A detailed microscopic image of a neural network. The neurons are depicted with blue, branching processes (dendrites and axons) against a black background. Numerous orange, spherical clusters, representing amyloid plaques, are scattered throughout the network, particularly concentrated around the cell bodies of the neurons.

TMC | PULSE

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Baylor St. Luke's Medical Center





Mark Mulligan/Houston Chronicle. Used with permission.

WILLIAM F. McKEON

President and Chief Executive Officer, Texas Medical Center

The Texas Medical Center's name alone cannot capture the unique scope of what we accomplish every day in the world's largest medical city.

We're home to 120,000 highly talented individuals who perform work here at a scale that exists nowhere else on Earth. We provide more advanced care to patients and conduct more cutting-edge research than anywhere else.

As we approach the Texas Medical Center's 75th anniversary, it's worth reflecting on the confluence of events that led to the formation of this vital place.

Monroe Dunaway Anderson, a banker and cotton trader, in partnership with his brother and brother-in-law, built the world's largest cotton company. Anderson, who never married, formed the MD Anderson Foundation. At the time of Anderson's death in 1939, the foundation held more than \$19 million.

Then, in 1941, the Texas Legislature appropriated \$500,000 to build a cancer hospital and research center. The MD Anderson Foundation agreed to match the state funds if the cancer center would be built in Houston.

Ernst William Bertner, M.D., a physician and surgeon, returned to Houston after serving in World War I and recognized that Houston needed more care providers to serve one of the fastest-growing cities in the United States. As a physician, he treated many of Houston's business leaders, and he garnered their support to form the Texas Medical Center in 1945. Dr. Bertner and several business leaders orchestrated the purchase of the original 134 acres of land from the City of Houston that formed the genesis of the Texas Medical Center. He served as the organization's first president and CEO.

Baylor College of Medicine was initially based in Dallas. Discussions were underway to potentially merge Baylor College of Medicine with UT Southwestern in the 1940s when the Texas Medical Center offered Baylor free land, leading to the medical school's relocation to Houston.

Next year, all of us here in the Texas Medical Center will celebrate our 75th anniversary. Over that time, we've grown from 134 acres to 1,400 acres. Of course, our founders couldn't have predicted exactly what our campus would look like after 75 years—but they did have the foresight to take the early steps that ultimately allowed us to become a world leader in clinical care and research. We are forever indebted to them.

As we approach our 75th anniversary, we aren't just reflecting on where we've come from. We're thinking about where we're going. Just as our predecessors set us up for years of success, today we must continue to be stewards of this extraordinary place for future generations. We continue to take bold, strategic steps that will allow the Texas Medical Center to remain a global leader. Our next 75 years will be even more exciting.

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

TMC | PULSE

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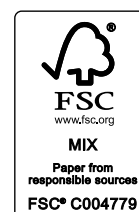


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ON THIS PAGE: D'Angelo looks out the window of his room at Covenant House Texas in Houston.

ON THE COVER: A computer illustration of amyloid plaques amongst neurons. Amyloid plaques are characteristic features of Alzheimer's disease that lead to degeneration of neurons in the brain. (Credit: Juan Gaertner/Science Photo Library)

TMC Innovation Debuts “Alpha” Program

Initiative supports early-stage innovation


BY ALEXANDRA BECKER

It is said that ideas shape the course of history—but how does an initial spark catch fire? It’s a question Lance Black, M.D., associate director of TMCx, is hoping to help answer with the creation of TMC Alpha, a new program at the TMC Innovation Institute.

Open to anyone employed at the Texas Medical Center, the program aims to guide individuals or groups who have ideas for improving health care or who are struggling to move beyond the earliest stages of innovation.

“This is a way for anybody who has an idea to walk into the TMC Innovation Institute and get formal support,” Black said. “It could be a nurse who has a seedling of an idea, or a research group that’s been working on a technology for some time and is now thinking about spinning out a company. We want to support those at the earliest stages of consideration for commercialization—to point you in the right direction.”

Held on the third Thursday of each month, the new TMC Alpha program is split into three parts:

 [WATCH A VIDEO ABOUT THE ALPHA PROGRAM AT TMCNEWS.ORG](https://www.tmcnews.org)

a lunch-and-learn session from noon to 1 p.m., opportunities to pitch from 1 p.m. to 3 p.m., and one-on-one “office hours” from 3 p.m. to 5 p.m., where attendees can meet with advisors for personalized coaching and guidance. There is no formal application process and no cost for the services offered.

Black said he hopes TMC Alpha will entice individuals with clinical backgrounds who may have great new ideas for health care but don’t know much about starting a business.

“Physicians, nurses, administrative staff—they all have a nuanced understanding of the unmet need,” Black said. “You have to be in the weeds living it day in and day out to be able to appreciate the nuances, and it’s from those nuances where real solutions come.”

“We’re trying to invite those people ... into what is really going to make technology progress to the next stage, and that is commercialization opportunities,” Black continued. “Part of our goal is trying to make sure they avoid the expense and time spent in areas that aren’t going to

be fruitful for the development of a company.”

The TMC Innovation Institute has more than 200 advisors, as well as community partners who can support commercialization efforts, Black said.

“It’s about matching people with the right skill sets to these innovators so they can take it forward to the next step,” he added.

TMC Alpha is also partnering with some of the innovation hubs embedded within Texas Medical Center hospitals and institutions to promote collaboration and provide a direct line between clinical settings and entrepreneurial experts.

Stuart Corr, Ph.D., director of surgical innovation and technology development at the Michael E. DeBakey Department of Surgery at Baylor College of Medicine, is one of a handful of ambassadors appointed to the new program.

“TMC Alpha can be very proactive in its approach and get things done very quickly,” Corr said. “They understand what’s at stake. All of the institutions within the TMC should view this as a resource that can give value back to their own institutions and to their employees.”

TMC Alpha will complement all the other work and research taking

place within hospitals and other institutions.

“These institutions already do a lot to support internal innovation,” Black said. “We want to be able to complement that. We don’t want to take the place of these resources; we want the innovators to go to their internal support systems and then come to TMC Alpha when they’re in need of next steps.”

William “Billy” Cohn, M.D., vice president for Johnson & Johnson Medical Devices Companies and executive director of the Center for Device Innovation at the Texas Medical Center, spoke at TMC Alpha’s first lunch-and-learn session.

Black said he hopes the monthly sessions will be casual and flexible—that attendees come dressed as they are, stay for as long as they like and return for future guidance as many times as necessary in order to propel their ideas forward.

“Being able to execute on a good idea and bring it to fruition is challenging and rare,” Black said. “I think TMC Alpha will ultimately be how we can best support local innovation and local companies.” ■

To learn more or to RSVP for a spot in the program, email alpha@tmc.edu.

“ This is a way for anybody who has an idea to walk into the TMC Innovation Institute and get formal support. It could be a nurse who has a seedling of an idea, or a research group that’s been working on a technology for some time and is now thinking about spinning out a company. ”

— LANCE BLACK, M.D.
Associate director of TMCx

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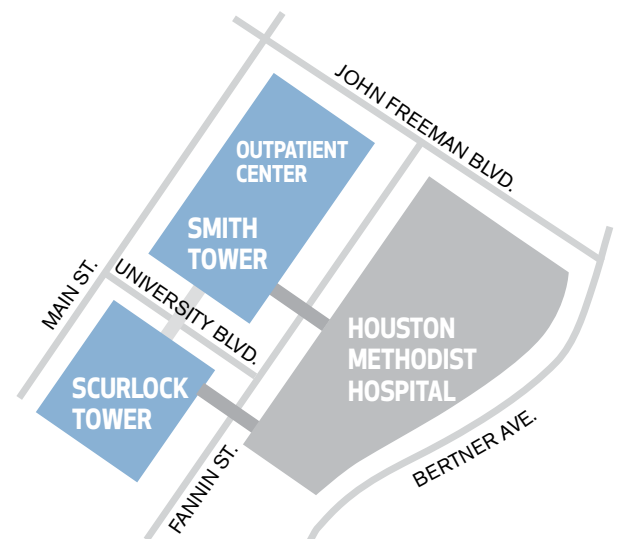


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How Two TMC Employees Saved Thousands by Joining a Vanpool

Thirteen years ago, Patricia discovered Houston METRO's regional vanpool program – METRO STAR Vanpool. Before then, she was driving from Crosby to the Texas Medical Center every day – twice a day. As if the stress from sitting in bumper-to-bumper traffic isn't enough, the cost of parking, tolls, and car maintenance can quickly turn a commute into the worst part of a person's job. Patricia had to fill up on gas at least 3 times a week. It made her feel like she was paying to go to work.

It was when she joined the vanpool that Patricia met Kathleen Henshaw. Thirteen years later, Patricia and Kathleen continue to share a ride to work, and a wonderful friendship. They are a shining example of how vanpooling brings people together and sometimes even creates life-long friendships. Patricia and Kathleen are part of an 8-person vanpool and share a 45-minute commute from Humble to the TMC. "It's really interactive," says Kathleen, "everybody knows each other. The newest person on our van has been with us almost a year."

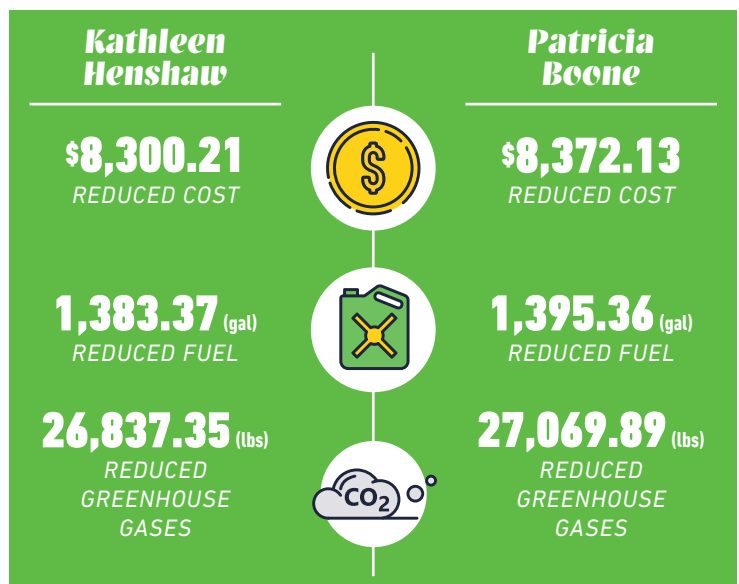
The TMC currently has 120 vanpool groups consisting of a total of 1,018 employees commuting from all over the Greater Houston area. "A vanpool route can end and/or start anywhere in the 8-county region," says Dezra Nauls, commuter services program manager at METRO. "We service Harris, Waller, Montgomery, Brazoria, Galveston, Fort Bend, Liberty, and Chambers County." METRO STAR has been Houston's vanpool provider for over 20 years. Through this program, thousands of commuters have been able to save time, money,

and reduce stress on their daily commute.

Taking the first step towards joining a vanpool is easy. Once a person registers, METRO STAR matches people with other commuters who live and work in similar areas with its ride-matching system. The cost is based on commute distance, van size and the number of commuters. The fare covers maintenance, fuel, tolls, insurance, roadside assistance and three emergency rides home per year.

Both women said they were compelled to give vanpool a try because of the potential savings, so we conducted a cost savings analysis on Patricia's and Kathleen's commutes to see how much money vanpooling saves them. Since 2016, both women have saved over \$8,000 each. Kathleen repurposes her savings towards the things that matter most to her while enjoying the benefits of not driving her car to work every day. "The savings mean more money in the family budget, less fear of breaking down on the road, less stress when I arrive at work and, of course, meeting new friends and colleagues from other UT locations."

COMMUTE SAVINGS SUMMARY SINCE 2016



Besides saving money, sharing a ride to work in a vanpool has also enhanced Kathleen's and Patricia's personal lives. "I can catch up on the news, nap, or relax and unwind from my day so when I get home to my kids I can be a better mom," says Kathleen. Patricia likes that she can pay bills, read, or plan things like family reunions during her commute. "Everyone on the van really respects your time. We've learned each other's personalities. So if we see someone reading or working, everyone tries to be quiet."

Vanpooling is a great way to improve your quality of life, meet new people, and help improve the region's traffic conditions and air quality. Commuters who are tired of driving in traffic every day and are ready to try their new commute can visit STARVanpool.com to register or call 713-224-7433 for more information.



