

# TMC | PULSE

THE OFFICIAL NEWS OF THE TEXAS MEDICAL CENTER SINCE 1979 — VOL. 36 / NO. 11 — SEPTEMBER 2014

## The Cooley Legacy

.....  
*The man, and the vision, behind the  
Texas Heart Institute*

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## GENOME SEQUENCING // p. 12

**RICHARD A. GIBBS, PH.D., DIRECTOR OF THE HUMAN GENOME SEQUENCING CENTER AT BAYLOR COLLEGE OF MEDICINE, DISCUSSES THE POTENTIAL ROLE OF GENOMIC DATA IN UNDERSTANDING DISEASE RISK AND TREATMENT, AND WHAT HE SEES FOR A FUTURE WHERE GENOME SEQUENCING MAY BE A ROUTINE PART OF PATIENT CARE.**



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ROBERT C. ROBBINS, M.D.  
*President and  
Chief Executive Officer,  
Texas Medical Center*

This month’s TMC Pulse cover features Dr. Denton A. Cooley. Growing up in a small town in Mississippi, I was aware of the legend of Dr. Cooley and the incredible work being done in the Texas Medical Center. His work came to life through the firsthand account provided to me by a local general surgeon who permitted me to follow him everywhere he went during my high school years, even allowing me to scrub on cases with him once I was a college premed student.

Dr. Cooley performed Dr. McCraw’s coronary artery bypass operation in the early 1970s, and he mesmerized me with details of how he was one of twenty operations performed by Dr. Cooley and his team that day. Following his convalescence, Dr. Cooley permitted Dr. McCraw to go behind the scenes to watch the coordinated effort orchestrated by the Texas Heart Institute day in and day out. Learning that Dr. Cooley was the surgeon to the surgeons clearly inspired and motivated me to become a heart surgeon. I first met Dr. Cooley at the American Association of Thoracic Surgeons annual meeting in New Orleans in 1984 when I was a second year surgical resident. I naively just went up to this giant in American surgery and introduced myself and told him of my dream to be a heart surgeon. He was gracious and encouraged me to work hard to chase my goal.

In the years that followed, I got to know Dr. Cooley and was fortunate enough to be visiting the TMC on his 76th birthday. He had just performed a minimally invasive coronary artery bypass operation with the heart beating without the support of the heart lung machine. He told me that surgeons needed to remain curious, to innovate and to learn new methods to improve the care of their patients.

Dr. Cooley developed a friendship with my mentor, Dr. Shumway, the Stanford heart surgeon who is recognized as the Father of Heart Transplantation. They were members of a senior cardiac surgeons traveling golf group and enjoyed many memorable rounds of golf together. I always enjoyed Dr. Cooley’s visits to Stanford and when we established the annual Shumway lecture, Dr. Cooley served as the inaugural speaker.

Dr. Cooley has performed more heart operations than any surgeon in history. It has been my great fortune to know and learn from him. We are all so blessed to have him as the pioneering, innovative spiritual leader of the Texas Medical Center and we all should be inspired to continue the work that has been Dr. Cooley’s life mission—improving the health of the people of Houston, Texas, our nation and the world.

*Robert C. Robbins*

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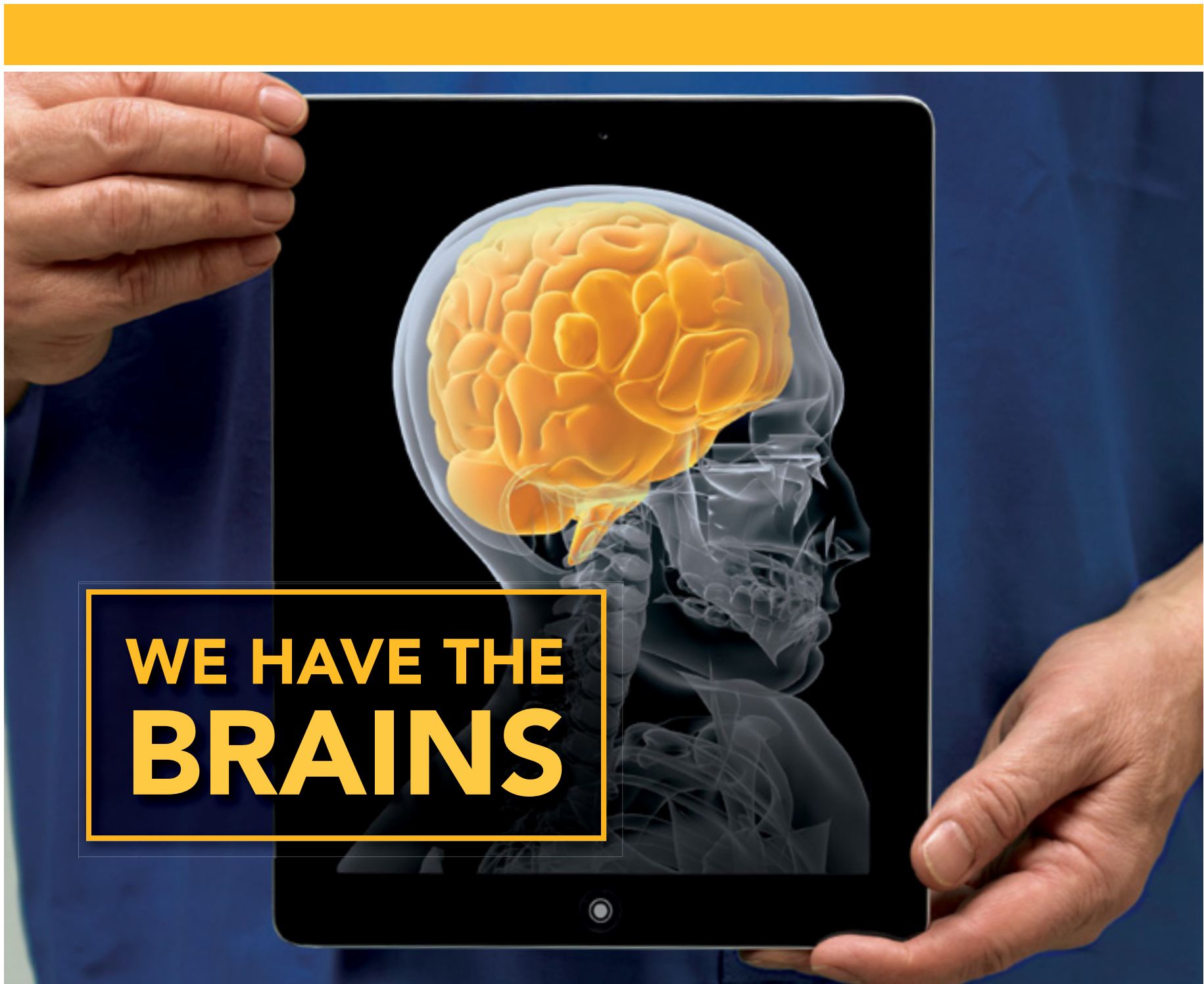


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ADVANCING HEALTH

## A Home Away From Home

WITH A TOTAL OF 86 ROOMS THROUGHOUT THE TEXAS MEDICAL CENTER, RONALD MCDONALD HOUSE HOUSTON OFFERS A WARM AND WELCOMING ENVIRONMENT TO FAMILIES OF CHILDREN FACING LIFE THREATENING CONDITIONS

BY ALEX ORLANDO



LEFT: On Holcombe Boulevard, a 50-bedroom house provides a welcome place to stay—often for extended periods—for families and children. In 2013, they provided 16, 583 nights of lodging to more than 519 different families. RIGHT: Ronald McDonald House Houston's resident Labradoodle Mogie, pictured with a young patient, helps kids and their families feel relaxed in their new home. "Mogie: The Heart of the House" by Kathi Appelt was released earlier this year. (Credit: Ronald McDonald House Houston)

At MD Anderson Children's Cancer Hospital, the aroma of chocolate chip cookies wafts through the air as a volunteer prepares to make her rounds. At Texas Children's Hospital, mothers and fathers find a moment of solace in the sanctuary of a private bedroom, resting their eyes for a few hours while harnessing the strength needed to support their child. At Children's Memorial Hermann Hospital, parents regain a semblance of normalcy and control as they do laundry and cook dinner, bolstered by the solidarity of other families who share similar experiences. On Holcombe Blvd, the frenetic beeping of hospital monitoring equipment is replaced by the ringing of infectious laughter and the eager barks of the House's resident labradoodle. At Ronald McDonald House Houston (RMHH), families with seriously ill children being treated in Texas Medical Center institutions find much more than warm beds and a roof over their heads—they're enveloped in an atmosphere of care, compassion and support.

Offering a nurturing environment to all families of children facing a potentially life threatening condition,

including those in need of an organ transplant, major cardiac surgery or fighting cancer, RMHH operates a total of 86 rooms and provides support services in several locations throughout Houston. Spanning across the medical center from a freestanding, 50-bedroom House on Holcombe Boulevard to smaller facilities inside Texas Children's Hospital, Children's Memorial Hermann Hospital and MD Anderson Children's Cancer Hospital, all of these programs loudly proclaim a home away from home in every detail from well-stocked bookshelves to ironing boards.

"We operate very much like a hotel in terms of the services that we provide, but the big difference is that this is a hotel with a big heart," explained Mikki Donnelly, director of advancement for Ronald McDonald House Houston. "The gift of a room and a place to stay is one thing, but the gift of sharing your story and finding solidarity is something else entirely. Very seldom do the families who have stayed here talk about the accommodations themselves, but they all talk about the sense of community with other families and the feeling of support that they receive from

volunteers who come in and just listen to what they have to say."

Families who come to Ronald McDonald House Houston are facing the reality of every parent's worst nightmare in the serious and often life-threatening illness of their child. In the wake of the trauma of their diagnosis, the prospect of finding a safe, affordable place to stay in an unfamiliar city, while dealing with a sick child, can make a stressful situation even more difficult. Coming from all walks of life and representing a full spectrum of cultural and economic backgrounds, these families journey on parallel paths—they all share a common bond through their children's experiences.

"The Ronald McDonald House provides, clearly, a place to stay, but that is way down the list of important elements," said Emily Crosswell, a member of the Ronald McDonald House Houston Board of Directors and an integral figure in RMHH's development since it's inception. "The families support each other, the staff and volunteers support the families, and the community comes into our House and is able not only



“ Very seldom do the families who have stayed here talk about the accommodations themselves, but they all talk about the sense of community with other families and the feeling of support that they receive from volunteers who come in and just listen to what they have to say. ”

— MIKKI DONNELLY  
Director of Advancement at Ronald McDonald House Houston

to share themselves, but take away something greater through their exposure to the courage of families who have been uprooted from their homes and are going through such stressful times in their lives.”

In 1978, spurred by Donald Fernbach, M.D., then head of the Hematology and Oncology Service of Texas Children’s Hospital, an assemblage of concerned parents of pediatric patients, McDonald’s franchisees and supporting members of Houston’s medical community began the initiative to build a Ronald McDonald House in Houston. Motivated by a collective desire to build a safe haven within the medical center, they worked tirelessly to bring their dream to fruition. Gaining traction thanks to the support of Bud Adams and the Houston Oilers and following in the footsteps of the Philadelphia Eagles and the Chicago Bears, who had also rallied beneath the banner of Ronald McDonald Houses, Houston’s NFL publicity machine kicked itself into gear to help raise awareness for the cause. With heightened support and visibility, fundraising began in earnest. Before the end of 1981, a 21-bedroom Ronald McDonald House rose near the Astrodome at 1550 La Concha Lane in Houston.

By 1992, the facility was at capacity, and families had to be added to a waiting list, leading the RMHH Board to initiate a capital campaign to build a larger House.

“After 10 years at LaConcha, we saw the need to not only expand, but to really grow and thrive, which would require a new site,” added Crosswell. “The Texas Medical Center had this location—the George Myers site—next door to the Houston Hospice on Holcombe Boulevard, which had previously been vacant. In fit in perfectly with our vision to build a larger home and provide van service to all of the pediatric hospitals in the medical center.” Thanks to the support and generosity of the Houston community, the new 50-bedroom House opened on Holcombe Blvd in 1997.

Providing a welcoming place to stay, often for extended periods, the Holcombe House combines the soothing luxury of a hotel—each private bedroom contains two queen size beds and a private bathroom—with an array of activities reminiscent of a cruise ship. In addition to both indoor and outdoor play areas for children that include everything from an indoor tree house to a putting green, a robust activity program developed with community partners—among them the Houston Symphony and the Museum of Fine Arts, Houston—acts as a much needed respite. For six weeks during the summer, the Holcombe House hosts

their own camp, which is open to all children and their siblings, reflecting their philosophy of creating a sense of normalcy for the families they serve.

“We can’t carry your child, but we can put a roof over your head, get you to your appointments—we run shuttles every morning because it’s so expensive to park in the medical center—and give you a diversion to keep your mind off the stress that you’re experiencing,” said Leslie Bourne, executive director of Ronald McDonald House Houston. “We don’t duplicate any services that are available at the hospital. We don’t do anything medical here. We’re here to comfort the families, make them feel safe and secure, and nurture them.”

That emphasis on a nurturing environment works in tandem with the Holcombe House’s efforts to help families reassert control over their lives. While different community partners prepare food several times throughout the week, shared kitchens and a community dining area allow families the opportunity to cook and socialize. The house also has a large laundry room. A Houston Independent School District accredited one-room school has been a fixture of RMHH for the past 32 years.

A typical conversation at the Holcombe House will often be punctuated by a resounding, enthusiastic ‘woof!’

“Mogie joined the team about five years ago—he pretty much runs the house,” laughed Donnelly. “He really is what makes this house feel like a real home and he’s not a therapy dog—when we were choosing a dog, that was intentional. Therapy dogs are trained to just sit and let themselves be petted. We wanted a family dog that can run around and chase tennis balls. Mogie is a true house dog, but without anybody realizing it, he provides a lot of therapy.”

Ronald McDonald House Houston has added locations to a handful of hospitals in recent years to address the needs of different patient populations within the medical center. The House inside Texas Children’s Hospital offers families a short-term place to call home while their child receives treatment in the neonatal, pediatric, or cardiovascular intensive care units. Consisting of 20 private rooms—available for brief overnight stays or nap time—a large communal kitchen, laundry facility, living area and quiet rooms, the feeling of arriving home allows the stress of the hospital to fade away momentarily. The House inside Children’s Memorial Hermann Hospital, a 14-room facility, serves families with children being treated

in either the neonatal intensive care or the pediatric intensive care unit.

“Just being close by is one of the biggest benefits of having the House right here in the hospital,” said Nanci Allen, director of hospital programs for Ronald McDonald House Houston. “Our locations are always right next to the populations that we serve to make it as easy as possible for the family. Here, it’s about the parents, and all they care about at this point is being close to their children. It’s kind of like grandma’s house—a very warm, cozy environment where you can have chocolate chip cookies or just take a nap. We don’t want you to feel like you’re in the hospital; we want you to feel like you’ve come home, for just a little bit.”

