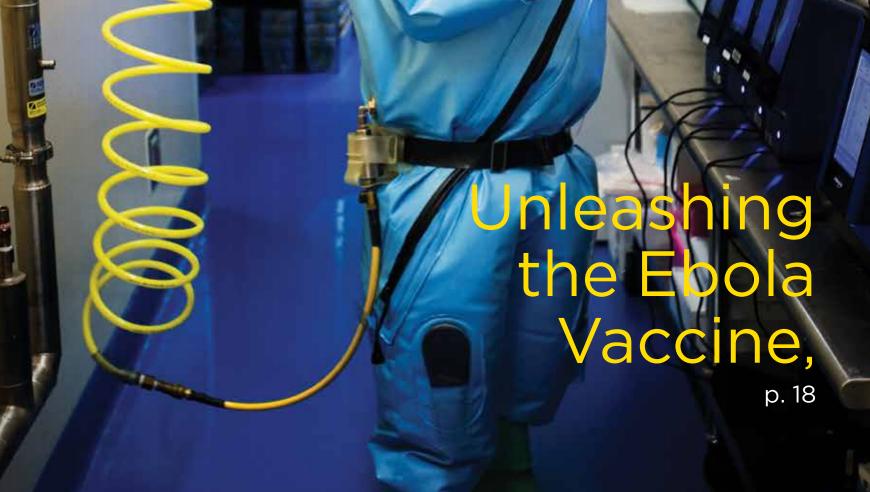
TMC PULSE

NEWS OF THE TEXAS MEDICAL CENTER — VOL. 5 / NO. 6 — JULY 2018

TOMO



Unpacking the Pounds, p. 12

Mosquitoes: Fight the Bite, p. 15

Treatments for Epilepsy, pp. 25-31

We've never been better!

Saying you want to be the best is one thing. Constantly driving to be better is a different story. That's what rankings measure and why we love to celebrate when they're moving in the right direction. Because, for us, outcomes = children's lives.

As ranked by U.S. News & World Report





#1 Cardiology & Heart Surgery

#1 Pulmonology

#3 Neurology & Neurosurgery

#3 Nephrology

#4 Gastroenterology
 & GI Surgery

#4 Urology





Cancer treatment as personalized as your DNA.

As an NCI-designated cancer center, the Dan L Duncan Comprehensive Cancer Center at Baylor St. Luke's is part of an elite group of 70 cancer research institutions in the United States. We offer personalized medicine where specialists use the patient's genetic makeup to help pinpoint the proper course of therapy, targeting the specific characteristics unique to the cancer. Additionally, many of our innovative cancer treatments stem from our own nationally recognized research. That's our answer to cancer.



For more information, visit BSLcancer.org.



A part of CHI St. Luke's Health

Baylor St. Luke's Medical Center | Brazosport Hospital | Lakeside Hospital | Patients Medical Center | Springwoods Village Hospital | Sugar Land Hospital | The Vintage Hospital | The Woodlands Hospital

CHI St. Luke's Health–Patients Medical Center and CHI St. Luke's Health–Lakeside Hospital meet the federal definition of physician-owned hospitals. Ownership information is available upon request.



WILLIAM F. McKEON

President and Chief Executive Officer

Texas Medical Center

In the last century, we have made the most significant advances in medicine. Now that we have unlocked the human genome, we are making tremendous discoveries that are quickly translated to new therapies through clinical trials.

More clinical research is conducted on the campus of the Texas Medical Center than any other place in the world. We have the greatest collection of scientists and researchers in our major academic institutions, yet their efforts are internally focused and not aligned across organizations. We are working to change that with the creation of the TMC Clinical Research Institute.

We collectively treat more than 10 million patients on an annual basis in one of the most diverse cities in the United States. This is an ideal environment to establish the largest and most efficient discovery platforms on the planet.

By aligning our efforts, we will attract industry that will bring the most promising therapies and medical devices to Houston so we can deliver the broadest range of treatment options to our patients.

As research funding continues to decline, it is more important than ever that we work together to reduce costs and redundancies and create new platforms to accelerate discovery.

We hope that our research leaders will seize this opportunity and embrace this bold vision. We can all be greater than the sum of our parts.

William 7 Myc

TMC PULSE

Vol. 5 No. 6 July 2018

President and Chief Executive Officer
William F. McKeon

Communications Director Ryan Holeywell

Pulse Editor

Maggie Galehouse

mgalehouse@tmc.edu

Assistant Editor Cindy George cgeorge@tmc.edu

Staff Writers Alexandra Becker Christine Hall Britni R. McAshan Shanley Pierce

Photojournalist Cody Duty

NEWSROOM

713-791-8812 news@tmc.edu

ADVERTISING Felicia Zbranek-Zeitman 713-791-8829

newsads@tmc.edu

DISTRIBUTION

Daniel Martinez 713-791-6136 distribution@tmc.edu

READ US ONLINE tmc.edu/news

FOLLOW US

@TXMedCenterf @texasmedcenter

(a) @thetexasmedicalcenter

TMC Pulse is an award-winning monthly publication of the Texas Medical Center in Houston, Texas. Permission from the editor is required to reprint any material.





A Cancer Patient, a Two-Toed Sloth and a Lifelong Wish



Changing Behavior



Combating Bias and Discrimination in Science and Medicine



Trauma Season



- 6 Spotlight: Lex Frieden
- 10 On the Side: Jessica Davila, Ph.D.
- 32 Solutions
- 37 Curated: Sensory Explorations at Museum of Fine Arts, Houston
- 38 Field Notes
- 40 Calendar

ON THIS PAGE: Mosquitoes are on display at Harris County Public Health's "Skeeter School."

ON THE COVER: Thomas Geisbert, Ph.D., of The University of Texas Medical Branch in Galveston, has spent his career studying Ebola. This spring, health officials in the Democratic Republic of the Congo began using the Ebola vaccine he helped develop.

A Cancer Patient, a Two-Toed Sloth and a Lifelong Wish

MD Anderson patient Caitlin Ambrose visits the Houston Zoo

By Shanley Pierce

aitlin Ambrose always wanted to hold a sloth. On June 8, the 21-year-old Ewing's sarcoma patient from Australia finally got her wish, thanks to Ronald McDonald House Houston and the Houston Zoo. Caitlin, her parents and her two siblings visited the zoo, where they were treated to an exclusive meet-and-greet with Curly, a 25-year-old Linnaeus's two-toed sloth.

"It doesn't feel real. It feels like it's a big prank," Caitlin said, gleefully, when she learned about the surprise. "I just love sloths. I just relate to them so well. They just sit there eating. They've got big claws and they just chill out all day. Those are my goals in my life. I love them."

Caitlin was diagnosed with Ewing's sarcoma in March 2017 after experiencing pain in her left ribs.

Ewing's sarcoma is a type of tumor that grows in the bone or soft tissue of the body. The tumor can form in the bones of the legs, arms, feet, hands, chest, pelvis, spine or skull, as well as the soft tissue of the trunk, arms, legs, head and neck.

Before her diagnosis, Caitlin was halfway through earning a double degree in nursing

and midwifery at Deakin University in Victoria, Australia, with hopes of becoming a midwife in London. But after her doctors in Australia discovered an 8-centimeter tumor in the soft tissue of her left ribs, she abandoned her plans and embarked on a rigorous cancer treatment journey, undergoing 17 rounds of chemotherapy, radiation therapy on her chest and hip, and surgery to remove a few ribs. Unfortunately, the cancer returned in January of this year.

The five-year survival rate for patients with localized Ewing's sarcoma is 70 percent; however, once the cancer has spread, the survival rate drops to 15 to 30 percent.

"At that stage, [doctors] told us it was terminal and there was no other treatment except palliative care," said Caitlin's mother, Mellissa.

"I had my whole life planned out," Caitlin said.
"I was going to be a nurse and midwife by 21. I was going to be married with a kid by 30, own a house by 31. After university, I was going to go on big trips and travel all over."

After doctors told her that she had only a few

months to live, Caitlin and her parents flew 8,333 miles in April 2018 from their home in Cabarita Beach, Australia, to Houston to participate in a first-in-humans clinical trial for Ewing's sarcoma at The University of Texas MD Anderson Cancer Center. The trial, which is testing the efficacy of the drug TK216, was a Hail Mary, but Caitlin and her parents sought to use what little time Caitlin had left to make a difference.

"It was a combination of last hope, but we also wanted to provide something for people after us," Mellissa said. "If it didn't work for us, her information could help others."

Sadly, Caitlin's test results showed that the tumor continued to grow. After 43 days in Houston, the family decided to return home, where Caitlin will receive palliative care in lieu of further treatment.

"Caitlin's wish when she got here was that she wants to die at home, not here," her mother said.

But the day before Caitlin and her family boarded their flight back to Australia, they made a special trip to the Houston Zoo to see Caitlin's favorite animal. She was experiencing excruciating pain in her left side—as if "boiling water was being poured on my left rib"—but she smiled from ear to ear as she hung out with Curly the sloth. She caressed his brown fur and took selfies with him while he ate.

"I've been in such a bad mood since getting the results, and I've really taken it out on the family," Caitlin said. "It's good to have something positive when you get so much negative news."

Organized by Amy Armstrong, house manager at Ronald McDonald House Houston, the meeting with Curly gave the Ambrose family an opportunity to focus on something other than Caitlin's terminal diagnosis.

"That's what makes the community in the House and these moments so special," Armstrong said. "They bring you into their story and their lives."

Caitlin plans to spend her remaining days surrounded by friends and family near the beach.

Leaving her family "is going to be s—," she said. Her goal, now, is to make it to her 22nd birthday in February, but she has learned to take things day by day.

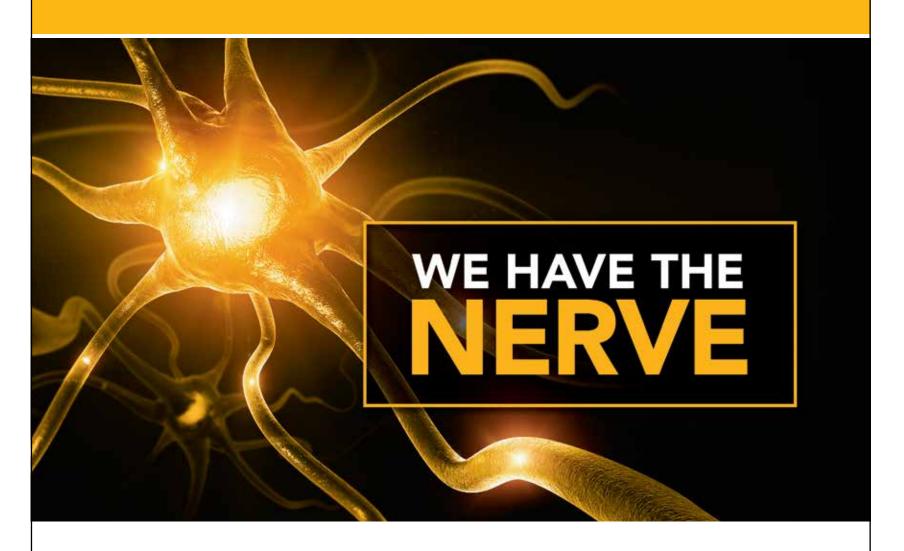
"If you want to do something, do it now," Caitlin said.

Her sister, Tia, fought back tears as she reflected on Caitlin's condition.

"She's such a kindhearted person. Even during this journey with cancer, she's always cared about how other people are doing," Tia said. "She always makes you want to be a better version of yourself. If you've had the worst day and something really hasn't gone well, she can come up to you, say a joke or stand there and hug you, and she can make you feel so much better. That's what I'm going to miss the most."



Ewing's sarcoma patient Caitlin Ambrose plays with Curly the sloth at the Houston Zoo.



Our neurosurgeons successfully perform complex surgeries others won't attempt.

Memorial Hermann Mischer Neuroscience Institute at the Texas Medical Center was among the first to perform minimally invasive epilepsy surgeries through stereoelectroencephalography (SEEG) and laser ablation. This advancement allows for seizure localization and treatment without invasive surgery. As pioneers of this approach, we have completed more cases than anyone in the nation. But that's just a fraction of what we do. From brain tumor resections to aneurysm repairs, we collaborate with McGovern Medical School at UTHealth to perform more than 4,500 neurosurgical cases every yearmore than anyone in Houston. Together we are bringing the forefront of neuroscience to you.

Learn more at neuro.memorialhermann.org

Mischer Neuroscience Institute



ADVANCING HEALTH

For nearly half a century, Houston disability rights activist LEX FRIEDEN has worked to ensure that Americans of all abilities receive equal access to public services. In addition to his role as an advocate, he serves as a professor at The University of Texas Health Science Center at Houston (UTHealth) School of Biomedical Informatics, a professor of physical medicine and rehabilitation at UTHealth's McGovern Medical School and an adjunct professor of physical medicine and rehabilitation at Baylor College of Medicine.

Q July 26, 2018 marks the 28th anniversary of the Americans with Disabilities Act (ADA). What does it mean to you to have played a leading role in such a monumental piece of legislation?

A This year, 2018, is 50 years after I graduated from what is now TIRR Memorial Hermann, 40 years after we founded the Independent Living Research Utilization (ILRU) Program at TIRR and 30 years after the Metropolitan Multi-Service Center opened. I'm just thankful. I'm thankful that President Ronald Reagan and the 15 appointed members of the National Council on the Handicapped hired me to be the director of that agency. I'm thankful that I had the opportunity to write the report that asked for the ADA. I'm thankful that I had the chance to write the original draft of the ADA. I'm thankful for the experiences that I had. I don't feel particularly, personally, responsible for it—I just feel thankful.

