# TMC PULSE

NEWS OF THE TEXAS MEDICAL CENTER - VOL. 5 / NO. 10 - NOVEMBER 2018



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# JOHN'S INSIDE Story

Triple Organ Transplant: Transplant Teams' Performance of a Lifetime Is Music to John Bell's Ears John Bell was born with cystic fibrosis, but he didn't let that stop him from doing anything he put his mind to as a child and teenager, including beginning piano lessons. When John moved to Houston after high school, he began seeing the cystic fibrosis team at the Baylor College of Medicine Lung Institute at Baylor St. Luke's Medical Center, one of the most comprehensive, multi-specialty lung institutes in Texas.

While living in Alaska for two years after leaving Houston, John didn't have access to cystic fibrosis care, and his lungs, liver, and kidneys started declining. John returned to Baylor St. Luke's, but the damage to his organs had been done, leaving John unable to remain active and in need of multiple transplants. It was during this time that John was able to reconnect with his passion for music.

In May 2018, John underwent a triple transplant at Baylor St. Luke's, receiving three organs—lungs, liver, and kidney—from the same donor simultaneously. This required an amazing collaboration among multiple organ teams and services.

Remarkably, John was walking the first day out of surgery and out of the ICU three days after his triple transplant. He credits this success to the expertise, dedication, and compassion of his extended team that works hard every day to advance care inside Baylor St. Luke's.

"I am so very impressed with the way the surgical teams interacted. There were many moving parts and countless team members that made my procedure happen," said John. "I'm a unique case, and other hospitals would not have performed the triple transplant I received at Baylor St. Luke's. For that, I am forever grateful."

In the months since his transplants and with the support from his wife, Isabel, John is now back on the bench and living life on a high note.

# **Baylor St. Luke's Medical Center**





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

s I write this, I'm making my way back home from Australia where I visited with Australian Prime Minister Scott Morrison, Australian Minister of Health Greg Hunt and medical leadership from across the nation. I was also joined by my friends and colleagues Dr. Giulio Draetta of MD Anderson Cancer Center and Dr. Adam Kuspa of Baylor College of Medicine.

We worked together to identify opportunities to accelerate the pace at which our nations can advance the discovery of treatments that will save patients' lives. We are now taking an important step forward through our work on clinical trials.

Clinical trials play a critical role in medicine, allowing us to determine whether new treatments are safe and effective. But the process of conducting a

trial is arduous; every trial has stringent criteria to ensure participating patients are the riaht fit.

Physicians and researchers comb through a great deal of data as they match patients to trials. This includes "structured" data, such as a patient's name, age and ethnicity, but it also includes important "unstructured" data found in the notes physicians maintain about their patients. That's problematic since each physician has his or her own style and terminology. Searching through unstructured data is exhausting work. Researchers must read hundreds of patient charts over weeks or months to find even a few patients who align with their trial. More than 50 percent of trials fail to match and recruit a single patient.

That work is about to become more efficient. With the advent of artificial intelligence, we have a new tool that will shorten this process from months to minutes. Artificial intelligence (AI) can learn the unique terminology used by physicians and automatically search through patient notes, making it faster and easier to match patients to the appropriate clinical trial.

So how does Australia fit into this? AI allows research centers across the globe to connect with each other. Researchers studying treatments for extremely rare cancers and childhood diseases will be able to get the necessary number of patients more quickly, since they can pull from a larger, international pool of patients.

As part of our trip to Australia, we expanded our TMC-Australia BioBridge, which includes a commitment to collaborate on this type of work. Researchers and physicians from around the world recognize that time is our enemy. We must share our very best ideas and technologies to make the clinical trial process faster, as it is the gateway to new and life-saving treatment.

We appreciate the openness and hospitality of our Australian friends and look forward to a thriving partnership for years to come.

William 7. Myc



Left to right: Dr. Karen Smith, Eliminate Cancer Initiative; Dr. Adam Kuspa, Senior VP and Dean of Research, Baylor College of Medicine; Greg Hunt, Australian Minister of Health; Scott Morrison, Australian Prime Minister; William McKeon, President and CEO of the TMC; Dr. Giulio Draetta, co-leader of MD Anderson's Moon Shots Program; and Alvin Tam, Chief of Staff, Deep 6 Al.

# TMC PULSE

Vol. 5 No. 10 November 2018

President and Chief Executive Officer William F. McKeon

Communications Director Ryan Holeywell

Pulse Editor Maggie Galehouse mgalehouse@tmc.edu

Assistant Editor Cindy George cgeorge@tmc.edu

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

Photojournalist Cody Duty

Contributing Photographer Nick de la Torre

Contributing Writer Alice Levitt

NEWSROOM 713-791-8812 news@tmc.edu

ADVERTISING Felicia Zbranek-Zeitman 713-791-8829 newsads@tmc.edu

DISTRIBUTION distribution@tmc.edu

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ON THE COVER: An original drawing of James Allison, Ph.D., by Ken Ellis.

# Fasting: Food for the Brain?

Patients are skipping breakfast for greater clarity and longer lives

#### By Alice Levitt

ou are what you eat, but increasingly, fasters hope to be what they *don't* eat, too. Although intermittent fasting is gaining popularity among those dieting for weight loss, some evidence suggests that abstaining from food for certain periods of time could also have profound effects on brain health.

Fasting has long been reported to help with mental acuity. Houston high school student Alina Khan, who fasts for Ramadan as part of her Muslim faith, says of eschewing food until sundown, "I think I'm more focused." Comments like this made scientists wonder if there was a biological reason for such reports from patients.

According to Philip Horner, Ph.D., scientific director for the Center for Neuroregeneration at Houston Methodist Research Institute, "If you take two mice with an identical diet and one group does every-other-day fasting, their outcome from a head injury or spinal cord injury is much better."

Scientists believe that new neural pathways and gene cells important for DNA repair are upregulated—their response to stimulus is increased—somewhere between 12 and 18 hours in a fasted state. That 12- to 18-hour window is what's been observed in laboratory mice, but dietitians are betting on that length of time for their human patients, too.

Kristen Kizer, RD, LD, a registered clinical dietitian at Houston Methodist Hospital, says that most studies of intermittent fasting have focused on a 5:2 schedule, meaning subjects eat normally for five days a week, but restrict intake to 600 calories for two days. "Personally, I wouldn't want to be around me on my day I'm not eating," Kizer jokes. "I have clients complain that the day they're doing 600 calories they're getting nauseous, they're getting headaches, they can't concentrate at work." Even Khan, who said she thought more clearly when skipping lunch, admits that when celebrating Ramadan with her family, "We all get an attitude when we're fasting."

That's why intermittent fasters are adopting another method, a 16:8 regimen, in which they consume all their calories within an eight-hour window. Houston Methodist pharmacist Chase Janak, Pharm.D., has followed the plan for a year-and-a-half for weight loss. While he says it hasn't been a magic bullet, combining the 16:8 regimen with healthy eating has helped him lose fat and maintain his weight. He adds that with the increased concentration at work that comes with skipping breakfast, he craves sugary snacks less frequently.

Janak also makes exercise a part of his diet plan. Horner emphasizes the importance of this, as well, saying that physical exertion increases production of neurons that we need to continually grow to make new memories. But fasting has been noted to keep those brain cells (and memories) alive. In fact, a laboratory mouse with Alzheimer's disease that fasts tends to live twoand-a-half years longer, on average, than a mouse that eats normally.

As for healthy mice who fast, "If you put them in spatial learning and



tasks, their hippocampus is bigger. It's pretty provocative, I think," Horner says.

But Horner explains that the boon comes not from fasting itself, but from flipping between two metabolic states. Some researchers call this concept "intermittent metabolic switching." Authors of a 2018 paper published in *Nature Reviews* Neuroscience found that with fasting and exercise, ketones are produced with the depletion of the body's fatty acids. Likely, humans evolved to thrive in a fasting state because those who could hunt successfully despite hunger lived longer. Basically, if you were built to function best with a pattern of switching between ketosis, followed by a flood of glucose that comes with eating and rest, you were best equipped to survive.

# When you're in that ketone state, we don't know why but your brain functions better.

— PHILIP HORNER, PH.D. Scientific director for the Center for Neuroregeneration at Houston Methodist Research Institute Still, Horner admits, "We don't know how you get from A to B. When you're in that ketone state, we don't know why, but your brain functions better." What we do know is that too much fasting is harmful. "More fasting is not good," Horner says. "There is this magic window."

Not everyone should try fasting, either. Omar Jaber, M.D., a pediatrician affiliated with Baylor College of Medicine and Texas Children's Hospital, warns that muscle cramping, dizziness and light-headedness can result from extended fasting. He adds that ancient Islamic laws exempt menstruating women, children, the elderly and the chronically ill from fasting during religiously prescribed times. Kizer agrees that patients who are recovering from surgery, pregnant, or dosing with insulin should probably stay away from fasting, but believes that overall, it is a very safe practice. "For most people, it would be fine," she savs.

Kizer is also quick to note that while longevity related to fasting has only been studied in mice, other evidence already suggests that fasting can increase longevity in humans, too. By losing body fat, she points out, you get yourself closer to the kind of healthy body weight that is noted among centenarians. The cell life in people whose bodies are stressed by factors such as excess weight is shorter than that in people who are healthfully slim. "That impacts longevity," Kizer says.

Practitioners like Janak say it's not difficult to simply stop eating at 8 p.m., then wait until noon the next day to break their fast. And if it means extra years of healthy old age, there's little to get in the way of most people making intermittent fasting part of their lifestyle.

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# **Putting Himself Out There**

Why a Baylor researcher told the world about his mental illness after keeping it secret for 20 years

By Ryan Holeywell

or more than two decades, Gabriel Lázaro-Muñoz, Ph.D., kept a secret from his friends, his colleagues and even some family members. Last year, he finally decided to share it in a place where it would exist forever: the internet.

The emotional essay Lázaro-Muñoz wrote describing his longtime experience with mental illness is the second result listed if you Google his name—appearing above his LinkedIn page, his Twitter feed and every single academic article he's ever published.

A year after sharing his story, the Baylor College of Medicine assistant professor says the decision to publish is still one of the best he's made.

"I've gotten to a point where I sort of accept [mental illness] is probably part of my life, and I just have to do the best I can to manage the symptoms," Lázaro-Muñoz said. "Being open about it has been one of those things that's made it easier."

In the 400-word essay, he detailed his experience with mental illness, his longtime efforts to hide it from those around him and—importantly—the role mental illness played in shaping his career, which now focuses on legal and ethical issues surrounding neuroscience.

"I constantly have intrusive thoughts, excessive worries and the occasional anxiety attack," he wrote in 2017. "This is how it has always been."

"Since I was a kid, I have struggled with depression, obsessive-compulsive disorder, and ADHD," he continued. "I have an extensive family history of mental illness so I have not only struggled with it, but I have seen many of those I love struggle." His essay explained that he decided to "come out" about his anxiety and depression in order to promote better understanding of those with mental illness.

It was a major shift for Lázaro-Muñoz, who hid his condition from friends, colleagues and classmates—everyone but close family members—for more than 20 years. He was worried that people, especially in a professional setting, would consider him unreliable if they knew the truth. But, quite suddenly, he decided to share his experience after a member of Baylor's communications staff asked him what had sparked his interest in his field of research.

(continued)



Gabriel Lázaro-Muñoz, Ph.D., sits on the balcony of his Houston home.



Lázaro-Muñoz and his wife, Rosa Rodriguez-Michel, play at home with their daughter, Marina Lázaro-Rodriguez.

It's a question he's often been asked, given his unique (and impressive) background. But it was also a question he had never answered honestly.