Four Family Rooms inside Texas Children’s Hospital offer families a comfortable place to rest while their children receive care. In 2013, as the newest addition to the RMHH network, a Family Room was added at MD Anderson’s Children’s Cancer Hospital. “It’s more than having a 1,000 foot space that serves as a waiting room, because we bring the feeling that exists all across RMHH into that space,” explained Bourne. “It’s that sensation of hope, that nurturing, warm environment that’s bolstered by the support of our volunteers—you’re not going to get that in a hospital waiting room where people are too busy to sit down and ask how you or your child are doing.”

“The hospitals that we serve keep coming to us and asking us to expand our programs—we bring a lot to them in exchange for valuable real estate,” she added “It’s becoming clear that we’re starting to impact research—published data has started coming out about how children cope better and heal faster if their family is staying in a Ronald McDonald House.”

While Ronald McDonald House Houston adapts their services to meet the steady advance of medical protocol and technology, their commitment to care and compassion is unwavering. “If we can help relieve stress for the adult, it translates to how they react towards their children,” concluded Donnelly. “Tension is counterproductive to the healing process for children. In a way, we’re the hospital’s customer service component—it’s a yin and a yang, where they work on the medical issues and we help them with some of the emotional issues. It’s a winning partnership. Who knew that chocolate chip cookies and fluffy chairs could do all that?” ■



(Credit: Ronald McDonald House Houston and Scott Dalton)



# Stronger Together

*Houston Methodist and Texas A&M join forces to enhance physician education and research innovation*

By Alex Orlando

As an emerging paradigm of inter-institutional collaboration continues to redefine the landscape of the Texas Medical Center, Houston Methodist and Texas A&M Health Science Center are partnering to bring even more innovative research and medical education to the state of Texas through several new health professions degree programs. Beginning in 2015 and serving as the cornerstone of their budding partnership, 24 Texas A&M medical students will begin clinical training and graduate research in Houston, with plans for that number to double by 2016. Houston Methodist doctors and scientists who participate in the program will receive Texas A&M faculty appointments and titles.

“The Texas A&M and Houston Methodist joint degree programs combine the strengths of our institutions to train the next generation of physician leaders,” said Tim Boone, M.D., Ph.D., co-director of the Houston Methodist Institute for Academic Medicine (IAM) and the new regional vice-dean for the Texas A&M College of Medicine. “Our programs will mentor young physicians to nurture their ideas for new cures and treatments, and provide them with the skills they need to turn these ideas into realities that improve health for patients everywhere.”

The medical degree program will begin with two years of basic medical science and pre-clinical training at Texas A&M Health Science Center College of Medicine in Bryan, and continue with the third year rotation and options for fourth year electives at Houston Methodist Hospital. As part of a joint M.D./Ph.D. degree program, Texas A&M Health Science Center will work with Houston Methodist to provide translational research opportunities on the Houston campus. Those individuals pursuing an M.D./Ph.D. joint degree will take their medical and graduate sciences classes at Texas A&M campuses and complete three to

four years of doctoral thesis work at the Houston Methodist Research Institute or the Texas A&M Health Science Center Institute for Biosciences and Technology, both leading medical research institutes.

“These are the kinds of programs Texas needs to cut through the barriers to medical innovation,” added Mauro Ferrari, Ph.D., president and chief executive officer of the Houston Methodist Research Institute and director of the Houston Methodist IAM. “They empower physicians at our nationally recognized hospitals to partner with our excellent universities and our growing biotechnology industry to use research dollars more effectively and achieve real progress in treating the worst diseases.”

Laying the groundwork for future generations of doctors and scientists, the institutions’ representatives view this collaboration as a tremendous asset for the city of Houston. “Through combined efforts, Texas A&M and Houston Methodist are offering aspiring physicians and clinical scientists a unique, unparalleled educational opportunity in an academically rich environment renowned for discovery and translation,” said Brett P. Giroir, M.D., chief executive officer of Texas A&M Health Science Center. “These are exciting times for the Aggie family as we continue to build our Houston campus, and in turn, lead world-class research and medical education in the most important health-related district in the world.”

Falling in line with the grand scope and ambitions of this partnership, it represents another step forward in Houston’s expansion efforts for the Texas A&M Health Science Center. This past January, the announcement of a two-year ground lease in the Texas Medical Center for future construction of a multidisciplinary research and education building adjacent to the Albert B. Alkek Building, which currently



Houston Methodist and Texas A&M Health Science Center are partnering to bring more innovative research and medical education to the state through new health professions degree programs in the Texas Medical Center. (Credit: Texas A&M Health Science Center)

houses the Texas A&M Institute for Biosciences and Technology, established a backdrop of growth which will continue to propel the fledgling institution forward.

Showcasing the alignment in philosophy and ambition between the two institutions, Boone feels a commitment to helping Texas A&M Health Science Center actualize those goals. “Symbolically, this is about reaching out to Texas A&M and saying, ‘You’ve been here for a while and we’d like to lock arms with you and bring you into the medical center in a larger way,’” he said. “It just makes sense to expand upon that relationship. With the plans for another research building on their existing campus footprint, we think

that Texas A&M Health Science Center needs to be in the mix—they’re committed to achieving that, and we’re committed to be a good partner for them to see that happen.”

“This really is a perfect collaboration,” concluded Giroir. “Although Texas A&M Health Science Center is relatively young, we’re one of the most rapidly emerging research institutions in the country. Houston Methodist is consistently rated as one of the top hospital systems in Texas and the nation. We compliment each other, and there’s tremendous synergy between clinical expertise, educational prowess and translational excellence. When you bring that together, special things are going to happen.” ■



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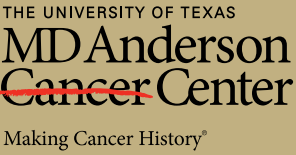
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# The Battle Within: America’s Veterans Work to Heal the Invisible Wounds of War

By Alex Orlando



In the wake of the United States’ longest combat operations since Vietnam, many service members return home with invisible—but no less devastating—battle scars. Research demonstrates that veterans deployed in Iraq and Afghanistan may experience mental and behavioral health needs that compromise their successful return to their families and their communities. “As service members, we’re programmed to accept everything that’s given to us and not really ask for help, even when we need it,” said Staff Sgt. Jamie Meza, a National Guardsman who was deployed to Iraq for 14 months from 2006 to 2007. “It took me a while to accept that I needed help and to recognize my own pride, because when you come back from deployment you really feel like you’re under a microscope—everyone wants to be around you because they missed you, but you also get the sense that they want to see if you’re visibly different. It’s very easy to put on this mask and let your exterior

show that you’re okay, when really you’re not.” Over 200,000 military veterans live and work in Houston and Harris County, making it home to one of the largest populations of military service members and families in the nation. Against the backdrop of this population, addressing the behavioral health needs of returning veterans in our own backyard is essential. According to a 2009 study from the RAND Corporation, one in five veterans returning from deployment in Iraq and Afghanistan meet the criteria for depression or post traumatic stress disorder (PTSD), yet only half of them have received mental health care. “We’re discovering that so many veterans are being diagnosed with traumatic brain injuries because this war is unconventional, and the amount of IEDs [improvised explosive devices] that we’re exposed to and the amount of fire that we’re exposed to really affects our brains and the way that we think

“As service members, we’re programmed to accept everything that’s given to us and not really ask for help, even when we need it. It’s very easy to put on this mask and let your exterior show that you’re okay, when really you’re not.”

— STAFF SGT. JAMIE MEZA  
*National Guardsman*

cognitively,” explained Tony Solomon, director of the Veterans Behavioral Health Initiative for Mental Health America of Greater Houston (MHA). “Often times, it doesn’t manifest itself until three to five years afterwards, so a lot of these diagnoses for traumatic brain injury and PTSD may come at a later period in time, when these veterans may be in school or at work. Soon, they’re able to discover that they might have not only some mental health issues, but cognitive and functional issues, as well.”

Compounding the issue, families of service members frequently do not have adequate community support. Ninety-four percent of military families feel that the non-military community doesn’t have the capacity to understand or appreciate the sacrifices that they make, based on a survey conducted by Blue Star Families, the largest chapter-based military families support organization in the country. For Bryan Seymour, who served in the Marine Corps from 2003 to 2007, that experiential divide between perspectives

“Unfortunately, there’s still a huge stigma associated with mental health. With warriors in particular, we’re taught to fight and never show pain.”

— TONY SOLOMON  
*Director of the Veterans Behavioral Health Initiative for Mental Health America of Greater Houston*

made transitioning back into civilian life incredibly challenging. “You change from being with your family, the family that you’ve been with every day, to people that don’t really know you—they can’t know you,” he said. “Being in the military, you all get to know each other really closely, whether it’s over the course of 24 hours or 24 months, and coming out of that environment, you’re forced to enter situations where you’re surrounded by people who can’t appreciate your experience.” In spite of the obstacles facing veterans and active service members returning from deployment, with the aid of peer support, community engagement, targeted assistance and outreach and increased access to available mental health services, the potential for veterans to thrive in their community and reintegrate with their loved ones is boundless. “I was in the presence of so much change and so much transition, and it finally came to a point where, as much as I thought I could handle it on my own, I just could not deal with it anymore and I wanted to be a better person for my son and for myself,” said Meza. “It was at that point that I needed to ask for help, but first you have to acknowledge that you need help. Don’t be so prideful that you think you can take it all on, on your own, even if you want to. You’re only human and you can only take so much. It takes courage to reach out and ask for help.” In an effort to better address the range of mental health care needs of veterans and their families, Mental Health America of Greater Houston joined forces with the Michael E. DeBakey VA Medical Center (MEDVAMC) for the second annual Veterans Mental Health Summit. Designed to enhance and establish relationships between the MEDVAMC and community partners throughout the Southwest region, supporting coordination of recovery-based care between the VA and their community partners will be invaluable in properly supporting returning warriors. The 2014 Veterans Mental Health Summit is a

collaborative community event, organized by the Michael E. DeBakey VA Medical Center, City of Houston-Office of Veterans Affairs, Mental Health America of Greater Houston, Gulf Coast Center and Hope for the Warriors. “Our most valuable resource is, of course, our staff,” said Laura Marsh, M.D., head of the Mental Health Care Line at the MEDVAMC. “We have a very large program at our VA in Houston that covers a broad swath of services. Each of our sites provides general psychiatric care, with clinicians who are embedded in primary care, in order to address shorter-term problems, but we strive to provide a continuum of comprehensive services.” Serving as the primary health care provider for almost 130,000 veterans in southeast Texas, the Michael E. DeBakey VA Medical Center treats veterans from throughout the county who are referred for specialized diagnostic care, radiation therapy, surgery and medical treatment. Understanding the complex relationship between emotional illness and medical illnesses, the MEDVAMC is home to a general mental health clinic, PTSD clinic, substance dependence program, and psychosocial rehab and recovery program while also demonstrating a commitment to a variety of research programs that intersect with clinical care. “Unfortunately, there’s still a huge stigma associated with mental health,” said Solomon. “With warriors in particular, we’re taught to fight and never show pain. So many of these men and women who have served have been deployed four, five or six times, and when you’ve been exposed to that amount of violence and trauma in life, it will affect you and it will change you and influence your professional and personal relationships.” “What people tend to think, on a national level, is to simply throw money at a problem, but individual communities have the privilege of serving military families,” he added. “Every community is different—especially out in rural communities, where



Through peer support groups—like the Combat Veterans Motorcycle Association—many veterans find comfort in sharing the challenges and triumphs of civilian life.

employment is a major issue and veterans aren’t always able to secure good employment, and outpatient clinics might also be limited in terms of their mental health services. The VA has adjusted accordingly to provide telemedicine and exchange medical information electronically, and the state has filled in some of the gaps with an increasingly expansive military veteran peer network. We’re really focused on peer outreach and using veterans that have successfully transitioned to connect military families with state, local and national resources, accordingly.” T’Liza M. Kiel, veteran volunteer coordinator for Veteran Support Services at the Gulf Coast Center and a veteran herself, believes that veterans are much more likely to broach the potentially turbulent waters of mental health issues with other veterans. “Peer support is so important because you’re dealing with cultural differences,” she reflected. “You’re more apt to opening up to someone who is familiar with your personal experiences, even before you open your mouth to begin to talk about it. From a personal perspective, it’s been a year since I came out of the military, and even after coming on and being able to take this position, it wasn’t until earlier this year that I actually went to the VA to talk to someone—volunteer coordinators and support groups haven’t just been a benefit to the community, they’ve been a benefit to me, as well.” In addition to cultivating a network of solidarity through peer-to-peer

support, providing services for the entire family is an essential element of recovery. “Families are a part of everything, from deployment to the transition and reintegration of service members—addressing their individual needs will also benefit the family as a whole,” said Chrystal Thompson, community development coordinator for Hope for the Warriors, a national nonprofit organization dedicated to enhancing the quality of life for post-9/11 service members, their families, and families of the fallen. “We have services and programs for all branches of the military, as well as for spouses, and we’re looking to incorporate more programming for military children. At the end of the day, they’re not always the ones who are at the forefront of discussion, but they’re the ones that have been in the action from the beginning.” For Donald Bay, who joined the Marine Corps in 1960 and retired in 1995 as a master gunnery sergeant, the decision to seek treatment would do more than sculpt the course of his future—it may well have saved his life. “I retired in January, and on the first day of April I checked myself into a program,” he recalled. “I truly needed that because my wife said I was institutionalized, and I was. The best day of my life was when I came into the VA program. It’s been hard but it’s also been fair—nobody’s promised me anything, and everything I’ve achieved I’ve had to work for. If it weren’t for the help I received, I would probably be dead.” ■





TMC SPOTLIGHT

**RICHARD A. GIBBS, PH.D., DIRECTOR OF THE HUMAN GENOME SEQUENCING CENTER AT BAYLOR COLLEGE OF MEDICINE, SAT DOWN WITH TEXAS MEDICAL CENTER EXECUTIVE VICE PRESIDENT AND CHIEF STRATEGY AND OPERATING OFFICER WILLIAM F. MCKEON TO DISCUSS THE VALUE OF INTEGRATING GENETIC DATA, AND A FUTURE WHERE GENOMIC SEQUENCING CAN LEAD TO PERSONALIZED PATIENT CARE AND TREATMENT.**

**Q | Tell us a little bit about your formative years.**

**A |** I was born in rural, Southern Australia. I went to college in Melbourne and was immediately enamored with biology and biophysics. Serendipitously, I came to the United States to work here in the Texas Medical Center with Dr. Thomas Caskey, at a time when we knew almost nothing about the structure of DNA changes that lead to genetic disease. But it was at a time when the technology was beginning to evolve and the human genome project was just a ‘twinkle in the eye’ of some key leaders. But this was a wave of excitement that began at that time.

