TMC PULSE

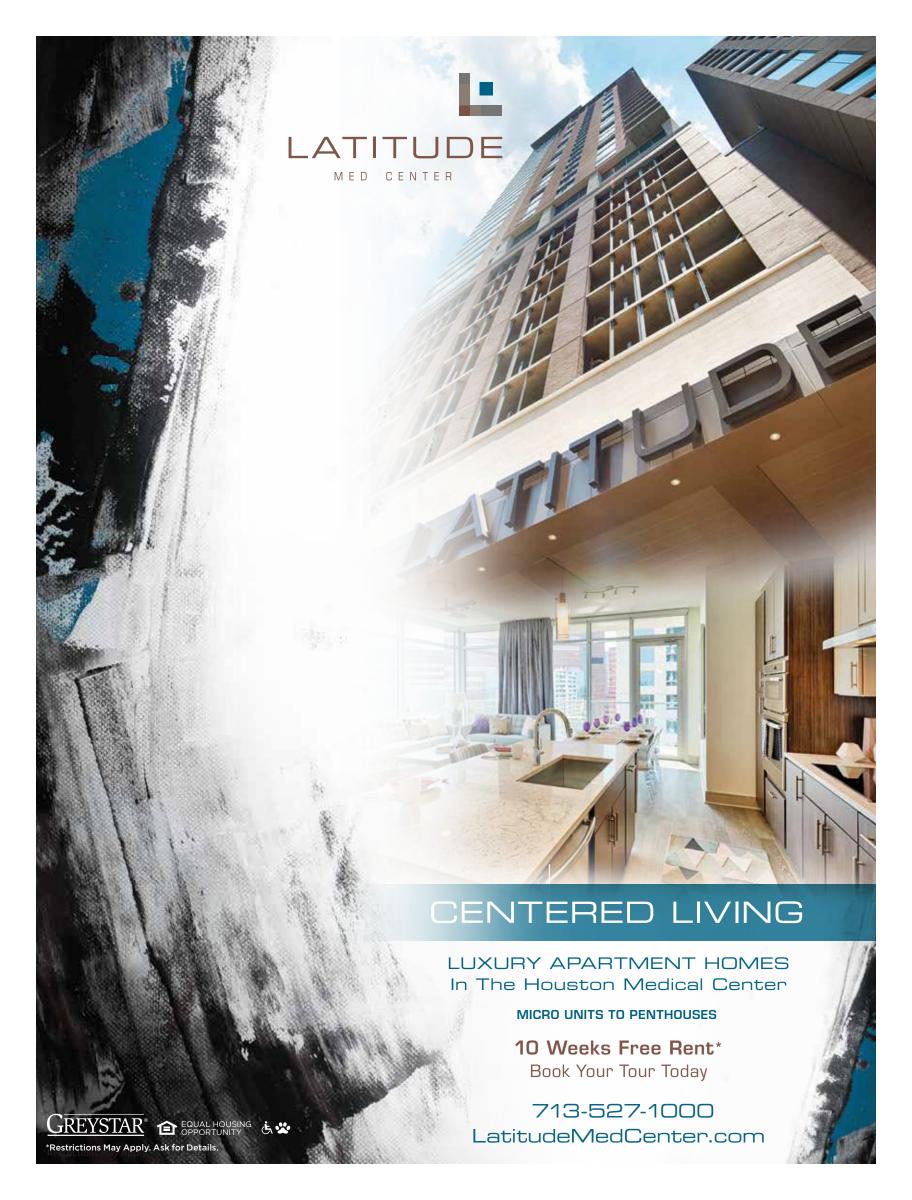
NEWS OF THE TEXAS MEDICAL CENTER - VOL. 5 / NO. 9 - OCTOBER 2018

Keeping His Heart in the Game

Surgery with minimal cuts offers quick recovery, p. 20



STDs HIT RECORD HIGH, p. 12 A TOOLKIT FOR NEWBORNS IN NEED, p. 14 BREAST RECONSTRUCTION REVOLUTION, p. 29





How Godfrey "GW"
Biscamp Realized His
Dream of Flying Again

As a test pilot for a defense contractor, Godfrey "GW" Biscamp tested fighter jets to the maximum to discover their limits. In one test, he was forced to eject, which is a last resort and quite violent. GW's spine was compressed, his shoulder tendons torn, and his diaphragm pushed into his ribcage. He recovered in the short term, though years later he began having trouble breathing and had repeated bouts of pneumonia. As a result, his pilot medical certificate was revoked.

After being unsuccessfully treated for interstitial pulmonary fibrosis, incorrectly diagnosed with a failing heart, and put in hospice at other hospitals, GW transferred to Baylor St. Luke's Medical Center, where pulmonologists quickly determined he needed a lung transplant, not a heart transplant as he had been told elsewhere.

GW successfully received his lung transplant through Baylor St. Luke's Lung Transplant Program and achieved his dream of flying again.

Baylor St. Luke's Lung Transplant Program has been performing successful lung transplants since the 1990s and continually strives to meet the needs of transplant patients through innovative research and leading-edge technology. In partnership with Baylor College of Medicine, Baylor St. Luke's Medical Center has established a collaborative environment for breakthrough research to better the standards of healthcare today—making transplants like GW's possible.

"I never dreamed I would set foot in an airplane again. What [the hospital has] given me is more than I ever could've asked for," said GW. "Baylor St. Luke's doctors really care, and it says a lot that they're willing to take on some of the toughest cases out there."

Baylor St. Luke's Medical Center







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

recently traveled to London and, together with United Kingdom government and research leadership, announced a BioBridge partnership between the Texas Medical Center and the UK. This unique collaboration is a testament to the Texas Medical Center (TMC) and the UK's commitment to fostering the cross-pollination of ideas and innovation in the life sciences to accelerate discovery.

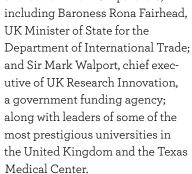
What, exactly, does this partnership mean? First, it solves a key challenge facing early stage companies. Those startups require a great deal of nurturing and support, and that's especially true when they expand beyond their home country into new markets. The BioBridge aligns the life science startup communities across the UK with the TMC Innovation Institute. UK-based companies are

now able to house themselves at the TMC and tap into our network of investors and experts. And the reverse is true, too: startups housed here at the TMC now will have an access point into the UK. The BioBridge serves as a mutual port of entry, where startups can establish a base and learn the regulatory nuances of a new market while building key relationships.

Second, the BioBridge aligns leading UK institutions, including Cambridge University, Oxford University, Manchester University and the University of Leeds, with the leadership of the Texas Medical Center. Researchers from both countries will collaborate on a range of projects, including the development and advancement of genomics and cancer treatments. For example, researchers are developing ways to use artificial intelligence to target treatments based on an individual's distinctive genomic profile.

It was exciting to see the genuine support and

enthusiasm from UK partners, UK Minister of State for the and Sir Mark Walport, chief executive of UK Research Innovation, a government funding agency; along with leaders of some of the most prestigious universities in the United Kingdom and the Texas Medical Center.



Importantly, we don't see this as a one-time partnership. We've established a BioBridge with Australia, as well, and we expect to develop more of these types of relationships as we continue to advance the Texas Medical Center's role as an international leader—and partner—in the life sciences.

Our BioBridge partnership is designed to share knowledge, technologies and insights to leverage our collective capabilities to develop treatments faster. We are united in our passion and dedication for improving the health of humanity.



McKeon, Fairhead and Walport

William 7 Mgc

TMC PULSE

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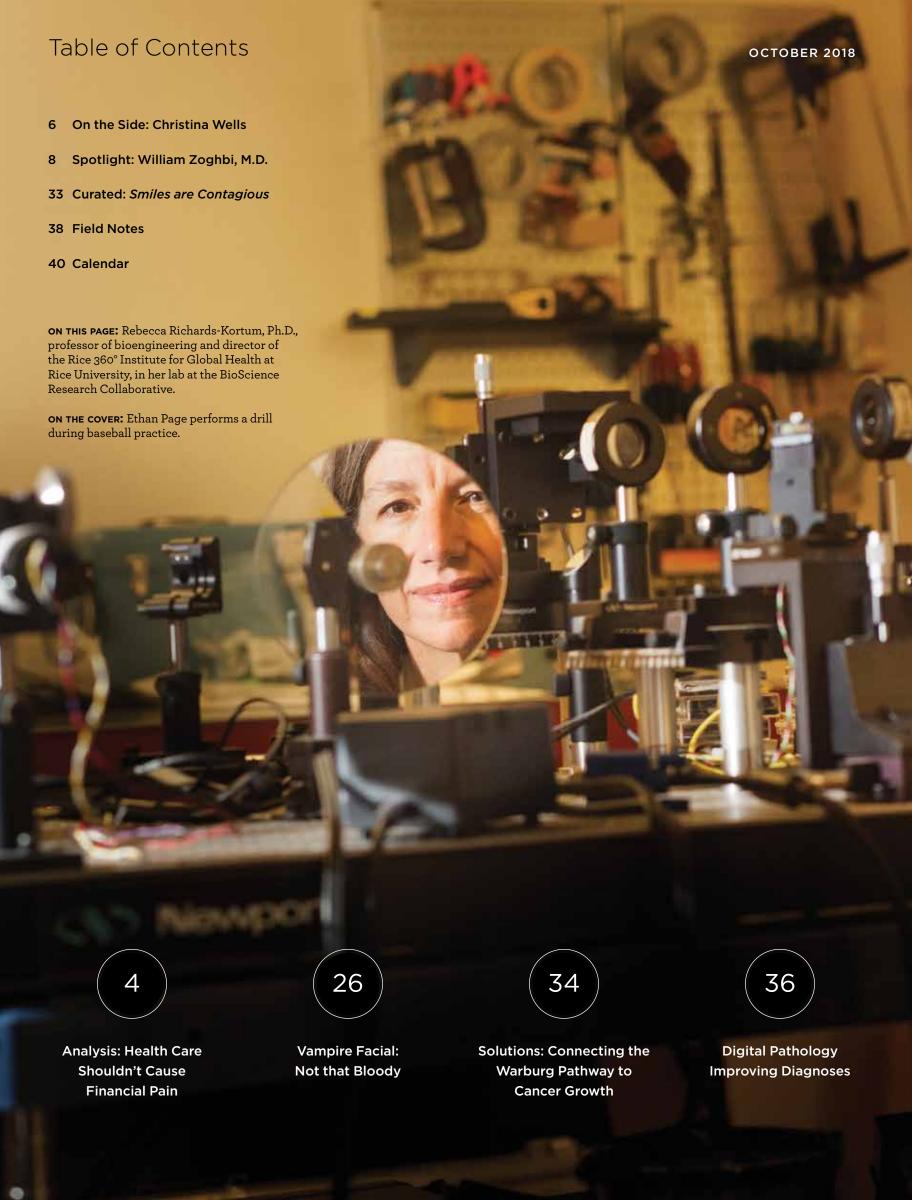
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Analysis: Health Care Shouldn't Cause Financial Pain

Studies show Americans are feeling the squeeze

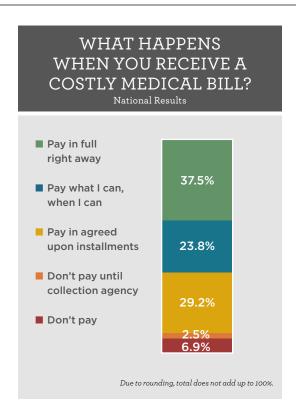
By Ryan Holeywell

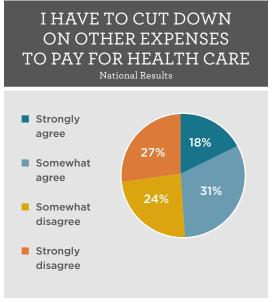
gruesome scene played out earlier this year in Boston that illustrates the state of health care for many of today's consumers. As a passenger exited a rush-hour transit train, her foot got caught in the gap between the train and the platform. Bloodied, with a laceration deep enough to reveal bone, she begged nearby commuters not to call an ambulance. "It's \$3,000," she said, according to a Boston Globe reporter on the scene. "I can't afford that."

The story went viral, garnering national attention for how perfectly it captured the terrible dilemma many Americans face when they interact with the United States health care system. The system can ease patients' physical pain, but, in exchange, it often demands that they endure extreme financial pain.

New survey data from the Texas Medical Center Health Policy Institute sheds light on how that predicament affects families across the country. For example, the survey shows that nearly two-thirds of Americans can't pay the bill in full when they receive a costly invoice for medical care. Half of Americans say they must cut back on other household expenses to pay for their health care.

These were problems that should have been eased by now. More than eight years after the Affordable Care Act became law, health care costs continue to challenge families. Americans of all types are feeling the squeeze. For those with Marketplace (Obamacare) plans, premiums have doubled in just five years, and family deductibles average a staggering \$11,500. Those who get insurance through their employers face their own challenges. Premiums are increasing faster than wages and a growing number of businesses are steering their employees toward high-deductible health plans that force workers to bear a growing share of health care costs. And, of course, the 10 percent of non-elderly adults without any health insurance are in the most precarious position of all.