Lázaro-Muñoz majored in psychology as an undergraduate at the University of Puerto Rico, where he was drawn to the field due to his own struggles with mental illness, which began at age 13. He said his studies were a way for him to learn more about the issues affecting him personally without confronting them directly. From there, he earned a doctorate in neuroscience at New York University, where he worked with an advisor who sought to apply research on emotional learning and memory to the understanding and treatment of PTSD and other anxiety disorders. Lázaro-Muñoz's hope was that if he could understand how the brain worked, he might find relief from his own afflictions. He admitted that he might have been too hopeful. "Understanding the neurobiology of mental illness doesn't really give you any control over the symptoms," he said.

He shifted his career and earned a master's degree in bioethics and a law degree from the University of Pennsylvania, which ultimately led to his current role at Baylor.

Today, Lázaro-Muñoz studies deep brain stimulation, a neurological procedure that sends

a message to the brain to disrupt electrical signals associated with symptoms of certain medical conditions. Deep brain stimulation is used to treat Parkinson's disease, but researchers are also working to determine if it can treat other conditions, as well.

Lázaro-Muñoz is also scrutinizing research that involves using drugs to help modify emotions associated with memories as a potential way of treating patients with PTSD. His research focuses on ethical and legal issues associated with the research and use of these procedures. Part of his research involves speaking with patients to understand their experiences. His journey with mental illness has provided a useful perspective.

But it took years for him to share his personal struggles with anyone outside his inner circle.

When he told his boss that he wanted to post a personal essay on the Baylor College of Medicine blog, it was the first time he had told anyone in a professional setting about his mental illness. "The only thought I had was that it was courageous, and it would benefit a lot of people," said Amy McGuire, Ph.D., director of Baylor's Center for Medical Ethics and Health Policy.

She believes Lázaro-Muñoz's story is one that

It's hard for people to understand you can sort of live with depression or anxiety and have a successful career. It's not that it doesn't have an impact—of course it does—but there's a lot of misconceptions and misunderstanding about the experience.

— GABRIEL LÁZARO-MUÑOZ, PH.D. Assistant professor, Center for Medical Ethics and Health Policy at Baylor College of Medicine needed to be shared, especially in the medical sector. "In the field we're in, it's underdiagnosed," McGuire said, adding that she's heard from friends and colleagues in medicine with mental illness who fear the very existence of their own medical records. "I think we shame people around mental illness."

About 6.7 percent of adults in America experience major depressive disorder, and nearly half of those diagnosed with depression also are diagnosed with an anxiety disorder, according to the Anxiety and Depression Association of America. About 1 in 5 adults in the U.S. experience mental illness in a given year, according to data compiled by the National Alliance on Mental Illness.

With the blog post, Lázaro-Muñoz's goal was to show that mental illness isn't necessarily debilitating. "It's hard for people to understand you can sort of live with depression or anxiety and have a successful career," he explained. "It's not that it doesn't have an impact—of course it does—but there's a lot of misconceptions and misunderstanding about the experience."

He also wanted his infant daughter to know that if she experiences mental illness when she's older, she doesn't have to keep it a secret, as he did for so many years.

After the blog post was published, Lázaro-Muñoz received an outpouring of supportive emails and text messages from professionals in his field, as well as total strangers who shared their own stories about mental illness. The messages still come, a year after the post went live.

McGuire said what made Lázaro-Muñoz's story resonate with so many people was his tone. "He wasn't asking for anything in return, and he wasn't a victim," McGuire said. "He was just presenting [his story] primarily for himself."

Rosa Rodriguez-Michel, Lázaro-Muñoz's wife, said she's seen a major change in her husband's personality since he shared his story with the world. "Gabe's very confident, and there's a new aspect to that confidence," she said. "It's more authentic. It's like he's been liberated."

Today, Lázaro-Muñoz no longer feels the need to be discreet if he wants to schedule an appointment with a mental health provider on the phone. And when someone asks to discuss mental health with him, he's happy to have that conversation.

"I always thought that someday, he'd open up to someone about it in a very low key or quiet way," Rodriguez-Michel said. "I'm so glad he didn't go the quiet route."

If you are experiencing symptoms of depression, anxiety or other mental illness and are seeking help, consider contacting the National Alliance on Mental Illness at nami.org or 1-800-950-NAMI.

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# ON THE FRONT LINES OF HEALTH CARE

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Veterans Day, observed every November 11, honors the men and women of the U.S. Army, Navy, Air Force, Marine Corps and Coast Guard. *Pulse* asked several veterans who work at the Texas Medical Center how their military training has helped them serve the world's largest medical city.

By Britni R. McAshan

#### JOYCE BURNS

Associate Director of the Stroke Program and family nurse practitioner at the Michael E. DeBakey VA Medical Center Houston; retired lieutenant colonel in the U.S. Army

When Joyce Burns was a girl, home health nurses came by regularly to check on her ailing grandmother.

"All of the nurses used to tell me what they were doing for my grandmother—putting in catheters, caring for wounds—and it seemed like a very interesting career," Burns said.

Because of a chance encounter, Burns decided to join the army while she trained to become a nurse.

"One day my high school announced that there were two army recruiters in the cafeteria. One of my friends and I, we were in homeroom and we were looking for a way to slip out, so we went down to see their presentation," she said. "My mom wasn't too excited because back in the '70s there weren't as many women in the military, but I really wanted to go and my dad was very supportive."

Burns served in the U.S. Army for 26 years before retiring as a



lieutenant colonel in 2003. She received her bachelor's in nursing from the University of South Carolina and her masters from the United States Army War College. She worked at army hospitals in Texas, South Carolina, California, Georgia and Colorado.

Today, Burns serves as Associate Director of the Stroke Program and a family nurse practitioner on the neurology care line at the Michael E. DeBakey VA Medical Center Houston.

"One of things I learned and carry with me today is that the military is like a family," Burns said. "It is similar here at the VA because we are like a family. With the patients that I am taking care of, I think about the time that they have put in. In the military you are moving around and your kids aren't able to be raised near family, so on active duty you build a camaraderie."

JOSEPH LOVE, M.D. > Medical Director of Memorial Hermann Life Flight; retired lieutenant colonel in the U.S. Air Force

Growing up in Fairbanks, Alaska, Joseph Love didn't anticipate he would have a career in the military or in medicine. But after completing his master's degree, his wife convinced him to apply to medical school.

"We applied all over the place and I got in, and as a young couple, now that we've done this, the question was, how do we pay for it?" Love said. "The military has something called a Health Professions Scholarship Program. I applied for it and got it, so they paid all my tuition, they bought all my books and supplies. And then, in return, you have to give back one year for every year that you are in medical school."

Over an eight-month period starting in 2010, Love was deployed to Bagram Airfield in Afghanistan during a very volatile period. While there, Love operated on U.S. soldiers and civilians. He was also known around the base for slipping a few Girl Scout Cookies under the pillows of his patients—not only to give them a treat from home, but also to remind them of U.S. programs that empower young women.

When Love made it back stateside, he accepted a job at Life Flight working under founder James "Red" Duke, Jr., M.D.

"I don't think I'd have the job I do if I hadn't had those experiences. I'm a small-town kid. I'm not boisterous," Love said. "My early discussions about Afghanistan with Red Duke ... He was there before the wars and he started up the medical school in Kabul. Although our experiences were vastly different—his memories of Afghanistan were a little bit romanticized compared to my experience-that sort of kindred relationship let him and my relationship grow to the point where he trusted me enough to take over Life Flight as the medical director."

In addition, the trauma Love saw in Afghanistan prepared him to care for Life Flight patients.

"I came here in 2011, just a few years out of fellowship, but the volume of trauma and breadth of trauma that I saw on the military side—it would take years to see that here," Love said. PATRICIA DARNAUER Senior Vice President of Support Services at Harris Health System; retired colonel in the U.S. Army Medical Service Corps

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In Afghanistan, Patricia Darnauer commanded a combat support hospital—a deployable medical task force.

"We were down in Helmand province. In 2011, that was a pretty hostile environment; we supported marines and we were a trauma hospital," Darnauer said. "It was an amazing time to know that you could make a difference. The one incredibly positive thing about a deployment is that sense of unity focus—everyone was there to take care of the soldier, the sailor, the civilian that came in—and Afghan soldiers."

Darnauer began her 29-year tenure in the U.S. Army through the ROTC program at Cornell



University. Upon graduation she started her career at Fort Sam Houston in San Antonio, Texas. Her time in the army took her to Hawaii, Kansas, New York, Louisiana and the Middle East. Just over two years ago, Darnauer accepted the position of Senior Vice President of Support Services at Harris Health System.

"The military teaches you to grow and to be a leader, to accept responsibilities and to be flexible," she said. "All of those things translate into the civilian sector. If there was one thing that transferred over without a second thought it was that mission focus—taking care of your patient, taking care of that population. Many of our patients, truth be told, they don't have many advantages or options in their lives, so to know that we are an entire health system that is focused on taking care of them and bringing them the best care possible is really meaningful and important."

(continued)

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#### **GEORGE V. MASI**

President and CEO of Harris Health System; retired colonel in the U.S. Army Medical Service Corps

When George V. Masi joined the U.S. Army in 1973 as an officer in the Medical Service Corps, he didn't plan to spend more than two years on active duty. But one tour turned into two, and that turned into a 27-year career that took Masi and his family to Korea, Germany and several different locations in the United States.

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Before coming to work at Harris Health, the largest safety-net health care system in the region, Masi worked with Ben Taub Hospital one of the institutions within Harris Health System.

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"The army, navy and air force used to send their surgeons to Ben Taub Hospital to a facility called the Joint Trauma Training Center," Masi said. "There was no war and the military needed a place to have their trauma surgeons train and Ben Taub was that hospital."

Masi has been with Harris Health for 17 years, but still brings lessons learned from the army to work with him every day.

"In the army, we used to say, 'Take care of the soldiers and they will take care of you if you are a leader,' and the same holds true in the civilian sector," Masi said. "So much of it is about people-treating people with dignity and respect, knowing full well that the mission is difficult. ... If you are attentive to the needs of your people—whether they are soldiers or, in this case, civilian members of the team—they will do incredibly wonderful things. That was my experience in the military and it has been my rewarding experience here at Harris Health."

#### YONG CHOI, M.D.

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Bariatric surgeon at CHI St. Luke's Health-The Woodlands Hospital; retired colonel in the U.S. Army

During a 25-year career in the military, Yong Choi, M.D., was deployed to the Middle East four times.

"I was deployed to Kuwait on Thanksgiving Day 2001 and then subsequently deployed ... once to Iraq and two more times to Afghanistan," Choi said. "While over there, we cared for U.S. and allied soldiers, local nationals, civilians and prisoners if they needed medical treatment. I can't think of anything better than taking care of the soldiers in the military. They are the best patients and they are so grateful."

A Houston native, Choi graduated from the U.S. Military Academy (West Point) before beginning his medical career with the armed forces. He completed medical school at the Uniformed Services University of the Health Sciences in Bethesda, Maryland; residency at Eisenhower Army Medical Center in



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Augusta, Georgia; did a fellowship in general surgery at Baylor College of Medicine and then became a general surgeon in the U.S. Army.

Upon retiring from the army last year, Choi began working as a bariatric surgeon at CHI St. Luke's in the Woodlands. He uses many of the skills he learned in the military in the operating room.

"The best thing that I learned in the service was time management

and teamwork," Choi said. "What you see out there and everything that happens in the military, it doesn't happen with one person by themselves. It requires a lot of effort, teamwork, cooperation and attention to detail. That also relates to medicine. Especially in my field as a surgeon, it is very important to make sure you don't deviate from how you do things and you do the same thing over and over and have a really keen attention to detail. I see the OR as just a big team operating-there's anesthesia personnel, circulating nurse, scrub nurse and you all have to be on the same page and no one person is more important than anyone else. Everyone is just as integral to the team."

