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NEWS OF THE TEXAS MEDICAL CENTER — VOL. 4 / NO. 9 — OCTOBER 2017
When Harvey Hit
How the Texas Medical Center survived an epic storm, pp. 12–29

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

As Tropical Storm Harvey stalled over Houston, I drove to my home—only one mile from the Texas Medical Center—to pack several days of clothing, in anticipation of a long stay working from our headquarters on Bertner Avenue.

In just the 20 minutes that it took me to drive home and back to the office, the roads were suddenly teeming with water and impassable. To make it to my office, I had to drive up onto the sidewalks in front of our buildings. It was surreal to watch vehicles floating slowly down roads that, just hours before, had been active with people, cars and trains.

And yet, despite all that water, the Texas Medical Center persevered through the storm. That wasn't a mere coincidence; it was the result of years of careful planning and investment.

Tropical Storm Allison devastated the Texas Medical Center in 2001, delivering more than 40 inches of rain over 15 days. The water crippled the largest medical city in the world, shutting down 22 hospitals and causing more than $2 billion in damage.

Sixteen years later, Harvey delivered 51 inches of rain over five days, setting a record for the largest amount of rainfall from a single storm anywhere in the continental United States. But the Texas Medical Center remained fully operational throughout the entire storm.

This is due in large part to the investment of more than $50 million in our infrastructure, including elevating our electrical systems and implementing an advanced floodgate system designed to protect all of the buildings from water. The floodgates are three feet high, 10 inches thick and lock tight with rubber seals to keep water out. In addition, we installed submarine doors on the tunnels that run under our buildings.

We also utilize a sophisticated sonar-based system designed by Rice University researchers that tracks and measures rainfall in the surrounding area. This technology and information provides us the advance warning to initiate our emergency flood protocol that coordinates the activation of our floodgates around all of our hospitals, clinics and research buildings.

As Harvey's rainfall continued, the Texas Medical Center became an island, cut off from the rest of the outlying areas. All of the streets became fast-moving streams of water. However, our storm gates held strong and protected our buildings from being inundated with water.

All of our hospitals remained open and employees continued to care for our patients throughout the storm.

Surprisingly, the challenges that unfolded during and after Harvey had less to do with water and more to do with the movement of people and supplies. We orchestrated the arrival of physicians to makeshift shelters established throughout the city, which was essential to supporting tens of thousands of people devastated by the storm. In addition, because all deliveries were cut off to the medical center for several days, we carefully monitored and shared resources to make it through.

I want to express my gratitude to the vast number of people who stayed in the medical center throughout the five days of the storm to keep it running and to provide care to our patients. These individuals sacrificed time away from families during this very difficult ordeal and many of them suffered devastating flooding in their own homes. That spirit and dedication make the Texas Medical Center a unique and special place.

William F. McKeon

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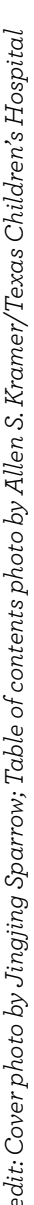

ON THE COVER:
Fannin Street, underwater, during Tropical Storm Harvey.

ON THIS PAGE:
A member of the Texas Children's Hospital ride-out team heads home.

ON THE SIDE

By Shanley Chien

A Cirrus SR22 single-engine aircraft in flight.

Credit: Left, Cirrus Aircraft; Below, Courtesy photo

NAME: Brian Dean

OCCUPATION: Senior Vice President and Regional President - Central Region, Memorial Hermann Health System

INTEREST: Piloting airplanes

As one of the leaders of Memorial Hermann Health System, Brian Dean is a pilot who steers institutions toward clinical innovation, collaboration and patient care. But for the past six years, Dean has also been a licensed pilot who volunteers for a nonprofit that provides free air transportation for patients receiving medical treatment.

Dean became enthralled with aviation and the wonders of flight by watching his grandfather—the head track coach at Georgia Tech University during the 1950s and 1960s—fly his own airplane to recruit athletes. But Dean's desire to fly planes came to fruition years later when a work colleague who moonlighted as a flight instructor invited him out one weekend to fly. He has been hooked ever since.

"As soon as you light the fuse on that, you're addicted," Dean said. "It's a privilege to be able to fly. It's not the easiest thing to get to do, which makes it a little fun, also."

A year after he was bitten by the flying bug, he earned his private pilot license and purchased his Cirrus SR22, a single-engine four-seater aircraft with a range of approximately 1,200 miles. It's a smaller aircraft, but it allows Dean to fly his wife and two children to and from College Station for burgers, or to and from Brenham for Blue Bell ice cream on the weekend. On other occasions, he'll take his family on a 1.5-hour flight to New Orleans for dinner and return home in time to put the kids to bed.

"I've done it a hundred times, but each time it's a little different. Weather is always going to be different, wind conditions, temperatures—all of that affects the airplane," Dean said. "It's a nice kind of getaway."

Besides weekend excursions with his family, Dean volunteers for Angel Flight in his spare time. He receives an email each night with a list of patients seeking transportation either to or from Houston, and chooses which missions to fly depending on his availability. Recently, he flew as a co-pilot to Fort Smith, Arkansas, to transport a young war veteran and lung cancer patient to the medical center for treatment.

"The ability to take a passion and blend it with the passion that we have here at Memorial Hermann in providing care is a lot of fun," Dean said. "It's really rewarding."

Finding time in his busy schedule to volunteer can be challenging, but Dean said he tries to protect calendar time during the week if he's unable to go on a mission over the weekend. He'll modify his schedule to accommodate a patient who needs a flight home or needs to be picked up from Dallas on a Thursday afternoon.

He views each trip as a way of being directly involved with bringing patients to the hospital—a small part of the overall process, but one that is essential to giving patients access to care.

"It's easy as administrators to get away from the patient, who is at the center of everything we do," Dean said. "But to be able to spend time with them and see the human spirit ... it's a nice dovetail into what we do."

When Dean isn't working, he can be found hanging out with Memorial Hermann Life Flight pilots and swapping airplane stories with fellow aviation enthusiasts. ■

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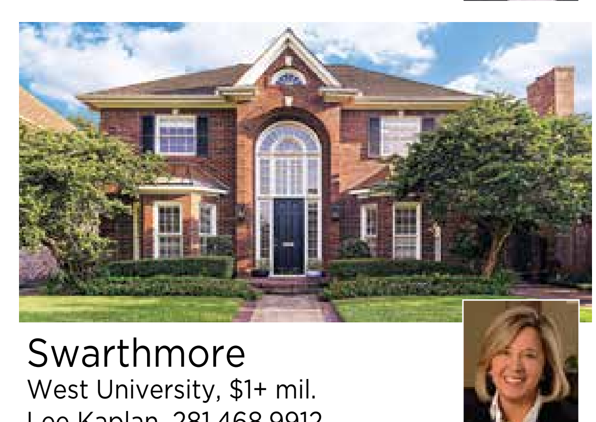

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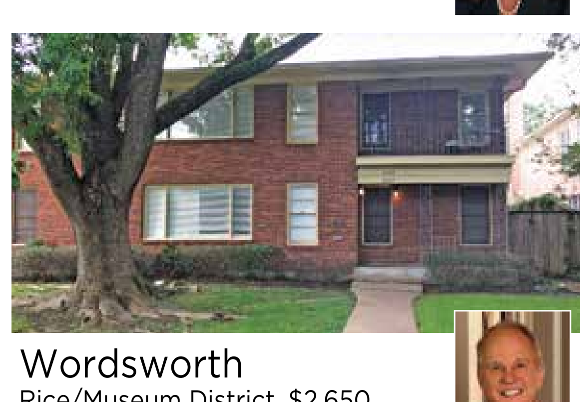

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‘A Rather Peaceful Place’

Inside the Galveston County Medical Examiner’s Office

By Ryan Holeywell

The green folder on Dr. Erin Barnhart’s desk continues to gnaw at her.

The Galveston County Chief Medical Examiner is trying to determine why, exactly, a seemingly healthy man in his 30s came to be found dead in his bed. All she knows is that, before he died, he reportedly had been feeling sick for a few days.

She flips through the pages inside the folder, ticking off the facts that deepen the mystery. The autopsy came back normal, and the toxicology report showed no signs of drugs. Organ samples looked fine too, and Barnhart—down to the last few tests she can perform—isn’t optimistic that she’ll come back with a definitive answer. He might have had undiagnosed diabetes, she speculates out loud, but admits that’s not looking likely. She’s dreading what she’ll likely have to enter into the record—“cause of death: undetermined”—and the uncomfortable conversations with his family that will follow.

“Those are some of the most frustrating, unsatisfying cases,” Barnhart said. “You wonder ‘Have I missed something? Is there something wrong with the story?’ You can drive yourself crazy with cases like that.”

For someone like Barnhart, who is motivated by the search for the truth and the challenge of peeling back layers of a case, the experience can be maddening. Fortunately, she has an impressive success rate: Fewer than 1 percent of her office’s cases wind up with an unknown cause of death. The rest of the time, thorough examination yields clues that ultimately lead to a conclusion. Her office performs about 1,200 autopsies annually.

“Just the way human bodies go together, they come apart in much the same way,” Barnhart explained. “They go together like puzzle pieces and come apart like puzzle pieces. You look at each of the pieces, and see which ones are dysfunctional or injured, and there’s a nice symmetry and organization to it.”

Erin Barnhart, M.D., in the morgue of the Galveston County Medical Examiner’s office.

For Barnhart, a Fort Worth native who took the job in Galveston in 2015, the position was something of a homecoming. She attended medical school at The University of Texas Health Science Center at Houston and did her anatomic and clinical pathology residency, as well as her surgical pathology fellowship, at The University of Texas Medical Branch at Galveston (UTMB). She completed her training in forensic pathology at the Miami-Dade Medical Examiner’s Office in Miami. Before returning to Galveston to lead the medical examiner’s office, she spent four years as the deputy chief medical examiner for the Mississippi State Medical Examiner’s Office. In her role as chief medical examiner in Galveston, she’s also an assistant professor at UTMB.

Barnhart didn’t expect to become a medical examiner when she was in medical school. But it was always in the back of her mind, ever since she saw autopsies performed while working at a hospital in college—and didn’t recoil.

“Without sounding too morbid, there’s a certain beauty to it,” Barnhart explained. She marvels at the wonders of the body, and her privileged position to observe and explore it. “Think of how few people in the world know what it feels like to squeeze a piece of brain in your hand.”

Barnhart’s office is charged with determining the cause of death in more than a dozen specific instances, including when a human body is found under uncertain circumstances; when a homicide may have taken place; when someone dies in the absence of a credible witness; or when children die, in some cases. Her office is responsible for examining deaths in Galveston, Fort Bend, Brazoria and Matagorda counties.

Though television dramas suggest that medical examiners spend most of their time working with police to solve homicides, those cases represent a relatively small portion of Barnhart’s work. The most common are natural and accidental deaths.

And there are other, television-inspired misconceptions about her job she wants to refute, too. “Those ‘CSI’ shows are the bane of my existence,” Barnhart said with a laugh. “I refuse to watch any of them.”

For starters, she doesn’t like the stereotype that the medical examiner is “the troll in the basement,” a morbid or antisocial type who doesn’t work well

with others. Medical examiners, she said, interact with the families of the deceased, not to mention police, crime scene investigators and attorneys. They're generally a friendly group.

And crime shows have created unrealistic expectations from everyone—law enforcement, juries, and the public—about what, exactly, an autopsy can reveal, she said. For example, those mysterious fibers that TV medical examiners inevitably seem to find, that so often crack the case? Barnhart's never seen them.

The other misconception is that a medical examiner's work is very depressing. "Nobody here is in pain," Barnhart says of the deceased who are brought to her office. "Nobody here is suffering. The family members here aren't facing complicated end-of-life medical decisions. It's a rather peaceful place." Though family members are often grieving when they visit the medical examiner's office, Barnhart and her staff are experienced at interacting with them and showing compassion, given their familiarity with tragedy and death.

> **"Just the way human bodies go together, they come apart in much the same way. They go together like puzzle pieces and come apart like puzzle pieces. You look at each of the pieces, and see which ones are dysfunctional or injured, and there's a nice symmetry and organization to it."**
>
> — ERIN BARNHART, M.D.
> *Galveston County Chief Medical Examiner*

Still, the nature of the job forces Barnhart to compartmentalize her work in order to remain emotionally healthy. She doesn't have an office at home. She avoids bringing photographs home to work on cases. "When you see so many sad cases, you have to have a sense of humor about it—and I don't mean we're standing around laughing," she explained. "But you can't stand around crying all day at work."

There's been one exception: In 2013, while working in Mississippi, Barnhart performed an autopsy on a detective she knew. The detective had been questioning a homicide suspect, but the suspect overpowered him and fatally shot the detective with his own gun.

(continued)

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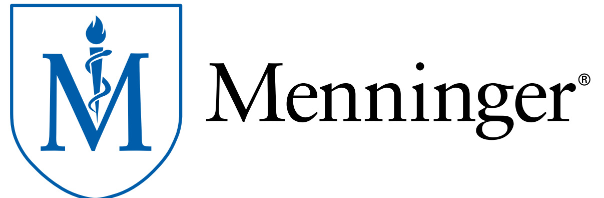

The Menninger Clinic is affiliated with Baylor College of Medicine; both institutions are Texas Medical Center members.

> “Nobody here is in pain. Nobody here is suffering. The family members here aren’t facing complicated end-of-life medical decisions. It’s a rather peaceful place.”
>
> — ERIN BARNHART, M.D.

Barnhart had met with the detective just a day earlier. It was the only time she ever cried during an autopsy.

But generally, medical examiners have to avoid identifying too closely with the deceased and their families if they want to continue to be successful at their jobs. “You really can’t let yourself do that,” she said. “Once you start doing that, it’s going to be very difficult to come back from that emotionally.”

One of the most rewarding aspects of her work, she said, is when she can explain to a family why a loved one died of seemingly mysterious circumstances. Often, it’s the result of an undiagnosed condition that runs in families, such as heart disease, and she can advise the rest of the family about potential health dangers. Though all of Barnhart’s patients are deceased, those cases may help her save other lives.

She can also tell parents of infants who died under unclear circumstances about undiagnosed conditions those children had. Often, parents blame themselves for a child’s death, assuming it resulted from some sort of mistake they made, like an unsafe sleeping position. But many times, Barnhart discovers the death is actually due to an undiagnosed medical condition, which helps assuage the parents’ guilt.

