better?"

Children's Memorial Hermann delivers more than 5,200 babies and performs close to 5,800 pediatric surgeries every year. The hospital offers more than 40 maternal and pediatric

specialties—including high-risk pregnancy, NICU and neonatal care and pediatric trauma—and has one of only four Level IV NICUs in the state to care for the most critically ill babies.

Throughout a mother's pregnancy, labor and delivery, she typically transitions from outpatient care with her primary OBGYN doctors to inpatient care with a team of delivery specialists at the hospital. Once the baby is born, mother and child are handed off to another team of neonatal specialists. The various teams of specialists working in silos can lead to blind spots and

“Our ultimate goal is to really improve the culture of patient safety. We think we are a safe organization. We think we do everything safely. But can we measure it so we identify the hot spots and how to make it better?”

— KUOJEN TSAO, M.D.
Principal investigator for the March of Dimes Perinatal Center

barriers within the health care system that can create medical errors along the way.

"We know that once you hit the hospital, you are taken care of ... by people, and people make mistakes," Tsao said. "We usually have systems for obstetricians or systems for the NICU, but it's really about creating one entire system for two patients from the beginning."

The journey through the hospital system can be even more complicated for premature babies who require extra care. On average, a premature baby will stay in the NICU for four months, according to Amir Khan, M.D., medical director of Children's Memorial Hermann Hospital NICU and administrative director of neonatology at McGovern Medical School.

"You have to do everything right every day for 120 days, which basically means you have to make sure that the ... 20 to 30 nurses, about five to six doctors and a whole bunch of other people are trained enough to take care of that specific baby for that period of time," Khan said. "Sustaining it is the hardest part. One mistake can result in a very, very bad outcome."

(continued)

The March of Dimes Perinatal Safety Center will focus on four main goals:

- **Increasing the use of antenatal corticosteroids (ACS) for women at risk of preterm birth to help fetal lung development:** Administering a single course of corticosteroids to women who were at risk of premature birth has been shown to reduce the baby's risk of death by approximately 30 percent. Children's Memorial Hermann will continue to administer the corticosteroids to at-risk women between 24 and 34 weeks of gestation.
- **Increasing maternal immunizations for flu and whooping cough to protect newborns:** Vaccines for flu and whooping cough are safe for women during pregnancy. Because pregnancy can change a woman's immune system, contracting the flu can cause women to become seriously ill and puts their babies at risk for developmental problems and premature birth. The Centers for Disease Control and Prevention reported that up to



Stacey D. Stewart, president of the March of Dimes, speaks at a press event at Children's Memorial Hermann Hospital to announce the March of Dimes Perinatal Safety Center.

20 babies die each year from whooping cough and approximately half of babies under the age of 1 will need to be treated in the hospital for the disease. Getting vaccinated for whooping cough and flu during pregnancy allows the body to create antibodies that

can protect the baby before and after birth.

- **Improving the transition from hospital to home for mother and baby:** According to the American Academy of Pediatrics, babies who were born preterm with low birth weight and treated in the

NICU had a higher rate of hospital readmission and death during their first year of life. The March of Dimes Perinatal Safety Center plans to develop an app that will help parents take care of their babies after they leave the hospital.

- **Reducing the number of medically unnecessary deliveries before 39 weeks of gestation:** According to the March of Dimes, early elective deliveries after 37 weeks and before the full 39 weeks of gestation can put the baby at risk for NICU admissions, transient tachypnea (a breathing disorder), respiratory distress, ventilator support, sepsis and difficulties feeding.

By the end of the three years, Tsao hopes the center will be able to develop a perinatal safety toolkit with recommendations and best practices. Other hospitals could then use this as a template for their own needs. ■

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From Crisis to Prevention

Thomas Street Health Center has been leading HIV/AIDS care for decades

BY BRITNI N. RILEY

In between seeing patients at Thomas Street Health Center—a freestanding HIV/AIDS clinic—Charlene Flash, M.D., takes a phone call from Ben Taub Hospital.

A homeless patient concerned about contracting HIV through risky sexual behavior asked Harris Health System for medicine to prevent him from getting the virus. Until recently, this wouldn't have been a possibility.

"The clinic used to be a place where we served HIV infectious people only," said Flash, assistant medical director of HIV prevention services for Harris Health System and assistant professor of medicine in the division of infectious disease at Baylor College of Medicine. "Our care focus has shifted and there are drugs available now that help us prevent patients from contracting the disease."

A drug called PrEP (Pre-exposure Prophylaxis) is prescribed to patients who possess a high risk of contracting HIV/AIDS. PrEP contains two HIV medications, tenofovir and emtricitabine, bundled into one pill trademarked as Truvada that must be taken once a day to be effective.

PrEP saved Regina Harris' marriage and her life.

"For me, May 16 is a day that is drilled in the back of my mind," Harris said. "It's the day my husband of 20 years was diagnosed with HIV through sexual contact with another person."

Harris has been on PrEP since September 2016. Because she takes her pill every morning at 8 a.m. and visits the health center once every three months, she has not contracted HIV from her husband.

"As a provider, it is very empowering to have this tool to offer my patients," Flash said. "If you have been married for 20 years and you don't want to desert your husband when he is sick, PrEP is something that allows you to maintain the emotional security of the relationship without this ongoing fear."

Because of their children and the life she and her husband have built together over the past two decades, Harris is committed to staying in her marriage.

“For me, May 16 is a day that is drilled in the back of my mind. It’s the day my husband of 20 years was diagnosed with HIV through sexual contact with another person.”

— REGINA HARRIS

Patient at Thomas Street Health Center



"I get mad sometimes at the fact that he had the audacity not only to take his own life in his hands, but mine, also," Harris said. "Because of PrEP, I feel like I have taken the control back."

For patients who are not on PrEP, like the homeless man who reached out to Flash for help, there is also hope. Nonoccupational Postexposure Prophylaxis, or nPEP, is a two-pill regimen of anti-HIV drugs that must be taken once a day for 28 days and must be taken within 72 hours of engaging in risky behavior.

"If you are in a network of people where HIV is common and you think that you are at high risk, then

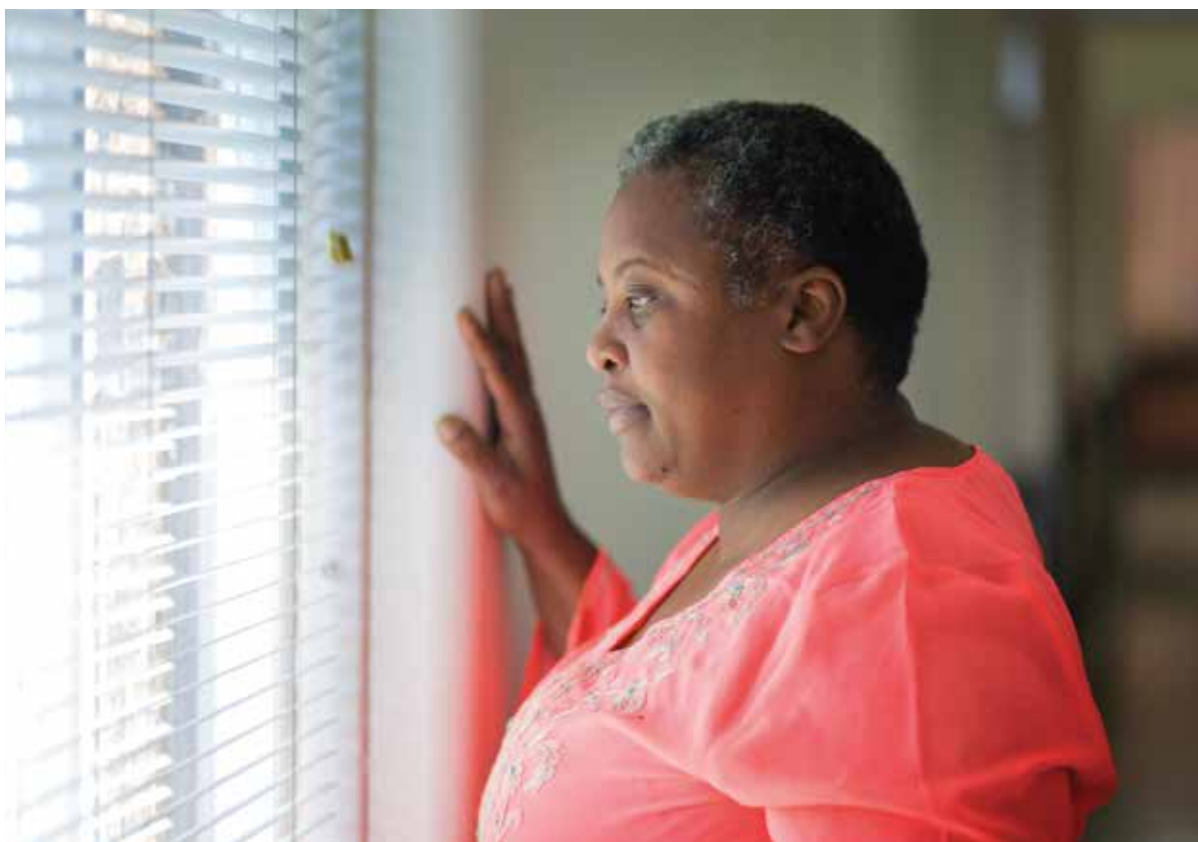
perhaps instead of always having this emergency and a fire drill, it would be better to just be on something once a day," Flash said.

There are currently 1.2 million Americans living with HIV/AIDS, as well as another 1.2 million men and women with a substantial risk of contracting the disease based on their lifestyles. To address this, Harris Health System has increased their testing efforts substantially.

"When I started at Harris Health, we established a new testing program for HIV/AIDS called Routine Universal Screening for HIV, or RUSH," said Ken Malone, HIV project analyst at Harris Health System. "We make it a routine practice throughout Harris Health to test patients for HIV/AIDS unless the patient opts out. We have now done over 600,000 tests."

This mysterious disease

For more than 30 years, Harris Health has offered a safe haven for patients suffering from HIV/AIDS. In 1989, Harris Health took their care to the next level, opening Thomas Street Clinic—now known as Thomas Street Health Center. The staff is proud to say that they work for the first free-standing AIDS clinic in the United States. *(continued)*





"The first cases of HIV/AIDS in Houston were identified in the early '80s," said Thomas Giordano, M.D., medical director of Thomas Street Health Center. "The first patients were being seen by clinicians at Harris Health in the tuberculosis clinic and chest clinic because there was this recognition in the beginning that people with AIDS had higher rates of TB. They were scattered with all of these other departments and there was this recognition that we needed some sort of centralized clinic to treat patients with HIV/AIDS."

In an innovative and unconventional move, Harris Health acquired a building from the city of Houston to house the clinic. Built in 1910 as Sunset Hospital—a Southern Pacific Railroad Hospital—Thomas Street Clinic did not look particularly innovative.

"We were in the basement in a very primitive area and it was almost kind of dangerous," said Wayne Shandera, M.D., an infectious disease specialist at Thomas Street Health Center/Ben Taub Hospital and assistant professor of internal medicine and infectious disease at Baylor College of Medicine. "We were worried about our blind patients falling down the elevator shaft."

Before working at the clinic, Shandera served on the front lines of the HIV/AIDS epidemic in Los Angeles. On a summer morning in 1981, while he was serving as the epidemic intelligence services officer for the Centers for Disease Control and Prevention (CDC), five mysterious cases of pneumonia appeared on his desk.

"I saw this disease since its inception," Shandera said. "There were three gay men who all had an unusual pneumonia at UCLA and a fourth at Cedars-Sinai and that very day there was another case on my desk from Santa Monica—St. John's Hospital. We described this unusual pneumonia that had only been seen in starvation victims in eastern Europe or kids with leukemia. And these were healthy young men who were getting it and we didn't exactly understand why."

Before fax machines and email, getting the word out quickly about an outbreak meant publishing it in the CDC's Morbidity and Mortality Weekly Report, which gathers data on infectious and chronic diseases from state health departments. On June 5, 1981, Shandera and his colleagues published the first report on this puzzling disease, referring to it as pneumocystis pneumonia.

More cases started popping up around the country. Men in New York were covered in purple splotches and red lesions. Haitians in south Florida showed symptoms of Hepatitis B. Heroin addicts with unexplained swelling of the lymph nodes were heading to hospitals in droves.

