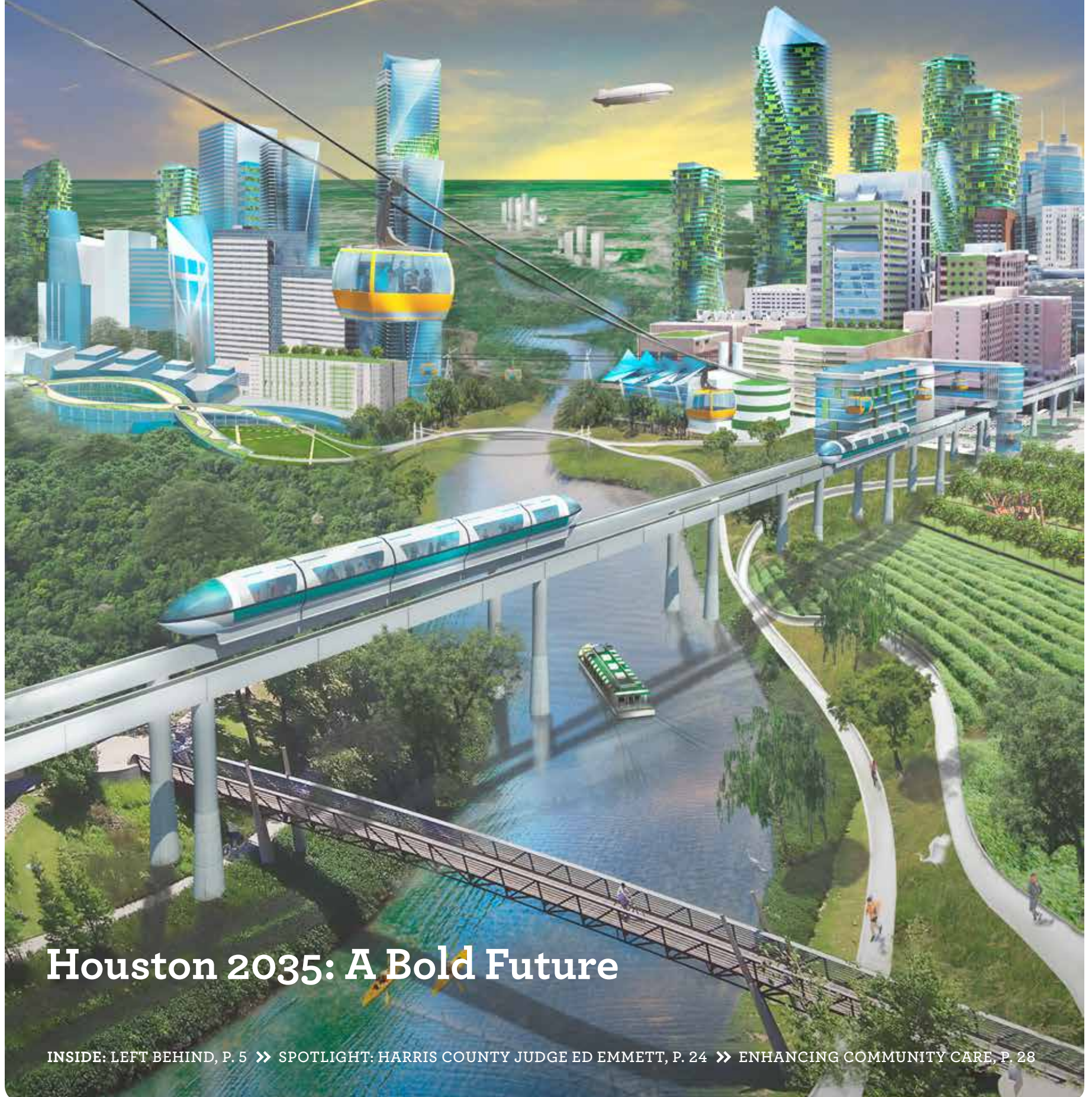


TMC | PULSE

THE OFFICIAL NEWS OF THE TEXAS MEDICAL CENTER — VOL. 2 / NO. 4 — MAY 2015



Houston 2035: A Bold Future

INSIDE: LEFT BEHIND, P. 5 » SPOTLIGHT: HARRIS COUNTY JUDGE ED EMMETT, P. 24 » ENHANCING COMMUNITY CARE, P. 28

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Left Behind

The Texas Medical Center offers an extensive range of world-class services to children and adolescents suffering from mental health disorders—if you're willing to stand in line.

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CHI St. Luke's Health-Baylor St. Luke's Medical Center is leading the way as the first and only hospital in Houston to implant the world's smallest minimally invasive cardiac pacemaker.

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Houston 2035: A Bold Future

In preparation for Houston 2035, a multidisciplinary conference designed to explore the future of the local high-tech economy, leading innovators speculate on what's waiting on the horizon.



SPOTLIGHT: JUDGE ED EMMETT // p. 24

AS A LONG TIME PUBLIC SERVANT, HARRIS COUNTY JUDGE ED EMMETT IS QUICK TO SPEAK UP FOR THE CAUSES THAT MEAN THE MOST TO HIS COMMUNITY. BUT NONE HAVE BEEN MORE PERSONAL THAN HIS CALL TO IMPROVE ACCESS TO MENTAL HEALTH SERVICES.

ON THE COVER: Gensler's concept of one possible future for Houston and the Texas Medical Center. In 2035, a multimodal transportation system will connect bayous, hike and bike trails, places and people. This network will improve the well-being of all Houstonians, becoming the foundation for a new, green architecture that will actively regenerate and restore a natural balance.

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PRESIDENT'S PERSPECTIVE



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

It is hard to believe this issue marks one year since the beginning of TMC Pulse. Over the past year, we have tried to really bring attention to those people who have made the Texas Medical Center the incredible place that it is. We look forward to continuing to tell those stories as this campus grows in new and exciting ways.

May is a particularly important month because it is observed as Mental Health Awareness Month. The Texas Medical Association reports more than 4.3 million individuals—1.2 million of them children—live with a mental health disorder in the state of Texas. That's a considerable demand for mental health care and resources, many of which are not readily available due to insufficient funding. It is critical that these needs be addressed, not only in Texas—a state that has consistently ranked below most others in dollars per capita allocated for mental health services—but across the country.

This month's Pulse features a story about how our own local hospitals are attempting to shoulder a burden too large for any single institution to manage alone. We are a community that is looked to as a leader in health care, and that is every bit as true when it comes to mental health. Every day across our campus, individuals seek treatment for serious mental illnesses—PTSD, depression, bipolar disorder, schizophrenia and eating disorders, among others. We have the opportunity together to do more than treat these patients who come to our hospitals. We must also be willing to engage in those difficult conversations about funding, help destigmatize these disorders, and actively collaborate to improve the mental and physical health of our city.

A handwritten signature in black ink that reads "Robert C. Robbins". The signature is written in a cursive, flowing style.

TMC | PULSE

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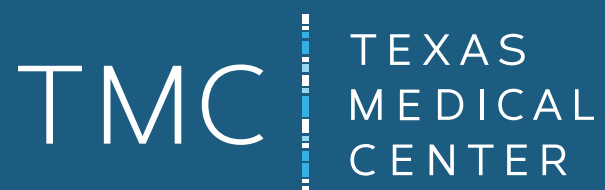
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Left Behind

BY ALEXANDRA BECKER

DESPITE THE WEALTH OF RESOURCES AVAILABLE THROUGHOUT THE TEXAS MEDICAL CENTER, TOO MANY CHILDREN AND ADOLESCENTS SEEKING MENTAL HEALTH SERVICES IN HOUSTON FIND THEMSELVES WAITING FOR TREATMENT.

Think of five children. They can be your own, your nieces or nephews, your grandkids, even the rowdy neighborhood brood who visit your front porch to trick-or-treat each year. Now close your eyes and picture one of them with a serious, debilitating mental health disorder—persistent depression or anxiety, recurrent yet unpredictable bipolar episodes, autism, alcoholism, or anorexia so severe his or her frail heart muscles eventually give out completely. It's remarkably unlikely, isn't it?

Open your eyes. According to the National Institute of Mental Health (NIMH), just over 20 percent, or one in five children, either currently or at some point in their lives suffer from a serious diagnosable mental health disorder. Some of these kids will require hospitalization, perhaps long-term treatment in acute-care facilities. Others will do well with weekly psychiatric counseling, medication, or other outpatient services. Still, there will be those who struggle despite numerous and varied combinations of therapy. No matter what form their treatment takes, some type of assistance is vital for these

children to learn coping strategies, build resilience and manage their disorder as best they can.