“You can definitively go to the parents and say, ‘This was not your fault,’” she said. “‘Nobody knew about it, and there’s not anything you could have done about it.’ That mother still doesn’t have her baby, but at least she can say, ‘I did everything I could have.’”

But most importantly, Barnhart says the job has given her an appreciation for the fragility of human life itself. As the person who looks into all accidental deaths in the region, she sees firsthand just how easily—and seemingly randomly—life can be taken away.

“You can eat right, and exercise every day, and always wear your seatbelt,” she said. “You can make every decision correctly and still be walking along on a sidewalk and get hit by a car. And there’s not a damn thing you can do about it.” ■

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Saving Decayed Teeth with Stem Cells

A dentist is researching alternatives to root canal treatment and extraction

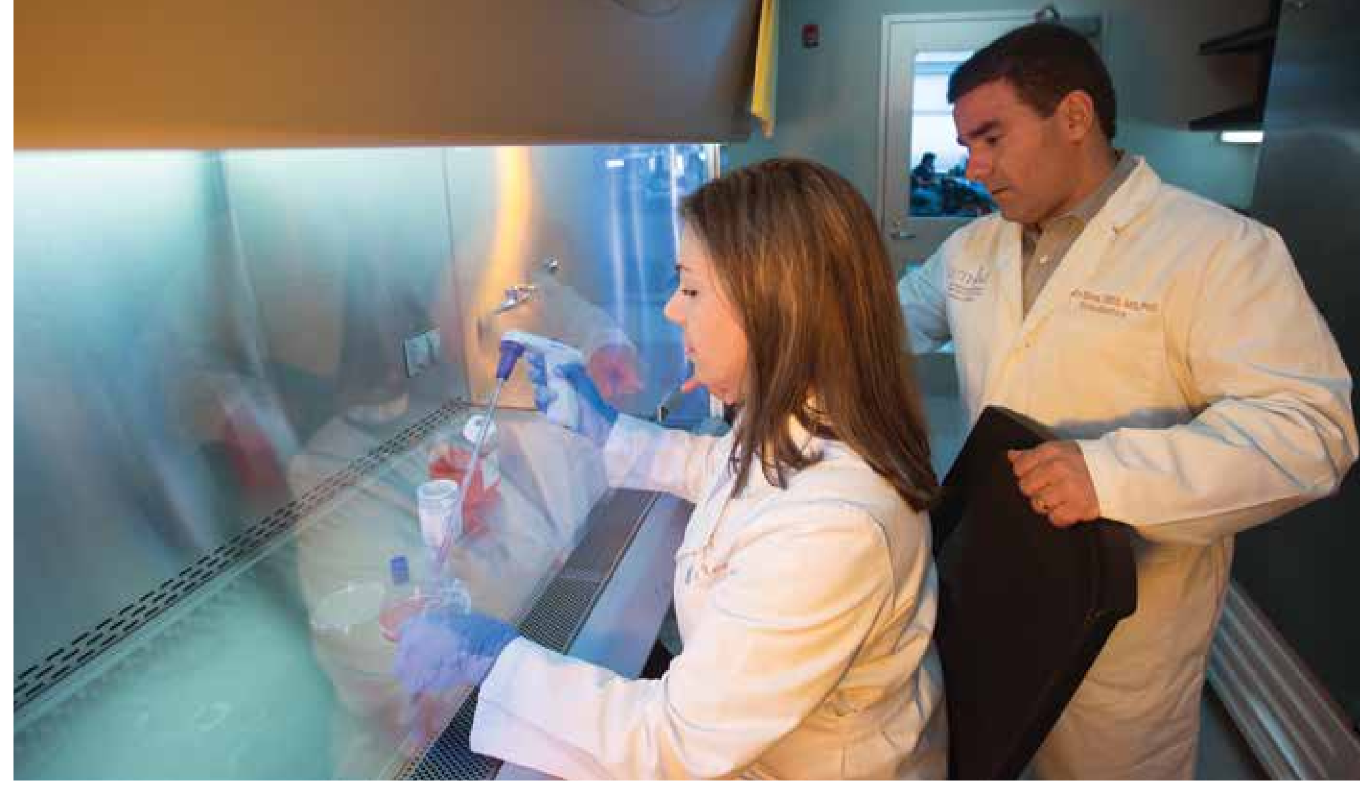
By Christine Hall

Can decayed young teeth be saved with stem cells? Dr. Renato Silva thinks so.

When decay penetrates the nerve space in an adult's permanent tooth—known as dental pulp—a root canal is the best solution. A dentist removes the nerve and pulp, and then cleans and seals the inside of the tooth.

But when that same problem occurs in a child or young adult, a root canal becomes much trickier, because the root of the tooth may not be fully formed. Dentists might try to clean and fill the root canal, or they might pull the tooth and replace it with an implant when the patient is older.

"We see a lot of kids come into our endodontic clinic and pediatric clinics with dental problems," said Silva, D.D.S., Ph.D., associate professor and chair of the department of endodontics at The University of Texas Health Science Center at Houston (UTHealth). Factors that contribute to decay include not brushing and/or flossing, diet, saliva composition and genetics.



Ariadne Letra, D.D.S., Ph.D., director of research in the department of endodontics at UTHealth's School of Dentistry, and Renato Silva, D.D.S., Ph.D., associate professor and chair of the department of endodontics at UTHealth, demonstrate how their team analyzes samples.

Depending on the age of the child, a permanent tooth will come in, but the root may take a few years to develop, said Ariadne Letre, D.D.S., Ph.D., director of research in the department of endodontics at UTHealth's School of Dentistry and a member of Silva's team.

Rather than choosing a root canal treatment or tooth extraction for young permanent teeth, Silva believes he can use stem cells to replace the damaged tissue with healthy tissue and promote root formation.

His research is in the preclinical stage, but results so far have been promising.

Dental pulp is a complex bundle of tissue, blood vessels and nerves. The tissue dies when it is contaminated by bacteria. During a root canal, a dentist will dig out that contaminated tissue and replace it with an artificial material, Silva said, because you can't leave an open space for bacteria to continue to grow. Even so, root canal therapy-treated teeth are destined to be brittle and devitalized.

But what if there was a way to revitalize the tissue and make the tooth healthy again?

While pondering ways to promote root formation, Silva and his team came up with the idea of using stem cells retrieved from the root area deep inside the tooth called the apical papilla. Since they also needed some sort of scaffold for the cells, they devised one made of a polymer fiber impregnated with a protein called vascular endothelial growth factor (VEGF), to stimulate the growth of new blood vessels that would help with tissue and pulp regeneration.

A microscopic image of tissue invagination into the tooth after 45 days of implantation.

Credit: Courtesy of Renato Silva

"These stem cells of the apical papilla can turn into any type of tissue, and in our case, we need root and pulp tissue, so we thought, 'Why not?'" Silva said.

After removing the decay from the tooth and cleaning out the root canal, Silva and his team fill in the area with stem cells and the VEGF scaffold, which will regenerate the pulp tissue, he said.

The stem cells come from extracting the third molar of the child—known as the "wisdom" tooth. Silva and his team collect the cells attached to the bottom of the tooth crown, isolate the stem cells and then use them in the decayed tooth.

Because the use of stem cells for dental treatment in humans is not yet approved in the United States, Silva and his team have been researching their theory on mice. After putting the stem cells inside the tooth, they implant the teeth on the back of mice to evaluate new tissue formation. The result has shown that the tissue and blood vessels from the mouse go inside the root and fill in the empty space, mimicking the original dental pulp tissue.

Once the use of stem cells is approved for this use, Silva and his team will move forward with isolating the stem cells of the apical papilla from third molars to deliver into the decayed tooth of the same patient.

"I believe our results are promising in light of future patient-centered approaches toward pulp and dentin regeneration therapies," Silva said.

This summer, the University of St. Thomas welcomed a new president, RICHARD L. LUDWICK, J.D., D.ED. Previously, the Indiana native served as president of the Independent Colleges of Indiana, America's oldest state association of private colleges.

Q | *Why University of St. Thomas?*

A | For me personally, that is an interesting discussion. About 15 years ago, I sat down and made a list of colleges that I thought matched my personal motivation for service and had some other things—diversity within the student body and faculty, an urban location, a fit between meaning and method. I made a list of 10 colleges that I thought fit that very nicely. The University of St. Thomas was in the top five of that list—and that was 15 years ago. As time went by and I had occasion to learn more about UST, I was more convinced that it was the right place to be. It came to pass that Dr. Robert Ivany, UST's last president, announced that he would retire, and I just threw my hat in the ring, like I'm sure so many others did. Whether it was providence or just the measure of the search, they asked me to join them and I was more than delighted to do that.

Part of my background, too, matches very well with the mission, the DNA of the University of St. Thomas as a Catholic institution in the Basilian tradition. Goodness, discipline, knowledge and community are things that are not just a tagline but are lived out here, and that is something that resonates deeply within me.

Q | *You are very active in the Catholic church and the Knights of Columbus. Is being Catholic an essential part of leading a Catholic university?*

A | We talk a lot here about the notion of vocation, the understanding of the gifts that one has and how they are able to continue God's creation by having those gifts and bringing them to the fore. For me, that's a natural outgrowth of my faith and the ability to bring it to full blossom in service to this university. Certainly, there are some who are not Catholic who are skilled leaders within a Catholic university, but I think it is one of those things that gives you an additional level of understanding.

Q | *You have held leadership positions at several institutions, including the University of Oregon School of Law and the University of Florida Levin College of Law. Would you say you have a certain leadership style?*

A | I believe that there is wisdom in decisions of the crowd. I try to create an atmosphere—an environment—where creativity can flourish and the best ideas come forward. And with any luck at all, we will come up with the right ones.

Q | *UST's previous president, Robert Ivany, Ph.D., left some pretty big shoes to fill. How do you hope to expand on his work and make your own mark on campus?*

A | He is … we actually wear the same size shoes. Dr. Ivany does leave big shoes to fill and certainly you can look at the accomplishments that he has had—the seminal one at the end here is UST's new Center

for Science and Health Professions. I think he has a particular gift in developing relationships with donors and those outside the community, so that is certainly an area that I hope to continue and develop. I also think that it is useful to have someone with a slightly different skill set come along. I see myself in that way, having worked with student affairs in the past and having been an academic leader on another college campus.

Q | ***UST sits in the heart of Houston, with close proximity to many resources, including the Texas Medical Center. Are you looking forward to a continued partnership with the TMC?***

A | This has been a real eye-opener for me to come to this community and learn more about the Texas Medical Center. I am not necessarily a native in the health care field, however my wife is a pharmacist and she has worked for both small and very large health systems in the past. She has a head start on me, of course, in understanding what the Texas Medical Center is and what it does and how the University of St. Thomas can fit within that. We are a relatively new member of the medical center, and I think we are just now scratching the surface of what that relationship means. We will look for ways to engage and to push the envelope of innovation in terms of how academics and health care can work together.

Q | ***You and your wife, Melynda, have two children. Where are they now?***

A | We have our daughter, Christiana, she is in Indianapolis, and her husband, Michael. They have two children, Gabriel and Pia, so we are grandparents and we are very excited about that. Our son, Richie, is currently in Indianapolis, but he has taken a new job at a consulting firm in south Florida.

Q | ***You are the ninth president of UST. What are the biggest challenges that have arisen since you started in July?***

A | You always have surprises and challenges that come along daily. One day it might be meeting the new freshman class and shaking all of their hands, and the next day it might be talking to people about how the new costume for our mascot, Lenny the Lion, might look. Then you have some that are sad and very challenging. I certainly didn't expect that something called 'Harvey' would strike our city, but it did. People are suffering, including some of our own students, faculty and staff at UST. But the incredible compassion and spirit of resilience I've witnessed at UST and across the region is truly extraordinary. Something like this requires a community response, and our campus community is responding, not only with action, but with care and love. We've dubbed it #CeltCare, and it's a multi-disciplinary approach to assessing needs and helping those who were adversely impacted by Harvey. We're speaking to each student, faculty and staff member individually, and if they need help, we're doing all we can to act quickly and provide assistance. Thankfully, generous donors and volunteers are stepping up to help us, and that help comes in different forms, from financial assistance with tuition, books and other school-related expenses, to flexible scheduling, carpools, counseling and opportunities for community fellowship. The goal is to keep our students in school, because I really believe that the education we offer makes our graduates hurricane-proof, in a sense. It will empower them financially, emotionally and spiritually to handle life's challenges—even ones like Harvey. You just never know what the day will present, but we have the confidence and the faith to know that the Lord works good for all those who love Him, and we do. ■

Richard L. Ludwick, J.D., D.Ed., was interviewed by Pulse *reporter Britni N. Riley. This interview has been edited for clarity and length.*

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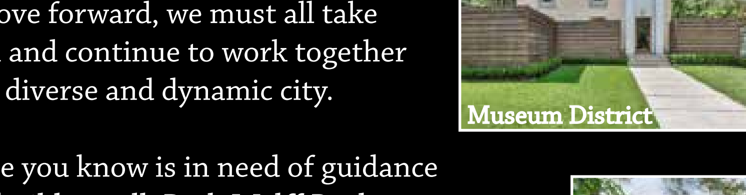

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WHEN HARVEY HIT

The Texas Medical Center began bracing for Hurricane Harvey long before it slammed into the Texas Gulf Coast on Aug. 25, tearing through the Rockport area as a Category 4 hurricane. After 2001, when Tropical Storm Allison forced evacuations and caused massive damage to the medical center, the TMC invested more than $50 million in infrastructure to fortify itself against storms and floods. Ultimately, Harvey dropped more than 50 inches of rain on the Houston area, but the TMC closed its floodgates and continued to care for patients. Employees walked, waded, paddled and hitched rides to work and to shelters around Houston. In the following pages, TMC workers share their stories, and TMC experts weigh in on what to expect in a city forever changed by an epic five-day flood.

Kayaking to Work

Two nurses hitched a ride to Memorial Hermann – Texas Medical Center

In the days leading up to Hurricane Harvey, many residents began stocking up on water, groceries and other essentials so they could ride out the storm at home. But Morgan McCullough and Casey Aslan, both nurses in the medical oncology unit at Memorial Hermann – Texas Medical Center, were making plans to get to work.

"Growing up in South Alabama, I didn't think much of the hurricane," McCullough said. "But I had never dealt with catastrophic flooding before, so that was all new to me and made me nervous."