"No one could pin it down and it was hard to identify," Shandera said. "At the time, I knew it was an outbreak, but I had no idea it was going to be one of the pandemics of the century."

A Texas native, Shandera returned to his roots and began his work with Harris Health.

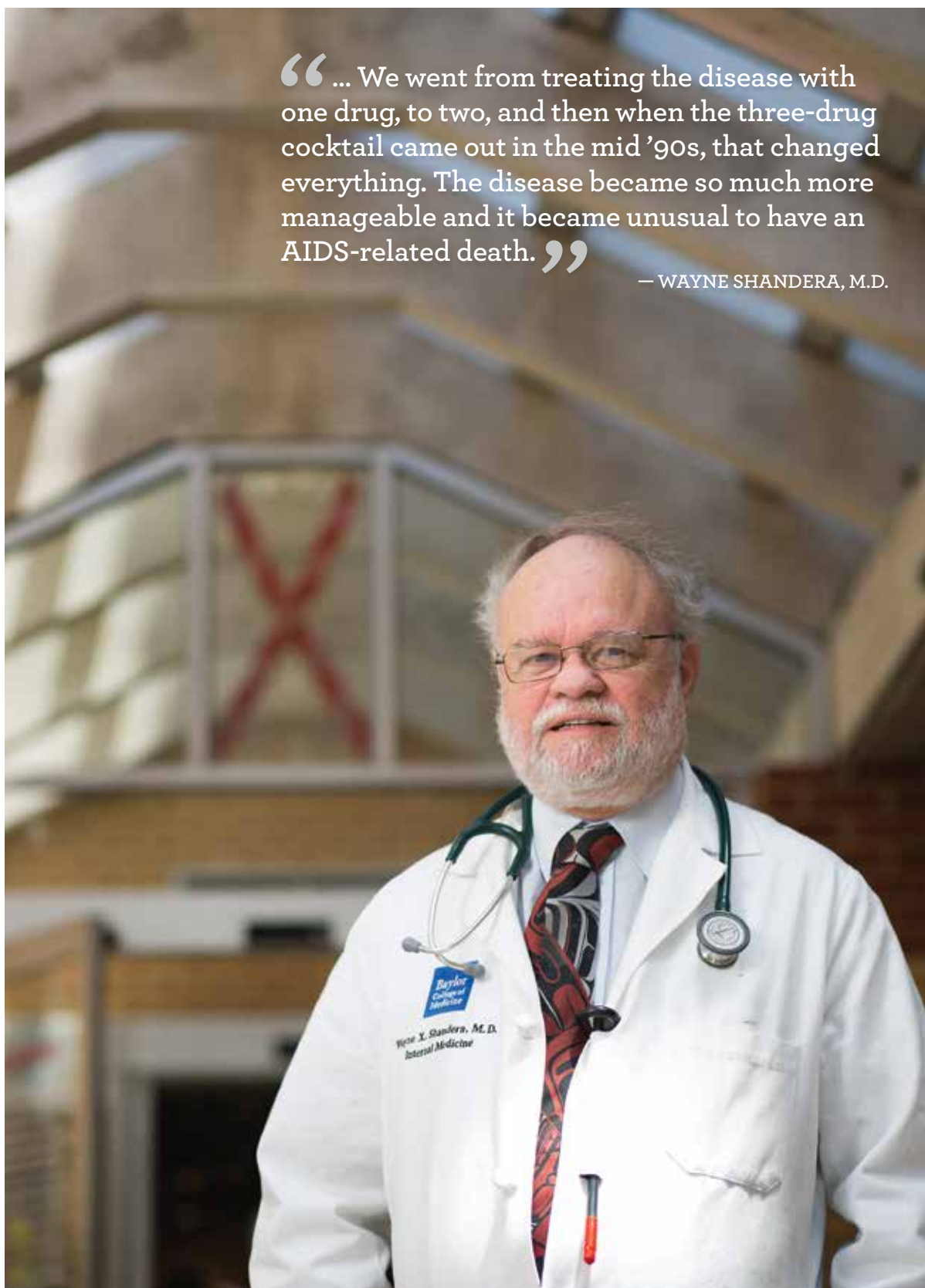
"In those days, we weren't curing patients," he said. "We would have one or two patients die each week."

But by the early 1990s, the conditions at Thomas Street and treatment for the devastating virus had improved. After a mathematician determined how rapidly the virus was multiplying in the bloodstream, doctors realized it needed to be attacked with force.

"We went from treating the disease with one drug, to two, and then when the three-drug cocktail came out in the mid '90s, that changed everything," Shandera said. "The disease became so much more manageable and it became unusual to have an AIDS-related death."

"... We went from treating the disease with one drug, to two, and then when the three-drug cocktail came out in the mid '90s, that changed everything. The disease became so much more manageable and it became unusual to have an AIDS-related death."

— WAYNE SHANDERA, M.D.



Top: Charlene Flash, M.D., assistant medical director of HIV services for Harris Health System and assistant professor at Baylor College of Medicine. Below: Wayne Shandera, M.D., infectious disease specialist at Thomas Street Health Center/Ben Taub Hospital and assistant professor of internal medicine and infectious disease at Baylor College of Medicine.

“... HIV/AIDS has gone from being a death sentence to a chronic manageable disease. We can give our patients legitimate hope to live for decades after their diagnosis. Some of the patients I had when I first started here 20 years ago are still here and we have watched each other grow old.”

— THOMAS GIORDANO, M.D.
Medical director of Thomas Street Health Center

Because of the three-drug cocktail, the virus became something more than manageable. It became undetectable.

“People who are first infected have over a million copies of virus in each milliliter of blood,” Flash explained. “Once they get on medication, that number comes down. The lowest amount that our machines can measure is less than 20 copies and once it gets to 20 copies, we call that undetectable. With older medicine it would take about six months to get there, three months with newer medicine. That doesn’t mean that the person is cured, but it does mean that in their plasma there is no circulating virus.”

Watching each other grow old

Although Thomas Street Health Center has shifted its focus to preventative care to reduce the rates of new HIV/AIDS cases, the threat of infection remains.

“Even though we do really powerful work in taking care of people with HIV/AIDS through testing, there are some people who despite the counseling that is given, you just feel as though eventually they are going to get infected,” Flash said. “Before, you felt like there was nothing you could do. You were just waiting for them to get infected so you could take care of them and put them on medication, but now there is something you can do.”

Today, the center offers a complete health care home to 6,000 Houstonians currently living with HIV/AIDS. Those services include primary care, oncology, endocrinology, pain management, dermatology, rheumatology, women’s health, adolescent health, ENT, neurology, treatment and management of hepatitis C, pharmaceutical services, physical therapy, psychiatry and counseling services.

“We have 20 clinics within Thomas Street that



offer all of the specialty care that a patient will need,” Malone said. “Our doctors are excellent and we have both medical schools, UT Health and Baylor, which is unique; we are lucky to have both of them here for our patients.”

The center also spearheads research initiatives to provide the most effective and efficient care.

“HIV/AIDS has gone from being a death sentence to a chronic manageable disease,” Giordano said. “We can give our patients legitimate hope to live for decades after their diagnosis. Some of the patients I had when I first started here 20 years ago are still here and we have watched each other grow old.” ■

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An electron micrograph of the measles virus, showing several spherical virus particles. Each particle has a dark red, dense core (nucleocapsid) surrounded by a lighter, fuzzy purple and green outer layer (envelope). The background is a light green, grainy texture.

BRACING FOR MEASLES

Is Texas poised for an outbreak?

BY SHEA CONNELLY

An electron micrograph of the measles virus.

Credit: Gopal Murti — MedicalImages.com

The spots started on the back of his neck. Ariel Loop's 4-month-old son, Mobius, was battling his first illness. His fever was 102 when Loop noticed the telltale rash—flat red spots that started on his head and gradually spread throughout his body.

"I thought I was crazy. There's no way," Loop said, laughing incredulously. Even two years later, the experience is surreal. Loop, a nurse, knew some of the signs of the measles, but they didn't spend much time studying it in nursing school, she said. Who expects to see cases of an eliminated disease, let alone in their own child?

The Loops had taken their son to Disneyland a couple of weeks earlier, in mid-January 2015. Living in Pasadena, California, Disneyland was a regular destination. Ariel and Christopher Loop were married there. It's where they announced they were expecting Mobius, and it was only a matter of time until they visited the park as a family.

As the spots spread and the fever wouldn't break, reality sank in: Mobius had caught the measles at Disneyland. Knowing how contagious the disease is, the couple called ahead to warn the emergency department of their local hospital. They were ushered through a back door and whisked into a negative pressure room where their infant was treated by doctors and nurses in protective gear—medical experts who had never seen measles in person.

The hospital did bloodwork, warned them of complications and sent them home under quarantine. Four days later, the test came back positive for measles.

One of the most contagious diseases

Distill the threat of measles down to its quantitative essence and you're left with a number between 12 and 18. That's its R_0 , or basic reproduction number. On average, one person with the measles will infect 12 to 18 others. Each one of those people infects a dozen or more, and each one of them infects another dozen. That's how an epidemic begins. One cough or sneeze sends the measles virus airborne. There, it can linger, able to infect for up to two hours. The R_0 of influenza? Two to three. The R_0 of SARS, the respiratory illness that in 2003 infected more than 8,000 people worldwide? Two to five.

Measles is one of the most contagious of all infectious diseases, but the development of a vaccine in the 1960s led to dramatically decreased rates of infection. It was officially



The Loop family at Disneyland.

declared eliminated in the United States in 2000. In the years since, however, misinformation about the safety of vaccines has caused immunization rates to reach dangerous lows in a number of places throughout the country, including some areas in Texas. A recent outbreak among unvaccinated people in Minnesota has public health experts wondering—could Texas be next?

"We've got about 50,000 kids whose parents have opted them out of getting vaccinated for non-medical reasons, and this has accelerated precipitously," said Peter Hotez, M.D., Ph.D., dean of the National School of Tropical Medicine at Baylor College of Medicine and president of the Sabin Vaccine Institute and Texas Children's Hospital Center for Vaccine Development.

Non-medical reasons to forgo vaccinations—known as conscientious exemptions—are often based on religious or philosophical beliefs.

The key to preventing measles from spreading is "more than 95 percent immunity through a two-dose vaccination regimen," the World Health Organization says. In the 2015-16 school year, 97.6 percent of Texas kindergarteners had received both doses of the measles, mumps and rubella vaccine (MMR), according to the Texas Department of State Health Services. While this is above the recommended rate, the number of exemptions still poses a threat, because unvaccinated children are not spread evenly throughout the state.

"They tend to be concentrated more in the Travis County, Austin area and around Denton, Texas," Hotez said. "I think that's where we're going to start seeing measles outbreaks."

When more people are immune to a disease through vaccination, it's more difficult for the disease to spread. High vaccination rates protect those who can't be vaccinated for health reasons, a concept called herd immunity. Low vaccination rates threaten herd immunity and put vulnerable communities—children too young to be vaccinated, individuals with compromised immune systems, people who are severely allergic to certain vaccines—at risk. (continued)

“We’ve got about 50,000 kids whose parents have opted them out of getting vaccinated for non-medical reasons, and this has accelerated precipitously.”

— PETER HOTEZ, M.D.

Dean of the National School of Tropical Medicine at Baylor College of Medicine and president of the Sabin Vaccine Institute and Texas Children's Hospital Center for Vaccine Development

"It's a global world, and higher immunization rates are safeguards to keep us from being susceptible to these diseases," said Brian Reed, M.D., director of disease control and clinical prevention at Harris County Public Health and Environmental Services. "Parents may be thinking they're doing the right thing for their child, but they're inadvertently harming the community."

The consequences of reducing herd immunity can currently be seen in action in Minnesota, where a measles outbreak has been spreading since April.