Source: "The Nation's Pulse: The Texas Medical Center's Consumer Survey,"
which pulled data from more than 5,000 participants nationwide

For many, the status quo means that a growing percentage of family income will continue to go toward health care costs at the expense of saving for retirement, college or starting a business.

The realities of managing medical bills can have a major, disruptive effect on Americans' lives.

About 60 percent of people who say they struggle with medical bills exhaust most or all of their savings to pay them. The same proportion take on second jobs or work more hours to pay medical bills.

For American families, the prospect of losing everything due to an unfortunate combination of injury and inadequate insurance is an everpresent threat. One recent study found that medical bills are the single largest cause of consumer bankruptcy, responsible for between 18 and 25 percent of cases. Two-thirds of Americans who struggle with their medical bills say they're the result of a one-time, short-term expense, such as a single hospital stay or treatment for an accident, according to a Kaiser Family Foundation survey. In other words, even if you think you're healthy, you could be at risk.

The U.S. has been a center of medical innovation, developing cutting edge drugs, procedures and tests to identify and fight disease. But the country has failed to innovate in an equally important area: developing policies to ensure that all patients can utilize those advancements. It should come as no surprise that most Americans say they delay necessary medical care due to cost.

Do we want our friends to take on second jobs if they are unlucky enough to get sick? Do we want our family members to lose their retirement savings if they have the bad fortune to suffer an accident? Citizens of most other Western countries have answered "of course not." In the U.S., many observers have been asking whether rising health care costs are sustainable. The truth is, they probably are—the trend has continued unabated for years. The real question is whether we will continue to accept them.

Ryan Holeywell leads communications for the Texas Medical Center Health Policy Institute.

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ONEFORALL HARRISHEALTH SYSTEM harrishealth.org





NAME: Christina Wells

оссиратіом: Registered nurse at Memorial Hermann Health System

INTEREST: Vocal performance

n June 5, 2018, millions of television viewers watched Christina Wells walk onto the "America's Got Talent" (AGT) stage in Los Angeles and deliver a powerful rendition of "I Know Where I've Been," a song from the musical *Hairspray*.

The self-described "very dorky, friendly, really chill girl" belted out lyrics she had sung for more than a decade. Filling the theater with her rich, orotund voice, Wells—a registered nurse for Memorial Hermann Health System—surprised celebrity judges Simon Cowell, Heidi Klum, Mel B and Howie Mandel and brought audience members to their feet for a standing ovation.

"I love being a nurse. I love being a mother. I know God put me on this Earth to do those two roles, but I know I was made to sing. I just feel it inside of me," Wells said.

Wells, 42, advanced to the semifinal rounds of AGT but was eliminated Sept. 11, after performing Aretha Franklin's "Natural Woman" in an homage to the late "Queen of Soul."

Singing has been a life-long passion for Wells. In her free time, the single mother of two boys performs in community theater (including Art Park Players in Deer Park and Stages Repertory Theatre in Houston's Montrose neighborhood) and has appeared at the Houston Livestock Show and Rodeo and Super Bowl Live.

"Singing for me is like breathing or eating. I just have to do it. You know that feeling of a waterfall? It feels like cool water calming my soul. There's nothing else that satisfies me in that way," Wells said. Appearing on AGT was an opportunity to showcase her voice, but it was also a chance for her to represent the "others." she said.

"I'm probably too old to start a pop career. I'm too heavy. I'm not a dancer. I'm not a perfect little package," Wells said. "I'm just a normal person."

But that is one of the reasons people respond to her.

"I'm glad they like my voice, but I think ... they relate to me as a human being," she said. "They understand what it's like to not look exactly like you're supposed to, according to whoever 'they' are."

Wells has faced discrimination for her weight. In March 1995, she was a 19-year-old college freshman returning home to Houston for spring break. She spent a week auditioning at Six Flags AstroWorld to become one of the singers entertaining the crowds. On the last day of auditions, she was among 20 candidates for 12 positions. The judges ultimately selected another contestant over Wells for the Whitney Houstoninspired role.

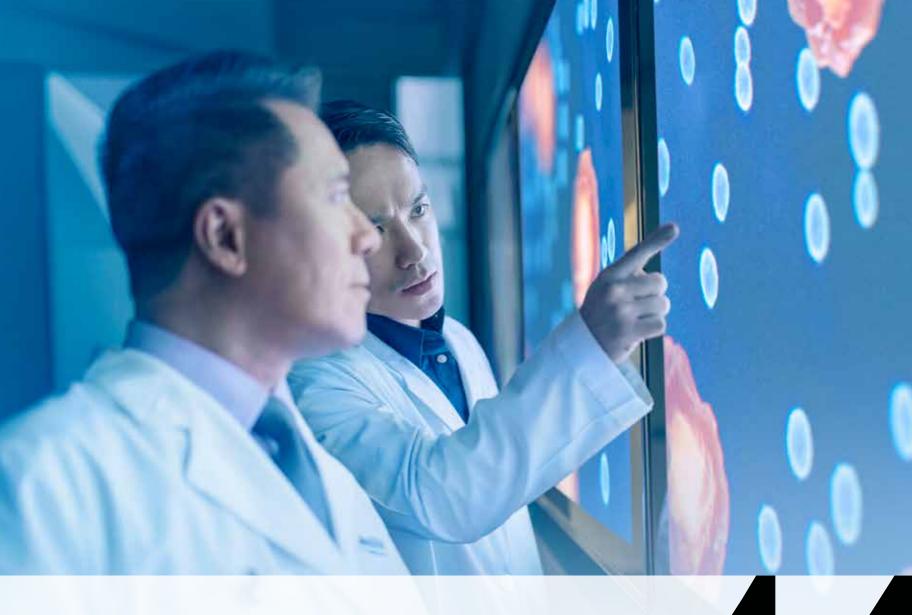
"They were like, 'You're not going to fit in the physical outfit that we want this person to have,' so they were willing to sacrifice the voice talent for the body," Wells said. "I was devastated. I sat in one of those photo booths and cried for three hours."

Feeling rejected and defeated, she put her singing dreams on hold and sank into a depression. But after she gave birth to her first son, Ethan, everything changed.

"It was no longer 'poor pitiful Christina and her fat self," Wells said. "It was 'Ethan's mother needs to be strong. ... Ethan's mother needs to understand her worth and her value if she wants Ethan to understand his worth and his value."

Although she did not win the competition, Wells' experience on AGT gave her an extra boost of confidence to keep singing. She plans to continue performing around the Houston community, while serving her patients as a nurse.

"I'm living proof that dreams have no expiration date," Wells said.

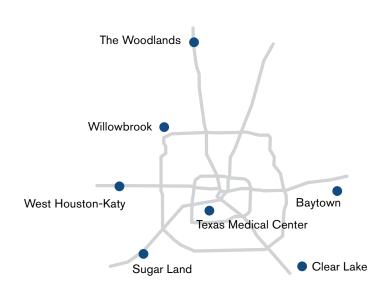


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WILLIAM ZOGHBI, M.D., started medical school in war-torn Beirut and went on to become a leading cardiologist in Houston. Professionally, he cares for and repairs hearts while advocating for cardiovascular health. Personally, he demonstrates a healthy lifestyle through diet and exercise. Chair of the department of cardiology at Houston Methodist Hospital and the Elkins Family Distinguished Chair in Cardiac Health at Houston Methodist DeBakey Heart & Vascular Center, Zoghbi has served as president of the American College of Cardiology and the American Society of Echocardiography.

Q | You were born in the small town of Ghazir, Lebanon. Can you describe your upbringing there?

A Just to set the scene: it overlooked the Mediterranean, in the mountains, at about 1,000-feet elevation. Growing up there gave me a great opportunity to love the outdoors and nature. I love the sea, fishing, hiking—just being outdoors.

My father was a carpenter with a billiard factory. My mother was fluent in French, so she was his correspondent with the rest of the world. She was also a home mom—she took care of us and everything else. From my parents, I learned independence, the pursuit of excellence and the importance of education.

How did you know you wanted to become a cardiologist?

A I loved math, science and physics, and I was inclined to be an engineer. I had a chance encounter with a medical student who graduated from my high school. We talked about how you have to be an expert not only in the medical sciences, but in the humanities, and that you have the opportunity to have wonderful interactions with individuals. Interestingly, when I was 5, I would point to a toy heart and ask my mom to dissect it for me, so I learned anatomy from her and she always reminds

me of that. There was a fascination with the heart that I had. There were no physicians in my family. I was the first.

Q | You started medical school in Lebanon, but finished in the United States. Why did you transfer?

A I went to the American University of Beirut (AUB), where I did my pre-medical school and then medical school. During my first year of medical school was when the [Lebanese Civil] war started. We lived on the first floor for about six months, trying to be sheltered from bombs and various things. Because of the intensity of the war, I started to look at opportunities outside of Lebanon. It was very difficult to transfer because I was in the middle of medical school. Luckily, after sending about 20 or 30 letters, I found out that one school accepted my transfer. I came to

Tennessee—Meharry Medical College. I'm very grateful they accepted me.

What did you learn from that disruption to your education?

A One thing about the adversity I was exposed to during the war is that it makes you much more adaptable. I think we have to be adaptable to different situations and try to find solutions to problems.

• How did you meet your future wife, Huda Zoghbi, M.D. (née El-Hibri), a fellow student who would go on to become a renowned geneticist affiliated with Baylor College of Medicine and Texas Children's Hospital?

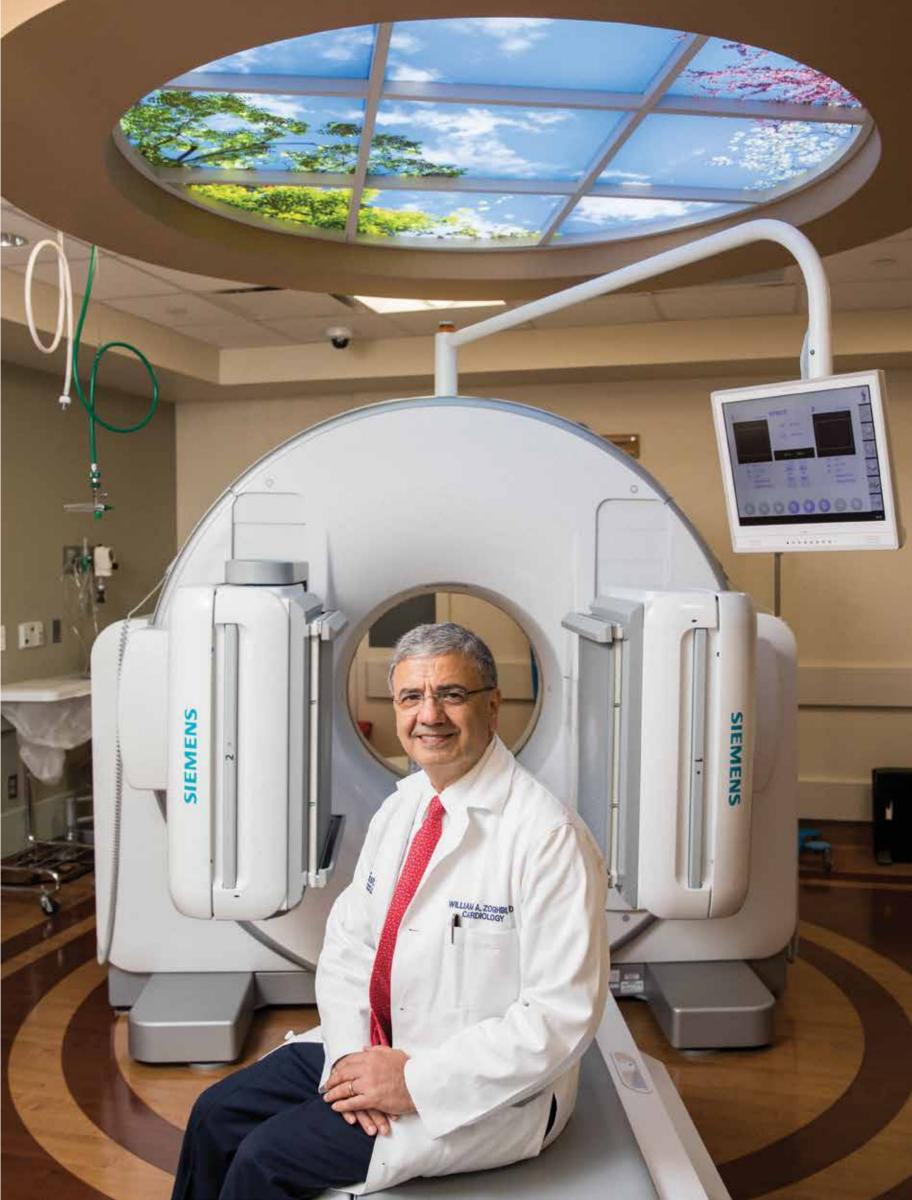
A I I think our first meeting was in anatomy class [at AUB]—not the most romantic setting. She came to the States a year earlier [than I did]. We reconnected at Meharry. At that time, there was no couples matching, but we matched in Texas. She matched at Baylor College of Medicine and me at The University of Texas Medical Branch at Galveston (UTMB), then we saw each other back in Houston and the rest is history. We got married here in Houston in 1983.