To help care for the Houston population, institutions throughout the Texas Medical Center offer an extensive range of services for children and adolescents, including inpatient and outpatient facilities geared toward the diagnosis and treatment of bipolar disorder, anxiety, ADHD, autism spectrum disorders, mood disorders including depression, tics, Tourette syndrome, disorders associated with trauma, learning and developmental disabilities, anorexia and bulimia, substance abuse, suicide and others.

The problem is, it's not enough.

Take for example the need for inpatient hospitalization. If a mother reaches out to her child's physician in the case of a critical mental health emergency, he or she will tell her to call 911 or go to the nearest emergency room for care. Unfortunately, the majority of hospitals in the Texas Medical Center, and throughout Houston for that matter, do not offer pediatric inpatient psychiatric care—leaving

physicians and parents with limited options during a crisis.

"I generally try hard not to admit a child to an inpatient facility unless absolutely necessary," said Laurel Williams, D.O., director of residency training, Child & Adolescent Psychiatry at Baylor College of Medicine as well as director of the Baylor Child & Adolescent Psychiatry Clinic and associate professor of the Menninger Department of Psychiatry & Behavioral Sciences at Baylor. "If we can find another option, usually hospitalization is the last resort."

It's not because the inpatient facilities that exist in Houston are not excellent, or that treatment is not effective—it's simply because resources are so scarce. Williams explained that the majority of hospitals in the TMC do not offer pediatric inpatient psychiatric care, so when a child presents at these emergency rooms in need of hospitalization because he or she is a potential harm to others or themselves, the child would need to be transferred to a different institution in order to be admitted to an appropriate treatment facility.



“There are only a few hospitals in the area that can provide inpatient care for children and adolescents, but sometimes beds are not available and they can be very expensive,” Williams explained. Even with good insurance, medications can be pricey and not all care is reimbursed.

The Menninger Clinic, ranked among the nation’s top five psychiatric hospitals, is an ideal inpatient option for adolescents ages 12 to 17 dealing with complex and co-occurring mental illnesses in need of a long-term treatment program. While they do have charity beds available for those who qualify, general treatment can be costly

and their 16-bed unit usually has a waiting list—all common obstacles parents face when seeking inpatient treatment at facilities throughout Houston.

Patients who do not have insurance or who cannot self-pay will be referred to The University of Texas Health Science Center at Houston (UTHealth) Harris County Psychiatric Center, but resources are extremely limited and they are often full as well.

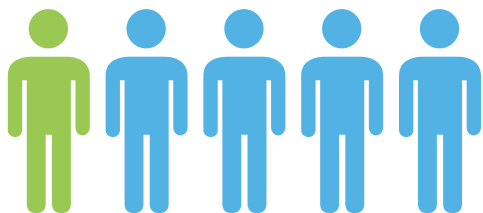
“It makes me choke every time I think about it,” said Asim Shah, M.D., chief of Psychiatry at Ben Taub Hospital/Baylor College of Medicine, who also manages the clinical behavioral health programs for Harris Health System. “For the entire city of Houston, there are only 20 beds for children and adolescents who are uninsured, out of which only four are for children under the age of 12. I just can’t swallow that.”

It’s a problem Shah is forced to face often. Owned and operated by Harris Health System, Ben Taub proudly serves as a safety-net hospital for the city of Houston and Harris County, treating any individual in need of care regardless of insurance or immigration status. It is considered one of the best public health systems in the state and is staffed by physicians from The University of Texas Health Science Center at Houston (UTHealth) Medical School and Baylor College of Medicine, two of the nation’s top medical schools.

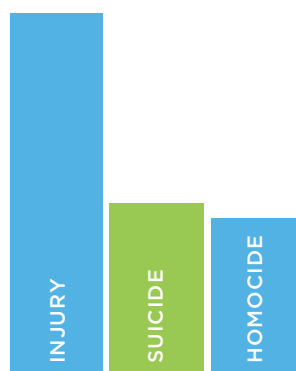
It is also the only hospital in Houston with a psychiatric emergency room open 24 hours a day, seven days a week. Still, it does not have pediatric inpatient psychiatric care built into its infrastructure. So what happens when an uninsured child comes through their emergency room in need of hospitalization and all 20 beds at Harris County Psychiatric Center are full?

“It occurs far too often,” Shah explained. “You see a patient on a Thursday or Friday and you want to admit them because they’re suicidal. I had a patient just recently who came in because she’d overdosed on two bottles of medicine and she needed to be admitted. She had no insurance so our transfer center called Harris County Psychiatric Center and they were full. So what do you do? Where do you keep them until a bed becomes available? Over the weekend, Harris County Psychiatric Center isn’t discharging patients usually, so she stays on a stretcher for observation for four or five days until a bed opens up. She is consulted by one of our psychiatrists during this time, but her treatment is delayed. Would you like that for your loved ones?”

Shah explained that it’s an issue the whole community needs to address. “We need to do something about it,” he said. “Even if you do have insurance, the number of beds is minimal.”



1 in 5 children, either currently or at some point during their life, have had a seriously debilitating **mental health disorder**.¹



Suicide is the **second leading cause of death** in youth ages 15 to 24.²



More teenagers and young adults **die from suicide** than from cancer, heart disease, AIDS, birth defects, stroke, pneumonia, influenza, and chronic lung disease **combined**.³

For children and adolescents who do not require immediate hospitalization, TMC member institutions offer a comprehensive range of outpatient services, but often the waiting lists are painfully long for parents who are anxious to find treatment and therapy options.

“Baylor, Texas Children’s and Harris Health all have a lot of outpatient clinics, which are great for kids who don’t need to be admitted to the hospital,” said Williams. “The only problem with these is the wait times—Texas Children’s Hospital can have up to a four-month waiting list to get in.”

DePelchin Children’s Center is one of the most recognized and respected institutions offering mental health services to children and adolescents in the Texas Medical Center. Having served the Houston community for over 120 years, DePelchin began as an orphanage and continues to focus on foster care and adoption in addition to providing mental health services including outpatient psychiatric services and counseling. They accept Medicaid, private commercial insurance and self-pay, and their multi-disciplinary specialty services, including their clinics in autism diagnostics and trauma-focused treatment, make the organization a sought-after option for Houston families—so much so that their waiting lists are notoriously long despite the multiple clinics they’ve

“One of the greatest opportunities that we have as mental health professionals in the TMC is to create a stronger network or ‘think tank’ combining all of our thought leadership to develop actionable ideas that would result in more prevention and treatment options for pediatrics as well as adolescents here in Houston.”

— ELIZABETH NEWLIN, M.D.

Program and Medical Director of The Menninger Clinic and Assistant Professor at the Menninger Department of Psychiatry and Behavioral Sciences at Baylor College of Medicine

established throughout the city.

It’s a problem prevalent in Houston. A third-grade teacher who works in an underserved area of the city has been trying to help one of her students secure counseling for months. He has exhibited aggressive behavior, partially due to problems at home, and she is worried about how far he will go if he does not see a professional soon.

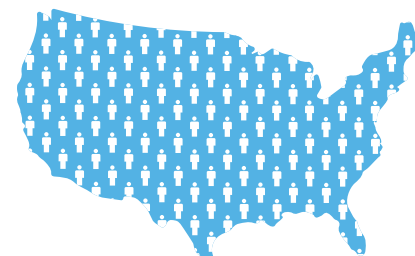
“The process has been extremely difficult and the waiting period is over two months just for an initial consult,” she said.

The TMC member institutions are doing what they can with the resources available, and over the past five years hospitals have increased their focus on extending outpatient services to reach more patients in the community.

Texas Children’s Hospital, in partnership with Baylor College of Medicine and the Menninger Clinic, now offers mental health services

at some of their Community Cares Program practices, providing mental health services to underserved patients at no cost. The Community Cares Program, which was created by specific philanthropic commitments from the community and is now funded by Texas Children’s Hospital, works to provide medical services for children who would otherwise go to the emergency room for non-emergent needs or forgo treatment completely due to low family income or a lack of health insurance.

Memorial Hermann has opened Mental Health Crisis Clinics so if an adult or pediatric patient is suffering from an acute mental health concern but does not require hospitalization, he or she can be evaluated and treated by a psychiatrist without standing in the proverbial waiting list line.



Each year, approximately **157,000 youth** between the ages of 10 and 24 receive medical care for **self-inflicted injuries** at emergency departments across the U.S. ²

Boys are more likely than girls to have ADHD, behavioral or conduct problems, autism spectrum disorders, anxiety, Tourette syndrome, and cigarette dependence. ²

Millions of American children live with depression, anxiety, ADHD, autism spectrum disorders, Tourette syndrome or a host of other **mental health issues**. ²

CONTINUING TO INVEST IN PEDIATRIC MENTAL HEALTH WILL HELP ENSURE THE CHILDREN AND ADOLESCENTS IN THE GREATER HOUSTON AREA HAVE ACCESS TO THE INPATIENT BEDS, OUTPATIENT APPOINTMENTS, TREATMENT PROGRAMS, AND SCHOOL AND COMMUNITY-BASED INTERVENTIONS THEY NEED.