#### ROBERT ATHEY

*McGovern Medical School student; retired sergeant in the U.S. Marine Corps* 

Robert Athey, a first-year student at The University of Texas Health Science Center at Houston's McGovern Medical School, decided to become a doctor while serving in the U.S. Marine Corps in Afghanistan.

"I ended up deploying to Afghanistan in 2012," Athey said. "The unit I was in was more medical related stuff—almost like what an EMT does."

During his deployment, Athey provided care for U.S. soldiers, Afghan soldiers and civilians.

"The whole local population there didn't really have access to care other than the Marines. We



were the ones they would come to for pain medication if someone was hurt or sick," he said. "There were mixed emotions because sometimes you were providing care to people who actually wanted to do harm to you because that is how the Geneva Convention works. But you put yourself aside in that moment and try to alleviate symptoms the best you can."

After five years in the Marine Corps, Athey returned home and attended Baylor University in Waco, Texas, before being accepted to McGovern Medical School.

"I look back at my years in high school and I wasn't well disciplined and I couldn't apply myself to school very well," Athey said. "In the Marine Corps, I went in as an intelligence analyst—it is a very schoolintensive job and they retaught a lot of study skills I needed. I ended up growing in maturity in the military and it has helped me achieve my goals—for example, getting into medical school."





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# A Vaccine Doctor Who's an Autism Dad

Peter Hotez's new book about his daughter is personal

#### By Maggie Galehouse

achel Hotez was diagnosed with autism in 1994 at the age of 19 months. As she grew up, her father, Peter Hotez, M.D., Ph.D., a pediatrician-scientist who develops vaccines for neglected tropical diseases, witnessed the rise of an influential anti-vaccine community that persists in connecting vaccines to autism—even though the 1998 paper that first linked autism to the measles, mumps and rubella vaccine was retracted in 2010.

In his new book, Vaccines Did Not Cause Rachel's Autism, Hotez, dean of the National School of

Tropical Medicine and director of the Texas Children's Hospital Center for Vaccine Development at Baylor College of Medicine, draws on his experience as a physician, academic and father to praise the effectiveness of vaccines and explain what experts are starting to learn about autism.

Q In your new book, you write quite openly about your daughter, Rachel, and how your family coped with her diagnosis. Your other books aren't this personal. Why write this book now?





A I feel an

urgency to

speak out,

driven by some-

thing terrible

that's going

on in Europe

and in many

states in the

of the western

United States, and that is the return

of measles. According to the World

Health Organization, we had 41,000

half of 2018 and 37 deaths. We've got

pockets in Texas and other western

states where 10, 20, 30 percent of the

kids are not being vaccinated, which

**Q** | Anti-vaccine groups attack

you regularly on social media

because you have spoken out

so stridently against them and written op-eds and journal

articles about the dangers of a resurgence of measles. How do

you think they will respond to

A This is going to be a threat to them. They are going to try to

exploit any vulnerability they can.

pate-because they're pretty nasty,

One of the things that I antici-

the book?

means we'll soon have measles return to the U.S. People forget

that measles is a killer disease.

measles cases in Europe the first

they say I'm making millions of dollars from my hookworm and schistosomiasis vaccines, to which my wife says, 'If only!'—is they'll say I'm exploiting Rachel for some kind of personal gain.

**Q** As a little girl, Rachel often ran away. The book shares stories of you, your wife, Ann, and your other children searching the neighborhood for Rachel and alerting neighbors that she was on the loose. That "mostly noncompliant little girl," as you describe her in the book, is now 26 and still living at home. What's Rachel like today?

A She's still very strong-willed and very determined. She's got, in some ways, a fuller life than she's ever had, in part because we've given her a lot of freedom to walk in our Montrose neighborhood, where she has befriended various merchants. Everybody knows Rachel. She recruits allies and friends. We'll go into the Hollywood convenience store and she'll say, 'Dad, this is my friend, Vin. He's from Vietnam. He doesn't speak English.' And Vin will say, 'Hi Rachel.'

(Q&A continued on page 16)

**66** Vaccines Did Not Cause Rachel's Autism was very much driven by living in Texas and seeing what's going on down here with large numbers of kids not being vaccinated—with seeing what an anti-vaccine movement looks like unfiltered, unopposed. Somebody's got to speak out. **9** 

- PETER HOTEZ, M.D., PH.D.

Peter Hotez, M.D., Ph.D., poses in his Montrose home with his daughter, Rachel.

#### EXCERPT

In the following excerpt from Vaccines Did Not Cause Rachel's Autism, author Peter Hotez describes a day in Cheshire, Connecticut when 5-year-old Rachel, who loved the sensation of running, had disappeared from home. As always, Hotez, his wife, Ann, and Rachel's older siblings, Matt and Emy, stopped everything to search for her.

When Rachel ran off, she could cover a lot of distance, fast, and she wouldn't respond to our shouts and pleas to return. Often she would wind up in different parts of our neighborhood. If we saw her take off, we dropped everything and chased her. Someone from the Hotez family running after Rachel was a common sight in our neighborhood, and often a caring neighbor would join in. ...

Her adventures often got us into difficult or even scary situations. Rachel's flights meant it was nearly impossible to take family vacations or have even modest outings as a family. Her autism demanded all hands on deck, including her siblings'. On this particular Saturday, Ann and the kids first went into the woods behind our house to hunt for Rachel, and then we piled in the car and drove to Rachel's usual spots, such as a local playground. Nothing. Back home, we started phoning neighbors. Had anyone seen her run by? No. Across the street lived a teenager named Kevin and his mother, Barbara. When I called their number, Rachel answered.

"Rachel, what are you doing in Kevin's home?" I asked.

"I'm looking in their refrigerator and at their photo album," she replied.

"Rachel, get Kevin and put him on the phone."

"Kevin's not here."

"Well, then get me Barbara."

"Barbara's not here either." There was excitement in her voice.

"Nobody's home, just me."

She had crawled through the pet entrance to enjoy an afternoon of Kevin and Barbara's hospitality by herself. Unable to reach Kevin or Barbara, we turned to Matt, who could still barely fit through the pet entrance. With an angry look, he went in and retrieved Rachel, telling us afterward to never again make a similar request!

*Reprinted from* Vaccines Did Not Cause Rachel's Autism © 2018 by Peter Hotez, M.D., Ph.D. Published by Johns Hopkins University Press on Oct. 30, 2018.

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#### AUTISM BY THE NUMBERS

## 1 in 59 8-year-old children

were identified with autism spectrum disorder (ASD) in 2014

Of children identified with ASD:

# about 85%

had developmental concerns by age 3, but only

about 42% were evaluated for developmental concerns by age 3

Source: Centers for Disease Control and Prevention, Autism and Developmental Disabilities Monitoring Network

## **Q** | You observe that Rachel's autism is atypical but not as atypical as experts once believed. Can you elaborate?

A This is one of the sub-themes of the book. We used to say autism was 10 to 1 boys to girls, but it's probably far closer to 1 to 1 than we realize. It's just different for girls on the autism spectrum. They camouflage it better; they're more verbal, more interactive, but oftentimes in a very odd way. There are often high rates of comorbidities for girls or women on the spectrum, such as a high incidence of obsessivecompulsive disorder or attention deficit hyperactivity disorder. We're now realizing a lot of adolescent girls with eating disorders are actually on the autism spectrum. It's the comorbidity that gets diagnosed, not the autism. That's the big revelation in the book.

**Q** | In the book, you confess that it wasn't the autism diagnosis that was so devastating

to you and your wife. It was Rachel's low IQ: " ... we came to an understanding that Rachel would have a very different life from what we had hoped for her. We faced a real possibility that she would not find a life partner, attend college, or have a meaningful career. There was a lot of sadness and sense of loss." A If it was just her autism, per se, that's not what's so disabling. There are many men and women on the autism spectrum doing important things. It's the associated disabilities, the comorbidities, that are so difficult. It's hard to test her because she's so impatient. Oftentimes, her verbal IQ is pretty good, but it's the performance IQ that's just dismally low. She won't count money, for example. She can't do that.

Q | What can you say about the genetic basis for autism? The expectation is that there will be 1,000 or so genes in the

# total sequencing. Where are we right now?

A We've identified at least 65 genes and that's just the beginning. One of the things that happened as I was finishing up the book is we did whole exome sequencing of Rachel here at Baylor College of Medicine in the department of genetics and we think we've identified a new gene for autism. The question is: What do you do with that information? Can you design interventions to improve especially the comorbidities associated with autism?

# **Q** | These sound like questions for ethicists.

A We're already seeing, especially on social media, a lot of interesting questions about genetics from the community of people with autism. They're saying, 'What are you going to do with that information? Does that mean you're going to weed us out? Is this a form of eugenics?' So we're really going to need an unprecedented dialogue between





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autism scientists, psychiatrists, neurologists and bioethicists and people from the autism community.

# **Q** What are the clinical markers of autism and how early do children receive this diagnosis?

A The clinical expression of autism is at its most florid often around 18 to 24 months of age. That's the time when, according to the Centers for Disease Control and Prevention, a lot of children on the autism spectrum get diagnosed. That clinical expression of autism coincides with when you see a big increase in brain volume expansion on an MRI. We have a good MRI marker of autism through that brain volume expansion, and that's important because that's around the same time parents often remember their kid got vaccinated. Now, a research group at The University of North Carolina at Chapel Hill can go back a full year before and actually show changes on an MRI at six months of age that will predict

We used to say autism was 10 to 1 boys to girls, but it's probably far closer to 1 to 1 than we realize. It's just different for girls on the autism spectrum. They camouflage it better; they're more verbal, more interactive, but oftentimes in a very odd way.

#### - PETER HOTEZ, M.D., PH.D.

which children are going to go on to develop those big changes at 18 months. And now a group at the University of California, San Diego can show that the changes are beginning prenatally. So we have a very good theory that there are genetic and epigenetic changes that are beginning prenatally that set into motion a developmental progression. The problem is, that's not a soundbite.

# Q Rachel is now working at Goodwill. How is that going?

A Goodwill really came to the rescue for us in a big way. The philosophy of Goodwill is: It doesn't matter who you are, we're going to make it work. It's a very nurturing place. Rachel walks to work and spends two hours a day there, Tuesday through Friday, sorting clothes. You can't underestimate the power of someone getting their first paycheck. In terms of affirming Rachel's existence, the satisfaction she gets is huge. The pride she has in that job—you can't put a price tag on that.

#### Q Back to vaccines and measles. Anything you'd like to say to parents trying to decide whether or not to vaccinate their kids?

A As recently as the 1990s, measles was the single leading killer of children in the world and we've allowed it to come back because we've allowed an anti-vaccine movement to go unopposed. Vaccines Did Not Cause Rachel's Autism was very much driven by living in Texas and seeing what's going on down here with large numbers of kids not being vaccinated—with seeing what an anti-vaccine movement looks like unfiltered, unopposed. Somebody's got to speak out.

The conversation was edited for clarity and length.





James Allison wins the Nobel

By Cindy George



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Credit: Akademie / Alamy Stock Photo

hrough weeks of international acclaim, with highlights that included an early-morning phone call from Sweden and a homecoming parade through the halls of MD Anderson, James Allison, Ph.D., insisted that he never set out to find a new way to treat cancer.

As a basic scientist, Allison arrived at immunotherapy by way of T cells.

"I've always been interested in the immune system and, in particular, a very specific part of it called T cells. These are cells that, to me, are just amazing," Allison said. "They go all through your body looking for infection or cancer, we know now, and respond to it by generating an army of similar soldiers who can attack ... in a way that doesn't harm normal cells. I've been intellectually challenged by the wonderful complexity of that."