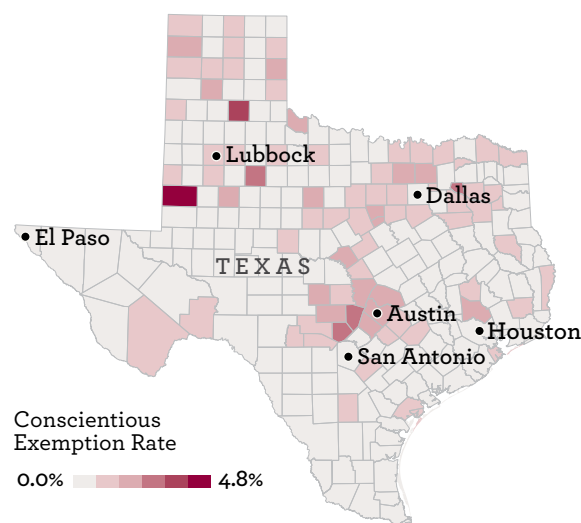
Minnesota-Austin connection

Like all epidemics, the Minnesota measles outbreak started out small. In early April, Hennepin County reported three cases of the disease. Two months later, that number has grown to about 70—the worst outbreak the state has seen in 30 years. Like Texas, Minnesota's vaccination rates are over 90 percent. The current outbreak can be traced to a Somali immigrant community in Minneapolis, where the vaccination rate in 2014 was reported to be 42 percent—a significant decrease since 2008, when the same community had some of the highest vaccination rates for two-year-olds in the state.

This swift decline is a result of targeting by anti-vaccine advocates. Most notable: Andrew Wakefield, the British doctor who rocked the medical community with his 1998 paper, published in *The Lancet*, claiming a link between autism and the MMR vaccine.

In 2010, the U.K. barred Wakefield from practicing medicine and *The Lancet* formally retracted his paper, but the

CONSCIENTIOUS VACCINE* EXEMPTIONS IN TEXAS, BY COUNTY



Source: Texas Department of State Health Services, 2015-16 Annual Report of Immunization Status. Includes data reported by independent school districts and accredited private schools.

* Includes DTaP, Hepatitis A and B, MMR II, Polio, Varicella 2

damage had been done. Despite numerous studies debunking the link between autism and vaccines, the myth persists. Wakefield continues to campaign against vaccines and parents continue to listen. In 2008, he visited the Somali-American community in Minneapolis and vaccination rates have been decreasing ever since.

MEASLES VACCINE: A HISTORY



1954

THOMAS PEEBLES, M.D., isolates measles virus in the lab of John Enders, Ph.D., at Boston Children's Hospital, using the blood of an infected 13-year-old boy. That isolated virus was used to create a series of vaccines.

Just three years earlier, measles erupted in southern Greenland for the first time. Only five people out of 4,262 did not contract the disease.

1958

SAM KATZ, M.D., working in conjunction with Peebles at Boston Children's Hospital, tests the first measles vaccine on 11 children.

JOHN ENDERS, PH.D., and colleagues license the first measles vaccine in the United States.



1963



1968

MERCK begins distributing an improved vaccine, the only measles vaccine used in the U.S. since it was licensed.



When questioned by The Washington Post regarding the recent outbreak, Wakefield said he was simply providing information about vaccines and autism.

“The Somalis had decided themselves they were particularly concerned. I was responding to that,” he said. “I don’t feel responsible at all.”

So, what does an outbreak in Minnesota have to do with Texas? Although Wakefield travels the country promoting his anti-vaccine agenda, he lives in Austin. He speaks at anti-vaccine rallies on the steps of the state capitol building, and he holds screenings of his film, *Vaxxed: From Cover-Up to Catastrophe*, throughout the state. Meanwhile, non-medical vaccine exemptions have increased since 2003, when the state enacted some of the loosest vaccine exemption laws in the country. At least one private school in Austin has an exemption rate of more than 40 percent.

“In 2003, we had less than 5,000. In 2016 we had 45,000 to 50,000 exemptions,” said Richard Lyn-Cook, M.D., medical director of Harris Health School-Based Clinics and assistant professor at Baylor College of Medicine. “It just takes one person to come in contact with a traveler who was not vaccinated and can spread it to a child less than one, the most vulnerable population.”

A common refrain among vaccine critics is that the measles is not dangerous. Robert “Dr. Bob” Sears, M.D., a California pediatrician and high-profile proponent of “alternative” vaccine schedules, wrote in a Facebook post: “Ask any grandma or grandpa (well, older ones anyway), and they’ll say, ‘Measles? So what? We all had it. It’s like chicken pox.’”

“About 50,000 were hospitalized per year before the vaccine. It was unbelievably dangerous to our population, and if we were hospitalizing 50,000 kids a year for a different disease it would be a national disaster.”

— RICHARD LYN-COOK, M.D.

Medical director of Harris Health School-Based Clinics and assistant professor at Baylor College of Medicine

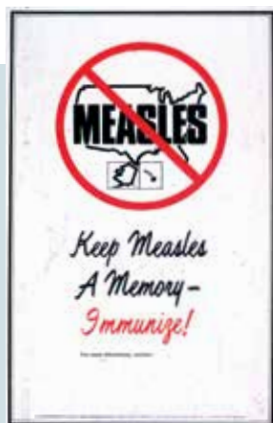
Lyn-Cook has a different take.

“About 50,000 were hospitalized per year before the vaccine,” he said. “It was unbelievably dangerous to our population, and if we were hospitalizing 50,000 kids a year for a different disease it would be a national disaster.”

Internationally, 2017 has been a bad year for measles. In Europe, the largest outbreaks have occurred in Romania and Italy. According to the European Centre for Disease Prevention and Control, most immunization rates in affected areas have fallen below the 95 percent threshold, due to skepticism about the vaccine and adults being ill-informed about how susceptible they are to the disease. Some locations have extenuating circumstances. In Guinea, where a full-scale epidemic is raging, vaccinations dropped during the 2014-2015 Ebola epidemic, according to Doctors Without Borders. Vaccination activities were suspended due to the risk of infection. (continued)

Merck licenses a measles, mumps, rubella (MMR) COMBINATION VACCINE. Rubella is also known as German measles, though it’s not as infectious or, generally, as serious as the measles.

In the decade after the MMR vaccine is licensed, MEASLES CASES DROP DRAMATICALLY.



Andrew Wakefield publishes his paper in *The Lancet* CLAIMING A CONNECTION BETWEEN THE MMR VACCINE AND AUTISM. The paper was later retracted and Wakefield was banned from practicing medicine in the U.K.

ENDEMIC MEASLES DECLARED ELIMINATED IN THE U.S.

1971

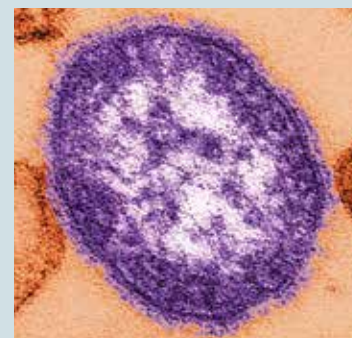
1981

1989

1998

2000

LOW VACCINATION RATES lead to a resurgence of measles cases.



Credit: Egg photo: World Health Organization, John Enders portrait: Harvard University, Measles must go van: CDC, Measles virus particle: CDC/Cynthia S. Goldsmith; William Bellini, Ph.D., College of Physicians of Philadelphia, timeline and photos



A 1-year-old boy receives the measles vaccine at the Aldine Community WIC.

Symptoms

The most common symptoms of measles are a high fever, cough and runny nose. Three to five days later, a rash breaks out, starting on the face and head and spreading downward. Fever can spike to over 104 degrees.

Children under five and adults over 20 are most likely to experience complications from measles. One in every 10 children will develop an ear infection, which can result in permanent hearing loss. One in every 20 children will develop pneumonia, the most common cause of death from measles. One in 1,000 will experience encephalitis, brain swelling that can leave a child with lifelong disabilities.

The most serious complication is subacute sclerosing panencephalitis (SSPE), a progressive, deadly brain disorder. SSPE takes seven to 10 years to develop after contracting measles. Throughout those years, the person may seem fully recovered, until symptoms like forgetfulness, unusually poor school performance and sudden personality changes appear. It is most common in children who contracted measles under the age of 2.

While SSPE is rare, recent studies have shown it is not as rare as once thought. Original estimates had it affecting 1 in 100,000. A study of cases stemming from a major measles outbreak in California in the late 1980s indicates 1 in 1,400 children under five and 1 in 600 infants under age 1 later developed SSPE.

“Measles is a killer infection, and the ones that are the most vulnerable are infants below the age of 1 who are not eligible to receive the vaccine,” Hotez said. “Those are the ones who are going to get sick, and those are the ones who could die.”

Ariel Loop’s son, Mobius, recovered from his bout with measles. Today, he is a happy toddler who is developing

normally. But Loop still worries about SSPE.

“I have to worry about that for such a long time,” Loop said. “I know it’s a pretty rare complication, but it’s hard not to think about that sometimes, that he could drop dead out of nowhere in the next 10 years.”

After Mobius recovered, Loop had a new mission: lobbying California state lawmakers to require all schoolchildren to be vaccinated barring any medical issues. She testified before California legislators, and Senate Bill 277 was signed into law June 30, 2015. Within two years, the measles vaccination rate among the state’s kindergarteners had risen from a dangerously low 92.6 percent in 2014 to 97.3 percent in 2016.

“It’s the silver lining,” Loop said. “Ultimately, the goal is to prevent other children from having to go through this. I’m glad that something positive has been able to come from it.”

Texas lawmakers debate vaccines

Watching the vaccination rates rise in California has medical professionals in Texas thinking state lawmakers should follow suit.

“We need to close all non-medical exemptions,” Hotez said. “The California legislature woke up and said, ‘Enough is enough.’ The Texas legislature needs to do the same.”

Vaccines have been a hot topic in the state capitol in 2017. House Bill 1124 proposed granting parents the ease of filing for an exemption online. It was an alarming step in the wrong direction for health experts.

“Well-meaning people are introducing measures for more freedom for exemptions,” Lyn-Cook said. “That may work for some things but it doesn’t work for vaccination. That’s like saying it’s optional for you to wear a seatbelt.”

Lindy McGee, M.D., a Texas Children’s Hospital physician and assistant professor at Baylor College of Medicine, is co-chair of the physician advisory board of The Immunization Partnership. As part of the organization’s goal “to eradicate vaccine-preventable diseases by ... advocating for evidence-based public policy,” McGee testified against HB 1124 in front of the House Committee on Public Health.

“Plenty of data from other states show that anything you do to allow exemptions to be easier increases the rate of unvaccinated children,” McGee said. “We are extremely concerned about any legislation that would make it easier to get an exemption.”

During the meeting, she was grilled by committee member Rep. Bill Zedler, who claimed more people have died

“It’s a global world, and higher immunization rates are safeguards to keep us from being susceptible to these diseases. Parents may be thinking they’re doing the right thing for their child, but they’re inadvertently harming the community.”

— BRIAN REED, M.D.

Director of disease control and clinical prevention at Harris County Public Health and Environmental Services

from the measles vaccination than from the measles. Zedler reached this conclusion by comparing data about vaccine injuries from the Vaccine Adverse Event Reporting System (VAERS) to CDC data about measles deaths.

The problem? Anyone can report an “adverse event” to the VAERS database, which is run by the CDC and the Food and Drug Administration. On the VAERS website, the CDC notes: “studies help determine if a vaccine really caused an adverse event. Just because an adverse event happened after a person received a vaccine does not mean the vaccine caused the adverse event.” In other words, correlation does not equal causation.

“I could break my arm the next day and I can report that to that reporting system,” McGee explained to Zedler. “It’s not necessarily due to the vaccine.”

Zedler responded, “For you to get up and tell this committee in essence they can put anything down there they want is quite dishonest.”

McGee said she sent documentation the next day that supported everything she said in her testimony.

“It’s frustrating to go to the legislature to argue facts,” she said. “I am always happy to answer a parent’s legitimate concerns about vaccines. My frustration is with people on the public health committee who are supposed to be protecting public health.”

The Immunization Partnership also lobbied for House Bill 2249, known as the “parents’ right to know” bill. This bill would have required the state to report vaccination exemption data at the individual school level rather than the school district level.



Peter Hotez, M.D., Ph.D.