Q You have worked for decades to encourage disability awareness in Houston and across the United States. After your injury, what motivated you to activism?

A | Every time you do something, you learn something—or you ought to. Every time you learn something, you ought to find a way to apply that knowledge. I happened to have opportunities to apply what I learned and I seized those opportunities.

☐ In 1968, an automobile accident in Oklahoma left you paralyzed from the neck down. How did you find your way to TIRR and what was your rehabilitation experience?

A | My dad visited the Rusk Institute of Rehabilitation Medicine in New York, the

Rehabilitation Institute of Chicago and TIRR [which stood for Texas Institute of Rehabilitation and Research at that time] in Houston while I was at the hospital in Oklahoma City. He came back from the last visit at TIRR and he said: 'There's no question. We should go to TIRR.' Two weeks later, I was in a medical airlift from Oklahoma City to Houston to TIRR, and I spent the next three months in what I would call a boot camp. Every morning, I was getting up and doing exercises. One thing that was different about rehab then compared to now is that we used to have wards, so there were five other patients in the room with me and, at night, there was a lot of really cool social interaction that went on. We talked about coping with our disabilities. We talked about how we got hurt. We talked about being stupid kids. We asked the older guys: 'Does life get better?' I'll never forget the kind of interchange that went on and the kinds of things we collectively thought about and dreamed about.

When you left TIRR, what helped you adjust to living with a disability?

A I Years before I got hurt, I liked amateur radio. The radio was really cool because I could get on and nobody would see me. They didn't know I had a disability. We didn't have to talk about that. While my friends were outside playing basketball and everything, I had something to do and I was enjoying myself. It was giving me a sense of well-being.

One day on the radio, I heard this deep voice call back to me. He had a British voice and his call sign was unique—it was JY1. I knew JY meant Jordan and the No. 1 must be the first person licensed in Jordan. Can this be the King of Jordan? And it was. I kind of had this catharsis and I said: 'Here I am, sitting in my little room



in Tulsa, Oklahoma, and my friends are outside playing. I always thought it was so cool that they could be outside playing and I felt bad for myself, but here I am talking to the King of Jordan.' I told him thank you and that he made my day, but he told me: 'Lex, I can't go outside either. There's a war going on outside.' He told me it's not all about where you are or who you're talking to at any given time. It's about what you think about yourself, whether you think you are doing the right thing and whether you're doing the best you can despite all of the odds against you. I remembered that lesson all my life and that sort of brought me out of my depression.



Lex Frieden visits the Metropolitan Multi-Service Center, an adaptive sports and recreational facility for people with disabilities in Houston's Montrose area.

• Was there a singular event that inspired your advocacy work?

A I After I was at TIRR, I went back to Oklahoma and applied to Oral Roberts University. I was turned down because I had a disability. [Editor's note: Oral Roberts University did not respond to questions regarding Lex Frieden.] I'm thankful for that experience. That taught me what discrimination was about. People were being told—some on the basis of race, some on the basis of gender—that they couldn't do things that they knew they could just because of a characteristic over which they had no control. That's what happened to me. They had sidewalks, doorways and ramps.

I'm thankful that President Ronald Reagan and the 15 appointed members of the National Council on the Handicapped hired me to be the director of that agency. I'm thankful that I had the opportunity to write the report that asked for the ADA. I'm thankful that I had the chance to write the original draft of the ADA.

Why couldn't I go to college there? Well, because they didn't want me there. Simple as that.

My friend, who graduated from the University of Tulsa, said: 'You ought to go out there and talk

to the admissions people.' I said, 'I don't see the point; they don't have a single building that is accessible.' I met the dean of admissions for the (continued) We thought there should be a place where people with disabilities could go and meet and exercise and play basketball and swim and enjoy. There wasn't any place. There were no parks in Houston with accessible playgrounds, there were no swimming pools that had ramps in them and no basketball courts reserved for wheelchair basketball players.

University of Tulsa in the parking lot because I couldn't get up the steps of the building and into his office. He said to me: 'See the building across the campus there? That's the first building we have built in about 15 years. It will be ready for the fall semester. It's got a level entrance and an elevator in it.' I asked him what they taught there and he said, 'Biology.' I said, 'Sorry, that's not my deal.' He said, 'Wait a minute. Take the catalogue, tell me what you want to take and those classes will be in that building.' It was such a simple solution and that experience was actually incorporated into the plans we made for the ADA. The ADA says you don't have to rebuild your building, but you have to find relatively inexpensive, simple ways to do things if you can.

○ What was your first taste of advocacy work?

A In 1978, we proposed that the city's transit system, HouTran, should be accessible by people who use wheelchairs, by people who use baby carriages and by people who are older and have difficulty walking. At that time, no transit system in the country had those kinds of facilities. The mayor at the time. James Fred Hofheinz, wanted the transit system to be better used, so he offered free rides all day on Saturday to encourage people to try public transit. So, we got about 40 people in wheelchairs to go down to City Hall, where he was going to ride the bus, and line up with him to have our free bus rides. Of course, the bus came, and we were all waiting to get on. Some of our colleagues got out of their wheelchairs and got down on the ground and started dragging themselves up the stairs of the bus. The press was just having a field day. That was kind of our first public advocacy action to bring attention to the need for accommodations for people with disabilities.

A I I met a professor while I was at TIRR who taught at the University of Houston and I wrote and asked him if they had a graduate school program I would be able to participate in. He invited me to come there and also told me about a program that TIRR was starting that would

provide housing for former patients and support services—attendant care. It was set up to be a community living arrangement where the residents managed their own facility. Logic pointed to Houston and I came here in 1972. Living in that place with other people who shared the same experiences is where we began to talk about how to change the world. What do we need to be full participants? Obviously, access, transportation and recreation.

Q | How did you meet your wife, Joyce?

A | She was a patient at TIRR. At the time, I was putting together the bylaws for the Houston Coalition for Barrier Free Living and I needed somebody to type. I couldn't type fast enough. I saw this woman in a wheelchair, kind of attractive, in the hall one day and I asked her if she could help me type. She came to my house and helped me type that stuff up. Then we got a rain—a Houston rain—and I told her: 'You can't leave here. You'll drown trying to get home. I'll stay up all night and you can lay in the bed.' She said: 'No, I can't get in your bathroom.' I had never widened the doorway, but my neighbor came over and knocked that wall down. Joyce stayed that night. We've been married for 40 years now. I'm glad to have a wife and a daughter and grandson and a soon-to-be granddaughter-in-law.

We are sitting in Houston's Metropolitan Multi-Service Center, an adaptive sports and recreational facility for people with disabilities. How was this space created and what does the center mean to you?

A | This center was conceived by a group of former TIRR patients in 1978. I went with my wife, Joyce, on television—the KHOU Channel 11 morning show—and introduced this idea that Houston should be the most accessible city in the world. People would come from all over the world to TIRR, and why shouldn't the city complement the medical center? We thought there should be a place where people with disabilities could go and meet and exercise and play basketball and swim and enjoy. There wasn't any place. There were no parks in Houston with accessible playgrounds, there were no swimming pools that had ramps in

them and no basketball courts reserved for wheel-chair basketball players. It was a novel idea. It took 10 years to get this thing built, then it became a national symbol. It was the first time that federal dollars had been used with city dollars to build a fully accessible center for people with disabilities. Because of that, members of Congress, when they were having hearings prior to the ADA, came to Houston and sat in that big auditorium. Some said this was going to cost cities and schools a lot of money to make everything accessible and the Houston leadership said they should do it anyway. It was significant because, at that point, the ADA was not a foregone conclusion.

What are some of the challenges Houston continues to face in serving people with disabilities?

A | Right now, we have huge opportunities in Houston because of Mayor Sylvester Turner and the City Council. Metro now has a plan to make all 9,000 transit stops accessible to people with disabilities, but that plan has a bad wrinkle: Before you can use the transit stop, you have to be able to get there. The city doesn't have sidewalks all over because there is a city ordinance that says the sidewalks have to be maintained by each property owner. When property owners choose not to make their sidewalks accessible or choose not to connect them to the Metro stop, we have a problem. This is an opportunity. I'm not sure what the solution will be, but there has to be a solution. It's silly for us to have this investment in the infrastructure, all the buses accessible and all the stops accessible and, yet, some people can't get down the sidewalk to get to the stop.

• Have there been any other defining moments in your advocacy work?

A In January of 1986, I met with then-Vice President George H.W. Bush about the ADA. He supported what we were doing, but reminded me that he was just the vice president and as soon as he had the chance to do more, he would. A couple of years ago, he had a meeting in downtown Houston and he was in a wheelchair at this point. They couldn't park near the building because of construction. They got him out, pushed him down the street, down the curb, across the street, down the ramp and down the next block. After that, he said to me: 'Am I really responsible for making those ramps on the sidewalk?' I said: 'Yes, sir, you are. You signed the law.' He said: 'That worked out pretty well, didn't it?'

Lex Frieden was interviewed by Pulse staff writer Britni R. McAshan. The conversation was edited for clarity and length.



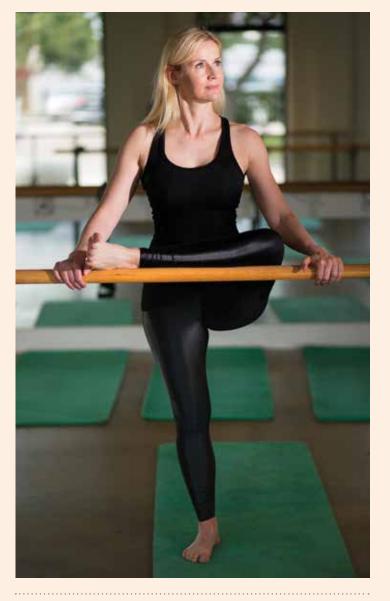
n a sunny Tuesday afternoon, Jessica Davila, Ph.D., stood on a green yoga mat in a mirrored studio at DEFINE body & mind's West University location, where she teaches weekly yoga classes. She inhaled deeply and began to quiet her mind. As she exhaled, she took a step forward with her right leg, raised up her arms and began the warrior pose sequence.

Off the mat, Davila is a clinical epidemiologist who has worked extensively in public health. Her latest project involves HIV in Houston's homeless population. Funded by the Health Resources and Services Administration, the longitudinal study includes six cities in the United States with high rates of homelessness and focuses on developing interventions that can be implemented in each city. Davila and her team collaborated with Harris Health System's Thomas Street Health Center, a freestanding HIV clinic in Houston, to recruit approximately 180 homeless HIV patients and help meet some of their needs, including treatment for substance abuse and mental health conditions.

"Some of them just needed a job, so we try to address those issues, as well as trying to promote the importance of health care, well-being and taking care of yourself so they can go out and ... do all the things that they really want to do," Davila said.

It's an exciting study for Davila, a lifelong yogi, because it's another opportunity for her to incorporate health and wellness into people's lives.

As a young girl growing up in Iowa, Davila often stayed with her grandmother while her parents worked. She watched her grandmother practice yoga every morning.



NAME: Jessica Davila, Ph.D.

OCCUPATION: Program chief of the Health Services Research Methodology and Statistics Core at the Michael E. DeBakey VA Medical Center; course director of Translational Research and Population Health at Baylor College of Medicine

INTEREST: Yoga instruction

Eventually, Davila started flowing through yoga movements and sequences alongside her grandmother.

"I had a big appreciation for the benefits of yoga, the breathing and just how to calm your body down and calm your mind down, get centered, get focused every day as a routine," she said.

Davila practiced yoga intermittently in college, but recommitted to it 15 years ago to help her manage the stress of juggling kids and a new job in a new city.

In 2013, she became

certified to teach all types of yoga, including Iyengar, Ashtanga, Vinyasa and even hammock yoga. She began her yoga career leading a full classroom of 35 students at YES Prep Northline charter middle and high school on Friday afternoons. At the same time, her section chief at Michael E. DeBakey VA Medical Center let her spearhead a health and wellness program to teach yoga and meditation classes on Tuesday afternoons in their department's conference room.

Eventually, Davila expanded her teaching practice and started leading classes at the YMCA for cancer survivors who had recently completed treatment.

"When they show up to come do some yoga, they're trusting you that you're going to take care of them, that you're not going to hurt them," she said. "You're going to make them better."