Both nurses worked Aug. 25 and Aug. 26—the Friday and Saturday before the deluge came. But in anticipation of flooding on Sunday morning, McCullough and Aslan on Saturday left their homes in the Heights and Katy, respectively, loaded up with air mattresses, pillows, blankets and clothing.

"We had planned to spend the night at our co-worker's apartment on Saturday, because we knew the roads would probably be bad the next morning," Aslan said. Their co-worker lived close to the Texas Medical Center.

When the nurses awoke in the early hours of Sunday, water from Brays Bayou was flooding the first floor apartment at Kirby Place Apartments—near the intersection of Holcombe Blvd. and Kirby Dr.—where they had spent the night. Greeted by shin-deep water outside, they quickly realized they would not be able to drive the three miles to work.

"Water was rising super fast, cars were already submerged in water and we felt like we were stuck," Aslan said. "We knew we would need to get to the hospital to relieve the night shift and because of the proximity, we probably had the best chance of getting there."

A friend and co-worker, Bert Zumaya, offered an interesting solution.

"We tried to get in a Jeep Wrangler and the water was way too high," Aslan said. "Our friend, Bert, mentioned he had a kayak and we kind of all laughed at it, but as things progressed, we realized that might be our only option."

As the apartment complex began evacuating residents, McCullough and Aslan threw their scrubs, shoes and a water bottle in a garbage bag and jumped onto the kayak with Zumaya and another friend, to make their way to the medical center. Although the inflatable kayak was designed for one and had a maximum weight limit of 330 lbs., the group floated slowly along.

"We were definitely over the weight limit," McCullough said. "We took on a good bit of water, but we took a side street and once we got to Main St., there was an area with about shin-deep water that we were able to walk in, and flip the kayak over to dump out the water."

It took them about two hours to get from Kirby Place Apartments to work at Memorial Hermann.

"It was one of those things—we had to really talk ourselves up to do it," McCullough said. "I'm still trying to wrap my head around the fact that we really did it. The whole five days we were at work doesn't feel like it really happened to me. We do love our jobs greatly and obviously wanted to be there, but we also knew that we were probably the closest to the hospital with a means of getting there and I think we thought it would be kind of selfish for us to not try to get there."

When McCullough and Aslan made it up to their unit on Sunday, co-workers were shocked and relieved to see them.

"No one at work believed that we actually did it; they were as shocked as we were," Aslan said. "We got there Sunday around noon."

For the rest of the week, the team went back to working 12-hour shifts to take care of the patients on the 17-bed unit.

"Our unit is pretty small so we both get to form a lot of relationships with our patients because they come and see us every 21 days," McCullough said. "A lot of our patients were very anxious when we got there because they weren't really sure what was going on and were wondering if their homes were okay."

Both nurses agree that kayaking to work that day strengthened their connections to co-workers and patients.

"If we wouldn't have been able to come in, our unit would have been short-staffed, overworked and our patients wouldn't have been able to get the care they needed," Aslan said. "The whole hospital came together. We never had to ration food, we were well supported—even people from physical therapy were coming up to see if they could help checking vital signs. We bonded a lot through this and we are even more of a family now." ■

— Britni N. Riley

Morgan McCullough and Casey Aslan pose in the kayak that carried them to work.

A Miracle Delivery

In the midst of Harvey, the Smiths welcomed their daughter

Greg and Annie Smith with their baby, Adrielle Charlotte.

Many parents have crazy stories from the day their first child was born, but few have a story like Greg and Annie Smith, who welcomed their baby girl amid the rising floodwaters of Hurricane Harvey.

The Smiths moved to Houston in June after spending four years at the University of Virginia for their medical residencies—Annie in internal medicine, specializing in geriatrics, and Greg in anesthesiology. Both are now completing fellowships in their respective specialties, Annie at Baylor College of Medicine and Greg at Texas Children's Hospital.

When they moved to Houston, Annie was pregnant with their first child and due to give birth in late August, right around the time that Hurricane Harvey arrived.

The couple had little experience with hurricanes, but as it became apparent that Harvey's arrival could coincide with their baby's birth, they made plans to leave for the hospital early Sunday morning (Aug. 27) if the storm got worse.

"Everything had gone smoothly at that point, though I had been having contractions off and on for four weeks," Annie said. "Greg's mother had been staying in Houston for two weeks prior to the hurricane in anticipation of an early delivery."

However, when the couple woke up on Sunday, their apartment was surrounded by two or three feet of water, with more on the way.

Hurricane Harvey had exceeded even seasoned meteorologists' expectations and unleashed devastating floods across the Houston area. As the floodwaters rose, Annie's contractions were growing worse.

"Around the time we saw the flooding on our street and parking lot, I went into active labor and started having frequent, painful contractions," Annie said.

Greg tried calling emergency services, but the lines were so busy with rescue calls that he could not get through. Annie called her fellowship program director, who was working at a nearby hospital, to see if they could do anything to help. While waiting on help, however, the

couple realized that they might have to deliver their child at home.

"I was terrified," Annie said. "I just keep thinking, what if something happened to me or happened to the baby? There would be very little we could do about it at home."

In another example of the solidarity that has characterized Texans' response to the storm, the couple's new neighbors were eager to help. Some also worked in health care and brought medical supplies.

"It was remarkable. There were at least 15 people who showed up at our doorstep in the rain offering to help," Annie said. "We both felt so full of gratitude for the amazing community."

The group decided to move Annie to a second-floor apartment—floodwaters were still rising at this point—and Greg began preparing to deliver his child.

"My anesthesia training taught me to stay calm and focused in very intense emergency situations," Greg said. "I received excellent training at UVA, but obviously this wasn't in obstetrics. I delivered five to 10 babies during medical school, but that was under very different, controlled circumstances."

He called an obstetrician friend from medical school, fellow Houstonian Dr. Cynthia Fountain, who talked him through the logistics of a home birth and offered to FaceTime the couple during the delivery if necessary.

"I tried to maintain my composure and do what I had to do to take care of my wife and baby," Greg said.

Fortunately, the Smiths did not have to go through with their improvised plans. The director Annie had contacted had called a member of her family who lived near a fire station. That person walked to the fire station and told firefighters of the family's predicament. Eager to help, the firemen drove a large dump truck through the flooded streets to the Smiths' apartment.

Neighbors formed a human chain to help Greg and Annie—who was still in active labor—wade to the truck and climb aboard. The couple rode in the back of the truck to Texas Children's Pavilion for Women.

> "Around the time we saw the flooding on our street and parking lot, I went into active labor and started having frequent, painful contractions."
>
> — ANNIE SMITH, M.D.

"I was sitting on a fire hose with a shower curtain over my head to protect me from the rain, having powerful contractions every four minutes," Annie said. "Thankfully, it was a short ride—about 15 minutes to the hospital."

The firemen had notified the hospital of their arrival, and Greg and Annie were immediately whisked to a delivery suite.

"There were a lot of patients and families who were stranded at the hospital because of flooding, causing some resources like pillows and blankets to be limited," Annie said. "Otherwise, the hospital was well-prepared for the storm and provided exceptional care."

The Smith's daughter was born at 1:59 a.m. Monday morning—warm, dry and safe after her parents' ordeal.

"I thought she was the most beautiful baby I had ever seen and cannot even begin to express how thankful I am for such an amazing gift and blessing," Annie said.

Adrielle Charlotte Smith

Greg, too, was overwhelmed by the moment.

"Holding my beautiful little girl for the first time was such a memorable moment," he said. "I remember feeling so thankful that she was there, safe in my arms, after all we had been through."

They named her Adrielle Charlotte—Adrielle because it means "belongs to God" and Charlotte after the city they grew to love during their time at UVA.

"We absolutely loved our time in Charlottesville, primarily because of the many friends and excellent training we received at UVA," Annie said.

As for her first name, the couple said it was something of a talisman to them throughout the whole ordeal.

"We had a lot of difficulties getting pregnant with Adrielle," Annie said. "The meaning of her name provided a lot of comfort to both of us through this crazy experience. No matter what happened, we felt God would take care of her."

Thankfully, the Smith's apartment was not damaged too badly. Like many in Houston, the new family of three is ready to return to normalcy and help their new city do the same.

"Houston has come together as a community in an amazing way, with an enormous amount of support from across America," Annie said. "It is encouraging to everyone to see the outpouring of love during such a difficult time. There is a lot of devastation all across the city and people are still working together to assess the damages and start to clean up and rebuild. It is going to be a long process." ■

— Caroline Newman

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At Work, with Loved Ones at Home

The family of Robert Aertker, M.D., evacuated while he was at Baylor St. Luke's Hospital

On Saturday, Aug. 26, as many Houstonians watched the news anxiously to see what Topical Storm Harvey would bring to Houston, Robert Aertker, M.D., a cardiology fellow at the Texas Heart Institute, prepared for work. He was scheduled for consecutive moonlight shifts at Baylor St. Luke's Hospital.

"Our schedules are made about a month in advance, so it just happened that I was supposed to work that Saturday and Sunday," Aertker said. "I had been picking up moonlighting shifts to make a little extra money."

Much as he was dreading leaving his family at their home in the Timbergrove neighborhood near the Heights that Saturday evening, he had to. His wife, Andrea, was 14 weeks pregnant and had her hands full with their two children, Alan, 5, and Riley, 3.

"Throughout the day Saturday, we didn't get as much rain as forecasters anticipated and as I drove over the bayou, it had actually gone from 23 feet earlier in the morning back down to 13 feet," Aertker said. "But as I was leaving I had almost an eerie feeling that I was sure to get flooded in at the hospital during one of my shifts."

Once safely at Baylor St. Luke's that evening, Aertker began his rounds in the coronary care unit of the hospital.

"My shift that night was fairly uneventful," Aertker said. "The census was low and my patients were stable. While I was in the hospital, I really couldn't tell how bad it was raining because you're usually not right by windows."

But that soon began to change. As the night dragged on and historic amounts of rain pounded Houston, Aertker, a 10-year veteran of the Texas Medical Center, heard an announcement on campus he had never heard before.

"Probably around 10 p.m., the hospital started making announcements that they would be closing the floodgates," he said. "I am from Katy and went to med school at UTHealth and went through Hurricane Ike during that time. I had never heard that before and it was a little concerning."

During his shift, Aertker also began to familiarize himself with the Harris County Flood Control District website, which monitors water levels in Houston's bayous. He kept a watchful eye on White Oak Bayou, a major tributary of Buffalo Bayou and the closest waterway to his home.

"I had been watching the flood gauges and rainfall amounts all night and had been texting my wife and my friend, Jamey Reynolds, who lives a block north of us, to check on things," he remembers.

Credit: Courtesy photo

A beach portrait of Robert Aertker, M.D., and his family.

According to Aertker, his wife could still see the road in front of their home around 4:30 a.m., but a mere two hours later the water was halfway up their lawn.

"What concerned me the most was how fast the water rose," Aertker said. "I had always assumed that if we got water in the house, it would be like our carpet would get damp. By 7 a.m., my wife went to open the garage door and water just poured in."

With no safe way to leave the hospital and no one to watch his patients, Aertker had no way to help his family as 18 inches of water crept into their one-story home.

"That ate at me for a while," Aertker reflected. "You never want your spouse to go through something like that without you."

Reynolds, the Aertker family's friend and neighbor, waded through chest-high water along Queenswood St. to rescue Andrea and the children and bring them safely to his house. Shortly after their arrival, however, the Reynolds home began taking on water, as well. Luckily, they all made it safely to another friend's house just a few blocks away.

Meanwhile, Aertker forced himself to stay focused at work. As the day progressed, more and more doctors and other staff members were able to make their way to the hospital.

By Sunday evening, Aertker was able to leave the hospital and make his way back to his family. Knowing parts of the city were still flooded, he used iPhone maps to navigate his way home safely.

"We lost the majority of our stuff due to the flood," Aertker said. "All in all, I feel very lucky for how fortunate we are and am very thankful to our friends, family and the community. ... I think this was a testament to the resolve of the people in our state and of our neighbors, like the Cajun Navy. The positive part of this was just everyone coming together to help people they don't know—of every kind of background, no questions asked." ■

— Britni N. Riley

A Milk Run

Carla Collado, M.D., picked up donor breast milk to be distributed around the TMC

Credit: Courtesy photo

Carla Collado, M.D, with 420 bottles of donor breast milk from Mothers' Milk Bank.

When Carla Collado's car was inundated by swiftly rising floodwaters left in Harvey's wake, it was yet another complication in an unusually difficult week. The neonatal medical director at Memorial Hermann Sugar Land Hospital was traveling home from delivering a premature infant when she followed another car into water that turned out to be deeper than it looked.

"I had just driven by the same area—the water came up really fast," Collado said.

Like so many Houston-area residents, it was just one of many unexpected situations thrown at her that week. Memorial Hermann Sugar Land's proximity to the Brazos River meant that patients had to be evacuated on Aug. 28. And Collado's broken-down vehicle meant she and her husband were facing a long drive in his car to pick up the closest available rental car in Giddings, Texas. The drive is nearly two hours under the best of circumstances, but likely more when flood-ravaged roadways are involved.

Then a silver lining appeared.

"Somehow our lactation consultant got word that I would be near the Austin area, and she called to see if I could pick up some donor breast milk for our NICU babies," Collado said.

Memorial Hermann Sugar Land's donor milk comes from Mothers' Milk Bank in Austin. It's typically delivered via courier service, but with the flooding topped off by a holiday weekend, Collado was concerned the hospital would not be able to receive new shipments of milk for another week.

"I thought, 'If I'm already driving over there, and if our babies need breast milk, I'm sure there are plenty of other babies in the Houston area that are also running low,'" Collado said. She reached out to other facilities, including some outside the Memorial Hermann system, and made plans to bring back milk for them, too.

Collado and her husband took off, picked up her rental car and loaded up 420 bottles of breast milk from Mothers' Milk Bank, to be dispersed to hospitals on Aug. 30. Each bottle contained about two ounces, she said. That's about 840 ounces of breast milk—plenty to sustain premature infants, whose tiny bellies can only hold very small amounts, until the next shipment.

Breast milk is a valuable source of nutrition for all infants, but particularly premature babies. Sometimes a new mother is not able to provide her baby milk. That can happen for a variety of reasons—she simply isn't able to produce enough or she's on medications that affect breast milk, for example. In those cases, donor milk can be life-saving.