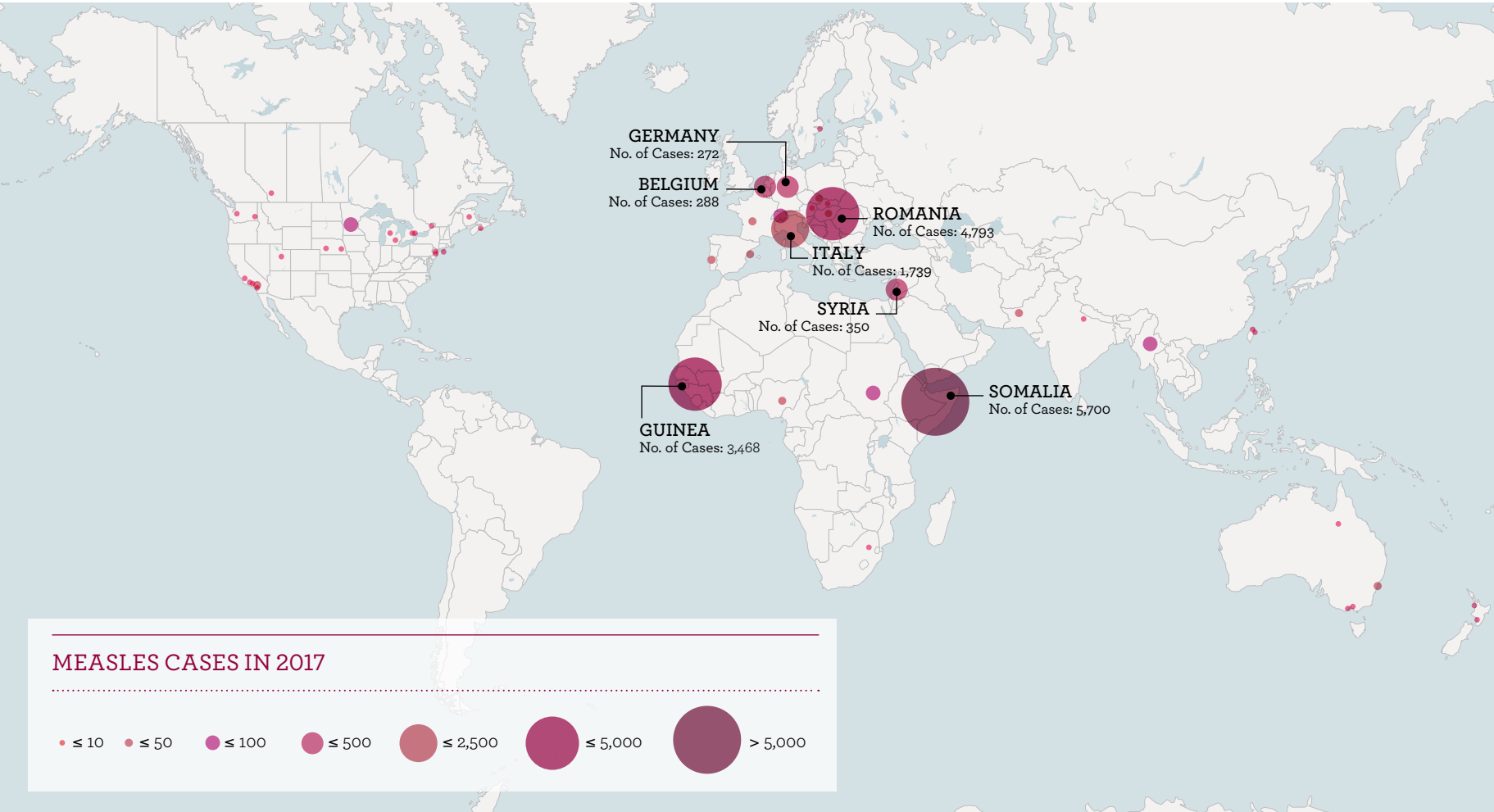
“We want parents to know how their school is doing in terms of vaccine coverage so they can make an informed choice,” Hotez said. “If they see vaccine coverage is very low at their school, they can decide, ‘This school isn’t safe for my child.’”

McGee noted that in addition to helping parents make informed school choices, House Bill 2249 “would help us as vaccine educators to know which schools to target and figure out what’s going on if the rates are low.”

But the bill died in the House on May 11.

Protecting Harris County

Lack of legislative action regarding vaccines is challenging for the medical and public health experts who know all too well what will happen if the anti-vaccine movement gains more traction. (continued)



Credit: Courtesy photo

Source: Council on Foreign Relations

“We need our elected leaders to talk about the importance of vaccinating and why there’s no link between vaccines and autism,” Hotez said. “We don’t really hear from the Office of the Surgeon General. We don’t hear from the White House.”

While vaccine-related bills stall in the state legislature, medical and public health professionals in Houston do what they can to protect the community. Organizations like Harris Health System, Texas Children’s Hospital and Harris County Public Health and Environmental Services (HCPHES) maintain mobile health clinics to provide vaccinations at schools, community and WIC centers, and other locations throughout the county.

HCPHES officials also discuss what actions they would take in the event of a measles outbreak in Harris County.

“We would have additional resources to provide immunizations to people who have had contact with someone who

has active measles and those at higher risk,” Reed said. The high-risk group includes pregnant women, immunocompromised individuals and young children.

A measles vaccine may still prevent the disease after an unvaccinated person has been exposed to it, if the vaccine is given within 72 hours, Reed explained. Immune globulin, a blood product containing antibodies that the county would also offer to vulnerable citizens, can lessen the severity of the disease if given within six days of exposure.

In terms of advocacy and awareness, groups like The Immunization Partnership campaign for legislation to promote vaccination and work to educate and encourage parents.

“We offer webinars and toolkits on increasing immunization rates and also work with school nurses,” McGee said. “A grassroots parents campaign is working to counteract anti-vaccine groups in the state and raise awareness.”

While medical professionals do what they can to provide vaccine access, education and resources, there are still parents they can’t reach. The ones convinced through their internet research that vaccines are dangerous. The ones who trust Andrew Wakefield over licensed pediatricians. Like all parents, they want what is best for their children. After seeing measles infect her child, Ariel Loop has some advice for them.

“Trust people who have spent their lives focusing on this,” she said. “As helpful as Google can be, it’s not the same thing as going to school for a decade. Find people who are experts, and trust science. It’s science—it’s not an opinion.” ■

“We need our elected leaders to talk about the importance of vaccinating and why there’s no link between vaccines and autism. We don’t really hear from the Office of the Surgeon General. We don’t hear from the White House.”

— PETER HOTEZ, M.D., PH.D.

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My Favorite Patient Died Because She Had a Pre-Existing Condition

BY ARTHUR GARSON JR., M.D., M.P.H.

My favorite patient was born with the same congenital heart condition as Jimmy Kimmel's son and had exactly the outcome that Kimmel predicted.

My first night as a pediatric cardiology trainee, I helped care for a 5-year-old who had just had surgery for her heart problem, Tetralogy of Fallot with pulmonary atresia. She had been a blue baby; because of her heart condition, blood had trouble flowing to her lungs to pick up oxygen for her body. Her heart stopped three times, and three times I went to tell her parents and grandparents that I did not think she would make it. But she did—and we all bonded.

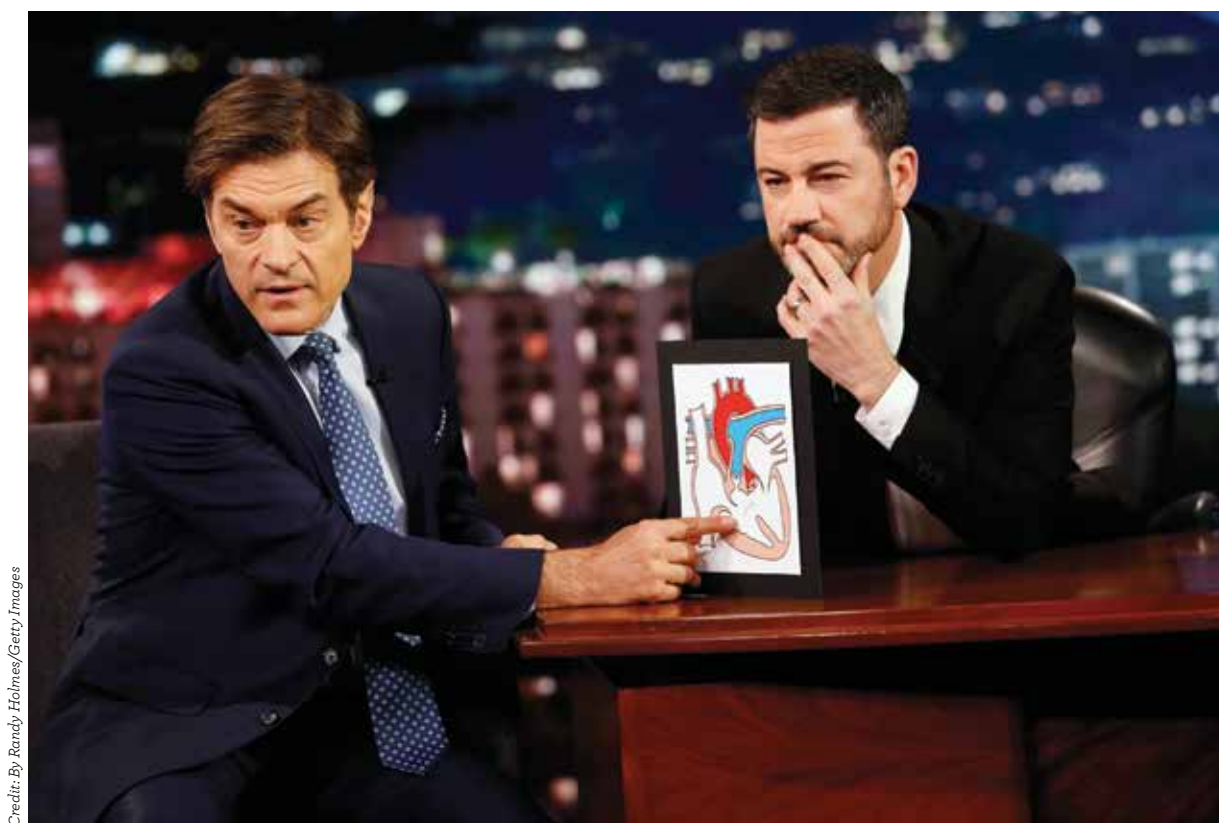
I went to her graduation ceremonies from grammar school and high school. She became a wonderful young adult with a phenomenal sense of humor. She was not able to do physical work, but was capable of desk jobs. Although she developed a dangerous irregular heartbeat, we were able to control it with medication. Her parents had few resources, yet she was covered by Medicaid.

But six months to the day after her 19th birthday, her mother called barely able to speak: They had found her dead in bed. They did some checking and she had not refilled a prescription for her medication—after her Medicaid ran out—six months previously. She had a pre-existing condition that no one in her small town would cover, and there were no large employers. This experience devastated all of us and made me go back and get a degree in public health, with the goal of helping the uninsured.

This was the situation 27 years ago.

For the past seven years, however, the Affordable Care Act (ACA)—also known as Obamacare—covered pre-existing conditions. Although the ACA surely has its failings and needs major surgery, many people with pre-existing conditions got access to health care. Prior to that, between 2007 and 2009, a Congressional investigation of the four largest insurance companies found that 651,000 people were denied coverage—one of every seven who applied—because of pre-existing conditions. All perfectly legal. The pre-existing condition exclusion was the only “stimulus” to have healthy people buy insurance. And it worked. While this was a horrendous provision, it was effective: healthy people did buy insurance.

The American Health Care Act (AHCA) that passed the House of Representatives in early May allows each state to apply to the federal government to permit pre-existing condition exclusions, as long



Jimmy Kimmel, right, host of Jimmy Kimmel Live on ABC, listens as Dr. Mehmet Oz explains the heart condition affecting Kimmel's infant son, Billy. Tetralogy of Fallot with pulmonary atresia is a condition that includes a malformed pulmonary valve and a hole in the tissue between the lower chambers of the heart.

as they do one of the following: “reduce average premiums for health insurance coverage in the State; increase enrollment in health insurance coverage; increase the choice of health plans in the State.”

Imagine how easy it will be for the state to add just one health plan and meet the criteria, thus allowing pre-existing exclusions. The bill also requires that states that allow pre-existing exclusions have in place ways to help people with pre-existing conditions, such as high-risk pools allowing people with high medical expenses to be paid for separately.