Allison was awarded the 2018 Nobel Prize in Physiology or Medicine jointly with Japanese immunologist Tasuku Honjo, M.D., Ph.D., for the discovery of cancer therapies that stimulate the immune system to attack tumor cells. Treatments developed from Allison's work have extended the lives of thousands of people with advanced disease, though certain cancers have responded better to immunotherapy than others.

"A few cancers, like glioblastoma and pancreatic cancer, thus far,

have not responded at all," Allison said. "There's a lot more hard work to be done."

Both Allison, 70, and Honjo, 76, made discoveries that led to the development of "checkpoint inhibitors," drugs infused into patients to block molecules that put the brakes on T cells. By releasing these brakes, the body's own immune system is able to fight cancer.

Allison recognized that a protein on T cells called CTLA-4 stopped their ability to fight disease. By inhibiting that checkpoint or releasing the brakes—he found that the T cells

could be unleashed to attack tumors. Allison developed an antibody to block CTLA-4, which turned into the drug ipilimumab, now used to fight metastatic melanoma. Known commercially as Yervoy, the drug was approved in 2011 by the U.S. Food and Drug Administration (FDA) and has delivered unprecedented results.

Honjo, of Japan's Kyoto University, also discovered a protein on immune cells that serves as a brake—the checkpoint molecule PD-1. In 2014, the FDA approved the drugs Keytruda and Opdivo, which inhibit PD-1 for the treatment of metastatic melanoma. In March 2015, Opdivo was approved for lung cancer treatment.

(continued)

Below: A crowd congratulates James Allison, Ph.D., at The University of Texas MD Anderson Cancer Center in October.



#### The fourth pillar

Now, Allison and his research collaborator and wife—MD Anderson oncologist Padmanee "Pam" Sharma, M.D., Ph.D.—plan to build on their accomplishments by using immunotherapy in tandem with traditional treatment to increase response rates in patients.

Allison said the melanoma data is especially encouraging. A study of almost 5,000 patients who had a single round of immunotherapy four injections over three-week intervals—showed that 20 percent were alive 10 years after treatment. A combination of immunotherapy with a traditional treatment tripled 10-year survival to about 60 percent.

"The good news is that we know it can be done in some patients," Allison said. "There's a lot of optimism, but still a ways to go. That's going to come from combining immunotherapy with conventional types of therapy."

Though Allison has been mentioned as a contender for the Nobel for several years, he said he was shocked by an early-morning phone call on Oct. 1, 2018 from his son, Robert, an architect in Manhattan, telling him he had won the coveted prize. Allison and Sharma were in New York for an immunology meeting and, after the new laureate spoke to Nobel officials in Stockholm, the couple's hotel room filled with friends and colleagues bearing champagne.

During a news conference later that day, Allison explained how his research has driven cancer treatment closer to a cure.

"After many years of resistance, I think the cancer field has begun to accept immunotherapy now as the fourth pillar—along with radiation, surgery and chemotherapy—of cancer therapy. ... Immunotherapy can be used in combination with the other three. I think that what we are looking forward to is combinations in the future—not just of multiple checkpoints, but of checkpoints with radiation, checkpoints with chemotherapy, checkpoints with genetically targeted small molecule drugs. It's not going to replace all those others, but it's going to be part of the therapy that essentially all cancer patients are going to be receiving in five years or so—and they're going to be curative in a lot of patients."

#### Three bouts with cancer

Allison is a cancer patient himself.

"I am currently being treated for bladder cancer," the scientist said. "I'm doing great. One of the benefits of working in a cancer center is that it was picked up early and I get the best treatment. It's an old, crude [treatment] that's been around since the '60s. It's called BCG treatment. It's the use of bacteria in the bladder. They irritate it and that leads to an activation of the immune system. Nobody knows exactly how that particular one works even though it's been around for 50 years now."

BCG is a germ placed directly into the bladder through a catheter.

This is Allison's third bout with cancer. The first occurred more than a decade ago.

"Pancreatic. It was caught early. I had surgery about 12 years ago. Then, a few years ago I had melanoma surgically removed from my nose," he said.

Because Allison's research is targeted to more advanced cancers, he personally has not benefited from the immunotherapy he helped pioneer.

Below: Supporters gathered inside MD Anderson to congratulate Allison on the Nobel.





"I have localized disease," he explained. "These immunotherapies the checkpoint blockades that I developed—start off as experimental therapies that treat the people that have no other alternative. ... As with all drugs, the treatments with time are going to move earlier and earlier in the disease."

#### Important questions

Allison was born in Alice, Texas, a small town 50 miles west of Corpus Christi. His father was a "country doctor" who helped inspire his son's interest in basic science. Allison lost his mother to lymphoma when he was 10 and cancer also claimed two uncles. The budding scientist witnessed the ravages of radiation and chemotherapy at an early age.

As a young man, Allison grew interested in the role T cells played in the immune system. After finishing his bachelor's degree in microbiology and a doctorate in biological sciences at The University of Texas at Austin, Allison first worked for MD Anderson at its science park in Smithville, Texas, where he began unraveling the mysteries of T cells from 1977 to 1984. He took a sabbatical to Stanford University to continue his research.

"He slept on my couch on and off for the next year. We got to be good friends," said Lewis Lanier, Ph.D., now chair of the department of microbiology and immunology at the University of California, San Francisco. The pair had bonded a few years earlier during a week of extracurricular skiing and wine-drinking at a lymphoma conference.

"We started doing things scientifically together related to understanding the T cell receptor and we published some nice papers together during that time," Lanier said, noting that Allison eventually jumped from Smithville to the University of California, Berkeley. "Then we got to be really close friends."

Over the next two decades, Lanier and Allison collaborated professionally while celebrating holidays at each other's homes. Their families vacationed together. During this period, Allison honed his love of the blues and country music as a harmonica player who performed with The CheckPoints, a band composed of immunologists and oncologists.

For years, Lanier has set his alarm to wake in the wee hours for the Nobel Prize announcement in medicine—and then gone back to sleep. This year, Lanier stayed wide-eyed and rang his longtime friend to offer congratulations.

"It's so well deserved. There really would not be this new checkpoint blockade therapy without him," Lanier said. "Jim always asked: "What is the important question to pursue?' And then he'd go after that doggedly. He did that with the T cell receptor. He did that with what is known as co-stimulation—identifying the turbocharge for the second segment of T cells—and then when he had the idea of blocking the inhibitors of the T cells to apply that to cancer. Those were three huge questions that he managed to address."

#### Driven to find the truth

Antoni Ribas, M.D., Ph.D., a professor of medicine at the University of California, Los Angeles (UCLA), met Allison in the mid-2000s after making a presentation at an American Society of Clinical Oncology meeting. Ribas had used a CTLA-4-blocking antibody in patients and was sharing the results.

(continued)



#### WHAT IS IMMUNOTHERAPY?

Immunotherapy is a type of treatment that trains the immune system to attack cancer. Immune system cells—including T cells (so-called because they develop in a small organ called the thymus gland) and antigen-presenting cells (APCs)—defend and protect the body. APCs patrol the body and T cells are the soldiers of the immune system. When an APC finds something suspicious, it sends a signal to a T cell to multiply and attack the suspicious cells.

But if T cells don't stop multiplying, they can damage healthy cells, so a safety switch in the T cell, called a checkpoint, prevents this. Because cancer is so complex, though, T cells are switched off before their work fighting cancer is done. Checkpoint inhibitor drugs, the most common type of immunotherapy, can prevent T cells from being switched off. This allows T cells to fight cancer. Immunotherapy also helps the immune system remember so the T cells can quickly target the cancer if it returns.

# WHAT CONTRIBUTION TO IMMUNOTHERAPY EARNED JAMES ALLISON A NOBEL?

Allison blocked a protein on T cells that acts as a brake, thus freeing T cells to attack cancer. Specifically, Allison developed an antibody to block the checkpoint protein CTLA-4. His work led to the development of the first immune checkpoint inhibitor drug, ipilimumab, known commercially as Yervoy.

Source: The University of Texas MD Anderson Cancer Center



"I told everyone that the person who invented this approach just walked in—Jim Allison," Ribas said. "After that, we had a very close relationship. We talk on Saturday mornings about what we are doing. It wasn't until I went to the celebration of his 70th birthday that Jim said that I was the first one to acknowledge his work in a medical oncology meeting. He said that many other people who were working on those antibodies acted as if they had invented them and there was nothing behind them."

Ribas, an oncologist-researcher, had been reading Allison's papers for years and trying to replicate his work.

"I emailed him at one point asking him for the mouse antibody. He didn't answer, but a week later I received the antibody in the mail and I was able to experiment," Ribas said. The first human trials of ipilimumab took place in a private oncologist's California office affiliated with UCLA. Ribas referred patients to the study. One of them, Sharon Vener, had several tumors that did not shrink with other treatments. She was the first patient whose cancer responded to ipilimumab. That was in 2001. Now in her mid 60s, Vener has survived cancer for 17 years thanks to Allison.

"His understanding of how the immune system is regulated led to the hypothesis that if you take away a brake, the immune system would attack some cancers. That has made a big change in the clinic and I have a bunch of patients who have benefited from that," Ribas said.

Allison always pursues big ideas, but he knows there is more to life than work.

"He is driven to find the truth of things," Ribas said. "Some people think the goal of their life is to write an article in *Nature* or *Science* or *The New England Journal of Medicine*. His motivation is to write about something important that may change how we treat cancer."

At the same time, Ribas added, Allison "is a fun guy. He is somebody who enjoys life and has a lot of interests."

#### With the band

Phil Greenberg, M.D., head of the immunology program at Fred Hutchinson Cancer Research Center in Seattle, became friends with Allison 40 years ago during their post doc days in San Diego.

Once, during a conference in Maui, Hawaii, Allison noticed a blacktie benefit in a newspaper headlined by Willie Nelson, with whom the future laureate had jammed in Texas. The scientists decided to "crash the event" in their jeans, Greenberg said. Both have long hair and

Above: MD Anderson president Peter Pisters, M.D., speaks with Allison and his wife, Padmanee Sharma, M.D., Ph.D., professor in the department of genitourinary medical oncology at MD Anderson, during a press conference.





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# Follow your heart. Find something you're really interested in. Do absolutely the best you can at your science without a whole lot of regard for potential translation—that can come later. When you really understand something, then you can think about how it'll be applied.

when they pulled up in a rented Ford Mustang convertible, the valets assumed they were with the band and escorted them into the affair.

"It was an open bar, so we kind of hung out. The show hadn't started," Greenberg said. As attendees moved to tables, they did too then enjoyed a meal and the concert. "After the performance, Willie came out. He had a drink with us and took a picture with us. ... It was a really fun time."

#### **Big leaps**

In a Dec. 10 ceremony in Sweden, James Allison and Tasuku Honjo will each receive a Nobel medal and diploma. The scientists will also share a \$1 million prize.

Allison is the first Nobel laureate for MD Anderson, where he is a professor and chair of the department of immunology. He is the executive director of the Immunotherapy Platform, which is part of MD Anderson's Moon Shots Program—an ambitious effort to more rapidly reduce cancer deaths and suffering by developing advances in prevention, early detection and treatment based on scientific discoveries. In addition, Allison holds the Vivian L. Smith Distinguished Chair in Immunology and serves as deputy director of the David H. Koch Center for Applied Research of Genitourinary Cancers in the department of genitourinary medical oncology.

#### - JAMES ALLISON, PH.D.

"The miracles actually come out of deep science and understanding how it works," Allison explained, following a parade in his honor when he returned to MD Anderson a few days after winning the Nobel. "Our work on this molecule, CTLA-4, had nothing to do with cancer it had to do with understanding how T cells work. And once we figured it out, then I was able to say: 'Oh, maybe we could do this' and take it to the clinic."