"Donor milk has been shown in premature babies to decrease incidence of sepsis and decrease incidence of necrotizing enterocolitis," Collado said. "It's a very serious illness that premature babies are susceptible to, especially very small babies. It can cause death. For these really tiny babies it can really be a life or death situation for them."

Mothers who have a surplus of milk can donate to the milk bank. Each donor's blood is tested for infectious diseases and the milk is pasteurized to ensure it's as safe as possible for vulnerable babies.

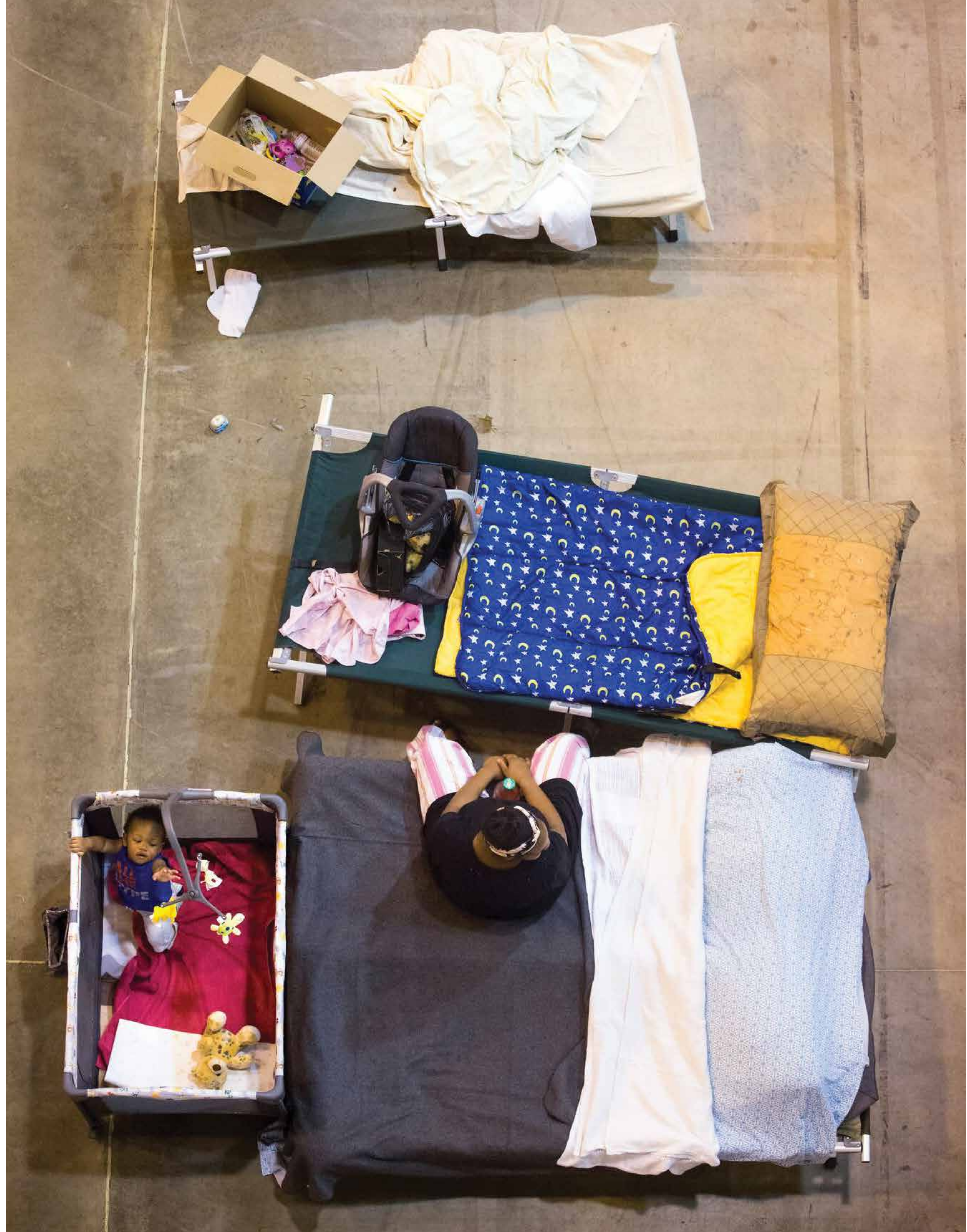
Collado said she was just doing what needed to be done.

"Anybody in my position to help the babies would do the exact same thing," she said. "I was glad to be able to do it, and I'm glad the babies got what they needed."

Amid so much destruction and heartache, the trip to the milk bank gave Collado a much-needed sense of purpose.

"If the hospital hadn't been closed, and if I hadn't lost my vehicle, I wouldn't have been able to leave to go get a rental car and bring the milk back," Collado said. "Everything happens for a reason."

— Shea Connelly



Evacuation by Boat, Truck and Bus

A TMC News writer chronicles her family's journey out of their Sugar Land home

"When I woke up Monday morning and found the Internet was out, I knew the end was near."

That was the joke I told a group of neighborhood mothers who had come together on a recent Friday to cap off two weeks of cleaning out flooded homes. Around a table of happy-hour cocktails and bar food, we promised no tears, just lots of laughing. And laugh we did.

Our house didn't seem to sustain any damage from Tropical Storm Harvey. In fact, we retained electricity, water and the Internet through the worst of it.

That's why Monday, Aug. 28, turned out to be interesting—for my family and the other 299 families living in the Millwood neighborhood of the Riverstone master-planned community in Sugar Land.

Mid-morning, we got word that there was a voluntary evacuation for our area and noticed water starting to pool in the streets. There were rumors going around that the floodgates in our neighborhood were closed, and pumps would be put to work to pull the water out. However, the water was rising pretty fast.

Around 3 p.m., the voluntary evacuation became mandatory. My husband, Matt, and I packed up ourselves and our kids, and threw some snacks and drinks in the back of my car. In less than half an hour, we were backing out of the driveway ... into at least two feet of water.

I had a Nissan Pathfinder (I say "had" because it was destroyed in the flood), but it was no match for that much water, so I turned the car around and we headed back to the house.

Now that we were stuck inside, we took some time to move things from the floor of the food pantry and our closet floor to higher shelves and to rooms upstairs, where we planned to camp out. We emptied out a desk of "important" papers and pulled up rugs in the entryway and living room.

Over the next five hours, Matt and I went downstairs every 15 minutes or so to see how fast the water was rising. First it was up to the curb, then the sidewalk, then the middle of the driveway, then past the tree in the yard, then to the first block of the path to the door, then to the second, then the third. When it finally got dark, the water had made it to the top of the bricked entryway that leads to the front door.

We knew at this point that flooding was inevitable, so we turned off the electricity and went to bed. I checked the weather once more, and instead of the rain clearing up on Tuesday as expected, it was forecast to continue and, at times, be severe. I remember telling Matt, "It's just not going to stop! If it would stop for just two hours, the water would go down."

When it's dark and quiet, it's interesting what you hear. It sounded like a swamp full of frogs had called a meeting outside our house. And when you go to bed earlier than usual, you have extra time to think, as well. What Matt and I thought was: We don't want to be stuck in this house.

So we got up, called 911 and asked to be evacuated. We shoved some clothes and toiletries into two doubled-up garbage bags.

Now it was a waiting game. We heard Missouri City Fire and EMS boats go by; they continued to make runs back and forth throughout the neighborhood, but didn't stop at our house. Matt sat at the foot of the stairs while the kids and I sat upstairs as water began to seep into our home.

We listened to the boats come and go, our frustration growing. When Matt went outside to try to flag them down, he let in water and garden mulch. By now, our house had taken in two inches of water.

(continued)

Facing: An overhead view of Harvey evacuees at the shelter set up at NRG Park.

We called 911 again to make sure we were still on the evacuation list. They recommended that someone stand outside. As Matt stood on the bench in our front yard, the kids, each wearing a garbage bag raincoat, began to complain of the heat and ask when EMS was finally going to get here.

It was then that the stress finally got to me, and I began to cry. I didn't want to alarm the kids, so I walked into their bathroom, cried for a minute, wiped my tears and resumed the wait.

As a boat went by, we could hear EMS workers shouting to Matt, telling him we were next. I decided we would wait on the stairs with our two trash bags so we would be ready when the boat returned. Water was now at the top of the baseboards.

We heard the boat and saw lights on the front porch, and for a minute there was a surge of excitement as the kids and I realized we were being rescued. As Matt and an EMS worker entered the house, a rush of water came with them. I was wearing rain boots, but I had to step down to get into the boat at my front porch. Water poured into my boots.

The EMS workers helped us into the boat. The kids did not want to get wet, but the benches in the boat had sitting water from the rain. As we drove away from the house, we saw other people shining flashlights or standing in their garages asking for help. They were told the same thing we were—that EMS would come back for them. It was still raining, so the water was stinging my face as I gripped my belongings and the children.

The kids thought this boat ride was the most fun they'd had all day. Meanwhile, I was in awe of the devastation around me. I saw cars parked in driveways with water up to the tops of their wheels, water up to my neighbors' front doors. The water on the street was at least four feet deep.

As we headed out of our neighborhood, I saw a fleet of emergency vehicles at the top of the hill. The boat took us as far as it could go, and then another set of EMS workers helped us out of boat and onto a large dump truck. Again, the kids were excited to ride in a fun vehicle.

Jackson, 11, and Daniel, 9, read to each other while the family waited for a rescue boat.

Everyone's socks and shoes were soaking. In the dump truck with us were two men and a family with a young girl and a baby. We made small talk, asking what was fast becoming the standard set of questions: What street do you live on? How much water was in your house when you left?

The dump truck dropped us off at a gas station where about 30 people—and several pets—lined up to wait for transport. At this point, it was close to midnight, way past my own bed time, but the children were actively talking. My youngest was fearful that one of the dogs would break free.

A large S.W.A.T. vehicle pulled up, and a line of wet people climbed on. In just two hours, my children had ridden on a boat, in the back of a dump truck and, now, in a S.W.A.T. vehicle. These were the best hours of their lives.

We headed to a church that was being used as an emergency shelter. We were thankful for a dry room, a bathroom and the chance to change into dry clothes. However, we would have to spend the night on a thin carpet. By now it was 1 a.m., and many people were still reeling from all the drama. Sleep wasn't immediate. I slept for maybe two hours.

The next morning, we found out that our neighborhood Facebook group had become a "help line" for people who needed to be rescued. People said there were five boats deployed there. The neighborhood made it into a KHOU video.

By 10:30 a.m., we were on the move again, riding on a Fort Bend School District bus to a shelter in Manvel, about an hour away. The kids were not impressed by this ride.

We drove near our neighborhood to avoid some flooding—how ironic—and saw our dump truck from the previous night waiting at the top of the hill. We later learned that Missouri City Fire and EMS spent the next few days rescuing many of our neighbors. Those guys are awesome!

At the intersection of Highway 6 and

Highway 288, the bus encountered high water. All the passengers voted unanimously to turn around.

The bus driver headed to a shelter at a nearby high school, and on the way I got a call from a restricted phone number. It was 911 checking to make sure we had been rescued.

We arrived at Kempner High School around noon. It had been turned into an American Red Cross shelter that was as busy as a thriving metropolis. People drove up and unloaded bags upon bags of clothing, food, bedding, toiletries and even games and activities.

One entire wall of the cafeteria had been transformed into a giant clothes bin. Matt and the kids were able to find dry shoes, and we were all treated to a hot lunch. We chose bedding to make a pallet on the floor and Matt foraged for some toiletries while the kids settled down to watch Netflix on my phone. We made friends with the couple next to us, who had also evacuated from their home.

> “A large S.W.A.T. vehicle pulled up, and a line of wet people climbed on. In just two hours, my children had ridden on a boat, in the back of a dump truck and, now, in a S.W.A.T. vehicle. These were the best hours of their lives.”

This was the first time in a while that Matt and I felt comfortable enough to close our eyes. I had never stayed at a shelter before, so I had nothing to compare it to. But everyone who volunteered—from the Red Cross to the high school students to the Fort Bend ISD employees—made us feel at home.

We didn't stay long, though, because one of Matt's work colleagues offered us a place to stay. Over the next week, we stayed in four different homes, dragging our doubled-up garbage bags with us.

By Sunday, Sept. 3, nearly a week after we were rescued, the water had receded enough for us to gain access to our home. The house took in 17 inches of water and the garage took in 20 inches. Both of our cars were ruined, and we had to completely gut the first floor of our house. We hauled ruined chairs, lamps, shelves and toys to the curb, the spoils of 15 years of marriage and two kids.

It's been more than five weeks since the storm. We are so thankful to everyone who helped us, from work friends to high school sports teams to random people who just wanted to lend a hand. We have a long road ahead—it might take until late December to make our house inhabitable again—but we'll get there. ■

— Christine Hall

Riding a school bus to a nearby shelter, the family encountered high water at Highway 6 and State Highway 288.

The Craniotomy Crew

In a life-or-death situation, a general surgeon performed brain surgery

Heading into work at Lyndon B. Johnson Hospital on Friday, Aug. 25, Erik Askenasy knew he wouldn't be leaving anytime soon.

"I packed a duffel bag," said Askenasy, 37, a general and colorectal surgeon who spent five days riding out Tropical Storm Harvey at the northeast Houston hospital.

During that time, LBJ became an island. Surrounded by five feet of water, it also succumbed to the same punishing winds that the rest of the area endured.

And smack in the middle of the epic storm, a worst-case scenario unfolded. Askenasy and other members of the ride-out team—staffers assigned to ride out the storm at work—were called on to perform a surgery that the hospital is not set up to do, that Askenasy and the operating room team were not prepared to do, and for which there were no designated tools or instruments.

A craniotomy—brain surgery.

LBJ is a Level III trauma center, which provides comprehensive medical and surgical services with the exception of neurosurgical care.

In other words, they don't do brain surgery.

• • •

Around 8 p.m., a middle-aged man arrived at the hospital on the back of a dump truck with a large bump protruding from his head.

"The story that we had received from his family was that a son or grandson had gone missing in the middle of the flood and he went out on an ATV to go look for him," said Merry Philip, administrative director of nursing at LBJ's emergency center. "During the time he was out, he hit something and got a head injury. As soon as he got here, we started doing our scans and we found out he had a subdural hematoma."

Time to activate the trauma team. Askenasy, a trained trauma surgeon, examined the patient's scans.

"I saw he had a significant bleed in his brain, as well as a large bleed between his brain and his skull," said Askenasy, a UTHealth assistant professor. "Normally, we'd send this guy to Ben Taub Hospital or Memorial Hermann, both Level I trauma centers. But no one could get in by ground or air."