Texas has a high-risk pool, but only 2.6 percent of eligible people actually participate. Why? The rates are higher than current insurance rates, which people can't afford to begin with, and the pre-existing condition exclusion requires the ill person wait a year before coverage.

No wonder people don't sign up for high-risk pools.

A number of U.S. members of Congress from both sides of the aisle have said after the passage of the bill in the House, which is projected to add 23 million

people to the ranks of the uninsured, they expect the Senate to fix everything. This is similar to the House jumping out of a plane without a parachute and expecting the Senate to rescue it and guide the both of them to safety.

I surely hope the Senate has a strong parachute. My patient would have been alive under the Affordable Care Act and dead with the recent legislation. ■

Arthur “Tim” Garson Jr., M.D., M.P.H., is director of the Texas Medical Center’s Health Policy Institute.



Headaches You Can Set Your Clock To

Researchers are studying the circadian rhythms of cluster headaches

BY CHRISTINE HALL

Most people have heard of migraines. But there is a lesser-known type of headache—a cluster headache—that is often referred to as a “suicide headache” because the pain is so intense that patients have taken their own lives to escape it.

The pain from a cluster headache is worse than childbirth, patients say. Worse than kidney stones. More like getting shot in the head or being jabbed in the eye by a sharp object.

This is where Mark Burish comes in. A neurologist and Ph.D., Burish is director of the Will Erwin Headache Research Center, part of the Memorial Hermann Mischer Neuroscience Institute at the Texas Medical Center and The University of Texas Health Science Center at Houston.

Burish and his team of neurologists, nurses, scientists and industry start-ups hope to demystify and find new treatments for cluster headaches and migraines at the center, which gets its name from a man who suffered from cluster headaches and ended his life when he was unable to find relief.

Some 47 percent of adults suffer from some type of headache disorder. Migraines can vary from person to person and tend to incorporate pulsing pain, nausea,

vomiting and sensitivity to light. They can last from two to 72 hours.

By contrast, cluster headaches, which occur in clusters, or patterns, tend to follow certain rules, Burish says. Typically, an intense pain is felt on one half of the face, and some features of the headache can be outwardly apparent. On the painful side of the face, the eye may be droopy, bloodshot, swollen and watery—to the point where the patient may go through an entire box of tissues.

“Patients also get agitated and restless and may rock back and forth,” Burish said. “That is different from a migraine, where the person wants to lie still in a dark room.”

“The time of day and time of week matters. Some patients are so worried about when the next headache will occur that they actually trigger a headache.”

— CORY KENNEDY

Co-founder and CEO of SensorRx

Same time every year

Cluster headaches have been around for centuries, but only properly diagnosed over the past 20 years. In part, that’s because very little research has been done on them. Between 1997 and 2007, the National Institutes of Health funded just two cluster headache studies.

One of the newer pieces of Burish’s research relates to the timing and circadian rhythm of cluster headaches.

They tend to last three hours or less, Burish said, and might happen many times per day. In addition,

most people with cluster headaches get them the same time every year.

“A lot of them can say something like, ‘On Jan. 1 at 11 a.m., I will get a headache, and it will go on like that for about a month,’” he said. “They go away and come back the next January. You can set your watch to it.”

Diagnosing cluster headaches is tricky because doctors often take into account the time of year, the runny nose and the watery eye and assume a patient is suffering from a sinus infection, Burish said. Doctors may also prescribe steroids and antibiotics that tend to alleviate cluster headaches for short periods.

Burish’s team intends to build a laboratory model of a cluster headache to study its patterns.

Treatments for cluster headaches include oxygen, certain types of blood pressure and seizure medications, and, more recently, electrical stimulation of nerves in the head and neck, Burish said. In addition, there is a drug for migraine and cluster headaches in clinical trials that blocks the activity of a molecule called calcitonin gene-related peptide.

In April, a new non-invasive device to treat headaches called gammaCore was approved by the U.S. Food and Drug Administration.

Mark Burish, M.D., Ph.D., a neurologist and director of the Will Erwin Headache Research Center, demonstrates one of the tools he uses when examining patients with cluster headaches.



The device stimulates the vagus nerve—a large nerve in the neck—which may help patients who want to avoid surgery or some of the side effects caused by medications.

Burish would like to do more research on circadian rhythms and cluster headaches, but says it could take five years to collect samples that will help his team. And because cluster headaches are somewhat uncommon, affecting 1 in 1,000 people, gathering data and funding research is challenging.

Long-term data on migraines and cluster headaches

Burish is interested in the kind of data Cory Kennedy, co-founder and CEO of SensorRx, is collecting. The startup, part of the current digital health class at the TMCx accelerator program, is developing an automated migraine management tool—an app—called MigrnX.

Some of the data collected comes from Keely Towne, a patient who was testing MigrnX as part of a clinical trial SensorRx did with Carolinas HealthCare System.

Towne's migraines began more than 20 years ago around the age of 12. Nausea and a sharp, throbbing pain in her head forced her to miss work and family activities on a regular basis. Only on the days she was able to take medication could she control her headaches.

Towne tried several treatments and has found Botox injections to work best, in addition to anti-inflammatory medication.

"This has brought the frequency of my migraines down tremendously," Towne said.

The app, which she downloaded to her phone, helps her track her progress and identify trends in her migraines.

Towne has some hormonal migraines that she can target around the time of her menstrual cycle, but her main headaches occur with drastic weather changes.

"It is nice to be able to glance at my month and see where any trouble spots may occur," Towne said. "And then I am able to share the information with my doctor in order for us to make a plan to continue preventing more migraines."

The clinical trial of MigrnX found that more than 60 percent of patients were not receiving appropriate care for their headaches, Kennedy said. In addition, patients had been under- or over-reporting the frequency of headaches to their doctor, a critical threshold in determining treatment.

There are 50 possible triggers for migraines, Kennedy said, and doctors rely on patients to provide that information.

He hopes the long-term data on the circadian nature of headaches will help in devising new treatments. For example, data shows that many people wake up with migraines, so doctors are trying to determine if treatments of melatonin could help put the sleep cycle back in line.

Kennedy thinks this sort of data could be relevant for Burish's research on cluster headaches.

"The time of day and time of week matters," Kennedy said. "Some patients are so worried about when the next headache will occur that they actually trigger a headache. We don't want patients to have to think, but put it all down in the app." ■



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Under Pressure

Alleviant Medical's transcatheter device treats heart failure

BY CHRISTINE HALL

Cutting a hole in the heart to treat congestive heart failure may sound counterintuitive, but a Texas Medical Center (TMC) startup company hopes to do just that.

Alleviant Medical is developing a transcatheter device to treat diastolic heart failure, which occurs when one or both of the ventricles do not fill up properly with blood and are unable to pump enough blood to the rest of the body.

The device will enter the body near the groin, travel through the body via the femoral vein, and then gain access

to the heart. At that point, an expandable blade will cut a hole in the wall separating the left and right atria. The blade and tissue will be pulled back into the device, which will then be removed. This hole will help blood flow from the left chamber to the right chamber of the heart.

Over the past 20 years or so, medical devices, treatments and drugs have helped people with heart disease, but there are few options for people suffering from heart failure, said Jacob Kriegel, M.D., co-founder and CEO of Alleviant Medical.



From left, Alex Arevalos, Ph.D., Avni Patel, M.E., and Jacob Kriegel, M.D., co-founders of Alleviant Medical, demonstrate their device, which cuts a hole in the wall separating the left and right atria to alleviate a build-up of pressure in the heart.

"It's a very morbid condition, so it rose to the top of the list as an important unmet need," Kriegel said.

Kriegel and his colleagues, Alex Arevalos, Ph.D., Albertien Greijdanus, MSc, and Avni Patel, M.E., examined several hundred unmet needs as part of TMC Biodesign, a one-year fellowship program that gathers people with diverse backgrounds to solve health care problems via medical devices or digital products.

"As a cardiac surgery trainee, I had seen hundreds of heart failure patients, but for me, it took sitting down with engineers to see the problem through new eyes," Kriegel said. "Our perspectives merged with market opportunity."

Kriegel and his colleagues understand that creating a hole in the heart comes with risk. But if the hole is precisely sized, it can distribute the correct amount of pressure from the left atrial to the right atrial without dramatically increasing the right-sided pressure—a therapeutic benefit while minimizing risk. The hole will allow blood to flow naturally from the left chamber to the right chamber, lowering the pressure on the left and slightly increasing the pressure on the right, where it is already low, Kriegel said.

With every heartbeat, it is expected that 30 percent of the blood in the left atrium will transfer into the right atrium, and the remaining 70 percent will get pumped forward along its natural pathway into the left ventricle and out to the body, he added. The blood that gets sent into the right atrium will travel to the lungs and then continue along through the normal circulation.

A hole may drastically improve quality of life for older patients, keeping them independent and out of the hospital. "The hole we create will be the least of their problems, and we believe it will alleviate their symptoms," Kriegel said.

Current treatments for heart failure include a diuretic, or water pill, but that medication has side effects that include kidney failure. Other treatment options include inserting a stent—an expandable mesh tube, usually made of stainless steel—to create a passageway between the left and right atria that allows blood to flow more freely. But all implantable devices come with the risk of blood clots—which can grow around the device—and stroke.

Alleviant Medical's device packs the severed tissue down inside the device and removes it safely from the body. That's important, because any particle or foreign material left can flow into the brain and cause a stroke, Kriegel said.

Though the company is less than a year old, it has gained traction in the business plan competition circuit. Already, Alleviant Medical has won challenges at Rice University and the University of Massachusetts. The team plans to continue at the Texas Medical Center, joining the upcoming TMCx medical device accelerator.

"These competitions have been good learning experiences for us because we have received validation on our device," Kriegel said. "We've been able to see where our risks are, where we have proven the technology and what people are concerned about. Overall, we hear good things, and that people are looking for a new solution to the problem." ■

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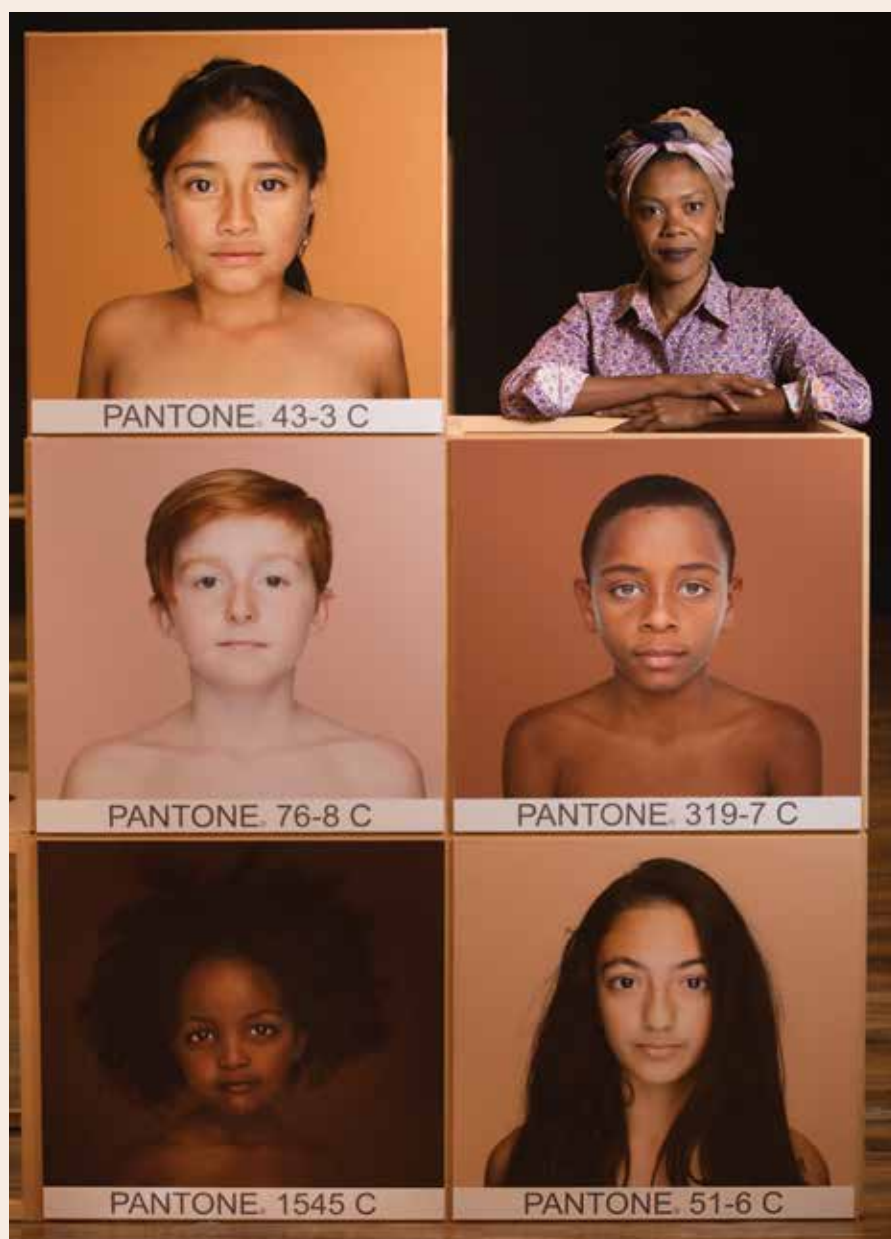
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CURATED

The Intersection of ARTS and MEDICINE

By Britni N. Riley



Top: A visitor contemplates *Humanae* (work in progress) at The Health Museum.