N→EXT MED+

New technology and techniques

By Alexandra Becker

Another set of legs



Increasingly, exoskeletons are becoming a standard tool to help individuals with spinal cord injuries practice movement and regain strength in their lower extremities.

At just 26 pounds, the Indego, a powered hip-knee exoskeleton, is a lightweight, portable option that can be used for both personal mobility and as a gait training tool for physical therapy. The device, which can be broken down into five pieces and placed into a compact bag, fits onto the lower limbs and trunk and offers numerous benefits for users.

“Humans are designed to stand and move—that’s why we have legs,” explained physical therapist Shuo-Hsiu “James” Chang, Ph.D., an assistant professor in the department of physical medicine and rehabilitation at The University of Texas Health Science Center at Houston’s McGovern Medical School. “From a clinical perspective, this device helps a patient who is injured stand up. That’s very important, not just for psychological benefits but also for physiological benefits: bone density, bladder function, skin condition, cardiopulmonary function—all these physiological systems are able to benefit from just standing.”

Chang, who led a trial of the Indego at TIRR Memorial Hermann and is administrative director of the NeuroRecovery Research Center at TIRR, added that a secondary benefit of the device in a physical therapy setting is that it aids the clinicians who are working with the patient. The Indego also includes an iOS pad to help track, manage and customize its use.

“It’s easy to set up, it’s lightweight, and the device can generate a more natural gait pattern, so it feels like you’re walking normally,” Chang said. “Our experience is that the research participants like it very much.”

Indego has been approved by the U.S. Food and Drug Administration for clinical and personal use and is available for purchase. In the United States, it costs about \$80,000. Many insurance carriers are still considering whether or not to cover it. ■

Music spills into the hallways of the Metropolitan Multi-Service Center on West Gray, filling the space with holiday cheer. Children and adults with disabilities are rehearsing for their end-of-the-week performance, *Audition Boot Camp Summer 2019 Showcase*, set to music from the classic Christmas comedy, *Elf*.

Each summer, The River Performing and Visual Arts Center, part of Theatre Under the Stars (TUTS), opens its doors to students with disabilities ages 4 and older who want to participate in a musical theater day camp. Siblings are welcome, too. Six one-week camps are offered over the course of the summer.

The River, which merged with TUTS in 2010, was founded by Cathy Binstock in 1996 to give her youngest daughter, Samantha, a chance to take ballet lessons. Samantha has mild cerebral palsy.

"Samantha wanted to take dance classes just like her sisters," said Eileen Edmonds, assistant director of education at The River. "Every dance school turned her away, so her mother decided that every child deserves the richness of an arts education and she started The River."

CURATED

The Intersection of ARTS and MEDICINE

By Britni R. McAshan

Edmonds brought her own son to The River 12 years ago. Francisco, now 18, was born with 16q deletion syndrome, a rare genetic disorder.

"He was naturally drawn to music as an infant," Edmonds said. "I brought him to the summer camp and it helped to bring him out of himself because he loves to sing and dance."

The program that started with one dance class and seven ballerinas has grown into a fine arts mecca offering music, movement, acting and visual art classes. More than 35,000 students have participated.

"The camp provides our students an opportunity to shine on stage," Edmonds said. "Students come in here and they may not verbalize or be able to expressively respond to you, but oftentimes, where they don't have that difficulty is with singing. What happens when you combine music with movements that cross the midline of your body—like dance—it helps create

new neuropathways between the two hemispheres of your brain."

Beyond taking part in the summer programming and classes offered throughout the year, River participants also have auditioned

and appeared in several TUTS performances, including *Beauty and the Beast*, *Oklahoma*, *The Addams Family* and *Seussical*.

"Because of the merger with TUTS, we have been able to expand our programming to include adults and that has been so meaningful to us because we felt horrible when our students aged out of the program," Edmonds said, adding that some of the adult students have gone on to become camp counselors and assistant directors.

Today, Francisco, Samantha and their siblings still participate in The River programs. Each end-of-the-week performance, Edmonds said, allows the participants to shine.

"Our students are so confident and brave by the end of camp," she said. ■

For more information about programming at The River Performing and Visual Arts Center, go to tuts.com/river or call 713-558-2600.



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HUGO ORTEGA is the executive chef and co-owner of some of Houston's most acclaimed restaurants, but the James Beard Award winner wasn't born with a silver spoon in his mouth. The eldest of eight children, Ortega was raised in Mexico and moved to Houston in 1984, determined to find employment. He started as a dishwasher and later as a busboy and line cook at Backstreet Cafe, working under owner Tracy Vaught, whom he later married. The two have since built a culinary dynasty in Houston, opening Hugo's, Caracol and Xochi.

Q | Who is your idol?

A | My grandmother. I was born in Mexico City, and when I was six, I went to live with her in the mountains in Oaxaca. I was a city boy always surrounded by people, and then when I went to live with her, it was just me and her by ourselves on the top of a mountain, with nobody around. So, I was afraid in the beginning. But she took me by the hand and she showed me how to work the land. In the summer, we harvested watermelons and cucumbers and tomatoes. We lived to eat, literally. We would make a live fire every day by collecting wood and by being exposed to nature, and she showed me how to respect the animals and the food and the people who are surrounding you. She showed me how to cook. That was really, really wonderful.

Q | When you made the decision to leave Mexico, why did you choose to come to Houston?

A | At the time, I had a cousin who lived here, and from time to time he sent letters to my aunt, his mom, and I would read these letters to her. And he would say he was doing well, and sometimes he sent \$20 or \$50, which at the time was a lot of money, especially considering the

exchange rate in Mexico then. Being a teenager, that opened my eyes, and I said, I need to go where he is. So that was the beginning of my considering it. Then at some point, eventually a couple of friends and I made the decision to come.

Q | We're sitting here in your flagship restaurant, Hugo's, which is situated in the heart of Montrose. What do you love most about this neighborhood?

A | Culturally, it's very important for me to be here in Montrose. It's where all the writers and artists live, where every person expresses themselves freely, and I'm very happy to be a part of this community and to be able to cook for these wonderful people. We've been here for 17 years now.

Q | Are the recipes you create today inspired by the culinary foundation you built when you were young?

A | You develop flavor by knowledge, by eyesight—seeing how previous generations have done it and add a bit of flavor to that. I think that has stayed with me. But as you get older, you spread your wings, and then someday you get brave enough to say, well, I want to tweak it a little bit and see what happens. And those

are baby steps. Now when you're cooking at home, of course, you're free to experiment more, but when you have the obligation to cook professionally and look at it from a business point of view, I'm responsible for another 40 families at the end of the day. Responsibilities kick in and you have to make sure you're careful how you approach something. Food is so important and you want to make sure people are still enjoying it. It's just part of owning a business.

Q | I've heard that you grow at least one ingredient for your dishes onsite at Hugo's. Can you tell me more about that?

A | About five years ago, a friend came by and give me a very small fig tree, it was maybe even just a branch. I thanked him, but said, 'Where am I going to plant it?' And he said, 'Figs love sun. Plant it right there in the middle of the parking lot.' So, I did that. And the following year it had grown into a small bush, and it gave figs. I see birds coming and taking advantage of the fruit and I said, wait a minute. I got upset and I said, you know, we need to be smarter than these birds. We need to collect the fruit ourselves and see what we can do. And of course, what came naturally to me was to

make molé. So, I did a fig molé. And then I asked Tracy and a couple of the chefs how they would serve the molé. Traditionally, for us, it is chicken and tortillas, but this molé had sweet tones. A friend of mine is a hunter, and from time to time he will bring venison and I will make tamales for him, and this particular time he told me he had some quail. So, I served quail with fig molé.

That was one of my first experiences with making a seasonal molé with fruit that grows around here. Since then, I've made others. This year I made two molés: mango, using fruit from Mexico, and pineapple. I've made cherry too, and peach.





I have a peach tree at Backstreet that, luckily this year, gave lots of fruit, so I am now doing a white peach molé. We serve that with lamb ribs. I've challenged myself to make a different molé now every summer.

Q | Is it critical to you to source your food locally?

A | Local is very important. When you are part of a community, you have to look around and see what you can utilize and contribute—to make the food more a part of who you are and where you live. From time to time I even ask my neighbor across the street from Hugo's if we can use flowers from his beautiful

magnolia tree. We use them for the tables for brunch on Sundays. It's a part of where we live, and that kind of relationship is very important.

Q | Increasingly, consumption of processed foods has been shown to have major health consequences, contributing to diabetes, heart disease and even some cancers. Do you think people would be better off if they cooked more and ate less processed or packaged foods?

A | Definitely, absolutely. It's a given as a Texan, because this state is so wonderful—it's big in every

direction. You have the ocean over here, the Gulf of Mexico, where you can just go to Freeport and get some beautiful fish and shrimp. You can get watermelon, peaches, tomatoes, corn—all summer long—and you don't need to worry about processed food at all. We have a Mexican market and a farmer's market we visit frequently, where you'll find chicken and farm eggs, organic produce, beautiful flowers—it's not important for us to get processed foods.

Q | What is your favorite food?

A | Corn! It's something I enjoy eating every day in many ways. There's corn on the cob, and masa is used to

make tortillas, and once you have that, you can put everything in a taco, right? It's the same with Italian food, when you combine water and flour and you make pizza dough, you can put anything in a pizza. I think Mexican food is more popular than ever these days—even the great Thomas Keller [chef and proprietor of The French Laundry] recently opened a Mexican restaurant in Napa. ➡

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Q | As a chef and business owner, do you have any regrets about your career?

A | I think we've taken a long time to develop new concepts. For example, we opened Hugo's in 2002, after Tracy owned Backstreet Cafe since the early eighties. And then six years ago we opened Caracol, which is coastal Mexican cuisine, and then three years ago we opened Xochi, where we serve Oaxacan food, which is where my grandmother was born. So, I wish I had been a little more aggressive and opened restaurants more frequently. But that's easier to say than to have the money to do it. There's always that competitive drive to challenge yourself and create a new concept.

Q | What are your hobbies outside of cooking?

A | I love cycling. It's a dangerous sport, but that's my passion. I go into George Bush Park and I cycle there with friends. I've had some really bad accidents; one time I broke my clavicle. You have to concentrate when you're riding your bike, but it's a wonderful thing to do—it's just you and the bicycle.

Q | In addition to the restaurants you have opened as part of H Town Restaurant Group, your wife co-operates Third Coast Restaurant at the Texas Medical Center and co-owns Prego Restaurant in Rice Village. Each year, all these restaurants participate in Houston Restaurant Weeks, during which proceeds from specially priced lunch, brunch and dinner menus benefit the Houston Food Bank. What makes this fundraiser so important to you?

A | Being here, you're always in a position to give back. I truly believe in that. There are people that need more than me today, and any way I can help, I want to do that, to contribute to my society. And a cook is always welcome. We can feed the world, right? I feel blessed to be able to contribute back to this wonderful city. ■

Hugo Ortega was interviewed by Pulse senior writer Alexandra Becker. The conversation was edited for clarity and length.

Mind-Body Medicine Goes Mainstream

Saybrook University, in collaboration with the Institute for Spirituality and Health, is offering graduate degrees at the TMC

By MAGGIE GALEHOUSE

Starting this fall, Saybrook University will offer satellite master of science and Ph.D. programs in mind-body medicine at the Texas Medical Center, hosted, in part, by the Institute for Spirituality and Health.

The graduate degrees promote a holistic approach to wellness, emphasizing the interconnectedness of the mind and body when treating patients and guiding overall care. Practices taught are designed to help manage stress and certain diseases, including Type 2 diabetes and obesity.

Classes in yoga, meditation, nutrition, spirituality, hypnosis and biofeedback—which uses electrical sensors to help individuals control certain bodily functions without drugs—are just a few of the

curriculum offerings.

“Our goal is to teach people new skills and lifestyle changes right away, when they’re amenable—to have a yoga practitioner right in the medical clinic,” said Donald Moss, Ph.D., dean of the College of Integrative Medicine and Health Sciences at Saybrook, an online university based in California. “People will trust their doctor and trust the practitioner in their doctor’s office. There have been holistic practitioners for decades, but the problem has been that physicians would treat the patient with a headache with medications. Then, eventually, patients would get referred to someone for hypnosis or biofeedback.”