Q | What else drew you to Houston?

A The big name that drew me was really Dr. [Michael] DeBakey and all the history of cardiovascular medicine that really was born in this city and at Houston Methodist and Baylor. It really is amazing how influential Houston has been in charting the major developments in cardiovascular disease. It has been an honor to train alongside the giants in medicine.

(continued)

Many people know what is good and what is bad for them, but knowledge is not enough—you need action. How do you stimulate people and engage them to get into healthy behaviors, diets and exercises? I think this is our current challenge.



Many consider you to be a pioneer in the field of echocardiography. What led you to specialize in this area?

A When I was doing my training, my mentor was Miguel Quiñones, M.D. He became my very close colleague. What attracted me to echocardiography was not only his mentorship, but also because I was able to see the heart in real time with ultrasound, without any invasive procedures. Ultrasound or echocardiography is the imaging portion of seeing the structure and the heart move—ticking and pumping. My major driver is to be able to understand diseases of the heart and vasculature with non-invasive imaging so we can detect disease early and understand how best to manage it.

• Heart disease is the leading cause of death for both men and women in the United States. What are some of the biggest challenges Americans are facing?

A If you look back over the past 40 years, the mortality as well as morbidity of heart disease has decreased by 40 percent in the U.S. This is predominantly because of advances in medications,

66 It really is amazing how influential Houston has been in charting the major developments in cardiovascular disease. It has been an honor to train alongside the giants in medicine. 9 9

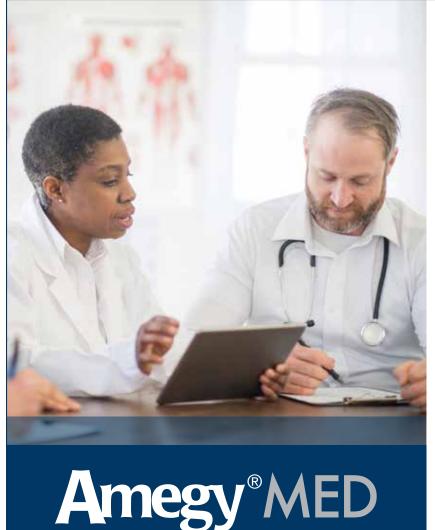
quitting smoking, reducing blood pressure, lifestyle changes and the devices we have now, such as pacemakers and defibrillators. The impact has been tremendous. Cancer is just a very close second and we do hope, and I will be elated, when we are No. 2. But there are trends in this country, unfortunately, that will erode some of these advances and outcomes. If you look at the maps of obesity in the country-and diabetes goes along with obesity—they are scary. If you think about health in the United States, we have one-third obese, one-third overweight and only about 30 percent ideal body weight. This is preventable.

• How do we improve these dismal

A | The ultimate goal for all of us is increasing longevity coupled with good quality of life. Yes, it is costly, and even now there are a lot of comorbidities, but I do hope we can engage the population and make patients aware of the importance of preventive and wellness measures. Many people know what is good and what is bad for them, but knowledge is not enough—you need action. How do you stimulate people and engage them to get into healthy behaviors, diets and exercises? I think this is our current challenge.

Both of your children work in health care. How do you and your wife feel about them following in your footsteps?

A Roula is our eldest. She works as the director of business operations at Texas Childen's Urgent Care. She has a beautiful daughter, Camila, nearly 2 years old. We get to see her often and volunteer to babysit any time. We also have a son, Anthony, who just finished his psychiatry residency at Columbia University. He married his sweetheart from medical school at Baylor.



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Zoghbi poses in his office at Houston Methodist's Smith Tower.

I feel proud that he was connected with Baylor and Houston.

You're 63. How do you stay healthy?

A I exercise regularly. I like to fast-walk with in-between spurts of jogging. That is important for me and my wife. We do that together, often

three to four times a week. I go to the gym. I use free weights and do reps. For exercise, I don't only think about cardiovascular. Toning and flexibility are important as we grow in wisdom and age. Joints and muscles and core are as important as cardio. Foodwise, growing up in the Mediterranean, that is my favorite and it turns

out to be the healthiest. Fruit and a little espresso in the morning and, during the day, something light. We usually bring leftovers from home. Lots of fruits and vegetables—not fully vegetarian, but maybe 80 percent. And lean and healthy. My take on diet also is to have as much variety as you can, good portion control and treat yourself so you don't have cravings.

Q Do you consider Houston home?

A I have two homes. Houston is definitely home for the majority of my life, but I feel I am a citizen of the world. I love to travel and explore many areas of the world. Lebanon is still my roots and I love the whole Middle East.

William Zoghbi, M.D., was interviewed by Pulse Staff Writer Britni R. McAshan. The conversation was edited for clarity and length.



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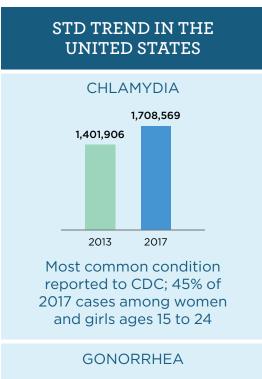
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STDs Hit Record High in U.S., Mirroring Upward Trend in Houston Area

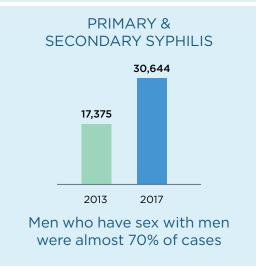
Testing and treatment urged to stop surge

By CINDY GEORGE





only one highly effective antibiotic used in the U.S.



Source: Centers for Disease Control and Prevention

exually transmitted diseases (STDs) in the United States hit a record high in 2017, marking a "steep, sustained increase" over the last four years and a discouraging trend after decades of decline. Texas and Houston have seen a similar spike in STDs, according to Texas STD data and the observations of Houston experts.

The Centers for Disease Control and Prevention (CDC) released preliminary 2017 figures showing a combined 2.3 million diagnosed cases of chlamydia, gonorrhea and syphilis. That number surpasses 2016 by more than 200,000 and represents a nearly 10 percent increase over one year.

"It's an important moment to message that testing is available for everyone and you need to be aware of your sexual health and that you need to be tested," said Paige Padgett Wermuth, Ph.D., M.P.H., assistant professor of management, policy and community health at The University of Texas Health Science Center at Houston (UTHealth) School of Public Health.

The 2017 surge marked the fourth straight year

Nationwide, chlamydia remained the most common condition reported to the CDC last year, with 1.7 million cases diagnosed. Nearly half— 45 percent—occured among girls and young women ages 15 to 24. Syphilis diagnoses nearly doubled over the four-year period, with more than half of cases among men who identify as gay, bisexual or sexually active with other men. Gonorrhea cases jumped 67 percent from 2013 to 2017. Officials expressed concern about gonorrhea growing resistant to treatment, with only one highly effective antibiotic remaining now in the U.S.

Federal funding cutbacks blamed for "crisis"

The preliminary 2017 STD figures were released during the 2018 STD Prevention Conference in Washington, D.C., where hundreds of sexual health experts convened in August. During a media teleconference, experts called the rising trend a "crisis" and an "epidemic," while lamenting the uptick following decades of decreasing STD cases.

David Harvey, executive director of the National Coalition of STD Directors, said during the call that funding cutbacks have crippled local STD public health programs from adequately addressing awareness, education, screening, testing and treatment.

66 Primary care providers and anyone, really, who is caring for a patient, should be screening for hepatitis, HIV and sexually transmitted infections. It's not that hard to do. 🤊 🦻

> - THOMAS GIORDANO, M.D., M.P.H. Medical director of Harris Health System's Thomas Street Health Center

"Federal STD funding has seen a 40 percent decrease in purchasing power since 2003," Harvey said. "That means that state and local health departments—most of which depend primarily on federal funding to support their STD programsare working with budgets that are effectively what they were 15 years ago."

Local numbers mirror national uptick

Harris County is a historical hot spot for the trio of infections outlined in the national analysis.

Gonorrhea, chlamydia and syphilis diagnoses rose sharply from 2013 to 2017 in Harris County, according to Houston Health Department data. Gonorrhea showed the steepest increase, from 6,482 diagnoses in 2013 to 8,827 in 2017a 36 percent increase. Chlamydia cases increased 17 percent and primary and secondary syphilis by 6 percent over the same period.

"That is disconcerting to us because it tells us that people are acquiring the disease and if they don't get treated, they can spread it to other people," said Michael R. Thomas, M.P.H., a CDC public health advisor who has been embedded with the Houston Health Department's Bureau of HIV/STD and Viral Hepatitis Prevention for more than two decades. "To be able to combat that, we are going to need the resources ... and that's why you are seeing the uptick in syphilis, gonorrhea and chlamydia."

Thomas also attributes some of the challenges with surveillance, partner identification and treatment to the ubiquity of social media applications.

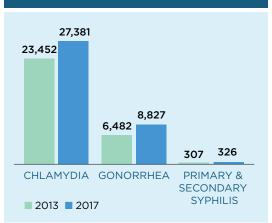
"A lot of the increase that's going on now, particularly syphilis—but also other STDs—is because of social media," he said. "People are now meeting partners on social websites. You have websites

that promote coming into town, meeting some-body and you can have a relationship with that person. That person could be infected with syphilis or HIV or gonorrhea or chlamydia and transfer it to another person. The difficult thing about it is that the person goes on to the next place and these websites don't keep names—there's no way to go back and identify who that person is—so traditional partner notification efforts are not as effective."

In her role as a principal investigator for the CDC-funded National HIV Behavioral Surveillance, Wermuth also worked on a study last year that offered on-site chlamydia and gonorrhea testing for the local population of men who have sex with men in places where they meet.

"Houston has definitely been a pioneer in allowing testing to happen in the bars—not just in a mobile unit outside. This is so important to getting people to change the community norm about screening and about awareness," she said. "From my work locally in Houston, I would say that people are aware that there are issues with chlamydia and gonorrhea and that people are interested in getting information and getting tested. You still have issues with sexual health awareness in general. We really should work on providing information on ... who should get tested, when they should get tested, where they should

STD TREND IN HARRIS COUNTY



Source: Houston Health Department

get tested and how they get tested.

"In Houston, there is Legacy, Bee Busy, St.
Hope, the Houston Health Department mobile
clinics—all sorts of clinics available for free
testing or sliding scale for people who are worried
that they can't afford it, because that shouldn't be
an issue for anyone. There is available free testing
and support."

Routine testing urged

The ongoing national spike in preventable infections highlights the urgent need for routine

testing, said Thomas Giordano, M.D., M.P.H., associate professor and chief of infectious diseases in the department of medicine at Baylor College of Medicine.

"I think health care systems and providers need to do more testing. There is plenty of evidence that people who should be screened for HIV and other sexually transmitted infections don't get tested enough, so we need to add this on to routine care," he said. "Primary care providers and anyone, really, who is caring for a patient, should be screening for hepatitis, HIV and sexually transmitted infections. It's not that hard to do."

Giordano also is the longtime medical director of Harris Health System's Thomas Street Health Center, one of the largest HIV clinics in the U.S.

"Get tested and get treated. Ignorance is not bliss," he said. "Some patients need to ask for testing because that will make the provider do the test, but providers need to take the initiative, as well. People think they're getting tested when they get routine blood work. They assume. We need to make sure we are thoughtful about this in approaching it from a very wide perspective to test people broadly. It's no moral failing to test for HIV, syphilis, chlamydia, gonorrhea and hepatitis. It's what we're supposed to do."



INVENTING A TOOLKIT FOR NEWBORNS IN NEED

Вч ALEXANDRA BECKER





wo years ago on Halloween,
Rebecca Richards-Kortum,
Ph.D., a professor of bioengineering at Rice University, walked
into her lab and stopped abruptly.
Staring back at her was a crowd of
familiar characters.

Her students, who wear costumes for the holiday every year, had conspired to go as different versions of their mentor. There was the mother-of-six Rebecca, the saving-dying-babies-in-Africa Rebecca, the marathon-runner Rebecca, even the Albert-Einstein Rebecca—a nod to the \$625,000 fellowship Richards-Kortum received from the MacArthur Foundation. Commonly known as a "genius grant," the stipend is paid out over five years to support visionaries in their creative pursuits for the benefit of humanity.

An honor of a lifetime, the MacArthur sits atop a long list of accolades Richards-Kortum has collected over more than three decades as a physicist, bioengineer and global health pioneer. She has developed 40 patents, authored numerous research papers and book chapters, and has been awarded grants from organizations that range from the National Institutes of Health to the U.S. Department of Defense and the Bill & Melinda Gates Foundation. In 2017, she was included on Fortune magazine's list of 50 World's Greatest Leadersalongside the likes of Pope Francis, Angela Merkel and Shakira—for her efforts to end preventable newborn deaths in Africa. And in June of this year, she was selected to serve as a Science Envoy for the U.S. Department of State—one of only 23 scientists ever to receive the honor.