“They are similar to the neighborhood minor emergency rooms you see all over the place, but they offer psychiatric services,” explained Carlos Guerra, M.D., medical director for psychiatric response case management at Memorial Hermann Health System. “Right now we have two clinics—one on the northeast side of Houston and the other in the Spring Branch area. It allows us to see patients quickly and start them on medications if need be, or help get them in with a psychiatrist in their area.”

Payment for these clinics is determined on a sliding scale, allowing Memorial Hermann to treat a wide range of patients regardless of insurance status.

“We also work to help patients acquire insurance if they qualify but for some reason don’t have it,” Guerra said. “Our goal is provide care and assistance while patients are waiting to get into outpatient treatment programs, so helping them secure funding is an important part of what we do.”

Guerra described the clinics as a godsend for the community. “I can’t tell you what a neat experience it has been to hear patients constantly saying thank you so much for being here, thank you so much for seeing us. I had one patient who had to tell me three times to make sure he drove his point in, he said, ‘No, sir, you don’t understand. You saved my life.’”

The clinics are partially funded by

funds made available through Texas’ Medicaid 1115 Waiver program, which was approved in Dec. 2011 to expand reimbursements for uncompensated care costs and support a Delivery System Reform Incentive Payment (DSRIP) pool to incentivize hospitals and other providers to develop programs that would enhance access to health care.

Through the DSRIP system, health-care organizations have created new, collaborative strategies for lowering the cost of care while improving access and quality. Ben Taub was able to increase its clinical behavioral health programs and outpatient services substantially, and DePelchin Children’s Center collaborated with the University of Texas to send therapists into schools and out into the community to help with prevention and treatment. It has been a significant benefit to the mental health community, but leaders are worried about the fate of these programs if funding is not renewed when the waiver expires Sept. 2016.



“Right now, Ben Taub has the capability today to provide appointments within a few weeks or even days at our specialty clinics, our intensive outpatient program and our clinics throughout Houston,” explained Shah. “If DSRIP is not renewed, I don’t know what would happen to these outpatient appointments or these programs, because a lot would need to be cut. If you stop these services all of a sudden, patients will be coming to the emergency room again for outpatient care because it’s the only place they have to go.”

What the DSRIP funds have demonstrated is that it is possible to bridge the gap between the emergency room and the months-long waiting lists—as long as resources continue to become available. It’s a pervasive problem in the field with wide-ranging consequences. Not only could increased funding allow for additional inpatient beds and a broadening of outpatient appointments and programs, but it could also prompt further education in the discipline, which in turn would create more psychiatrists, more practices and more open appointments.

“There is a major shortage of psychiatrists and child psychiatrists,” said Guerra. “The residency programs are very small and I’m not sure why we are not pushing for this field the way we are for primary care. There is such a huge need for it, especially when you consider that a large percentage of the population at any one time is having some form of mental health issue.”

Guerra suggested that increasing mid-level providers like nurse practitioners and physician assistants would go a long way toward alleviating some of the need. Regrettably, Houston has closed its only psychiatric nurse practitioner program.

“The program would probably graduate about five to 10 nurse practitioners a year, and I guess they felt that it was not viable to keep the program running, but in our community they would be swooped up in two seconds,” said Guerra.

Williams voiced the same concern for the lack of providers in the field. “Texas Children’s really only has eight child and adolescent psychiatrists on staff, and there are over 1,000 pediatricians that can refer to us. There are just not enough of us.”

Williams added that insurance companies are loath to reimburse forms of psychotherapy, making the field less attractive than others. “As much as there is a problem for parents finding a good psychiatrist, there is equally a problem for finding a therapist that is trained in the specific form of therapy that can help your child.”

In spite of the shortage, TMC member institutions continue to emphasize the importance of helping the next generation of mental health clinicians, with many of them expanding their educational missions.

“We feel that one of our community responsibilities is not only to train our own staff, but also to provide an extensive array of training opportunities for others outside of DePelchin,” said Oscar Bukstein, M.D., M.P.H., medical director of DePelchin Children’s Center. DePelchin hosts professionals from the Baylor College of Medicine child psychiatry and psychology training programs.

Elizabeth Newlin, M.D., program and medical director of The Menninger Clinic and assistant professor at the Menninger Department of Psychiatry and Behavioral Sciences at Baylor College of Medicine, echoed these sentiments and said investing in the future workforce is one way Menninger is addressing both the quality of adolescent mental health care in Houston as well as the quantity.

“I feel like a contribution that Menninger makes is through training social work fellows, social work interns and child psychiatry fellows. On any given day we have a huge number of trainees here on our adolescent unit,” Newlin said. “We’ve expanded Menninger’s fellowship program within the past five years and I’m very proud of what we’ve done with our education and training of child psychiatrists. Many of our fellows are now out in the community doing really important work.”

The worth of which cannot be understated. While one in five children in the U.S. suffer from a serious mental health disorder at some point in their lives, nearly half—46 percent—will experience some form of mental health issue. In Harris County alone, it is estimated that nine percent of children and adolescents will have a severe functional impairment during a given year. Suicide is the second leading cause of death for 15 to 24 year olds in the U.S., killing more teenagers and young adults than cancer, heart disease, AIDS, birth defects, stroke, pneumonia, influenza and chronic lung disease combined.

And here’s another statistic: In 2012, Texas ranked 48th in the nation in state mental health expenditures per capita. Although the 2013 legislative session responded by securing record levels of funding, for an issue this prevalent, with consequences as devastating as any disease treated here in the medical center, there is still far too much to be done.

Continuing to invest in pediatric mental health will help ensure the children and adolescents in the Greater Houston area have access to the inpatient beds, outpatient appointments,

treatment programs, and school and community-based interventions they need. Even more, it could generate a surge of early treatment and prevention programs throughout the city—something many clinicians believe could have the greatest benefit of all.

“The thing is, when you talk to an adult about their mental health problems, regardless of what it is, and you ask them when their symptoms began, the vast majority will tell you that their symptoms started in childhood. It’s not like you turn 18 and suddenly you have mental health problems,” said Williams. “One of the things that motivates me as a child psychiatrist is that I wanted to see if maybe we could change the outcome.”

That’s the shared goal—one that the institutions believe can be accomplished with the right resources and a culture of collaboration.

“One of the greatest opportunities that we have as mental health professionals in the TMC is to create a stronger network or ‘think tank’ combining all of our thought leadership to develop actionable ideas that would result in more prevention and treatment options for pediatrics as well as adolescents here in Houston,” Newlin said. “It will take time, but that to me is how we can graduate from an awareness level to a problem-solving level, and that’s how we can all reach even more young people throughout the Greater Houston Community.”

Shah reiterated that it is not a problem for one institution to shoulder.

“All involved parties need to come forward and work on a resolution, because we’re truly talking about our future generations here.” ■

“The thing is, when you talk to an adult about their mental health problems, regardless of what it is, and you ask them when their symptoms began, the vast majority will tell you that their symptoms started in childhood. It’s not like you turn 18 and suddenly you have mental health problems.”

— LAUREL WILLIAMS, D.O.
Director of the Baylor Child & Adolescent Psychiatry Clinic



ADAM KUSPA, PH.D., SENIOR VICE PRESIDENT FOR RESEARCH AND PROFESSOR OF MOLECULAR AND HUMAN GENETICS 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 A RENEWED FOCUS ON COLLABORATION AND COMMERCIALIZATION, AND HOW AN EXCITING JOINT VENTURE COULD HELP OPEN NEW DOORS IN MEDICAL GENETICS.

Q | I want to hear about your early days growing up in California...

A | I grew up in a small beach community, north of San Diego, surfing and skateboarding. In junior high, I became interested in biology. I was inspired by a very dynamic high school biology teacher who had a master's and whose husband was a professor at the University of California, San Diego. So from a very early time, I guess the ninth grade, and being five miles from one of the great research universities, I just assumed I would go in that direction, and sure enough, I did.

Immediately I wanted to do bench research, so I latched onto a laboratory, run by Bill Loomis who had a very infectious enthusiasm, and who really cared about what people did in his lab. It seemed like a great place to work, and it turned out it was. The focus of his lab was developmental biology, using the social amoeba as a model.