**Q | Where were the epicenters of discovery at that time?**

**A |** The early genomics groups were widely distributed at that time. There were many groups that were involved at the genesis of the human genome project. There was a period of discussion in the late 1980s and a realization internationally that this might be a good thing—even though we didn’t really quite know what the ‘it’ would be. It was similar to the Mars mission now. For a while we talked about the ‘moonshot of biology,’ but really because there are so many challenges, it is more like today’s view of the Mars journey.

That was the mood for the early thoughts of the human genome project. Not even having a clue about what the good way to get there was. So there were probably about 20 groups that were seriously engaged in the project internationally. And of course, there were model organisms that were also tackled because they were simpler problems. So there was a period then, towards the late 80s, when things began to ferment. That was before the project really hit the ground in the very beginning of the 90s. It began with trying to improve the technology, a long way from being able to sequence the first human genome. The methods were really very crude by today’s standards.

Then there was a collapsing down of the number of groups that were involved. This reduction in the number of participants was partly because of the focus of the funding agencies. But also there was a realization by the participants that completing a human genome was a full time, long-term commitment. It wasn’t something one could do part time! You really had to want to get this task done. So the struggle to get the methods to high enough efficiency continued on through the mid 90s, then there was just about the moment that we saw the light at the end of the tunnel, a fierce competition with a private group emerged. That really kicked the public groups into action. Because

all those involved in the human genome community were committed to the idea that these data should be freely available to all researchers. The idea there was that we didn’t want a private group to sequence the genome and exercise DNA patents—like a ‘land grab’. We wanted to stimulate research, not hide information away and lock it up into early patents.

So we fought that battle and won. We got the data out there into the public domains by the early 2000s. That was the whole 13-year project from 1990 to 2003-2004. It was originally supposed to be a 15-year project with a \$3 billion dollar budget. We did it a little faster and cheaper.

**Q | I’ve heard people describe early genome sequencing as being like a New York City phonebook. There is a lot of information in there, and it’s hard to know what to do with it all.**

**A |** Great analogy—except at that time we did not even how many telephones are in New York or how to organize them! That would be the better analogy. So it wasn’t just taking existing phonebooks and stacking them in a pile. It was really figuring out what a phonebook might look like. There are very basic principles of biological research that were forged during that period. Those are some of the unrealized contributions of the human genome project, and more subtle transitions that occurred during that period, which people are really feeling the ramifications of now.

So what are those things? There is digitalization. Biology was completely an analog science up until then. That’s really critical because with the digitization you have a precision and an operability that you don’t have otherwise. Comprehensiveness was emphasized—the idea that you don’t just nibble at the side of a problem. Instead you slice it, you dissect it fully and then you completely describe it. That’s really a fundamental principle that’s practiced widely now.

Free and open data release was also a product of the project. Historically, scientists are very secretive about their data, right up until they publish it. We changed that principle. We developed a model where data can go straight from a machine, into the public view. That’s a huge contribution and one that is echoed in many projects now. In fact now, if you do a large project in biology, it’s very difficult to get traction and support unless you are supportive of free data release and free sharing. Those principles really have been transitional.

Another one worth mentioning is simply scale. Biologists historically have been small thinkers. I

really mean focused thinkers. They look down and practice reductionism to figure out problems. But the human genome project challenged that. I am not sure that is recognized. Now, when big projects come along, like Google mapping the world, people will often say ‘Well we can map the entire planet and have a click on view of every room in the world.’ You think that’s pretty amazing, but biology really got that going. Let’s take something as vast as the human genome and have a comprehensive complete view of it. So those principles really came out of the human genome project.

**Q | Talk about the cost of sequencing a genome today, as compared to the past.**

**A |** The advances are astounding. It was three billion dollars for the first half genome. We have two copies in each of us, so we only sequenced one for the reference. It was also a mosaic of many people’s DNA, and that’s what you see in the reference database now. If you get a new sequence, you compare it to that reference. The reference is pretty refined, but it’s still only a half copy and it costs three billion or so dollars to produce. Now, we have tremendous advances in the DNA technologies. These are all technologies that were around at that time, but took this long to do the engineering required to support them. But now, we are talking realistically about the \$1,000 genome. Today it costs anywhere from \$5,000 to \$8,000 for a genome sequence, but we’re really heading to a point where a \$1,000 genome is realistic. Now we’ve also got methods where we can look at just the interpretable part of the genome, the one percent that contains the genes. That cost today is now about \$600, and we’re thinking we can get that down to under \$100. So that’s very affordable. This is really key because when you think about general use, where a genome sequence becomes as accessible as an X-ray, that’s the order of cost that you need.

**Q | With this technology coming faster and being less expensive than it has been in the past, what should we envision in the next five to ten years relative to genomic data?**

**A |** I think it depends on how far you want to project, but in the five to ten year time frame, it’s almost certain that genome sequencing will be a routine part of your medical workup. That is, unless you have some personal objection. But from the medical point of view, there’s not rational reason to object. So because this is inexpensive and comprehensive, there are issues that can be discovered within that data that may be critical



to you. It will be a standard of practice. That’s a reasonable prediction.

**Q | How much of what you’re doing is starting to affect decisions on the therapeutic side?**

**A |** Well if you’re asking about what we can do today, it really does depend on your definition of intervention. It is growing, but we have some way to go. For example, we can ask today, if you are a cancer patient and you have your tumor genome sequenced, how often would that data impact your care? That’s an important question. The answer ranges from five percent to 25 percent. In five percent of the cases, you can find an answer that is truly directive for your therapy. This is taxol, or herceptin or other drugs that are targeted to specific genetic changes. There’s a clear direct link there between what you’ll find in the cancer profile versus what can be chosen for therapy. Now, to go from five percent to 20 percent, the definition of intervention needs to be ‘useful information.’ Then that includes a patient being steered towards a new trial or towards another drug that may not have been in the frontline before. Then there may be a subtle shift in the therapeutic regimen, so I think we’ve got ourselves in a bit of a corner if we paint the picture that this is truly directive for all patients at this time. If you are in the group that is helped, this is already very important. In the next five to ten years, more and more will be in that category.

**Q | Can you tell us about the team you have built within the Human Genome Sequencing Center?**

**A |** We have an accumulation of expertise. If you look back a decade, DNA sequencing was an art form. Now, even though many aspects of the process are ‘plug and play,’ the process is still challenging. There are parts of the genome that are very hard to understand and physically difficult to decipher. And it turns out that there’s actually enrichment of those hard-to-decipher regions that cause disease, so the challenge is even harder than it might seem at first. So simply what you get from some of these new machines with the standard methods analysis often needs to be improved by human experts.

Next, there is the general question of data analysis. Even if you have high quality data, how do you interpret it? That’s a whole industry on it’s own. There are complex challenges including those that result from the databases of reference information not being perfect.

**Q | If a patient came to you with a specific health issue of concern, what are the various techniques that could be employed?**

**A |** So the corner stone of this whole branch of science and medicine is genetics and genetic determinism. When you ask ‘when is something genetic’ and ‘what is the evidence that something is genetic,’ the best thing to do is to look and see if it runs in families. When you have an aggregation of a disorder with very similar pathology within individuals in a family, the immediate logical jump is that it likely has a genetic component. Now in some cases, that genetic component is very easy to track. If the disorder is very clear and its pattern of segregation in the family is unambiguous,

then that is a simple genetic problem often caused by a single gene, and a single letter change in the genome. You can go work with a family like that, track the gene for a disease successfully.

Other disorders just have a loose tendency to run in families. Examples are many of the behavioral disorders and cancers. We know there are genetic contributors and we know that understanding those will help us understand the mechanism of the disease. But it is a much more difficult problem to track down the genes for these common conditions. This is the big challenge in genetics and we are making good progress.

One of the things we discovered in the last five years is how much natural variation there is between each of us. We have known for a long time that if we sequence any new person, there would be about three million differences between them and the reference database. But we’ve learned more recently that even in the gene regions—the one-percent that really matters—there are hundreds of individual DNA changes that we will not likely see in anybody else on the planet. So we’re very different genetically from each other. Now that’s thinking just in terms of population, genetics and the structure of life. But it is also a big practical problem when you try to figure out these genetics stories.

For example we can examine different families with multiple siblings, some of whom have heart disorders, to find genes that cause adult heart problems. But when we do that, there are going to be a lot of parts of the DNA sequence that are unique to individual families, but that are not related to the disorder. So we have an issue of scale. We can’t learn things from three families, but perhaps we can learn something from 3,000 families. So if we want to solve these genetic problems and we want to apply the genetics tools we have developed, we really need to work with more families.

There is a big sea change in the ability to scale these activities. Historically, research and clinical care have been two activities that are well separated. For example, if you told your clinician about a family history of heart disease, I’m sure that you’d get that acknowledged but it would not have led to you becoming a research subject. If you heard about a heart disease study you might volunteer as a research participant, but not through your regular physician. Previously, the research investigator would have looked at enough families who volunteered in order to make a discovery about a particular gene. Then the researcher would declare that gene important in these families, and perhaps develop a test for and then tell the physician ‘You should test for this gene in families like that.’ That’s the current cycle that we have.

What we envision in the future when the act of sequencing entire genomes is more routine for all sorts of reasons, is that we can generate the data to complete that kind of research activity in a much faster and more direct way. So it would be as simple as an investigator could come to the clinical databases that have DNA sequence information, and with the right IRB approvals, and with consent, they could mine that data and say ‘Hey look at this. In all the families with that history of cardiac problems we find these

genes have these mutations every time.’ Hence, the discovery would be catalyzed by better collection of clinical data together with DNA sequence. It will be a faster and more efficient cycle.

**Q | You’ve played a really key role in leading the new TMC Genomics Institute design team. What would be your vision for a world-class clinical genomics program?**

**A |** Consider some of the things I said earlier about how genomics has changed research. One of the changes is the definition of deliverables in research. The genome project showed that quantifiable deliverables can be a part of a dynamic and active and flexible research program. So in the case of the human genome, we said ‘We’re going to determine this many letters’ and we then did that. This basic concept has become a quality of many different projects in biology. Now we can say that with new patients in the medical center, we quantitate the number that we can advantage by providing their genome sequence data, in their medical record. We can be specific and quantitative about the classes of patients, the needs of different groups of patients and the speed with which we can deliver genomic data to them as an adjunct to their current care.

**Q | So for families in the future, when sequencing may be as common as getting an X-ray, where do we begin to set that new standard of care?**

**A |** So it’s all about risk and familiarization. I think the clearest place to start is in reproductive health and in the administration of carrier testing for couples planning to have children. Clearly you want to be aware of the possibility of some inborn error that is inherited. That’s the easiest scenario to conceptualize. But the impact of these technologies actually goes on from there. For example, you can monitor the fetal genome early in development and that can impact care as well. There are really three main fronts in this area. One is these very early predictors to improve child health. The second one is in cancer prediction. Of course, many of us carry cancer predisposition genes and the story of the breast cancer gene is the most dramatic because you have the clear impact of the locus of the gene and the clear clinical follow up that you need if you are at high risk. But there are many other genes that impact cancer and should be considered. The third category of risk is where we’re lagging behind the most. You are an essentially healthy adult, you’ve had all of your cancer screens and you don’t have cancer in your family, why would you want your genome sequenced? What we tell healthy people right now, with the current state of knowledge, is that your need to have your genome sequenced today is minimal. But the fact is that there are many adults who are not healthy—or who have family risk they have not considered—or soon will have disease.

We can’t sequence everybody today. Even at \$100 a person it’s still too much of a burden. But as we see these methods grow to a greater efficiency and an even greater interpretability, and as we build programs that are based upon new families and upon



(Credit: Baylor College of Medicine)

people with pre-malignancy, we are going to see the numbers increase.

**Q | Tell me about your vision for a TMC Genomics Institute.**

**A |** I think that the unique nature of this opportunity is a reflection of the wonders of the TMC. When we talk about the mission of enhancing discovery to drive better health care, then we’re talking about programs that require scale and integration of very different kinds of data and effort. In a sense, this new opportunity is a kind of reflex from the specialization that we see in the current institutional structures. We really want to integrate the range of data that come from newborns to adults who have cancer. That’s the whole range there. Right now, if you’re in one category or the other, you basically go to different institutions. This is a chance to network and integrate the data and really synergize the information to create new discoveries. These new discoveries will improve care.

**Q | Do you see that exist anywhere in the world today?**

**A |** No. I think that is what keeps many of us here in Houston and so excited everyday. When you look out the window of our buildings, you see the vast, rich opportunities here. I don’t think there is anything quite like the TMC elsewhere on the planet. Certainly not from what I’ve seen. You see elsewhere the obstacles to achieving this kind of integration and comprehensive

amalgamation of data.

**Q | You were recently awarded the Companion of the Order of Australia, a prestigious honor issued by the Australian government. What did it mean to you?**

**A |** It’s very nice to get awards. It’s a reminder of the special opportunities that you have—to be part of the human genome project, for example. To be here and to be part of the teams that work here. It is an amazing community. It’s a synergistic community and when you look around the rest of the world at different places and you see the failures of others to interact, you realize that we’re doing pretty well here. We really are. So to be part of the TMC, and be part of the process, is a privilege. To have your life’s work do something that is enriching and improving other people’s lives, that’s just a really special opportunity. The accolades are nice, but that’s nothing compared to that. But I do get to go to Australia and have all my family with me. We’ll have a nice dinner at the governor’s house. That’s going to be fun.

**Q | Tell us about some of the mentors who have impacted your career.**

**A |** Well, the medical center here has a tremendous asset and legacy in doctor Tom Caskey. He virtually invented the field of human molecular medical genetics. He was an early force in the conceptualization of the human genome project. And, of course,

Dr. Michael DeBakey. I only had a small number of interactions with him, and he was a no-nonsense person. His emphasis on excellence is so important. If you do something, do it totally! That very basic concept is very powerful and should influence any investigator or clinician. So those two mentors were pivotal.

**Q | You’re young in your career, but have already accomplished so much. What are you most proud of?**

**A |** Interesting question! I think maintaining the standard of intellectual excellence in genomics and being a proponent of that. For a long time, and even now to some extent, there’s been a division between what’s regarded as experimental science—which is supposedly more intellectual—versus technology-driven science. So the notion was that somehow if you’re doing something with demanding technology, then that means you are not bringing intellectual wisdom to your work. That is simply wrong. I always tell students that their colleagues initially called the great evolutionary biologists of our time ‘bug collectors.’ So I think to be able to drive these technologies and the idea of high throughput biology and computational approaches to understanding biology into the practice of biological research is an achievement. There are individual inventions along the way, but this general achievement is probably the most important. ■





# The Cooley Legacy

**YEARS BEFORE HE IMPLANTED THE FIRST ARTIFICIAL HEART IN FORTY-SEVEN-YEAR-OLD HASKELL KARP, DENTON A. COOLEY, M.D., LAID THE GROUNDWORK FOR A HALF-CENTURY OF RESEARCH AND EDUCATION IN CARDIOVASCULAR SURGERY.**

BY AMANDA D. STEIN

His name is almost synonymous with hearts, and his reputation as a pioneer of cardiovascular surgery is well deserved. The legacy of Denton A. Cooley, M.D., reaches far beyond the walls of the Texas Heart Institute (THI). It is alive in the patients around the world whose hearts are still beating today because of Cooley and his team.