"She seems to have boundless energy," said her husband, Philip Kortum, Ph.D. "She's up at 5:30, out sitting on the couch or in front of the fireplace working, and seems to be able to sustain that for just endless periods of time. She'll essentially sprint all day long, squeeze in a 12-mile run, and then work until it's

finished. And she won't just do that for a couple of days to get a project done, but she'll do that again and again and again and again."

Part of Richards-Kortum's genius lies in channeling her energy. A strategic thinker with a competitive spirit, she identifies a goal and then marches toward it, assembling an army of collaborators and building a plan of action so direct and so fundamentally sound that everyone around her wonders why no one thought of it sooner.

But nothing about her work is easy, and bringing her plans to fruition is another story entirely.

'Just Becky Richards'

As a young girl in Nebraska,
Richards-Kortum dreamed of
becoming a novelist. She cherished books like A Wrinkle in Time,
Harriet the Spy and The Little
Prince. But in high school, she found
herself drawn to math and science.
When it came time to pick a major
at the University of NebraskaLincoln, Richards-Kortum chose
physics because, as she put it, it was
the hardest thing she could do.

"I was so fortunate that the person who taught the freshman physics class I took, Paul Burrow, was this amazing teacher," Richards-Kortum said earlier this year in her office at Rice University's BioScience Research Collaborative. Now in her early fifties, she keeps her hair just past her shoulders and wears a round black running watch that she doesn't check as often as you'd expect.

"He's one of the best teachers I ever took a class from—ever," she added. "He made it so engaging and fun."

Not long after, when the chairman of the physics department, David Sellmyer, encouraged her to work in his lab, Richards-Kortum discovered her love for applied science.

"He was a hugely important mentor, and he totally changed the

direction of my career," she said.
"What I took away from that is the
power that one person can have on
the direction of other people's lives.
I try not to forget that as a mentor
and as a teacher."

She met Philip Kortum freshman year. They lived in the same building, she in room 2211 and he in 2311, right upstairs.

"We didn't actually meet in the dorm, though," said Kortum, now an associate professor of engineering psychology and human factors at Rice University. "Someone else on my floor had taken her to a party and then had consumed enough alcohol that he was unable to take her home, so I offered, and we just really hit it off. It was just one of those things—I kind of knew from the minute I met her that she was awesome."

The couple got married the day after they graduated.

"We took finals on Friday, graduated on Saturday, then got married on Sunday," Kortum recalled. "We just had a one-day honeymoon right there, because then we had to pack up the U-Haul and head out to Boston so she could go to MIT. I should have looked at that and said, 'This is going to be indicative of the pace that life is going to take with Rebecca."

Of course, neither of them knew what the future had in store.

"Back then, she was just Becky Richards," Kortum said. "She was just a physicist and I was just an engineer. I think that's one of the reasons we've got such a fabulous marriage. When we went out to Boston, we didn't have two dimes to rub together. We owned a lawn chair and a mattress."

Equipment graveyards

After wrapping up MIT with her M.S. in physics and a Ph.D. in medical physics, Richards-Kortum took a job at The University of Texas at Austin as a professor of biomedical engineering.

(continued)

She spent 15 years immersed in optical imaging research geared toward early detection of cervical, oral and esophageal cancers before leaving for Rice University in 2005.

In Houston, Richards-Kortum found herself looking for creative ways to engage her bioengineering students in projects that would have a more immediate impact on the world. She was invited by Mark Kline, M.D., now physician-in-chief of Texas Children's Hospital, to the opening of the Baylor International Pediatric AIDS Initiative clinic in Malawi to explore potential opportunities for her undergraduate students to address some of the challenges African clinics faced in delivering care.

The experience changed her life.

"That was really a transformational trip because I saw two things," said Richards-Kortum, who speaks evenly, almost always projecting a sense of calm. "I saw the heartbreaking, normal situation for hospital-based care for newborns, but what I saw right adjacent to that was this huge failure of existing technologies that were being imported that couldn't withstand the heat, the dust, the humidity, the lack of trained technicians, the lack of supply chain for spare parts."

Donated technologies can save lives in parts of the world with reliable electricity, spare parts and controlled environments. But in less fortunate areas, as soon as a critical component breaks or the electricity sputters, high-tech machines can no longer keep infants warm, measure oxygen or pump air into tiny lungs. The machines are rendered useless and set aside, piling up into equipment graveyards. In Africa, Richards-Kortum saw them everywhere.

Upon returning from Malawi, Richards-Kortum recruited her colleague, fellow bioengineering professor Z. Maria Oden, Ph.D., to create the Oshman Engineering Design Kitchen (OEDK) at Rice, a place for undergraduate students to create solutions for real-world engineering problems. The two also now serve as co-directors of the Rice 360° Institute for Global Health, a



Richards-Kortum in her lab at the BioScience Research Collaborative.

program that works in conjunction with the OEDK to foster new technologies for health challenges in the developing world.

"It took us a while, honestly, to figure out what was the best way to engage our team and make a difference," Richards-Kortum said. "We did a lot of things that didn't work and learned what could work. And really, what we learned was to focus on a place in the health care system and focus on a place geographically. We applied those lessons to this focus on newborns and a focus on sub-Saharan Africa."

The key was to create machines tailor-made to low-resource settings: they needed to be affordable, capable of withstanding harsh environments and repairable with limited tools and resources.

A mother herself, Richards-Kortum knew that childbirth could be traumatic under the best of circumstances, but she couldn't live with the odds for newborns in sub-Saharan Africa. In Malawi alone, where about 1,800 babies are born every day, 40 will be stillborn and another 38 will die daily before reaching their first month, according to recent data collected by the United Nations Children's Fund, known as UNICEF.

Surely, Richards-Kortum thought, we can fix that.

More space

Originally, Richards-Kortum and her husband weren't interested in having children of their own. But then one day in graduate school, she changed her mind.

"She probably remembers it differently, but I just remember one day she woke up and said, 'I think we should have children,'" Kortum recalled. "We're sort of careful, considerate thinkers and planners. And so, we had big discussions about it and we decided, yeah, maybe this

I saw the heartbreaking, normal situation for hospital-based care for newborns, but what I saw right adjacent to that was this huge failure of existing technologies that were being imported that couldn't withstand the heat, the dust, the humidity, the lack of trained technicians, the lack of supply chain for spare parts.

— REBECCA RICHARDS-KORTUM, PH.D. Bioengineering professor at Rice University

would be a good thing to do."

"It was a process of convincing him at every stage," Richards-Kortum said, laughing. "The first baby my husband ever held was ours."

The couple now has six children, ages 8 to 26: three boys and three girls, two of whom they adopted from orphanages in Ethiopia. The idea of adding two more to their family first gripped Richards-Kortum after a trip to Africa.

"I came home and I was like, 'You know, we really have more space, in every sense of the word," she said.

As part of the adoption process, their biological children joined them on trips to Ethiopia to meet their future sisters.

"It was good that our kids were able to go over and see firsthand what was going on and why there was such a big need," Kortum said. "It just breaks your heart when you go into the orphanages. You want to help all of them. It's heartbreaking because you realize, you can help in small ways, but helping in big ways is harder."

But tackling big problems is what Richards-Kortum does best.

"Everybody in the family understands what Rebecca's doing and why it's important," Kortum said. "Everybody also understands that when Mom has to go to Africa, it's for a good reason. And certainly, I think, a lot of that was brought home when we adopted our two youngest children. That sort of solidified in my biological children's minds that this wasn't just a job—this was a lifelong commitment to bettering the world. I think it's made them more empathetic to the fact that you've got to use your talents for the greater good."

For Richards-Kortum, though, it's more than that. She is a formidable force, and she never steps down from a challenge. Her husband recounted a time during the adoption process when social workers visited their Houston home to interview their biological children.

"In one of those interviews, they asked my children, 'What's the one word that would describe your mother?" Kortum recalled. "And they said, 'Competitive."

An entire toolkit

One of the first inventions Richards-Kortum and her team created for newborns in sub-Saharan Africa was a continuous positive airway pressure machine, known as a CPAP, an essential tool in any neonatal intensive care unit (NICU) for helping newborns who have problems breathing. The students managed to keep production costs around \$350 per machine, whereas a typical CPAP runs upwards of \$6,000. Initially prototyped using a Nalgene water bottle and a shoe box, the simple design requires minimal maintenance, with flow coming from an air pump and pressure provided by a newer, mass-produced version of the original plastic bottle. After introducing the machine to one hospital in Malawi, the newborn mortality rate there dropped dramatically.

"I think, somewhat naively, we thought that once we scaled the CPAP, that would be good work done and that would really be the end of what we intended to do," Richards-Kortum said.

But after disseminating their CPAPs to district hospitals, Richards-Kortum and her team learned that creating one machine that solved one problem simply wasn't enough. In order to deliver quality, comprehensive newborn care, they needed an entire toolkit.

"Just because a baby has breathing problems, if you treat that alone, if they're cold or they're hypoglycemic or they're jaundiced, they don't do well. We saw that babies weren't doing as well as they could and we met so many clinicians who were very frustrated. They didn't have the tools they needed to do their jobs," Richards-Kortum said.

And so, Richards-Kortum and her team have set out to assemble this toolkit. Dubbed NEST360°, the suite of 17 technologies will save an estimated 500,000 newborns every year—half the current mortality rate for newborns in sub-Saharan Africa.

In addition to the CPAP, the toolkit includes tailor-made devices like a radiant warmer and incubator to help infants maintain their body temperature; diagnostic tools for glucose monitoring, sepsis and

infections; a spectrometer that can provide quantitative measurements for bilirubin, PH levels and hemoglobin in the blood within approximately 30 seconds; monitors for breathing, oxygen levels and temperature; a low-cost and lowpower syringe pump to help supply medicine, fluid or formula; and a unique phototherapy machine that helps treat jaundice. If left untreated, jaundice can cause brain damage or death, and NEST360°'s diagnostic tool can detect the condition at the bedside in less than two minutes, with one drop of blood. Each test costs only five cents.

The full toolkit is estimated to cost 10 times less than the tools and machines used in high-resource settings, including NICUs across the U.S.

"What was both amazing and exciting to me was when you cost out how much it would be to deliver that suite of technology, it turns out to be \$1.50 per each baby born at the hospital," Richards-Kortum said. "It's just crazy that for that small amount, these tools are not available. I think it could be as cost-effective and as lifesaving as vaccines."

Kortum offered his analysis of his wife's work and impact.

"She started to see that there was this whole realm of global health where she could attack the heart of some problems," he said. "It's kind of interesting because when you see the end devices, a lot of people say, 'Well, gosh, it's so simple, anybody could have thought of that.' And then the question is, well then, why didn't anybody, and why do devices in the United States cost 10, 20, 30 times more and not work as well? Because it is hard. It's super hard."

It was, in fact, the hardest thing she could do.

Sacred time

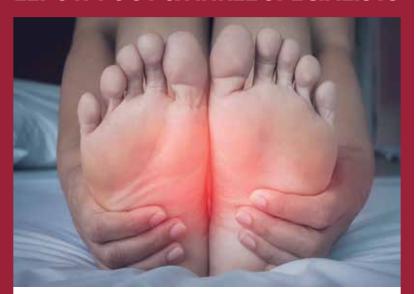
Richards-Kortum's work takes her to Africa about four times a year, and she is gone for her fair share of domestic travel, too. She tries not to be away from family for more than 10 days at a time, but with 30-plus hours of travel from Houston to Malawi, it's not always easy. So she wrings every second out of every day.

(continued)

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713.951.5000 Downtown "When everyone else is watching in-flight movies, Rebecca is on the laptop," said Sharmila Anandasabapathy, M.D., one of Richards-Kortum's research collaborators who serves as director of Baylor Global Initiatives and the Baylor Global Innovation Center at Baylor College of Medicine. "She balances everything—kids, a dog, exercise. I think she's one of the most balanced people I've ever met."

Yet amid her frenzied schedule, Richards-Kortum still makes time to be available.

"She doesn't have a minute to spare, but she always, always has time for everyone," said Kathleen Schmeler, M.D., an associate professor in the department of gynecologic oncology and reproductive medicine at The University of Texas MD Anderson Cancer Center who has worked with Richards-Kortum on projects related to cervical cancer prevention and early detection. "Everyone loves working with her and for her, for that reason. Even

if you're the first-year graduate student in her lab of all these superstars, you're a very important person, and are made to feel that way."

Richards-Kortum tries to be protective of evenings and weekends, and each year in August she unplugs for a few weeks to vacation with her husband and the kids. Everyone knows that is sacred time—don't text, don't email, don't call. Still, like most busy mothers, she is constantly re-evaluating how best to balance her responsibilities.

"The thing that I've really come to, in the last few years especially, is thinking about focusing time on things that matter," Richards-Kortum said. "It can be professional or it can be personal, but I think it's really easy to let email take over your day, and whatever's in your inbox becomes your to-do list, and then someone else is in charge of your priorities. And so really thinking about, how do you make sure that you're allocating your energy and your time in a way that

is consistent with the things that are fundamentally important to you?"

One way? By making lists. Richards-Kortum likes to check things off, and sometimes she'll make two lists just so she can check things off twice. She tries to think about her goals for the year, for the month, the week and the day.