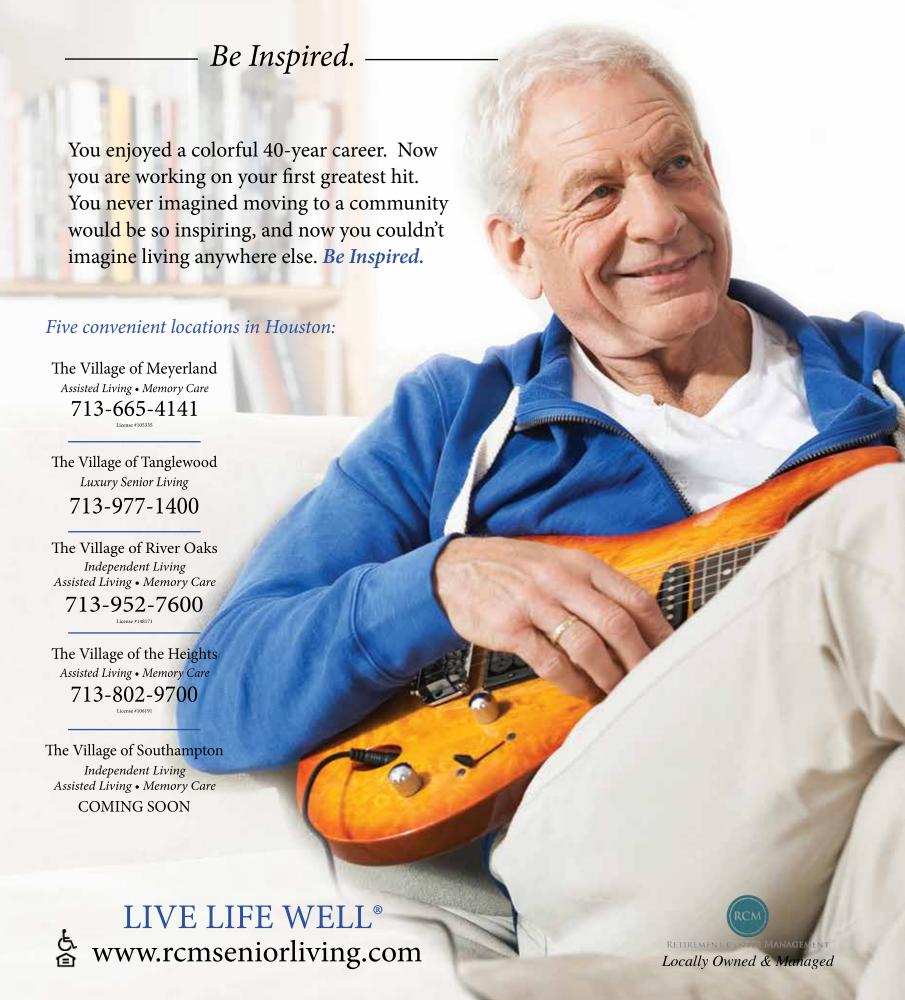
Many of Davila's clients included breast cancer survivors who took her classes to help ease tightness in their chests from surgery, and lung cancer survivors looking to alleviate difficulty breathing.

"So many of the people who have come to my classes have been so over-treated with medication that the last thing they want is another pill," Davila said. "They want something that's going to help them, that they can do on their own, that's more of a longer-term solution."

Davila seeks to heal their bodies "from the inside out," she said.

"Yoga's a way, I've found, that people can often regain some normalcy in their life and get back into a routine," she said. "At those times when they're in need of that critical support, that's when I like to show up."

Retired Geologist. Now Community Rock Star.



Unpacking the Pounds

TMC dietitians weigh in on ways to curb the obesity epidemic

By Shanley Pierce



Clinical dietitian specialist Sharon Smalling displays healthy food products in her office to teach her patients about good nutrition.

The collective waistlines of Americans have expanded over the last three decades, causing obesity to rise as a leading health concern in Texas and across the United States.

Dietetic experts in the Texas Medical Center have a two-pronged plan to help Houston's health community treat patients: Educate to overcome nutrition barriers and tackle health challenges.

"[Obesity] is frustrating, but I think, from our end, we're excited because we see the potential growth: The interest from the med students—the interest from the next generation of people saying this is a problem," said J. Wesley McWhorter, nutritionist supervisor of the Nourish Program at the Michael & Susan Dell Center for Healthy Living at The University of Texas Health Science Center at Houston (UTHealth). "Five years ago, people didn't care. Ten years ago, it was like: 'Why would you care about nutrition? Who cares about nutrition?' Now, it's becoming, 'Yes, we can actually address this. We can do something.' This is important."

An analysis published this year in the *Journal* of the American Medical Association noted upward obesity trends among adults and youths in the United States. The conclusions came from

the National Health and Nutrition Examination Survey—conducted by researchers affiliated with the U.S. Centers for Disease Control and Prevention (CDC)—which examined obesity during two periods over the last decade. Although there was a slight uptick in obesity for youth, researchers found a 6 percent increase among adults. The adult obesity rate jumped from nearly 34 percent in 2007-2008 to 40 percent in 2015-2016.

Nearly 34 percent of adult Texans are obese, making the state the eighth most obese in the country.

The cost of obesity

Individuals are considered overweight or obese if they exceed what is considered "normal weight" for their height, age, gender and build. According to the National Institutes of Health (NIH), a person who weighs too much is considered "overweight," but a person with too much body fat is "obese." More precisely, obesity has been defined by the NIH as a body mass index, or BMI, of 30 or more. BMI is a calculation of a person's weight and height, which strongly correlates to body fat content.

Obesity increases an individual's risk for chronic health conditions, including hypertension, type 2 diabetes, stroke and cardiovascular disease. According to the CDC, obesity can also increase the risk of at least 13 types of cancers, such as endometrial cancer, liver cancer and pancreatic cancer. The agency reported that 40 percent of all cancer cases in the country were diagnosed in association with obesity.

In addition to the personal health toll, all of these medical issues also translate to heftier medical expenses.

The nation's obesity epidemic currently costs between \$147 billion and \$210 billion each year in medical care, including preventive, diagnostic and treatment services, according to the CDC.

If we can teach people how to make healthy food taste good, that solves a lot of the problem. If food tastes good, people will eat it. If it tastes bad, they might eat for a small amount of time, as long as their will allows them to. But we all know that the will to do something is very small.

- J. WESLEY McWHORTER

Nutritionist supervisor of the Nourish Program at the Michael & Susan Dell Center for Healthy Living at UTHealth

Providing solutions

Although the causes of obesity are clear, simply telling Americans to drop the extra pounds hasn't worked.

"We know why people are obese. We know the reasons behind it. We know what they need to change, but what's lacking is how to tell people to do it," McWhorter said. "We can tell people, 'You need to lower your BMI, you need to reduce your heart disease risk, etc.,' but we don't tell them how to actually do it. That's that missing link. ... It's one of the reasons we're seeing a trend that's gradually increasing."

The Nourish Program at UTHealth combines culinary medicine with nutrition education. Culinary medicine is a hands-on, evidence-based approach that merges nutrition and culinary science to teach people in the community how to cook for optimal health.

"It's a food-first education model," said Laura Moore, director of the Nourish Program. "We start with food, whether it's from the garden or from the grocery store, and then we take it into the kitchen and make healthy food taste good."

Preparing food that is healthy and delicious is an important strategy to ensure people cultivate and continue good nutrition habits.

"If we can teach people how to make healthy food taste good, that solves a lot of the problem," McWhorter said. "If food tastes good, people will eat it. If it tastes bad, they might eat for a small amount of time, as long as their will allows them to. But we all know that the will to do something is very small. It doesn't last. When food tastes good, you're going to eat it and you enjoy it."

The doctor is in ... the kitchen
In addition to helping community members

learn how to cook, the Nourish Program also allows medical professionals—including physicians, medical students, residents and nurses—to swap their scrubs for aprons. The program isn't intended to produce master chefs, but to teach basic cooking skills with nutrition information that can be shared by health care providers treating overweight and obese patients.

"We believe that if we start at the top with our physicians and work all the way down, we're spreading the same word across the board to everyone and we're all on the same page," Moore said.

Despite obesity's link to a slew of preventable chronic diseases, fewer than one-fifth of American medical schools make a nutrition course mandatory for students, according to David Eisenberg, M.D., director of culinary nutrition at the Harvard T.H. Chan School of Public Health in Boston, Massachusetts. (continued)



¿Eres bilingüe?

Grow your medical career with a certificate from The University of Texas at Austin.

Medical Interpreter Certificate Program

Enrolling Now in Austin • Coming Soon to Houston

utmedinterpreter.org



"Today, most medical schools in the United States teach less than 25 hours of nutrition over four years. The fact that less than 20 percent of medical schools have a single required course in nutrition, it's a scandal. It's outrageous. It's obscene," Eisenberg told *PBS NewsHour* last year.

Nutrition education is especially important for health care providers in internal medicine, gastroenterology and cardiology—specialties covering many of the diseases that can be prevented or delayed by healthy eating.

A recent survey of 930 cardiologists commissioned by the American College of Cardiology found a similar information gap about nutrition. The results, published last year in the American Journal of Medicine, found that 90 percent of the cardiologists surveyed reported receiving no or minimal nutrition education during their fellowship training and 31 percent reported no nutrition education in medical school. Still, nearly all of the cardiologists—95 percent—considered it their responsibility to provide patients with basic nutrition information.

But without adequate training, most medical professionals are ill-equipped to give their patients useful, relevant and consistent healthy eating advice—particularly with the plethora of diet plans, pills and potions in the marketplace.

To successfully combat obesity, it will take representatives from all entities affected by the obesity problem—insurers, health care professionals, educators, corporations large and small, and, yes, food companies, too—coming together ... ? ?

— SHARON SMALLING Clinical dietitian specialist at Memorial Hermann-TMC

"One of the biggest problems is that mixed diet messaging. You hear from one provider, 'This is what you need to do,' and then it's something different from someone else. Then you have somebody with letters behind their name; they have a book, and you follow what they're saying," McWhorter said. "We're trying to keep that messaging consistent, which is really important for the public that doesn't understand nutrition because it's super confusing right now."

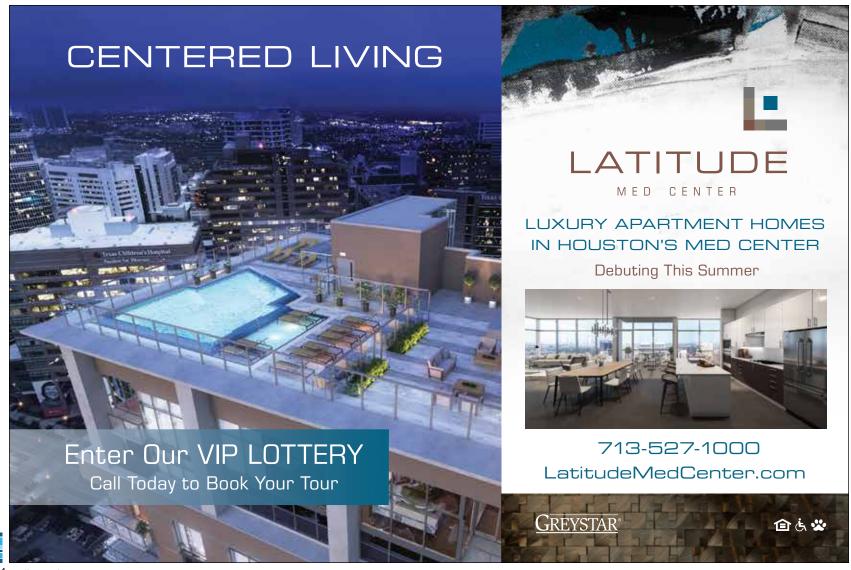
'It takes a village'

Other dietitians in the medical center advocate for nutrition by visiting local schools, community events and businesses to teach healthy eating habits.

"Our hope is that we educate one person, who educates or at least tries to influence changes in others—be it their family, co-workers or friends," said Sharon Smalling, a clinical dietitian specialist at Memorial Hermann-Texas Medical Center, who coaches patients recovering from cardiac and pulmonary conditions.

Ultimately, there is no one-size-fits-all solution to the obesity health crisis. With genetics, food deserts, food prices and time constraints contributing to the complex kaleidoscope of obesity issues, experts agree that "it takes a village," Smalling said.

"To successfully combat obesity, it will take representatives from all entities affected by the obesity problem—insurers, health care professionals, educators, corporations large and small, and, yes, food companies, too—coming together to determine strategies that will work in many different circumstances to overcome barriers to healthier lifestyles and access to the assistance needed," Smalling said.



Fight the Bite

Targeting mosquito habitats using geographic information system (GIS) software

By Christine Hall

osquito season is in full swing in the Houston area, which means residents face an increased risk of catching a potentially serious disease from a mosquito bite.

Harris County Public Health has studied mosquito-borne illnesses and prevention techniques for half a century, and now with a research group that includes Baylor College of Medicine and ExxonMobil, the county is developing a new way to analyze Aedes aegypti mosquito vectors across the Houston area.

Using a geographic information system (GIS), researchers are able to evaluate and then create an algorithm to detect where the mosquitoes are most likely to live, said Melissa Nolan, Ph.D., an epidemiologist at the University of South Carolina who started working on this project while she was a research associate at Baylor.

GIS software, enabled by California-based mapping and technology company Esri, offers a way to gather and analyze data using spatial location, maps and 3-D to reveal patterns and relationships. The software narrowed mosquito habitats to three general areas around Houston: The north side, the west side and the Houston Ship Channel.

The trap that researchers are testing is made by Microsoft and features automated sensors that detect the mosquitoes they want to trap based on wing beats, explained Mustapha Debboun, Ph.D., leader of the research group and director of mosquito and vector control at Harris County Public Health.

Researchers visited the three areas and set up traps to collect mosquitoes and test them for possible diseases. At 268 different



Harris County Public Health's laboratory breeds mosquitoes for research.

We are always collecting, sampling and surveying. We are trying to figure out a model of where the mosquitoes can be found, and the satellite images will help us.

— MUSTAPHA DEBBOUN, PH.D.

Director of mosquito and vector control at Harris County Public Health

sites, 400 traps were deployed underground and above ground, Debboun said. Surveyor technicians go out on a weekly basis and collect the mosquitoes.

"We are always collecting, sampling and surveying," Debboun said. "We are trying to figure out a model of where the mosquitoes can be found, and the satellite images will help us."

Puddles of water

The GIS is also helping researchers analyze the breeding habitats of mosquitoes.

Houston's peak season for mosquitoes falls between May

and September, when some 56 different species are swarming. Only female mosquitoes bite because they need the blood to produce eggs.