At 94 years old, Cooley continues to work nine to five, four days a week. The way he sees it, keeping an active mind is the best way for someone his age to stay sharp. A former University of Texas varsity basketball player, Cooley graduated with highest honors from UT in 1941. He still carries a scar on his chest in the shape of a UT symbol, earned during a junior-year social club initiation ceremony by The Cowboys involving a hot branding iron and tremendous UT pride.

After two years at The University of Texas Medical Branch at Galveston, he transferred to Johns Hopkins University School of Medicine, graduating Alpha Omega Alpha in 1944. As an intern, he assisted Alfred Blalock, M.D., on the first “Blue Baby” operation. Cooley earned his medical degree from Johns Hopkins, and served as a Senior Registrar in London with Russell Brock, a prominent heart surgeon. He went on to serve as a faculty member at what is today Baylor College of Medicine alongside the late Michael E. DeBakey, M.D., then the chairman of the Baylor department of surgery. The 1950s and 60s ushered in exciting advancements in cardiovascular surgery—from the introduction of open-heart surgery, to transplantation, to mechanical assist devices—and Houston’s renowned surgeons were at the center of it.

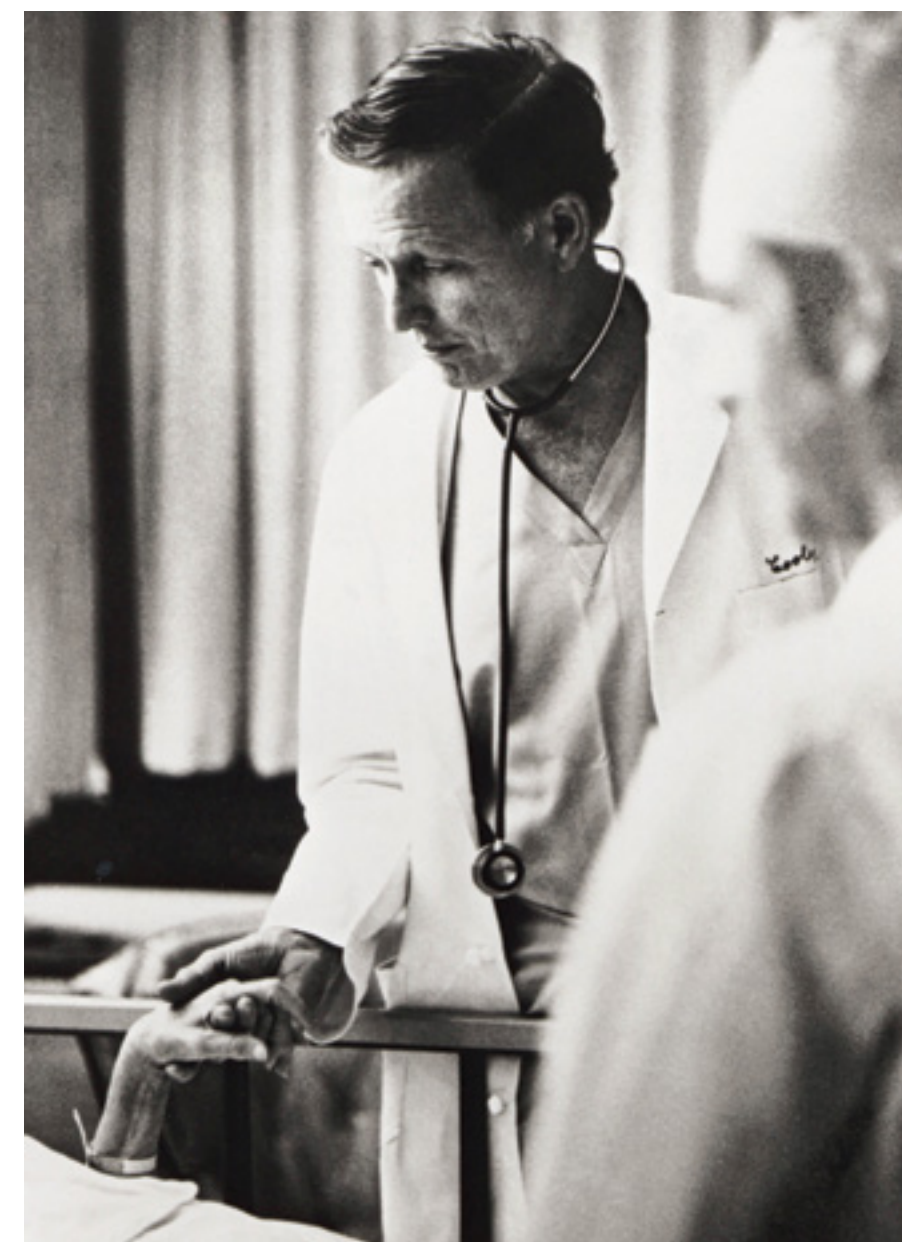
“I did the first successful heart transplant in the United States, and I was so impressed with the fact that you could actually replace this pump for the whole circulatory system,” said Cooley. “The

heart is one of the simplest organs in the body...not nearly as complex as the liver or the kidneys. The heart has only one function, which is to pump.”

The Texas Medical Center was growing at that time, and Cooley saw an opportunity to create a heart institute in a clinical partnership with what is today CHI St. Luke’s Health–Baylor St. Luke’s Medical Center.

“Dr. Cooley wanted to create an entity that would try, through research, to help people with cardiovascular disease,” said James T. Willerson, M.D., president of the Texas Heart Institute. “He and his colleagues at the time were doing most of the heart surgery for the entire United States, in adults and children. But he wanted to do more than the surgery, and he believed that he could establish a Texas Heart Institute that would be involved in research and education—the education of young doctors, in all facets of cardiovascular disease.”

Nearly seven years after the founding of the Institute, Cooley notably became the first in the world to implant a total artificial heart (TAH) in a human. The operation took place on April 4, 1969, when a device designed by Domingo Liotta, M.D., a surgical fellow at Baylor College of Medicine, was implanted as a bridge to transplant in forty-seven-year-old Haskell Karp. Karp survived the initial TAH implantation, and subsequent heart transplant



(Credit: Texas Heart Institute)

“Dr. Cooley wanted to create an entity that would try, through research, to help people with cardiovascular disease. He and his colleagues at the time were doing most of the heart surgery for the entire United States, in adults and children.”

— JAMES T. WILLERSON, M.D.  
President of the Texas Heart Institute

FACING PAGE: Cooley holds a BiVACOR total artificial heart. Research on the device is ongoing at the Texas Heart Institute.





Visiting surgeons from around the world gather to observe a procedure by Cooley's team in the early days of the Texas Heart Institute. (Credit: Texas Heart Institute)

“Dr. Cooley is probably the very best heart surgeon who has ever lived. He has great technical skills, enormous experience, the courage to tackle these things, and wonderful judgment about what needed to be done in individual patients.”

— JAMES T. WILLERSON, M.D.

sixty-four hours later, but he ultimately succumbed to renal failure and acute pneumonia.

“It was the first bridge to transplantation,” recalled Cooley. “We did not perceive having the patient live months or years with an artificial heart, we just wanted him to live long enough to find a donor.”

There have been immeasurable advances in cardiovascular medicine since then, largely due to the lessons learned from early assist and replacement devices. With each new device developed or innovative surgical procedure introduced, physicians worldwide are able to provide better patient care.

“Dr. Cooley envisioned the Texas Heart Institute as being committed to prevention and cure, as well as surgical repair,” said Willerson. “That continues still today, and all of this work needs to continue in the future. The direction

is exactly the same, but continues to enhance the basic research toward curative and preventative strategies.

“It was always about building a team that would work from the subcellular up to and through the devices, as a team,” he added. “A team devoted to trying to prevent cardiovascular disease. And when we can’t prevent it, to cure it or make it much more tolerable for the individual patient.”

O.H. “Bud” Frazier, M.D., THI director of cardiovascular surgery research, and a surgeon who Cooley proudly refers to as “one of my stars,” was an early champion of mechanical circulatory support. He is known for, among many other things, being the first to implant the HeartMate I left ventricular assist device (LVAD) in a human. That device would go on to become the most widely used implantable LVAD in the world. Together with William E.

Cohn, M.D., co-director of the Cullen Cardiovascular Research Laboratory at THI, Frazier remains active in the development of new heart assist and replacement devices.

The team also recently welcomed Daniel Timms, Ph.D., a biomedical engineer and native Australian who envisioned a heart replacement device that would be small enough for use in children, but powerful enough to support an active adult. He first began development of the BIVACOR total artificial heart over ten years ago as a Ph.D. candidate at Queensland University of Technology and The Prince Charles Hospital in Australia. After Timms met Cohn, Frazier and Cooley in 2012, the team began discussing plans to bring his lab to Houston. Today they continue testing on the device, hopeful that the magnetic rotating disc will reduce the likelihood of device failure due to mechanical wear over time.

Beyond mechanical devices, the THI team is also researching ways to help repair damaged hearts with the use of stem cells. Doris Taylor, Ph.D., THI director of regenerative medicine research, is exploring ways in which a patient’s heart could be repaired without the long-term use of a device. Taylor and her team have used a pig heart to demonstrate how healthy adult stem cells could potentially help repair or rebuild damaged organs.

“More women die of heart and vascular disease than all cancers combined. There are 35,000 children born each year with heart and vascular disease in the United States. And one out of 2.5 men worldwide will have heart and vascular disease during their lives,” explained Willerson. “So it’s really an important effort, and we have to help people realize that really the greatest threat to their health and their lives—no matter what their gender or age—is heart or vascular disease. And that effort has to continue.”

From treating patients to developing new surgical techniques or mechanical assist devices, the Texas Heart Institute has been impacting lives for 52 years. For those who have worked alongside Cooley in that time, credit is due, in no small part, to his personal commitment to the institute and the patients.

“Dr. Cooley is probably the very best heart surgeon who has ever lived,” said Willerson. “He has great technical

skills, enormous experience, the courage to tackle these things, and wonderful judgment about what needed to be done in individual patients.

“And, of course, he is the father of the Texas Heart Institute, and certainly one of the fathers of cardiovascular surgery worldwide. He has always encouraged others to do their very best, and be the best they can be in caring for patients with cardiovascular disease.”

Though he shows no sign of slowing down any time soon, Cooley acknowledges that time with family is something he enjoys most outside of work. He and his wife Louise have been married for 68 years.

“From a personal standpoint, I have always believed that a man who is going to get ahead has to have a balanced life,” said Cooley. “I’ve tried, for most of my life, to give my first attention to my patients and to my practice, but also to my family. I have a family of women...five daughters and my wife.

“An old friend of mine just invited me to a birthday luncheon for his 100th birthday, and I told him he was sort of a role model for me. I’ve always thought life was like a marathon,” he added. “You want to save some effort for the last hundred yards and have a little kick at the finish. And that’s what I would like to do.” ■

“From a personal standpoint, I have always believed that a man who is going to get ahead has to have a balanced life. I’ve tried, for most of my life, to give my first attention to my patients and to my practice, but also to my family.”

— DENTON A. COOLEY, M.D.  
President Emeritus of the Texas Heart Institute



TOP: Among those who consider Cooley a role model and friend is Texas Heart Institute President James T. Willerson. BOTTOM: Cooley and O.H. “Bud” Frazier review an X-ray of the first patient to receive a continuous-flow artificial heart. (Credit: Texas Heart Institute)



# Milestones in

1962	1964	1966
<p>1962</p> <p>Texas Heart Institute founded by Denton A. Cooley, M.D.</p>		

1967  
Christiaan Barnard, South African surgeon, performs the world's first heart transplant procedure.

1968  
*January 6, 1968*  
Norman Shumway,  
Stanford University  
Hospital, performs  
the first adult heart  
transplant in the  
United States.



1968  
*May 3, 1968*  
Cooley performs the first adult heart transplant in the Texas Medical Center. His patient, Everett Thomas, lives 204 days with the donated heart—longer than any other transplant recipient before him.



1969  
Cooley implants the  
first artificial heart  
in a human.

1972  
Establishment of the  
Cullen Cardiovascular  
Research Laboratories  
to advance the under-  
standing and treatment of  
cardiovascular disease.

1978  
First bridge-to-transplant  
with a left ventricular assist  
device (LVAD).

1985  
First laser  
angioplasty  
procedure in the  
United States.

1986  
O.H. "Bud" Frazier,  
M.D., performs the  
first implantation of the  
HeartMate pneumatically  
powered LVAD, as a  
bridge to transplant.

1981  
Second implantation of  
a total artificial heart in  
a human.

# Heart History

1991  
First patient in the world left the hospital with an electric, portable, battery-powered LVAD.



2000  
The Texas Heart Institute becomes the first in the world to use adult stem cells to treat patients with severe heart failure.

2001  
The Texas Heart Institute  
marks 100,000th open  
heart surgery.

2002  
Dedication of the Texas  
Heart Institute at St.  
Luke's Episcopal Hospi-  
tal-The Denton  
A. Cooley Building.

2003  
The Texas Heart Institute becomes the first nationally ranked cardiovascular center in the United States to open a cath lab medical simulation training center.

2004  
First center to receive FDA approval for human trials of adult stem cells to treat patients with advanced heart failure.

2006  
The Texas Heart Institute marks  
1,000th heart transplant.

2011  
First successful implantation  
of a continuous-flow total artificial  
heart in a human.



2012  
The Texas Heart  
Institute leads largest  
heart failure stem cell  
clinical trial to date.



2014  
Daniel Timms, Ph.D., and his team  
work to further development of the  
BiVACOR total artificial heart.



# Pediatric Sim Training Delivers Results

*With monitors beeping and the sound of a baby crying, trainees work though high-risk scenarios with the help of the Texas Children’s Simulation Center*

By AMANDA STEIN



Simulation training allows parents and physicians to practice life-saving techniques using high-fidelity mannequins. (Credit: Texas Children’s Hospital)

“The immersion aspect of simulation training is just so powerful. You may forget what you heard in lecture, but you will never forget the mistake you made during a mock code. As we say, a mistake made in simulation is not a mistake that will be made in real-life.”

— MARTIN LORIN, M.D.