Very quickly, I turned into a lab rat. College classes became secondary, and I was usually running out of

the lab arriving late to my lectures, and then running back to finish my experiments. I published a paper and was thinking about going to grad school when Bill Loomis advised me to think about the Stanford Biochemistry Department, which was one of the great departments of that era. It had a small number of faculty, but they were all excellent and each of them cared about training future scientists. I did okay in college—Mostly As. But I didn't think I had a shot at getting in a top graduate school. I remember asking one of the postdocs in the Loomis lab about it. I said, 'You know, Stanford biochemistry gets 400 applications and they take four students. What are my chances?' And he looked at me and said, 'You only need one slot.'

So I applied and got in. Training at Stanford was a transformational experience. You don't really realize it when you are in the middle of it, but looking back—10, 20 years later—you realize. I was discussing and debating scientific concepts with the folks who would be the leaders in American science for the next 40 years, and sure enough, almost every person that I

interacted with in that department 20 years later was in the National Academy, or a department chair, or a professor at MIT, Harvard, and so forth. The intellectual atmosphere was so enriching and so exciting, you couldn't wait to get to work. You couldn't wait to interact with your colleagues.

And that's why I'm here, actually. I did a postdoctoral period back at UCSD, the same where I was an undergrad with Bill Loomis. It's just hard to find a mentor who is just as interested in every single experiment as you are and who wants to discuss things with you every day. It's hard to get that kind of mentorship and support.

I did a lot of good things with him, but when I was looking for jobs, I thought I would do a little preliminary job search—just a limited number of applications. I didn't think I would get a job. But I ended up interviewing at 11 different places, and had three offers: Duke, here and the University of Connecticut. And The Texas Medical Center and Baylor College of Medicine just instantly felt like Stanford. I just walked

“I very much view the whole TMC enterprise as a communal endeavor, and Houston is competing with the rest of the world.”

the hallways and could instantly sense the same kind of collaborative spirit. It's what they told me in my interviews here, "This is a really collaborative place!" One might think they are just trying to sell you on the place, but you could just feel it in the way people seemed to genuinely care about what everyone else in the place was doing.

I think it's about the faculty. And I think that's true across the medical center. Just consistently attracting people who are not so egotistical—to the exclusion of everyone else—but they are genuinely interested in science and biomedicine. They are just genuinely collaborative. And it's a spirit that has been maintained throughout my 21 years here. And you really learn about the robustness, about academic structures, when you go through the economic downturns. You know, we are just coming out of 10 years of rough financial times, since losing our primary affiliation with the Methodist Hospital System.

What I learned in this time is the robustness of the academic enterprise, being rooted in the faculty. Our faculty members didn't waiver, and not that many left. They just put their noses to the grindstone and kept getting the grants and driving their programs forward, in spite of the financial challenges. And that's what carried us through—on the research side, on the education side, and on the clinical service side. It was a great thing to witness.

Q | Collectively, the research engines on this campus are number two in NIH grants—second only to Johns Hopkins. Is there also a compendium effect of having these other institutions on the same campus?

A | People think we are hyper-competitive, and maybe we are on the private clinical side. But in research, the TMC is one of the most collaborative places in the world. Our faculty members collaborate with every other institution equally well. There are few boundaries or feelings of antagonism or competition. And we have lots of cancer folks—about a quarter of our research is in cancer—and yet there are substantial collaborations between MD Anderson and Baylor in research and education. There is a huge amount of collaboration between Rice and Baylor, of course. So the TMC really functions as one big research ecosystem. Sure, at the executive level there is some friction about the movement of faculty, or programs, but even there it is becoming more collaborative.

There is sort of a renewed spirit of collaboration around commercialization, and that's very healthy. I think that has also spurred on the collaboration around the research cores, and sort of a shared interest in trying

to make all of the resources of the individual institutions available to everyone. This is all funded by either public money or local philanthropy. I very much view the whole TMC enterprise as a communal endeavor, and Houston is competing with the rest of the world.

Q | As you are responsible for all research at Baylor, how do you find the time to conduct your own research?

A | Some people would call what I do now vanity research, because although I have a federally funded lab, I can only actually physically be in it about four hours a week. I have to fit my manuscript and grant writing in at nights and on weekends because I have at least eight hours of meetings every day, plus 'home work' stemming from my role as senior vice president.

Q | Is that hard for you as a dedicated researcher?

A | Most folks in my position live with a conceit that they will eventually go back to the laboratory. And seeing that Harold Varmus did, after running the NIH and the National Cancer Institute, go back to running a lab at Cornell gives me hope. You see this kind of example and think, "That's me! I am going to go back to the lab eventually." I worry a bit about losing the possibility of going back to research full time and I worry about maintaining credibility in my field. Having said that, I love what I do now.

When they asked me to interview for the chair of biochemistry, I had no thought of going into administration, although I was program director for the graduate program for 10 years prior. I had enjoyed helping students and mentoring students and making sure they were taken care of and that they were in laboratories that were best for them, and that they were progressing toward their degree. I knew I enjoyed mentoring students, but I was not sure I would enjoy being chair of biochemistry. However, I found that I really loved it. Just as a lab head worries about how their postdocs and students do in the lab, as a chair you worry about how your assistant professors do; you mentor them, read their manuscripts and their grants and try to give them advice that will advance their career. I found that I really loved the chair role. When they asked me to come downstairs, I thought, "Well I liked organizing science at the department level, let's see how it would be at the college level."

I was appointed by Bill Butler, who was the interim president at the time. I quickly learned that being a corporate officer, a fiduciary of the institution, is very different from being a department chair. There was a steep learning curve. Paul Klotman, the

current president, came just a few months after I was appointed, so it wasn't clear at all that I would be continuing. One of the first conversations I had with Paul was along the lines of, "You don't know if you want me to be dean of research, and I don't know if I want to continue to be dean of research. So let's talk in six months." He agreed and about six months later, February 2011, he asked me to stay on and I have been doing it ever since.

I wondered initially whether I could have an impact and help to guide the institution in research. No one is irreplaceable and I knew that if I were unable to do this, I would step aside. But it has been very rewarding, interacting with the leadership at other institutions within the TMC and around the state. Trying to develop programs within Baylor and with other institutions. Under Dr. Klotman's leadership, the executive team has been trying to effect the kind of change that I think most people would agree needs to happen in science today. We need to operate more efficiently, develop new sources of funding to drive program development, while still allowing the faculty to drive the science and set the direction. That's what we are trying to do.

Q | What do you see changing over the next five years, relative to the research program at Baylor?

A | From a technical management point of view, we are working towards becoming more service-oriented around clinical trials. Clinical research in terms of reaching outside the institution. We have a pretty big operation: 4,000 human subjects protocols, 11,000 patient accruals a year, with about 4,000 of those having therapeutic intent. But our support infrastructure is pretty decentralized. This is not necessarily a bad thing, but if you want to present a positive, user-friendly face to the outside world, if you want to interact productively with industry more, it requires that you centralize resources and have master agreements that don't have to be negotiated independently for every trial. This is an operational improvement that we would like to make.

On the scientific side, we are paying more attention, and allocating resources, toward taking our basic science toward the clinic. That's not an original idea—everyone is trying to do that. But we have been a great basic science research institution, so this is a change in direction. We used to joke that we discover a drug target every week, but we don't do anything about it. And that certainly was true 10 years ago and even five years ago.

“The thought that we can sequence the relevant genes of a patient over a few week period and then interpret the clinically relevant genetic variants and return a diagnoses back to the patient really truly seems like science fiction.”

We spend \$400 million a year on biomedical research and yet we did not have much in the way of drug development or other experimental therapeutics. We have sort of been on both ends of the research spectrum; third-party clinical trials on the one side, basic science on the other and not that much in between.

We are trying to bring forward that opportunity at several levels. We are hiring chemists and developing a center for drug discovery so that we can bring forward small molecule therapeutics. We are building the support structure that would allow that to happen. In terms of pilot projects, we have the opening of an Innovation Development Center, and other commercialization efforts. We are trying to pull the most promising projects out of the lab and put them along a critical path towards some kind of therapeutic or diagnostic outcome. We are just getting started, so it is too early to judge our efforts. But it has been a lot of fun.

Q | Do you believe the multi-institution institutes like Innovation and Clinical Research will serve as a springboard for the next generation of discovery and commercialization?

A | Yes, I can see a future where all of the institutions interact robustly on the scale of the TMC, in much the way you have laid out in your innovation programs. That said, I don't see the individual efforts of the TMC institutions going away. I only see them strengthened. Because the larger entity—the interaction with the third parties, big pharma, and so forth—they will not want to develop every single project that comes out of all of the institutions. The institutions will want to ensure that their own individual projects have the maximum impact through their own natural course of development.