Bottom: Angélica Dass, upper right, poses with part of her exhibit.

Brazilian photographer Angélica Dass has been fascinated by color her entire life.

Born into a multiracial family, Dass sees herself and her relatives not in black and white, but in shades of chocolate, cinnamon and vanilla.

"I remember when I was younger there was this skin-colored crayon—flesh-colored—that, of course, was not mine," Dass said. "I have this brown skin and curly hair and, of course, I am black. But I'm also proud to be white, to be native Brazilian. Inside my home, things look equal. But outside, it seems that this color brown has a lot of tags and stereotypes, and I was treated in a different way because of the color of my skin."

Inspired by her longing to understand the social implications of race and color, Dass began a photography project, *Humanae* (work in progress), now on display at The Health Museum. The exhibit is made up of portraits of individuals from around the world, each labeled with the number from Pantone's industrial color palette that corresponds to the subject's skin tone.

"I really believe that, linguistically, we are using this separation of colors exactly to separate people," Dass said. "I want to celebrate this colorful world, all of the differences, and to embrace it."

In the beginning, Dass took photographs to explore the diversity of color in her own family, but that quickly grew to photographing men, women and children of all races and ethnicities from 17 countries. *Humanae* has garnered international acclaim.

"The most important things in my photos are exactly what you can see," Dass said. "You can't see the nationality, you can't see who is the poor and the rich, the refugees. You don't know who has disabilities."

Using her Canon EOS 5D Mark II, Dass shoots against a white backdrop. She then takes a color sample from the subject's nose and finds Pantone's corresponding color, which she uses as the background for the photo.

“The most important things in my photos are exactly what you can see. You can't see the nationality, you can't see who is the poor and the rich, the refugees. You don't know who has disabilities.”

— ANGÉLICA DASS

Photographer and creator of *Humanae*

Although she has photographed close to 4,000 faces, the exhibit displays just 250, grouped together in a sort of oversized cubist jungle gym.

"I wanted to make this space kind of like a playground," Dass said, "because I want to have this talk with children. To change the mind of our youth to really make them feel connected with this idea that we are completely different, and we need to receive the same treatment—be equal and different at the same time."

Dass' popular 2016 TED Talk, "The Beauty of Human Skin in Every Color," will run in The Health Museum's theater for the duration of the exhibit.

"Houston is one of the most diverse cities in the country and we are looking into what diversity really means for Houston," said Melanie Johnson, Ed.D., president and CEO of The Health Museum. "There is only a .5 percent genetic difference in all of us, so it is important for us to speak about diversity on the surface—cultural differences and cultural commonalities. And that is exactly what *Humanae* does." ■

Humanae (work in progress) will be on display through Sept. 5 at The Health Museum, 1515 Hermann Drive. Information: 713-521-1515 or thehealthmuseum.org.



FIRST PROM

*Prom Party Palooza at
MD Anderson Cancer Center*

BY MAGGIE GALEHOUSE



Clockwise from top left: Roberto Borjas is fitted for a tuxedo at MD Anderson; Roberto waits for the elevator to Prom Party Palooza; Mauricio Cordova takes a prom selfie; Madisson Somero, center, and Brittini Lafolette laugh on the dance floor; Roberto poses for a photo with his brother, David.

Roberto Borjas had modest hopes for the second annual Prom Party Palooza, held at The University of Texas MD Anderson Cancer Center.

"I'm hoping that prom has some good food," said the soft-spoken Roberto, who wears glasses with fashionably thick frames and identifies as an "old-style type of gamer" who loves Donkey Kong.

Roberto, 13, is a sixth-grader who is being treated for acute lymphoblastic leukemia (ALL).

"Every kid looks forward to their prom, and part of the sadness for these kids is they have to miss out on school activities," said Thomas Nguyen, founder of Prom Party Palooza and chief marketing officer and partner at Houston's Peli Peli restaurant. "We want them to feel as comfortable as possible. They can bring siblings, best friends."

A few days before prom, Roberto and other attendees were fitted for tuxedos and gowns—donated by Al's Formal Wear, Stage Stores and others—at MD Anderson's The Pavilion.

Roberto was excited. It would be his first prom. He picked out a black tux with a hot pink bow tie and vest. Those pops of color promised to be bright spots in a dark year.

Super tired

In May 2016, Roberto was diagnosed with ALL, a blood cancer that occurs when abnormal white blood cells, known as lymphoblasts, accumulate in bone marrow and spread to other organs, inhibiting the production of normal cells. ALL makes up the largest percentage of leukemia diagnoses in children under 15.

"When someone tells you your son has cancer, you think it's the end of the tunnel," said Dunia Sandhu, Roberto's mother.

In the weeks leading up to his diagnosis, Roberto said he "started to feel tired. Super tired. Even when I woke up I was tired, light-headed and queasy."

Sandhu shook her head when she recalled how hard she'd been on her son during that time. At first, when doctors didn't think his symptoms amounted to anything serious, she had started to wonder: Was Roberto faking it? Was he saying he didn't want to go to karate because he was lazy?

Once, he threw up on the carpet in the middle of the night.

"I did?" Roberto interjected, as he listened to his mother tell the story.

"And I was angry about the vomit on the carpet," Sandhu said, wiping away tears.

Roberto is currently taking oral and intravenous chemotherapy, visiting MD Anderson for treatment once a week.

"Things that used to be fun for me were going outside, riding my bike, playing with my cousins, and karate," he explained. For now, though, most of his physical activities are suspended. His immune system is weak, thanks to the chemo, and doctors don't want him to catch a cold or the flu.



Roberto Borjas on the dance floor at Prom Party Palooza.

Roberto used to attend Paul Revere Middle School, but he is now homeschooled.

"He is a shy boy," his mother said.

"But I'm jolly," Roberto added. "I make my days happy. Look at the bright side and turn your frown upside down."

Prom prep

On prom night, Roberto wasn't feeling well. From 3 to 6 p.m., as other teens came to pick up their formal wear, his tux waited on a hanger.

But the place was buzzing, as families mingled in The Pavilion. Pageboy, a Houston-based app that lets customers call stylists to their homes, set up a special salon for prom-goers where Jessica Taylor, 12, got her makeup done. Diagnosed with Ewing's sarcoma two years ago, Jessica sported

a close-cropped hairstyle and a short dress, originally bought for her brother's wedding.

"She's here in honor of her friend, Ashley, who passed away in March," said Jessica's mother, Kelly Taylor. "That was her buddy."

Madisson Somero, 17, accessorized her white, strapless gown with a necklace from the Kendra Scott booth set up for prom, a black headband, false eyelashes and red high-top Chucks. At last year's prom, she was in the first stages of her leukemia diagnosis and didn't have much energy. This year, she said, she and her friend Brittini Lafollette—who wore white high-top Chucks with her prom dress—were ready to dance.

with food from several area restaurants.

"For a lot of the parents, it's the first time they're able to interact in a social setting with other parents going through the same thing," Nguyen said. "A lot of parents don't feel comfortable leaving their kids, so this is a great support system."

Meanwhile, Roberto got into an elevator with others bound for prom and headed up to the observation deck on the 24th floor.

Prom Party Palooza

A wave of nausea swept over Roberto on the elevator.

"I don't like taking chemo," he said.

When the elevator doors opened, he stepped onto a red carpet that led to the observatory, a room with tall windows on three sides and a panoramic view of Houston. J-Mac, a radio personality from 97.9 FM The Box, encouraged people to dance.

"Just move," he told the crowd. "If you can't move on the dance floor, move where you are. But you've got to move."

Roberto stood off to the side, at one point ducking into another room to grab an ice cream. He didn't know anyone, but he didn't seem to mind. Several people—other teens and volunteers—came up to talk with him.

Every prom has a life of the party. On this night, it was 14-year-old Mauricio Cordova, a ninth-grader who lives in Venezuela and comes to MD Anderson for leukemia treatments. Mauricio rocked a slouchy cap with his tux. He was the guy in the middle of the dance floor, surrounded by friends, mugging for a prom selfie.

Every prom also has someone who says little but sees all. On this night, that was Roberto. Leaning against a window, slowly eating his pink and blue ice cream pop, he took it all in. The swirling lights. The sequined tablecloths and pillows. The kids in wheelchairs, on crutches, standing and dancing in groups.

Since his diagnosis, Roberto has grown a little bolder, a little more outgoing. After several songs, and with a little encouragement, he strode onto the dance floor, flashing a smile so wide it looked like he was hosting his own party. ■

Sarah Whittaker, 21, who's been under treatment for lupus for nine years, showed off her new manicure as boyfriend Travis Guillory, also 21, pushed her wheelchair. Sarah wore a sky blue dress that matched her nails, and Travis wore a dress, as well—a tailored brown garment that fell just below the knee.

"There weren't any suits left," he explained. "So I decided I wanted to be a princess to make her smile."

Half an hour before prom was set to start, Roberto arrived with his mother, stepfather Rajinder Sandhu, and 5-year-old brother, David.

"I look good," said David, sporting a vest and tie.

After posing for photos, Roberto's family headed off to a special party for parents at The Park at MD Anderson,

Maternal Mortality in Texas

Unpacking the truth behind the state's spike in pregnancy-related deaths

BY ALEXANDRA BECKER

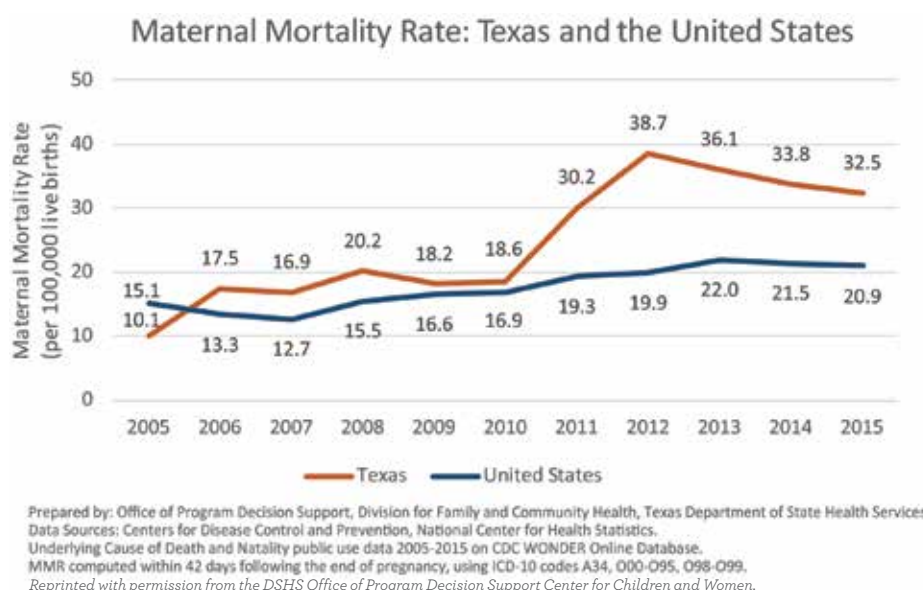
It's 8 a.m. on a Thursday, and Jammie (pronounced Jay-me) has just finished a prenatal checkup. She is 19 weeks and three days pregnant—with twins—and has been coming to The Center for Children and Women in Southwest Houston for her prenatal appointments. It's a unique clinic—part of Texas Children's Health Plan—designed to provide a full spectrum of health care under one roof. Without the center, Jammie isn't sure she'd be able to get all the services she needs, especially while carrying multiples. In Texas, that could mean the difference between life and death.