Senior Teaching Faculty at Texas Children’s Simulation Center

For a family taking home an infant with a tracheostomy and ventilator, the reality of all that could go wrong can be “horrifying,” says Amanda Spears, mom to fifteen-month-old Christian Zachary Spears, a patient of Texas Children’s Hospital. But on the day when a complication with his tracheostomy tube caused her young son to stop breathing, Amanda knew exactly how to provide life-saving care—using a device known as an Ambu bag to provide manual breaths for respiratory support—while waiting for paramedics to arrive.

“We immediately started chest compressions,” Amanda Spears recalled. “Around the third cycle of us doing chest compressions and bagging him, he started breathing again. We bagged him until the paramedics showed up. They were just amazed with how well we handled the situation. Of course, emotions were high. But we were able to keep cool because we had actually been in this situation—not in real life, but in

training. We had practice and preparation for that moment.”

While all parents of infants on a ventilator with a tracheostomy go through standard training before the infant is released from the hospital, Amanda took part in a pilot program offered through the Texas Children’s Hospital Simulation Center. She trained for four different airway emergencies using a high-fidelity mannequin fitted with a tracheostomy tube.

“The high fidelity, or high tech mannequins that we use in simulations are very realistic. They do many things a real baby would do, providing an opportunity for traditionally health care providers, and now laypersons to practice management of life threatening situations. Our babies turn blue—signaling oxygen deficiency—breathe, cry, and have pulses,” explained Jennifer Arnold, M.D., neonatologist at Texas Children’s Hospital and medical director of the Texas Children’s Simulation Center. “We always say that the technology is great, and that’s what usually gets people excited about simulation, but it’s not about the technology. These high tech mannequins are just a tool to allow a learner to really practice what they would do in a real situation and get immediate feedback from the ‘patient.’ It’s really about the learning experience.”

Texas Children’s releases as many as fifty patients a year on ventilators, and hospital educators hope that hands-on training for various airway emergencies could help decrease mortality and readmission rates. Nationally, tracheostomy-related airway emergencies after discharge from the hospital account for three percent of deaths in this patient population.

In this simulation training program, trainees are given a series of tracheostomy-related airway scenarios—including a tracheostomy tube obstruction or a power failure—and are tasked with addressing the simulated emergencies with the skills they were taught in the classroom. As the trainees work

“The high fidelity, or high tech mannequins that we use in simulations are very realistic. They do many things a real baby would do, providing an opportunity for traditionally health care providers, and now laypersons to practice management of life threatening situations.”

— JENNIFER ARNOLD, M.D.

Medical Director of the Texas Children’s Simulation Center

through a scenario, simulation center educators are watching from a separate room, and video recording the exercise to refer back later during a one-on-one debriefing.

“The immersion aspect of simulation is just so powerful. You may forget what you heard in lecture, but you will never forget the mistake you made during a mock code,” said Martin Lorin, M.D., professor of pediatrics at Baylor College of Medicine and senior teaching faculty member with Texas Children’s Simulation Center. “As we say, a mistake made in simulation is a mistake that will not be made in real-life.

The family training pilot program, which ended in July and is currently becoming a part of the discharge education process for these patients and their families, is just one of the programs offered to deliver more personalized, hands-on training for families, physicians, and local first responders. The goal is to improve communication and provide a safe, controlled environment in which teams and individuals can prepare to handle high-risk medical situations.

In addition to the neonatal and pediatric mannequins, the simulation center also trains with a birthing simulator. They practice performing a complicated delivery, stabilizing mom and baby, and then transferring the baby to the team in the neonatal intensive care unit. It’s an opportunity to bring together all of the different individuals and teams that may play a role in the care of a single patient.

“I think what really makes our program unique is the emphasis on patient safety,” said Arnold. “Our priority is to improve medical errors, because we know that in our health care systems about 60 to 70 percent of medical errors are due to deficiencies in communication and teamwork. We really try to embed those crisis resource management skills into all of our simulations.

“For example, maybe the team leader calls for a dose of epinephrine

and they don’t say it specifically to one person. So two people are drawing up doses of epinephrine and two doses are given, or no one draws it up because it was a request in the air and everyone else thinks someone else is doing it and it doesn’t happen,” she added. “So the human factor has a play in medical errors. It’s not because people aren’t well trained or well intended. It’s just we don’t often get to practice as a team. Simulation provides an opportunity in real time to practice how we work together in a crisis.”

Even for personnel familiar with routine training and real-world medical emergencies, the chance to review decisions and outcomes in a controlled setting can be invaluable.

“Experience alone does not teach us everything we need to know about how to manage critical events and avoid errors,” said Kelly Wallin, assistant director of Texas Children’s Simulation Center. “By examining what happened—or did not happen—afterward with each team member in the room, we discover important information that would otherwise have been missed. And when it comes to talking about mistakes, we can create an environment where it is safe for people to talk about and learn from their mistakes.”

The team tries to run trainees through the most realistic scenarios possible, in hopes of preparing them to calmly and confidently care for a patient in a situation they might one day actually encounter. One of their training scenarios actually played out in a real-life scenario earlier this year when a baby was delivered in the parking lane outside of Texas Children’s. Lobby staff and medical personnel responded quickly to care for mom and baby.

“We practiced that scenario,” said Wallin. “We had done that in simulation before. I had to believe that lobby staff was so confident in their ability because we ran them through that scenario so many times.” ■



(Credit: Texas Children’s Hospital)





**EDWIN C. FRIEDRICHS, SENIOR PRINCIPAL FOR WALTER P. MOORE, REFLECTS ON WHAT LED HIM TO ENGINEERING, AND HOW THE INFRASTRUCTURE OF THE TEXAS MEDICAL CENTER HAS CHANGED OVER THE PAST SEVERAL DECADES.**

**Q | Tell us about your formative years.**

**A |** I was born in San Antonio and raised in San Antonio and South Texas. In my early years, I spent a lot of time with my family in South Texas. I have great memories of visiting with my cousins on their farms and hunting with them and my family.

During high school, I was interested in science. Back then there was no STEM program to really get you interested in science or engineering, but I always liked taking things apart and putting them back together. We worked on everything that we had at home. We didn't have people fix things. If something broke we fixed it. One of my grandfathers was a carpenter, and so I learned about building somewhat that way. My father always worked on his own cars, so I learned to repair cars. I guess what really led me into engineering was seeing a presentation by Texas A&M University at a high school career fair. That presentation clearly presented what engineering was all about and I liked what I saw.

As some people might say—although I don't like the phrase—I grew up on the wrong side of the tracks in San Antonio and went to a junior high school where I was right on the diving line. I did not know this, but

it was explained to me when I reached high school. I was in a poorer junior high school area by one street, but I was in a more affluent high school by one street. There were some 1,200 students in my class in high school, and very few of us came from my junior high school. We all had to push hard to get into accelerated classes. My parents were very strong supporters of my sister and me. They would say 'You can do anything you want to.' Once I was accepted into the more accelerated classes, the teachers were outstanding. The quality of the teachers and the encouragement from them was really great. When I was 14, I started work at a department store after school. I had one of the best bosses you could have. As a new employee, he challenged you, but he trusted you. In other words, he would give you responsibilities, as much as you could take. He never screamed at you, never corrected you. He was always encouraging. I only worked with him for two years before he moved, but he gave me a special education on management and leadership during those years.

One thing that I still remember today is my final meeting with my high school counselor to discuss my plans following graduation. During that meeting,

my high school counselor suggested that I not attend college and that I attend a technical school as it would be more appropriate for me. That meeting, along with my parents always encouraging me, inspired me to graduate from a major university.

My father is Austrian/German and my mother is German. Our whole family is very conservative, so it was clear I was going to a conservative school. When I visited the Texas A&M University campus for the first time, it obviously had a military influence. I was not in the CORP, but I lived in a CORP dormitory and actually was a waiter at Duncan Hall, which was their dining facility. I met a lot of good friends there.

**Q | Tell me about your job today.**

**A |** I always try to remember I have an internal job and an external job. One internal job is leading and teaching my staff. In personality trait studies, I've always been told that if I wasn't going to be an engineer I was going to be a teacher. It's something I really enjoy, so I take that on as a very important part of my job. Outside, I work a lot more on planning projects than the execution part. If you don't plan a project right, it will never end up correct. I try to develop strong

relationships with a few very important clients of growing areas such as Downtown, the Texas Medical Center, Uptown and, more recently, Midtown. The first three I probably have worked in since the early 80s.

**Q | So if we look around at the largest medical campus in the world, how many of these institutions have you worked with?**

**A |** We've worked with all the big hospitals but also with many of the smaller institutions. I have probably worked personally with 25 of the member institutions in the medical center. Our firm has done projects here since 1950. We have probably touched two-thirds to three-quarters of the buildings in the Texas Medical Center.

**Q | When you drive through the campus and see the buildings, do you often think back to what it took to actually build or renovate the area?**

**A |** I do, and what I remember sometimes more than anything is the people that made it happen. We did planning and we executed, but there were people who had to make the tough decisions to make it happen. Where do you spend money? What's the best use of the money for the Texas Medical Center and each of the individual institutions? The people on the boards and the people in charge of the institutions are really inspiring.

I think one of the things that is very clear is the amount the area has changed over the years. You can see that in some of the older aerial photographs you have of these facilities. When I came to Houston in the 70s, it was buildings surrounded by a sea of parking lots. To see it transformed, in turning parking lots into research centers, hospitals and clinics that are helping prevent diseases, is very inspiring to me and all of my employees that work with me on the projects. One thing that has really been great in the last 15-20 years is the focus on creating special places, retreats, for the patients and the visitors. They used come here and park on a surface parking lot, walk along asphalt for 200 yards to a facility for treatment. Or walk out of a hospital for exercise and walk across an asphalt parking lot.

Today there are parks, gardens, and shaded sidewalks. Photos of Texas Medical Center sidewalks are actually used in Scenic Houston's Streetscape Resource Guide as examples of a walkable area.

**Q | So as you look to the future of the medical center, and surrounding area, what are the things we should look forward to?**

**A |** I've been here many years and I've never seen the kind of collaboration going on between the institutions and I hope for that collaboration increasing. I worked in the 1990s on what was the pre-strategic planning effort. I have two four-inch notebooks with meeting notes from running information-gathering meetings. In many of these meetings, no attendees would say anything. It was a room full of silence if I was not talking. It took 20 questions for me to get an answer.

**Q | What do you attribute that mindset to?**

**A |** History. Historically it was just that way here. They were facing other issues also: uncertainty in government regulations and government funding, which are still issues today. There was a huge competition for talent. So there were a lot of things to be afraid of. There hadn't been a lot of collaboration, so there was no breaking of the ice to see how it could work.

There were probably a few instances where groups worked together. Back then, of course, the teaching schools provided doctors to the hospitals, but there were few researchers from different institutions working together. That's why it is so exciting to see what's planned now with the innovation centers. A lot of the leaders are standing up and challenging each other to be more collaborative, and many of them are standing together to support more collaboration.

**Q | How do you describe the Texas Medical Center to someone who is not from Texas or has never been here before?**

**A |** I see it as a place for hope for people, and I think that needs to be recognized more. Working here, I see the great buildings and I know what's inside and how much work it took from the leaders that made it all happen. But if we look from the outside world, of the patients and visitors, I believe they see something different. I've had many family members, coworkers and friends come here. I have four being treated at MD Anderson right now. They all see it as hope. To me that's an image that we need to see as we're doing our projects.

**Q | Is there anything that makes your work in the medical center area different from other areas of the city?**

**A |** In all of those areas, I've worked with the same group of people for more than 20 years. There are a lot of similarities, but the Texas Medical Center—in terms of the work we do as engineers and consultants—is much more mission critical. For instance, if a water line breaks and it's two o'clock in the morning, we have to do what we can to fix it or stop the problems that it's causing. If there's a fire in a garage, you have to be prepared because the consequences can be so much greater. Much like in the problems faced during Tropical Storm Allison. The consequences here are greater because there are so many people. The density is so great. The floor area ratio in the medical center main campus is greater than downtown or central uptown. It's one of the densest areas around for floor area ratio. Therefore, there are a lot of people in a very small space that are impacted by what we do.

**Q | What are some of the most exciting projects that you see coming about in the next five years?**

**A |** Hopefully in the very near future, the Innovation Center will take off and continue to gain momentum. It has the potential to really change the speed at which cures are found and delivered to the public. It will change attitudes and increase the hope that I mentioned earlier for finding cures and preventing disease.

A number of institutions also have major initiatives underway. Private developers are coming in with a number of projects specializing in hospitality, residential, retail and other support service developments that are badly needed in this area. Therefore, we have exciting projects of many types underway now and many more planned for the next five years.

**Q | What do you love most about your job?**

**A |** Right now, what I love most is teaching and helping other people be successful wherever I can. You asked earlier about formative years, but for me formative years never stop. If you're going to be a teacher, you have to keep learning. That's something that excites me in my job... learning something new that supports my goal of teaching. Being part of something as exciting as the Texas Medical Center is great. If you talk to the people who work here, you cannot help but get excited.

I need to bring more of my staff to the medical center to meet a researcher or a doctor who just cured somebody. If you ask them 'What are you working on?' they will talk for hours about how excited they are about the possibility of curing a patient or preventing disease. I'm reminded every day of what a great honor it is to just be contributing to this. It's so rewarding. It makes you want to come in early and work late.

**Q | Do you have any closing thoughts?**

**A |** I think one thing that's really held the Texas Medical Center together are the basic values that exist here. Everything you do here, everything we do in successful companies, has to be guided by your values. We see the Texas Medical Center as a critical part of our community. Walter Moore Sr. always told us 'Don't forget your community. If you have a strong community everything is going to be okay.' He encouraged innovation, which is something that is always inspiring at the Texas Medical Center, through research and trying to find new ways for cures and prevention. He was always big on innovation. I think those core values or thoughts for our firms helped strengthen our relationship with the Texas Medical Center. He used to always say 'Don't be afraid to innovate. If you think you're right and you can do it, don't be afraid to do it.' At our company, and I know at the Texas Medical Center, innovation is not optional.

The Texas Medical Center thrives on having some of the greatest talent in the world. It's not much different for our business. When we look to hire somebody, we look for someone who has passion, someone that has expertise in their desire to get better within their area, and somebody that can perform and actually make something happen. ■



# Baylor Joins NIH Undiagnosed Diseases Network

*Clinicians and researchers at Baylor join forces with other top medical institutions to address hard-to-solve medical cases*

By Zoe Quezada



Professor and Interim Chair of Molecular and Human Genetics, Brendan Lee, M.D., Ph.D., will lead a team of clinicians and researchers who will lend their resources and expertise to the Undiagnosed Diseases Network. (Credit: Baylor College of Medicine)

Eager to help patients and families who struggle for years without a diagnosis, the National Institutes for Health (NIH) has created the Undiagnosed Diseases Network to help provide patients with the answers they have been desperately searching for.