After technology billionaire Sean Parker invested \$250 million in 2016 to form the Parker Institute for Cancer Immunotherapy a research collaboration between six leading academic research institutions in the United States—Allison, Lanier and Ribas were selected to direct the Parker centers on their respective campuses.

In mid-October, Allison was asked to offer advice to young scientists during an online chat hosted by STAT news. His thoughtful response articulated the philosophy of his steady, four-decade pursuit.

"Follow your heart. Find something you're really interested in. Do absolutely the best you can at your science without a whole lot of regard for potential translation—that can come later," he wrote. "When you really understand something, then you can think about how it'll be applied. Don't start with trying to solve a particular issue of medicine; you're unlikely to find any great leaps or findings. The big leaps come from understanding fundamental mechanisms in detail."



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# Amegy<sup>®</sup>MED

Health economist **VIVIAN HO**, **PH.D.**, has spent more than three decades educating the public about health care and working to ensure people of all income levels have access to affordable care. She'd like to put herself out of business, but doesn't think that's likely anytime soon. Ho, who serves as the James A. Baker III Institute Chair in Health Economics and Director of the Center for Health and Biosciences at Rice University, spoke with *Pulse* about her peripatetic career and her vision for the perfect health care system.

#### Q In addition to your position at Rice University's Baker Institute for Public Policy, you're a professor at Baylor College of Medicine. What is your mission as a health economist and as an educator?

A When I came to the Baker Institute, it all became really clear to me that the goal is to get as many people as possible access to high quality health care. You can't do that without health insurance. But health insurance is not going to be affordable until we control health care costs. I basically decided I'll look broadly, but I am only going to look at projects where you find some way to control the growth of health care costs-whether it's something as small as freestanding emergency departments or as big as how the Affordable Care Act is structured. You wouldn't believe it, but this integration of physicians and hospitals is actually driving up costs.

Everything is about getting people access to care by controlling the growth of costs. Some people just say, 'Oh, yes, we have to get more people health insurance,' but the reason why we're having such a struggle and why so many people can't get health insurance is because the underlying health care is too costly.

## Q | I understand you grew up in Canada and moved to the United States at an early age. Tell me about your upbringing.

A I was born in Montreal, Canada. My father was a chemical engineer. At an early age, we moved to Calgary, Alberta, for my dad's work. It was so cold there. He tells me this story of when they were getting ready to go to a Christmas party and he couldn't start the car. He had to take the car battery and put it in the oven and heat it up so that they could go to this party. He decided at that point it was much too cold and so he was able to go to Southern California to work for Flora Corporation, so I grew up in California since I was six years old. I consider myself mostly an American.

## Q You initially wanted to go into business before you became an economist. What made you change career paths?

A I was planning on majoring in economics and becoming a businessperson. I didn't know what a manager was, but I thought that sounded pretty good. Then I went to Harvard to do my undergraduate degree, and they have a senior honors thesis there. As part of the senior honors thesis, I ended up working with a visiting Australian professor who gave me this great opportunity to compare differences in wages between men and women in the United States and Australia. This was with very a large databasethe current population survey from the U.S. and then a similar survey in Australia.

The Baker Institute and the relationship it has with the Texas Medical Center has been such a boon for me. We're really lucky to have this general policy institute that is so well connected with so many talented doctors. That's something that does distinguish us. Other think tanks don't have that advantage and I think that shapes the type of work that we do. I thought the experience was so fantastic. You could tell stories about how the real world works by analyzing data. I thought, 'This is great; this is what I want to do.' I said, 'Forget trying to go out in the business world,' and went on to get a Ph.D.

# Q Why did you decide to focus on health care?

A I feel like so much of my life has just been the accidents that happen along the way. When I was at Stanford for my Ph.D., I thought, since the background and work I had done so far was in labor economics, I would become a labor economist. But I was sort of struggling to find a research topic. Late one night, one of the professors walked by my office. At that point I was going to do something on the newspaper industry. He says, 'No, don't do that. I was just over talking to someone in the Hoover Institution. You should work on health care. As a matter of fact, you should work on the hospice industry and the Medicare hospice benefit because no one's doing any work on it.'

I had no idea. I didn't know what Medicare was, really, and I knew very little about what hospices were. But at that point, I said, 'Well, what have I got to lose?' I started working on it, and it was fascinating. This notion that the government tries to provide assistance to these families when someone is at the end of life; it's such a difficult time.

That was just the start of this career of learning, and, since then, it's just been learning along the way. The industry, unfortunately, has grown to be a massive component of the gross domestic product—probably too much. But there is always something to learn—so many different components of health care and the changes that we've had along the way. It's unending. I feel bad, though, because what I really want to do is put myself out of business. I'm not sure I'm ever going to be able to get there.

Q Over the course of your 32-year career, you have published 91 papers, 57 abstracts and received 23 research grants—all related to the goal of giving people access to affordable health care. If you had a magic wand and could create the perfect health care system, what would it look like?

A There are lots of people who get poor quality health care. In the Texas Medical Center, we have some of the best institutions in the world. People come from all over the country to go get treatment at many of our hospitals because they are world-renowned. The challenge is to keep that while getting everyone access to the care they need. It's a big, giant information problem in terms of patients. We need to figure out how to analyze our data to get the patient crystal-clear information on which providers are the best and to help providers figure out which are the best treatments.

That's the first component. The second thing is there's too much consolidation in the industry and I'm really very concerned about it. I don't think consumers understand how pervasive consolidation has been for the last three decades, but it is steadily raising prices.

The final thing is to somehow build the right incentives for people to engage in healthy lifestyles. That's a big puzzle. The challenge of how to do that without disadvantaging a lot of people who don't have the resources to live healthy lifestyles is pretty hard.

(continued)





# You take care of us let *us* take care of *you*





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## 0/KARAT22JEWELERS



# Spotlight

Q Can you elaborate on how too much consolidation in the health care industry is detrimental to consumers? A How many different health care systems do we now have in this city? There's Methodist, there's CHI St. Luke's, Memorial Hermann. ... It's a few major systems selling most of the health care, with four or five major insurers. Every time you have that few competitors, we call it an oligopoly. We need multiple competitors who are then going to be forced to bargain with each other to give more competitive prices. We don't have that on the insurance side; we don't have that on the provider side. Physician practices are consolidating. All of this is driving up prices.

# Q | You aren't the first person in your family to go to Boston.

A My dad went there to get his undergraduate degree, then his master's degree in engineering from MIT. My mom's family did the typical Chinese thing: They ran a laundromat. The laundromat apparently was the place for young people to go and socialize, so they were there one night and my dad came with a friend. That's how my mom and dad met.

The laundromat is still there [in Massachusetts]. They kept that laundromat in the family for generations.

# Q Did your mother also attend school in the U.S.?

A She did not go to school here in the United States. Her family left China because of the Communist Revolution. She was not able to enroll in high school or college once she got here. It was just a challenge enough for her to learn English.

When she first came, she contracted tuberculosis. She was in a sanatorium for several months until she recovered. It amazes you that your parents go through this whole experience. Q After Boston, you moved back home to California to earn your Ph.D. in economics from Stanford University. You also returned to Canada to work at McGill University, then moved to St. Louis for a position at Washington University and relocated again to work for The University of Alabama at Birmingham. How has living in different cities across North America informed your work as a health economist?

A I think that's been one of the biggest gifts. It was just not planned, but to be able to learn about people, about different communities and their outlooks on life has definitely shaped my understanding of what people are looking for in terms of health care.

#### Q How does Houston compare to the other cities you've called home?

A This place is fantastic. I love it here. Some people complain about it, but there's so much growth and activity that it's this multicultural melting pot. At the Texas Medical Center, you get doctors who are tops in their field and they're happy to talk about the health care system. I've written a lot of papers with terrific co-authors across the street.

The Baker Institute and the relationship it has with the Texas Medical Center has been such a boon for me. We're really lucky to have this general policy institute that is so well connected with so many talented doctors. That's something that does distinguish us. Other think tanks don't have that advantage and I think that shapes the type of work that we do.

Vivian Ho, Ph.D., was interviewed by Pulse columnist and news writer Shanley Pierce. The conversation was edited for clarity and length.

# How TMC Employees Spend Their Spare Time



NAME: Konstantinos Charitakis, M.D. occupation: Interventional cardiologist at Memorial Hermann Hospital; assistant professor of cardiovascular medicine at McGovern Medical School at UTHealth

## INTEREST: Cycling

s an interventional cardiologist, Konstantinos Charitakis, M.D., understands the importance of maintaining a healthy and active lifestyle.

Whether he's pedaling along the roads in Fulshear with former patients and his local cycling team or racing other enthusiasts online on his stationary bike at home in Montrose, Charitakis puts in 150 miles every week. "It's definitely a good way to improve and maintain cardiovascular health and I definitely recommend it to all my patients," Charitakis said, adding that cycling is an easy way to get back in shape and is kinder to the knees and hips than running.

Charitakis was first introduced to cycling by a friend during his residency and fellowship training at New York-Presbyterian Hospital/ Weill Cornell Medical Center. He quickly fell in love with the sport—not only because it's such an effective form of exercise, but because of its team dynamic.

"It's usually noncompetitive in the sense that it's a big bunch of people going out all together. ... We try going fast and help each other because we do form a peloton," Charitakis said, explaining that a peloton is a group of cyclists who conserve energy and reduce drag by riding close together. "It is the sport that if one of us doesn't do well, the team doesn't do well, so we try to help each other."

Charitakis was also drawn to cycling because it gives him an opportunity to enjoy the outdoors and soak up beautiful landscapes—especially when he's riding through the picturesque countryside hills of Crete, the Greek island where he was born. After you cycle to the top of a hill, he said, you can take a break and enjoy the beautiful view.

"My dream would be for every place that I want to visit, to visit with the bike," Charitakis said. "It's not only what you see but where we stop—and we talk and we go into little cafes."

The increasing popularity of online cycling communities, such as Strava and Peloton, makes the cardiologist's commitment to his love for cycling easier. He often opts for an indoor ride on his stationary bike to escape unfavorable weather.

"People don't have to go out and ... face the rain, or the cold, or the heat here in Houston," Charitakis said. "They're able to cycle from home with good AC, a fan, and the online cycling community. They can cycle, compete and enjoy, as well." When Charitakis moved to Houston, he created an online cycling account under the username "GreekCowboy" an homage to his Greek heritage and his new home in Texas.

"Many times the people see you logging in, because it's a live class, and they're like 'Hey, GreekCowboy!" he said. "That's my five seconds of fame in the online community."

Although every exercise needs to be tailored to fit the specific needs and heart strength of the individual, Charitakis believes that it's his job to lead by example and encourage his patients to embrace exercise.

"The fact that you may or may not have a serious heart problem does not mean that you're done with physical activity," Charitakis said. "Even 15 minutes in the morning, you'll see that the more you do, the better you're going to get. You're going to see change in your body. You're going to see changes in your heart healthand that, you'll see at the end of the day—is going to make all the difference. It may or may not prolong your life, but it will definitely improve the quality of your life, and that's as important."

Charitakis has participated in several MS 150 events in New York and Houston, as well as an RBC GranFondo race a long distance bike ride sponsored by the Canadian bank. He is currently training to ride 120 miles in Colorado next year for the Triple Bypass Bicycle Ride, which is named for the three mountains through which the course travels: Juniper Pass, Loveland Pass and Vail Pass.

"It's funny, as a cardiologist, that it's named the Triple Bypass," Charitakis said. "Hopefully, I won't need one."