The hospital was eerily quiet at this point. Although the storm raged outside, the flood of people who were hurt or displaced had not yet begun to arrive.

As Askenasy hurried to talk to the patient, he had a sneaking feeling he might need to operate to relieve the pressure building inside the man's head. He started to play out the scenario in his mind.

"I run in and talk to the dude," Askenasy recalled. "I can tell he's altered. He's confused, searching for words. He's not there."

Askenasy called Tien Ko, M.D., chief of surgery and chief of staff at the hospital, and said: "I don't see how we'll be able to get this man to Hermann." Ko, in turn, communicated with Alan Vierling, executive vice president and administrator of LBJ Hospital, who was on site, and got him up to speed on the situation.

Meanwhile, hospital staff did what they always do in cases like this: hustled to find a way to get the patient to a Level I trauma center.

"We called CMOC [Catastrophic Medical Operation Center] and said we have a patient who is critically ill; we need to get him out," Philip said.

At the same time, Askenasy went upstairs to the operating room and spoke to the nurses.

"We may have to do a craniotomy," he told them. "I need to find some instruments.'"

"Dr. Askenasy explained step by step what he was going to do and that really helped," said Alberto Cortez, an OR nurse clinician and the charge nurse.

"He was really calm, too," said Ashley Acosta, an OR nurse clinician. "He made us feel really comfortable, because we had never done this. We all talked about what we needed and kind of ran around to get supplies. We asked Dr. Askenasy what tools we should use, and the anesthesia faculty gave me a number to a neurology nurse at Memorial Hermann to ask about what we needed. Most of the stuff we didn't have because we don't do neuro, so we kind of just had to improvise."

Cortez found drill bits used by ear, nose and throat surgeons that would work to bore burr holes into the patient's skull. The team also got their hands on a Gigli saw—a flexible wire saw used to cut bones—that would allow Askenasy to perform the surgery he had planned: Imagine a game of connect-the-dots, except the dots are burr holes and instead of drawing a line between them, a surgeon cuts the bone between them. Once that's done, a piece of the skull can be removed.

"The bone pops off and you're staring at the brain," Askenasy said.

• • •

A busy general and colorectal surgeon, Askenasy spends three days a week at UTHealth and two at LBJ. He operates on Mondays at LBJ, and on Fridays he typically sees patients in clinic.

Twelve years ago, though, he began his medical career in neurosurgery.

"I was at Baylor for two years in the neurosurgical program and then I decided I enjoyed general surgery because there was more opportunity to do mission work," Askenasy said.

During those two years at Baylor College of Medicine, however, he did have some surgical responsibilities.

"As a resident, I was assisting and taking part in surgeries," Askenasy said, "but I had an attending with me in the room. I was never unsupervised."

He had been present for craniotomies, but he had never been the person in charge. And the last time he'd been involved in any type of neurosurgery was a decade ago.

• • •

Askenasy and the OR team waited to hear if they were headed to surgery or if there was any way to transport the patient. Essentially, hospital personnel were planning for two potential situations at once, waiting for definitive word on which way it would go.

Erik Askenasy, M.D.

Askenasy called a friend who's a neurosurgeon and told him the scenario. His friend said, "You go, buddy. You've got to do it."

He also went back downstairs and deliberated again with Vierling and the attending physician, Stephen Hecht, M.D. They wanted to make sure they could give the patient the best possible care under next-to-impossible circumstances.

"After an hour, we finally got the last call from CMOC, who said the Coast Guard cannot fly in these wind conditions, that it would be dangerous to land," Philip said. "CMOC *did* say they could get a helicopter in the following morning. We said, okay. Next? What do we do now?"

By this point, the patient was in decline. He had grown nauseous and had started throwing up, signs of a neurological deficit.

It was time to talk to the patient's family, most of whom were assembled in the hospital. Askenasy, who is Colombian, communicated with the Hispanic-American family in Spanish.

He told them in straightforward terms what they were facing. Under ideal circumstances, he explained, the patient would be transferred to a facility equipped for neurosurgery. Since that was impossible, they were left with two choices: wait and hope for transport, or proceed with surgery to remove the blood clots and relieve the pressure in the patient's brain.

"I'm a very direct person," Askenasy said. "Families deserve honesty. I told them I am not a neurosurgeon and that apart from very extreme circumstances, I would never consider doing this surgery."

The patient's family responded: "Are you good?" Askenasy chuckled at the memory.

He reiterated to the family: "I think I can do this, but I am not a neurosurgeon."

The family asked: "Can you give us some time?"

Askenasy gave them 10 minutes, then returned. The family told him to go ahead with the surgery, that they believed this was the right decision.

The OR team prepped and intubated the patient, shaving and sterilizing the area of his head that was protruding, which took close to 30 minutes.

Then, Askenasy prayed.

"I'm a person of faith," he said. "In a situation like this, I pray. Absolutely I pray. *God give me wisdom, understanding, peace and clarity of mind to help this gentleman.* And it wasn't just me. It was everybody—this was a total team effort."

• • •

The surgery began around midnight and lasted close to two hours.

Throughout the drilling, Askenasy had to be very careful not to disrupt the brain. Ordinarily, instruments for this type of procedure include a drill that stops automatically when it bores through the bone. The drill Askenasy was using had no such feature, so he had to proceed slowly, stopping to make sure he wasn't going too far. After drilling the four burr holes and sawing lines between them, Askenasy had some trouble wedging an instrument under the scalp to pop out the mass of bone. He called his neurosurgeon buddy who recommended that he make the burr holes larger. That worked.

"We were able to remove part of the skull and visualize the clots on the brain," Askenasy said. "We were able to remove the clot that was compressing his brain as well as the one in one of the lobes. We closed his scalp and placed the bone flap we removed in his abdominal tissue—that goes with him and doesn't get lost in a freezer somewhere."

Members of the OR team said one of the clots was huge—the size of a fist.

• • •

Elsewhere, another piece of the drama was unfolding.

Midway through the surgery, the Coast Guard called LBJ Hospital to say they could collect the patient within the next few hours. Vierling ran upstairs and asked the OR team if the patient would be stable enough to transfer. The team said yes.

Then, hospital staff had to find a place for the helicopter to land. Ordinarily, Memorial Hermann Life Flight and other choppers land in front of the hospital, but that was impossible because the area was underwater.

"We had a couple of our guys that are military who went out and found an area in the physician parking lot where the helicopter could land," Philip said. "There were three cars parked there, though, and no one knew who they belonged to. We took pictures of the license plates and asked the Houston Police Department to help us find who owned these cars and where they worked in the facility. Ultimately, they were all able to move their cars."

Once the surgery was complete, the patient was taken to ICU. Askenasy showed the post-op team how to take care of him, then went back to the call room, turned on his PlayStation 4, and reflected on what had just happened.

"Without Dr. Askenasy, we don't know what we would have done," Philip said. "There's no other general surgeon who would have been able to do what he did. Without the surgery, if the patient had not died he would have been brain damaged, absolutely."

Credit: Facing page and right: Courtesy photos

The craniotomy team at LBJ: Kevin Ibarra (anesthesia tech), Renee Crooks (OR RN), Jorge Iniguez (PACU RN), David Roife (MD, general surgeon resident), Denisse Salas (surgical tech), Ashley Acosta (OR RN), Alberto Cortez (OR RN).

And the child that the patient had gone out to rescue in the first place? He was found, safe, and was waiting anxiously with the rest of the family at LBJ to learn the fate of his loved one.

Nearly two hours after the surgery, an LBJ staffer went out in the rain with a basic flashlight to help guide the Coast Guard to the improvised landing area in the physician parking lot. Within a matter of minutes, the chopper lifted off with the patient on board, bound for Memorial Hermann Hospital.

Today, the patient is doing well.

"My understanding is that he's fine," Askenasy said. "He woke up, asked to go home and was discharged within a few days."

• • •

One week after the surprise craniotomy, Askenasy took the entire OR team out to eat at Pappasitos.

A week after that he headed out to Guatemala for mission work with a group called Faith in Practice. "We will typically perform 80 to 100 surgeries the week we are there," he said.

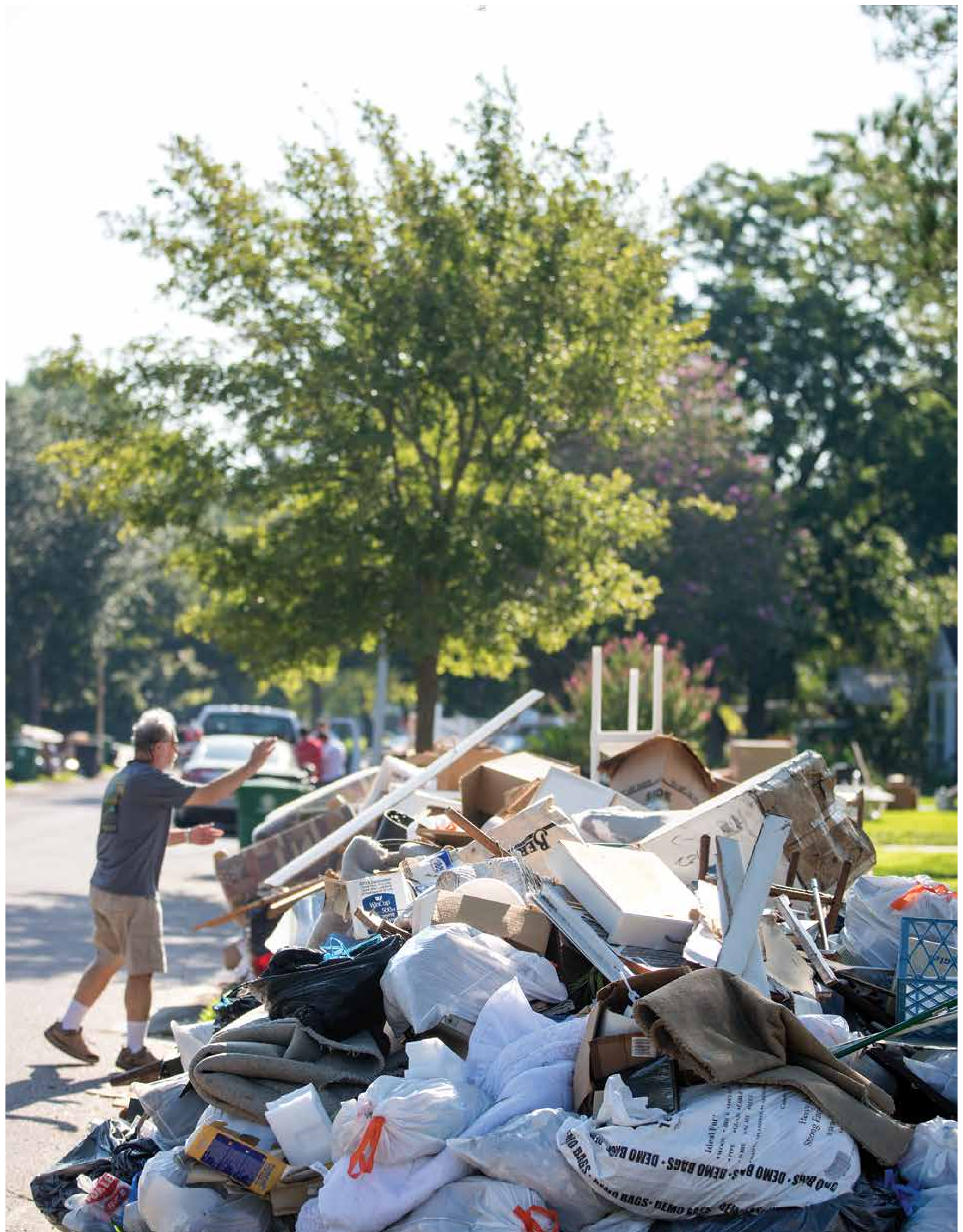
Mission work helps Askenasy think on his feet, a quality that came in handy during the craniotomy.

"In the field, you have to think outside the box," he said. "We have so many luxuries in the U.S., but you can provide well for patients with much less."

Askenasy also believes that no one's life experiences are accidental.

"I did two extra years of medical training because of my time in neurosurgery," he said. "Sometimes you don't get to see the reason you've gone through what you've gone through. But I did."

— Maggie Galehouse



Navigating Houston's Emotional Recovery

Experts across the Texas Medical Center explain what to do to help survivors heal

Jeff Temple, Ph.D., stands in front of his Galveston home.

When the home of Jeff Temple, Ph.D., flooded during Hurricane Ike in 2008, the UTMB professor and psychologist learned firsthand what survivors of disasters need from friends and family after the unthinkable happens.

A helping hand goes a long way, but so does a friend who simply acknowledges that a bad situation is unfolding. "They just want to hear someone say, 'This really sucks, I'm sorry,'" said Temple, an expert on the psychology of trauma.

Temple, drawing on his professional and personal experiences, said friends and family members will play a critical role for those who have been impacted by Hurricane Harvey.

"Whether it's humor, anger, sadness, despondence or no reaction—it's all okay at this point," Temple said. "Abnormal situations cause abnormal reactions, and that's perfectly normal."

"People might say things like 'I'm acting crazy' or 'I shouldn't be so sad over material things,'" Temple said. When a survivor says something like that, it's helpful to indicate there's no such thing as an inappropriate feeling so soon after a disaster.

But it's also important to know what *not* to say. Those trying to support Harvey survivors should avoid language that puts pressure on survivors to feel a certain way, said Mariam Massoud, Ph.D., behavioral health education resource specialist with Memorial Hermann Behavioral Health Services.

Expressions like "you have to stay positive" or "there's always a silver lining" can alienate survivors who aren't ready to be optimistic. Instead, Massoud said, it's important to allow those survivors to work through their feelings.

"If today I'm feeling overwhelmed, then give me permission to feel exactly what I feel," Massoud said, explaining the thinking of someone who's been affected by the storm.

If that means you don't know what to say to someone devastated by Harvey, that's okay. "I can't imagine what you're going through" is a good response.

Psychologists and counselors generally don't begin treating people in the days following a natural disaster. Instead, they listen and comfort. For those who are volunteering and encounter strangers who have been displaced, Temple suggests a simple question: "I know this is terrible, but is there one thing I can do to make it a tiny bit better?"

In the coming weeks, he added, it's important to know that those who may need help with cleanup and recovery won't necessarily ask for it. "It's probably best to just show up," he said.