"I have a colleague and she makes her to-do list, and she makes her not-to-do list, which I think is a very good strategy, thinking about what it is that you're not going to do, and really saying no," she said.

Richards-Kortum still loves to read. She's into detective fiction—author Sue Grafton and Alexander McCall Smith's *The No. 1 Ladies' Detective Agency* series—but her favorite hobby of all is running. It's a passion that began in China after a trip 10 years ago with Anandasabapathy for a project focused on esophageal cancer screening.

"We went to the Great Wall at the end of our trip, and I was there with



her and all these young graduate students who were super fit, and I felt like, 'Oh my gosh, I can barely keep up with these people. I've got to start doing something for exercise,'" Richards-Kortum recalled. "So I came back and I started running after that, and then I just





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Richards-Kortum jogs along Brays Bayou on a mid-July morning.

fell in love with it. I ran a little 5K and I was like, 'This is so cool, you get to drink water out of paper cups!"

Now, she tries to run two marathons a year, always with her Brooks Ghost brand shoes laced tight, always with her Honey Stinger fuel tucked into her shorts.

After all, Rebecca Richards-Kortum does nothing halfway.

A \$100 million plan

Currently, eight of the 17 items in the NEST360° toolkit are commercially available, while the remaining nine are in various prototype and testing stages. Many of the devices were initially designed by students at Rice and tested and refined by teams in Malawi. This innovation is an all-hands-on-deck effort, with Richards-Kortum and her collaborators working tirelessly—even through disappointment and frustration—to bring the suite to life.

Late last year, NEST360° vied for a grand prize of \$100 million in the MacArthur Foundation's inaugural 100&Change competition. For months, the team—which included members from Houston, Malawi. Tanzania and Nigeria, along with collaborators at Northwestern University, The London School of Hygiene and Tropical Medicine and 3rd Stone Design-worked on a proposal for the prize money that would implement and sustain the full suite of technology. The team made it to the final round, but fell short of what would have been the final piece of their financial puzzle.

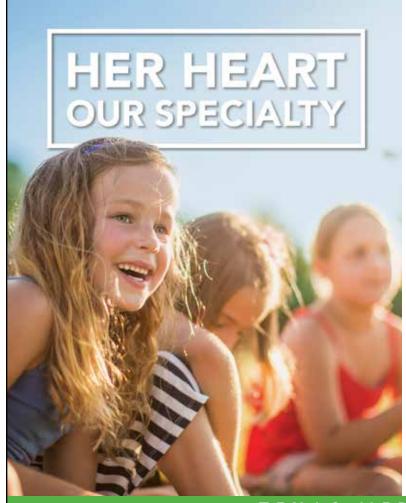
Richards-Kortum was quick

to mention that the MacArthur Foundation generously awarded each finalist \$15 million. It's a seed she's been laser-focused on nurturing since.

"We made a \$100 million plan and we're working on bringing together a group of partners to try to fund the project as a whole," she said. "I think solving a problem of this size—it's not a \$15 million problem. And the thing that was exciting about the plan that we made was that it really allowed us to take a systems approach and think about all the things that need to change to allow you to get to scale and be able to sustain that afterwards without constantly needing more philanthropic support."

She knows \$85 million is a lot of money, but it's a matter of perspective. And priorities.

"There are hotel renovations that cost more than \$85 million," Richards-Kortum said.



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TEXAS MEDICAL CENTER



KEEPING HIS HEART IN THE GAME

Surgery with minimal cuts offers quick recovery

By Britni R. McAshan

t's a hot August night in Kingwood, a planned community in northeast Houston, and 8-year-old Ethan Page leaps effortlessly to catch a baseball. Without pause, he snaps the ball back to his coach.

"Ethan has the strongest arm on our team and I'm not just saying that," said Brandon Kirk, assistant coach of the Dynasty, the competitive baseball team for which Ethan plays.

This boy is a natural athlete. Long and lean, Ethan stands a head taller than most of his teammates.

Watching him run, throw, catch and pitch, it's hard to believe that not even one month prior, Ethan underwent a four-hour heart surgery to repair a ventricular septal defect (VSD)—a hole in the wall of the heart that separates the two lower chambers.

At birth, Ethan weighed 9 pounds 14.6 ounces—larger than the average newborn. After a difficult delivery at Houston Methodist Sugar Land Hospital, Julie Page and her husband, Brent, were told that their baby boy was born with a heart defect. A diagnosis at Texas Children's Hospital later confirmed that Ethan had three VSDs in his heart.

"His VSDs were small enough at birth to not need to do anything about it immediately," Julie said. "We've always been told that a lot of VSDs close naturally over time and that his weren't considered to be large—they were small to medium."

But when Ethan began having trouble breathing at baseball practice, the Page family knew surgery would be imminent.

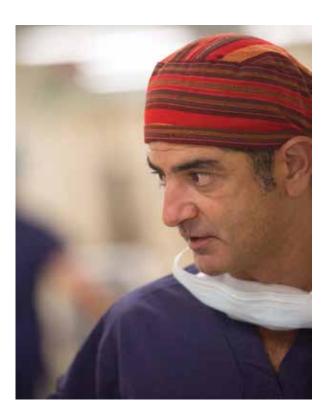
"He is just so healthy and active, so anyone you would tell he had a hole in his heart, they were shocked," Julie said.

Ethan was nervous about surgery, but eager to get it behind him. His only stipulation was that it not interfere with baseball. He didn't want to miss the Nations Baseball 9U and 10U World Series, held in

San Marcos, Texas in early July.

"Am I going to miss baseball? Am I going to miss the World Series? Am I going to miss fall tryouts?" Ethan asked his parents, repeatedly.

As fate would have it, a surgeon specializing in a minimally invasive technique to repair congenital heart defects—a technique that offers a reduced recovery time—was headed



to Houston, just in time for a break in Ethan's vigorous schedule. This surgeon avoids traditional open heart surgery, which involves making a long vertical incision down the sternum and cracking the sternum to gain access to the organ—in favor of a small incision under the right arm.

(continued)

Facing page: Ethan Page, 8, poses with his bat for a portrait at his home in Kingwood, Texas. Above: Ali Dodge-Khatami, M.D., Ph.D., responds to questions before performing heart surgery on Ethan Page at Children's Memorial Hermann Hospital.

Ali Dodge-Khatami, M.D., Ph.D., an Iranian-born surgeon who was raised and trained in Switzerland, arrived in Houston in July—right after the Nations Baseball World Series and just before fall tryouts. Dodge-Khatami is director of pediatric heart surgery at McGovern Medical School at The University of Texas Health Science Center at Houston (UTHealth) and an attending pediatric cardiovascular surgeon at the Children's Heart Center at Children's Memorial Hermann Hospital.

"We were presented with three options that would have been possibilities to repair the hole," Julie said. "One would have been to have a heart catheter through the groin, which is an overnight procedure—done and done. The second was a method through the armpit—the right axillary thoracotomy. Or, the third, through the chest."

Ethan did not have the proper amount of tissue to qualify for the heart catheter through the groin.

Ultimately, the Page family chose the right axillary thoracotomy.

A window to the heart

A right axillary thoracotomy for transatrial repair of congenital heart defects is a highly uncommon approach in pediatric cardiology in the United States today. Dodge-Khatami is one of a handful of doctors in the country doing this surgery, according to administrators at Children's Memorial Hermann.

"What will happen over time is, people will train on this, expand it and then people will be in a fellowship program for congenital heart surgery and they will learn how to do it," said Kevin P. Lally, M.D., surgeon-in-chief, Children's Memorial Hermann Hospital, and chair of the department of pediatric surgery at McGovern Medical School at UTHealth. "I am confident that for certain operations, this will clearly be the approach, but it will take a while."

Dodge-Khatami begins by making a roughly four-inch incision (depending on the size of the patient) down the right side of the chest, underneath the armpit. Once the incision is made, he separates two ribs—the third and fourth or the

fourth and fifth—with a chest-spreader.

"Entering on the right side places you at a bit of a distance away from the heart," Dodge-Khatami said. "It gives you less room to operate in, so there is definitely a learning curve to this."

Once he separates the patient's ribs, Dodge-Khatami pushes through layers of muscle and tissue, passing the lungs to eventually reach the heart.

"What everybody has in between two ribs is muscles," he explained. "You do have to cut one muscle, which you put back together at the end ... You don't actually cut the middle of the muscle. Whenever you cut perpendicularly through a muscle, even when you suture it up at the end, that muscle doesn't have the same function or strength as it otherwise would, so what we try to do are muscle-sparing incisions."

Keeping cuts to a minimum—spreading muscles as opposed to clipping muscles on the way to the heart—offers huge benefits for his patients.

"To get to the heart, there are various layers of muscles that all of us have in



our shoulders and back, and we don't cut them, either," Dodge-Khatami said. "We spread them apart so we are able to enter the chest in an area where we are not actually cutting muscle. That helps the kids recover more quickly and they can move their shoulders and they can move their back muscles."

The minimally-invasive surgery takes a little bit longer to perform than an open-heart procedure to repair a VSD, but Dodge-Khatami said it reduces the recovery time for patients and leaves a far less visible scar.

"Ultimately, the one or two days less in the hospital, or the 30 or 40 minutes extra that it takes to do the operation, in the lifetime of a kid, probably doesn't mean much," Dodge-Khatami said. "But what it means to them 10 or 15 years from now is where I would anticipate the huge benefit to be. They won't think of themselves as heart patients."

Dodge-Khatami began doing this procedure in the early 2000s and has performed it hundreds of times.

"When I started this with my boss in

Zurich, I thought it was crazy ... because it is technically more challenging," he said. "It takes more time to do in the beginning when you are learning. You have to be more careful with certain things because there is not a lot of margin of error. In time, when you get comfortable with it, you eliminate that risk and it shouldn't be any riskier than what we do up front. I think that is part of the reason it is not as widespread as it could be."

Although the procedure is uncommon now, a right axillary thoracotomy was a method of entry for cardiology pioneers 70 years ago.

"The right thoracotomy approach, historically, if you go back, is one of the initial approaches surgeons used in the '40s and '50s," Dodge-Khatami explained. "At a time when we still didn't have the heart-lung machine, some of the more primitive repairs—closed valve repairs—were done through this approach."

(continued)







Far left: Ethan Page leaves the hospital with his parents, Brent and Julie Page, four days after his surgery. Left: Julie Page holds up Ethan's shirt to show his wound from surgery. Facing page: Ethan draws at home while his younger brother, Kylan, does a headstand on the sofa.

By the mid-1950s, the cardiopulmonary bypass pump, commonly known as the heart-lung machine, had revolutionized cardiac care by temporarily taking over the function of the heart and lungs during surgery. Because so many tubes are needed to connect a patient to the heart-lung machine, surgeons began to approach the heart through the front of the chest rather than the side, Dodge-Khatami said.

"You can access every single part of the heart and the vessels in order to use the heart-lung machine through the front, so it just became commonplace," he said. "Slowly, the right chest approach was abandoned."

A study by Chinese researchers

published in the Journal of Cardiothoracic Surgery in May 2018 compared three different procedures to repair VSDs. The authors found that right vertical infra-axillary thoracotomy and right submammary thoracotomy (an incision under the right breast) deliv-

ered better cosmetic results for patients with isolated VSDs than the conventional median sternotomy approach (a long vertical incision down the center of the chest, after which the sternum is cracked open). Authors of the study also concluded that, for children, the right vertical infra-axillary thoracotomy "may be a better choice" because the incision



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under the armpit makes the scar almost invisible and the incision site does not interfere with the development of the chest wall.

Still, the procedure has a long way to go to gain widespread acceptance.

"It really is the minority of us who feel comfortable or feel that it is the right thing to do a thoracotomy when there is a ventricular septal defect," said Luca Vricella, M.D., chief of pediatric heart transplantation at Johns Hopkins Medicine as well as the director of pediatric cardiac surgery. "But having said that, if the results are good, and the incision is small, you can't complain. And maybe it is something we should embrace in the community."

Reaching for the big leagues

Four days after surgery, Ethan was discharged from Children's Memorial Hermann. He walked out of the hospital

"When I woke up from the surgery, it felt like someone was punching me or stabbing me," Ethan recalled, a few days into recuperation. "But I'm feeling better now. I've been playing the Wii and talking with my friends."

One month postsurgery, Ethan returned to the baseball field.

"At my first practice back, I was kind of worried if I stretched too far that my stitches would break," he said. "But after that, it was fine and I haven't been in too much pain."

His coaches weren't pushing him too hard, but after that first practice, Ethan told his mom he was done with that.

"They were very patient and understanding," Julie explained. "They said he could sit out or take it easy. After his four-week checkup, Ethan told me to text his coaches to tell them, 'Don't take it easy on me!""

Just after Labor Day, Ethan played his first game of the season with the Dynasty. He helped lead the team to a



13-2 victory by striking out four players. When he grows up, he wants to follow in the footsteps of his favorite Astros player, George Springer, and compete in Major League Baseball (MLB). He already knows how he will give back once he becomes famous: he's going to visit patients at Children's Memorial Hermann.