As part of an interdisciplinary approach, the NIH has selected six clinical research institutions from across the country to work together, combining resources and expertise to advance medical knowledge for these rare diseases.

Widely recognized for their advancements in genetics and genomics, Baylor College of Medicine has been selected to be a part of the

program and was awarded a \$7.3 million dollar grant to support their clinical site.

For the past six years the NIH has been developing the pilot program for the Undiagnosed Disease Network. The intramural program began at the NIH headquarters in Bethesda, Maryland, and took advantage of the clinical research resources available there. Since its inception, the program has evaluated people from all over the U.S. and has been successfully able to diagnose many of the participants.

Soon after the pilot program started, the NIH received an overwhelming response from physician referrals and patients who wanted to

be evaluated. Many of the patients who applied were admitted and put through rigorous research studies and testing for evaluation. Using their vast resources in genomics, the NIH provided specialized testing that, for many of these patients, was not readily accessible elsewhere.

As more diagnoses continued to be made, the NIH was able to make several discoveries of new diseases, and in some cases, they were even able to determine better treatment strategies for the troublesome diseases.

The program spurred a tremendous amount of new knowledge and the NIH recognized that if it wanted the program to expand, it needed to

collaborate with other top clinical research institutions.

“The NIH really wanted to take advantage of the enormous national resources to try to make discoveries and diagnosis in patients who have rare and unusual diseases which has been problematic in the health care system,” said Brendan Lee, M.D., Ph.D., the principal investigator for the Baylor extension site of the Undiagnosed Disease Network, Interim Chair of Molecular and Human Genetics, and founder and director of the Skeletal Dysplasia Clinic at Texas Children’s Hospital. “We (Baylor) have had a four decade history of leading in genetics and genomics in discovering new genes exactly aligned with the mission of this program.”

When the NIH announced its plans Baylor, and its hospital affiliate Texas Children’s, were determined to join forces and become a part of the program. Recognizing that its location in the Texas Medical Center could be a huge strength, they made sure to put that forward in the application process.

“We at Baylor have been very lucky,” said Lee. “I think what distinguished our application is a combination of the history of discovery we’ve had in genetics and genomics, the support and collaboration with the other departments at Baylor, and more broadly, the other institutions of the Texas Medical Center.”

“The Texas Medical Center has a wealth of expertise and I think there has been a long history of collaboration between institutions,” said Lee. “Potentially being able to tap into expertise at the investigator level has been a well established tradition and certainly adds to our strengths, because when you put an application like this forward it must showcase what we do well. But when we are dealing with undiagnosed disease, having the potential to tap into the broad scientific and medical expertise locally is an enormous strength. Our ability to reach

other colleagues in the Texas Medical Center has added real value when we think about the problems that we will encounter in this program.”

In terms of medical genetics, Baylor has proven strength in skeletal biology, cardiovascular biology, neurobiology and metabolic diseases for patients of all ages. Now, as a part of this program, Baylor will expand its focus to all organ areas, and at the same time lend its specialized expertise to other members of the network who may encounter struggles in their evaluation. As one of the core features of the program, all of the institutions in the network will take an interdisciplinary approach in evaluating patients.

“One of the mechanisms of this program is that if there is a patient with an unusual presentation who may benefit from our expertise, there will be collaboration between sites,” said Lee. “It’s a collaborative network. It may be that other sites may do the initial evaluation, and they say ‘Hey there are some unusual skeletal findings. The investigators at Baylor are really good at this. Let’s communicate and see if we can together identify the basis of the skeletal disease.’ It truly is a network; it’s not separate sites. At some level you’re actually leveraging the expertise broadly of all of these institutions.”

Of the six joining medical institutions, Baylor is the only site located in the South. Although patient evaluations have not yet begun, Baylor is already building a long list of patients from all over the region who want to participate in the program.

“We’ve got quite a big catchment area right now,” said Lee. “Even without the program being formally rolled out, we already have had many inquiries and we’ve been keeping a list to try and start responding to all of the patients out there once the program is activated.”

The network plans to begin its outreach with a centralized web portal that can be accessed by physicians and patients across the country. Referrals will be reported to the program, and in a regional fashion, institutions will then screen candidates to determine their issues and evaluate whether the work that has already been done on the patient was appropriate.

“At the end of the day, the initial decision of who gets picked will be based on if we can, given our abilities and resources, make an impact on that patient’s diagnosis,” said Lee.

“There are many patients who may have already had a complete work up. In that situation, we may not really be able to add very much and it would be a waste of their time and resources to bring those individuals here. We’ll focus on the ones where we think, based on what’s been done already, we can provide added value on the clinical research front.”

In cases where members of the network feel more work or evaluation should be done, and there is a possibility of identifying a diagnosable cause, patients will be invited to the nearest clinical research site for further study. Examples of resources that may be used in this program include imaging, physical examinations, and collections of bio specimens, as well as sequencing of the patient’s genome.

“A big part of this program will be sequencing of the patient’s whole genome, as well as studying other aspects of their genetic architecture, like doing family studies,” said Lee. “All of that information will then be collected and integrated by the team of experts in all different areas—pediatrics, medicine, neurology, genetics, and others—so we can determine what the most likely diagnoses are. That report will then be returned back to the patient, and in cases where there is actually a new discovery, we will then report that to the public.”

Lee says that the goals of the program are two-fold. First, the network wants to help patients and their families determine the cause of their illness. Secondly, the network hopes that by doing extensive research within a rigorous clinical research program, new discoveries will be made that will broadly impact the world of medicine. “We all are focused on helping the patient, but the patient also helps us and helps medicine broadly,” said Lee. “One of the features of undiagnosed disease is that often times, they point to new experiments in nature. When something goes wrong it causes a previously unrecognized disease. By identifying the cause, we will identify ‘new signposts’ of how things can go wrong in our bodies. By focusing on undiagnosed and difficult to diagnose disease, we may actually highlight something that no one has previously observed. These types of discoveries are the ones that can transform medicine and give us a more refined, higher resolution picture of the human body.” ■



“These types of discoveries are the ones that can transform medicine and give us a more refined, higher resolution picture of the human body.”

— BRENDAN LEE, M.D., PH.D.  
Interim Chair of Molecular and Human Genetics  
at Baylor College of Medicine





# Building a Brighter Future

## 28th Annual Harris County Precinct One Street Olympics’ Summer Games

By Alex Orlando



A’syria Williams gives a strong rendition of the national anthem to commemorate the final event of the 2014 Street Olympics’ Summer Games.

“Over the past 28 years, we’ve touched the lives of over 100,000 kids. If we made a difference in the life of one of them, then it’s been successful.”

— YVETTE CHARGOIS  
Chair of the Street Olympics Board of Directors

Cocooned by the triumphant sounds of high school marching bands, hundreds of children from community youth agencies throughout Harris County proudly pace around the perimeter of NRG Arena. Carrying homemade team banners emblazoned with the name of their organizations, the finalists are flanked by mascots and sponsors as they participate in a ceremony with grandeur and spectacle reminiscent of the international Olympics. As the torch ignites the Olympic flame, the all-too-familiar words from El Franco Lee, Harris County Precinct One Commissioner, echo across the stadium at the end of his opening address: “Let the games begin!”

On August 8th, about 2,300 boys and girls ages six to 15 competed in 12 events, from jacks to football-pass accuracy, at the culmination of the 28th Annual Harris County Precinct One Street Olympics Summer Games. Three hundred gold, silver and bronze medals were awarded in each sport and in each age division. The young athletes represent the best of approximately 3,500 participants who trained and competed for eight weeks at participating youth organizations. While the event will conclude this year’s Summer Games, other Street Olympics’ components will continue throughout the year, including the Harris County Aquatics Program, Traveling Naturalist Program and the Northeast Adolescent Program.

“The Street Olympics was not something that was contrived,” reflected Lee, who founded the Street Olympics in 1986, cultivating a well-rounded program offering an enriching educational experience to Houston-area youth throughout the summer. “It was something that helped me to develop and I believe in guiding others on the path to development—this is just a way to systematize that and harness the potential of the young people in our community.”

The Street Olympics’ Summer Games begins competition in

community based youth groups, such as the YMCA and City of Houston Parks & Recreation Department, in June of each year. Since its inception, the Street Olympics has grown from a summer-only recreational program to include four major components that address the social service, health care, educational and vocational needs of Harris County youth. Starting with a roster of little more than 200 participants, the program involved upwards of 10,000 youth and young adults this past year.

“Over the past 28 years, we’ve touched the lives of over 100,000 kids,” said Yvette Chargois, chair of the Street Olympics Board of Directors. “If we made a difference in the life of one of them, then it’s been successful. What we try to do is not just show them some fun games and fun things to do, but also try and educate and let them know that there are many resources available for them.”

Providing a cross section of Lee’s comprehensive efforts to address the needs of young people throughout Harris County, the Bright Futures Fair acted as a companion event to the athletic competition. It was held throughout the day at the other end of NRG Arena. The Bright Futures Fair consisted of 90 exhibitors who strove to keep the athletes busy between their events while exposing them to the wealth of opportunities available in Harris County and beyond.

“The Bright Futures Fair exposes kids to what’s happening in their community,” said James G. Wooten, Planetarium Astronomer at the Houston Museum of Natural Science (HMNS). “A lot of kids, especially those in the inner-city, aren’t sure of what’s available or what’s happening around them—the cycle often gets repeated where underserved kids get stuck in a rut because they’re not aware of the options out there. This exposes them to a sampling of everything and everyone

around them, and shows them what they’re capable of.”

Walking amidst the controlled, chaotic energy of the Bright Futures Fair, children could be found entranced by the mysteries of the universe under the Discovery Dome, HMNS’s portable, full-dome theater; descending into the depths of three different ecosystems at Discovery Camp’s exhibit, an extension of the Street Olympics’ Traveling Naturalist Program; or learning about the lush variety of herbs, plants and vegetables present at the Harris County Horticulture Department booth.

“A lot of these children who come from low income families don’t really have the opportunities to participate in anything like this—for them it’s a new experience,” said Christina Hartman, a naturalist for Harris County Precinct One who works with Discovery Camp, a one-day summer program designed to teach young people about their relationship with nature. “They might have never been hiking before or had the opportunity to visit a park setting outside of the city limits. We just want them to have fun in nature and value that experience, hopefully fostering a

respect for the things around them. We hope that they’ll want to protect the environment.”

After five hours of competition, entertainment, free lunch and the energy of the Bright Futures Fair, the Olympic flame is extinguished, closing out the 28th year of the games. Tired but happy athletes, many of them wearing their medals, make an organized exit to go home to celebrate their day. “Today is all about repurposing our connections, from the involvement of the Texas Medical Center to our partnership with NASA,” concluded Lee. “That’s what this

simple event accomplishes, as we try and light a spark or plant a seed, in anything from music to science, to initiate a conversation and generate ideas that could lead young people to become anything from a pediatrician to a musician. Even if that spark of an idea won’t manifest itself for a year to ten years, if we do that and that alone, then this mission will have been successful.” ■



LEFT: (Left to right) Torchbearers Dylan Martin, Leo Richardson, and Lilly Walton re-light the Olympic flame that was originally lit at the June 13 Opening Ceremonies. It was extinguished at the conclusion of the final medal presentation. TOP: At the exhibit for Harris County Precinct One Horticulture Department, students have the opportunity to learn about growing herbs, vegetables and plants. BOTTOM: At the booth for the Texas Medical Center, athletes are able to interact with a display that demonstrates different parts of the human anatomy.





# Patients as Partners

Researchers recommend larger role for patients in medical error investigations

BY ALEX ORLANDO



Embracing the potential for partnership, Eric Thomas, M.D., MPH, professor of medicine at the UTHealth Medical School, and Alicia Cole, a patient safety consultant, stand together in their efforts to engage patients in medical error analysis.

The potential to learn from our mistakes and improve upon them is limitless—it’s a defining characteristic of being human. In health care, a field where medical errors claim up to 98,000 lives each year, according to a 1999 report from the Institute of Medicine, the necessity of learning from those mistakes requires transparency, communication, and courage.

When a medical error occurs, a patient is typically informed of the mistake, but he or she is frequently not involved in the follow-up investigation. New research led by faculty at The University of Texas Health Science Center at Houston (UTHealth) Medical School suggests that clinicians may be able to enhance patient care by better utilizing the input of their patients. Their findings appeared in the January issue of the peer-reviewed journal, Health Affairs.

“We’ve learned that a health care organization which does not ask patients what they know about the causes of the error that harmed them has unfortunately decided up front to have an incomplete picture of what happened and why,” reflected Eric Thomas, M.D., MPH, the study’s senior author and professor of medicine at

the UTHealth Medical School. “This limits the organizations’ ability to learn and improve.”

Thomas and his colleagues interviewed 28 people with firsthand medical error experience during the first phase of his study. Nine were patients or the family members of patients impacted by an adverse event. In addition to recounting their personal experiences, patients and their families shared their thoughts on how they would like to see follow-up inquiries handled. The remainder of those interviewed were clinicians or administrators at hospitals owned or affiliated with The University of Texas System, who reported that patients and their families were typically not included in post-event analysis.

Alicia Cole, a patient safety consultant who was unwittingly thrust into the realm of advocacy after contracting a preventable hospital-acquired infection in 2006, was one of the patients interviewed. “The thing that struck me is that when I was interviewed, the questions themselves didn’t seem to be judgmental or dismissive,” she said. “I’ve been interviewed before and if you’re asked a question and start really delving into the answer, and it doesn’t

“Patients need to really begin to be involved in every step of the disclosure of medical errors [...] Rather than be afraid of patient input, it’s about embracing it.” — ALICIA COLE Patient Safety Consultant

reflect positively on the hospital, then the next question veers into the opposite direction. They didn’t do that—they really wanted to hear the good, the bad and the ugly.”

Cole is no stranger to consequences of medical complications. Following a routine procedure, she immediately began showing classic signs of sepsis. Instead of being discharged after two days, Cole spent the next two months in the hospital fighting for her life. She had contracted a severe, tissue eating, hospital-acquired infection, which resulted in a bedside surgery, five more operations and nearly cost Cole her leg, as well as her life. Since her recovery, she has gone back to school and received a Graduate Certificate in Healthcare Management and Leadership from the University of California, Los Angeles in order to better collaborate with administrators and policy makers.

“We need to begin to involve patients in every step of the disclosure of medical errors, from investigations to surveys given as soon as they leave the hospital,” she added. “Rather than be afraid of patient input, it’s about embracing it.”

While many health care institutions aspire to communicate with patients and families after an adverse event, investigating what happened is a parallel, separate process known as the event analysis. One way for hospitals to involve patients in patient safety efforts is to include them in the event analysis, allowing them to offer their unique perspective and a privileged vantage point.

“There are so many benefits to

involving patients. You’re going right to the source,” said Cole. “Patients are experiencing a health care facility 24/7, and they’re not experiencing it in silos. A patient has experienced every department, from housekeeping to coordination of care. They can give you a 360-degree view of your facility, as opposed to a singular, administrative perspective that arises when health care leadership is talking to one department at a time.”