Often, someone who's been displaced won't know how to answer the simple question, "How can I help?" said Julie Kaplow, Ph.D., a psychologist and director of the Trauma and Grief Center at Texas Children's Hospital. If they don't know, offer suggestions. Help them figure out where to go next. "Offering specific suggestions can be helpful," Kaplow said.

Experts say it's important to convey a sense of hope to children and let them know a recovery is underway.

Family and friends can help loved ones navigate the logistics of recovery by assisting with paperwork related to insurance, loans and federal aid. Or, they can provide childcare to busy parents who need to work on those issues—or might just need a break.

If, after about six weeks, a survivor is still experiencing distress, it may be time to work with a professional counselor or mental health provider. In particular, Kaplow said, look for signs of anxiety in children, such as attachment to their parents, nightmares and behavioral regression. Look for signs of depression in adults, like crying or being unable to get out of bed.

Post-traumatic stress disorder is also a risk any time individuals feel like their lives have been endangered. Adults should be aware of feelings of disconnection or numbness in the longer term.

The most important thing survivors can do to work through their trauma is talk about it. Friends, family and volunteers can encourage that behavior.

"The more secret something is, the more power it will hold," Massoud said. "Even if they say, 'I've told this story 800 times,' I'd encourage them to talk about it."

— Ryan Holeywell

Flooding and the Future of Houston

Rice University's flood guru, Jim Blackburn, weighs in

Hurricane Harvey claimed 75 lives in Texas and dumped an unprecedented 51 inches of rain on Houston, leaving thousands displaced and billions of dollars in damages.

First responders, neighbors, friends and strangers pulled together during some of Houston's darkest days to rescue people by boat and helicopter. Massive shelters at the George R. Brown Convention Center and NRG Park opened to welcome those who were displaced from the storm.

"I think we handled the disaster part of it great," said Jim Blackburn, an environmental attorney, co-director of the Severe Storm Prediction, Education and Evacuation from Disasters Center at Rice University (SSPEED) and director of Rice's undergraduate minor in energy and water sustainability. "The emergency response, the first responders, the Texas National Guard, the Coast Guard, federal, state, local, I think we all did as well as the volunteers—one of the finest moments I think I've seen in Houston."

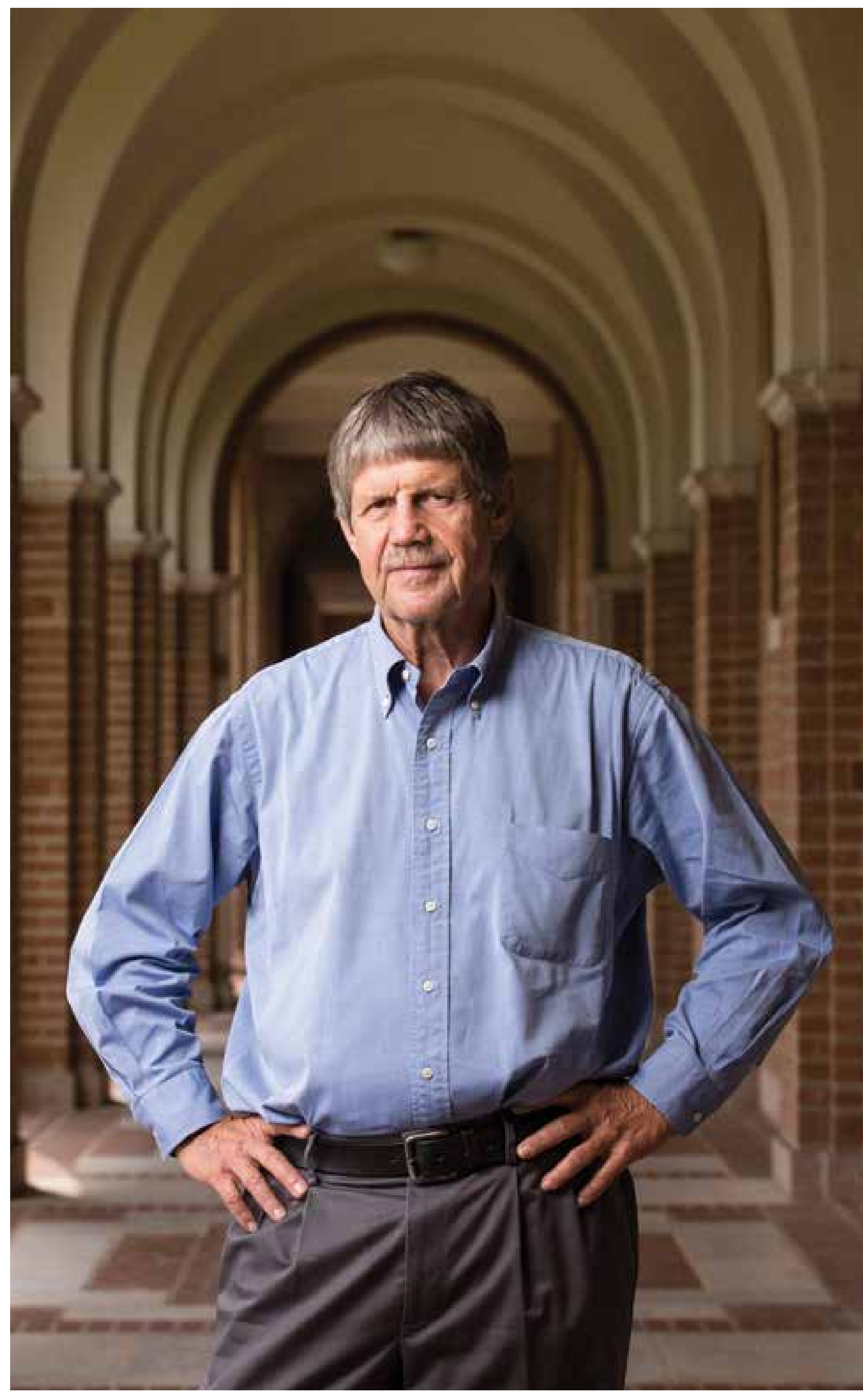
But given that most of Houston is just 50 feet above sea level, Blackburn believes better city planning is essential for the future.

"Our planning is not nearly as good as our emergency response, so I think that's where our long-term work is," Blackburn said. "Thinking about how we approach flooding and living with flooding as opposed to controlling flooding, I think our philosophy is sort of backward here. No one is going to control a 40-inch rain, but we can manage it. We can live with it."

According to Blackburn, "living with flooding" means understanding the severity of future storms, buying out large portions of the city that are prone to flooding, imposing regulations on new developments and creating better flood warning systems for the city.

"As bad as Harvey was, it was not the worst case," he said. "We have to consider in the future that the sea level is going to be higher and that storms are going to be getting bigger. The oceans are getting hotter—the Gulf is getting hotter, and that is just a fact. These storms run off of the heat of the ocean and if the ocean is getting hotter, the storm is getting bigger. Period."

Blackburn noted several areas in Houston that have flooded multiple times since Tropical Storm Allison in 2001, including Cypress Creek, Brays Bayou, Friendswood, Clear Creek, Mary's Creek, Greens Bayou, Halls Bayou, Hunting Bayou and White Oak Bayou. To mitigate the losses of flooding, Blackburn suggests a massive buyout of areas that have flooded multiple times. *(continued)*



Jim Blackburn is co-director of the Severe Storm Prediction, Education and Evacuation from Disasters Center at Rice University.

> “The whole county needs the flood warning systems that the Texas Medical Center has. The medical center has got the best flood warning system certainly in the state of Texas if not the United States, and there is no reason we shouldn’t have that for the whole Harris County.”
>
> — JIM BLACKBURN
>
> *Co-director of the Severe Storm Prediction, Education and Evacuation from Disasters Center at Rice University (SSPEED)*

“We’ve never really wanted to admit we couldn’t protect some areas, but I think we have to admit that and turn them into green space,” he said.

Blackburn proposes a combination of local, state and federal funding for the buyout, including taxing Harris County citizens.

“I think there are several things that need to be done,” he said. “We need new reservoirs, we need buyout money, we need money for improving the overall system and we are going to have to raise some of that locally. Local, state and federal will be the combination. We are looking at needing several billion dollars. It is not small money; we had major damage and we have had recurring major damage.”

Responsible building and accurate planning will make a big difference in avoiding massive flooding in the future.

“I think it is primarily the development community who has benefited from the past rules,” he said. “That has allowed cheaper housing to be provided, and it has been subsidized in part by flooding people downstream.”

Most new developments in Houston are also built according to a 100-year floodplain, Blackburn explained. The problem with that? We have endured three 100-year floods in the past 20 years.

“We had a huge rainfall during Harvey and probably no city in the world could have handled that much rain,” he said. “But it’s a lot more than we have been planning for and we have known for a long time we weren’t planning for large enough rains. We have to figure out what number we need to plan for and then we need to use it across the board.”

Blackburn also suggests looking at the areas of Houston that did not flood during Harvey to gain insight about future development in the city.

“There is a lot of the city that didn’t flood,” he said. “Let’s figure out what we’re doing right and which areas we don’t have problems in and perhaps focus future development planning there. We help the ones we can, we buy out the ones we can’t—we turn that into green space—and we try to build new reservoirs to the west. We try to find native prairies and coastal areas to protect. It’s just a different philosophy. It’s not all about engineering in the future.”

The Texas Medical Center (TMC) was the area best prepared for Harvey, Blackburn said. After the devastating damage Tropical Storm Allison unleashed in 2001, the TMC took enormous measures to ensure damage like that would never occur again. Floodgates were installed across the campus and the TMC enlisted the help of Philip B. Bedient, Ph.D., Herman Brown Professor of Engineering at Rice University, to develop a real-time flood alert system for the campus.

“The whole county needs the flood warning systems that the Texas Medical Center has,” Blackburn said. “The medical center has got the best flood warning system certainly in the state of Texas if not the United States, and there is no reason we shouldn’t have that for the whole Harris County.”

Technology to implement real-time flood alerts across Harris County is already available, he added.

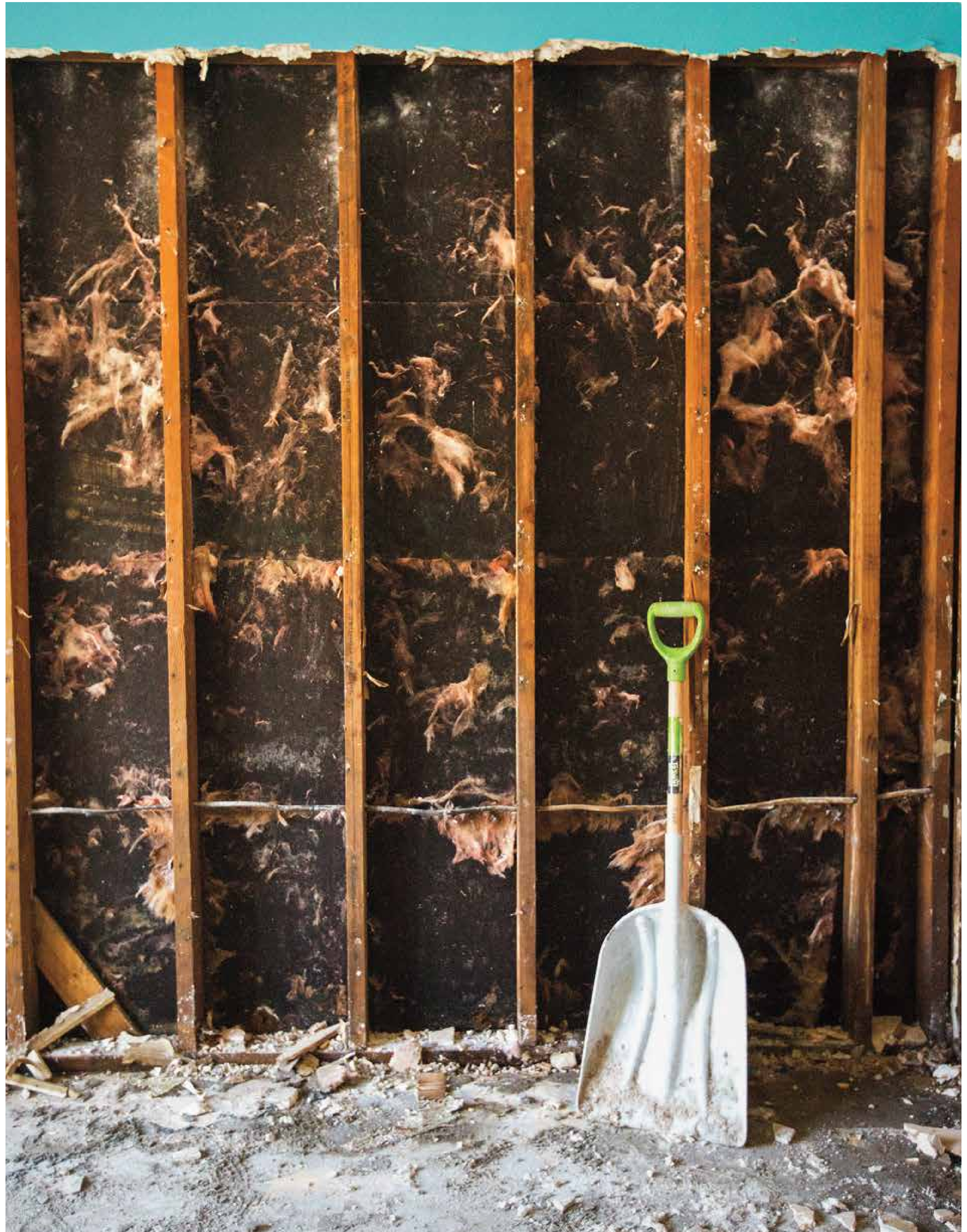
“It’s really all a matter of getting the infrastructure set up across all of the different watersheds, getting the gauges tied in,” he said. “It’s all keyed off of radar imagery and gauge flow, most of which Harris County already collects. I think Harris County had excellent information internally, it’s just that the focus has never been about providing that information to the public as well as I think it could be provided.”

Blackburn believes the way Houston responds to Harvey, long-term, will decide the fate of the city.

“I really see this as being a pivotal moment in Houston’s history,” he said. “I think that the city is really at a turning point and if we get this right, I think it will be a fabulous place to live in the future and we will continue to grow. I think if we don’t get this right, it’ll be the beginning of a long decline.” ■

— Britni N. Riley

Facing: A home that took in water near the Addicks and Barker reservoirs.