I have seen enough of these projects now, just going back five years. I started as a chair of biochemistry with one particular small molecule therapeutic starting in 2005, and am seeing how it is only now getting to phase one clinical trials over a 10 year period. These things have such a circuitous root. On the one hand, you wonder if it can only come to fruition in an academic setting. This project could have been shut down five times over if it was in industry, and it may have been rejected in a TMC-wide down-select process. But there are going to be these projects that individual institutions believe in. For whatever reason—the specific need that is being addressed, or the particular faculty member, or whatever set of criteria they have in their own institution—they will want to be able to drive that forward, independent of other exigencies. So I see that going forward we will have a hub-of-hubs sort of

model of innovation. There will be hubs at the institutions whose projects may feed into the TMC program or be developed independently.

Q | Someone once told me that on the east and west coasts, they worry most that the Texas Medical Center member institutions will actually come together programmatically, and in doing so, will become the dominant force in discovery and commercialization. Is that all talk, or do you believe there really is an opportunity here?

A | I believe this 100 percent. The strong research institutions in the TMC are fully onboard and this will be a very attractive center in the coming years. The turnover in the leadership of all of the TMC institutions has really changed the culture toward commercialization. This is not just to generate revenue to support our missions, but to maximize the impact of what we do. The Baylor Miraca Genetics Lab is a great example of this.

Q | Tell us more about that. I think it is a perfect example of something that has grown out of research and became a service that grew into a business.

A | It started in the early '70s, with Tom Caskey and Art Beaudet starting to see pediatric patients with odd biochemical anomalies that they could trace back to a genetic cause—an inborn error in metabolism. That led to a more robust formulation of a biochemical genetics laboratory and collaboration with Texas Children's Hospital. The unique features of this from the late '70s, when this was formalized and growing into the arena of molecular genetic diagnostics, were: patient volume; our world-class genetics department that was built over decades under Tom Caskey and, later, Art Beaudet; and the national Human Genome Sequencing Center under Richard Gibbs. Those three things together led to this unique opportunity to drive innovation in clinical genetic diagnostics. Art Beaudet saw this and started pushing the model of an academic reference lab, the Medical Genetics Lab (MGL), that would continually innovate and would be essentially forcing the conversation around the clinical utility of molecular genetic diagnostics. They would typically offer a test before most doctors knew it would be useful, and offered it to the academic physician scientists who had patients with complex cases with a suspected genetic component.

In the late '90s, early 2000s, the vision was to replace karyotyping by chromosome spreads with chromosome microarrays. So we were the first to launch that commercially, and it was a spectacular

success. For the first time you were able to diagnose not only large chromosomal rearrangements and trisomies, but also small deletions and duplications by basically reading a chip. The uptake of that was tremendous. It drove revenues for quite a while. So it developed into a \$40-50 million a year revenue business. The latest innovation involved bringing Richard Gibbs and his team on board to create the first clinical whole exome sequence test. They were the first to launch a whole exome test in 2011, doing about 200 cases a month, with a 26 percent diagnostic rate. For you and I, having lived in the days in the mid-'80s when the suggestion that we would sequence even one human's genome was thought to be science fiction, this is remarkable. The thought that we can sequence the relevant genes of a patient over a few week period and then interpret the clinically relevant genetic variants and return a diagnoses back to the patient really truly seems like science fiction.

Q | Any closing thoughts?

A | There are intense pressures on how academic medical centers are being funded and have been funded in the past. I think the public does not understand the threat that the TMC institutions face. Our institutions are where the innovative new medical treatments are developed and they are an invaluable national resource. The traditional fee-for-service medical revenues cross-subsidize our education and research programs, and they are under pressure and rapidly changing into a new model of medical care delivery. I view this generally as a good development, but it presents a major challenge for the next five to 10 years. We have to morph our old academic medical center model, with the traditional sources of support, into one where we develop new sources of support through carefully thought-out joint ventures and bring commercial funding into the mix in a meaningful way. To the extent we can align incentives between commercial interests and academic priorities, this should work. I think we have to take advantage of the market forces in biotech and pharma to drive what we do in better ways than we have in the past. I have spent the last five years making this argument to our faculty and they have responded positively, but it is too early to judge the outcome of our hospital joint venture with CHI, or our diagnostics joint venture with Miraca. And we have other JVs in the works. We are trying to leverage our unique capabilities in research into some sort of a commercial format that brings a unique opportunity to an outside venture but also brings a unique opportunity to support the academic enterprise. ■

A man in a hat and vest is fly fishing in a river. The background is filled with trees showing vibrant autumn colors in shades of yellow, orange, and brown. The water is blue with white rapids and large rocks.

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Testing the Tiniest Pacemaker

The world's smallest minimally invasive pacemaker comes to Houston

BY ALEX ORLANDO



“Everything in the industry is changing. With technology, things are not just getting smaller—they’re becoming more efficient.”

— JOHN SEGER, M.D.
Cardiac Electrophysiologist
at the Texas Heart Institute
at Baylor St. Luke’s Medical Center

John Seger, M.D., performed the procedure to implant the Micra transcatheter pacemaker. Less than one-tenth the size of a conventional pacemaker, the Micra is delivered directly into the heart through a catheter inserted in the femoral vein.

The miniaturization of our world is relentless. Clunky and cumbersome technology is increasingly replaced with sleek and streamlined versions, from laptops and cell phones to burgeoning developments in nanotechnology. In the domain of cardiac pacemakers, where current devices are visible outside the chest and wires have the potential to cause blood clots or breed bacteria, smaller might really be better.

CHI St. Luke’s Health-Baylor St. Luke’s Medical Center recently announced that it had become the first hospital in Houston to implant

the world’s smallest pacemaker—the Medtronic Micra Transcatheter Pacing System (TPS), which was implemented as part of a pivotal global clinical trial. Baylor St. Luke’s Medical Center remains the only hospital in the Houston area selected to participate in the trial.

“Everything in the industry is changing,” said John Seger, M.D., a cardiac electrophysiologist at the Texas Heart Institute at Baylor St. Luke’s, who implanted the Micra transcatheter pacemaker. “With technology, things are not just getting smaller—they’re becoming more efficient.”

With an elegant design that looks like something straight out of a science fiction movie—small tines protrude from the top of the cylinder, resembling metallic tendrils that attach to the meshwork of muscle bands within the heart—the Micra is less than one-tenth the size of a conventional pacemaker. Comparable in size to a large vitamin, it’s delivered directly into the heart through a catheter inserted into the femoral vein.

“The most striking thing about this device is that it doesn’t actually have any wires in it,” explained Seger. “When we put it into the heart through the leg,

we use sheaths as delivery tools without ever having to open up the patient's chest—we can perform this procedure in a relatively uncomplicated manner.”

Leveraging the understanding that all veins lead to the heart, the miniature Micra securely attaches to the heart wall once positioned, where it can be readjusted or retrieved, if needed. Once in place, the pacemaker delivers electrical impulses through an electrode located at the end of the device prompting the heart to beat at a normal rate.

“In basic terms, pacemakers do several things,” explained Seger. “Their primary role is to ensure that the heart rate doesn’t get too slow. We know that there are different diseases that can influence the conduction and electrical systems of the heart, intermittently impeding its ability to start generating impulses, which can cause people to faint abruptly or become unable to do their normal activities without feeling dizzy or short of breath when trying to exert themselves.”

According to Seger, traditional pacemakers have two components: the hardware and software of the device itself and the connecting wire, known as the lead, that attaches it to the heart. A small incision is made to access the subclavian vein, located under the collarbone, to thread the lead through to reach the inside of the heart’s right ventricle. The lead is either actively fixed by screwing it to the bottom of the heart or passively attached with a grappling hook mechanism.

There are several distinct disadvantages associated with that type of system.

“First and foremost, you need to have access,” said Seger. “Some people might have congenital abnormalities where their veins aren’t available, while others may have undergone radiation

therapy that necessitated frequent IVs and their veins are clotted as a result.

“We know that the wires can create their own problems,” he added. “They can clot the vein itself, which renders the vein unusable for other purposes. They can also serve as a nidus for infection. We know that a small number of pacemaker wires become infected after they’ve been in patients for a while.” With that in mind, practitioners have been scanning the horizon for emerging technologies that might circumvent some of those issues.

Standing in stark contrast to the current pacemaker implantation procedure, installing the Micra doesn’t require a surgical incision in the chest, nor does it create a “pocket” under the skin. Removing any visible signs of the device, as well as eliminating a potential source of complications, are attractive incentives for pacemaker patients.

“I’ve never thought of myself as a typical pacemaker person,” admitted Betty Funk, who received the Micra TPS in January of this year, becoming the first patient in Houston to have the procedure performed. “I’ve talked to other people who have pacemakers, and it worried me that a pacemaker might wake me up at night. But the Micra hasn’t at all.”

Funk, 62, has suffered from two strokes over the past few years, which led to the realization that her heart had a tendency to stop beating for short intervals at night—up to 20 seconds, at the most.