Researchers are looking closely at three species: Aedes aegypti, which can carry the Zika and West Nile viruses; Culex quinquefasciatus, which can transport the West Nile virus and St. Louis encephalitis; and Aedes albopictus, the Asian tiger mosquito that can carry the West Nile, dengue and chikungunya viruses.

Already in 2018, mosquitoes carrying West Nile virus have been discovered in Harris County and north of Houston in Montgomery County.

(continued)



Most people infected with West Nile virus experience flu-like symptoms, although severe cases can cause inflammation of the brain and the membrane around the brain.

Between 2015 and May 2018, some 5,700 symptomatic Zika cases were reported in the United States, according to the U.S. Centers for Disease Control and Prevention. Meanwhile, the World Health Organization says dengue is Mustapha Debboun, Ph.D., director of the mosquito and vector control division at Harris County Public Health, stands inside one of the county's mobile mosquito laboratories.

responsible for about 22,000 deaths yearly worldwide, mostly among children.

Mosquitoes like to lay their eggs on stagnant water, and warm summer water increases development of the eggs. Culex quinquefasciatus adult female mosquitoes prefer to breed in polluted stagnant water and to feed on blood from birds. Viruses are often spread by mosquitoes who have fed on the blood of infected birds.

"The satellite images show places where puddles of water are created when it rains—tire groupings, bird baths, cemeteries and construction sites," Debboun said.

Not all mosquitoes emerge at the same time of day, making it difficult to employ one type of prevention method. Aedes aegypti mosquitoes prefer the daytime and often hide in the grass, so spraying—which is often done at night when

HTG:TX

Medical Center Core Labs + HTG

Now you can use HTG's next-generation sequencing based technology for molecular profiling. Core Labs will process your samples on-site – including sample prep, sequencing, and data analysis – for as little as \$300 per sample including two-group differential expression analysis. HTG EdgeSeq technology allows you to profile hundreds to thousands of targeted RNAs and miRNAs with no extraction – from most samples as small as:

- 15 µl of biofluid
- One 5 µm FFPE section
- 10 ng of extracted RNA
- ≥3,000 cells

To learn more, call **Miguel Medina**, **Ph.D.** at 832-599-0013 or email **mmedina@htgmolecular.com**



HTG Molecular Diagnostics, Inc. 3430 E. Global Loop, Tucson, AZ 85706 Call 877-289-2615

For Research Use Only. Not for use in diagnostic procedures.

In the U.S. and other applicable jurisdictions, HTG EdgeSeq is a trademark of HTG Molecular Diagnostics, Inc Any other trademarks or trade names used herein are the intellectual property of their respective owners.



66 We have a hypothesis of what is going on, but the challenge is trying to narrow it down. There are many ditches in Houston, so massive bioinformatics will be needed. 99

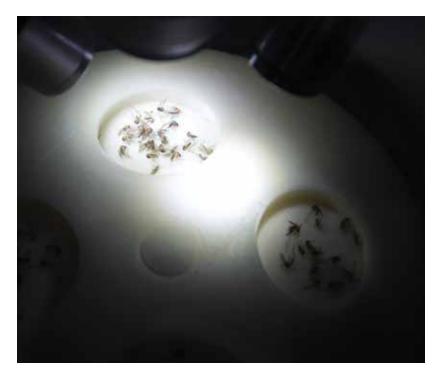
> - MELISSA NOLAN, PH.D. Epidemiologist at the University of South Carolina

most people are inside—isn't a viable solution.

Bringing partners together

Local researchers using GIS software hope that places beyond Houston will benefit from their work.

"My goal is to provide this algorithm so rural areas in Texas that don't have a vector control program like Houston can train two or three people to use this program," Nolan said.



She continues to work on the project from the University of South Carolina, which intends to launch its own version of the GIS project.

Nolan presented her early findings in 2017 at the Pumps & Pipes conference, an annual Houston-area event that unites the aerospace,

energy and health care industries for education and collaboration.

GIS is, indeed, uniting different disciplines. One is ExxonMobil's upstream unit, where remote sensing and GIS technology are being used to locate mosquito breeding habitats in Central America.

A close look at different breeds of mosquitoes at Harris County Public Health's "Skeeter School," designed for elementary-age students.

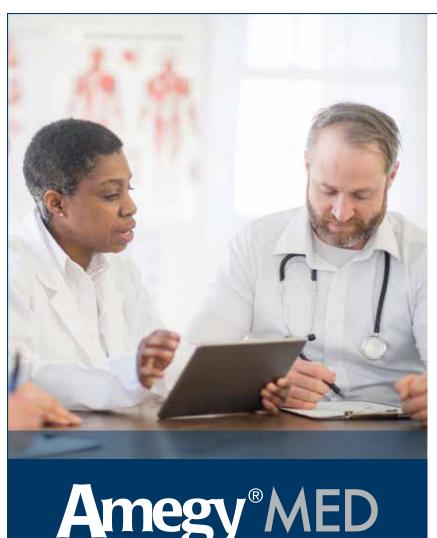
ExxonMobil often uses this technology to assess environmental impact and oil reserves.

In addition, Nolan and others are working with University of Houston researchers on a machine that releases sound waves to kill mosquito larvae in water.

The technology could benefit the military, too. GIS could be useful in locating the habitats of sand flies, mosquito-like insects that pester troops in the field and can cause disease.

For now, the research in Houston's three mosquito hot spots continues, as researchers work to get a complete picture of habitats in the area.

"We have a hypothesis of what is going on, but the challenge is trying to narrow it down," Nolan said. "There are many ditches in Houston, so massive bioinformatics will be needed."



Specialty Banking for Physicians

As a medical professional you dedicate your life to the health of your patients—often at the expense of your own financial well-being. This is where Amegy Bank® can help. In this ever-changing healthcare industry, we're committed to supporting you with innovative financial instruments, ranging from lines of credit and home and practice financing' to the latest treasury management products and solutions-based wealth planning.

Personalized service for you, so you can stay focused on your patients.

Amegy Bank. Here, you grow.

Contact me to learn more.



Jordan Golson Vice President, Private Banking 815 Walker Street, Suite 1350 Houston, TX 77002 NMLS# 1094641 713.235.8825 | jordan.golson@amegybank.com

AmegyBank_®

¹ Loans and some treasury management products and services are subject to credit approval. Terms and conditions apply. See banker for details.



A division of ZB, N.A. Member FDIC 🔯 Equal Housing Lender NMLS# 467014

UNLEASHING THE EBOLA VACCINE

Fighting a virus in the Democratic Republic of the Congo

By Ryan Holeywell

fter three decades of working with the deadly Ebola virus, Thomas Geisbert, Ph.D., a professor of microbiology and immunology at the University of Texas Medical Branch at Galveston (UTMB Health) is finally reaping the life-saving fruits of his professional labor.

In May, the World Health
Organization (WHO) began distributing more than 7,500 doses of
the experimental rVSV-ZEBOV—
the Ebola vaccine Geisbert helped
create—to contain an outbreak in
the Democratic Republic of the
Congo that has infected more than
60 people and killed at least 28.

WHO officials say the inoculations represent a "paradigm shift" in the way countries respond to the deadly virus, whose symptoms include a high fever and internal bleeding, because this is the first time a vaccine has been used to fight Ebola at its onset.

"It's clear that this is what we have all wished for for quite some time," said Joseph McCormick, M.D., a former official with the U.S. Centers for Diseases Control and Prevention who is now an epidemiology professor and regional dean at UTHealth School of Public Health in Brownsville. "In terms of Ebola control, this is a big deal."

What we do in the BSL4 [Biosafety Level 4] is dangerous. My wife runs my lab. The people in the lab are some of my closest friends. You're used to putting people you care about in harm's way.

— THOMAS GEISBERT, PH.D.

Professor of microbiology and immunology at UTMB Health

For Geisbert, it's the culmination of decades of Ebola research dating back to the 1980s when he started his career working at the U.S. Army Medical Research Institute of Infectious Diseases.

Since Ebola was discovered in 1976—and until the major outbreak in western Africa in 2014 that killed thousands—the virus generally emerged every few years and killed dozens to hundreds of people in small African villages with each outbreak.

At the start of his career, the military wasn't concerned about widespread Ebola illness, Geisbert said. There was greater worry that the then-Soviet Union would try to use Ebola and its cousin, the Marburg virus, as biological weapons. After the Sept. 11, 2001, terrorist attacks and the deadly mailed anthrax letters that same year, officials worried about potential terrorism involving Ebola.

(continued)

Facing page: Thomas Geisbert, Ph.D., works inside the Biosafety Level 4 (BSL4) laboratory at UTMB's Galveston National Laboratory. The lab is designed to contain the world's most deadly, easily transmittable diseases.





Motorcycle and bicycle taxis wait for passengers outside Wangata hospital in the town of Mbandaka, Congo, where hundreds were vaccinated against Congo's deadly Ebola outbreak in late May.

While in the Army, Geisbert worked with Heinz Feldmann, M.D., Ph.D., then-chief of the special pathogens program at the Public Health Agency of Canada's National Microbiology Laboratory, on what ultimately would become an Ebola vaccine. Both scientists were part of a multi-national team of 14 researchers, including Geisbert's wife, virologist Joan Geisbert, from the United States, Canada, Germany and France who published the seminal 2005 paper in Nature Medicine unveiling their Ebola vaccine that worked in non-human primates.

Traditionally, vaccines for conditions like the flu or meningitis work by prompting the body to generate disease-fighting antibodies. But when that same technique has been used with Ebola, the resulting antibodies have been ineffective at controlling the disease.

So researchers used a different technique. The rVSV-ZEBOV vaccine works by placing part of the Ebola virus within a benign virus that isn't dangerous to humans. The Ebola vaccine essentially teaches the body's T-cells, a key part of the immune system, to recognize and attack Ebola, preventing the virus from replicating. Basically, the body trains on a fake version of the virus so it's better prepared when it encounters the real thing.

Though the vaccine was promising, not much happened for a decade. Administering the vaccine faced a major logistical challenge because it's difficult to predict where the virus will strike. Meanwhile, testing the vaccine had been ethically fraught. And, there's the reality of the economics: Ebola was a relatively rare disease that only emerged every few years and

there wasn't a lot of money to be made from vaccinations.

"So we had these vaccines in the 2000s, and we knew they worked great in monkeys, but they just sat there, honestly," Geisbert said.

It's a problem that's not unique to Ebola, said Peter Hotez, M.D., Ph.D., dean for the National School of Tropical Medicine at Baylor College of Medicine. Ebola was considered a "neglected disease," Hotez said, and was viewed as a low priority.

Then came the Ebola outbreak in West Africa from 2014 to 2016, which killed more than 11,000 people. Cases also arose in the United States. No longer could the disease be considered a terrifying condition that had relatively limited impact. For the first time, Ebola killed on a massive scale.

"It changed the way we thought about Ebola," Geisbert said.

Governments and philanthropic organizations around the world were forced to recognize the devastation that Ebola had unleashed. Those entities sped up development of the vaccine, Hotez said, so it could be used at the end of the outbreak. Officials administered the vaccine to people in close contact with the infected and they also gave it to those known to be in contact with the contacts through a method called the ring technique. More than 4,000 at-risk people received the vaccine.

"I remember telling reporters, when this was used at the end of the big outbreak, 'if it saves one person's life, it was worth it," Geisbert recalled. The vaccine performed better than that: Not one person who received it contracted Ebola.

But those numbers were bittersweet. On one hand, they proved that the vaccine was extremely effective. On the other, Hotez said, the outcome suggested "11,000 people died who didn't have to die."

The success of the vaccine at the end of that outbreak gave officials the confidence to use rVSV-ZEBOV—at this point licensed to drugmaker Merck—at the onset of this spring's outbreak in the Democratic Republic of the Congo. McCormick, of UTHealth, said as long as health officials figure out how to maintain ample stocks of the vaccine and get it to rural areas, it might prevent

Democratic Republic of the Congo something like the West Africa outbreak from ever happening again.

In late June, WHO officials said the current Ebola outbreak appeared to have stopped, though it would take until the end of July to officially confirm. Peter Salama, M.D., WHO deputy director-general for emergency preparedness and response, told *Stat News* that he believes the vaccination effort helped contain the outbreak.

Geisbert's role in developing the vaccine is his third brush with Ebola-related fame. In 1989, he discovered the Reston virus, a species of Ebola, in monkeys that had been imported to a laboratory in the Washington, D.C. suburbs. The discovery set off a minor panic, given the lab's proximity to the nation's capital. The incident was chronicled in the Richard Preston bestseller, The Hot Zone. Geisbert snapped the photo of the virus that appears on the book cover.

His expertise was crucial again in 2014 when a Liberian man in Dallas was diagnosed with Ebola, as were medical personnel who treated him.

"I was on the phone with [then-Texas Governor] Rick Perry every other day," Geisbert said.

But as Geisbert reflects on his years of work in dangerous conditions, he's hopeful.

"What we do in the BSL4
[Biosafety Level 4] is dangerous,"
Geisbert said, referring to the type of lab where he works, which houses the world's most deadly, incurable diseases. "My wife runs my lab.
The people in the lab are some of my closest friends. You're used to putting people you care about in harm's way."

When he's in the lab, he often thinks about people in Africa and elsewhere who could be saved by his work.

"They can't help that that's where they were born or that they're in this setting," Geisbert said. "You realize that could be your brother, your son, your wife."