# **PulseRider: A Promising New Artery Stabilizer**

Baylor St. Luke's doctor is the first in Texas to test the vessel-reinforcing implant

#### By Christine Hall



Peter Kan, M.D., holds PulseRider, a neurovascular device that enables minimally invasive endovascular treatment of patients diagnosed with wide-necked bifurcation aneurysms.

ide-necked bifurcation aneurysms, which are balloon-like bulges in an artery wall in the brain, present a unique challenge for surgeons because of their location.

Resting near the base of the skull, these aneurysms can be difficult to dissect or treat with endovascular technology, said neurosurgeon Peter Kan, M.D., of Baylor St. Luke's Medical Center. Brain aneurysms are fairly common and can be repaired. But in 1 to 2 percent of patients, the aneurysm ruptures, causing headaches, dizziness and irreversible brain damage, he said.

A traditional treatment involves surgical clipping, in which doctors place a tiny clamp at the base of the aneurysm to stop or prevent bleeding. Another corrective measure emerged in the early 1990s: accessing the aneurysm through a leg artery—known as endovascular surgery—rather than performing an open procedure on the brain. That method was the standard for years, Kan said.

Since then, a popular treatment emerged involving installing coronary stents or detachable coils as a way to seal off the aneurysm. But for wide-necked aneurysms, this procedure is not foolproof; the coils can fall out, Kan said, so doctors have adapted by using a combination of clipping and coils.

Most recently, surgical clipping with endovascular therapy has become the preferred treatment for wide-necked aneurysms. Kan was among the first to treat patients with PulseRider, a neurovascular implant developed by the California-based medical device company Pulsar Vascular, which enables minimally invasive endovascular treatment for the complex brain aneurysm.

"I have a long-standing interest in devices used to treat brain aneurysms, so I'm involved in a lot of trials," Kan said. "I've done about six cases, and I'm trying to be one of the early adopters."

PulseRider's technology uses a collapsible, bony frame made of nitinol (nickel titanium) that is installed in a closed position through a leg artery. Upon reaching the aneurysm at the base of the skull, the frame opens like the scaffolding of an umbrella to reinforce the vessel walls and mitigate the problems of earlier endovascular devices while preserving blood flow. Essentially, the retrievable implant acts as a bridge for aneurysms located near a vessel branch point and is used in conjunction with coil embolization, where platinum springs are employed to seal an aneurysm to avoid rupture or hemorrhage, Kan said.

"We can use this as a bridge device," he said. "We put stents in to hold the coils, but putting in that much metal is a risk."

PulseRider leaves 90 percent less metal inside the patient than traditional stenting, Kan said, and also conforms to the anatomy of each patient's aneurysm.

A group of European and American researchers tested PulseRider in 15 patients with unruptured wide-necked bifurcation aneurysms and published the results in the January 2016 edition of the American Journal of Neuroradiology.

Among the 14 patients where PulseRider was effective, 12 showed complete occlusions, or closed blood vessels, and two showed neck remnants, which is the presence of a portion of the original arterial wall. The researchers concluded that "PulseRider stent-assisted coiling of wide-neck bifurcation aneurysms was feasible with low procedural complication rates," and that "preliminary results are encouraging," despite the study's small number of participants.

"It's a great device and there is an advantage to using it," Kan said.

In addition, the recovery period for patients treated with PulseRider is generally shorter than for those who undergo traditional open aneurysm procedures. In fact, Kan said, the first patient to receive this treatment at Baylor St. Luke's was discharged from the hospital the day after PulseRider was implanted. J asper Johns declared himself an artist more than six decades ago when he began exploring the human condition through drawing. Over time, his works have been associated with abstract expressionism and pop art. This month, a compilation of his drawings spanning from 1954 to 2016 will be the inaugural exhibit at the new Menil Drawing Institute.

The Condition of Being Here: Drawings by Jasper Johns takes viewers on a journey of what it means to be human—both physically and emotionally.

"We tend to think about drawings as pencil or pen on paper," said Kelly Montana, assistant curator at the Menil Drawing Institute. "These drawings are also oil on canvas, ink on plastic. ... You can see that the ink kind of does what it wants. ... It stops of its own volition."

Johns' half-century fascination with the human body and curiosity about the human mind are evident in his sketches, which are reminiscent of figure studies by Leonardo da Vinci and the abstract works of Pablo Picasso.

"For Johns, skin was a container, it was a material, ... a way to think about the body," Montana said. "The skin holds everything in and is part of this world."

In the studio of his Connecticut home, Johns covered portions of his body in oil to create *Study for Skin I*. Once the oil was applied, he rubbed his body onto a sheet of drafting paper and went back over the oil with charcoal to find impressions of his body to visualize the three-dimensionality of the human form on a flat surface.

"This concept of transferring the world into a flat surface is an idea that has longevity in art. Think of the Renaissance," Montana said. "How do we make the world seem like the way we see it on paper? It requires an understanding of vision, but also a complete reorientation of depth."

# CURATED

## The Intersection of ARTS and MEDICINE

By Britni R. McAshan



Drawings by Jasper Johns, clockwise from top: Study for Skin I, 1962 >> Flag on Orange Field, 1957 >> Study for Map, 1967 >> Untitled, 1990





The Condition of Being Here: Drawings by Jasper Johns *will be on display at the Menil Drawing Institute,* 1412 W. Main Street, through January 27, 2019. The institute is a new extension of the Menil campus. Information: 713-525-9400.

In *Green Angel* and an untitled drawing from 1973, Johns rearranges the human body. For the untitled piece, human body parts were cast and traced onto canvas with oil paint and graphite pencil. In an interesting twist, Johns did not place the tracings to recreate the human form, but jumbled them on the page.

"A subtle disorientation of the viewer is behind each of these works," Montana said. "He has taken the elements of the lips, moved the lips and he's moved them into this square configuration."

Johns also explores the emotional toll of life in his drawings. From his depiction of an anguished soldier returning home from the Vietnam War to more domestic drawings made from the vantage point of his bathtub, Johns conveys the subtleties of mood and circumstance.

"The way his life transpired in the mind's eye concerned him, so he went to see a psychologist," Montana said of the artist, now 88, a Georgia native who was raised in South Carolina. "The psychologist called this 'racing thoughts' and said that they are very normal. There are lots of different things in [this drawing]—it's the bathtub, it's a weird sign in German—things that are major moments in your life mixed with private moments and these moments that stand out to you for some reason."

Ultimately, Johns' work is suggestive, even subjective, which gives viewers a chance to pull from their own experiences and draw their own conclusions.

"I think [humanity] fascinated him," Montana said. "I think that if Johns wasn't such a masterful draftsman, I think in a lot of ways he would have been a philosopher."

# **Finding Opioid Alternatives**

Doctors and startups are proposing new ways to manage chronic pain without heavy medication

## By Christine Hall

elen Brindell is not thrilled about taking pain medication. "I want to manage the pain on my own," Brindell said. "I like to keep my mind in focus rather than take the drugs and not know what happens."

To watch Brindell on the job at a landscaping office or to converse with her, it's hard to tell that behind her bubbly personality and distinct Louisiana accent is a woman who plans her day around the possibility of physical discomfort.

Treatment for a tumor at the top of her spine and fusion surgery on her lower back left Brindell in chronic pain.

In the current health care environment, where providers are increasingly hesitant to prescribe opioids, doctors and startup companies are finding innovative ways to help patients manage chronic pain without relying on high doses of medication.

Among the problem solvers is Rex Marco, M.D., vice chairman of the department of orthopedics and sports medicine as well as chief of reconstructive spine surgery at Houston Methodist Hospital. He said the opioid epidemic started 20 years ago when "pain" became the fifth vital sign monitored by hospitals. Since then, preventing pain with medication has become a standard practice.

As an alternative, Marco now recommends digital health applications, including Stop, Breathe & Think for mindful meditation and The Back Doctor for daily exercises—as a way to avoid taking medication or, at least, to take less. Brindell tried both apps after

going to Marco for her back surgery. "It's amazing. The app takes in the information and gives you meditation homework," she said. "I had

10 Itation nomework," she said. "I had 20 minutes of meditation yesterday because my day was not so good."

Brindell explained that stress exacerbates her pain, but combining meditation and back exercises at night often leaves her feeling better by the next morning.

"Do I feel 100 percent? No, I'm never going to feel 100 percent, but it is enough to get me through the day until I get home and do the meditation and Back Doctor again. It's like exercising," she said.

Recently, the meditation techniques got Brindell through a particularly painful medical examination during which a sudden move nearly caused her to jump off the table. Rather than react with anger, she asked for a moment to refocus her mind so she could better tolerate the pain.

## Your brain on stress

Being more mindful is not only something Marco recommends to his patients, but a discipline he practices himself.

About three years ago, he started using meditation apps and practicing yoga following some life-changing experiences, including a divorce, one of his children almost dying from a fall and substance abuse problems in the family.

"I didn't know this about myself, but my brain didn't ever really stop," Marco said. "Just sitting there or I want to manage the pain on my own. I like to keep my mind in focus rather than take the drugs and not know what happens.

#### — HELEN BRINDELL Houston Methodist patient

lying there and being present was a completely new concept to me."

He has learned that being present is difficult for humans, who are often thinking about the future. While that kind of mental preparation can be helpful in finding success, the same mental acuity can lead people to dwell on what they could have done differently in the past.

"When we think about the future, we are really in a state of anxiety, and when we think about the past, we are often in a state of sadness or depression," Marco explained. "I was trained to think about how to prevent problems. If you do this, this, this and this, then this horrible thing won't happen. The people I revered the most were able to avoid problems and complications by having that approach."

When someone is anxious, the brain tells the body to be stressed out. The amygdala, the part of the brain involved in experiencing emotions, triggers the pituitary gland to signal the adrenal gland to release stress hormones, Marco said.



Even in that situation, people can pretend they are calm even though they are constantly stressed. Marco identified as one of those people, but knew it was not healthy, so he worked to turn his life around.

During his early years of yoga and meditation, Marco found quieting his mind difficult. He would think about things going on in his life, his patients, what just happened moments ago and even what might happen in the next five minutes.

A self-proclaimed perfectionist, he would get upset with himself for allowing his mind to drift. It wasn't until his instructor said it was acceptable to let his mind drift and come back that he allowed himself to take those steps.

"That was amazing to me," Marco said. "Probably the first time I tried yoga, I felt a sense of calm."

It was that sense of calm that inspired him to recommend the same exercises to his patients who were undergoing painful surgeries and wanted to reduce their reliance on opioids.

He read articles that discussed the amygdala as the center of fear and anger and how certain activities could calm those emotions and even help with pain cessation. When Marco sensed fear and anger in his patients, he suggested some of the meditation activities. Not only did patients report back that their anxiety was released, but, like Brindell, they were able to reduce pain, and, in some cases, stop using opioids altogether.

"It's not going to get rid of all of the pain, but the pain can be lowered through endorphins," he said. "I've

*Left:* Helen Brindell meditates and exercises to manage her pain.

seen patients come out of major spinal surgery without narcotics, but just taking regular pain medicine."

# Treating and avoiding addiction

Edythe Harvey, M.D., addiction psychiatrist at The University of Texas Medical Branch at Galveston (UTMB), treats patients for chronic pain who are addicted to pain medication.

More than 191 million opioid prescriptions were dispensed to American patients in 2017, according to the Centers for Disease Control and Prevention (CDC). The Center for Behavioral Health Statistics and Quality estimates that more than 2 million Americans are dependent on or abuse prescription opioids. And the CDC notes that, on average, 115 Americans die every day from an opioid overdose, which includes prescription opioids, heroin and fentanyl.

Amid an opioid crisis, Harvey and her colleague, pain medicine specialist Courtney Williams, M.D., created a task force to share ideas about educating staff, identifying community resources, monitoring opioid data and examining opioid alternatives.

Harvey confirmed there was a push in hospitals to make sure no one was in pain.