Historically, involving patients who have been injured as the result of a medical error hasn’t been standard procedure. The possible legal risks have made health care providers, as well as clinicians, concerned about potential litigation. In addition, staff members might feel inhibited in the presence of the patient, making it more difficult to disclose important information. Timing is a delicate factor, balancing the desire for patient input with sensitivity towards their emotional distress.

The next step in the process, according to Thomas, is to try and address the barriers to engaging patients in the analysis and learning process after their own event. “To do that, it takes a very strong degree of institutional commitment, and even a little bit of courage,” he said. “It’s essential that top leadership, as well as clinicians and quality improvement and risk management departments, are supportive, paving the way to provide more education and implement change.” ■



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# Looking Up

SINCE 2012, MORE THAN 75,000 VISITORS FROM AROUND THE WORLD HAVE COME TO EXPERIENCE THE TWILIGHT EPIPHANY

BY ZOE QUEZADA

Thoughtfully crafted to be more than just a beautiful piece of art on Rice University’s campus, the James Turrell “Twilight Epiphany” skyspace offers visitors from all over the world a chance to participate in a contemplative, awe-inspiring experience.

The skyspace is one of Turrell’s largest public installations and is comprised of a two level, pyramidal structure that is designed to seat up to 120 people. The optimal viewing time occurs each day during sunrise and sunset when carefully conducted light performances fill the space with vibrant colors in accordance with the movement of the sun.

“When people come and visit the skyspace for the first time and walk out after they’ve experienced a light sequence, they have this sort of euphoric feeling,” said Emily Stein, assistant director of Rice Public Art. “They enjoy it and they’re mesmerized by it and they just want to understand it more.”

Turrell, the artist behind the skyspace, is known for his immersive art installations. A pioneer in the Light and Space art movement, he was recently awarded the National Medal of Arts following a three city retrospective tour held in 2013 at the Los Angeles County Museum of Art, the Museum of Fine Arts Houston (MFAH), and the Guggenheim. His work explores the effects of sensory deprivation, the psychology of perception and what it means to come into the light.

“Some artists choose to paint, some artists choose to draw, and Turrell chose light,” said Stein. “He’s regarded for being on the forefront of this movement.”

Houston is fortunate to have more public installations by Turrell than any other city in the United States. In addition to the “Twilight Epiphany” at Rice, other local works of his include “The Light Inside” tunnel at the MFAH, and the Live Oak Friends Meeting House in the Heights. Over the course of his 40

year career, Turrell has created over 80 skyspaces in 25 different countries.

“Turrell’s work is groundbreaking,” said Stein. “Anyone who has experienced one of his installations understands that his work is moving in a way that art should be. It taps into a level of emotion that artwork really should stir within you. I think it was long overdue for Turrell to receive such a high honor [as the National Medal of Arts].”

At Rice, his installation is unique in more ways than one. Commissioned through the aid of a generous alumna, Suzanne Deal Booth assisted the artist during the early days of his career in the 1980s. Booth played a direct role in helping Turrell build his first skyspace at the Museum of Modern Art PS1. She maintained a friendship with the artist throughout his career and was excited to commission the artist to envision a skyspace for Rice as part of the university’s

pledge to provide great artwork that is truly accessible to the public, through the Rice Public Art program.

Built to be enjoyed by both students and the large flow of visitors from Houston, the skyspace is much larger than Turrell’s other spaces. Most of Turrell’s commissioned skyspaces are small and intimate in size, with a seamless view between the walls and the opening to the ceiling. The “Twilight Epiphany” skyspace is large enough to fit 120 people, and has an open air viewing deck on the upper level that allows visitors to see beyond the skyspace and look at the other buildings at Rice and the nearby medical center.

Additionally, the skyspace was acoustically engineered to create a space for interdisciplinary art and collaboration for Rice students at Shepherd School of Music. The school hosts musical performances throughout

the year, both during the daytime and in the evening after the sunset light sequence. As an added gift to the students, Turrell composed a unique light sequence for the Rice musicians, to accompany their performances.

“What I love most about this space is that it inspires everyone,” said Stein. “People who do not have an artistic background, or who don’t really consider themselves art lovers are inclined to want to learn more about art and to understand what sort of experience they just had. It’s an emotional experience and it’s a different experience for everybody.”

The installation is open to the public six days a week. Admission to the space is free, and reservations are only required for the light performances at sunset. ■

“Turrell’s work is groundbreaking. Anyone who has experienced one of his installations understands that his work is moving in a way that art should be.”

— EMILY STEIN  
Assistant Director of Rice Public Art



At sunrise and sunset, the Twilight Epiphany skyspace changes colors as part of an elaborate light sequence designed by artist James Turrell. (Credit: Rice University)

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**DEAN B. ANDROPOULOS, M.D.**, has been named anesthesiologist-in-chief at Texas Children’s Hospital. Andropoulos, who is also a professor of pediatrics in the section of anesthesiology at Baylor College of Medicine, leads a department of more than 50 fellowship-trained pediatric anesthesiologists who perform more than 35,000 anesthetics annually. Author of more than 50 peer-reviewed articles, 20 textbook chapters and two textbooks, Andropoulos serves in various leadership roles. He is the founding director and first president of the Congenital Cardiac Anesthesia Society and the leader of the Pediatric Anesthesia Leadership Council Task Force on Advanced Pediatric Anesthesia Fellowship Training.



**C. EDWARD COFFEY, M.D.**, a neuropsychiatrist and health care executive, has been named president and CEO of The Menninger Clinic, one of the nation’s leading psychiatric hospitals, effective September 29. Coffey will have a faculty appointment at Baylor College of Medicine in the Menninger Department of Psychiatry and Behavioral Sciences and the Department of Neurology. A proven leader and collaborator, Coffey was most recently vice president of the Henry Ford Health System in Detroit and concurrently served as CEO of Henry Ford Behavioral Health Services and chair of psychiatry for the Henry Ford Medical Group.



**SUSAN TOTORELO EMERY, PH.D.**, has been awarded the Douglas B. Kirby Award for Adolescent Research. Emery is a professor of Health Promotion and Behavioral Sciences and Epidemiology at The University of Texas Health Science Center at Houston School of Public Health. She is also director of the Center for Health Promotion and Prevention Research as well as director of The University of Texas Prevention Research Center. Emery has more than 20 years of experience conducting research on risk and protective behaviors regarding adolescent physical and mental health.



**ANITA HUFFT, PH.D., MSN**, has been named the new dean of the Texas Women’s University (TWU) College of Nursing for the university’s Denton, Dallas and Houston campuses. A TWU alumna, Hufft previously served as dean of the College of Nursing and Health Sciences for Valdosta State University in Georgia. She began her duties at TWU on July 15. A registered nurse, Hufft served as a professor of nursing and dean of the College of Nursing and Health Sciences for Valdosta State University since 2004. She also has held academic appointments at Louisiana State University, among others.



**PHILLIP ORLANDER, M.D.**, director of the Division of Endocrinology, Diabetes and Metabolism at The University of Texas Health Science Center at Houston (UTHealth) Medical School, has been named the 2014 Physician of the Year by the Houston Chapter of the American Diabetes Association. The presentation was made at the chapter’s 2014 Wine and Roses Auction and Gala at the Royal Sonesta Hotel, which raised \$500,000 for the fight against diabetes. Orlander is a distinguished teaching professor of The University of Texas System. He joined the faculty of the UTHealth Medical School in 1983, and was appointed division director in 1993.



**WADE R. ROSENBERG, M.D., FACS**, a general and vascular surgeon at Houston Methodist Hospital, was recently named the inaugural recipient of the Rikkers Master Clinician Award by the Society for Surgery of the Alimentary Tract (SSAT) at their annual meeting in Chicago in May. The SSAT established the Rikkers Master Clinician Award in 2013 to recognize an outstanding clinical surgeon. The award is presented annually to a member of the SSAT who exemplifies excellence in clinical surgery. Rosenberg has served in several leadership positions including acting chief of surgery at Houston Methodist Hospital and president of the medical staff at Houston Methodist Hospital.



**BIN S. TEH, M.D., FACR**, professor, vice chair and full member in the Department of Radiation Oncology at Houston Methodist Hospital, Cancer Center and Research Institute has been inducted as a fellow in the American College of Radiology, one of the highest honors the ACR can bestow on a radiation oncologist/radiologist. Teh has contributed significantly to the field of radiation oncology, including pioneering innovative technology such as intensity-modulated radiotherapy, image-guided radiotherapy, stereotactic body radiotherapy, accelerated partial breast irradiation and combining novel targeted therapy with radiotherapy.



**ELIZABETH K. WILSON, M.S.**, was recently named the new director of development for The University of Texas School of Dentistry at Houston. She began the job this summer and will report to Dean John A. Valenza, DDS. Wilson was most recently employed as vice president of resource development for Bering Omega Community Services, and she has worked in nonprofit health care development for 25 years, with a resume that includes the American Heart Association, the Leukemia and Lymphoma Society, the American Diabetes Association and Cancer Counseling, Inc.



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## MD Anderson Announces First Latin American Clinical Partnership

The University of Texas MD Anderson Cancer Center has announced a partnership with Hospital Israelita Albert Einstein (HIAE) to pioneer multidisciplinary patient care in Brazil and advance MD Anderson’s mission to eliminate cancer globally.

The 489-bed private hospital located in São Paulo will be the first clinical extension of MD Anderson in Latin America and the first international member of MD Anderson Cancer Network®, a select group of hospitals and health systems with access to best practices, education, research and treatment protocols developed at MD Anderson.

“Our mission and vision challenge us to be the single most impactful institution in relieving the burden of cancer globally, and we can achieve this by extending our brand of prevention, care, research and education to like-minded organizations worldwide,” said Ronald DePinho, M.D., president of MD Anderson. “Hospital Israelita Albert Einstein is recognized for its exceptional physicians, state-of-the-art facilities and high quality care, and we’re combining their excellence with MD Anderson’s vast cancer expertise.”

“Brazil has a cancer burden of over a half million cases a year. By expanding our collaboration with Latin America’s leading hospital, we intend to address that challenge by delivering advanced and research-driven multidisciplinary care,” said Amy Hay, vice president of business development at MD Anderson. “Together, we’re changing cancer care delivery in Brazil for the benefit of patients across the region.”

As an associate member of the network, HIAE will be operationally and clinically integrated with MD Anderson across the entire cancer care continuum and mirror MD Anderson’s multidisciplinary, research-driven and patient-centered care.

This means that for the first time in Latin America, patients will have access to a multidisciplinary, multi-specialty cancer center with outpatient care, advanced treatment technologies and a full range of support services all in one location. Services will include

medical, radiation and surgical oncology, as well as pathology, laboratory, diagnostic imaging and other supportive clinical services.

“This marks a new era in cancer care delivery in Brazil,” said Deborah Kuban, M.D., professor in Radiation Oncology and MD Anderson’s clinical lead in the partnership. “This is a novel approach to cancer management in Latin America. Patients will have more than just one doctor dictating care. They’ll benefit from the attention of a full multidisciplinary team at Albert Einstein Hospital in Sao Paulo with the support and experience of MD Anderson in Houston.”

MD Anderson will provide HIAE with clinical care oversight, order sets, and treatment algorithms. The clinical integration will also include planning and clinical program support, faculty and staff education and training, quality measurement and reporting tools, access to clinical trials and research collaborations. HIAE physicians will consult directly with MD Anderson faculty through tumor boards and visits and deliver care based on the same protocols and practice standards provided at MD Anderson.

The partnership represents a historic milestone in the institutions’ long standing relationship. HIAE became MD Anderson’s first formal sister institution in 2002, leading to a number of academic exchanges.

Since 2008, MD Anderson has provided specialized expertise to help transform HIAE’s oncology program into a premier cancer center by focusing on patient care, research, education and prevention. Their joint efforts have resulted in the launch of multidisciplinary breast, genitourinary, thoracic, neuro-oncology and gastrointestinal clinics, a new cancer prevention program and the redesign of oncology facilities to centralize services and optimize the patient experience.

HIAE opened a new Oncology and Hematology Center last December, modeled after MD Anderson’s facilities. The four-story structure features 23 exam rooms, 28 infusion rooms, areas for meditation and yoga therapy and

gardens designed to offer comfort to patients and their families. It offers state-of-the-art technology, including minimally invasive surgical techniques, advanced imaging and the first True Beam linear accelerator in South America for cutting-edge radiotherapy techniques.

Founded in 1971, HIAE was the first hospital outside the United States to be accredited by the Joint Commission International (JCI) in 1999, and became Latin America’s first

health care institution—and one of only three worldwide—to have a Stroke Care Center certified by the JCI.

MD Anderson’s clinical global reach also extends to affiliate programs in Spain and Turkey. Together with its 29 sister institutions across 23 countries in its Global Academic Program, MD Anderson leads the largest cancer-fighting network in the world. ■

—La Chanda Ricks,  
MD Anderson Cancer Center

“ This marks a new era in cancer care delivery in Brazil. This is a novel approach to cancer management in Latin America. ”

— DEBORAH KUBAN, M.D.  
Professor in Radiation Oncology



(Credit: MD Anderson Cancer Center)

## Students’ BreathAlert Monitor for Premature Infants Wins Seed Funding



(Credit: Jeff Fitlow, Rice University)

The Rice 360°: Institute for Global Health Technologies has won a grant to continue development of a device invented by Rice students to help premature infants at risk from apnea, a breathing condition that can cause cognitive damage or death if not treated.

The BreathAlert device, originally designed in 2012 by engineering students as their senior capstone project, will be evaluated and optimized to detect and correct episodes of apnea in low-resource settings where traditional vital-signs monitoring is not available.

This work is part of an ongoing collaboration with pediatricians at Queen Elizabeth Central Hospital in Blantyre, Malawi, who identified the critical need for low-cost monitoring tools and have provided clinical guidance on the project, said Maria Oden, director of Rice’s Oshman Engineering Design Kitchen and a professor in the practice of engineering education.

Rice won one of 26 seed grants awarded last week by Saving Lives at Birth: A Grand Challenge for Development, a partnership of the U.S. Agency for International Development

(USAID), the government of Norway, the Bill & Melinda Gates Foundation, Grand Challenges Canada and the United Kingdom’s Department for International Development.

Maria Oden pitched the project at the organization’s annual DevelopmentXChange in Washington, D.C., on July 30. “We’re so excited,” she said of the award. “This will allow us to finalize the design and complete an initial clinical evaluation of BreathAlert.”

Rebecca Richards-Kortum, Rice 360° and Beyond Traditional Borders (BTB) director and the Stanley C. Moore Professor of Bioengineering, also attended the event. She helped present BreathAlert and reported on progress in the ongoing bubble continuous positive airway pressure (bCPAP) project, also funded by Saving Lives at Birth, as it rolls out in Malawi.