KEY FACTS ABOUT EBOLA



- Ebola virus disease (EVD), formerly known as Ebola hemorrhagic fever, is a severe, often fatal illness in humans.
- The virus is transmitted to people from wild animals and spreads in the human population through human-to-human transmission.
- The average EVD case fatality rate is around 50 percent. Case fatality rates have varied from 25 percent to 90 percent.
- The first EVD outbreaks occurred in remote villages in Central Africa, near tropical rainforests. The 2014-2016 outbreak in West Africa involved major urban areas as well as rural communities.
- Community engagement is key to successfully controlling outbreaks.

 Good outbreak control relies on applying a package of interventions, namely case management, infection prevention and control practices, surveillance and contact tracing, a good laboratory service, safe and dignified burials and social mobilization.
- Early supportive care with rehydration, and symptomatic treatment improves survival.

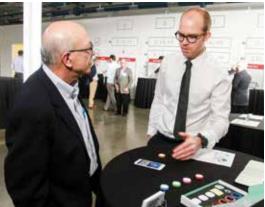
Source: World Health Organization

Changing Behavior: Challenging, But Possible

Two TMCx digital health startups and a UH researcher offer solutions

By Christine Hall





Top: Sean Eldridge, co-founder and CEO of Gain Life, pitches his digital health solution at the TMC Expert Forum in March. **Bottom:** Aleksander Eiken, M.D., medical associate at Klikkit, explains the Klikkit smart button to a TMC Expert Forum attendee.

umans are creatures of habit, which makes change difficult. Starting an exercise program, beginning a medication regimen or adhering to a new schedule can be challenging, even for the most determined people.

But two startup companies that recently completed the Texas Medical Center Innovation Institute (TMCx) digital health accelerator program, along with a University of Houston researcher, are offering creative solutions to help individuals change their ways.

Gain Life

Behavioral change has two necessary components, according to Sean Eldridge, co-founder and CEO of Gain Life, a technology company focused on behavior design. One part is executive function—conversation, planning, goal-setting and creating routines. The other part is "centered identity," which involves clarifying one's purpose and values.

Eldridge created the digital application Gain Life with his co-founders to help individuals change their behaviors. The team was inspired by psychologist Daniel Kahneman, Ph.D., winner of the Nobel Prize in economics and author of *Thinking, Fast and Slow.* Kahneman's work is based on a model he calls System 1 and System 2 thinking. System 1 is unconscious or "fast" thinking, while System 2 is conscious or "slow" thinking.

Eldridge's real-life example of System 1 thinking is buying fast food on the way home, while System 2 thinking would be buying ingredients to make a healthy meal.

"How you want to change behavior is to take a person from unhealthy System 1 thinking to System 2—taking control of decisions to be healthy or managing your diabetes—and then back to System 1 making those subconscious healthy decisions," Eldridge said. "When you are lost in the jungle with a machete, you can carve a path, but you don't know which way to go. If you have that North Star, you have a path and can see where you're going. That is where Gain Life comes in."

Klikkit

Klikkit is a Danish company that uses sound alerts and visual signals from smart buttons to reinforce good habits. The buttons—which can be placed on almost anything, from a jar of vitamins to a vegetable—work with an app that can be downloaded onto a smartphone.

When a person clicks one of the buttons, the app makes a record and monitors progress. If the button isn't pressed, the user will receive a notification while the Klikkit beeps and flashes.

This process is based on the "habit loop," a neurological cycle discovered by Massachusetts Institute of Technology researchers that governs habits and consists of a cue, a routine and a reward.

"You have the visual cue, and even more powerful—a light flash and sound," said Aleksander Eiken, M.D., a Klikkit medical advisor. "The more senses stimulated, the more powerful the reminder."

Clicking the button develops a "routine" and delivers a "reward." The user feels accomplishment as the body releases a small amount of dopamine, which is what keeps people addicted to reward-motivating behavior, Eiken said.

Motivational interviewing

Building new behavior can take a few months to a few years, which can be problematic for patients with complicated or ever-changing medication regimens.

Susan Abughosh, Ph.D., is hoping to improve medication compliance by changing patient behavior. The University of Houston (UH) pharmaceutical health outcomes and policy researcher recently received \$459,000 from the National Institutes of Health to help patients with diabetes and high blood pressure follow their medication schedules.

Poor medication adherence kills 125,000 Americans annually and costs the health care system nearly \$300 billion a year in additional doctor visits, emergency department visits and hospitalizations, according to the American Heart Association (AHA). The AHA also identifies four reasons why people don't take their medication: they forget, they don't think it's working, they fear side effects and the cost is too high.

Abughosh, an associate professor in the UH College of Pharmacy, plans on taking a personalized approach to the problem via customized conversations between patients and UH pharmacy students. This process, known as motivational

interviewing, includes asking open-ended questions, providing positive reinforcement and expressing empathy and understanding.

"Instead of talking as an expert, we train students in motivational interviewing of patients to move them down to behavior change," Abughosh said. "Patients are the experts of themselves, and they have their own reasons why they are not [taking their medications]."

Abughosh is working with Marcia Holstad, a project consultant with Emory University School of Nursing, to teach the students motivational interviewing techniques. The students will then interview patients by phone during their six-week rotation at Cigna Healthspring, a north Houston health care provider.

For the first year of the three-year grant, the team will identify medication refill patterns among a group of about 15,000 patients who have been prescribed an angiotensin-converting enzyme (ACE) inhibitor or an angiotensin II receptor blocker (ARB), commonly used to regulate high blood pressure and diabetes. Students will make monthly follow-up calls for six months, Abughosh said, and post-intervention data will be examined to see if there has been any improvement for high-risk patients.



The University of Houston's Susan Abughosh, Ph.D., received a grant to help patients with diabetes and high blood pressure follow their medication schedules.

"We know that knowledge doesn't always translate into behavior change, but empathy and reflecting back on the problem actually helps," she said. "Motivational interviewing intervention is a powerful tool and could be used in other settings. And providing the pharmacy students with this kind of resource is a skill they can carry into their own lives."



Combating Bias and Discrimination in Science and Medicine

An essay by Carl E. Josehart

There is much going on in our world that can lead us to doubt whether progress towards equality is possible. We live in a time of rising intolerance, a resurgence in anti-LGBTQ and anti-immigrant sentiments and actions, a renewed attack on women's reproductive freedoms, and the list goes on. Persistent bias still exists for people of certain religious faiths, people of certain ethnic backgrounds, undocumented immigrants, LGBTQ individuals, the disabled, the poor, the homeless and the mentally ill.

Even if we do not consciously act on them, biases cause harm by impacting who we hire, what we expect and what issues get prioritized for study, research and treatment. Science stands as an important arena to break down barriers and improve acceptance; and yet, as scientists, we are human beings and remain susceptible to society's biases.

The history of science and medicine is littered with examples of social biases clouding scientific judgment. While it would be easier to believe that these issues are behind us, evidence shows bias and discriminatory beliefs are hardly historical footnotes.

A study published in *Proceedings of the*National Academy of Sciences of the United
States of America in 2016 shows that among
medical students and residents:

- 25 percent of white respondents believe that blacks have thicker skin than whites
- 30 percent believe that blacks have stronger and denser bones than whites
- 5 to 10 percent believe that nerve endings in blacks are less sensitive than in whites.

Overcoming bias takes more than tolerance. It takes more than acceptance. It takes equal representation in all levels of academia, scientific study and clinical practice in order to challenge false beliefs and break the cycle of discriminatory practice.

A range of poor health outcomes has long been associated with communities of color, including depression, cardiovascular disease, infant mortality, preterm labor and low birthweight. A growing body of evidence shows that negative, harmful physiological changes are caused by the stress of living with discrimination. In other words, discrimination, like smoking, is itself the cause of disease through a process

described as "weathering" or allostatic load, according to a study published in the *American Journal of Public Health*. This evidence challenges us to address discrimination and bias as a public health issue.

In 2016, a woman earned, on average, 79 cents to every dollar paid to a man, with the gap widening to 60 cents for black women and to 55 cents for Hispanic women. Wage disparities contribute to poverty, the single greatest predictor of health outcomes in the United States today. By age 25, Americans with the highest incomes live, on average, more than six years longer than their poor counterparts, and this gap remains throughout life. At age 65, those at the top half of the income distribution live almost five years more than those in the bottom half—a finding that has been consistent since the 1970s, according to data collected by the U.S. Government Accountability Office.

Women have historically been underrepresented in scientific research. Therefore, clinical guidelines in medicine have historically been normed on male subjects, leaving treatment for women sub-optimized or even harmful. A study published in the *Journal of Women's Health* in 2011 analyzed whether or not clinical trials funded by the National Institutes of Health (NIH) included women and minorities as participants, as required by the NIH Revitalization Act of 1993. The results were disappointing.



"This research was undertaken to examine studies published in nine high-impact journals in 2009 for compliance with the NIH inclusion and reporting guidelines for sex and race/ethnicity and to compare the results with previous findings from 2004," the authors wrote. "We found very little improvement over the last 5 years. The median enrollment of women in studies that included both sexes remained low, at 37 percent."

Representation for people with disabilities is significantly worse. While approximately 20 percent of the U.S. population has a disability, fewer than 1 percent of students with disabilities make up medical school graduating classes. A 2016 U.S. Bureau of Labor Statistics report states that a mere 17.9 percent of persons with a disability were employed, compared to 65.3 percent of those without a disability. The medical model of disability that sees disability as a disease, rather than a normal part of life, contributes to bias in employers who routinely report that people with disabilities pose greater risks to their organizations, are less reliable as employees and are less productive. Admitting more students with disabilities to medical school is a critical step in normalizing disability, diminishing the stigma associated with disability and opening up new avenues for research.

With respect to issues of gender identity and sexual orientation, a survey from Stanford's LGBTQ Medical Education Research Group suggests that medical students do not always feel adequately trained to care for the needs of LGBTQ patients. For example, 74 percent of medical students surveyed felt prepared to care for patients with HIV, while only 25 percent felt prepared for care related to sexual reassignment surgery.

We cannot fight intolerance with ignorance. We need to first start by making sure that all populations are adequately represented as clinicians, scientists, research participants and academics.

Carl E. Josehart is interim COO of Houston's Jewish Family Service and the former CEO and senior vice president of TIRR Memorial Hermann. This essay was adapted from his 2018 acceptance speech for the Albert Schweitzer Fellowship Humanitarian of the Year Award (asfhg.org), which is bestowed upon individuals who have made great contributions to the community through service.

Treating Epilepsy with CBD Oil

Only certain patients have access to the cannabis-based oil under Texas' restrictive law

By Ryan Holeywell



alveston resident Trysten
Pearson, who has epilepsy,
experienced his first seizure in 2013
when he was 12 years old. But last
summer, his mother Shena Pearson
explained, his condition began to
deteriorate quickly.

Despite taking a slew of medications, and despite having a device implanted under the skin of his chest that sends electrical impulses to his brain to reduce the number and severity of his seizures, Trysten's symptoms persisted.

He often felt nauseous and he'd vomit every few days. Because exercise triggered his seizures, his school stopped allowing him to participate in physical education, leading to weight gain. His grades were dropping and his memory was fading, too.

"Because of these horrific seizures, when I show him photos from when he was younger, his memory

is completely lost," Shena explained.
"Sometimes, he looks at a photo
from his past, and he just bawls.
He says, 'It's unfair to me that my
history is gone."

But this spring, Trysten's luck finally turned, thanks to a treatment that has become available to him and thousands of other epilepsy patients across the state.

"My life has changed so much," said Trysten, who turns 17 in July.

Teachers told Shena that
Trysten was less distracted at
school and that his performance
had improved. In his first 30 days on
his new treatment, he had just one
seizure. He hasn't felt this well for

the past three years.

And it's all thanks, the Pearsons say, to cannabis.

"I really wanted this medicine to work because of how many times pills have failed me," said Trysten, who takes drops of the oil orally. "Once I started taking it, I felt so much better. I don't have seizures."

For the Pearsons, cannabis was a last resort to relieve Trysten's epilepsy after years of other treatments failed to provide relief. *(continued)*

Left: Epilepsy patient Trysten Pearson has found relief with CBD oil. Below: Morris Denton, CEO of Compassionate Cultivation in Manchaca, Texas, checks on cannabis plants.



They were astounded by how quickly, and how well, the treatment worked.

Across Texas, doctors and patients are now finally able to take advantage of a three-year-old law that makes cannabidiol oil, or CBD oil, available to some epilepsy patients. CBD oil is derived from the cannabis plant, also known as marijuana. CBD oil provides symptom relief without intoxicating effects. A different substance in the plant, tetrahydrocannabinol, or THC, is responsible for the high associated with cannabis.

In June 2015, Gov. Greg
Abbott signed into law the Texas
Compassionate Use Act after it
passed both chambers of the state
legislature by wide, bipartisan margins. But it wasn't until late 2017 that
the state issued full licenses to the
only three businesses in Texas that

can now legally provide CBD oil to prescribed patients.

Meanwhile, doctors have been slow to sign up for the program as they navigate the new law. As of late June, just 42 physicians across Texas were registered with the state to become CBD oil prescribers, including 12 in Harris County, though not all are prescribing CBD oil at this point. According to the Epilepsy Foundation of Texas, approximately 149,000 Texans have been diagnosed with the form of epilepsy that would make them eligible for the program.

For many who have used CBD oil, the newly available treatment has provided relief when all else failed. About two thirds of epilepsy patients will respond to the first or second medicine they're given for epilepsy. But once an epilepsy patient has taken two different

Top: Compassionate Cultivation partners with Xabis, a cannabis processing company, to extract, purify and distill CBD oil. Below: Taylor Kirk, director of

medicines
without
relief, the
odds that a
third medication will
work are
less than
1 percent,
doctors
say. That
leaves other
options,

such as special diets, surgeries, device implementation—or CBD oil.