"However, if you are addicted to opioids, what are you going to tell the nurse about your pain? That is a problem," Harvey explained. "Lots of factors go into prescribing behaviors, which include prescribing more so the pain is taken care of."

(continued)

The UTMB Opioid Stewardship team, a result of the task force, is engaged in an awareness campaign. That work includes monitoring resources like the Texas PMP AWARxE system, a prescription monitoring solution to help identify people who may be going to multiple doctors for the same medication, and incorporating that data into electronic health records.

Team members are also exploring prescribing habits and opioid use.

"Most people need a little pain medication to get them through a surgery, but maybe that's just three days' worth rather than a 90-day supply," Harvey said. "We aren't trying to do a witch hunt—we want people to get their medication we just recognize it is one of the problems out there."

# Relief at the push of a button

Simply moving can be difficult for people in chronic pain, as can

getting a good night's rest.

Richard Hanbury, who lived with chronic pain for 22 years as the result of a life-threatening car accident which left him in a wheelchair, now uses his experience to help others.

As the founder and CEO of Sana Health, a medical device company attached to the Texas Medical Center's TMCx accelerator program for health care startups, Hanbury is developing a non-invasive pain relief device that resembles virtual reality goggles. Using neuromodulated light and sound stimulation, the goggles help patients with severe pain enter a state of deep relaxation in about 10 minutes, which then reduces pain levels.

Hanbury says the device brings the patient to an "altered state of consciousness," likening the experience to watching a good movie or being engrossed in a sports match.

The first day he used the goggles, there was some trial and error, though he still managed Most people need a little pain medication to get them through a surgery, but maybe that's just three days' worth rather than a 90-day supply. We aren't trying to do a witch hunt—we want people to get their medication—we just recognize it is one of the problems out there.

#### – EDYTHE HARVEY, M.D.

Addiction psychiatrist at The University of Texas Medical Branch at Galveston (UTMB)

to snatch a couple of pain-free minutes. Over time, as the team calibrated the device, Hanbury said those minutes turned into hours and now he is able to enjoy long periods without pain.

"I get normal pain, but I don't have any nerve damage anymore," he said, adding that the device was "literally life-saving. It's given me freedom and more control of my life."

Sana Health is currently conducting a clinical trial at Mount Sinai Hospital in New York and is moving toward U.S. Food and Drug Administration approval for the goggles. Hanbury will be demonstrating the goggles at the TMCx Demo Day event on Nov. 14 at the TMC Innovation Institute.

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# **Have Some Respect for Antibiotics**

people globally-more than cur-

superbug crisis could reverse the

medical gains of the last century.

times and the physician wanting

sometimes prescribed when they are not needed," said Cesar Arias,

M.D., Ph.D., professor of infectious diseases at McGovern Medical

School at The University of Texas Health Science Center at Houston

(UTHealth). "It is important for the

taken when they are not needed, it is

not only harmful for the patient, but

it is also one of the reasons we are in

Valdez maintains that antibiotics

the crisis of superbugs right now."

are among "the laziest medicines

in the world. They do not help you

get rid of the cough or the conges-

biotics do is kill the bacteria if and

when the bacteria is in your system.

... When you don't have the bacteria in your system, you will continue to

feel sick and build an immunity to

Alexander Fleming discovered penicillin, the world's first mass-

produced antibiotic, in 1928. Nearly

Infections such as tuberculosis,

pneumonia and gonorrhea, which

antibiotics, are now increasingly

were once successfully treated with

a century later, scientists and doctors around the world are

scrambling to find solutions to growing antibiotic resistance rates.

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tion or the fever. The only thing anti-

public to be aware that if they are

to please them, antibiotics are

rently die from cancer—by 2050. The

"With patients pushing some-

Use infrequently and only when necessary

#### By Britni R. McAshan

any Americans grew up in a time when running to the doctor for a shot of penicillin or a bottle of amoxicillin to clear up a pesky ear infection was commonplace. But antibiotics aren't the answer to every ailment, and their misuse has had grave global consequences.

"A lot of infections are from a virus and they do not need antibiotics," said Isabel Valdez, a physician's assistant and instructor in the department of family and community medicine at Baylor College of Medicine. "Antibiotics should be respected and used only when necessary and as infrequently as possible. We have to realize that antibiotics are finite ... and if we create a resistance, there may be a time when you need an antibiotic and it will not work."

Because the common cold and flu are both viruses, they do not respond to antibiotics. But many bacterial infections with similar symptoms do require antibiotics including some forms of pneumonia and strep throat, both of which present with a high fever and sore throat.

Antibiotics are among the most commonly prescribed drugs in human medicine, according to the Centers for Disease Control and Prevention (CDC). Yet as much as half of all antibiotics prescribed are not needed or are not optimally effective because they are not taken as prescribed. Valdez has witnessed this first hand.

"Unfortunately and regrettably, I have seen an abuse of antibiotics," Valdez said. "I have been in family medicine for 10 years and, very often, patients will come into clinic demanding an antibiotic because they woke up with green mucus or they have a cough."

Each year in the U.S., at least 2 million people get an antibioticresistant infection, and at least

# If we use [antibiotics] too much in a nonproper way, we are going to lose them. And if we lose them, we will die.

- CESAR ARIAS, M.D., PH.D. Professor at McGovern Medical School at UTHealth

23,000 people die, accordinguntreatable because of antibioticto the CDC. The World Healthresistance.Organization estimates that anti-<br/>biotic resistance will kill 10 million"Bacteria are millions of years

old. ... If you think about when we started using antibiotics, that is a very short span of time compared to the rest of the world," Arias said. "In the beginning, they were wonder drugs. Suddenly, injuries of war could be treated, organ transplants are now possible. But as we started using [them], the bacteria started to adapt and become resistant."

Arias chairs two groups that were created to address this crisis: UTHealth's Center for Antimicrobial Resistance and Microbial Genomics (CARMiG) and the Gulf Coast Consortium for Antimicrobial Resistance, which gathers researchers from Gulf Coast Consortia and TMC institutions.

"One of the missions in my life is to help people understand that we need to have a lot of respect for antibiotics," Arias said. "If we use [antibiotics] too much in a non-proper way, we are going to lose them. And if we lose them, we will die."

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# **Building Back Strength**

How blood flow restriction therapy has revolutionized sports medicine

#### By Alexandra Becker

our years ago, Walter Lowe, M.D., the team physician for the Houston Texans, watched as outside linebacker Jadeveon Clowney-the No. 1 NFL draft pick in 2014—injured his knee in the first game of the season. When word got out that Clowney would undergo microfracture surgery to help grow new cartilage in his torn meniscus, the sports world buzzed with speculation about whether he would ever play professional football again. After all, the highly-specialized surgery, which creates tiny punctures in the bone, requires at least six weeks of non-weight-bearing recovery. For a professional athlete, that could mean losing a lifetime of muscle memory and strength.

Not long after, Lowe got a call from physical therapist Stephania Bell, a medical reporter and injury analyst for ESPN. She asked if he'd ever heard of blood flow restriction therapy or BFR. Lowe, who is also the chairman of the department of orthopedic surgery at McGovern Medical School at The University of Texas Health Science Center at



Walter Lowe, M.D., is medical director of the Memorial Hermann IRONMAN Sports Medicine Institute.



Houston Texans linebacker Jadeveon Clowney rests during an NFL football game against the Indianapolis Colts on Sept. 30, 2018 in Indianapolis.

Houston and medical director of the Memorial Hermann IRONMAN Sports Medicine Institute, was only vaguely familiar with the concept. Bell told him about a physical therapist in San Antonio named Johnny Owens who had developed the treatment for patients at the San

Now it's an integral part of most physical therapy programs. It's all over the country. It's used in every NFL training room, every NBA training room—it really has blossomed very quickly.

- WALTER LOWE, M.D.

Antonio Military Medical Center, many of whom had returned from deployment with missing limbs or multiple broken bones. Those types of injuries, Lowe knew, were especially challenging because without the ability to bear weight on the limb during rehabilitation, it was notoriously difficult to build back strength—particularly enough strength for a prosthesis.

Could BFR work for Clowney? Bell arranged for Owens and Lowe to speak over the phone. It turned out the two actually knew each other; Owens had spent a month as a young physical therapy student under Lowe's tutelage.

Owens drove to Houston, where he and Lowe met with the head trainer for the Houston Texans to discuss Owens' technology. They walked through the science and took an in-depth look at the apparatus. It didn't take long before Lowe, speaking on behalf of the Texans and Memorial Hermann, said, "We're in."

The BFR device includes a tourniquet cuff and an instrument with a digital display that self-calibrates and maintains pressure. BFR works by fitting the cuff onto the limb above the injury and then adjusting the pressure of the cuff to reduce blood flow to the limb by 80 percent. While some blood still flows into the muscle, the tourniquet completely occludes the venous drainage out of the limb and creates a high-stress environment in that extremity. This "tricks" the muscle by making basic exercises extremely difficult; patients feel as if they are lifting very heavy weights.

"It creates a high-stress environment in that extremity down below where the blood pressure tourniquet is, and so under high stress, little muscle contractions can result in huge strength gains," Lowe explained.

The technique worked for Clowney, who recovered and has become the Texans' leading defensive player. In week four of the 2018 NFL season, he was named AFC Defensive Player of the Week after returning a fumble recovery for a touchdown in a game that ended in an overtime victory.

After introducing BFR to Houston via the Texans' training room, Lowe worked to get the devices into all of the Memorial Hermann IRONMAN Sports Medicine clinics. Meanwhile, Owens' star rose quickly. BFR success stories among veterans and professional athletes were shared far and wide. Over the past four years, the technique has become a mainstay in rehabilitation programs throughout Houston and the United States.

"Now it's an integral part of most physical therapy programs," Lowe said. "It's all over the country. It's used in every NFL training room, every NBA training room—it really has blossomed very quickly."

Professionals working with elite athletes have started to use the therapy not just for injury rehabilitation, but for routine training, as well, since lower weight load can reduce the risk of injuries outside the game.

Athletes "spend hours on their legs each day, so it's a way to strengthen without having huge loads applied to their bodies, which they get too much of anyway," Lowe said. "It substitutes lower-load exercise for some of the higher-load ones, and you can still build similar strength profiles."

BFR has become so popular that it is now being applied to the everyday patient.

Kyle Shortsleeve, a veteran of the U.S. Army, found BFR to be instrumental in his recovery after a partial knee replacement in July of 2017 at age 30. Shortsleeve, who spent six years on active duty, encountered a number of injuries during training and deployment. He was medically retired in 2015 due to osteoarthritis in his knee. After his surgery, he went to Memorial Hermann IRONMAN Sports Medicine Institute, where his trainers introduced him to BFR. Shortsleeve found the therapy helped with muscle hypertrophy—the growth and increase of the size of his muscle cells.

"One of the reasons why this therapy has been so helpful is because the more muscle I'm able to build, the more protected my knee joint will be," Shortsleeve said. "It was really effective when I was first recovering because it allowed me to gain strength and do some exercises that would contribute to hypertrophy without adding a ton of weight. I wasn't in a lot of pain and it was still relatively low impact."

Shortsleeve, who enjoys mountain-biking, snowboarding and backpacking, has regained his quality of life. He works in medical device sales and, according to his Fitbit, averages about 12,000 steps a day.

"I'm often standing in the operating room and I'm moving around in my customers' clinics, so I need to be mobile to do that and then have stamina to continue to live my personal life after a long day of work."

Just like Clowney, he isn't slowing down.



Kyle Shortsleeve uses a blood flow restriction (BFR) device at Memorial Hermann IRONMAN Sports Medicine Institute.