Saybrook’s courses are web-based, but each degree requires students to attend “residential

conference” sessions. For Houston area students, these classes will be held at the Institute for Spirituality and Health (ISH), located in the Texas Medical Center at 8100 Greenbriar Road. Ordinarily, students must travel to Oakland, California, where the university is based, for the sessions.

“Students who enroll in the Houston residential conference program will take four, four-day residential conferences as fulfillment of the residential training requirements for the 40-credit M.S. in mind-body medicine and the 76-credit Ph.D. in mind-body medicine,” Moss explained. “A certificate in mind-body medicine will also be available.” ➡

The Institute for Spirituality and Health, which will host Saybrook University conferences, offers yoga and meditation classes.



The collaboration between Saybrook and ISH took root when John Graham, M.D., the CEO of ISH, started taking classes at Saybrook. He approached Moss about offering the advanced degrees and certification program at the Texas Medical Center, home to more than 100,000 health care professionals. Moss liked the idea, as did Saybrook University President Nathan Long and the school's board of trustees.

"This is a hybrid university," explained Graham, who is working on his master's degree at Saybrook. "You meet the Saybrook faculty over a four-day period. We meditate before each class. We do practices throughout the training. You know your professors quite well and they know you. Then you do classwork over seven or 14 weeks in what's called 'modules' and you meet with faculty in video conferences every two weeks. They answer questions and go over new material."

Most of the students who enroll come from the health care field and are hoping to augment their knowledge or expand their career options.

"We recruit a variety of health professionals—physicians, nurses, psychologists, mental health professionals," Moss said.

"Many students already have a license to practice in their field," Graham added, "and the mind-body medicine courses they're taking are complementary and integrative to what they're already doing. But they're also going to be learning how to take care of themselves. They're going to be very aware of how important it is to learn self-care practices that will help them stay balanced."

Laura Licato, Ph.D., who was a cancer immunologist for two

decades, said that her attitude toward health and wellness gradually started shifting several years ago.

"What happened was, I became more interested in a broader view of health," said Licato, who works for Harris Health System as a learning and development education specialist. "I was doing clinical trial work and FDA work—fairly bureaucratic stuff. I was feeling like I wasn't having the impact I wanted to have. I have a son on the autism spectrum and I was going through that journey and looking at health in a different way."

Licato found her niche in health and wellness coaching and, for the past few years, has been teaching integrative wellness coaching at Saybrook University. She is

impressed with the caliber of the students and the communal feel of the classes.

"It's amazing how intimate it can be," she said.

One of the biggest overall challenges of her field, she added, is teaching people that mind-body medicine can and should be integrated into standard medical practice.

"I see a big disconnect," Licato said. "Some people think of the conventional medicine world and alternative medicine as separate things—just as we used to think of the body as totally separate from the mind. The challenge is getting people to understand our bodies are shaped by our brains and vice versa. We really are integrated beings. It's easy to separate things when we're trying to study; we tend to compartmentalize symptoms. But we need to understand how all the pieces fit together." ■

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White meat vs. red meat

If you're a steak lover who begrudgingly orders chicken for health reasons, read on.

White meat has long been considered more beneficial than red meat, especially in terms of reducing cardiovascular risk. But a recent study challenges these claims.

The randomized study, published in June in *The American Journal of Clinical Nutrition*, analyzed 113 healthy participants who were separated into two groups. In one group, 62 people ate a diet high in saturated fat, and in the other, 51 people ate a diet low in saturated fat. Both groups consumed protein from three sources—red meat, white meat and nonmeat (including vegetables, legumes, nuts, grains and soy products)—for four weeks each.

The major findings of the study are two-fold. First, the study showed what experts in the field already expected: regardless of the protein source—whether it's red meat, white meat or nonmeat—people who consumed high amounts of saturated fat had elevated levels of low-density lipoprotein (LDL) cholesterol (the so-called bad cholesterol) and apolipoprotein B (apoB), both markers of cardiovascular risk.

"It doesn't matter if you're eating plant-based," said Karen Aspry, M.D., co-chair of the American College of Cardiology Nutrition and Lifestyle Workgroup and associate professor of medicine at the Alpert Medical School at Brown University. "You have a lot of people who are in the vegan/vegetarian diet world, and that's great that they're not eating meat, but they may be consuming some of these very high saturated fat tropical oils, like coconut oil."

Second, the findings showed that, contrary to popular belief, there was no benefit to consuming white meat instead of red meat to

reduce the risk of cardiovascular disease. LDL and apoB levels rose in both red and white meat groups and outcomes did not differ significantly between red and white meat when saturated fat levels were equivalent.

"If you are maybe thinking, 'Well, if I eat high amounts of fat, but I eat white meat instead of red meat, I'll be okay,' the answer is no," Aspry said. "It doesn't matter if you're eating red or white meat, you're going to see these numbers go up."

The study suggests that the cardiovascular effects of meat may be influenced by more than saturated fat content.

Every five years, the U.S. Department of Agriculture and the U.S. Department of Health and Human Services publish *Dietary Guidelines for Americans*, which outlines nutrition information and offers advice and recommendations to improve health and reduce chronic disease.

Results of the recent study could potentially impact these guidelines, said Sue Day, Ph.D., professor of epidemiology at The University of Texas Health Science Center at Houston's School of Public Health. But before that happens, more research must be done comparing the cardiovascular risks of white and red meat.

To tease out the specific roles of each protein source within a large-scale population study is enormously difficult and has never been done, Day said.

"To understand the association between protein and cardiovascular disease risk, all of the protein types need to be clearly defined and studied while considering the total diet and all the other nutrients in food that can affect cardiovascular disease risk," she said. ■

Talk to Me with Your Mind

Crafting the future of brain-to-brain and brain-to-computer communication

BY RYAN HOLEYWELL

If all goes precisely as planned, something astonishing will occur at the Texas Medical Center in 2023. In a scenario that seems borrowed from science fiction, two patients, linked by their minds, will be able to transmit information back and forth without speaking, typing or writing.

And, as if that's not ambitious enough, they'll be able to do it without having undergone any surgery.

Brain-to-brain and brain-to-computer communication are part of a major research effort by the Pentagon, which views these types of links as critical to supporting the soldier of the future.

The work happening in the medical center, led by researchers at Rice University, is one of several projects occurring throughout the country to support a government-funded initiative called Next-Generation Non-Surgical Neurotechnology, or N³. The research and development wing of the U.S. Department of Defense will sink \$18 million into the Rice-led project alone.

This research aims to solve a key problem facing those who seek to improve these types of communication. On one hand, technology already exists that allows researchers and clinicians to establish connections between groups of neurons in the brain and machines. But that technology typically requires surgery, and it's considered too invasive to use on those who haven't suffered injuries or illness—such as able-bodied soldiers. On the other hand, noninvasive neurotechnology exists, but it lacks the precision and sophistication for application in the real world. Researchers, then, are working to help the military have the best of both worlds: a high-quality connection between brains and computers—or brains and other brains—without the need for surgery.

The Defense Advanced Research Projects Agency (DARPA), which develops emerging technologies for the military, is funding six different research teams across the country that are trying to make advances on this front. If successful, the techniques could have diverse, seemingly inconceivable applications. Soldiers might gain the ability to control unmanned aerial vehicles—or, theoretically, an entire swarm of them—using only their minds.

"Just as service members put on protective and tactical gear in preparation for a mission, in the future, they might put on a headset containing a neural interface, use the technology however it's needed, then put the tool aside when the mission is complete," said Al Emondi, Ph.D., the N³ program manager, in a statement.

For patients, treatments previously seen as unimaginable without surgery—restoring sight to the blind or movement to the seriously injured—may be within reach. For example, if a patient loses the ability to see or hear due to disorders of the eye or ear, but the underlying part of the brain that receives those signals remains intact, the technology could be applicable.

"You can imagine there'd be people who might benefit from a visual prosthetic but are still uncomfortable with the idea of brain surgery," said Jacob Robinson, Ph.D., an associate professor in Rice's Brown School of Engineering who leads the Rice research team.

Theoretically, the technology could not only support military operations, but also could open up treatments to a broader pool of patients who may not be interested in having brain surgery but would still benefit from neurotechnology.

The Rice-led effort, dubbed MOANA, includes 15 co-investigators from Rice University, Baylor College of Medicine, the Jan and Dan Duncan Neurological Research Institute at Texas Children's Hospital, Duke University, Columbia University and the John B. Pierce Laboratory affiliated with Yale University. Under the initiative, researchers aim to establish the mind-machine link via a special cap worn by patients and outfitted with lasers, optical detectors and magnetic field generators.

Robinson's team is charged with proving it's possible to use non-surgical technology to both detect and control brain signals—specifically, that light can be used

to measure the activity of cells in the brain and that magnetic fields can control activity in brain cells. The team will also have to show that the process can occur quickly—at the speed of thought.

"Our goal is to access information from the individual cells that might be communicated 100 times per second," Robinson said. Any slower, he added, and the information gets "washed out" and difficult to interpret.

In order for the cap to function, though, the brain must be prepped. Viral vectors that edit genes will be delivered to precise locations in the brain. These vectors change the way neurons respond to light when they're active, taking advantage of the property of certain light wavelengths that can penetrate the skull. That would allow the cap to "read" brain activity. Meanwhile, neurons would be reprogrammed to fire in response to magnetic activities, which would enable researchers to "write" to the brain.

Initially, researchers will test the technology on rodents and non-human primates. And that's where the science fiction comes in.

"What we're aiming to do ... is to be able to transmit one animal's sensory perception to another animal," Robinson said. For example, researchers could present one mouse with a stimulus—a certain tone or a specific image—and the "connected" mouse would behave as if he heard or saw it.

By the end of four years, the team hopes to be able to sustain that same process with humans.

First, the team would develop an image—say, a car or a house—and try to transmit it to the mind of a blind person through the cap. Next, the subject would be able to describe exactly what he or she "saw."

“An important thing to realize is that the [images and sounds] we are seeking to decode are processed in ways that are very different from, say, your stream of consciousness or private thoughts.”

— JACOB ROBINSON, PH.D.
*Associate professor at
Rice University's
Brown School of Engineering*



Jacob Robinson, Ph.D., works in his lab at Rice University.

Then, the team would test whether a blind person can imagine an image that can be transferred back to a computer for researchers to see. The final test would determine whether images can be transferred back and forth between the minds of blind patients. Researchers are working with blind patients because they are required to work with patients who could benefit from the technology—eventually, those patients could potentially be connected to cameras that help them “see” without brain surgery.

Working with blind patients provides an important opportunity to study brain-computer interfaces, said Michael Beauchamp, Ph.D., professor and vice chair of basic research at Baylor’s department of neurosurgery.

“Humans are primarily visual creatures,” he said. “A big chunk of the brain is dedicated to vision. If you want that interface, the visual cortex [of the brain] is a natural target.”

In a separate project, Beauchamp and his colleagues at Baylor, along with a team at the University of California, Los Angeles, are working with a company called Second Sight that has developed a pair of glasses outfitted with a video camera that transmits images to a tiny computer chip implanted in the brains of the blind. The resolution isn’t great—only about 60 pixels—but it’s enough to allow for basic functionality.

Paul Phillips, who lost his sight more than 13 years ago and is using the device, says the technology hasn’t restored his sight. But it does allow him to detect the difference between dark and light. He can identify the location of his white sofa, for example, and he can tell the difference between the sidewalk and the grass when he’s outside his home. Although the device doesn’t allow him to perceive color, he was able to recently detect the light and motion of fireworks.

Over time, researchers hope to improve the resolution of those images. And in theory, the technology being developed as part of the DARPA project may help patients like Phillips one day “see” without the need for brain surgery. ➡

Twice a week at Baylor, researchers work with Phillips to determine how well he “sees” patterns of light on a monitor, using the glasses-mounted camera that connects to his brain. They can also turn the camera off and prompt him to “see” moving patterns of light by triggering electrodes implanted in his brain.

“Essentially, we’re trying to draw on Paul’s visual cortex,” said William Bosking, Ph.D., assistant professor of neurosurgery at Baylor. Bosking compares the technique to tracing the shape of a letter on someone’s palm. Phillips, for his part, says the experience is “pretty cool”—especially after seeing nothing but darkness for so long.