Worst in the nation

In 2016, the publication of two independent reports suggested that the maternal mortality rates in Texas had doubled within the past decade, ranking Texas the worst in the nation and on par with economically underdeveloped countries. The findings were shocking to investigators and the public alike, sparking a media frenzy that pointed to the state's severe anti-abortion legislation and reintroduced the phrase "everything's bigger in Texas."

But the reality is far more complex than any headline could suggest, and investigators are still analyzing data to truly understand the facts behind the numbers and, most importantly, how to reverse the trend.

Original research published in the September 2016 issue of the medical journal *Obstetrics & Gynecology* launched the first public outcry.



When examining maternal mortality trends in the U.S. between 2000 and 2014, a group of Maryland-based researchers found Texas to be an outlier. According to their data, Texas maternal mortality rates showed "a modest increase" from 2000 to 2010, from a rate of 17.7 in 2000 (calculated per 100,000 live births) to 18.6 in 2010. But after 2010, "the reported maternal mortality rate for Texas doubled within a two-year period to levels not seen in other U.S. states."

According to data collected by the Centers for Disease Control and Prevention (CDC) and the National Center for Health Statistics, the rate of maternal mortality in Texas jumped to 30.2 per 100,000 live births in 2011, then spiked to 38.7 in 2012 and remained above 30 through 2014—

a rate significantly higher than the CDC's annual national benchmarks over that same period, which ranged from 19.3 in 2011 to 21.5 in 2014.

That 2011 increase in Texas was the focus of the other major report, published prior to the *Obstetrics & Gynecology* research, by a state-appointed Maternal Mortality and Morbidity Task Force and the Department of State Health Services. Comprised of 15 Texas-based multidisciplinary experts and chaired by Lisa Hollier, M.D., professor of obstetrics & gynecology at Baylor College of Medicine and medical director at Texas Children's Health Plan, the task force used additional metrics to analyze the deaths between 2011 and 2012. In addition to finding an increase in reported deaths during those years, the task

force found racial disparity among the mothers dying in Texas. Black women were found to bear the greatest risk for maternal death, with a rate nearly three times higher than other women. In 2011 and 2012, black women were responsible for 11.4 percent of births in Texas, but they also claimed 28.8 percent of all maternal deaths. By comparison, white women accounted for generally equal proportions of total births and total maternal deaths, and Hispanic women and women of other ethnic and racial groups accounted for a lower proportion of total maternal deaths than total births.

Based on death certificates, the task force also determined that cardiac events, drug overdoses and hypertensive disorders like pre-eclampsia (formerly called toxemia) were the leading reasons for the maternal deaths recorded, and that the majority of the deaths didn't occur in the delivery room or shortly thereafter, but more than 42 days after delivery.

"These findings were informative and concerning," Hollier said. "They reinforce the need for detailed reviews of maternal deaths so that the problems can be understood and the right solutions identified to correct them."

Advocates for women's reproductive rights were quick to blame Texas lawmakers for the state's spike in pregnancy-related deaths, citing the 2011 decision to slash the state's family planning budget by more than \$70 million and the 2013 mandate that abortion clinics meet ambulatory surgical center requirements—resulting in the shuttering of numerous women's health clinics throughout the state.

(continued)

“Every maternal death is a tragedy and we should strive for a case rate of zero. But when you look at the data ... it suggests that the potential increase in maternal deaths is not occurring at delivery or in the immediate postpartum period, but the time period from 42 to 365 days after birth—thus, outside the hospital.”

— SEAN BLACKWELL, M.D.

Maternal-fetal medicine specialist at Children's Memorial Hermann Hospital and department chair for obstetrics, gynecology and reproductive sciences at McGovern Medical School at UTHealth

Facing page: Erica Giwa, M.D., an OBGYN with Texas Children's Hospital and assistant professor of obstetrics and gynecology at Baylor College of Medicine, examines a patient during a prenatal checkup at The Center for Children and Women.



Recommendations from the *Maternal Mortality and Morbidity Task Force Report*

1. Increase access to health services during the year after delivery and throughout the interconception period to improve continuity of care, enable effective care transitions, promote safe birth spacing, reduce maternal morbidity, and reduce the cost of care in the Medicaid program.
2. Increase provider and community awareness of health inequities and implement programs that increase the ability of women to self-advocate.
3. Increase screening for and referral to behavioral health services.
4. Increase staffing resources in support of the task force.
5. Promote best practices for improving the quality of maternal death reporting and investigation.
6. Improve the quality of death certificate data.

Source: Maternal Mortality and Morbidity Task Force and Department of State Health Services Joint Biennial Report, July, 2016.

“There are a lot of physiologic changes that occur with pregnancy, so women who may have more pre-existing disease may be at higher risk. We do know that when we looked at the numbers, we found that high blood pressure, diabetes, obesity, cesarean delivery and late prenatal care were all seen more commonly in those women who died compared to those who did not.”

—LISA HOLLIER, M.D.

*Professor of obstetrics & gynecology
at Baylor College of Medicine
and medical director
at Texas Children's Health Plan*

But while both decisions undoubtedly created gaps in care for many Texas women, the timing doesn't quite synch.

“I put it this way,” Hollier said. “The time-course of the increase doesn't fit with the time-course of the clinic closures, so it's unlikely that the clinic closures caused the increase.”

Disentangling the data

It is important to note that the data used for the maternal mortality studies was unusually difficult to analyze and potentially shaped some of the results, since the studies used varying benchmarks for measuring maternal mortality ratios.

For the Texas task force's analysis, a pregnancy-associated death was defined as any woman who died within 365 days of birth or fetal death from any cause; the analysis examined all maternal deaths during the 2011-2012 time period, excluding motor accidents and non-pregnancy related cancers.

By contrast, the national *Obstetrics & Gynecology* report relied on death certificate questions related to pregnancy, which changed during the time period measured, 2000 to 2014. A so-called “pregnancy question” was added to the 2003 revision of the U.S.



standard death certificate and included checkboxes for whether an individual was pregnant within the past year, pregnant at the time of death, not pregnant but pregnant within 42 days of death, not pregnant but pregnant 43 days to one year before death (considered later maternal death), or if she was unknown to be pregnant within the last year.

Not all states adopted the revised death certificate in 2003, so some data was based on a 42-day standard time frame while some had nonstandard time frames. Texas didn't adopt the new death certificate—and with it, the revised “pregnancy question”—until 2006, and researchers noted that these variations in the death records led to findings that required adjustments. In addition, the Texas task force found that a number of maternal death cases

identified in the 2011-2012 evaluation included incorrect classification coding for the cause of death, further muddying the data.

The inconsistencies were so pervasive that both studies acknowledged the fallibility of the data in their reports and the task force dedicated three of its six recommendations for improving maternal mortality rates to the area of data collection.

“We identified multiple problems with the consistency of the evaluation of the maternal deaths,” Hollier said. “I think there are opportunities for education as well as standardization regarding those evaluations to ensure that the appropriate information is collected at the time of death so that a complete assessment of the cause of death can be made.”

Access to care

Shortcomings in record-keeping aside, experts agree there has been an increase in maternal deaths in Texas. Their challenge is understanding why.

Sean Blackwell, M.D., explained that the primary issue isn't that medical care in Texas hospitals is worsening or below par, but rather that too many women are not receiving care.

“Every maternal death is a tragedy and we should strive for a case rate of zero,” said Blackwell, maternal-fetal medicine specialist at Children's Memorial Hermann Hospital and department chair for obstetrics, gynecology, and reproductive sciences at McGovern Medical School at UTHealth. “But when you look at the data, and all of the improvements in safety and quality on labor and delivery units within Texas hospitals, it suggests that the potential increase in maternal deaths is not occurring at delivery or in the immediate postpartum period, but the time period from 42 to 365 days after birth—thus, outside the hospital. If anything, I would argue our hospitals are getting better. The major current opportunity for improvements is related to making sure women have access to care, especially our most vulnerable patients who are underserved and have chronic or severe medical conditions. We sorely need to have the system infrastructure and the ability to follow these women through that first year post delivery.”

For low-income women who qualify for Medicaid, benefits are available during pregnancy and up to only two months after birth, creating an abrupt end of care despite evidence that women remain at risk for the first year after their pregnancy has ended.

The task force ranked cardiac events and hypertension/eclampsia as the first and third most common causes of maternal deaths in Texas, statistics experts believe may be exacerbated by a general population that is growing unhealthier across the board, making pregnancies more complex.

“The number of women we see who have a BMI over 40, who have diabetes and hypertension, is definitely rising,” Blackwell said. “Today, well over half of women who are having babies in the state of Texas are obese. Our population is getting sicker.”

According to Hollier, the task force found that the rate of complications increased across all racial and ethnic groups in Texas between 2005 and 2014.

“There are a lot of physiologic changes that occur with pregnancy, so women who may have more pre-existing disease may be at higher risk,” Hollier explained. “We do know that when we looked at the numbers, we found that high blood pressure, diabetes, obesity, cesarean delivery and late prenatal care were all seen more commonly in those women who died compared to those who did not.”

Another observation: it’s difficult to measure how much the surge in prescription opioids and drug overdoses dovetails with maternal mortality in Texas, yet the task force did identify many missed opportunities for screening and referral to treatment during prenatal care, delivery hospitalization and postpartum care for mental health conditions.

“There’s no doubt that mental health and access to care for underserved women are major drivers,” Blackwell said, “but are they ‘pregnancy issues,’ or is that more of a societal issue?”

This question speaks to one of the most complicated components in the analysis of the maternal mortality numbers: the distinction between pregnancy-related deaths and pregnancy-associated deaths.

“Pregnancy-related deaths are due to any cause related to or aggravated by a woman’s pregnancy or its management, so this would exclude some of the opioid-related deaths, the homicides, and possibly some of the suicides,” Hollier explained. “But when we talk about Texans being increasingly unhealthy, that contributes significantly to maternal mortality, and pregnancy-related mortality does include women who develop pre-eclampsia more commonly now because they have pre-existing hypertension or, for example, because they are older.”

No quick fixes

Where do we go from here? The task force made six major recommendations in their report, half focused on better data collection and analytics and the rest concentrating on improving access and continuity of care, tackling health inequities, and increasing screening for

behavioral health services.

Already, state-run programs and institutions throughout the Texas Medical Center are working to address some of these issues.

The state-funded Healthy Texas Women program, which was introduced last year, focuses on helping low-income women gain access to family planning services, STD testing, breast and cervical cancer screenings, postpartum depression screenings, and help with chronic diseases related to obesity, even after their Medicaid benefits from pregnancy expire.

Harris Health System offers an OB Navigation Program that provides pregnant patients with enhanced care coordination and support throughout their pregnancy and postpartum period.

The Center for Children and Women, which is open to families enrolled in the Texas Children’s Health Plan through Texas Children’s Hospital, provides a new kind of medical facility that combines a full network of care under one roof—including pediatrics, obstetrics, psychology and more.

Children’s Memorial Hermann Hospital has increased its focus on preconception and interconception health—the time period between pregnancies—which minimizes risk factors by helping women plan for their pregnancy through education and ongoing access to preventative care. The hospital has also partnered with the March of Dimes to create a new Perinatal Safety Center to research and streamline maternal and infant care.

The Texas Department of State Health Services is in the process of establishing an electronic database to track cases of pregnancy-related deaths. And in late May, Texas legislators passed Senate Bill 1929, which renewed funding for the task force and outlined specific directives, including postpartum depression services for low-income women.

“I am optimistic that we are making progress with improving access to care, and the spotlight that has been shone on the problem will help make it a priority among all the other health care challenges that exist in our state and across the U.S.,” Blackwell said. “The issues related to improving maternal mortality in Texas are not quick fixes.” ■

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On Target for Demo Day

TMCx accelerator companies aim to leave their mark on the Texas Medical Center

BY CHRISTINE HALL

Entrepreneurs from around the world come to the Texas Medical Center (TMC) to fine-tune their digital health solutions and target health care organizations that will benefit from their innovative ideas.