# *Congrats,* TMC Pulse

#### The Texas Medical Center congratulates *TMC Pulse* staff on recent awards:

**Alexandra Becker** won the 2017 Sigma Delta Chi Award for magazine writing (regional/local circulation), given by the Society of Professional Journalists, for "Alan Dickson's Final Days," a profile of a hospice patient.

**Cody Duty** won a first place *Houston Press Club Lone Star Award* for print photography for "Scar Stories: Portraits of Survival." These photos also appear in "Body as a Work of Art: More Than Skin Deep," an exhibit at The Health Museum that runs through Jan. 11, 2019.



**Britni R. McAshan** won a first place *Lone Star Award* for her column, "Curated: The Intersection of Arts and Medicine."

**Shanley Pierce** won a first place *Lone Star Award* for her magazine article "Twin Skin: 3 TMC Doctors, 2 Identical Sisters and 1 Extraordinary Transplant." Pierce also won a third place *Lone Star Award* for her column, "On the Side: How TMC Employees Spend Their Spare Time."

*TMC Pulse* won a first place *Lone Star Award* for magazine layout for the March 2017 issue.

Read the award-winning stories at www.tmc.edu/news/awards/

TMC TEXAS MEDICAL CENTER

# **Shauntelle Rings the Bell**

Irish teen's viral video raises money for her cancer treatment at Texas Children's Hospital

#### By Alexandra Becker

n 2017, teenager Shauntelle Tynan uploaded a tearful video to her YouTube channel revealing that she could no longer get the treatment she needed in her home country of Ireland for her rare form of cancer.

"The only worldwide specialist is in Texas," Tynan said to the camera in reference to Texas Children's Hospital. But, she added, "traveling to Texas comes with a price."

Tynan went on to explain that after a short trip to Houston, the specialists she worked with told her she would need to relocate to the city for successful treatment. Her disease, known as Langerhans cell histiocytosis (LCH), is so rare that it affects only 1 to 2 in 100,000 people, according to the National Institutes of Health. Tynan's case was especially complicated, making her specific condition one in millions.

"The doctors in Texas told me that if I don't come for at least 12 months, then they don't have a great chance of helping me survive," she said in the video. "There is no European specialist."

Her hope, she said, was that anyone watching the video would share it, and, if they could, perhaps host a fundraiser or donate "even one euro." Hers was a live-or-die plea. "I really want to raise this money," she said, crying. "Because I don't want to die."

Within days, Tynan's video went viral. Today, the video has gotten more than 85,000 views and, most important, the social media exposure helped Tynan's family raise more than \$700,000 for moving, medical and living expenses.

Tynan traveled to Houston sooner than she intended. Her health had deteriorated so much that her physician, Kenneth McClain, M.D., Ph.D., director of the Histiocytosis Program at Texas Children's Cancer and Hematology Centers, urged her to remain in Texas and begin aggressive chemotherapy.

Over the course of a year and a half, Tynan underwent numerous treatments—some of which were still in clinical trials—as McClain and his team worked to rid her body of the cancer. It was a physical and emotional roller coaster, but a journey made possible through the donations she received from individuals and charitable organizations.

"There were so many times where we would give ourselves a limit and think we'd be going



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home, and every time the limit was reached, we weren't able to go home yet," Tynan said. "It was breaking our hearts each time."

But this summer, after some adjustments to her medication routine, things turned around.

"It literally felt like overnight that it was finally working," Tynan said. "Everything started to come together."

Then, during an Aug. 14 appointment, she was unexpectedly declared cancer free.

"There was no response from us," Tynan, now 20, recalled while exchanging gleeful glances with her mother. "We were in complete shock."

By the time Tynan ran through a tunnel of outstretched arms from relatives, nurses, physicians and friends at Texas Children's Hospital on Sept. 28 and rang the bell signifying she was finished with cancer treatment, that shock had turned to joy.



Shauntelle Tynan rings the bell at Texas Children's after completing cancer treatment.

At the bell-ringing ceremony, Tynan presented a surprise present to the physician who saved her life: a check for \$10,000—the rest of the money from the funds she had raised—to go toward histiocytosis research. Her hope is that someday when a child or teen from another country receives her same diagnosis, they can stay in the comfort of their hometown; that even though her disease is rare, there will be enough investment in research for its cure. Today, Tynan is back home with her friends and family in Ireland. She still takes oral chemotherapy every day to keep her cancer from relapsing and she plans to spend the immediate future learning to drive and rebuilding her stamina. She intends to keep her popular YouTube channel active, and said she is grateful for having done so during her time in Houston—especially after losing much of her memory during some of the more aggressive chemotherapies.

"I like being able to look back and remember, even the low points, because now that you're at a better point, you feel even more grateful," she said. "You never think that's going to happen to you. You see it all the time, but it's crazy. It's life-changing. You look at everything in a different way. You'll never walk past an organization again without looking into it and trying to help."

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1 HARVEY LEVIN, M.D., professor of physical medicine and rehabilitation at Baylor College of Medicine, received the 2018 American Congress of Rehabilitation Medicine Gold Key Award.

2 MARY ELLEN TRAIL ROSS, DRPH, MSN, associate professor at the Cizik School of Nursing at The University of Texas Health Science Center at Houston (UTHealth), received a Gold Medal in the "Nursing Education: Faculty" category from The Good Samaritan Foundation.

3 | RONALD MCDONALD HOUSE

**HOUSTON** opened its newly renovated flagship facility, Holcombe House, at the end of September. The updated space brings accommodations from 50 to 70 bedrooms.

4 Three dozen health care innovation officers from across the country convened at the Texas Medical Center (TMC) for the inaugural HEALTHCARE INNOVATORS PROFESSIONAL SOCIETY (HIPS) conference in October.

conference in October.

**5** | The University of Texas MD Anderson Cancer Center joined communities and institutions across the country in hosting a local Biden Cancer Community Summit. One of the panels, "The Patient Experience: Improving Access, Navigation & Survivorship," included DAN BLUM, patient advocate; ALYSSA RIEBER, M.D., chair of general oncology at MD Anderson; DAMION SMITH, cancer survivor; JENNIFER KENNEDY-STOVALL, director of patient access support services at MD Anderson; and WELELA TEREFFE, M.D., chief medical officer at MD Anderson.

**6** | JAIR C. SOARES, M.D., PH.D., professor and Pat R. Rutherford, Jr. Chair in Psychiatry in the department of psychiatry and behavioral sciences at UTHealth, was named president of the International Society for Affective Disorders.

7 ANGELLE SANDER, PH.D., associate professor and director of the division of clinical neuropsychology and rehabilitation psychology at Baylor, won the 2018 William Fields Caveness Award from the Brain Injury Association of America.

8 MARK. A. WALLACE, president and CEO of Texas Children's Hospital, welcomed HIS EXCELLENCY MOKGWEETSI E.K. MASISI, president of Botswana, in September. Masisi met with clinical and executive leaders to discuss health care in Botswana and the continued relationship with Texas Children's.



Credit: Nos. 1, 2, 3, 5, 6, 7, 9, 10, 13, 14, 15, courtesy photos; No. 8, Allen S. Kramer / Texas Children's Hospital; No. 11, Jenny Antill; No. 12, Jeff Fitlow

8













DO YOU HAVE TMC PHOTOS YOU WOULD LIKE TO SHARE WITH *PULSE*? SUBMIT HIGH-RESOLUTION IMAGES TO: news@tmc.edu **9 CHERYL WALKER, PH.D.,** director of the Center for Precision Environmental Health at Baylor and professor of molecular and cellular biology, will receive the Roy O. Greep Award for Outstanding Research from the Endocrine Society at their annual meeting in 2019.

**10** | NICHOLAS MITSIADES, M.D., associate professor of medicine-hematology and oncology at Baylor and co-leader of the Nuclear Receptor Program at the Dan L Duncan Comprehensive Cancer Center, along with a team at Baylor, has been awarded \$6.3 million by the National Cancer Institute to develop tools to better understand biological causes behind racial and ethnic health disparities in prostate and breast cancers.

11 | Philanthropists LESTER AND SUE SMITH attended The Legacy of Motown gala, which raised more than \$83 million for TEXAS CHILDREN'S CANCER CENTER AND LEGACY TOWER. At the gala, Texas Children's President and CEO Mark A. Wallace announced that the new tower will be named The Lester & Sue Smith Legacy Tower in honor of the couple, who donated \$50 million.

12 | Rice University bioscientist NATASHA KIRIENKO, PH.D., won a new class of grant from the National Institute of General Medical Sciences called an R35. The five-year grant for nearly \$2 million will support efforts by Kirienko and her team to study a pathway in mitochondria.

**13 | MARK KUNIK, M.D.,** chief of the Behavioral Health & Implementation Program at the Michael E. DeBakey VA Medical Center Houston; professor of psychiatry research at Baylor; and director of the South Central Mental Illness Research, Education, and Clinical Center, received the Texas Society of Psychiatric Physicians Psychiatric Excellence Award.

14 | SARAH CANDLER, M.D., assistant professor of medicine at Baylor and the Michael E. DeBakey VA Medical Center Houston, was elected to the board of directors of the Texas Chapter of the American College of Physicians.

**15 | HARRIS HEALTH SYSTEM'S BEN TAUB HOSPITAL** celebrated the delivery of its 150,000th baby on September 23, 2018. Genesis Michell Bonilla, who weighed 6 pounds and 11 ounces, is the daughter of Ana Garay and Jose Antonio Bonilla.

# Calendar

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# November 2018

# 11/10

MD Anderson Cancer Center's Boot Walk to End Cancer Saturday, 1 p.m. MD Anderson South Campus 7007 Bertner Ave. Registration: mdanderson.org bootwalk@mdanderson.org 844-363-2262

# 11/13

Updates on Care and Research for Children with Angelman Syndrome Evenings with Genetics Seminar With Arthur Beaudet, M.D., Carlos Bacino, M.D. and Debra Sukin, Ph.D. Tuesday, 6:30 – 8:15 p.m. Children's Museum of Houston 1500 Binz St. bcm.edu geneticevenings@bcm.edu 832-822-4280

11/14

TMCx Demo Day-Medical Device TMCx medical device companies pitch their products Wednesday, 1 – 8 p.m. TMC Innovation Institute 2450 Holcombe Blvd., Suite X Registration required: eventbrite.com tmcx@tmc.edu 713-791-8855

# 11/15

State of the Texas Medical Center With TMC President and CEO William F. McKeon; presented by the Greater Houston Partnership Thursday, 10:30 a.m. – 1:30 p.m. Hilton Americas Houston 1600 Lamar St.

Individual tickets: \$90 - \$135 Information and registration: events.houston.org sfarid@houston.org 713-844-3682

# 11/17

**Get Your Rear in Gear-Houston 5K Run & Walk for Colon Cancer** Saturday, 7 – 9 a.m. Baylor College of Medicine McNair Campus 7200 Cambridge St. Fees: \$15-\$35 Registration:

Registration: coloncancercoalition.org/houston houston@getyourrearingear.com

FOR MORE EVENTS, VISIT *TMC.edu/news/tmc-events* 



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Mulberry Ln. Bellaire, \$2.7+ mil. Beverly Berry, 713.302.6999



Aberdeen Way Braes Heights, \$2.7+ mil. Jan Yardley, 713.882.1885



University Blvd. Rice/Museum District, \$2.6+ mil. Cathy Blum, 713.320.9050



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Hawthorne Montrose Area, \$660s Caroline Keeland, 832.524.4402



Inwood Briarcroft, \$1.9+ mil. Sharon Ballas, 713.822.3895



Mount Vernon Rice/Museum District, \$660s Carol Barndollar, 713.942.6837



Arlington Heights, \$750s Caroline Schlemmer, 713.446.2716



Sullivans Landing Sienna Plantation, \$590s Kristin Tillman, 281.785.3566