Through that process, they’re mapping the brain’s visual cortex and learning more about how triggering those electrodes prompts the perception of light and lines. Though that study is separate from MOANA, some of the lessons the researchers learn about the brain’s visual



Paul Phillips, who is blind, works with researchers at Baylor who are trying to help him “see” patterns of light.

cortex could be applied to the MOANA project.

As for the potential wireless brain-to-computer technology, the possibilities are seemingly limitless. “We don’t have to wait for someone to move the muscles in their mouth to say what they’re seeing; we don’t have to wait for them to move the muscles in their finger to type what they’re seeing,” Robinson said.

In other words, those patients could share information through their minds faster than any other way currently possible. If the tech-

nology works, it may mean that, one day, people could communicate with devices or vehicles faster than speaking, typing or controlling a steering wheel or joystick.

“If I want to tell another soldier there’s a bad guy around the corner, I’d have to pick up a walkie talkie,” Beauchamp said. “If I could flash an image of what I’m seeing, that’s more effective.”

Robinson acknowledges that the whole idea of tapping into people’s brains wirelessly may make some people uncomfortable. But he is quick to acknowledge that his team includes neuroethicists, who consider how the techniques might be misused and offer potential safeguards. He also emphasizes that he’s not developing devices that can read patients’ private thoughts.

“An important thing to realize is that the [images and sounds] we are seeking to decode are processed in ways that are very different from, say, your stream of consciousness or private thoughts,” he said. “The idea is that, throughout the process, we are making sure the user is in control of how their device is being used.” ■

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Starving Pancreatic Cancer

Finding a new therapeutic target to kill pancreatic cancer cells

BY SHANLEY PIERCE

Pancreatic cancer cells are cloaked in a protective shield that blocks drug therapies from penetrating their surface, making pancreatic cancer extremely difficult to treat. But a team of researchers at The University of Texas MD Anderson Cancer Center has discovered a potential approach that would essentially “starve” these cancer cells to death.

Successful therapies that target the molecular pathways of pancreatic cancer are scarce. In a recent study published in *Nature*, researchers sought to understand how all proteins on the surface of pancreatic cancer cells are rearranged and how that regrouping affects tumor cell growth.

Very often, researchers will focus on one particular gene protein, said the study’s senior author, Giulio Draetta, M.D., Ph.D., chief scientific officer and professor of genomic medicine at MD Anderson. But this time, Draetta and his team took the opposite approach.

“We asked, instead: can we look at anything that is expressed there on every pancreatic tumor cell?” Draetta explained.

By doing so, he and his team discovered that a particular protein, syndecan 1 (SDC1), mobilizes to the cell surface after receiving a signal transmitted from a mutated oncogene, KRAS. When KRAS functions normally, it regulates cell growth; however, when it becomes mutated, its signaling goes haywire and causes an uncontrolled overgrowth of cells—oftentimes leading to the development of cancer.

The American Cancer Society estimates approximately 56,770 Americans will be diagnosed with pancreatic cancer in 2019. The five-year survival rate is 9 percent.

A certain subtype of pancreatic cancer known as pancreatic



Giulio Draetta, M.D., Ph.D., is chief scientific officer and professor of genomic medicine at The University of Texas MD Anderson Cancer Center.

ductal adenocarcinoma (PDAC), which makes up 90 percent of all pancreatic cancers, is particularly devastating. Standard treatments for PDAC include surgery, radiation, chemotherapy and immunotherapy, but because it is one of the most chemo-resistant cancers, prognosis remains bleak. The five-year PDAC survival rate hovers between 5 and 7 percent, according to a paper published in the *International Journal of Molecular Sciences*.

The protein KRAS is present in nearly all cases of PDAC.

Whack-a-mole

After determining that KRAS and SDC1 proteins play an integral role in pancreatic cancer, Draetta and the team set about understanding how KRAS drives the aggressive growth of pancreatic tumors.

“What we found is that it’s really responsible for allowing these tumor cells to feed themselves by

using a mechanism called macropinocytosis,” he explained.

Macropinocytosis, also referred to as “cell drinking,” is the mechanism cells use to gulp up surrounding molecules, nutrients and antigens.

“Basically, they can take proteins from the outside environment and use them as food,” Draetta said.

No current drug therapy can starve pancreatic cancer cells. KRAS is “one of the most elusive targets in cancer research” and has earned a reputation as an “undruggable” protein, according to the National Cancer Institute.

The findings of Draetta and his team open the door for future studies to target KRAS and SDC1 to cut off the food supply of these cancer cells.

Ultimately, curing cancer is going to take a combined approach, Draetta said.

“The moment you block something, the cancer cells come

up with something else,” he added. “Sometimes we think of cancer cells as a whack-a-mole game—you hit them somewhere and something else pops up, so the more agents they put forward that are hitting different components of the pathways, the more there is a chance that in combination they might actually overcome this resistance mechanism because you are going to limit the ability for them to escape.”

Draetta approaches the possibility of developing a new KRAS-targeted therapeutic with cautious optimism.

“I’m trying to keep everybody honest in terms of publishing solid observations and be able to think about translation ... as opposed to pretending that everything we discover and publish is made true,” he said. “We try to find a different way and really focus on things that provide high promise. This is because we owe it to our patients.” ■

Life, Disrupted

ALZHEIMER'S AND THE LONG GOODBYE

By Shanley Pierce



In the crowded clubhouse of her New Orleans apartment complex, Judie Gabler noticed a dashing young man stagger through the door with two friends. It was Friday, Oct. 15, 1971—close to midnight—and Gabler’s apartment building was throwing a Las Vegas-themed party for tenants.

The man had “the most beautiful eyes” and a smolder that made him look like an actor right out of Hollywood’s Golden Age.

Kenny Tidwell, who was almost 29 and recently divorced, was a former college football star who played for Louisiana Tech University and graduated with a degree in accounting. He lived just a few blocks from Judie and had been working as a scout for Getty Oil before being promoted to a landman.

Judie and her friends taught Kenny and his friends how to shoot craps that night. Around 3 a.m., Kenny turned to Judie and said, “I have tickets to the Saints game Sunday. Want to go?”

Judie paused. She already had season tickets, but she was undeniably smitten.

“I was crazy about him right off the bat,” Judie said.

Two days later, Kenny and Judie watched the New Orleans Saints beat the Dallas Cowboys 24-14. It was the first of many dates.

“He was adamant he was never getting married again, would never own another house, never mow another lawn, never have another kid,” Judie said. “Never, never, never, never.”

She heard that speech from him often, each version bringing tears to her eyes. But on June 23, 1975, Kenny popped the question.

He brought her to Antoine’s in the French Quarter of New Orleans, her favorite restaurant, where they dined on crabmeat ravigote, filet mignon with marchand du vin sauce, a soufflé and drank a bottle of Châteauneuf-du-Pape.

Even after nearly 44 years of marriage, Judie can recall that night in great detail.

But Kenny doesn’t remember anything.

“Did I go?” he asked, earnestly, after listening to Judie reminisce about their courtship.

“You must have. You gave me the ring,” she quipped.

It was a magical proposal, by all accounts, but those memories and so many others have been stolen from Kenny by Alzheimer’s disease.

Confusion, frustration

Kenny was diagnosed with Alzheimer’s in January 2013 at the age of 70.

The previous fall, just a few months before his diagnosis,

the Tidwells and their daughter, Amy, took a family trip to Ireland. Judie graduated from Saint Mary’s College—the University of Notre Dame’s sister school—and wanted to watch the Fighting Irish play long-time rival, the Navy Midshipmen, in Dublin’s Emerald Isle Classic.

It was meant to be a trip filled with school spirit and adventure, but the mood was interrupted by Kenny’s unusual behavior.

“When we first got to Ireland, the first night in the hotel, he had no clue,” Judie said. “He was fumbling around and very discombobulated.”

Kenny wandered into the hallway of their hotel in the middle of the night several times, trying to get to the bathroom. He had trouble with money; he didn’t understand when to pay and when not to pay and struggled with basic

math to calculate a tip. On the return home, Kenny tried to get on every flight that was boarding at the airport. Judie and Amy had to pull him back each time to make sure they didn’t lose him.

The two women returned to Houston in tears.

“The night we got home from Ireland, he said to my mom, ‘I think something’s wrong with me,’” Amy recalled. “In some ways, it was a relief because he had been fighting so hard for there to *not* be something wrong.” ➡



Left: Judie and Kenny Tidwell on their wedding day in 1975. Above: The Tidwells in 2019.



Judie took Kenny to Baylor College of Medicine, where doctors diagnosed him with mild Alzheimer's. Four years later, in 2017, his condition graduated to moderate Alzheimer's.

"Most of the time, I understand, but I forget," Kenny said. "It comes and it goes."

The faces and places that colored Kenny's memory are gradually fading. He's aware that his memory is slipping and that trying to hold onto his past is like trying to grip sand in his hand. Try as he might to cling to what's left, the sand will eventually trickle between the cracks of his fingers until his hands are empty.

"It makes me mad, frustrated, sad," Kenny said. "It makes me want to cry."

Learning from failure

Alzheimer's is named for Alois Alzheimer, a German psychiatrist and neuropathologist who, in 1906, was the first to identify the neurodegenerative disease in a 55-year-old woman named Auguste Deter. Alzheimer studied Deter in a Frankfurt psychiatric facility for more than four years, until her death on April 8, 1906. He identified a host of unusual symptoms similar to dementia, including disorientation, loss of memory, unpredictable behavior and trouble with language.

After performing an autopsy, Alzheimer discovered high levels of a naturally-occurring protein in her brain. The clumps of amyloid plaques in Deter's cerebral cortex (the part of the brain that controls personality, motor function, language and information processing), along with tendrils of tau proteins that had become entangled, disrupted normal communication between neurons in her brain. Today, Alzheimer's disease is recognized as the most common form of dementia, although not everyone with dementia has Alzheimer's.

Alzheimer's disease has pillaged the memories, emotions, experiences, personalities and—ultimately—identities of millions of victims. To this day, it has no survivors.

The Alzheimer's Association estimates that 5.8 million Americans are living with the disease; by 2050, this number is projected to reach nearly 14 million, with more baby boomers aging into a high risk of developing the disease. Because that risk increases with age, nearly one in two baby boomers who reach 85 will develop Alzheimer's.

The disease progresses in three main stages: mild (early), moderate (middle) and severe (late).

"The most common early presentation are things like disorientation, forgetting what day it is, repeating oneself, losing items within your home and not being able to retrace your steps," said Melissa Michelle Yu, M.D., associate director of the Alzheimer's Disease and Memory Disorders Center at Baylor College of Medicine. "There are normal things that happen with aging—we all forget our keys on the counter, those kinds of things—but ... you go out the door without your keys and they're in the refrigerator, that's something different."

More than a century after Alois Alzheimer characterized the disease, medical experts still don't know what exactly causes it, how to prevent it and—most significantly—how to treat it.

In pursuit of a cure, Alzheimer's research has suffered scores of disappointments and dead ends. No drug exists to slow the progression of the disease. Instead, the Alzheimer's

Kenny Tidwell walks up the stairs in his Kingwood, Texas, home.

medications currently on the market only treat symptoms. Cholinesterase inhibitors, for example, are used to control some behaviors associated with mild to moderate Alzheimer's by preventing the breakdown of a chemical messenger in the brain.

The U.S. Food and Drug Administration (FDA) has not approved a new drug for the disease in more than a decade. The last FDA-approved therapy was Namenda—also known by its generic name, memantine—which is used to improve memory, awareness and daily functioning. That was 16 years ago. (In 2014, the FDA green-lit Namzaric, which is a combination of two long-approved Alzheimer's drugs, memantine and donepezil.)

Most recently, in March 2019, Biogen halted two major studies on its drug, aducanumab, which was supposed to slow the progression of Alzheimer's by targeting amyloids (proteins long thought to destroy brain tissue. The drug showed great promise, according to data that Biogen and Japanese pharmaceutical partner Eisai presented at the Alzheimer's Association International Conference in 2018. But no drug in history that specifically targeted amyloids has ever succeeded in defeating the scourge of toxic proteins responsible for Alzheimer's—

let alone keeping them at bay. In the end, Biogen's promising drug was no exception.

But the lack of a cure is not for lack of trying.