Raising Awareness of Intersex Issues

Common surgical practices are being reevaluated

By Shea Connelly

Every Friday night, for years, Mo Cortez and Koomah attended the same youth group. As teenagers, they sat in a room together for hours, neither knowing they each harbored the same secret: they were born intersex.

"We both didn't talk about it, because there was a lot of shame and stigma," said Koomah, who goes by one name. "We sat next to each other for years feeling like the only person on the face of the planet."

It wasn't until 2012, about a decade after they had met, that they discovered a kinship they never knew existed. Koomah, an artist, had written a performance piece that was related to being intersex. Cortez heard of the performance through a friend, which led to the two reconnecting.

"That day, we decided nobody else should ever feel like we had," Koomah said. June 17, 2012, marked the founding of their organization, the Houston Intersex Society.

The term "intersex," also known as "differences of sex development," or DSD, refers to "congenital conditions in which development of chromosomal, gonadal or anatomic sex is atypical," according to the American Medical Association (AMA). While DSD conditions are not common, they are also not particularly rare—some estimates indicate between 0.05 and 1.7 percent of the population are born with intersex traits, according to the Office of the United Nations High Commissioner for Human Rights (OHCHR). The upper limit of that range is similar to the number of people who are born with red hair.

For decades, intersex conditions were seen as issues that needed to be corrected as soon as possible—often via surgery on infants or young children.

"It used to be believed that a lot of somebody's gender was socially determined," said Janet Malek, Ph.D., an associate professor in the Center for Medical Ethics and Health Policy at Baylor College of Medicine. "The practice was to make a decision as early as possible, and then raise the child with that gender the parents or doctors agreed was more appropriate, often depending on physical features."

Koomah, left, who goes by one name, and Mo Cortez first met as teenagers, not knowing they were both intersex. They reconnected a decade later and founded the Houston Intersex Society.

Cortez, 33, a contractor at a military vendor, recalled the first time he realized his body was different—when he woke up in the hospital at age 5, post-surgery.

"Medically I was considered 'corrected,' but that was the first time I had a vague inkling I was intersex," he said.

Born with ambiguous sexual organs, Cortez said doctors told his mother to raise him as a female. When he was 5 years old, his "mother was turned in to child welfare because someone thought she was raising a boy as a girl," according to personal medical records provided by Cortez.

> "The idea here is that we should let the child be the one to make that decision. If the parents choose to have the surgery very early on, they take that choice away from the child. Out of respect for the fact children will grow into adults who will need to make their own decisions, we want to offer them that choice."
>
> — JANET MALEK, PH.D.
> *Associate professor in the Center for Medical Ethics and Health Policy at Baylor College of Medicine*

"They went ahead and performed normalization surgery" to make him appear more female, said Cortez, who identifies as male. "For the rest of my life, I will have to take synthetic hormones."

Cortez's experiences are not uncommon among intersex adults. But in recent years, many have been advocating for a change in the way the medical community approaches intersex conditions. A watershed moment, Koomah said, was a public demonstration held by intersex organizations at a 1996 American Academy of Pediatrics conference in Boston.

"That was a springboard moment of this community coming together and not being afraid to speak out anymore," Koomah said. That day—Oct. 26—has since been declared Intersex Awareness Day. Last year, Houston's City Hall was illuminated in yellow and purple to mark the occasion. This year, the illumination will take place on Oct. 25.

Intersex individuals, along with the United Nations, human rights organizations and some medical professionals, have also been questioning the practice of performing medically unnecessary surgery on intersex infants or young children before they have the ability to understand and consent.

On 2016 Intersex Awareness Day, the U.S. Department of State released a statement saying, "Intersex persons routinely face forced medical surgeries that are conducted at a young age without free or informed consent. These interventions jeopardize their physical integrity and ability to live free."

And more recently, in June 2017, three former surgeons general—M. Joycelyn Elders, M.D., David Satcher, M.D., and Richard Carmona, M.D.—released a document entitled "Re-Thinking Genital Surgeries on Intersex Infants." They urge that "treatment should focus not on surgical intervention but on psychosocial educational support for the family or child … until children are old enough to voice their own view about whether to undergo the surgery."

The question of informed consent is a key ethical consideration when it comes to medically unnecessary surgery on children, Malek said.

"The idea here is that we should let the child be the one to make that decision. If the parents choose to have the surgery very early on, they take that choice away from the child," Malek said. "Out of respect for the fact children will grow into adults who will need to make their own decisions, we want to offer them that choice."

The AMA does not currently have a specific policy for treating intersex patients, however the AMA's House of Delegates is expected to consider adopting an official policy at a future meeting. The organization does have established ethical opinions and policies that broadly address decisions for minors, including one that "encourages involving minor patients in decision making at a developmentally appropriate level."

This past legislative session, Cortez and Koomah contributed to Texas Senate Bill 1342, which would have amended the Texas Family Code to prohibit "nonconsensual genital surgery" on intersex minors under state care. But the bill, introduced by Sen. Sylvia R. Garcia, D-Houston, died in the State Affairs Committee at the end of the session.

Koomah and Cortez both emphasized that the bill was focused on surgeries that are "medically unnecessary."

"There are things that do need surgical intervention right away, and we are not trying to prevent those kinds of surgeries," Koomah said. "But if it's just cosmetic, it's something that can safely be put off until someone is older and can make their own decision."

As part of that decision-making process, Marni Axelrad, Ph.D., a child and adolescent psychologist at Texas Children's Hospital, counsels intersex children, as well as their parents.

"I talk a lot about gender identity, which is in some ways easier when it's an older child, because the gender identity is established," Axelrad said. "With a baby, it's tricky because we don't know what a baby's gender identity is going to be." She added that typically children can reliably report their gender identity between ages two and four, "when it really becomes more established and clear."

(continued)

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Koomah, an artist, advocates for education and awareness regarding the intersex community.

Additionally, Axelrad said, she discusses with parents the most developmentally appropriate ways to talk to their children about being intersex. Part of that includes initiating conversations "from the moment your child can understand that this is their body, and the importance of being honest with them."

"The ultimate treatment position for any child and any family is made on an individual basis, thinking about the overall wellbeing of the child," Axelrad said. "Psychological wellbeing does play a role in that."

Both Cortez and Koomah said their families did not have such open communication about being intersex, or provide much psychological support.

"It was always a big secret. Part of that is I don't think they fully understood it either. And then with their own backgrounds and belief systems, they had their own perspective," Koomah said. "I was never quite female enough for my parents, so there was this thought, 'Well, if you're not going to be a girl, you're going to be a boy.' That didn't really work either so I'm kind of in this great in between space. This is what works and what makes me happy."

Malek said society's increased acceptance for ambiguity around gender, sex and sexual orientation may also be contributing to increased awareness and advocacy regarding intersex issues.

"People are more aware that it's not necessarily black and white," Malek said. "With increased understanding comes increased tolerance. Parents can say, 'I'm OK with the idea that I'm not sure yet whether my child is a boy or a girl.' Obviously some still have a very hard time with it, but we tend to be more accepting in today's culture than it used to be."

Acceptance, awareness, education—these are cornerstones of the advocacy work Cortez and Koomah are doing. The pair, who live together as roommates, talk to medical students and give lectures at universities about being intersex. They attend conferences and participate in lobbying. Their goal is to increase visibility of intersex people in society so no other young people have to grow up with the same feelings of isolation they both experienced.

"Our bodies are different," Cortez said, "but embrace the diversity. Embrace the difference."

"A lot of what is presented about our community is doom and gloom," Koomah added. "We do have a lot of issues, but at the same time, there are a lot of happy, healthy, productive intersex people who are doing amazing things. Our lives are not a tragedy. Whether a person has had surgery or hasn't, there are folks that are very happy with their bodies."

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A Poem Cycle

By Stacy R. Nigliazzo

Cloudburst

They struck the windshield like iron arrows—
stars unpinned from their moorings
through her hair,
silver
on the splintered glass.

Ploughshare

Where was she when her brain was lost—
when her lungs rose and set
in a plastic sky—
when the decision was made
and those who loved her said good-bye,
cradling her warm hands?

Harvesting Her Heart after the Accident

And when the surgeon pierced her breastbone there was a ripple of light—
a fluttering—
a scatter of fireflies.

"Cloudburst" and "Ploughshare" were published previously as part of the As It Ought to Be Saturday Poetry Series. *"Harvesting Her Heart after the Accident" was published by Matter Press.*

Stacy R. Nigliazzo, clinical coordinator for Memorial Hermann Northeast Emergency Room, wrote these poems after a friend died in a car accident in 2016. Nigliazzo has worked in health care for 19 years, first as a medical practice manager and now as an ER nurse. Her debut poetry collection, *Scissored Moon*, was published by Press 53 in 2013. Her poems have been featured in literary and medical journals, including *JAMA* and the *Bellevue Literary Review*.

Credit: Courtesy photo

Is It Time to Start Paying Doctors Salaries?

Salaries cut down on paperwork and remove incentives for costlier patient treatments

By Ryan Holeywell

Medical care in the United States is high-tech and high quality. It's innovative.

But it's also expensive. About a third of annual U.S. medical spending is wasteful, and about $200 billion of that waste is due to "overtreatment," according to many estimates.

Donald Berwick, M.D., a physician who ran the federal agency that administers Medicare and Medicaid, knows the topic well. He calls overtreatment "the waste that comes from subjecting patients to care that, according to sound science and the patients' own preferences, cannot possibly help them." Berwick and others blame fellow physicians for this overtreatment.

Doctors, generally speaking, are paid via a system called "fee-for-service." The more treatment they provide—and the costlier that treatment is—the more money they make, often as a result of bonuses tied to the amount of care they deliver. It's not that different from the way many other professionals get paid, from plumbers to lawyers to insurance agents.

Paying fee-for-service is not unreasonable, but the big problem is that the person who decides whether it's necessary for a patient to undergo an operation or an expensive test is the same one who's paid to administer it. Marcia Angell, M.D., a physician and former editor of the *New England Journal of Medicine,* has called it the problem of the physician being a "double agent."

"I doubt most physicians are even conscious of this in their decision-making," said Arthur "Tim" Garson Jr., M.D., director of the Texas Medical Center's Health Policy Institute.

Overtreatment can take many forms, like when a doctor orders a blood test that another physician recently ordered, or when a doctor orders repeated imaging in response to minor symptoms. For patients, overtreatment can lead to high bills, heightened anxiety and wasted time. Some researchers have managed to quantify the scale of the problem. For example, the Dartmouth Institute for Health Policy and Clinical Practice estimates that 30 percent of Medicare clinical care spending could be avoided without worsening patients' health outcomes.

Attacking overtreatment is not simple, but the Centers for Medicare & Medicaid Services (CMS) has set out to change the way physicians are paid. CMS is transitioning from

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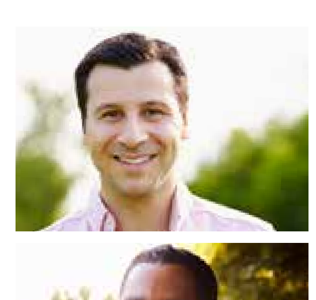

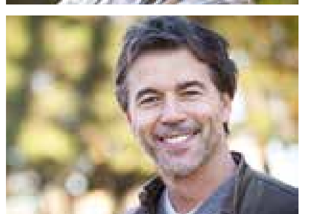

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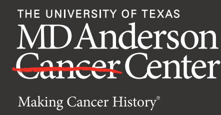

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> “If physicians were against the concept, it just wouldn’t fly. But I think the data are clear that even without consciously changing their practice, they will order fewer tests and do fewer procedures.”
>
> — ARTHUR “TIM” GARSON JR., M.D., MPH
> *Director of the Texas Medical Center Health Policy Institute*

fee-for-service to “pay-for-performance,” in which a portion of doctors’ pay is tied to patient outcomes. But according to Garson, that transition has been slow, it’s enormously complex and physician pay is still based on volume.

His solution: Start paying doctors salaries.

Doing so would remove incentives—even unconscious ones—to pursue costlier treatments, and it would drastically reduce the amount of paperwork doctors must complete, Garson argued. He cited research studies showing a 9 to 33 percent reduction in lab tests and procedures associated with physicians who were paid salaries.

A new national survey by the TMC Health Policy Institute indicates that U.S. doctors might actually opt for salaries over the existing form of pay. The survey found that 69 percent of doctors said their preferred method of compensation would be a high proportion of their pay as straight salary with a low proportion of their pay based on incentives, or a straight salary with no incentives at all.

“I am encouraged,” Garson said. “If physicians were against the concept, it just wouldn’t fly. But I think the data are clear that even without consciously changing their practice, they will order fewer tests and do fewer procedures.” A vast majority of studies have concluded that with less overtreatment, patients may actually do better, he added.

To encourage the transition to doctor salaries on a wider scale, Garson said, CMS could pay a bonus to physician groups that choose to compensate the majority of their physicians primarily via salaries. Commercial insurers could implement a similar strategy.

Perhaps it’s telling that some of the country’s top health care providers recognize the merits of the salary system. The Mayo Clinic, the Cleveland Clinic and the Kaiser group in California all pay physicians salaries without volume incentives. Officials at the Mayo Clinic say they’ve deliberately chosen to salary their physicians in order to reduce the potential for conflicts of interest.