"When I play in the MLB, I want to come back and visit the kids here and give them my money," Ethan said.



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Vampire Facial: Not that Bloody

Kim Kardashian made this cosmetic procedure famous. How does it work?

By Britni R. McAshan

he vampire facial got its first 15 minutes of fame when reality television star Kim Kardashian posted a dramatic selfie on Instagram directly after the treatment. Her face, which looked raw, was covered with tiny beads of blood.

More recently, the elective cosmetic procedure made headlines again, after a client at a spa in a New Mexico strip mall developed an infection that may have been the result of unsafe practices.

But in a sterile environment with trained professionals, the vampire facial—also known as a platelet rich plasma facial—can be an effective way to rejuvenate and smooth out tired or troubled skin.

Kim Chang, an aesthetician and phlebotomist with more than 14 years of experience, performs three or four vampire facials a week at Baylor College of Medicine's Aesthetics Studio, located in the Jamail Specialty Care Center.

"As far as what I can do as an aesthetician, this is my most effective treatment," Chang said. "It can help with acne scarring by evening out hyper-pigmentation and it also helps with anti-aging in terms of reducing frown lines and marionette

Right: At Baylor College of Medicine's Aesthetics Studio, Sabrea Munz is treated under an LED light after a vampire facial.

lines. But it doesn't necessarily help with wrinkles. We can't help what is underneath, but we can help with the collagen and it's all about the collagen."

The vampire facial involves injecting part of the patient's own blood directly into the face. Key to the treatment is platelet-rich plasma (PRP), the yellow-colored portion of blood that remains after red and white blood cells and other components have been removed. PRP helps blood clot and contains proteins that support cell growth. By stimulating collagen production, PRP helps rejuvenate aging skin by giving it more elasticity.

Chang begins the 90-minute procedure with a deep cleansing of the face and the application of numbing cream. During the numbing process, Chang draws blood from the patient's arm and then places two vials of blood in a centrifuge for 10 minutes to isolate the PRP. Chang then removes the numbing cream from the patient's face, applies some PRP to the face



and then injects the plasma into the skin with a microneedling machine.

"The microneedling machine is like a pen that has 12 microneedles at the tip," Chang explained. "They go up and down on the skin, creating channels for the PRP to penetrate deeper into the skin.

The punctures create localized trauma that, in turn, helps the

VAMPIRE FACIAL AT A GLANCE

After numbing cream is applied to the patient's face, blood is drawn from the patient's arm. >> The blood is placed in a centrifuge. >> The centrifuge separates the platelet rich plasma (PRP) from other components of the blood. >> PRP is spread onto the face and a microneedling machine is used to pierce the skin and inject PRP to help boost collagen production.









collagen production."

The vampire facial is not as bloody as one might expect. Because the PRP is almost colorless, the only blood involved is brought



to the skin's surface by microneedling, and the amount is minimal.

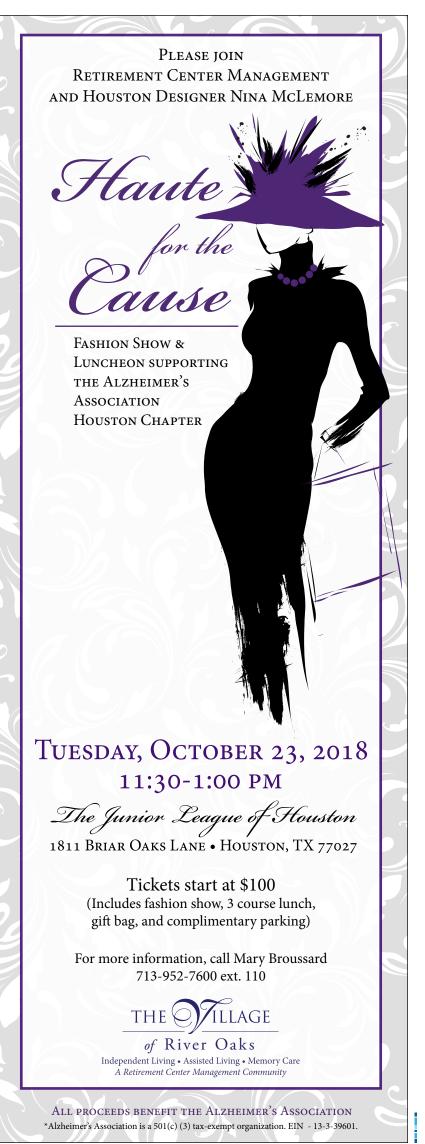
"A lot of people expect vampire facials to look like Kim
Kardashian's, but if they are done
properly, they really shouldn't look
like that and you certainly shouldn't
be putting a towel by your face right
after," Chang said. "The PRP goes
on clear so there is hardly any blood
at all."

A 2016 Turkish study published in *Annals of Dermatology* found evidence of new collagen formation using PRP and concluded that even a single PRP application could be considered an effective and safe procedure for facial skin rejuvenation.

Once the treatment is complete, Chang applies a soothing cream that contains stem cells and then sunscreen to the patient's face. She compares the treatment to a chemical peel or a laser in terms of inducing local trauma to boost collagen. To further accelerate the healing process for patients, Chang often uses an LED light. For about 20 minutes post-procedure, patients remain on the treatment table under a tri-paneled lamp. Infrared light is known to accelerate skin recovery and red light is known to reduce inflammation.

Sabrea Munz, one of Chang's patients, has been elated with the results of her vampire facials. In the past year, she has had the procedure done three times.

(continued)



"My skin looks really healthy and has a nice glow that lasts for about four months after the procedure," Munz said. "Before I got this treatment done, I only did the microneedling and the results have been night and day. Adding the PRP makes a huge difference."

Edward Reece, M.D., associate professor and chief of adult plastic surgery in the Michael E. DeBakey Department of Surgery at Baylor College of Medicine, said the vampire facial is a great option for patients.

"It is minimally invasive and can be done with very little down-time," Reece said. "It provides youthfullooking skin, so I encourage our patients to look into it."

But at the Baylor Dermatology Clinic, Chang has had to turn some patients away.

"Many of our patients come here because they know that we will be a lot more compliant with everything-disinfecting things, making sure we have their best interest in mind," Chang said. "I have turned





VISIT TMCNEWS.ORG TO WATCH A VIDEO OF A VAMPIRE FACIAL.

down patients who are on blood thinners, recent cancer survivorsthey may not heal well."

Interested patients should also

understand that because of the punctures in the skin, there is a risk of infection.

"There is a moderate risk of

Left: Aesthetician Kim Chang injects PRP into Munz's face with a microneedling machine.

infection with this treatment," Chang said. "It's not high. It's not like a surgery where you are opening the body up, but it is moderate because when you are doing any type of puncturing to the skin, you are exposing it to environmental factors so, therefore, you can always get an infection."

After recovery, patients are advised to stay away from murky waters for at least one week.

"You can't go put your face into Buffalo Bayou or go swimming in Galveston or jump in your hot tub," Chang said. "Anything that deals with water, humidity or sweating can always pose a threat of infection."

A vampire facial at the Baylor clinic costs \$750-or \$500 per facial with the purchase of three.

"If you are looking for shinier, more youthful skin, this is a really good option," Reece said.



















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Breast Reconstruction Revolution

Microsurgery is changing the way breasts are rebuilt

By Shanley Pierce



Surgeon Matthew Hanasono, M.D., center right, performs lymphedema surgery on a breast reconstruction patient at MD Anderson alongside other surgeons.

n Nov. 1, 2017, millions watched as the Houston
Astros beat the Los Angeles
Dodgers in Game 7 of the World
Series, winning their first championship title in franchise history. But while fans cheered on the Astros,
Melissa Williams-Scott was on the phone with her oncologist, who was sharing different news: she had ductal carcinoma in situ (DCIS), a type of stage 0 non-invasive breast cancer that forms in cells inside the milk ducts.

As Williams-Scott spoke with

her doctor about her breast cancer diagnosis, her wife, Brenda, sat in an MD Anderson clinic, undergoing treatment for lymphoma.

"It was daunting, but we knew it was something we could handle," Williams-Scott said.

Although DCIS does not spread beyond the breast, it can progress into breast cancer that metastasizes if left untreated. The American Cancer Society estimates about one in five new breast cancers will be DCIS, yet it is nearly completely curable.

The diagnosis didn't surprise Williams-Scott, who had a mass removed 14 years earlier. She had a sneaking suspicion that she might receive a cancer diagnosis at some point.

"I spent many years waiting for this diagnosis," Williams-Scott said. "I didn't want to do this again with Brenda's diagnosis looming. Hers will come back. We're blessed that it's in remission right now, but with that looming, I didn't want always to wonder."

(continued)

After meeting with her reconstructive plastic surgeon, Margaret S. Roubaud, M.D., assistant professor in the department of plastic surgery at The University of Texas MD Anderson Cancer Center, Williams-Scott decided to be aggressive and have both of her breasts removed entirely.

"I always thought of myself as not caring about my breasts. They were just a part of me. They weren't very large. I'm not really a girly girl," Williams-Scott said. "I was a little fascinated by people's body image because I thought I was immune to that. This made me look at myself differently."

As her double mastectomy date drew closer, Williams-Scott grew increasingly torn between choosing to go flat or reconstructing her breasts.

"I realized that there really is something about your identity that goes with your [breasts]," she said. "I would have days when I would think, 'I don't need reconstruction.' ... Then, I'd have other days when I'd think,



Breast cancer survivor Melissa Willams-Scott stands in front of MD Anderson. Williams-Scott underwent surgery after finding out she had ductal carcinoma in situ (DCIS), a type of stage 0 breast cancer that forms in cells inside the milk ducts.

'No, I want to get the ones I always thought would be nice to have.' I went through the whole gamut of that, but I realized that I just want to be healthy and the size I was before. I want to be comfortable in my skin. My biggest desire, if possible, was to

only [use] my tissue."

Williams-Scott scheduled her double mastectomy and tissue flap reconstruction for January 2018. Prior to her surgery, she got undressed at home, stood in front of the mirror and stared at her body.

"It was like I wanted to memorize what [my breasts] looked like at that moment because I knew they'd never be the same again," she said. "When we look in the mirror, we expect things to always look kind of the same. Yeah, we're going to get wrinkles, gray hairs, lose and gain weight, but things were always going to be sort of the same. I was afraid that would upset me."

Breast reconstruction

Breast reconstruction closes the loop in a patient's breast cancer journey, Roubaud said.

"In the beginning, women are just really focused on surviving the cancer," Roubaud said. "As that immediate danger passes, what they realize is there's a huge part of their identity that was wrapped up in their body. All of us have it. Women, in particular, are brainwashed early in life to pay attention to what they look like. There's a grieving and a loss."

Some women worry that their partner may look at them differently. Some fret over how their clothes fit. Others, who nursed their children, view mastectomies as having their motherhood stripped away.

"Until women are reconstructed, we haven't finished their treatment. We haven't finished restoring them," Roubaud said. "We know now more than ever in the medical community that you can't cut people's bodies and ignore their soul. You can't do surgery and not pay attention to their emotional needs. This is definitely addressing both."

There were 106,295 breast reconstruction procedures performed in 2017 by members of the American Society of Plastic Surgeons (ASPS). Researchers have observed a steady growth in breast reconstruction rates, with a 35 percent increase since 2000.

There are two main approaches to breast reconstruction: breast implants filled with silicone or saline inserts, and tissue flap procedures using the patient's own body tissue.

Although implants are a popular option for mastectomy patients and entail a less invasive operation, implant reconstruction may not be possible for every patient.

Additionally, with time, some patients may need to undergo revision surgery to replace the implants. Tissue flap reconstruction is a much more complex and extensive procedure, but the benefit is that the results are "for life," Roubaud said.

"You're basically recreating yourself with yourself," she said. "We know the anatomy of the body and we're stealing from Peter to pay Paul—where we can borrow, where we can move it to, etc. It's really about using the body to heal itself."

Plastic surgeons take skin and fat, sometimes muscle, from one part of the body and move it to the chest wall to form a breast. Under a high-powered microscope, microsurgeons connect all the blood vessels in the tissue graft—usually

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"In recent years, in the field of breast cancer, we've come up with a number of new techniques ... primarily in the sense of improved outcomes with implants and new flap techniques to reconstruct," said Matthew Hanasono, M.D., professor and director of the Reconstructive Microsurgery Fellowship Program in the department of Plastic Surgery at MD Anderson.

"Today, the gold standard is to use tissue from the abdomen (the so-called DIEP flap) or the older version of the flap, called the TRAM flap," Hanasono said.

The DIEP (deep inferior epigastric perforators) flap contains blood vessels, skin and fat from the lower abdomen to use for breast reconstruction. The TRAM (transverse rectus abdominus) flap uses muscle, skin and fat from the abdomen for breast reconstruction.

With the advent of new technologies, including more powerful microscopes and finer tools, plastic



Margaret S. Roubaud, M.D., is an assistant professor in the department of plastic surgery at The University of Texas MD Anderson Cancer Center.

surgeons are entering a new frontier of microsurgery that is revolutionizing soft tissue reconstruction.