"We learn from every failure," Yu said. "Walking these patients and their families through the disease is difficult. It's a difficult road they have to go down and I wish we had more that we could offer, but we're learning more and more about what leads up to when the patient shows symptoms." ➡



Judie sits next to Kenny as he paints at Memory Café, a monthly social event for people living with Alzheimer's and their loved ones.

Beauty

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Multifaceted problem, multidisciplinary solution

One of the most exciting developments in Alzheimer's research has been identifying biomarkers in the brain, blood, urine and cerebrospinal fluid proteins that detect the disease before symptoms manifest. Currently, Alzheimer's patients are diagnosed based on signs and symptoms of cognitive decline, but by that point, the disease has already been destroying brain tissue for decades.

"Identifying the Alzheimer's pathology years before the onset of the clinical symptoms is really a huge advancement," said Eliezer Masliah, M.D., director of the Division of Neuroscience at the National Institute on Aging (NIA).

Researchers are also working on developing vaccines to prevent Alzheimer's. At the University of New Mexico, scientists recently engineered a drug using virus-like particles that eliminate tau tangles in mouse models. At Harvard Medical School, Cynthia A. Lemere, Ph.D., is working on an amyloid-targeting vaccine to prevent the disease.

However, because the scientific community has not yet reached a consensus on the precise pathology and causes of Alzheimer's, it's unlikely that a vaccine will become a reality anytime soon, said Jim Ray, Ph.D., head of the

Neurodegeneration Consortium at The University of Texas MD Anderson Cancer Center's Institute for Applied Cancer Science.

Instead of searching for a vaccine, Ray and his lab are working on a number of drug discovery projects focused on neuroinflammation and promoting a beneficial immune response in the brain.

"The brain has its own private immune system, separate from the blood-borne system that protects the rest of the body, and the cells that safeguard the brain are called microglia," Ray explained. "As we have begun to understand what genes lead Alzheimer's to run in families, we have identified a whole new slate of genetic risk factors. These new genes almost entirely map onto the microglia of the brain. We're learning that the microglia reaction to the aging of the brain must be appropriate or there is a risk that Alzheimer's pathology will take hold and begin to spread."

In addition to genetics, a growing body of Alzheimer's research has shown that lifestyle factors—physical, social and mental activity—may play a key role in reducing the risk of cognitive decline.

"One of the reasons we're looking at lifestyle changes is because Alzheimer's disease occurs over a continuum," said



Ann Marie McDonald, chief programs officer at the Alzheimer's Association Houston & Southeast Texas Chapter. "Because of the use of PET imaging and things like that, we can start seeing those changes much earlier ... and maybe we can intervene with lifestyle changes and be able to affect the disease progression. ... Having to attack the disease from all fronts is really important."

Because Alzheimer's is a multifaceted problem that requires a multidisciplinary solution, collaboration is critical.

"It's not going to be one individual in one lab making a serendipitous finding," Masliah said. "It is very similar to what you see now in the world of physics. To discover the Higgs boson, or to discover gravitational waves, it is not one individual working in one lab. It's hundreds of individuals working together and making the data publicly available. I think we're doing the same thing, and I think we're beginning to see the products of this."

Even if a cure is discovered today, it could take 10 to 15 years for drug therapy to make its way from the laboratory to the patient.

The caregiver

Because Alzheimer's is a slowly progressing disease, life doesn't stop the day of a diagnosis. It's a very gradual goodbye.

"It hurt Kenny in the beginning to think that he's losing [his memories], but after you reach a certain point, there's no pain involved," Judie said.

With Alzheimer's, the family and friends closest to the patient may feel the pain of the disease the most.

Amy has watched the slow change in her parents' relationship and witnessed the burden it places on her mother.

"She sees moments of their life together slipping away," Amy said. "And they are."

Because that shift from spouse to caregiver takes an emotional, mental and physical toll, support for Alzheimer's caregivers is as important as support for patients.

"Over time, it's always going to be a challenge as you lose that partnership—that true partnership—and that's where the grieving comes in," said Mary Kenan, Psy.D., a psychologist at the Alzheimer's Disease and Memory Disorders Center at Baylor. "It's not like a light switch. You don't go to bed one day a spouse and, the next day, you wake up a caregiver. It's that gradual transition."



Above: Melissa Michelle Yu, M.D., associate director of the Alzheimer's Disease and Memory Disorders Center at Baylor College of Medicine, tests Kenny's vision. Below right: At Yu's office, Kenny draws the face of a clock and writes a sentence to test his memory.

When Kenny was diagnosed, Judie joined a local Alzheimer's support group that meets the second Monday of every month at the Good Shepherd Episcopal Church in Kingwood. For 90 minutes, it's a brief respite for the husbands, wives, sons and daughters of Alzheimer's patients.

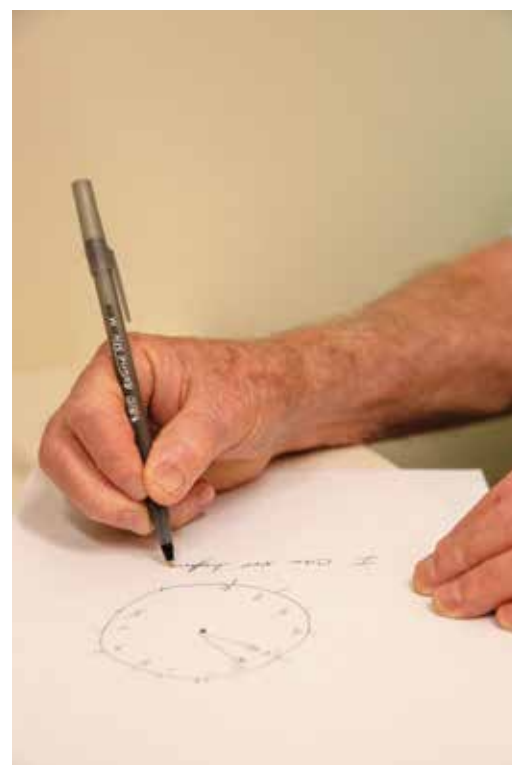
"This is a place for 'mekon hanekhama,'" said Barbara Hemphill, who started the group 17 years ago. "A safe place to do the work of grief."

Last fall, Judie sat in a circle with 14 people in a small classroom at the church. The laughter that welcomed guests in the beginning died down as the jovial atmosphere became punctuated by somber moments, as each guest confronted the lonely reality of being an Alzheimer's caregiver.

"He went to sleep," said a woman in the support group, whose husband has severe Alzheimer's. "A couple hours later, he woke up and made this sound like an animal. It was not human. Maybe he was dreaming, maybe he had a nightmare.

I tell him, 'Wake up, wake up,' thinking he had a bad dream—and that's when he spit on me. The sound he was making was awful. I went into the kitchen. We had a bottle of wine on the counter. He grabbed the bottle of wine and said, 'I'm going to kill you.'"

A few people around the circle gasped. Others shook their heads in solemn understanding. ➡



"I tried to get the bottle, but he was trying to get it away from me and smashed it on the counter," she continued. "I tried to talk to him slowly, and we walked around the house, the both of us holding the bottle of wine. We walked, I don't know, for what seemed to be hours, but it wasn't, I'm sure. ... He calmed down and went back to sleep."

As Judie listened to the woman, she couldn't help but feel thankful that Kenny is still as good-natured as he was before Alzheimer's and remains mostly capable of taking care of himself—although now he struggles to find words and form sentences.

Members of the support group help Judie understand where this Alzheimer's road is leading.

"They also show me how blessed we are that we are traveling said road so slowly," she said.

But her mind is constantly fighting with her heart. She still loves Kenny the same way she has always loved him, but it's heartbreaking watching him fade away.

"Our anniversary was a rough day," Judie said.

Judie took Kenny out to a local steakhouse for dinner to celebrate their 43rd anniversary on Oct. 24. She always loved spending their anniversaries together, but ever since Kenny developed Alzheimer's, these celebrations have

retained only the basic outline of anniversaries past. Kenny still prefers his steak cooked medium, but the significance of the date is lost on him. For him, Oct. 24 is just another day.

Judie tries to find comfort in humor.

"You either laugh or you cry," she said. "I try to make light of the situation because the alternative is crying yourself to sleep on your anniversary night."

A matter of when, not if

Before Alzheimer's, Kenny always had cheesy dad jokes and zingy one-liners at the ready.

Now, he is a little more subdued and disengaged.

"This new self is timid, unsure," Amy said, adding that her father seems more comfortable around people he doesn't know. "One time, my husband and I were daddysitting him. We took him to MOD Pizza. By the time we got to the counter, he was friends with everyone in the line. I think it's because he doesn't have to be self-conscious. They don't know he has Alzheimer's."

The last time Amy caught a glimpse of the dad she grew up with was the day of her wedding, May 13, 2017.

"There was a part of him—the spark—that was back that I hadn't seen in a long time. It was just like having him back for that day, and it was the perfect day for him to make an appearance," Amy recalled. "Even now, sometimes he just comes out and you're just like, 'There he is!' Then you blink and he's fading away again."

Barring any other health issues, Kenny's condition will progressively worsen as he advances into late-stage Alzheimer's. As more faces and memories evaporate from his mind, he'll also lose the ability to eat, speak and walk.

"Once they cross that plane, they're not hurting anymore," Judie said. "They're not upset by it. They don't know the difference. It hurts the people who are watching it."

Judie tries not to think that far into the future. She has prepared by purchasing a long-term care insurance policy, but there's little she can do to ease the fear of not being able to look after her husband.

"I think mostly about what will happen when I can no longer

take care of him," Judie said. "Where would I put him?"

Amy has watched the disease erode her father's mind and identity for years.

"I worry about him, but I worry about her more because I know how hard it's going to be for her," Amy lamented. "I think it's worse when

he's going to be cognizant less and less, and she's going to be lonelier and working harder trying to keep him at home."

For the past few years, Judie and Amy have talked about the day Kenny will no longer recognize them. They have always known it's not a matter of *if* it will happen—it's a matter of *when*.

This spring, Amy's greatest fear came true. On the way home from Easter brunch, Kenny turned to Judie and asked if Amy was his sister.

"I was devastated," said Amy, who was riding in the car with her parents and overheard her father's question. "It was just like someone had punched me in the stomach. All I could think was, 'I thought I had more time.'"

'Something someone can do right now'

One major problem in Alzheimer's research is the low rate of participation in clinical trials, Masliah said.

Kenny has participated in clinical trials through Baylor, including one in 2017 that tested BACE (beta-site amyloid precursor protein cleaving enzyme) inhibitor drug verubecestat. Although that drug ultimately joined the mass of other failed



Kenny Tidwell looks over papers in his home office.

drugs, Kenny's participation—along with that of other affected patients—was essential.

"We want to help, but we need their help, as well," Masliah said. "The progress is not only thanks to what people are doing in their labs, but really it's thanks to them. To test these drugs, [patients] need to participate in clinical trials."

The NIA is currently ramping up efforts to recruit more patients for various Alzheimer's studies, including two types of prevention trials: one in which the disease pathology is already present but patients show no clinical symptoms, and another in which individuals show no pathology and no clinical symptoms.

Studying both affected and healthy individuals is critical to Alzheimer's research, but it's a tough sell.

"It's the same thing with many other diseases: people get into a clinical trial when they have a very advanced disease and



The Tidwells share a light moment at home.

right now."

'Right now' is where Judie tries to keep her heart and her head. For the moment, she is Kenny's memory, his link with a rich and happy past. She is there to answer his same questions, over and over again.

"He just wants to know when he's going to get better," Judie said. "I say, 'Kenny, you're not going to be better. The goal is to keep it moving slowly like it is right now.' Then he forgets he asked." ■

they are motivated," Masliah said. "When you ask people to participate in a clinical study ... when they are clinically healthy, it's harder."

While reports of failed studies may be disheartening, experts urge people not to lose hope in clinical trials.

"If you want to be part of a solution," McDonald said, "this is something someone can do



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Covenant House Texas Expanding Services

Capital campaign will allow nonprofit to serve more young adults facing homelessness and hardship

BY CINDY GEORGE

One of the only constants in his life—his cell phone, his lifeline to the world—was interrupted when Marquis landed at Covenant House Texas in Houston after the July Fourth weekend.

“There’s no Wi-Fi,” the newly minted 18-year-old said, a flash of uncertainty in his eyes.