Twenty-one startup companies conclude a four-month TMCx accelerator digital health program with a Demo Day on June 8. Many will leave with an agreement to test their products at one of the medical center's 21 hospitals.

Joshua Mecca, co-founder of M&S Biotics, has already secured letters of intent with two hospitals and a medical school. His Scranton, Pennsylvania-based company combines artificial intelligence and radio-frequency identification technology to improve

utilization and efficiency in the operating room.

He has a few other prospects at the moment, including one with a large medical device manufacturer. Mecca is pitching to angel networks (groups of investors who have organized to invest collectively) and investment firms in an effort to raise a \$1 million seed round—where investors would subsidize the company in exchange for an equity stake in it. If Mecca can get the funding he needs, he might shift his headquarters to Houston.

"I have done more in the past three months than I did in a year and a half," Mecca said. "I knew if I was going to come down to Houston, I was going to have to put both feet in. Plus, most



Credit: Gary Fountain

TMCx company ConsultLink, led by CEO Alexander Pastuszak, M.D., is a mobile workspace for care team members to streamline and improve patient care.

of the relationships I made here were by chance—definitely not something I could have done remotely."

Meanwhile, Alexander Pastuszak, M.D., CEO of ConsultLink, based in Houston, will leave the TMCx program with a letter of intent from a hospital to deploy a trial run of his product: a mobile workspace for care team members to streamline and improve patient care.

But getting that far for both startups was not easy.

"Our solution is for the care team, so identifying the right solution in the right organization is a challenge," Pastuszak said. "We had to learn what the good routes were."

TMCx opened up that network for Pastuszak and his team, and helped them identify high-value targets.

"It was reaffirmation that we are not crazy in terms of our approach," he said. "Plus, we had a chance to talk to other companies in TMCx, and ask how they were doing it. Some were further down the line than us, so it was good to know we were on the right track."

Startups must navigate each hospital's unique infrastructure. Often, one of the initial challenges is finding a physician—or someone impacted by the problem the entrepreneur is trying to solve—to champion the concept.

But even with that person, there are always others higher up the food chain that need to be brought on board, and that doesn't always happen. Pastuszak said he came to understand that a hospital's director of innovation was not always the person who cared about the product.

"They may say this is interesting and see the potential need, but they

may not make the sale to the hospital," he added.

M&S Biotics and ConsultLink are just a few examples of success that TMCx companies have had in the Texas Medical Center. Others, like Washington, D.C.-based Babyscripts, which offers a remote-monitoring kit to better identify high-risk pregnancies, is working with a TMC institution to have its kits distributed to patients. Minneapolis-based Vios Medical, which created a patient management information system, secured four pilots aimed at patient data for clinical decision-making.

Leaders in the TMC Innovation Institute, which runs the accelerator program, say all of the traction is evidence that TMCx, which launched in 2014, is becoming more mature.

TMC's member institutions are more aware of the program and more willing to engage with the companies, said Erik Halvorsen, Ph.D., director of the TMC Innovation Institute. The program has also gained greater visibility. More members of the medical center community are participating as advisors and mentors.

"The Texas Medical Center has 21 hospitals and 100,000 employees in 58 member institutions," Halvorsen said. "That's a lot of organizations to meet in a short period of time. This class has been more successful at creating those engagements than ever before."

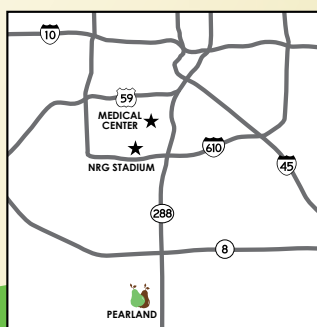
Indeed, this class has raised close to \$44 million in funding and departs on June 8 after securing more than 80 agreements or partnerships. ■

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NAME: **Stacey Berg, M.D.**

OCCUPATION: **Director of the Palliative Care Program and the Developmental Therapeutics Program at Texas Children's Hospital**

INTEREST: **Writing science fiction**

As a physician-scientist, Stacey Berg, M.D., has co-authored more than 100 papers on pharmacology and experimental therapeutics, specifically on the development of new anticancer drugs for children. But in her spare time, Berg writes speculative fiction that explores the imaginative world of science fiction and fantasy.

To date, Berg has written two novels, *Dissension* (2016) and *Regeneration* (2017), published by HarperCollins. Set in a dystopian future, her duology follows the story of a female clone soldier named Echo Hunter 367, whose mission to hunt down a

group of insurgents is threatened when she falls in love with a rebel leader and begins to doubt her purpose. The novels explore Echo Hunter 367's internal struggle to choose between the woman she loves and duty, while focusing on her strength and courage—qualities Berg said were rarities in the books she read as a child.

"I like big adventure stories with lots of strong women in them," Berg said. "One of the really nice things to see is all the stories that are out there for girls and young women that show them that they can save the day. They don't have to wait for

somebody or trick somebody or finagle somebody into doing the work. They can do it."

At a young age, Berg immersed herself in *The Jungle Book*, *The Chronicles of Narnia* and *A Wrinkle in Time*. These stories allowed her to escape the humdrum nature of everyday life and transport herself to other worlds of endless possibilities.

"It's the magic of magic," Berg said.

Berg recently joined a panel of science fiction writers at Houston's Comicpalooza to discuss her double life as a doctor and author.

She often relies on her medical research background to flesh out the futuristic science and technology in her stories. With her knowledge of genetic research and engineering, she is eager to explore the possibility of human cloning in her books.

"Science is so amazing," Berg said. "Every day I come into work and say, 'Wow, by a year from now, we might be doing

this or that. It doesn't take much to give you an idea of where something could be, just a little bit further than where we are."

We're not able to clone humans now, she said, but we will probably be able to one day. We may decide not to do it, she added, but it won't be a technical limitation.

Berg's scientific training and keen attention to detail help her create vivid, progressive scenes. The whole point is to "convey a lot of flavor and make you feel like there's a whole world there," said the author, who is already working on her next novel.

"When you're a scientist," she said, "one of the things that you do is really try to look at very specific facts and try to understand what this fact is telling you ... and what next question to ask or what experiment you should do to produce the next fact." ■

[1] Thousands participated in the **MARCH FOR SCIENCE – HOUSTON** to support research, medicine and technology. Several faculty members of TMC institutions addressed the crowd at City Hall.

[2] **SINCHITA ROY CHOWDHURI, M.D., PH.D.**, assistant professor at The University of Texas MD Anderson Cancer Center, Department of Pathology, received a 2017 Shirley Stein Scientific Endowed Research Award.

[3] **BURTON DICKEY, M.D.**, professor in the Department of Pulmonary Medicine at MD Anderson, was the recipient of the Finneran Family Prize for Translational Research.

[4] **GIOVANNI DAVOGUSTTO, M.D., UDAY SANDHU, M.D.**, and **RAYMUNDO “ALAIN” QUINTANA QUEZADA, M.D.**, internal medicine residents at McGovern Medical School at UTHealth, were named champions at the Doctor’s Dilemma national competition in San Diego.

[5] **TEXAS WOMAN’S UNIVERSITY** held the school’s first family graduation. Andrea Brooks, Ph.D., RN, PNP, who received her doctorate in nursing, brought her children, Elizabeth Amos and Mikayla Wimberly.

[6] The Giving Back to the Future Gala raised more than \$650,000 for **NORA’S HOME**. Margaret Alkek Williams, left, was honorary chair of the gala honoring Lynda Knapp Underwood, right, and her late husband, David Underwood, longtime chair of the TMC Board of Directors.

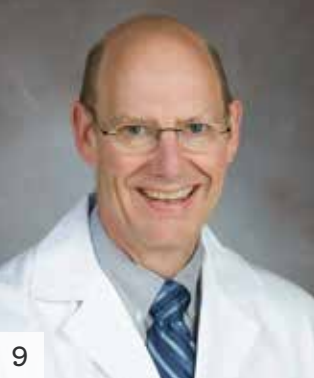
[7] **DARIO MARCHETTI, PH.D.**, right, director of the Cancer Biomarker Research Program at Houston Methodist Research Institute, received a research grant from the Avon Foundation for Women.

[8] **KELLY HACKETT**, managing director of family office services for Salient Partners, L.P., has joined The Menninger Clinic Board of Directors.

[9] **PHILIP C. JOHNSON, M.D.**, vice chair of the Department of Internal Medicine and director of the Division of General Medicine at McGovern Medical School at UTHealth, was honored with the Anne and Edward H. “Ted” Patton, Jr. Award.

[10] **NICHOLAS NAVIN, PH.D.**, assistant professor in the Department of Genetics and Bioinformatics at MD Anderson and an Andrew Sabin Family Fellow, received the Jack and Beverly Randall Prize for Excellence in Cancer Research.

[11] An article by **MICHAEL J. PALDINO, M.D.**, neuroradiologist at Texas Children’s Hospital, was selected as the Lucien Levy Best Research Article by the *American Journal of Neuroradiology*.



Credit: No. 6: Daniel Ortiz Photography, No. 8: Michael Hart, No. 13: Jenny Antill, No. 16: Michael Hart, No. 17: Alexander’s Fine Portrait Design, No. 18: S. Kramer/Texas Children’s Hospital and Chinh Phan, “Courtesy photo



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[12] **ELISE COOK, M.D.**, far right, associate professor in the Department of Clinical Cancer Prevention at MD Anderson, was honored by the YWCA during the 31st annual Outstanding Women's Luncheon. Also pictured are YWCA board members Jolyn Brand and Jacqueline Bostic McElroy.*

[13] Elizabeth Vargas, center, co-host of ABC's 20/20 news program, was the keynote speaker at **THE MENNINGER CLINIC'S** Annual Signature Luncheon, co-hosted by Jeff and Paula Paine, left, and Dorothy and Ronny Cuenod, right.

[14] **THE TEXAS MEDICAL CENTER ORCHESTRA**, led by founder and artistic director maestra Libi Lebel, was awarded The American Prize as best community-based orchestra in the United States for the 2016-2017 season.

[15] **SIMONA SHAITELMAN, M.D.**, assistant professor of radiation oncology at MD Anderson, was named one of the 2017 recipients of the Shirley Stein Scientific Endowed Research Award.*

[16] **ANN GORDON TRAMMELL**, of Trammell Interests, has joined The Menninger Clinic Board of Directors.

[17] The **AMERICAN HEART ASSOCIATION HOUSTON** Go Red For Women Luncheon raised \$1.1 million for the fight against heart disease and stroke. Journalist, author and television host Joan Lunden, center, who was guest of honor and keynote speaker, posed with 2017 campaign co-chairs John and Vicki Crum.

[18] An Evening with a Legend, which benefited **TEXAS CHILDREN'S CANCER CENTER**, honored Olympic swimmer Michael Phelps. Television sports journalist Andrea Kremer interviewed Phelps about his gold medal journey and the next phase of his life.

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8 TMCx Demo Day
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2450 Holcombe Blvd., Ste. X
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tmcxevents@tmc.edu
713-791-8855

9 The Future of Obamacare: Knowns and Unknowns
Lecture by Vivian Ho
Friday, Noon – 1:30 p.m.
Rice University
James A. Baker Hall
6100 Main St.
Registration required:
\$50; lunch included
mpruitt@rice.edu
713-348-4336

10 ScienceDay
Hands-on activities for children ages 4 – 12
Saturday, 12:30 – 4 p.m.
Houston Methodist Research Institute
6670 Bertner Ave.
Free
events@houstonmethodist.org
713-363-9049

14 Off Script: Stories from the Heart of Medicine
Live storytelling
Wednesday, 5:30 – 7 p.m.
McGovern Medical School
6431 Fannin St., Rm. 2.135
Free
woodsnash@hotmail.com
570-780-4435

JUNE 27: NATIONAL HIV TESTING DAY

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For more information about HIV/AIDS prevention and for testing locations, visit the Texas Department of State Health Services website:
www.dshs.texas.gov/hivstd/services/service_h.shtml

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For more information about our events, or to schedule an event with your office, please call our Education Team at 713-572-3888, ext. 106.



Bing You, MD (China), LAc.
Licensed Acupuncturist and Herbologist



Tao Ma, MD (China), LAc., PhD
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