“Needing a pacemaker was a little bit of a surprise for me, even in the aftermath of those issues,” she said. “Initially, I thought I was going to receive the traditional type of pacemaker, but Dr. Seger asked if I wanted to participate in this study. My husband and I were both on board. I didn’t

really have many reservations—it was something new and it was an opportunity for us.”

After a brief procedure—30 to 40 minutes—Funk was up and moving that same day. “I had to spend the night, but I can’t complain about anything, really,” she laughed. “I don’t remember any big restrictions, but I did take it easy for a couple of days following the procedure. The only thing that really affected me was when they told me I couldn’t take a bath for 10 days—I like to take baths, so that was the worst part!”

In spite of the success of Funk’s experience, Seger noted that there are still some potential risks associated with the Micra’s innovative approach, which are being evaluated in the clinical trial. “It’s a little different from the risks associated with a traditional pacemaker procedure,” he said. “These devices require delivery systems, which may disrupt the structural integrity of the heart. We have the capability

to remove them in the first several months, but after they’ve grown in, we install another device if needed.”

Fortunately, the future may be bright for the tiny transcatheter pacing system. While the current Micra TPS design allows practitioners to regulate pacing solely in the lower chamber of the heart, those boundaries are being tested.

“The future of this technology will likely allow us to put small devices in multiple chambers of the heart,” said Seger. “These devices will be able to communicate with each other—instead of being connected physically, they’ll be connected through different types of frequencies so that when one beats, the other can beat synchronously. These may even be able to communicate with something that we implant under the skin, such as a defibrillator. There’s no question that this is the direction that the field is headed, and it’s going to completely change what we do.” ■



Betty Funk, 62, received the Micra transcatheter pacemaker this past January.



HOUSTON 2035: A BOLD FUTURE

By Alex Orlando

AS WE HURTLE ALONG THE PATH OF PROGRESS, THE DISTINCTION BETWEEN THE PRESENT AND THE FUTURE BECOMES INCREASINGLY HAZY. Will the landscape still look familiar in 20 years? What can we do to cast a spotlight on major, high-growth areas that are key to ensuring our collective development? What can today's stakeholders do to position Houston as a beacon of global innovation?

At Houston 2035, a unique, daylong conference designed to look 20 years into the future, attendees will probe the possible as they address those questions. Developed by Xconomy, a news and events organization focused on the business of technology, and hosted by TMCx, the event will take place on May 21.

"The concept of exploring 20 years into the future is something that we've been thinking about for a long time," noted Robert Buder, founder, editor-in-chief and chief executive officer of Xconomy. "Everyone's always so focused on their near-term goals, whether those are quarterly projects or even one to two years out. There was less and less of the long-term, fundamental thinking that's so essential to the growth of cities, industries, regions and economies. To counter that, we wanted to encourage thinking about what you have to do to grow the areas you're leading in already, while still considering emergent new areas."

Four of those leading areas—health care and life sciences; energy; education and talent; and infrastructure, design and architecture—have been selected as conversational focal points, giving featured speakers a platform to speculate, collaborate and, most importantly, innovate.

"On one level, those four areas of focus that we selected are fundamental drivers of anything," explained Buder. "In conducting

research here in Boston when we studied long-term planning and the future of cities, those areas kept coming up, along with some other ones like transportation. In education, there's a lot of innovation going on both in terms of how people learn but also in whom you're teaching and how people who haven't been included in education are incorporated. We also have to tackle these big questions surrounding energy, which underpins everything. If you look beyond that to health care and the Texas Medical Center, there's importance there not just to the region but also relating to big problems in the world."

"We need to get a critical mass of management-level talent in the life sciences," said Robert C. Robbins, M.D., president and chief executive officer of the Texas Medical Center. "It's essential that the many students, trainees and faculty members across all of our institutions understand that the fundamental discoveries they're making every day can be translated into new, commercializable drugs, devices and digital solutions to improve the health of humanity."

In the medical sector, several major advances are underway that will continue to advance knowledge and improve patient care.

Unlocking the mysteries of the genomic profile will give way to a clearer vision of the unique aspects of every disease. We will surely migrate from describing a disease class—such

as breast cancer—to defining each case by the individual's genome and treatment will truly be "personalized."

"Take a look at the genomics programs at Baylor College of Medicine and MD Anderson Cancer Center," said William F. McKeon, executive vice president and chief strategy and operating officer of the Texas Medical Center. "These are some of the top thought leaders in the world and they are driving DNA sequencing and analysis to be the gold standard of care at the Texas Medical Center."

McKeon thinks that harnessing the information from genomic analysis will pave the way for more targeted therapies, providing the capability to preemptively attack diseases before they can cause harm. He noted that this is also an appealing option as the costs to sequence the human genome have reduced significantly, and could soon cost less than a conventional blood test.

From minimally invasive surgery to the miniaturization of medical devices, advances in technology continue to benefit both patient and practitioner. Pacemakers, first introduced as large devices perched on a cart outside the patient, now reside comfortably under the skin, the size of a quarter. Technology today even allows for some medical devices to be remotely monitored for performance.



“I’m excited because we rarely take an opportunity to stop for a moment, reflect, and look over the horizon for the next 20 years.”

— WILLIAM F. MCKEON

Executive Vice President and Chief Operating Officer of the Texas Medical Center

“It’s essential to educate the many students, trainees and faculty members across all of our institutions that the fundamental discoveries they’re making every day can be translated into new, commercializable drugs, devices and digital solutions to improve the health of humanity.”

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



According to McKeon, the next few decades will allow for tremendous strides in cultivating a proactive, personalized approach to patient care. “When we think of proactive measures and prevention today, we think of eating less fats and getting more exercise,” he said. “We are already identifying genomic nuances that allow us to better select the most effective targeted therapy. Twenty years from now, we will understand more sooner, and, where appropriate, intervene.”

Wearable and implantable sensor technology will become fundamental in the future, woven throughout the fabric of our lives from both a health and fitness standpoint. These sensors will be capable of communicating and routing information, providing physicians and researchers with crucial, objective data.

McKeon is confident that this evolution will be used to validate potential conditions, chronicling them as they develop. “Twenty years ago, cars had fewer than 10 sensors,” he added. “Today, each car has over 1,000 and they monitor and provide us with essential information. Sensors are continuously becoming smaller, more accurate and less invasive. Imagine a future when your sensors and home dashboard provide you and your doctor with a diagnosis before you leave home.”

This evolutionary trajectory has similar counterpoints in education, especially as education and technology become more intertwined.

“Since we’re talking about 20 years from now, let’s look at 20 years in the past,” said George L. McLendon, Ph.D., Howard R. Hughes Provost and professor of chemistry at Rice University. “Back then, one of the measures of a great university was the size of your library. Today, basically everyone has the same library because it’s all digitized and freely available, everywhere. In the future—and this is happening right now—the things you learn will be processes instead of information.”

McLendon affirmed that experiential learning and process might supplant our current classroom-based model, coupled with an increasingly personalized focus on individual preferences and learning styles.

“Today, there are some precursors to that,” he observed. “If you do a key word search on your device, whether it’s a phone or a computer, you will not get the same hits as someone else. It’s learned what we’re most interested in and is

delivering customized content. All learning is going to start to work more and more like that.”

At the same time, McLendon concedes anything that disrupts the status quo will undoubtedly be met with some resistance. “Familiarity breeds content,” he laughed. “People are usually happy with the way things are. Anything that portends significant change in things that they’ve taken a long time to get used to is going to be hard. It’s going to be hard on teachers, students and families alike, but it’s inevitable. Part of our job as educators is to say, ‘This can be really exciting; let’s make this really exciting and move forward.’”

“One thing we can do today is to let go of our defensiveness and think about what good things are made possible,” he added. “To think about the benefits that might emerge, go all the way back to the time of the monks—they owned all the information. They were the only ones who could read or write, so they had disproportionate authority, and associated with that, disproportionate power. It’s really important that we make sure that the kids coming into school now are empowered to be these future, independent workers. That’s going to require a lot of social support and a lot of resource commitment.”

Within the constantly shifting landscape of infrastructure, design and architecture, David J. Calkins, regional managing principal at Gensler, envisions self-perpetuating construction materials with the capability to grow, heal and clean themselves, enhanced three dimensional visualization tools that enable the user to experience environments before a hammer is raised, and large-scale 3-D printing capabilities that render the hammer itself irrelevant.

“We’ll be able to highly customize spaces based on people’s real perceptions walking through them, in simulation,” said Calkins. “In the case of manufacturers, they might be able to try out manufacturing processes before they’re ever put together in reality—you can almost live in it before it’s even built.”

In addition to construction processes that make our current methodology seem practically primitive, Calkins thinks a trajectory towards self-reliance will sketch the model for future cities.