Marquis spent the last few years in foster care, but aged out in July. He woke up after the holiday at his aunt’s house—his final morning of the visit. After three beef breakfast burritos and an orange juice at Taco Cabana, his aunt delivered Marquis to his uncle, who brought him to Covenant House. The teen arrived with only a few bags of clothes.

He would have shelter for the night. Maybe longer.

His foster care advocate hoped Covenant House could offer him a new beginning. Marquis, who didn’t want his last name published, wasn’t so sure.

“I was not ready to come here,” said Marquis, who had to place his belongings in a “hot box” upon arrival to zap potential bed bugs. Standard procedure.

Covenant House Texas, the largest youth emergency shelter in Harris County, serves young adults ages 18 to 24 in immediate need of safety, sanctuary and support services. The campus is tucked into a city block in Houston’s Montrose neighborhood.

A daily lottery determines who will sleep in the shelter’s 20 emergency beds each night. Safe Haven, a short-term residential program, has a two-month waiting list, while Rites of Passage, a longer-term transitional living dormitory with two people to each room, is at capacity.



Marquis, left, and Xavier arrive at Covenant House Texas in Houston.

More beds are desperately needed. The campus needs additional safe spaces for all the young people it serves, including teens who have survived trafficking and growing numbers of LGBTQ homeless youth.

The organization has launched a capital campaign—Building for Life, Homelessness to Hope—that aims to raise about \$25 million over the next three to five years, Executive Director Leslie Bourne said.

In July, Covenant House Texas purchased an office building across the street, on Lovett Boulevard, for \$3.75 million. The structure will be a key component of a campus reconstruction and expansion project. The wireless internet upgrade is just the tip of the iceberg.

Trauma-informed care

Limited space leads to soul-crushing choices. After the 20 emergency beds per night are assigned, those who don’t get shelter can access a bus pass to search elsewhere for overnight housing.

To bring attention to this daily crisis, Texas Medical Center President and CEO William “Bill”

McKeon will oversee Covenant House Texas’ largest annual fundraiser on Nov. 21. As honorary chair of the 2019 Sleep Out: Executive Edition, McKeon hopes to raise \$1 million by seeking the commitment of Houston business leaders—many of whom will spend the night outside to more closely connect with the reality of homelessness.

“We’re here to draw awareness to something we drive by every day and don’t see,” McKeon said during a spring luncheon with young adults on

campus, noting that youth aren’t top-of-mind for many people who think about or encounter the homeless.

Covenant House Texas is part of a New York City-based international nonprofit with three dozen locations in North and Central America that serve homeless and trafficked youth.

The organization delivers trauma-informed care—a framework for services that helps individuals gain power and control over their lives as they work toward employment, education and self-sufficiency, said Victor Hay, director of program and community services at Covenant House Texas.

Engaging youth

The youth engagement center on the Houston campus bustles with activity on a recent afternoon. In the laundry room, washers agitate and dryers tumble. A television blares just beyond the lockers and youth speak with caseworkers in small offices nearby.

A young woman naps while her toddler snoozes in a stroller. Others hang out and literally chill out, taking a break from the 90-degree heat outside.

The center is the initial entry point for services. Young adults seeking housing or access to health care at the on-site Baylor Teen Health Clinic drop by. Showers, meals and laundry facilities are available.

Many of the residential youth are off campus in the afternoons working, attending school, looking for jobs or securing identification cards before the 7 p.m. curfew.

On this particular afternoon, the center is a respite for Xavier, who said he was homeless in New Orleans before landing in Houston at Covenant House in May. Tall and talkative, the 23-year-old said he's ready to build a stable life. He was waiting for a callback about a job at a popular Texas hamburger restaurant.

"My plan now is to get housing, get on my feet and to start fresh," Xavier said. "I would love for Covenant House to have the funds they need to fit more people so that more people can stay and not sleep outside."

Staff members offer compassion and encouragement to the young people they encounter.

"Hang in there," chief development officer Felicia Broussard said as she ended her chat with Xavier. "The longer you are here, the more you will see a difference."

Gabby, a young woman who has spent about

six months in Rites of Passage, said her living circumstances fell apart when a stepfather evicted her and other members of her family. The 21-year-old beamed while sharing that she'd been hired as a cashier and barista at a local bakery after spending time working with outreach.

The aspiring writer plans to work full time, start college and pen self-help books.

Xavior and Gabby have made it inside, but others have not.

Outreach prevention specialist Michael Blockson provides for those without a home base. Much of his time is spent driving around in a van pulling a trailer stocked with water, sandwiches and supplies, such as socks.

"I educate the street community about the services here at Covenant House," he said.

His team also distributes hygiene packages that contain toothpaste, toothbrushes, mouthwash, floss and deodorant.

"They'll use the restrooms in the stores to wash up," Blockson said. "We are consistent about going out every day. The kids recognize us and when they're ready to make a change, we're here."

New beginnings

In addition to increasing capacity at Covenant House, additional resources through the capital

campaign will help the organization expand services, including wireless internet connectivity.

"We took a survey of our youth and that was the No. 1 thing," Hay said. "We're just looking at the cost and seeing how we can do it."

This will be helpful to newcomers like Marquis, whose next steps were to acquire a government ID and visit the vocational educational department to discuss his GED.

"Whatever he's lacking in, they will work on that so that he can take the test," Hay said. "We will pay for the test."

Marquis said he wants to earn his diploma, then learn graphic design or engineering to create architectural images or video games.

"I like to draw," he said. "I draw on computers. I draw on my phone. I draw in real life."

He's grateful for Covenant House Texas, but gets a vibe that the youth engagement center environment might be too loud and chaotic for him.

A few hours after he arrived, he seemed more relaxed, but spoke hesitantly about the future.

"Tomorrow? I don't know," Marquis said. "I may not get a bed." ■

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IN NEED ⊕ F NURSES

What's behind the nursing shortage? How can we fix it?

BY MAGGIE GALEHOUSE

When Tonya Robinson was 9 years old, she fell off the jungle gym at her Albuquerque, New Mexico elementary school and suffered a concussion.

"My mom took me to the ER," Robinson recalled. "While I was there, a little girl, about 2, was in a curtained area next to me. I could hear her screaming and crying."

Robinson drifted in and out of sleep at the hospital, but at one point she woke up and asked about the little girl. The nurse explained that the child's grandmother had been frying sopapillas in a pot of boiling oil on the stove and the girl had grabbed the pot and burned herself quite badly.

Robinson's worry showed on her face.

"But the nurse told me the little girl was going to be okay," Robinson said. "It was the way she spoke to me and held my hand. From that moment on, I wasn't scared anymore. That was the day I realized I wanted to do that for somebody

else—be their comfort when they are scared."

Today, Robinson, 45, is a research nurse in urology at The University of Texas MD Anderson Cancer Center. Her childhood experience speaks to an essential truth: that nurses are the human face—the caring touch—of health care.

Most hospital patients, whether they realize it or not, judge the quality of their care on the expertise of the nursing staff.

"The nurse is the only professional with patients 24 hours a day in the hospital," said Chuck Stokes, president and CEO of Memorial Hermann Health System and a registered nurse. "The doctor comes and goes. The physical therapist comes and goes. But the nurse is always there."

Nursing is the nation's largest health care profession, with 4 million registered nurses (RNs) practicing across the country, according to the American Association of Colleges of Nursing.

Unfortunately, that is not nearly enough nurses to go around.

As nursing career options have expanded and the need for RNs has increased alongside aging baby boomers, the United States finds itself on the cusp of a serious nursing shortage.

In Texas, the supply of RNs, nurse practitioners, certified registered nurse anesthetists and certified nurse-midwives is projected to fall short of demand by 2030, according to the Texas Center for Nursing Workforce Studies. Some 60,000 RN jobs will need to be filled.

But nursing pays. The median income for RNs was \$71,730 in 2018, according to the Bureau of Labor Statistics. With the chance to earn a decent wage, along with opportunities for overtime and flexible hours, why is the United States staring down a nursing shortage? And how can institutions in the Texas Medical Center and beyond fill these posts and retain this vital segment of the health care workforce?

Age and education

"The aging of the current nursing workforce is one reason for the nursing shortage," said Cathy Rozmus, Ph.D., vice dean for academic affairs at Cizik School of Nursing at The University of Texas Health Science Center Houston (UTHealth). "In the state of Texas, 25 percent of all nurses are age 56 or older."

Tonya Robinson, right, is a research nurse in urology at The University of Texas MD Anderson Cancer Center.

Cathy Rozmus, Ph.D., left, is vice dean for academic affairs at Cizik School of Nursing at UTHealth.





You've got a quarter of the workforce within 10 years of retirement. The statistics for Harris County are about the same."

Beyond that, the U.S. population is aging overall. By 2030, one in every 5 residents will be retirement age, according to the U.S. Census Bureau.

"With the aging population, we are getting ready to consume more health care resources than we have ever consumed in our country," Stokes said. "There's no reversing that trend."

Education also plays a crucial role in the nursing shortage.

"As a nurse, you used to advance whether or not you went back to school. Now you see more nurses going back to school to advance," said Cindy Zolnierrek, Ph.D., the CEO of the Texas Nurses Association. "With today's violence, the opioid epidemic and different expectations from the workforce, more education is needed so you can prepare for that complex health care environment."

Increasingly, the gold standard for nursing care in hospitals is Magnet designation, which is conferred by the American Nurses Credentialing Center. A Magnet hospital sustains excellent patient outcomes, a low turnover rate of nurses and open communication between nurses and the rest of the health care team. Mortality rates are 14 percent lower at Magnet hospitals, according to a 2013 analysis from the University of Pennsylvania School of Nursing.

Hospitals wishing to acquire or maintain Magnet status must be able to show that 80 percent of RNs on staff have earned a bachelor of science degree in nursing or provide evidence that the nursing staff will achieve that goal by 2020.

But that's harder than it sounds.

Educational opportunities and nursing programs are



Chuck Stokes is president and CEO of Memorial Hermann Health System and a registered nurse.

resource-intensive and scarce. A shortage of nursing schools and faculty means a limited number of places and spaces to deliver the classroom and clinical education a nursing degree requires.

"To be a licensed RN, you can go to an associate's degree program or a bachelor's program—but those are the programs that have more applicants than they can accept," Zolnierrek said.

Stokes concurred.

"Nursing schools just can't afford the faculty they need to accept all the people who want to go into nursing," he said. "Also, you make more money as a nurse than as an educator."

New opportunities, new deficits

Fifty years ago, ambitious nurses in hospital settings climbed a career ladder with a clear, vertical trajectory—moving from staff nurse to charge nurse to nurse manager/head nurse to director of nursing. Over the past half century, that ladder has been tipped on its side and new opportunities have proliferated across a broader landscape.

"In the 1960s, if you were a nurse you likely worked in a hospital," Rozmus said. "Now you can work in a clinic, in advanced practice delivering primary care services. You can get a Master's or a Ph.D. and teach. The kinds of things nurses do have expanded like a sponge."

This absorption of additional duties and extension of options within the profession has been going on for decades, Stokes said. ➡

“With a nursing background, you can go to work for a biomedical company, a pharmaceutical company, Blue Cross and Blue Shield. You can become a hospital administrator. There are so many options for nurses other than taking care of patients at the bedside,” Stokes said.

But the bedside is still where nurses start. When nurses talk about “the trenches” they’re talking about bedside care.

“I truly believe bedside nurses who are working with patients who are admitted to the hospital have the hardest job,” Robinson said. “You are pulled in so many different directions—lots of coordination of care. You have five patients and you probably have five different physicians to deal with. ... The family members have questions. The doctors want the reports from the night before.”

Keeping nurses at the bedside has become a challenge. Increasingly, the front lines of nursing have become a checkpoint on the way to someplace else.

“The new generation likes to have a lot of change and varied opportunities,” said Becky Sam, a nurse manager of pediatric and congenital heart surgery at McGovern Medical School at UTHealth who works at Children’s Memorial Hermann Hospital. “I see a lot of people leaving the bedside, some of them having families, a lot of them going to school to become nurse practitioners.”

The potential for higher salaries is a major reason for the shift away from bedside care.

“Bedside people are really talented,” Stokes said. “But nurses are figuring out, *If I can put my*

life on hold for two years and go back to school to become a nurse practitioner, I can go from a salary of \$75,000 to \$150,000. Nurses going on to become neonatal nurse practitioners or geriatric nurse practitioners are creating a deficit at the bedside of a talent pool that is already limited.”