Supermicrosurgery is a technique of dissection and anastomosis of small vessels ranging from 0.3 to 0.8 millimeters using suture needles 30 to 80 microns thick—finer than the average human eyelash. In addition, surgeons are able to use

Until women are reconstructed, we haven't finished their treatment. We haven't finished restoring them. We know more now than ever in the medical community that you can't cut people's bodies and ignore their soul.

- MARGARET S. ROUBAUD, M.D.

other parts of the body—beyond the abdomen—to form a breast.

"The newest evolution of this is to take it either from the thighs or the buttocks or the hip—places we didn't think were options before," Roubaud said. "Women carry a lot of extra weight in those areas, and they are usually more than happy to let us take it and turn it into a breast."

Under federal law, breast reconstruction is covered by insurance.

Prior to the Women's Health and Cancer Rights Act of 1998 (WHCRA), which protects breast cancer patients who have chosen to undergo mastectomies and requires insurance to cover reconstructive surgery, breast reconstruction was considered a cosmetic procedure and, therefore, not medically necessary. Many insurance carriers claimed that a breast did not serve a bodily function and, therefore, did not affect a woman's health.

"I consider a mastectomy an amputation," Roubaud said. "At no other place in the body would we cut off a body part and not offer someone rehabilitation—a prosthetic leg, a prosthetic arm, etc. The fact that, for years, we cut off women's breasts and didn't offer them anything seems to be a little archaic."

(continued)





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In addition, there is "no clock for when women have to complete breast reconstruction," Roubaud said. Women can either have reconstruction soon after a mastectomy or they can delay it. Few patients are aware of their breast reconstruction options. Although the WHCRA requires coverage for breast reconstruction, only 23 percent of women know their options for post-mastectomy reconstruction and less than half of women requiring mastectomies are offered breast reconstruction surgery, according to the ASPS.

"MD Anderson can be a sad place. Everyone here has cancer, but what's cool about MD Anderson is they cure people like crazy," Roubaud said. "When [patients] come into my office or my clinic and everyone's clinic in this department, they all are looking for some way to feel whole again. We get to deliver that. Whatever body part was taken away, we can help give that back as best as we know how, medically."

'The year of reconstruction'

After Hurricane Harvey hit, the two homes Williams-Scott and her wife own in Alvin, Texas, flooded with several inches of water. Like thousands of other Houston-area residents whose lives were affected by the storm, the couple needed to repair their homes. While they were undergoing treatment at MD Anderson, they were also removing sheetrock, drying out cabinets and replacing flooring.

"We've laughed uncontrollably that it is the year of reconstruction, whether it's a body or a home," Williams-Scott said. "We're just going to fix things."

On Jan. 31, 2018, Williams-Scott underwent a double surgery with Roubaud and her colleague, Rene Largo, M.D., who pioneered the thigh flap technique at MD Anderson. Williams-Scott decided to have a double mastectomy and

breast reconstruction—using fat and skin from her inner thigh and buttocks—in one fell swoop. Five months later, she returned to Roubaud to have more fat grafted from her thighs and belly to fill in some areas of her breasts.

"Most days, when I look in the mirror now, I don't miss what I saw before. They're definitely different, but I'm okay with that," Williams-Scott said. "I feel like I still am me. That's what I was worried about. I don't feel like I lost me in this process."

With her sense of identity intact, Williams-Scott hopes her breast reconstruction journey will urge women to screen for breast cancer and encourage breast cancer patients to consider their options.

"I kept thinking, 'Why was it so easy for me? Why, when I have dear close friends who have either lost the battle or had to go through radiation, chemo, hair loss, vomiting and all those things, did I get to breeze in?"" Williams-Scott said. "I think my role is to tell people: go get checked. Just do your mammogram. No, it's not fun, but trust me, it's easier than the alternative."

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A smile is a universal gesture of kindness, a welcome greeting to an old friend or a stranger.

To highlight the beauty of his young patients' smiles, Matthew Greives, M.D., a pediatric plastic surgeon at Children's Memorial Hermann Hospital, enlisted the help of the hospital's marketing team and award-winning photographer, Scott Dalton, to create "Smiles are Contagious," a gallery of portraits showcasing patients who are being treated for cleft lip and palate.

Samaya Reyes, a 5-year-old who is featured in the gallery, has undergone three surgeries and will have more in the future.

"I want to show her smile off to the world," said Samaya's mother, Paula Cortez. "It was hard. She had her first surgery at eight months, another one at 18 months and again when she was 3 years old. But she is a strong little girl and she gives me strength when I don't have any left."

In the cheerful photos headshots of 15 children—Dalton captured the individuality of each patient.

"Our kids have something that is so visible," Greives said. "Everybody can relate to what a cleft lip and palate is. You see that, you can see a picture of that and have a very visceral response to that, whereas with a lot of other medical problems, it is hard to understand what exactly is going on. Our kids—what they go through in surgery is to rebuild their smile."

The Centers for Disease Control and Prevention estimate that 7,090 babies are born with a cleft lip or palate each year in the United States. Depending on the severity of the birth defect, a patient with cleft lip or palate will potentially undergo several surgeries in childhood.

"If it is an isolated cleft lip, maybe one surgery. If it is

I think we are at a big cultural change. If you look at movies like *Wonder*, or shows like "Glee," people are showcasing their differences and showcasing what makes them special.

— MATTHEW GREIVES, M.D. Pediatric plastic surgeon

something like a full cleft lip and palate where you are missing bone, teeth, muscle—you could be upwards of five, six, seven surgeries," Greives explained. "Some of our kids have gone through six or seven surgeries by the time they are 18."

The portrait gallery is an opportunity to show not only the work being done in the craniofacial field, but also to celebrate diversity.

"I think we are at a big cultural change. If you look at movies like Wonder, or shows like 'Glee,' people are showcasing their differences and showcasing what makes them special," Greives said. "We want to do that with our kids with cleft lip and palate and show them that they are special. Their smile is unlike anyone else's and that doesn't make it bad or something they should hide—it makes it something they should show off and embrace."

"Smiles are Contagious" will be on display in the Rick Smith Gallery on the first floor of Memorial Hermann-Texas Medical Center, 6411 Fannin St., through October. On November 1, the portraits will move to Third Coast restaurant on the sixth floor of the John P. McGovern Commons at 6550 Bertner Ave.

Clockwise from top: Matthew Greives, M.D., a pediatric plastic surgeon at Children's Memorial Hermann, stands inside the exhibit. >> Whitney Hutchens looks on as her son, Charlie Adams, 3, admires his larger-than-life-size photo. >> Gena Moore, holds her daughter, Harper Jackson, 2, as she points to her photo in the exhibit. >> Samaya Reyes, 5, stands next to her portrait in the gallery.



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By Britni R. McAshan



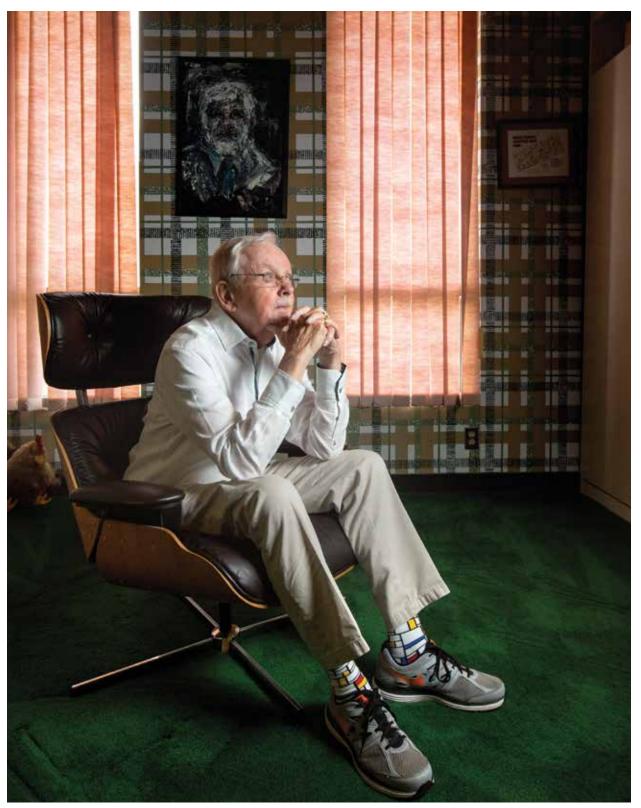




Connecting the Warburg Pathway to Cancer Growth

Solving a 100-year-old mystery points to potential breast cancer therapies

By Christine Hall



Bert O'Malley, M.D., considered a founding father in the field of molecular endocrinology, sits for a portrait in his office. O'Malley, chancellor of Baylor College of Medicine. was awarded the National Medal of Science in 2007.

rmed with new insights about the way cancer cells fuel their growth, Baylor College of Medicine researchers are working with colleagues in New York to explore new possibilities for cancer treatment, particularly breast cancer.

Their work solved a century-old mystery about the Warburg pathway—a process most cancer cells use to generate energy via glucose fermentation.

Bert O'Malley, M.D., a founding father in the field of molecular endocrinology and the longtime chair and professor of Baylor's department of molecular and cellular biology, is leading the team. Members include researchers from Roswell Park Comprehensive Cancer Center in Buffalo, New York.

The team discovered a connection between PFKFB4, an enzyme in the Warburg pathway, and the glucose-driven activation of a protein called SRC-3.

SRC-3 (steroid receptor coactivator-3) was identified as an important regulator of gene expression years ago in O'Malley's laboratory. Once sparked by PFKFB4, the protein becomes an oncogene—a gene that can cause cancer and its rapid growth and metastasis.

"We knew SRC-3 was the key to cancer growth, and we knew what could affect SRC-3, but we didn't know sugar could," said O'Malley, now chancellor of Baylor College of Medicine. "In fact, nobody knew the Warburg pathway did anything to the oncogene or that the enzyme could activate the protein."

Meet Otto Warburg

The Warburg effect is named for Otto Warburg, M.D., Ph.D., a German physiologist who won a Nobel Prize in 1931 for his work investigating the metabolism of tumors and the respiration of cancer cells. He is the

namesake of two observations in biochemistry: a pathway in plant physiology and another pathway in oncology.

Warburg hypothesized that cancer growth

stemmed from tumor cells generating energy—called adenosine triphosphate, or ATP—through the anaerobic breakdown of glucose, known as fermentation. This is in contrast to normal cells, which get energy from converted glucose called pyruvate in a process known as glycolysis.

In a biographical sketch of Warburg chronicled by the National Institutes of Health, Warburg said this about his hypothesis during a 1966 lecture:

"Cancer, above all other diseases, has countless secondary causes.
But, even for cancer, there is only one prime cause ... the replacement of the respiration of oxygen in normal body cells by a fermentation of sugar."

By activating SRC-3, the Warburg pathway unleashes one of the most potent oncogenes responsible for the spread of breast and other cancers.

"It is the second-most expressed oncogene in all of the human cancers," O'Malley said. "Normally, it plays a nice little function to keep the cell going, but when it gets over-activated, the cancer cell uses it to drive all of the processes for cell division and replication."

This happens when the sugar activates the PFKFB4 enzyme, which then phosphorylates the SRC-3 oncogene, making it go from inactive to active and stimulating all the genes to grow the cancer.

Generating cell energy

Though some cells choose the

Warburg pathway to make ATP, it is not the only way normal cells produce energy from glucose.

The other way takes place in the

mitochondria—the powerhouse of the cell—which yields significantly more energy than the Warburg pathway, explained O'Malley, who also served as Baylor's Thomas C.

Thompson Chair in Cell Biology and associate director of basic research in the Dan L Duncan Comprehensive Cancer Center.

Yosef Gilad, Ph.D., left, a postdoctoral associ-

ate in Baylor's Department of Molecular and

Cellular Biology, works with O'Malley.

Still, about 80 percent of cancer cells switch to the Warburg pathway, preferring to generate ATP via fermentation, he noted.

"Cancer cells need a lot of energy, so people have wondered why the cancer cells do this,"
O'Malley said. "They have hypothesized that this pathway must provide other things the cancer cells want. That is the mystery we shed new light on with our study—that the Warburg is also activating the SRC-3 oncogene that drives the cancer cell to grow."

The findings appear in a paper in the April 12, 2018 issue of the journal *Nature*.

Subhamoy Dasgupta, Ph.D., the first author on the study, is an assistant professor of oncology at Roswell Park who completed his post-doctoral fellowship in O'Malley's lab at Baylor.

Removing PFKFB4 or SRC-3 from the tumors suppresses breast tumor growth in the study's mice model, Dasgupta explained in the abstract.

With that knowledge, the research group is working on therapies to directly target SRC-3, including developing drugs that bind to the protein and inactivate it.

Team members are studying the effects of these drugs on breast cancer in animal models and could be ready to do a Phase 1 clinical trial in humans as early as next year.





Digital Pathology Improving Diagnoses

Scanned images and computer interpretation are moving pathology into the digital realm

By Christine Hall

at hologists have been looking at body tissue samples under microscopes for centuries, but the digital age is bringing innovation and understanding beyond the human eye and mind to the study of diseases.