“The vast majority of physicians care first and foremost about their patients,” wrote UCLA’s Ian Larkin and Carnegie Mellon University’s George Loewenstein in a widely-read column in the *Journal of the American Medical Association* published earlier this year. “But a significant body of literature in the social sciences demonstrates that financial incentives can and do influence decisions in ways not recognized by decision makers.” ■

“The Nation’s Pulse: The Texas Medical Center’s Consumer & Physician Survey,” is available at tmc.edu/health-policy/

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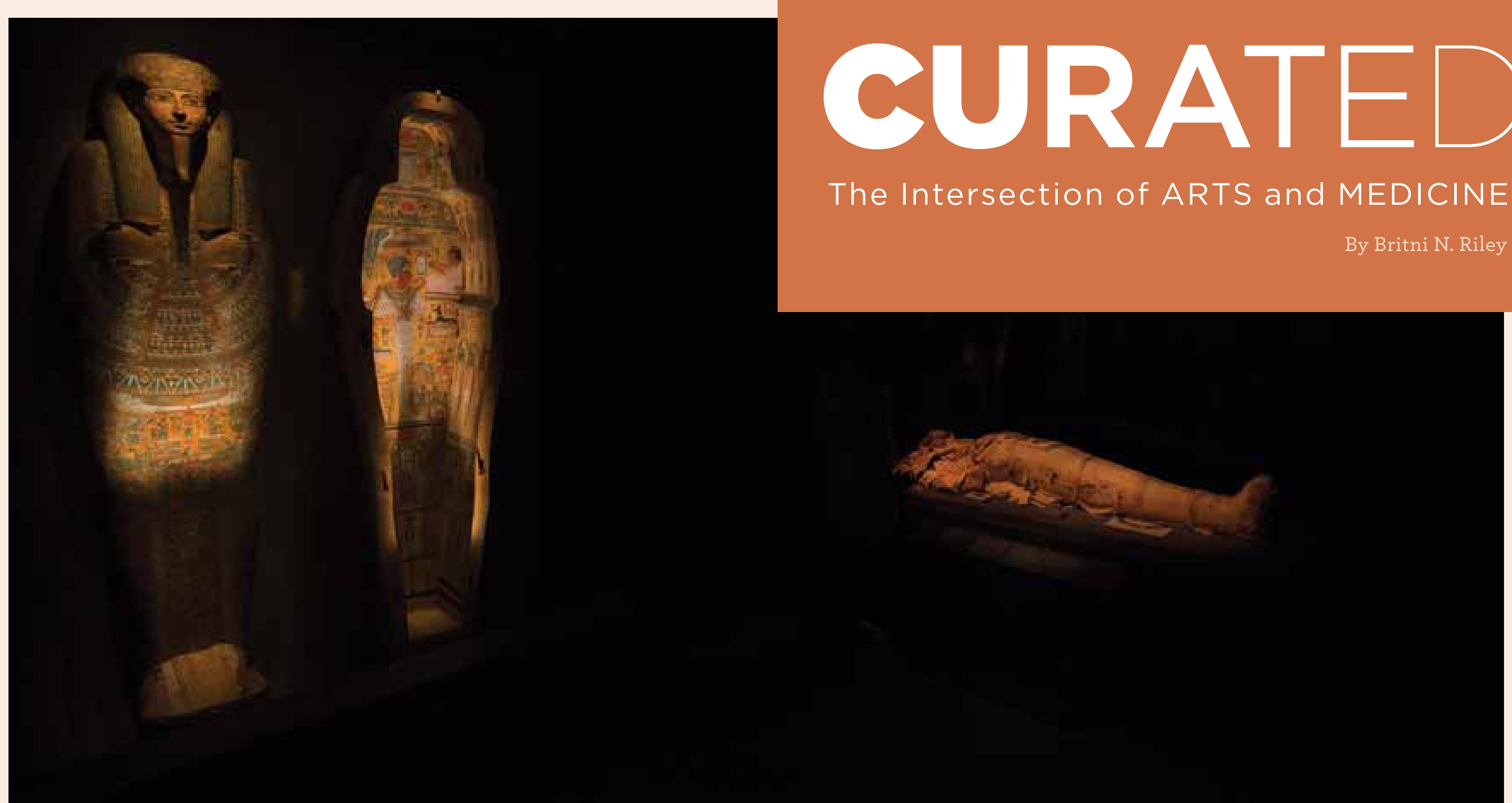
The Intersection of ARTS and MEDICINE

By Britni N. Riley



Sarcophagi and a mummy on display at the Houston Museum of Natural Science. Below, Dirk Van Tuerenhout, Ph.D., curator of anthropology at the museum.

In ancient Egypt, many priests were also physicians. A priest-physician might diagnose a stomach aliment, provide a treatment of honey, and then instruct the patient to pray to Horus—the God of protection—for healing.

"We have evidence of what we call today the placebo effect," said Dirk Van Tuerenhout, Ph.D., curator of anthropology at the Houston Museum of Natural Science (HMNS). "If you were stung by a scorpion or bitten by a snake, or worse a Nile crocodile, in which case you would most likely be dead, what people would do when they got home was pour water over representations of Horus. And the water that ran over this statue, which was thought to have medicinal properties, would be collected and then the person who was stung or bitten would drink it to be healed. If it worked, it was most likely the power of the mind."

The Hall of Ancient Egypt at HMNS is a permanent exhibit that devotes 11,000 square feet to the daily life of this primary civilization, through artifacts that include mummies, statues and vessels.

"The artifacts in the exhibit show where Egyptians were geographically and chronologically, their daily lives, religion, mummification and burial, and finally an explanation of how we know all of these things about their culture," Van Tuerenhout said.

Health concerns were top of mind for ancient Egyptians because their lives were so hazardous and dangerous. Situated in the Sahara Desert and along the Nile River, Egyptians were exposed to intense heat, diseases from river water, hippopotamus attacks, and more.

"It's a toss up, because you have a river, but it is not the cleanest, Van Tuerenhout said. "It is good for some things like fishing, but it is not good for drinking or bathing."

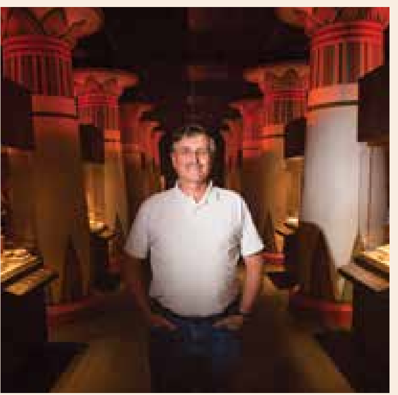
But Egyptians did use river water to make a beverage that is still popular today.

"Egyptians made many receptacles of pottery and glass to safely store food," Van Tuerenhout explained. "They also made strainers which were used to strain barley and wheat from water. It didn't take them long to discover when you have water and grain you can make beer. That is a good thing in many ways … If you drink the regular water, you might get sick, but if you have fermentation and alcohol in your drink, it might kill some bacterium and improve your overall health. It is a mark of a highly sophisticated society."

Hygiene was also very important to ancient Egyptians, whether that meant bathing daily, shaving the hair from their bodies or using galena, a ground up mineral that was applied to the eyes of men and women—similar to eyeliner today. Galena not only enhanced the eyes, but protected them from the intense desert sun and repelled flies that could cause disease and blindness.

"Egyptian men would be clean-shaven, shaving their entire bodies—women as well, including the hair on their heads," Van Tuerenhout said. "They would wear wigs made of human hair. That would have helped to escape the heat and mitigate any infections, as well."

The first forms of surgery and understanding of human and animal anatomy emerged from the burial practices of ancient Egypt. At the time, reincarnation and the afterlife were major concerns, and Egyptians spent decades and fortunes to ensure a comfortable transition.



"When you mummify a person, it is, of course, a surgical procedure," Van Tuerenhout said. "They were preparing the bodies for the afterlife and realized over time to properly preserve the body, all fluids would need to be drained."

Techniques for mummification transformed over the years, but most commonly, a priest or physician would remove a corpse's internal organs and drain all moisture from the body using a Y-shaped carving tool, which made a very small incision. The organs would be placed in separate receptacles and then the body would be wrapped with long strips of linen and covered with a large linen cloth before being placed in a sarcophagus.

The paintings and symbols on the sarcophagus, a wooden or stone coffin that protected a mummy, told stories of the deceased and their hopes for afterlife.

"On a mummy sarcophagus," Van Tuerenhout said, "you will find all kinds of prayers for what everyone wants—and that's eternal life." ■

The Houston Museum of Natural Science is located at 5555 Hermann Park Drive. Information: 713-639-4629 or hmns.org.

[1] **PETER PISTERS, M.D.,** a sarcoma surgeon, was named the fifth president of The University of Texas MD Anderson Cancer Center.

[2] **OMKARA LASKHMI M. VEERANKI, DVM, PH.D.,** a second-year postdoctoral fellow in pathology at MD Anderson, received the Department of Defense's Horizon Award from the Peer Reviewed Cancer Research Program of the Office of the Congressionally Directed Medical Research Programs. The award provides $240,000 in funding for a two-year research project.

[3] **TEXAS CHILDREN'S HOSPITAL** staff members embrace after Tropical Storm Harvey.

[4] **THE TEXAS MEDICAL CENTER HEALTH POLICY INSTITUTE** held a symposium, "Reducing the Cost of Health Care: Current Innovations and Future Possibilities," with health policy experts including **GEORGE MASI,** CEO of Harris Health System and **STEPHEN LINDER, PH.D.,** director of the Institute for Health Policy at The University of Texas Health Science Center at Houston School of Public Health and associate director of the TMC Health Policy Institute.

[5] Chef **HUGO ORTEGA,** center, and members of his restaurant staff at **CARACOL** delivered food to Texas Medical Center employees who worked through Tropical Storm Harvey.

[6] A Vietnam veteran and dialysis patient from Beaumont, Texas, was airlifted to the **MICHAEL E. DeBAKEY VA MEDICAL CENTER** due to flooding from Hurricane Harvey.

Credit: No. 3 Allen Kramer/Texas Children's Hospital; No. 6: Joseph Bravenec III; No. 9: Adolfo Chavez/MD Anderson; Nos. 1, 2, 5, 7, 8, 10, 11, 12: Courtesy photos

[7] **STEAK 48** delivered steak sandwiches to staff at **RONALD McDONALD HOUSE HOUSTON** during Tropical Storm Harvey.

[8] **RONALD McDONALD HOUSE HOUSTON** broke ground on a renovation and expansion project of their flagship facility, Holcombe House.

[9] **JAMES P. ALLISON, PH.D.,** of MD Anderson Cancer Center, was one of two recipients of the Balzan Prize for cancer research in tumor immunology. He and Robert Schreiber, Ph.D., of the Washington University School of Medicine, were cited for work that has increased the survival of patients with metastatic melanoma.

[10] **BROOKE HANEY,** advancement coordinator at **RONALD McDONALD HOUSE HOUSTON**, shows her gratitude to **GROCER'S SUPPLY** for a large donation of food after Tropical Storm Harvey.

[11] **WHEN UTHEALTH SCHOOL OF DENTISTRY** Dean **JOHN VALENZA, D.D.S.**, put out the word for volunteers at the George R. Brown Convention Center's emergency shelter for victims of Harvey, the school responded.

[12] A patient brought in by the U.S. Coast Guard on Aug. 29, during Tropical Storm Harvey, arrives at **THE UNIVERSITY OF TEXAS MEDICAL BRANCH AT GALVESTON** campus. The helicopter landed on the athletic field across the street from the Field House to deliver the patient.

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Lecture with Richard Kogan, M.D., part of the Stasney CPAM Lecture in Arts and Medicine

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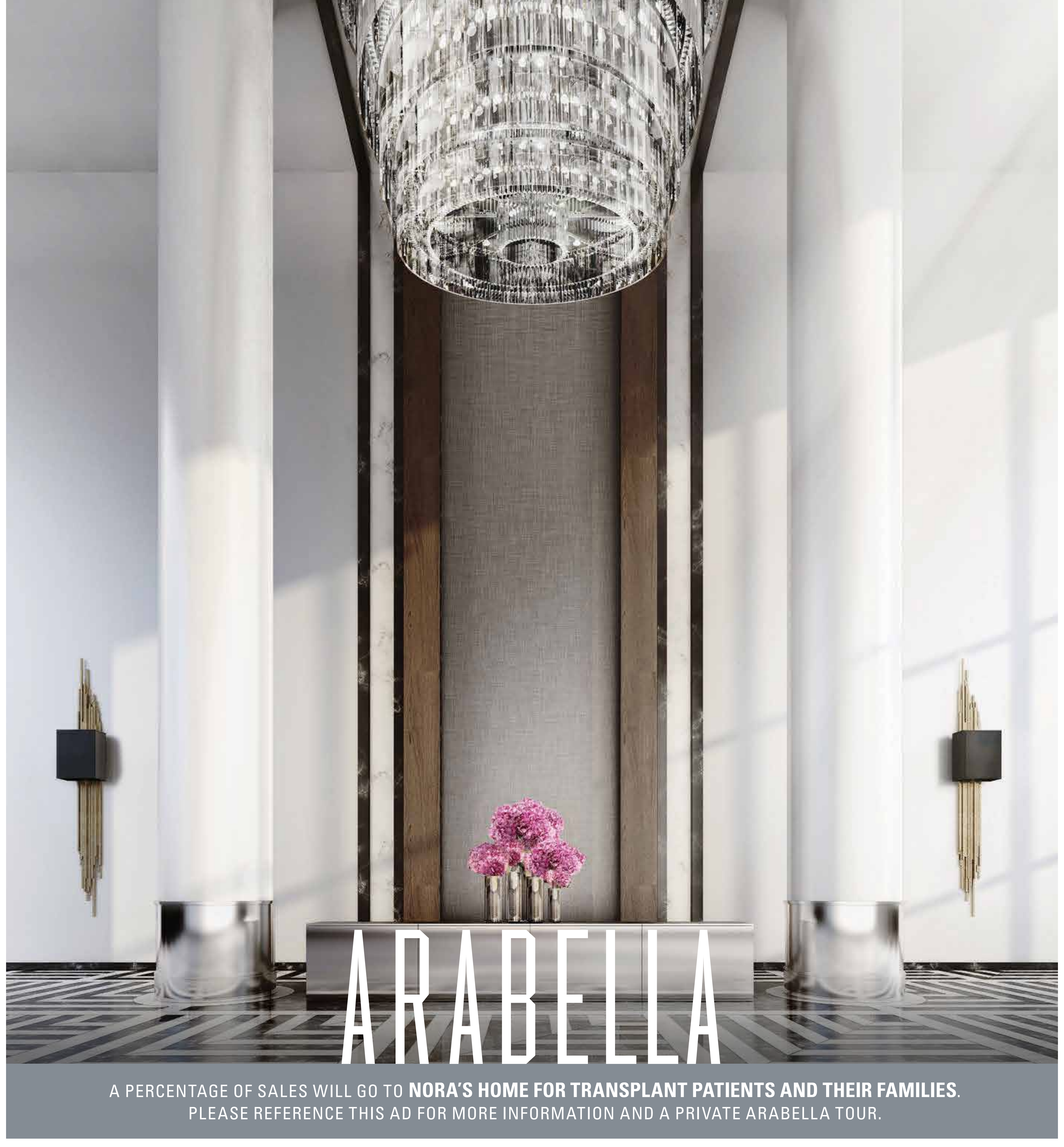
Researchers and physicians across the Texas Medical Center are working to lower fatality rates related to breast cancer through genetic testing, hormone therapies and surgical procedures.



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