Bedside work also can be grueling. Handling patients can cause musculoskeletal injuries, Zolnieriek said, including Carpal Tunnel Syndrome, tendonitis and bursitis.

“Those things affect a nurse’s quality of life and well-being,” she said.

A trusted, stable profession

For 17 years in succession, nurses have topped the annual Gallup poll that ranks ethics and honesty in the workplace, making nursing the most trusted profession.

Many nurses—along with teachers and preachers—use the words “vocation” and “mission” when describing their relationship to the job.

“I tell my kids, if you can love what you do, you’ll never work a day in your life,” said Robinson, whose blinged-out lanyard and whimsically-decorated headbands help communicate her enthusiasm to patients. “Nursing isn’t work to me. It’s a gift, every single day.”

For one part of the student population, nursing is a lifelong goal, said Ainslie Nibert, Ph.D., associate dean of the Texas Woman’s University nursing program in Houston.

The other part of the student population is drawn to the security of the profession.

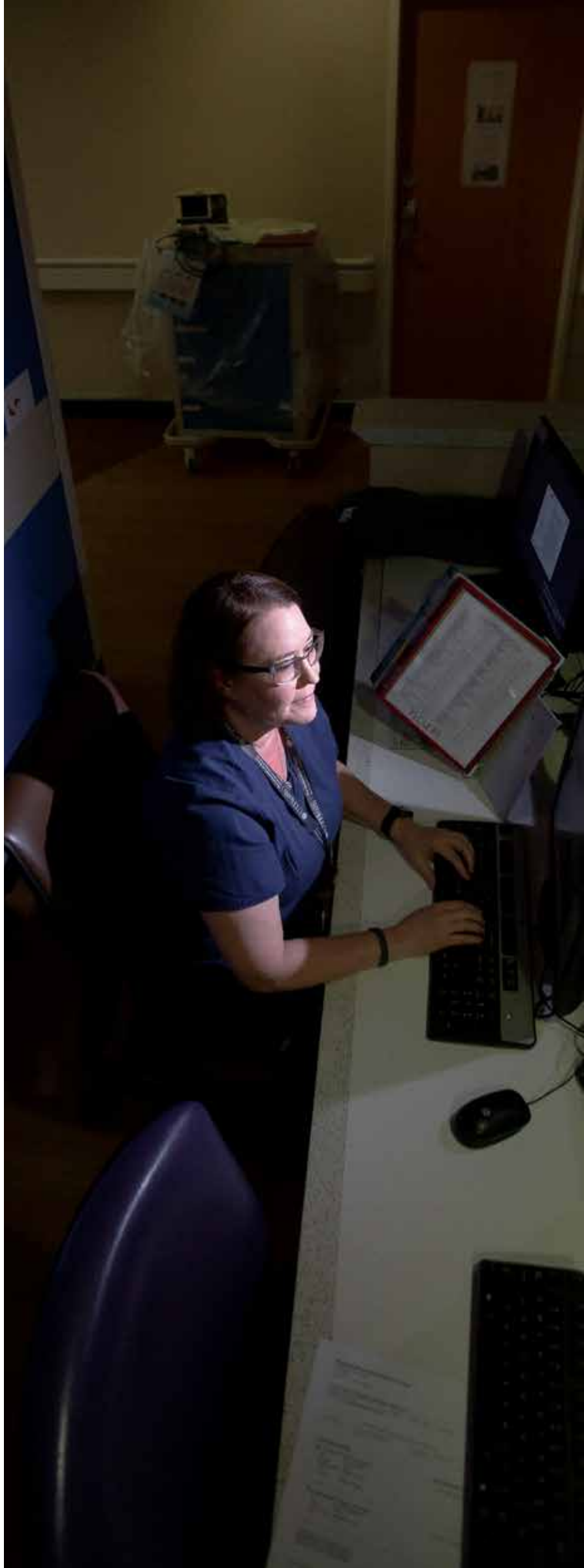
“When you’ve had economic upheavals—the financial crash of 2008, the energy industry cycle through its ups and downs—we’ll see folks who recognize that people need health care in both boom and bust years. It is a stable industry,” Nibert said.

Becky Sam, right, a nurse manager of pediatric and congenital heart surgery at McGovern Medical School at UTHealth, works at Children’s Memorial Hermann Hospital.

Cindy Zolnieriek, Ph.D., left, is CEO of the Texas Nurses Association.



Credit: Lifetouch, Inc.



Credit: Courtesy photo



Deborah Jones, Ph.D., is dean of The University of Texas Medical Branch (UTMB) School of Nursing.

Some individuals entering nursing today have more than a decade of work experience elsewhere. That mingling of generations and expertise makes for a rich classroom experience, said Deborah Jones, Ph.D., dean of The University of Texas Medical Branch (UTMB) School of Nursing.

"The number of students who have come back to school to study nursing—from engineering degrees, business students, school teachers—they come back to study nursing because they've always thought about it," Jones said "They're in class with 19- and 20-year-olds, so there's a mixture that makes for such a great cohort. The older students consciously lived in the world and chose to come back to nursing. The younger students, who might be coming out of high school, are learning from us and these older peers."

Becky Sam was 36 when she became a nurse in 2007. For the decade prior, she was director of recreation for the First Presbyterian Church of Houston.

In the 12 years since she started nursing, Sam has pursued more education and set her sights on leadership.

"I'm a second-career nurse. I went back to school in my thirties and got an associate's degree in nursing at Houston Community College," Sam said. "In 2017, I got my bachelor's in nursing from UT Arlington online. This past January, I started a master's program in administration and leadership." ➡



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Registered Nursing is among the top occupations in terms of job growth through 2026. The national RN workforce is expected to grow from 2.9 million in 2016 to 3.4 million in 2026, an increase of 438,100 or 15 percent. By contrast, the average growth rate for all occupations is 7 percent. An estimated 203,700 new RNs will be needed each year through 2026 to fill new positions and to replace retiring nurses.

Source: Bureau of Labor Statistics

Passionate and focused, Sam was among the hordes of nurses nationwide who bristled against comments made by Washington state senator Maureen Walsh this spring. Walsh denounced a bill that would grant nurses uninterrupted rest and meal breaks, saying she suspected that nurses in some rural areas “probably play cards” during their shifts because they have so much down time.

Nurses shot back on social media, laying out the breadth and scope of their work. Many, many nurses sent Walsh decks of cards.

Managing the looming shortage

Institutions are digging deep to educate incoming nurses and retain the nurses they have.

In 2012, The University of St. Thomas opened the Carol and Odis Peavy School of Nursing with 28 undergraduate students. Six years later, the school added the doctorate of nursing practice—graduates of this program will become nursing professors.

To keep a steady influx of prospective nurses, UTHealth’s Cizik School of Nursing admits students to their baccalaureate program three times a year.

“No summers off,” Rozmus said. “There’s always going to be that need for that nurse by the bedside. Patients are hospitalized for nursing care. In our baccalaureate education, that’s what we’re preparing people to do.”

Most hospitals offer residency programs that help new nurses get up to speed by pairing them with preceptors—experienced nurses.

At Memorial Hermann Health System, a nurse residency program offers between six and 12 months of training for new nurses, pairing

new graduates with experienced nurses before giving newbies their own patients. In addition, Memorial Hermann offers a nurse executive leadership academy that helps nurse managers and executives develop leadership skills.

Because it is so difficult to find settings where nursing programs can give students hands-on time with patients, simulation training is catching on.

Texas Woman’s University College of Nursing created an immersive, 72-hour training, modeled after a program designed by NASA educators, in which nursing students are called on to juggle complex medical scenarios. Students also play the part of patients.

In June, UTMB opened a simulation center on campus—a 92,000-square-foot building with high-tech mannequins and room for students and actors.

What more could we do?

All institutions should strive to accommodate the nurse who is 55 or 60 and wants to work, say, a 6-hour shift rather than a 12, Stokes asserted.

“Let somebody job share with that nurse,” he said. “You don’t want that nurse to retire. That’s the nurse who’s training all the younger nurses. That’s the brain trust. You want to be flexible in your scheduling.”

Zolnierrek said she worked in a medical surgery unit with a clinical mentor program that paired new graduates with experienced nurses, including a nurse who celebrated her 80th birthday in the unit. The clinical mentors did not take any patients; they simply provided clinical oversight to the new nurses.

“I thought that was an innovative

approach,” Zolnierrek said. “We were trying to accelerate the skill development you only get through experience, and we offloaded the physical demands of the work. ... Younger nurses weren’t getting burned out because they had a level of support.”

Stokes also sees a local opportunity to nudge high school students from the Houston Independent School District (HISD) toward health care careers.

“We need to work with HISD,” he said. “During junior and senior years, if you want to be a nurse, you go to school in the morning and nursing school in the afternoon. When you graduate from high school, you can sit for your LPN [licensed practical nurse] boards and make \$18 to \$20 an hour as a living wage. ... For some families this is about breaking the cycle of poverty. And if community colleges partnered with high schools to get kids interested in health care, it would go a long way toward solving the allied health workers shortage.”

Nursing students also should be encouraged to consider jobs outside of major metropolitan areas.

“A lot of underserved areas have to incentivize folks,” Nibert said. “We’ve got real problems with health care personnel concentrated in major cities and not so much in rural areas. If you are willing to go where the areas of

clinical practice skills and get time with patients is to tap into non-traditional health care settings, Zolnierrek said. Assisted living facilities, homeless shelters, primary health care clinics and other places that need nurses might offer valuable opportunities.

Most experts agree that the profession would be able to keep more nurses at the bedside by devising more creative retention strategies.

“We have to figure out ways to keep nurses at the bedside while they go back to school,” Jones said. “We have to increase partnerships between nursing schools and hospitals and outpatient settings so we are working together. Maybe a school of nursing provides all those nurses with a master’s degree with hospital-procured funding and the nurses stay in that hospital setting. That could be a win for everybody involved.”

There is no simple solution to the nursing shortage, but as

the need for nurses grows more acute, patients and the health care community will feel the pain.

“People see what nurses do. What they can’t see is what’s going on between a nurse’s ears—what she is looking at,

evaluating and thinking,” Zolnierrek said. “That’s the real value of the nurse. The nurse can interpret what she is seeing and know what needs to be done to protect a patient and allow a body to heal.” ■



Ainslie Nibert, Ph.D., is associate dean of the Texas Woman’s University nursing program in Houston.

Credit: Courtesy photo

TECO Wins International Recognition

The district energy system earns top industry award

BY MAGGIE GALEHOUSE

The district energy system that cools and heats the Texas Medical Center won a top industry award in June.

Thermal Energy Corporation (TECO) brought home the 2019 System of the Year Award from the International District Energy Association (IDEA)—the highest honor the organization confers.

“It is one thing for me to stand up and say, ‘Hey, we do a good job,’” said Steve Swinson, CEO and president of TECO. “But when an independent third party says it, it gives everybody in the medical center some comfort, some confidence. If we don’t do what we do, the hospitals and institutions don’t do what they do.”

The TECO plant produces thermal energy—chilled water and steam—in a closed loop system for 50 buildings and 16 different institutions in the Texas Medical Center, reusing and recycling everything it pushes out. This energy-efficient system means that individual institutions do not have to house and operate their own heating and cooling equipment.

“Chilled water is cooled down to 40 degrees and we circulate it in pipes to air-condition the buildings,” Swinson said. “We send out steam and it is used for cleaning, sterilization, heating—things like that.”

The plant was originally built and operated by Houston Natural Gas in 1969 to serve St. Luke’s Hospital and Texas Children’s Hospital. In 1975, the Texas Medical Center helped bring many of the institutions together to create TECO, a nonprofit.

With approximately 36 miles of pipe, TECO is the largest district energy chilled water system in North America.

“We only know of two other systems in the world that are larger—in Dubai and Abu Dhabi,” Swinson said.



Located at 1615 Braeswood Blvd., TECO’s central plant includes an 8.8 million-gallon thermal storage tank.

Part of TECO’s role is to prepare for the worst. The system was able to maintain service to the medical center during natural disasters including Hurricane Alicia in 1983, Tropical Storm Allison in 2001, Hurricane Rita in 2005, Hurricane Ike in 2008 and Hurricane Harvey in 2017.

The lessons learned from Harvey, when Houston sustained 60 inches of rain over several days, were small but not insignificant, Swinson said.