"This can be really beneficial to patients," said Michael Watkins, M.D., assistant professor of pediatric neurology with McGovern Medical School at The University of Texas Health Science Center at Houston (UTHealth). Watkins works at the Pediatric Epilepsy Clinic at UTHealth, where about 20 patients have been prescribed CBD oil. He said the stigma associated with taking medicine derived from cannabis is fading.

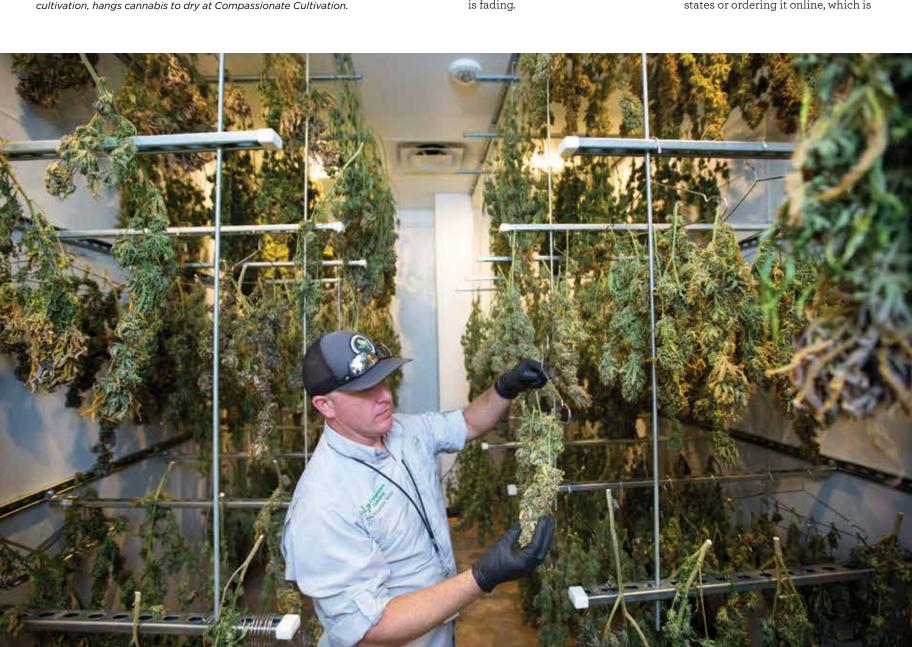


"Most
people are
looking for
anything
beneficial
to prevent
their kids
from having
seizures,"
Watkins
said.

Doctors, patients

and advocates are quick to point out CBD oil isn't a miracle cure. It doesn't eradicate epilepsy and it doesn't help everyone. But for some patients, it can help eliminate or reduce their symptoms, and it may allow them to ease off of other drugs that have serious side effects, including anemia, low platelet levels, liver failure, pancreatitis, allergic reactions and suicidal tendencies.

Before the Texas law took effect, many patients were trying CBD oil on their own by visiting other states or ordering it online, which is



Now that the people of Texas are seeing the real impact of this medicine, not just the potential impact, we need to figure out how to get it into other people's hands that are as deserving as people with intractable epilepsy. That's up to the legislature to figure out how to make that happen.

- MORRIS DENTON CEO of Compassionate Cultivation

a legal gray area. The problem with that, doctors say, is it's difficult to determine the precise potency of the drug the patient is receiving.

"It's kind of risky, but these parents and families are desperate for their kids," said Gretchen Von Allmen, M.D., chief of pediatric epilepsy with McGovern Medical School at UTHealth and a pediatric neurologist at Memorial Hermann-TMC.

Under the state's compassionate use law, patients' medicine must contain at least 10 percent CBD oil and no more than 0.5 percent THC. For context, recreational marijuana might measure 20 percent THC. Those restrictions ensure Texas CBD oil makers maximize the compounds that provide symptom relief while minimizing those that can cause side effects or a high (Trysten Pearson, for his part, said he experiences no side effects from CBD oil).

Still, Texas's CBD law is considered "pretty restrictive" compared to those involving cannabis in other states, said Katharine Neill Harris, Ph.D., a drug policy fellow at Rice University's Baker Institute for Public Policy.

Texas patients must get two doctors to approve their use of CBD oil. And they are only eligible for a prescription if they have what's called "intractable" epilepsy—meaning at least two other medications have failed to help them. Harris said she wouldn't even call Texas' policy a "medical marijuana" law.

Perhaps the biggest hurdle of all is price. The Pearsons pay \$350 per month for Trysten's CBD oil a typical amount—and the cost isn't covered by insurance. That's unlikely to change, experts say, as long as the federal government views cannabis as a Schedule I drug with no accepted medical use. In May, a federal appeals court sided with the Drug Enforcement Administration, ruling that CBD oil is a Schedule I controlled substance. But in June, the U.S. Food and Drug Administration approved Epidiolex, a CBD oral solution to treat seizures associated with rare and severe forms of epilepsy.

Morris Denton, CEO of
Compassionate Cultivation, which
provides the CBD oil used by the
Pearson family, has launched a
discount program with the Epilepsy
Foundation Texas to help subsidize CBD oil costs for low-income
Texans. So far, the program has
served 12 of its approximate
300 customers.

Meanwhile, the Texas law doesn't permit people with any diagnosis besides intractable epilepsy to use CBD oil, even though some other states allow those with multiple sclerosis, late-stage cancer, Crohn's disease and other conditions to access CBD oil or medical marijuana. That has frustrated some patients and advocates, but skeptics say more research must be done to evaluate whether and how CBD oil can treat those illnesses.

"Now that the people of Texas are seeing the real impact of this medicine, not just the potential impact, we need to figure out how to get it into other people's hands that are as deserving as people with intractable epilepsy," Denton said. "That's up to the legislature to figure out how to make that happen."

EXTRACTING CANNABIDIOL OIL









Chris Woods, director of process, extraction, and testing at Xabis, uses a machine to extract pure plant oil from cannabis. The machine uses a carbon dioxide (CO2) extraction process in a closed-loop system to recapture more than 90 percent of the CO2 used. After extraction, several steps including purification, distillation and chromatography will yield oil with cannabinoid purities as high as 99 percent.

Saving Umair

Texas Children's Hospital performs a novel endoscopic epilepsy surgery

By Alexandra Becker

is parents describe it as a miracle—a gift from God. Just six months ago, Umair Majeed, now 12, was suffering from debilitating seizures multiple times a day. But last November, Sandi Lam, M.D., a pediatric neurosurgeon at Texas Children's Hospital, performed an endoscopic hemispherotomy as a surgical treatment for Umair's worsening epilepsy. A first for both the surgeon and the hospital, the innovative, minimally-invasive approach to the procedure has only been reported by two other institutions worldwide.

Sitting in their living room in Conroe, Texas one evening in late May, Umair's father, Ashif Majeed, and mother, Bushra Majeed, spoke about their son's transformation since the successful operation. Although the family was fasting for Ramadan, they had set out food for guests-dates and yogurt-covered raisins, walnuts and Gatorade, and a large box of chocolates their youngest had won in a fundraiser for their mosque. They were eager to share every detail and overwhelmed with gratitude for their son's renewed health.

"There have been no seizures, or any symptoms of seizures, either," Ashif said. "Before, he was having seizures, headaches and vomiting all the time. The situation was becoming more complicated. First, it was once a month, then once a week, then every other day, then in a single day, five times, so it was a really scary situation for us."

To make matters worse, Umair's epileptic episodes would often result in physical injuries. He had to wear a helmet because of his frequent unpredictable falls from seizures; during Hurricane Harvey, he broke his arm after having a seizure



Umair Majeed, 12, was the first patient at Texas Children's Hospital to undergo an endoscopic hemispherotomy for the treatment of his epilepsy.

in the bathroom, and clinicians at Texas Children's Hospital The Woodlands had to guide a frantic Bushra by phone around the flooded roads so that she could reach the emergency room.

His medications, it seemed,

were no longer effective.

Ashif, a veterinarian originally from Pakistan, explained that Umair had suffered a stroke at birth that damaged the left side of his brain and rendered the right side of his body weak. But until 2014—the first

We wanted to give a better life to him. There was no solution except for surgery. They were increasing the doses of medicine, but it wasn't helping.

— BUSHRA MAJEED

Mother of epilepsy patient, Umair Majeed

time Umair was paralyzed with a seizure—the effects of this right-sided weakness were a manageable part of his daily routine, so his level of disability had been minor. As his episodes worsened, however, physicians at Texas Children's Hospital became convinced that surgery was Umair's only shot at a normal life.

"We wanted to give a better life to him," Bushra said. "There was no solution except for surgery. They were increasing the doses of medicine, but it wasn't helping."

Another option

Because Umair's seizures originated from just one side of his brain—the side that had been damaged by a stroke when he was a baby—he was an ideal candidate for a surgery in which one side of the brain is either removed (called a hemispherectomy) or completely disconnected from the other side (called a hemispherotomy) in an effort to detach the rest of the brain and the body from the problematic area causing seizure activity. Seizures arising from the diseased side of his brain would no longer be able to spread to the unaffected half of the brain, thus allowing the healthy side of the brain to function to its full potential.

Hemispherectomy and hemispherotomy surgeries have been performed for decades by select neurosurgeon specialists. They typically involve a large, question mark-shaped incision on the top and side of the head through the scalp, and are frequently associated with a long recovery, swelling, postoperative pain, substantial blood loss and, often, the need for a post-surgical shunt to help drain accumulated fluid.

But Lam, one of just a few specialists who has performed a large

number of traditional open hemispherectomy and hemispherotomy surgeries, believed there could be another option: a less invasive way to achieve seizure freedom.

Before she met Umair, Lam had been working for months on a novel technique to do hemispherotomies through smaller surgical access points, reasoning that a smaller incision would mean easier recoveries for her patients. She gathered tools already found in the operating rooms at Texas Children's for other minimally invasive procedures, and prepared by working in the surgical anatomy and cadaver lab at Baylor College of Medicine. She also developed contingency plans alongside



The Majeed family poses at home in Conroe, Texas, from left to right: Ashif, Umair, Ayan, Bushra and Sara.

the technique so that her team could fall back to the traditional "open" method once the surgery began, if necessary. When she reached a point where she felt she could perform the procedure with the new, minimally-invasive technique, she waited for a patient whose condition would lend itself to the highly specialized operation.

"It was kind of a journey in responsible innovation," Lam said. "Instead of just trying this in any patient, we actually developed it in the surgical anatomy lab, and then very carefully picked our first cases based on who had the anatomy that would really be the most amenable to this type of surgery. It's my job to worry and it's my job to be able to fix things, and Umair's anatomy, and his specific condition worked very well for this minimally-invasive technique."

(continued)



A little courage

Sitting on the couch surrounded by his family, Ashif recalled the evening before Umair's surgery—when he was ready to cancel everything.

"The day before the surgery, they called us because they needed more blood for analysis, and I took him but thought, in the morning, we will not go back. Those were my inner feelings," Ashif said, remembering how nervous he had been. "Then I came home and [Bushra] told me we have to go. I prayed to God and I got a little courage, and now he has a new life."

Umair's surgery began on the morning of Nov. 22, 2017. Rather than cut a larger incision around the top and side of the scalp, Lam made a straight, 5-centimeter incision in the skin. Through that, she created a small opening in the skull bone, about 2 centimeters by 4 centimeters, on the top of Umair's head, where she used an endoscope to see deep inside his brain.



Sandi Lam, M.D., is a pediatric neurosurgeon at Texas Children's Hospital who developed a minimally invasive surgical technique to treat epilepsy.

With specialized microneurosurgical instruments and what look like extra-long tweezers, Lam carefully disconnected one of the brain's hemispheres from the other in a multi-step process. This method

would ensure that the frequent seizures from the diseased, seizing, left side of the brain would not spread to the healthy right hemisphere.

The surgery lasted six hours. Umair's parents said that when Lam emerged from the operating room, she seemed both exhausted and elated. As for them, the surgery's success, and Umair's recovery, exceeded their wildest expectations.

"We were scared the wound would remain open and his face would remain swollen for days, that the recovery would take a few months. But with this technique, the recovery is just a few days," Ashif said. "He was out of bed within a day, and he was only in the hospital for about a week. They had said one to three months and that he should have homeschooling for six months, but he was home the ninth day and in school after about a month and a half."

Potential and plasticity

Umair said he feels much better now that he no longer has seizures, and he is thrilled to have shed the helmet that used to protect his head. He is working with physical therapists, occupational therapists and rehabilitation specialists to learn how to use the right side of his brain to its full potential. Although Lam hopes Umair will remain seizure-free and that he can be independent in his daily life, she does not anticipate that he will develop fine motor skills in his right hand—something he never had because of damage from his stroke at birth.

But that doesn't seem to slow him down. At a follow-up appointment after the surgery, Umair excitedly told Lam a new joke he learned from friends at school, then proceeded to give her an enthusiastic high-five with his right hand.