“There’s a whole trend towards resilience,” considered Calkins. “How do you make a city resilient and sustainable? How does it keep

“Anything that portends significant change in things that [people have] taken a long time to get used to is going to be hard, but it’s inevitable. Part of our job as educators is to say, ‘this can be really exciting; let’s make this really exciting and move forward.’”

— GEORGE L. MCLENDON, PH.D.

Howard R. Hughes Provost and Professor of Chemistry at Rice University

going? It’s not just about saving energy but how we perpetuate ourselves. Somehow, our buildings being more self-contained, more self-sufficient, and producing fewer waste products that need to be hauled off to other locations—that would be a real benefit.

“Then we’re talking about net-zero buildings that don’t consume energy, whatsoever,” he added. “If you move beyond that, you get to buildings that actually produce an oversupply of energy that would be available for others to use.”

Calkins thinks that in addition to generating an excess of energy through photovoltaic technology—the process of converting solar energy to electricity—it might be possible to construct buildings that actually restore the environment by harvesting photosynthesis.

“I think we need to keep taking risks, challenging ourselves and moving ahead while trying to be a leader,” he said. “We’re trying to push the envelope here. If the public demands sustainable buildings and the government demands more sustainable structures, then we’ll be moving along the right path. We just have to ask for these things. We have to push for them.”

At Houston 2035, which will feature national and local executives, entrepreneurs, educators and other innovators from startups, venture capital firms, universities, and leading technology, life science and energy companies, the deck is stacked to enhance the city’s role as a hub of progress.

“For this kind of conference, we really think that the multidisciplinary element is key,” said Buder. “Framing the issue as looking out 20 years and identifying the really important areas that everyone needs to know about was critical to the concept. So many new things come out of the intersection of existing things. Look at computer technology and life sciences; those have led to the emergence of health care

technology based on information technology, whether applying to genomics or electronic medical records. What is energy plus nanotechnology going to yield? It could be a whole new field.”

“I hope that this event begins the conversation—I don’t know that we’ve had Houston involved in a dialogue across all these lines,” added Angela Shah, editor of Xconomy Texas. “In the short term, I think it’s crucial to start by getting these kinds of people in the same room together. The conference provides an opportunity for them to bounce ideas off each other. Hopefully, down the line, we’ll be able to watch things progress and evolve going forward.”

In addition to the four key areas of focus, Houston 2035 will address opportunities in software, nanotechnology and entrepreneurship, as well as venture capital and angel investing. More importantly, it will help industry leaders and innovators reflect on the past and together envision a bold future.

“I’m excited because we rarely take an opportunity to stop for a moment, reflect, and look over the horizon for the next 20 years,” concluded McKeon. “It is important to recognize the patterns and trajectory of the past as a guidepost to the velocity of change we anticipate in the future.

“I’ve always been working on the innovation side of companies, and there are always these lovely surprises in the present,” he added. “I love the opportunity to look at education, health care, energy, and these other major categories with experts around the table—we can take a breath, look back, and then look forward to make bold predictions and say, ‘I think this will happen.’ We won’t all be right, but I think many of us will. The cadence of change gives us some insight into the speed at which it will evolve moving forward. If anything, we’ll be too conservative in our guesses.” ■



“I think we need to keep taking risks, challenging ourselves and moving ahead while trying to be a leader. We’re trying to push the envelope here. If the public demands sustainable buildings and the government demands more sustainable structures, then we’ll be moving along the right path.”

— DAVID J. CALKINS

*Regional Managing Principal
at Gensler*



Health Care

- >> More patients will be receiving care in their homes than currently receive care in hospitals.
- >> Every person in the United States will have access and coverage for health care.
- >> Patients will own their health data, including phenotypic and genomic data, and will become better educated about their own numbers and health.

PREDICTIONS: HOW

Looking 20 years down the line, industry leaders speculate on what the future holds.

ROBERT C. ROBBINS, M.D.

President and Chief Executive Officer
Texas Medical Center

In 2035, there will be wireless transmission of data to your health care provider. Potentially, you could even envision that information being included in a primary care physician's panel of patients. The hope would be that they would look at your weight, temperature, exercise, diet and other specific information, from your oxygen saturation to your ability to perform basic tasks. Your physicians would be getting that data, and there would be better artificial intelligence algorithms that would be constantly analyzing that data to alert them when necessary.

There will be an evolution over the next 20 years, much like when Medicare was passed

in 1965—at the time, there was significant backlash against that. Today, it has progressed and gone through many different iterations, changes and amendments that have been accretive to the initial bill that was passed. I think the same thing is going to happen for our entire population. The mechanism and the funding for that are still to be determined.

Patients will be better-educated consumers of health care, and can use that information to promote their own personal health, taking greater responsibility and ownership. We're going to have enough data to know when we need to lose a little weight, work on our exercise capacity, or even get an inhaler. If I know

I have the gene for colon cancer, for example, I need to change my diet, exercise more and potentially take drugs that may be protective, such as vitamin D or aspirin. In that case, I'd be especially fastidious in making sure that I get frequent colonoscopies. If I know that I have a family history of breast cancer, I'm going to be more fastidious about mammograms and other tests that we haven't even thought of yet—those might use nanotechnology and molecular imaging to be able to guide us. All invasive treatments are going to use more sophisticated image guiding therapies.

Architecture

- >> Rapid prototyping and 3-D printing will fundamentally change the construction industry.
- >> Emergent cities will be resilient, sustainable and self-perpetuating.
- >> Buildings will be designed that restore the natural environment and possess a healing capability.



STON 2035

DAVID J. CALKINS

Regional Managing Principal
Gensler

The construction process is heading towards being highly automated. You could set up a machine that could, essentially, squeeze out a house like toothpaste coming out of a tube. Very quickly, the structure is printed. In addition, 3-D visualization tools will continue to evolve—eventually, you'll be able to experience a space or a building, in three dimensions, before it's ever built. On the construction side, we will see the reduction of the use of resources, and the speed of construction will increase. It used to be that construction was a subtractive process, but with 3-D printing it's an additive model. Lastly, there are new construction materials being developed that can grow, heal themselves and that are self-cleaning. The term is 'self-assembling,' and these materials could be used for building skins. They will know how to put themselves

together much like a seashell grows, and they will also be capable of taking themselves apart, dissolving back into the environment when they are no longer needed.

There's a whole trend towards resilience—how do you make a city resilient and sustainable? Building with water systems, waste management and power generation will become increasingly efficient and reliable. In addition, they will be making use of solar, thermal and wind technology. In terms of power consumption and water treatment, we may see the tendency to go away from big, centralized systems towards systems that are much more localized. If photovoltaic technology continues to evolve, we could have nearly every face of a building collecting energy in a very unobtrusive way. That may result in fewer power lines.

Seeking to improve indoor environmental quality, there are green walls that we're putting into projects now, and we are maximizing access to natural light. All kinds of studies have shown that people work better and are more productive in naturally lit settings. What if we could design buildings that actually restore the environment? That would be greener than green—maybe we could start to harvest photosynthesis so that buildings look more like forests or green plants than anything. If you can keep people comfortable and keep them safe, they would be embedded in a green, lush, nurturing kind of environment that's full of natural light. It would be the opposite of today's cities where there's noise and environmental pollution. They would be greener, healthier and more fundamentally satisfying.



Technology

- >> Implantable and wearable sensors will be worn by everyone, serving as the key link between patients and care providers
- >> Every person will have his or her DNA sequenced, analyzed and utilized to optimize individual care.
- >> Computer intelligence will allow everyone to make verbal requests and receive comprehensive, optimized solutions.