“From a tech perspective, it went exactly like we wanted it to go,” he said. “I would say we changed some collateral things. We had 35 employees on the ride-out team on site for five-and-a-half days. We learned we need bigger cots, better mattresses, better pillows. ... We learned that we need to do a better job of regimenting our schedules. It’s one thing to push through and work 72 hours when you’re getting five to six hours of sleep each day, but we found that’s not optimal for five-and-a-half days and it sure wouldn’t be optimal for seven days. We learned we almost need a curfew. If you’re off shift, you’ve got to eat and go to bed, even if there’s anxiety and excitement. What if in the fifth day we had a breach?”

TECO competed against district energy systems around the world for the 2019 System of the Year IDEA award. Eighteen different countries were represented at the conference in Pittsburgh where the award was presented.

“This is really an award for the Texas Medical Center,” Swinson said. “We’re unique in that TECO is essentially a cooperative. The institutions we serve govern us, so it’s a testament to 50 years of employees. The vision to create this campus was more than just hospitals, research and education. There needed to be the collateral support function that makes these things happen. TMC employees showed the same vision for that as they did for health care.” ■

Bringing Mental Health to the Masses

Meru Health aims to provide a digital clinic for the iPhone generation

BY ALEXANDRA BECKER

Kristian Ranta wants you to get help—and he wants to make it easy for you. The founder and CEO of Meru Health, a digital clinic focused on treating anxiety and depression, knows how important managing those conditions can be: he himself went through years of therapy after losing his brother to suicide in 2005, and he hopes that his company can do for others what his therapists did for him.

“I started realizing how important these things are for people when tough stuff happens,” Ranta said. “And through my own experience, I started to have a clear idea of how I could actually, through a digital intervention, deliver these pieces to people like my brother.”

Ranta, originally from Finland, hails from an entrepreneurial background. His parents both had careers in business, and he founded his first company at age 25. After selling a diabetes management system he was developing in 2015, he founded Meru Health the following year—yoking his background in medical device development to his newfound mission to make mental health services accessible to the masses. The company is now based out of both Finland and Palo Alto, California.

Digital therapeutics is an emerging trend in medicine that uses digital products to help manage, treat or prevent disease.

Meru Health, which was part of a recent TMCx cohort, is unique in the world of digital platforms in that it is not an app in the traditional sense, but more akin to a digital clinic.

“We are a medical corporation with technology,” Ranta explained. “We have psychiatrists on staff and we have licensed therapists on staff. ... It’s kind of like a telehealth clinic



Kristian Ranta, founder and CEO of Meru Health, pitches his company at TMCx Demo Day in June.

with a digital program that is on your smartphone.”

The platform is set up as a 12-week program supported by video lessons, practice tools and anonymous peer support groups. Each user has access to a personal licensed therapist who is available through chat or phone or video calls, if necessary. A psychiatrist oversees each therapist’s caseload and can assist with medication management and other services requiring that level of expertise.

Having dedicated therapists on call is critical to the platform’s

success, Ranta said.

“I learned this in my previous company, that if you just have an app or a website—if you’re just relying on people going through that on their own—most people just won’t do it,” Ranta said. “There’s a lot of cool technology available, but there’s no adherence or engagement. ... What works is if they have a provider relationship. Then they stick to a treatment.”

Combining that accountability with the app-based tools has paid off, he added.

“People can do a lot of it on their

own whenever they want and when it is good for their schedules. That’s really important and has allowed us to get to a point where we have an 89 percent completion rate,” Ranta said. “That’s way beyond normal care.”

The platform also measures high in engagement, with users completing lessons or practices nearly five days out of every seven—which translates to between 15 and 20 hours of interacting with the program.

“That has allowed us to get really good clinical outcomes. Normally

what's challenging in delivering high quality care is visits, but in our case, in this model, we're able to deliver way more care in terms of hours than would normally be possible in a visit-based health care setting," Ranta said. "In a visit-based health care setting, you would only see your provider once a week, or maybe once every two weeks, so it's episodic. But in our case, it's like daily interaction. It may be small interactions, but it's very engaging, very in-the-moment with your daily life and events and whatever happens when you're a patient going through the program. That's why we're able to get such high completion rates and help people actually get better."

A paper analyzing the company's 12-month post-treatment outcomes, which is currently in peer review, shows somewhere between 5 to 10 times better outcomes for treating depression and anxiety than normal standard of care, Ranta added.

"The important point is that we are actually spending less provider time, too" he said. "People are doing the work themselves—that's the beauty of combining the app with the providers. The providers spend somewhere between 10 and 20 minutes per patient per week, which is way less than they would spend in structured psychotherapy. ... So it's kind of a cool thing how technology allows for the implementation of new types of care processes."

Meru Health recently secured more than \$4 million in financing from Freestyle Capital, Bonit Capital, Y Combinator, Lifeline Ventures and IT-Farm. This funding will help the company gather additional data through their pilot programs and publish more case

studies and clinical research—all of which will support future growth and open up a world of therapy to any patient with a smartphone.

Currently, the company's platform is available to patients via corporate partnerships, large health plans and managed care companies. Primary care providers also have expressed interest, Ranta said, and Meru Health is seeking ways to collaborate with primary care networks, primary care clinics and accountable care organizations. Ranta hopes the service ultimately will be offered directly to consumers because, as he well knows, the battle with depression and anxiety is hard enough—gaining access to help shouldn't be.

"Meru is a summit in the Himalayas, and it was the last summit that was conquered," Ranta said, explaining his company's name. "In 2011, a group of climbers conquered the peak, and it was a really, really big deal ... and it was super difficult. It's kind of like a symbol for depression and conquering one's mind. It's going to be super difficult, but it's doable, and with the right team, with help and support, it's doable." ■



Before founding Meru Health, Ranta, far right, was a member of the Finnish death metal band Norther.

Death Metal Musician to CEO

Before Kristian Ranta founded Meru Health, he spent nearly a decade as a member of the Finnish death metal band Norther. Known by the nickname "Kride," the now-CEO sang vocals and played guitar. He and his band grew famous in Finland and beyond, playing sold-out shows across Europe, Asia and Canada after a label manager serendipitously picked up a demo they'd left on a table in a rehearsal studio.

"It was so crazy," Ranta recalled. "Most bands try demo after demo and they don't get a record deal. We never sent our demo anywhere."

Ranta thinks back on those days fondly, saying his best memories are hanging out with his bandmates in the van, going to and from their shows. During his time with Norther, he completed his university studies and founded his first company. Although the band is no longer together, some of his bandmates have moved on to ambitious careers—including one who is a physicist and another who just completed his Ph.D. in music therapy with a focus on stroke rehabilitation.

As for Ranta, all those years on stage have helped inform his role as founder and CEO of Meru Health.

"It was a huge help to learn to be natural in front of an audience," Ranta said. "In the early years, I was pretty nervous in front of the public when we would perform, but eventually you get used to it and then actually really love it. ... That's definitely been very beneficial for my current career as an entrepreneur."

The band was also like a small company, Ranta added, with management and different members having varying responsibilities—all necessary components for the whole to be successful.

"In a way," he said, "it was kind of like my first startup." ■

1 | SHARON PLON, M.D., PH.D., professor of pediatrics-oncology and of molecular and human genetics at Baylor College of Medicine and co-director of the Texas Children's Cancer Center's Cancer Genetics and Genomics Program, has been appointed by the Secretary of the Department of Health and Human Services to the National Advisory Council for Human Genome Research until 2020.

2 | MIKE BENNETT has been named chief nursing officer at The Menninger Clinic.

3 | KENNETH McCLAIN, M.D., PH.D., professor of pediatrics-oncology at Baylor College of Medicine, has received the 2019 George R. Buchanan Lectureship Award from the American Society of Pediatric Hematology/Oncology.

4 | HUDA ZOGHBI, M.D., founding director of the Jan and Dan Duncan Neurological Research Institute at Texas Children's Hospital and the Ralph D. Feigin Professor in the departments of pediatrics, molecular and human genetics, neurology and neuroscience at Baylor College of Medicine, has joined The Menninger Clinic's Clinic Board of Directors.

5 | TEXAS CHILDREN'S HOSPITAL tied for third overall in the *U.S. News & World Report's* 13th annual rankings of the best children's hospitals. Texas Children's was also named the best place in the country for children in need of pediatric cardiology and heart surgery, as well as pulmonary care.

6 | THE UNIVERSITY OF HOUSTON hosted the nation's first Women's World Wheelchair Rugby Invitational Clinic, a four-day training camp featuring athletes from the United States, Canada and France.

7 | Marc Boom, M.D., center, CEO and president of Houston Methodist, led a celebration welcoming one of the world's most powerful MRI machines to the **HOUSTON METHODIST TRANSLATIONAL IMAGING CENTER**. The Siemens 7 Tesla (7T) MAGNETOM Terra was procured through a Siemens Healthineers and Houston Methodist multi-year consortium agreement. This is the first 7T MRI of its kind in Texas and the first 7T MRI scanner approved for clinical use in the U.S. The MAGNETOM Terra is scheduled to be operational in the second half of 2019.



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Credit: Nos. 1, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14 courtesy photos; No. 2, Michael Hart, No. 15, Dwight C. Andrews/McGovern Medical School at UTHealth Office of Communications



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8 | SHRINERS HOSPITALS FOR CHILDREN - HOUSTON received \$30,000 from the Reliant Gives program.

9 | The first lady of Botswana, Neo Jane Masisi, is the first member of the International Council of Global HOPE (Hematology-Oncology Pediatric Excellence), a **TEXAS CHILDREN'S CANCER AND HEMATOLOGY CENTER** initiative to improve the long-term care of children with cancer and blood disorders in Sub-Saharan Africa.

10 | ALEJANDRO CHAOL, PH.D., assistant professor and director of education at The University of Texas MD Anderson Cancer Center's department of palliative, rehabilitation and integrative medicine, has received a \$1 million endowment from the Huffington Foundation and been named the Huffington Foundation Endowed Director of the Mind Body Spirit Institute at the Jung Center.

11 | SREYRAM KUY, M.D., a practicing general surgeon at the Michael E. DeBakey VA Medical Center and deputy chief medical officer for quality and safety for a network of VA facilities, has been awarded a Health Innovators Fellowship by the Aspen Institute.

12 | PATRICE HARRIS, M.D., right, a psychiatrist and the first black woman to lead the American Medical Association, poses with **TOI BLAKLEY HARRIS, M.D.,** Baylor College of Medicine Associate Provost of Institutional Diversity and Inclusion & Student Services. Patrice Harris delivered the keynote speech at Baylor's Center of Excellence in Health Equity, Training and Research annual summer research summit.

13 | STEPHEN PFLUGFELDER, M.D., professor of ophthalmology at Baylor College of Medicine, delivered the Binkhorst Lecture and received the Binkhorst Medal at the annual meeting of the American Society of Cataract and Refractive Surgery/American Society of Ophthalmic Administrators.

14 | BEHRANG AMINI, M.D., PH.D., associate professor at MD Anderson Cancer Center and director of the musculoskeletal imaging fellowship program, received the J.T. "Lamar" McNew, MD, Award by the Texas Medical Association Resident and Fellow Section.

15 | Officials broke ground on the \$125 million **UT CONTINUUM OF CARE CAMPUS FOR BEHAVIORAL HEALTH**, a joint project of The University of Texas Health Science Center at Houston (UTHealth) and the Texas Health and Human Services Commission.

Do you have TMC photos you would like to share with *Pulse*?

Submit high-resolution images to: news@tmc.edu

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August 2019

8/10

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events@mdanderson.org
866-434-7084

8/17

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Hosted by the McGovern Medical
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Saturday, 9 – 10 a.m.
Miller Outdoor Theatre,
meet near ticket booth
Hermann Park
1500 Hermann Dr.
walkwithadoc.org
Samuel.D.Luber@uth.tmc.edu
346-291-5808

8/13

Rice University Farmers Market
Tuesdays, 3:30 – 6:30 p.m.
Rice University
Parking lot entrance 13B
5600 Greenbriar Dr.
ricefm@rice.edu

8/22

**Hurricane Harvey:
Two Years After
Symposium**
Thursday, 9:30 a.m. – 4:30 p.m.
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Baylor College of Medicine
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Free; registration required.
harveystudy@bcm.edu
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