Digital pathology takes the glass slide into the 21st century by switching the physical to an environment that scans, manages and interprets biological information as computer images.

The field wasn't much of a reality in the United States until 2017, when the U.S. Food and Drug Administration (FDA) approved the Philips IntelliSite Pathology Solution. The automated digital system allows users to create, view,

manage and interpret digital slides prepared from biopsied tissue.

This technology marked the beginning of pathology's domestic conversion from microscope to digital imaging, said Gustavo Ayala, M.D., professor and vice chair for outreach in the division of urologic pathology at McGovern Medical School at The University of Texas Health Science Center at Houston (UTHealth).

Now, with a reliable system, Ayala said, The University of Texas System plans to outfit each of its Texas Medical Center institutions—UTHealth, MD Anderson Cancer Center and UTMB Health in Galveston—with a Philips IntelliSite Pathology Solution. Computers can help us count. They can also take a picture of tissue at every nanometer of the spectrum.

— GUSTAVO AYALA, M.D.

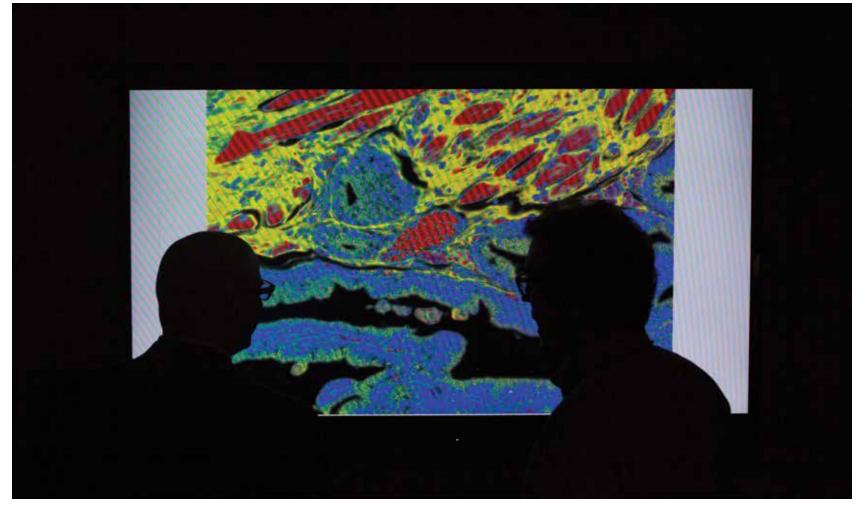
Professor and vice chair for
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urologic pathology at McGovern
Medical School at UTHealth

Ayala already uses digital pathology as part of a U.S. Department of Defense grant.
One of Ayala's co-collaborators is Michael Ittmann, M.D., Ph.D.,

professor of pathology at Baylor College of Medicine and director of the human tissue acquisition and pathology shared resource at the Dan L Duncan Comprehensive Cancer Center. The pair have conducted research together for more than two decades.

The federal money has supported work to image and analyze the environmental differences of prostate cancer's stroma—or cell framework—with a focus on African American males. Digital pathology can help solve the mystery of how to prevent and address more aggressive forms of prostate cancer that are more prevalent and deadly in this population.

"With the digital images, we



Gustavo Ayala, M.D., and Michael Ittmann, M.D., Ph.D., professor of pathology at Baylor College of Medicine and director of the human tissue acquisition and pathology shared resource at the Dan L Duncan Comprehensive Cancer Center, examine a digital slide prepared from biopsied tissue.

have prepared an algorithm to quantitate the active stroma, so we can readily integrate it into a treatment, but it needs to be validated first,"

Ittmann said.

Advantages of digital pathology

Pathologists recognize patterns and then predict the behavior of diseases. Modern pathology dates back to the 19th century, when medical professionals began to routinely examine specimens on glass slides with microscopes to help make diagnoses, Ittmann said.

Digital technology offers an advantage over slides, which can break, get lost and deliver images that are difficult to share with colleagues for second opinions, he said.

Ayala anticipates imaging will advance the current standard of assigning grades and stages to cancer tumors, which was developed six decades ago.

"We have started to embrace technology—not to replace pathologists, but to make them better," said Ayala, also a distinguished chair in pathology and laboratory medicine at McGovern Medical School.

Pathologists are good at diagnosing, he explained, but when it comes to counting and predicting certain behaviors, there are some things the human mind doesn't do as well as a computer.

"Computers can help us count," Ayala added. "They can also take a picture of tissue at every nanometer of the spectrum."

Though the Philips device is advancing pathology, there are kinks in the system that still need to be worked out, said Liron Pantanowitz, M.D., professor of pathology and biomedical informatics and vice chairman for pathology informatics at the University of Pittsburgh Medical Center.

Challenges include workflow issues. For example, not everything can be scanned, which requires some pathologists to employ a hybrid of digital images and traditional slides. In addition, the FDA's current approval is for one kind of scan and there is currently just one imaging software, said Pantanowitz,

who publishes and lectures frequently about digital pathology.

"We've made a lot of progress," he said. "The FDA is already primed to expect future studies, and it is loosening up on that. There will also probably be more products available in the future that will be less costly and faster to use. It's new territory that we are embracing, but it is going to take time."

Teaching the computer

Meanwhile, pathologists are adding other new methods to their research repertoire by teaching computers to learn different patterns of disease. That will allow pathologists who want to examine malignant cancer cells in an organ to program the computer to recognize the cancer with a certain degree of clarity and dependability.

This enables medical professionals to examine the cancer and see the receptors in every nucleus in the stroma, Ayala said. With that richness of data, there is better information.

And the better the information, the better the diagnosis.

In the future, digital pathology could be used for other tests beyond cancer, such as Pap smears, Ayala added.

"Pathology is not going to be replaced by the computer, but it is a powerful adjunct," Ittmann said. "We are not sure we can teach a computer to see everything, as there are hundreds of alterations in tissue, but in 10 to 20 years, we are going to see this breakthrough."

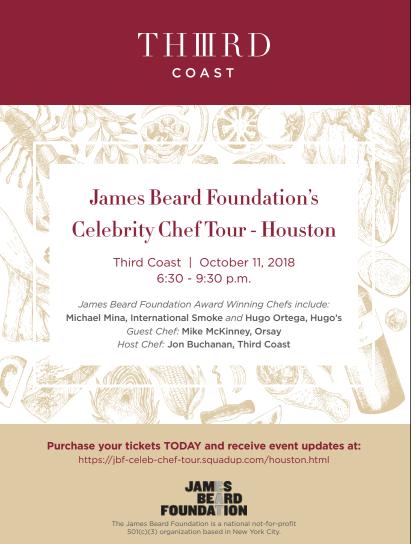
As pathology moves through the digital age, imaging will become the norm, experts predict.

Ittmann said an early victory arrived as a byproduct of The Cancer Genome Atlas, a decadelong, \$300 million project funded by the National Institutes of Health that collected tissue samples from more than 11,000 patients and completed a genomic analysis of 33 cancers this year.

The project also produced an unprecedented digital pathology slide archive.



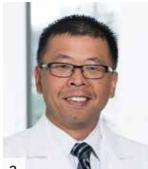
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chiropractic

- 1 | RADHE MOHAN, PH.D., professor in the department of radiation physics at The University of Texas MD Anderson Cancer Center, was honored with the William D. Coolidge Award, which recognizes a member of the American Association of Physicists in Medicine for a career in medical physics.
- **2** | HOWARD J. HUANG, M.D., is the new medical director of the lung transplant program at Houston Methodist J.C. Walter Jr. Transplant Center.
- **3** | The Periwinkle Foundation's 28th "Making A Mark" art exhibit unveiled art and creative writing by children touched by cancer and blood disorders at TEXAS CHILDREN'S CANCER AND HEMATOLOGY CENTERS.
- 4 | RICE UNIVERSITY hosted a groundbreaking ceremony Sept. 13 for the Patricia Lipoma Kraft '87 and Jonathan A. Kraft Hall for Social Sciences, a new home for the School of Social Sciences. The \$38 million, four-story, 73,000-square-foot building is expected to be completed by November 2019.
- **5** | RICHARD HANBURY, founder and CEO of Sana Health, pitched to potential advisors, mentors and opinion leaders at the TMC INNOVATION INSTITUTE (TMCx) EXPERT FORUM.
- 6 | RAJARAJAN AMIRTHALINGAM
 THANDAVARAYAN, PH.D., instructor at
 the Houston Methodist Research Institute's
 department of cardiovascular sciences,
 was awarded a two-year American Heart
 Association Innovative Project Award.
- 7 | JANE HAMILTON, PH.D., M.P.H., assistant professor of psychiatry and behavioral sciences at McGovern Medical School at UTHealth, was selected to serve on AcademyHealth's Behavioral Health Interest Group National Advisory Committee.
- 8 LAURA A. PETERSEN, M.D., M.P.H., professor of medicine-health services research at Baylor, associate chief of staff for research at the Michael E. DeBakey VA Medical Center won the 2017 Under Secretary's Award for Outstanding Achievement in Health Services Research.
- **9 | JOHN ARCIDIACONO** was appointed president and CEO of The John P. McGovern Museum of Health & Medical Science.



















Credit: Nos. 1, 2, 3, 6, 8, 11, 13, 14 courtesy photos; No. 4, Rogers Partners; No. 7, Dwight C. Andrews; No. 9, Justin Calhoun; No. 11, Paul Vincent Kuntz; No. 15, Allen S. Kramer / Texas Children's Hospital

8













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10 | MARY AGNES CAREY, right, partnerships editor and senior correspondent for Kaiser Health News, moderated a panel Sept. 12 at Third Coast restaurant to discuss the results of "The Nation's Pulse: The Texas Medical Center's 2018 Consumer Survey." Panelists included, from left to right, JESSICA MANTEL, JD, co-director of the Health Law & Policy institute at the University of Houston Law Center; PEGGY LANDRUM, PH.D., RN, clinical professor of nursing at Texas Woman's University; and VIVIAN HO, PH.D., director of the Center for Health and Biosciences at Rice University's Baker Institute for Public Policy.

11 | Donnell Chatman was one of the tiny patients in the neonatal intensive care unit of TEXAS CHILDREN'S HOSPITAL THE WOODLANDS who celebrated Texans Friday on Sept. 14 wrapped in a new, handmade fleece blanket.

12 | SHAWN W. CLOONAN, chief operating officer and executive vice president of the TMC, joins Nora's Home founders LILLIAN GABER, M.D., associate medical director of renal pathology at Houston Methodist Hospital, and her husband, OSAMA GABER, M.D., director of Houston Methodist J.C. Walter Jr. Transplant Center and the J.C. Walter Jr. Presidential Distinguished Chair, at a ribbon cutting ceremony for an expansion of Nora's Home that doubles its capacity.

13 | PADMANEE SHARMA, M.D., PH.D., professor of genitourinary medical oncology and immunology at The University of Texas MD Anderson Cancer Center, won the William B. Coley Award for Distinguished Research in Tumor Immunology.

14 | MAYAR AL MOHAJER, M.D., associate professor of infectious diseases in the department of medicine at Baylor College of Medicine, was selected by the Infectious Disease Society of America as a Fellow in their Distinguished Physicians and Scientists group.

15 | Texas Children's Hospital patient Ella Garner strikes a pose in September, when TEXAS CHILDREN'S CANCER CENTER and other TMC hospitals, participated in "going gold" to honor all the brave superheroes fighting cancer during National Childhood Cancer Awareness Month.

TMC.edu/news/tmc-events

October 2018

10/6-10

Mission: Neurosurgery

Congress of Neurological Surgeons Annual Meeting Saturday - Wednesday George R. Brown **Convention Center** 1001 Avenida de las Americas

Registration fee starts at \$150 Register at: cns.org/annual-meeting-2018 cns@mcievents.com 800-931-9543

Glycogen Storage Disorders: An Old Disease at Forefront of Modern Medicine

Evenings with Genetics Seminar Series, with Claudia Soler-Alfonso, M.D. Tuesday, 6:30 - 8:15 p.m. Children's Museum of Houston 1500 Binz St.

Registration required Register at: bcm.edu/eveninggenetics geneticsevenings@bcm.edu 832-822-4280

Prospects for Universal Health Coverage in the U.S. Conference

Tuesday, 8 a.m. – 1:30 p.m. Rice University James A. Baker III Hall **Doré Commons** 6100 Main St.

RSVP at bakerinstitute.org bipp@rice.edu 713-348-4683

Bridging the Political Divide

A Discussion with Sarah Palin and Donna Brazile

Saturday, 7:30 - 9:30 p.m. University of Houston Cullen Performance Hall 4800 University Dr.

Tickets start at \$45 Purchase at uh.edu/calendar/ cmiller6@central.uh.edu 713-743-2685







Bridging the Gap

Closing Cultural Barriers in Access to Care

Tuesday, October 23, 2018

11:30am - River Oaks Country Club

featuring speakers from the University of Houston College of Medicine: Stephen J. Spann, MD, MBA - founding Dean & David Buck, MD, MPH - Associate Dean for Community Health

sanjoseclinic.org/FSS2018

This event has been approved for continuing medical education credits: 1 Hour Ethics Credit

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