"When one side of your brain is disconnected, sometimes you have to relearn whatever that part





Ashford Gardens

7210 Northline Drive, Houston, TX 77076 713.699.2882

The Bradford at Brookside

301 W. Park Drive, Livingston, TX 77351 936.328.5021

The Broadmoor at Creekside Park

5665 Creekside Forest Drive The Woodlands, TX 77389 281.255.8180

The Colonnades at Reflection Bay

12001 Shadow Creek Parkway Pearland, TX 77584 713.434.3800

The right setting at the right time

- Multi-Disciplinary approach to manage complex medical conditions
- Personalized, appropriate therapy and cardiac recovery
- Coordinated care to achieve a speedy recovery and return home
- Avoid hospital readmission
- Reduce patient length of stay
- We accept MCR, MCD and Private Pay as well as most insurance plans

The Crescent

11353 Sugar Park Lane, Sugar Land, TX 77478 281.276.2050

Fort Bend Healthcare Center

3010 Bamore Road, Rosenberg, TX 77471 281.342.2142

Larkspur

201 S. John Redditt Drive, Lufkin, TX 75904 936.632.3346

Laurel Court

3830 Mustang Road, Alvin, TX 77511 281.824.0070

Solera at West Houston

2101 Greenhouse Road, Houston, TX 77084 281.599.5540

Call today for a tour or more information.

Elysian Hospice 281,333,2458

TheraCare Home Health 281.488.4663

of the brain was doing—you have to retrain the good side of your brain to take over," Lam said, adding that if one side of her own adult brain was removed, for example, the opposite side of her body would be paralyzed. "Umair was a case in which the affected side was damaged as a baby, and over the years, the seizures had already taken over, so functions from the affected, diseased, seizing side had already started to shift over to the healthy side—that's why he was able to walk and move his right arm and right leg after we disconnected the whole left side of his brain."

For this reason, Lam said, the younger the patient, the better the candidate for this type of surgery.

"Because of brain plasticity, younger patients are able to really retrain or relearn skills—a younger patient has more potential and plasticity than an older patient," Lam said. "We have to be very careful when we pick who to do this surgery 66 We developed this more minimally invasive technique so that it would be easier for the patients to tolerate and so that they could go on with therapies and rehabilitation faster.

> - SANDI LAM, M.D. Pediatric neurosurgeon at Texas Children's Hospital

on—that we plan to do no harm, and that we also plan for expected benefits in cognition and neurodevelopment, as well."

Since Umair's groundbreaking surgery, Lam has performed endoscopic hemispherotomies on eight other pediatric patients. She has observed that not only has the minimally invasive technique cut down on recovery time, but, thus far, it seems very rare for patients to require a blood transfusion or a shunt—both of which are common with the typical "open" procedure.

"Some of the children in need of this surgery are much smaller than Umair, and just cutting through the

skin and cutting through the bone and really exposing all the areas of the brain that need to be visualized can result in enough blood loss to require a blood transfusion," Lam said. "We developed this more minimally invasive technique so that it would be easier for the patients to tolerate and so that they could go on with therapies and rehabilitation faster."

Lam said that since the first surgery in November, her team has presented their initial findings in different forums around the world. They also submitted a write-up detailing the surgery for publication and have been invited to present

the technique at the upcoming Congress of Neurological Surgeons and at the annual meeting of the International Society for Pediatric Neurosurgery. Colleagues from hospitals across the country are eager for opportunities to observe the surgery and learn the technique for their own patients.

"It's definitely something that has a learning curve. We are very conscious about the big responsibility in how we develop and disseminate this new technique, because it's a quite complex procedure," Lam said. "The families and kids don't realize that they've actually just had one of the biggest surgeries that we do in pediatric neurosurgery."

The Majeed family considers Umair's surgery a resounding success.

"The miraculous outcome of this technique is the quick recoverythe very quick recovery," Ashif said, looking at his son.



School of Public Health George McMillan Fleming Center for Healthcare Management

LEARN FROM LEADERS IN HEALTHCARE MANAGEMENT

Housed in UTHealth School of Public Health, the George McMillan Fleming Center for Healthcare Management provides rigorous training in healthcare management paired with a one-of-a-kind focus on population health.

- Houston area's only MPH program in healthcare management
- One of only five MPH programs in healthcare management in the nation accredited by the Commission on Accreditation of Healthcare Management Education (CAHME)
- Located in the heart of the Texas Medical Center
- Diverse faculty includes researchers, consultants, former executives and current administrators of major healthcare organizations
- Offers degree and certificate programs in the fast-growing field of healthcare management

Learn more about our programs go.uth.edu/flemingcenter



Can't Read the Label on Your Meds? Ask Chloe.

"Hey Chloe" is 'like having a sighted person in your pocket'

By Christine Hall

early 70 percent of Americans take prescription drugs, according to the Mayo Clinic.

Reading the tiny print on medication bottles—where dose amounts and critical instructions are found—can be tricky. For those with low or no vision, it's next to impossible.

But a recent collaboration between the AT&T Foundry for Connected Health, located in the Texas Medical Center Innovation Institute, and La Jolla, Californiabased Aira, which makes smart glasses for people who are blind or have low vision, offers a solution.

Aira's remote assistive technology connects smart glasses users—dubbed "explorers"—with a network of certified agents via an augmented reality dashboard. The agents serve as visual interpreters, helping users

accomplish a wide range of activities, such as walking down the street, navigating an airport or even reading a bedtime story.

Members of the AT&T Foundry for Connected Health team, while developing an artificial intelligence (AI) and machine learn-

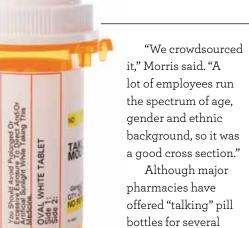
ing system to read the labels on medication bottles, partnered with Aira about a year ago to provide network connectivity to Aira's smart glasses.

The result is "Hey Chloe," a recognition solution with built-in, voice-activated technology that debuted in March 2018. Aira's new AI platform identifies prescriptions and over-the-counter medications.

Nadia Morris, former director of the AT&T Foundry, explained the process.

"First, [the computer] has to determine if it is a medication bottle or not," she said. "It's similar to the TxTag, where a photo is taken. Their systems are trained to know what a license plate looks like."

The TxTag system, which allows drivers to pre-pay tolls, works off an AI system that recognizes license plates. Morris's team applied the same process to medication bottles; team members brought in their own bottles and trained the computer to read them. The team even set up a secure system for other AT&T colleagues to donate images of their bottles to help train the computer.



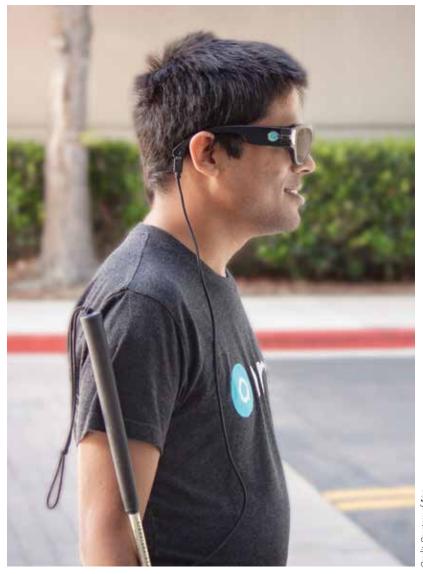
records instructions on a device that attaches to the bottle—"Hey Chloe" accesses instructions in a different way.

years—typically, a health professional

"Hey Chloe" users can activate the AI assistant by asking, "Hey Chloe, what medication is this?" The AI assistant will scan the field around the user and find the bottle of prescription medication. The glasses will read the label and turn that information into an audio file that is read into the user's ear, Morris said. The system also works for over-the-counter medication.

The AT&T Foundry team learned a few things during this project. One challenge with machine learning is providing a varied data set from which the computer can learn. In addition, because most pill bottles are cylinders, the user often must rotate the bottles for the glasses to read the prescriptions correctly.

Team members also discovered that while it seems like there is a CVS or Walgreens on every corner, a large number of prescriptions come from independent pharmacies, so they had to train the computer to recognize different types of labels, Morris said.



Members of the AT&T Foundry for Connected Health team partnered with Aira to provide network connectivity to Aira's smart glasses.

During the project, Morris was often asked why the team didn't use photos from the Internet, where such images are readily available. She said it was because those pictures are typically perfect, with the label always facing the right way. People who are visually impaired might not always pick up the bottle with the label facing them, she said.

Aira's next-generation wearables, Horizon smart glasses, come with "Hey Chloe" and became available in May 2018. The glasses are already paired with an Airadedicated smartphone, powered by AT&T, for those who don't own a smartphone.

There is a lot of synergy between the work Aira is doing to connect blind users and human agents, and what AT&T is accomplishing to power that connectivity, explained Greg Stilson, director of product management at Aira.

"AT&T has been a huge partner with us," said Stilson, who is blind.
"It stemmed from the need to have a partner who provided data. Imagine a constant video feed with a blind user connected to agents managing all of that data, with the 'explorer' using up that data on their own smartphone plan."

More than 35 percent of the interactions between agents and users involve some level of reading,

he added, which is why "Hey Chloe" provides such an advantage.

The artificial intelligence platform also helps users locate pill bottles that have been misplaced. Users scan an area with the glasses and ask the AI agent to locate the bottle of medication. In turn, the glasses recognize the medicine label among other items and direct the user to the bottle.

AT&T is helping Aira add new interactive abilities to "Hey Chloe" so the AI program will be able to recognize other items and even tell the user to move closer to an object if it is blurry, Stilson said.

The overall goal is for people to have freedom and interaction. "It's like having a sighted person in your pocket," he said.

And "Hey Chloe" is just the beginning.

"We have this beautiful AI and human interaction," Stilson said. "The pill bottle is one thing, but we are moving toward being able to read any text out there. Imagine going through an airport, one of the most challenging environments, where you have to go from Point A to Point B, passing restaurants and restrooms. Soon, all you will have to say is 'Chloe, read this.' Text reading is opening up the world of print, and we are very excited about it."



Aira's Horizon smart glasses were released in May 2018.

LARGE, MEDICAL/MUSEUM AREA BUILDING SITE



For a most successful real estate experience, call

Belinda B Schmidt

Top Producer 713.417.1177

belindas@johndaugherty.com





LUXURY PORT OLIO
INTERNATIONAL

MAYPARE

in central Houston with a short commute yet in a peaceful and pleasant neighborhood with room to stretch out and stake your claim? 3819 S Braeswood provides a great opportunity on an almost 17,000 square-foot lot, situated near the Texas Medical Center, Rice University and Houston Museum District. The neighborhood is platted with large lot sizes all around. Your new home would sit pretty,

overlooking wide open spaces and enjoying

Mother Nature—not looking into the windows

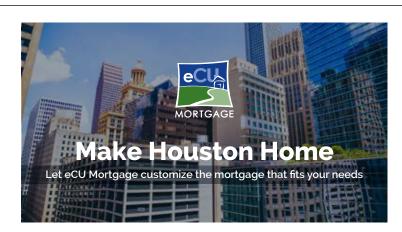
of your neighbor. With *Project Brays and

local underground detention underway, the

future looks promising and affords a great opportunity not envisioned long ago.

*See attachments for projected impact and timelines at johndaugherty.com (enter

3819 S Braeswood in search box).



Highlights

- True Foreign National Loans
- Fresh Start & Newly Self-Employed Loans
- Conventional I FHA I VA I USDA I Jumbo
- Track loan status with SKIPbySeth.com

Seth Delano Brown l NMLS #1501197

Residential Mortgage Loan Originator

Apply Today on our mobile app www.SKIPbySeth.com

- c: 713.330.9511
- 0: 713.676.8939
- e: sbrown@ecumortgage.com

eCU Mortgage, LLC l NMLS # 1071847 16430 Park Ten Place, Houston, TX 77084 ecumortgage.com





Trauma Season

Level 1 trauma centers and the YMCA work to prevent childhood injuries during the summer

By Alexandra Becker



With kids out of school for the summer, hospitals are braced for the annual uptick in emergency room visits.

Known as "trauma season" in the field, the months of May through August harbor an increase in childhood injuries for a variety of reasons, including lax adult supervision and the dangers associated with swimming or playing in the heat.

"We see a spike in unintentional injuries in children during those months, and we speculate that it's partly because children are out of school and there's a lot more to get into when you're not structured in the school environment," explained Kristen Beckworth, manager of the Center for Childhood Injury Prevention at Texas Children's Hospital, a Level 1 pediatric trauma center.

Level 1 trauma centers, which deliver the most comprehensive trauma care available for the most complex or severe injuries, also stand on the front lines of prevention.

Through federal and local grants, the Center for Childhood Injury Prevention at Texas Children's implements programming geared toward child safety within the hospital and throughout the Houston area. The center also serves as the administrative arm for Safe Kids Greater Houston, the local chapter of Safe Kids Worldwide, a national organization.

"Our focus is on unintentional injury prevention—things that happen unexpectedly," Beckworth said. "We don't like to use the word 'accident' because when we're talking about car seat safety or bike safety or water safety, these

Our focus is on unintentional injury prevention—things that happen unexpectedly. We don't like to use the word 'accident' because when we're talking about car seat safety or bike safety or water safety, these things can be prevented.

— KRISTEN BECKWORTH

Manager of the Center for Childhood Injury Prevention

at Texas Children's Hospital

things can be prevented."

In the summer months, the trauma center does see an increase in hot-car deaths, heat strokes, bicycle injuries and drownings, Beckworth said.

Unintentional injuries are the leading cause of death among children in the United States and drownings are the leading cause of injury death for children ages 1 to 4, according to the U.S. Centers for Disease Control and Prevention (CDC). On average, three children in the United States die every day as a result of drowning. By late June, Texas had already recorded 45 drowning fatalities for 2018.

"Go for Green"

The YMCA of Greater Houston, which hosts 4,000 campers each day during the summer months, spends a lot of time teaching children to swim.