Rachel Gilbert has worked for Rice 360° since graduation to develop the project she helped start with Rice graduates Rachel Alexander, Jordan Schermerhorn, Bridget Ugoh and Andrea Ulrich as part of BTB. Gilbert will leave Rice this summer to

work in Vietnam under a Whittaker International Program Fellowship.

“We’ve been improving the design to get it to the point where it’s ready to be tested in clinics,” she said. “We are currently testing how well it can detect breaths and apnea on breathing mannequins.”

Gilbert, fellow bioengineering alumnus Tyler Young and Kelley Maynard, Rice 360° director of technology development, have begun testing the device on full-term infants in Houston “to see if BreathAlert can accurately detect breaths and if its vibration can stir sleeping babies.”

The low-cost device incorporates a stretch sensor that wraps around a child’s chest and a vibrator that activates if the child stops breathing for more than 15 seconds. It is intended for busy neonatal clinics in developing countries.

“Sixty seven percent of babies born before 32 weeks’ gestation suffer from apnea of prematurity, so that is well over a million babies a year worldwide,” Oden said. “If a baby stops breathing in the developed world, an alarm

immediately summons a nurse to intervene. That nurse will usually pat the baby vigorously to wake them up.

“In a busy ward where there might be 40 babies and one overworked nurse, this baby’s survival is really a game of chance. It relies on this nurse to observe the baby at the exact moment they stop breathing and intervene. BreathAlert was designed to detect and automatically intervene in cases of apnea.”

Oden said part of the grant will also allow the team to develop the, product requirements and specifications to prepare BreathAlert for commercial manufacturing.

Richards-Kortum and Oden expect BreathAlert to find a home alongside bCPAP and other projects invented by Rice students as part of the Day One Project, a Rice initiative to build modern, cost-effective neonatal clinics for hospitals in developing nations. The pilot “Nursery of the Future” project is underway at Queen Elizabeth Central Hospital.

The grant is the third to Rice in the highly competitive program’s four years. The bCPAP device won a seed grant in the program’s first year and a larger “transition-to-scale” award in 2012. The device is being deployed in African hospitals.

The Grand Challenge funded 59 projects in its first three years to address 289,000 maternal deaths, 2.9 million neonatal deaths and 2.6 million stillbirths that occur in the world each year. ■

—Mike Williams,  
Rice University



# UTMB Scientist Heads into Ebola Hot Zone

At a time when most are fleeing the outbreak of Ebola in West Africa, one of Galveston’s own flew in to help. Thomas Ksiazek, director of high containment laboratory operations for the Galveston National Laboratory at The University of Texas Medical Branch, left for Sierra Leone on Aug. 11 to lead U.S. Centers for Disease Control and Prevention Ebola outbreak control operations, assisting the government of Sierra Leone. His role is part of a massive effort being supported by research and medical professionals from the CDC as well as from other institutions from around the world. Ksiazek is director of the National Biodefense Training Center and a world-renowned virus expert with 40 years of experience on the front lines of some of the worst outbreaks the world has ever seen. Before coming

to the medical branch, he was chief of the Special Pathogens Branch at the CDC in Atlanta where he coordinated outbreak and control responses to especially dangerous pathogens such as Ebola, Marburg and SARS. In fact, he codiscovered the SARS virus. Through the years, he has played a significant role in disease discovery and outbreak response efforts in Asia, Africa, South America and the Middle East. Sierra Leone is where the worst of the current Ebola outbreak is centered. Ksiazek will not be treating patients. As a veterinarian, epidemiologist and expert on exotic diseases in international and developing world settings, he will be looking to contain the current epidemic. ■

— Kristen Hensley,  
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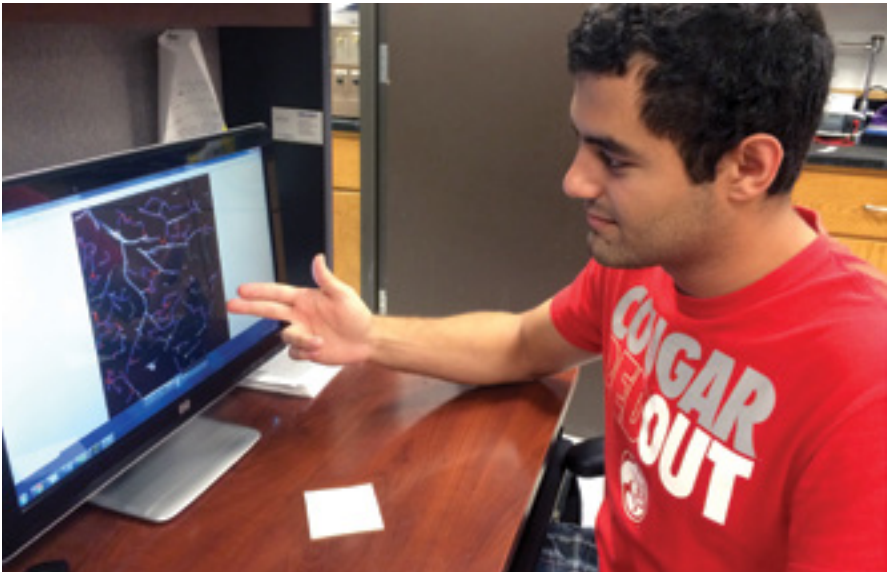
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# Student Projects Include Turning Cancer to Fat, Drunk Fruit Flies



LEFT: Khadeeja Tarique is studying how alcohol changes brain activity that can result in alcoholism. RIGHT: Sina Rezaei analyzes 3-D images of brain tissue in an effort to paint a more complete picture of how the brain is affected by Alzheimer’s disease. (Credit: Karen Weber/UH Honors College)



Seeking eventual solutions to problems ranging from alcoholism, cancer and Alzheimer’s to finding better ways to clean contact lenses and use Lego models to build bridges, University of Houston (UH) students devoted the summer to some serious scholarship.

Delving into a number of complex projects over the course of 10 weeks, 61 students across a variety of disciplines each received \$3,500 stipends for an intensive, full-time research experience in the Summer Undergraduate Research Fellowship (SURF) program under the mentorship of UH faculty members.

“Cancer is something I have experienced through many family members and have seen in helpless children in the pediatric ward of hospitals I volunteered in,” said biomedical sciences sophomore Radhini Abeysekera. “When I saw the opportunity to work in a lab doing research on osteosarcoma, a cancer that usually targets children and teenagers, I was very interested to get a look behind the scenes.”

Working under the mentorship of professor Preethi Gunaratne in the Department of Biology and Biochemistry, Abeysekera is studying a specific type of RNA that may be able to control what a cell matures into, possibly being able to convert cancer cells

to fat cells, which are easier to eliminate than cancer.

In another project from the Department of Biology and Biochemistry, Khadeeja Tarique is studying under the direction of professor Gregg Roman as the recipient of an additional scholarship from the Biology of Behavior Institute.

“In the Roman lab, we are trying to understand how alcohol changes activity of the neurons within the brain to bring about tolerance and other behavioral changes that can result in alcohol abuse and addiction,” Tarique said. “We are studying the effect of alcohol on neural activity using fruit flies. Once we understand which proteins alcohol interacts with to bring about these changes, we can then use these proteins to develop drugs to interfere with this interaction, which may inhibit the formation of tolerance and help stop people from becoming addicted to alcohol.”

Another biology senior, Sina Rezaei, is working with College of Pharmacy professor Jason Eriksen, researching one of the lesser studied aspects of Alzheimer’s disease. He is working with Eriksen to analyze 3-D images of brain tissue using a computer program that will give them a better understanding of changes in the blood vessels of the brain, what these

“In the Roman lab, we are trying to understand how alcohol changes activity of the neurons within the brain to bring about tolerance and other behavioral changes that can result in alcohol abuse and addiction.”

— KHADEEJA TARIQUE  
University of Houston Student

changes are and how they relate to other effects of Alzheimer’s.

“SURF has allowed me to spend much more time in the lab, which has made me more confident in my work,” Rezaei said. “Hopefully, this technology will pave the way for future studies to give us a more complete picture of how the brain is affected by Alzheimer’s, with the end goal of creating new treatments.”

Echoing Rezaei’s sentiments about the value of lab experience, senior biology and biotechnology double major Sara Elchehabi says, “working in the lab has given me the opportunity to exercise my problem-solving skills and develop a conceptual understanding of what I am studying in my classes.”

Embarking on what may be more immediately applicable research, Elchehabi is working under College of Optometry professor Alison

McDermott on what may be an efficient alternative for cleaning contact lenses. She is analyzing whether the addition of a particular antimicrobial agent to contact lens solution may prevent the growth of a common bacteria known to grow on contacts.

“Contact lens wearers are especially susceptible to infections caused by bacteria,” Elchehabi said. “While solutions containing hydrogen peroxide are best at protecting the wearer from infection, they require a minimum soaking time and complicated preparation process. A solution that resists bacterial growth more effectively, could offer lens wearers the greater protection they desire without all the constraints of traditional contact lens maintenance.” ■

— Lisa Merkl,  
University of Houston

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PERSONALIZED INTEGRATIVE ONCOLOGY:  
TARGETED APPROACHES FOR OPTIMAL OUTCOMES

OCTOBER 26-28, 2014 | HOUSTON, TEXAS

REGISTER TODAY

INTEGRATIVEONC.ORG/CONFERENCE

SOCIETY OF  
INTEGRATIVE  
ONCOLOGY

MD Anderson  
Cancer Center

Come check us out and see why our children and families are happy

MUSEUM DISTRICT  
Childcare Center

Monday-Friday  
6:30am-6:00pm  
5010 Caroline St.  
713-521-1234

Attentive and qualified staff.

Inviting classrooms where children have fun learning and exploring.

Engaging curriculum tailored to each child’s development.

Accepting ages 6 weeks to 6 years.  
Serving the medical center and downtown area  
Only childcare center in Houston to incorporate S.T.E.A.M.

LEARNING WHILE PICKING UP S.T.E.A.M. (SCIENCE, TECHNOLOGY, ENGINEERING, ARTS & MATH)

LUXURY APARTMENTS

- On-Site Storage Included
- Assigned Garage Parking
- No Water or Garbage Bills
- 24hr. Valet & Concierge Service
- Pets Accepted
- Minutes from Texas Medical Center
- Sophisticated Surveillance System
- Discount to Texas Medical Center Employees

THE PARKLANE

ASK ABOUT OUR GREAT MOVE IN SPECIALS!

1701 HERMANN DR. | 713.526.VIEW



# September 2014

- 4-5

**Robotic Advances in Gynecology**  
Thursday and Friday  
7:55 a.m.-5:00 p.m.  
1155 Pressler St  
CTierney@mdanderson.org  
713-745-0432
- 5-6

**18th Annual Interdisciplinary Conference on Supportive Care, Hospice and Palliative Medicine**  
Friday, 7:45 a.m.-5:30 p.m.  
Saturday, 7:30 a.m.-3:30 p.m.  
MD Anderson, Main Building, Hickey Auditorium
- 5-7

**5th Annual Multi-Modality Cardiovascular Imaging**  
Friday, Saturday, and Sunday  
8:00 a.m.-5:30 p.m.  
6670 Bertner Ave.  
Houston Methodist Office of CME  
cme@houstonmethodist.org  
713-441-4971
- 6

**TMC Night at Miller Outdoor Theatre**  
Saturday, 8:00 p.m.-10:00 p.m.  
Miller Outdoor Theatre  
6000 Hermann Park Drive  
csmith@milleroutdoortheatre.com  
832-487-7102
- 8-13

**A Comprehensive Board Review in Hematology and Medical Oncology**  
Monday through Friday  
7:45 a.m.-5:00 p.m.  
Festelle@mdanderson.org  
713-745-0083
- 9

**House Bill 5 & Paths to Graduation**  
Presented by Dr. Michael Webb, HISD  
Tuesday, 11:30 a.m.-1:00 p.m.  
Behavioral and Biomedical Sciences Building  
1941 East Road, 2nd floor  
Margaret.thornsborg@uth.tmc.edu  
713-486-2783
- 19

**TMC Police & Security Services First Annual Blue Santa Golf Tournament**  
Proceeds benefit the Rise School and Nora's Home.  
Friday, 1:30 p.m.  
Tour 18 Houston  
3102 FM 1960 E  
WMiddleton@texasmedicalcenter.org

- 19

**Hearts of Gold: Honoring Women in Health & Medical Science Gala**  
Friday, 6:30 p.m.  
Hotel ZaZa  
5701 Main St.  
development@thehealthmuseum.org  
713-337-8443
- 24

**Neiman Marcus Stiletto Strut and Luncheon**  
Wednesday, 11:00 a.m.-1:00 p.m.  
Westin Galleria  
5060 West Alabama  
snhaque@bcm.edu  
713-798-1649
- 26

**Hail to the Chief Complaint!**  
The presentation features the medical issues of seven former U.S. Presidents.  
Friday, 7:00 p.m.-9:30 p.m.  
1133 John Freeman Blvd.  
Sarah.Keith@library.tmc.edu  
713-799-7108

FOR MORE EVENTS, VISIT [www.tmcnews.org](http://www.tmcnews.org)



## Cardiovascular care at UTMB.

### It's about getting your life back.

John always enjoyed fishing with the guys and dancing with his wife. Coronary bypass surgery at age 42 did not stop either activity. Then 17 years later, he knew something was not right.

Tests confirmed John's suspicions. The only option appeared to be getting on a heart pump and waiting for a transplant, but the cardiovascular team at UTMB Health saw another way. They recommended an aggressive bypass graft procedure. John benefited from the work of skilled specialists, subspecialists, surgeons, nurses, and technicians. These are gifted clinicians who teach others their art, using the very latest technology and techniques. Today John has his full life back.

Cardiovascular care at UTMB is state of the art and comprehensive, from heart rhythm studies to bypass to transplants to cardiac rehab. With more than 30 locations throughout Galveston and the Bay Area, we're also close by, which makes visiting easy and appointments convenient.

Don't let your heart hold you back. Take charge of your health and call us at 800-917-8906 or go to [utmbhealth.com](http://utmbhealth.com).



Working together to work wonders.™

Left: Daniel Beckles, MD, PhD, FACS, FACC, FCCP, Director, Minimally Invasive Cardiac and Thoracic Surgery  
Center Left: Michael Silva, Jr., MD, FACS, Chief, Division of Vascular Surgery and Endovascular Therapy  
Center Right: Wissam Khalife, MD, FACC, MAAC, Director, Advanced Heart Failure, Transplant and LVAD Program  
Right: George Carayannopoulos, MD, Director, Heart Rhythm Center

The four clinicians featured here are representative of the whole team of specialists spanning our cardiovascular services.

The University of Texas Medical Branch  
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**TMC**

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