Campers attending the YMCA's day camp qualify to participate in free swim lessons in the "Go for Green" program. Each day campers swim, they take a swim test administered by the YMCA's aquatics staff. The kids qualify with a red, yellow or green band—the latter signifying the most proficient swimmers.

"Our goal is for all kids to have green bands by the end of the summer," said Curtis Lemieux, the executive director of summer programs for YMCA of Greater Houston.

The YMCA also trains counselors to help prevent other potential injuries. Each staff member spends more than 40 hours getting certified in first aid, CPR, emergency oxygen and automated external defibrillator (AED) use. In addition, the YMCA's risk management department ensures each program and environment is safe for the campers.

"They'll do a playground audit or a field audit—we call it a 360 assessment of the areas that surround us to make sure that it is a safe place for our kids," Lemieux said.

Hydration and shade are top priorities, he added.

"We make sure that all of our programs have water breaks scheduled every 30 minutes throughout the day and that even our outdoor camps have indoor spaces for kids to be sheltered from the sun," Lemieux said.

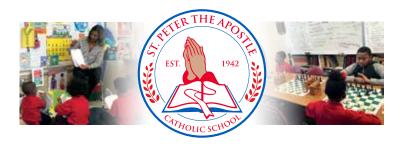
100 deadliest days

Fatalities related to teen driving also increase substantially in the summer—so much so that the weeks between Memorial Day and Labor Day have been called the 100 Deadliest Days of Summer by the AAA Foundation for Traffic Safety.

(continued)

Stressing Spiritual & Academic Excellence

From Pre-K3 through 8th Grades



Half-Off Tuition Scholarship
Available to EVERY newly enrolled student

EXTRACURRICULAR ACTIVITIES



6220 La Salette Street | Houston, TX 77021 www.stpacs.org | 713.747.9484



Make this summer a season for living life on your terms. Licensed chiropractors at The Joint help provide pain relief and preventative care, so you can live life to the fullest. Chiropractic can help with back and neck pain, joint discomfort, allergies, migraines and more. **Stop by a clinic today!**

West U

(713) 588-0858 | thejoint.com 3177 W. Holcombe Blvd. Houston, TX 77025



*Offer valued at \$39. Valid for new patients only. See clinic for chiropractor(s)' name and license info. Clinics managed and/or owned by franchisee or Prof. Corps. Restrictions may apply to Medicare eligible patients. Individual results may vary © 2018 The Joint Corp. All Rights Reserved.

I would be remiss if I didn't say we've seen an increase in gunshot wounds. Here at Texas Children's, typically we see this after someone accessed a gun at a friend's house. The kids are playing and they find a parent's gun and play around with it and it goes off. It's often not an intentional or violent act.

- KRISTEN BECKWORTH

The nonprofit research organization reported that, in 2016, more than 1,050 people were killed in crashes involving a teen driver during this period—an average of 10 people per day and a 14 percent increase compared to the rest of the year.

Children's Memorial Hermann Hospital, also a Level 1 pediatric trauma center, provides teen driver safety education for adolescents and parents through a multi-faceted high school-based program called Live Your Dreams.

"The CDC has designated

danger zones for teens behind the wheel, and we see these danger zones increase during the summer—driver inexperience, driving with teen passengers, nighttime driving, not using seat belts, distracted driving, drowsy driving, reckless driving and impaired driving," explained Sarah Beth Abbott, the injury prevention and outreach education coordinator at Children's Memorial Hermann Hospital. "We involve the teen and the parent and let them know about these dangerous behaviors and work to intervene."





Participants in "Stop the Bleed" training learn how to apply a tourniquet.

"Stop the Bleed"

As gun-related incidents continue to rise throughout the U.S., trauma prevention teams also are prepared for a spike in gun-related injuries during the summer.

"I would be remiss if I didn't say we've seen an increase in gunshot wounds," Beckworth said. "Here at Texas Children's, typically we see this after someone accessed a gun at a friend's house. The kids are playing and they find a parent's gun and play around with it and it goes off. It's often not an intentional or violent act."

Memorial Hermann Red Duke Trauma Institute and Children's Memorial Hermann Hospital, together with Ben Taub Hospital and Texas Children's Hospital—all Level 1 trauma centers—recently rolled out Stop the Bleed, a national prevention campaign that teaches the general public how to apply a tourniquet. Alongside first responders, individuals including HISD school nurses, parents and caregivers can learn a lifesaving skill that has increasingly been credited with reducing fatalities from gunshot wounds.

"It empowers people to respond and help those in need because,

often, first responders will not be the first at the scene," said Abbott, adding that uncontrolled bleeding can be a result of many types of injuries, not just shootings.

Abbott and Beckworth both stressed the need for adult supervision as the No. 1 general rule for keeping kids safe—during the summer months and year-round.

"If you're to watch the kids in the pool, then you are to watch the kids in the pool. You're not to watch the kids in the pool and Snapchat," Abbott said.





CURATED

The Intersection of ARTS and MEDICINE

By Britni R. McAshan

useums are designed to be stimulating, but individuals with special needs require special accommodations to make the most of their visits. The Museum of Fine Arts, Houston (MFAH) has partnered with local and national groups to develop three programs that serve specific populations.

The newest program, Sensory Explorations, is designed for young adults on the autism spectrum.

"There are certain things that we need to be aware of and certain things that we can try and build into the program to make sure it is as relevant and accessible for this particular population as possible," said Chelsea Shannon, an educator, writer and art historian at MFAH.

Sensory Explorations came about through a local partnership with Social Motion, a nonprofit founded by Wendy Dawson.

"I founded Social Motion eight years ago because of my stepson, Cameron," Dawson said. "I went into the community to find the social skills and extracurricular activities that he needed, and there was not anything for him. We teach our students with autism and similar special needs the social skills that they need—we call it 'front loading'—so when they meet occasions and situations in life, they will be able to handle them."

Sensory Explorations usually draws 10 to 12 participants for each session. Individuals in the group begin their museum experience with a gallery discussion and end by making their own art.

"We know that there is a real interest in exploring a multisensory experience for this population, and in kind of a safe and controlled environment," Shannon said. "They have a chance to process, reflect and talk about the experience they have just had."

Sensory Explorations is a great way for young autistic adults to experience the best of Houston's cultural resources, Dawson added.

MFAH's other special programs include Art Beyond Sight, for visitors who are blind or have low vision, and Looking Together, for visitors with dementia or Alzheimer's disease.

Art Beyond Sight, a national program started by Art Education for the Blind, emphasizes a verbal and tactile experience at the museum. At MFAH, tours begin with a detailed description of the piece of art the group will encounter. Gallery leaders also bring in materials used in the art work—including different types of stone, textured paint or raised and textured surfaces and diagrams.

Looking Together, a program

made possible through a partnership between MFAH and the Alzheimer's Association's Houston and Southeast Texas Chapter, begins each session by asking participants to observe an object and reflect on what they see.

"The program kind of becomes a way to access memories or life experiences," Shannon explained.
"In that way, it is a little bit less structured than the other programs because it really is based on that moment of connection and reflection."

For Dawson, MFAH's special programs help participants experience Houston on a deeper level.

"Like my son, everyone with autism strives to be normal ... to have the chance to experience these beautiful attributes that our city has in a 'normal' way that is tailored to their needs," she said. "Maybe it's just turning the lights down a little bit lower or limiting the amount of participants that come through. But it allows them basically equal access to everything that we love and enjoy and take so for granted in life."

Sensory Explorations, Art Beyond Sight and Looking Together are free programs, but space may be limited. Museum of Fine Arts, Houston is located at 1001 Bissonnet St. For information about special tours, email tours@mfah.org.





Young adults on the autism spectrum interact with art at the Museum of Fine Arts, Houston in a controlled environment.

- 1 DOUGLAS BARNES, M.D., chief of staff for Shriners Hospitals for Children Houston, was awarded the W.B. and Brandon Carrell Humanitarian Award.
- **2** | KATHERINE KING, M.D., PH.D., assistant professor of pediatrics infectious diseases at Baylor College of Medicine, received the Society for Pediatric Research New Member Outstanding Research Award at the Pediatric Academic Societies meeting.
- **3** | In early June, JAMES GEE was one of several new officers sworn in to the Texas Medical Center Police Department.
- 4 | Members of the TMC INNOVATION INSTITUTE pose before TMCx Demo Day on June 7. Twenty-one digital health companies presented their ideas to more than 350 investors and hospital stakeholders.
- 5 | The State Department selected REBECCA RICHARDS-KORTUM, PH.D., a Rice University bioengineer and global health pioneer, to serve as a U.S. science envoy. The Science Envoy Program selects distinguished scientists to promote the United States' commitment to science, technology and innovation as tools of diplomacy and growth.
- 6 On May 23, the first surgery was performed in Legacy Tower at TEXAS CHILDREN'S, their new home for heart, intensive care and surgery. Doctors performed a craniofacial procedure on a 9-month-old boy.
- 7 | JAMES ALLISON, PH.D., of The University of Texas MD Anderson Cancer Center, won the 2018 Dr. Paul Janssen Award for Biomedical Research, which was established by Johnson & Johnson. Allison won for pioneering a novel and effective strategy to harness the immune system for treating solid tumor cancers.
- **8** | MENG WANG, PH.D., associate professor in the Huffington Center on Aging and the department of molecular and human genetics at Baylor College of Medicine, was named a Howard Hughes Medical Institute Investigator at Baylor.







Credit: Nos. 1, 2, 8, 9, 11, 12, 13, courtesy photos; No. 5, © John D. and Catherine T. MacArthur Foundation – used with permission; No. 6, Paul Vincent Kuntz, Texas Children's Hospital; No. 7, Adolfo Chavez III; No. 10, Morris Makakoff











DO YOU HAVE TMC PHOTOS YOU WOULD LIKE TO SHARE WITH *PULSE*? SUBMIT HIGH-RESOLUTION IMAGES TO: news@tmc.edu

9 | PETER PISTERS, M.D., president of The University of Texas MD Anderson Cancer Center, takes a selfie with cyclists from Texas 4000, a charity that raises funds for cancer research. In addition to shorter rides, Texas 4000 is responsible for the longest charity bicycle ride in the world—Texas to Alaska. Texas 4000 donates regularly to MD Anderson.

10 | JORDYN TURNER, posing with McDonald's characters, was one of 85 high school students who received a \$2,000 scholarship from the Ronald McDonald House Charities (RMHC) of Greater Houston/Galveston at a celebratory RMHC Scholars brunch.

11 SALIM S. VIRANI, M.D., PH.D., associate professor in cardiology and cardiovascular research at Baylor College of Medicine and investigator at the Center for Innovations in Quality, Effectiveness and Safety at the Michael E. DeBakey VA Medical Center, was appointed chair of the leadership council and council for the prevention of cardiovascular disease at the American College of Cardiology.

12 | LAURA A. PETERSEN, M.D., chief, section of health services research at Baylor College of Medicine; director of the Center for Innovations in Quality, Effectiveness and Safety; and associate chief of staff for research at the Michael E. DeBakey VA Medical Center, was appointed to the Performance Measurement Committee of the American College of Physicians.

13 | Houston Texans defensive end
J.J. WATT received an honorary degree
from Baylor College of Medicine for his
humanitarian response to Hurricane Harvey
recovery. Watt spoke at the graduation as
PAUL KLOTMAN, M.D., president and CEO
of Baylor, along with other Baylor luminaries,
looked on.



7/9

Prairie View A&M University College of Nursing Information Session

Monday, Noon – 1 p.m. Prairie View A&M University 6436 Fannin St.

fdsmith@pvamu.edu 713-797-7000 7/10

Rice University Farmers Market

Tuesdays, 3:30 – 6:30 p.m. Rice University Parking lot entrance 13B 5600 Greenbriar Dr.

ricefm@rice.edu 713-348-5445 7/13

Functional Medicine: Approaches to Inflammation, Anti-Aging and Chronic Disease Conference

Friday, 7:15 a.m. – 4:45 p.m. Houston Methodist Research Institute 6670 Bertner Ave.

Tickets: \$10-\$190 Register: events.houstonmethodist.org cme@houstonmethodist.org 713-441-4971 7/28

Hot Topics in Liver Disease Conference, hosted by Baylor St. Luke's Medical Center

Saturday, 7 a.m. – 5 p.m. Houstonian Hotel Ballroom 111 N. Post Oak Lane

Free for medical and nursing students; tickets start at \$25 for medical professionals Register: eventbrite.com nforward@stlukeshealth.org 713-882-0136





Connected care. Superior outcomes.

HealthSouth Corporation and Encompass Home Health & Hospice have combined our post-acute strengths into Encompass Health. As part of a nationwide network, we are redefining expectations for how providers work together to create better patient experiences and deliver unparalleled outcomes. As a coordinated care team, we set the standard for the future of rehabilitation.



Rehabilitation Hospitals

Cypress • Humble • Pearland Sugar Land • The Vintage The Woodlands • Vision Park

ENCOMPASSHEALTH.COM/HOUSTONREHAB



Arrowwood Cir. Piney Point, \$6.4+ mil. Colleen Sherlock, 713.858.6699



West University, Price Upon Request Kristin Tillman, 281.785.3566



Boulevard Oaks, \$4.9+ mil. Colleen Sherlock, 713.858.6699







GREENVVOOD KING

3201 KIRBY DRIVE / 1616 S. VOSS RD., SUITE 900 / 1801 HEIGHTS BLVD. HOUSTON, TEXAS

LUXURY PORT/OLIO