WILLIAM F. McKEON

Executive Vice President and Chief Strategy and Operating Officer
Texas Medical Center

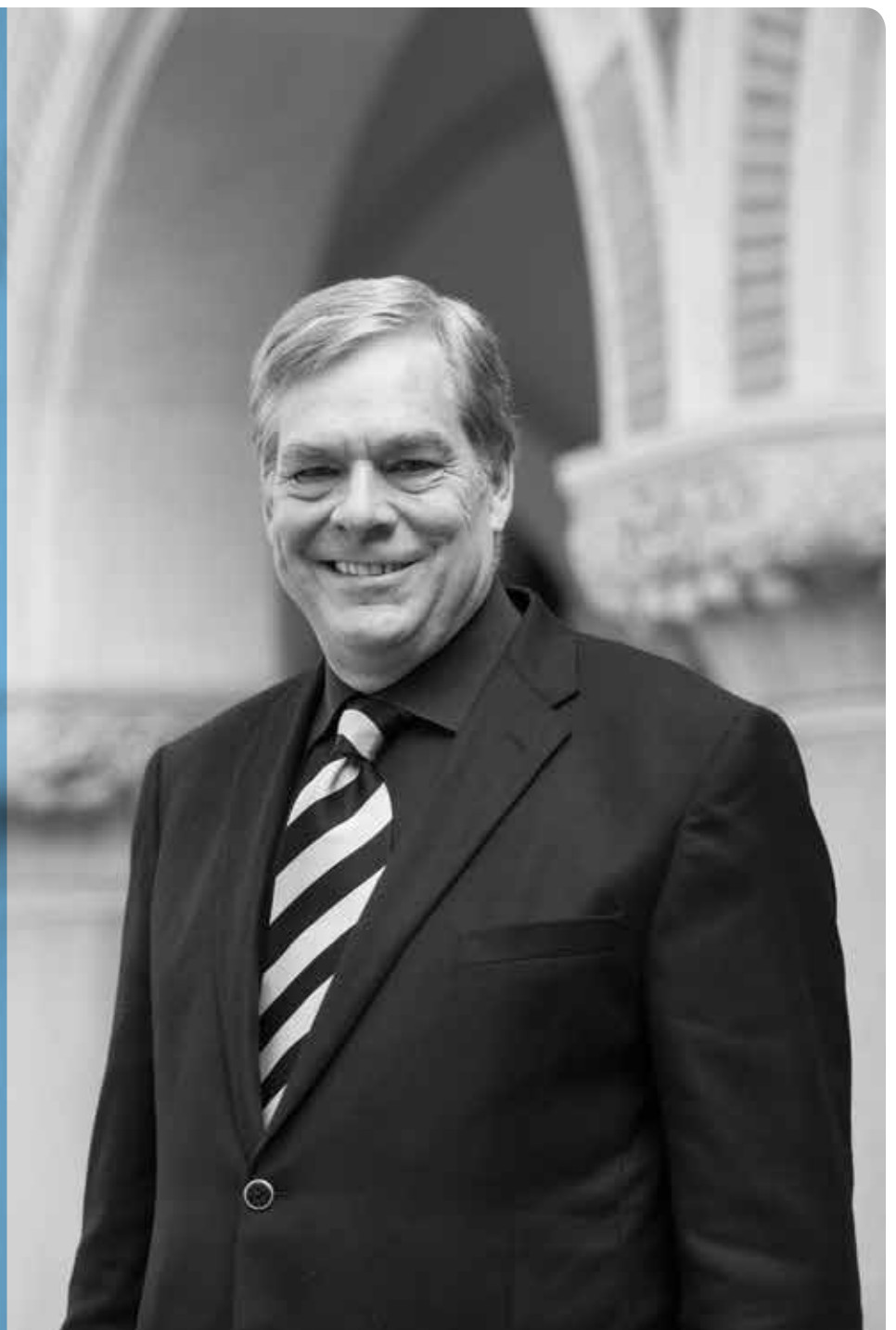
Sophisticated nano and micro sensors will create a “Body Area Network,” capturing the body’s most essential biological information. That data will continuously pass to your mobile and home devices, providing a real-time “health dashboard” that will diagnose most of the common ailments and detect serious abnormalities—often well before a patient becomes symptomatic. These sensors will be a part of our daily lives without impeding activity, allowing us to behave more naturally so that they can pick up the reality of how a condition is manifesting itself. One of the most valuable things that sensors will provide in future technology is that ability to capture information in real-time so that it can be acted upon.

Computer processing power and costs are rapidly driving the cost of DNA sequencing down to the price of a standard blood test. Every human is unique from all the billions of other people on the planet, and care will move from a disease approach to a unique individual plan. It will be exciting to see that with many of these major areas of disease that we battle today, you will have your own personalized plan to address it, hopefully before the onset of the disease itself. It’s a way of using the best available information to optimize an individual’s health, in all areas of their life, so that we’re actually being preemptive rather than palliative in our care.

Computers are already making small decisions today by analyzing traffic patterns and redirecting us to less congested areas. In the future, we will ask computers to solve more complex tasks that will combine all relevant information from disparate places. Imagine asking a computer, “Where would be the best place for our family to live?” or, “What would be the best university for my daughter to attend?” The computer will pull information from all relevant repositories (financial, social, geographic, etc.) and perform tasks that are too complex for humans to perform quickly.

Education

- >> Digital technology is going to completely transform the way information feeds into education.
- >> Traditional classrooms will be supplanted.
- >> We will have an entirely different learning continuum, based more on process than information.



GEORGE L. McLENDON, PH.D.

Howard R. Hughes Provost, Professor of Chemistry
Rice University

In 2035—and this is happening right this minute—the things you learn won't be information; they'll be processes. The learning materials of the future, let's call them books, are not going to be simply digital the way that they are if you order a book from Amazon and download it to your Kindle. Instead, your book will be unique to you—it will be completely tailored to individual preferences and learning styles but with defined outcomes. We might have the same textbook, but your textbook and mine won't look the same at all. There are some precursors to that. If you do a key word search on your device, whether it's a phone or a computer, you will not get the same hits as someone else. It's learned what we're most

interested in and is delivering customized content, and all learning is going to start to working more and more like that. You need to end up at the same place in terms of mastery of the material, but how you get there will not be the same anymore.

Experiential learning and process is going to replace content learning to a substantial degree. You won't have people talking at you. Instead, you'll be working together in groups trying to solve some relevant, real-world problem. That's going to be very different, as will the way that we credentialize things—you'll be building portfolios instead of earning grades.

K through 12 is not going to be the way to think about things—instead, it'll be K through

R.I.P. A big reason for that is that people aspired, 20 years ago, to a job within some larger entity, often as a lifetime experience. Today and in the future, you don't even aspire to more than one job—you probably aspire to more than one career where your absolute career goals may change midstream. Living in a multi-career world means that you're going to have to constantly refresh your learning, in major ways. If you move from being a chemistry professor to being an entrepreneur, those are very different skill sets. You're going to have to learn how to make that transition from one to another in order to be successful in these serial careers.



HARRIS COUNTY JUDGE ED EMMETT SAT DOWN WITH TEXAS MEDICAL CENTER EXECUTIVE VICE PRESIDENT AND CHIEF STRATEGY AND OPERATING OFFICER WILLIAM F. McKEON TO DISCUSS THE PATH THAT LED HIM FROM THE HALLS OF RICE UNIVERSITY TO THE TEXAS HOUSE OF REPRESENTATIVES, AND HOW HE IS HELPING TO ADDRESS SOME OF THE CITY'S MOST PRESSING CHALLENGES.

Q | Can you tell us about your formative years?

A | I was officially born in Overton, Texas, but my whole early youth was spent in New London, Texas, which is three miles from Overton. Famous in the old days because the school blew up in 1937. Because it sat on top of the East Texas Oil Field. And that's why you can now smell natural gas. Natural gas is naturally odorless, so they added mercaptan to it. My father was an oilfield worker his entire life, until they moved him into an office job later on. He had a panic disorder that I didn't know about until I was a junior in high school, such that he could never be alone. And that's why I have this passion for mental health. Now, he was able to cope with it and mask it with things as extreme as he would always ride the bus when we lived here, because there was always someone on the bus. But he had such good friends, they'd meet him at the elevator and ride up with him to his office. They'd come get him for lunch. And then he would ride out to where my mother worked at Meyerland Mall at JC Penney and he would just walk the mall until she got off of work, because there were all of these people around. That plays into the mental health, for the obvious reason, but also, had he not been kind of a mid-level oil company guy, he would have been arrested for vagrancy, particularly if he had been a minority.

So, back to where I grew up. East Texas Oil Field. We moved to Tyler for five years after that because the regional office moved there, and then we moved here. I didn't know anybody, so I had nothing to do but play tennis all summer. You come to the end of your junior year, and what do you do? I didn't know that you didn't go to Hermann Park and play tennis at night. But I did. So I got to know all kinds of people, mainly in the Third Ward. But me being from up there, it didn't matter to me.

I graduated from Bellaire, and the simple reason I went to Rice was that if you got into one of four schools, then the Humble Oil Company would give you a scholarship. It's called the Teagle Foundation. Humble Oil changed its name. It's called Exxon now, but my father never agreed to that name change. He always said he worked for Humble Oil. So you had to go to Columbia, Rice, MIT or Tulane. I didn't get into MIT. I didn't apply to Columbia. I got into Rice and Tulane. Rice was a better financial deal, but one of the real reasons was the admissions director at Rice went to Bellaire Methodist Church and had this sort of penchant for Bellaire kids, I guess. So a whole lot of us went to Rice. That's how I ended up at Rice.

Q | Did you imagine, before you started at Rice, where you would end up?

A | I was going to be a physics major. Even though I came at the end of my junior year to Bellaire, I represented Bellaire at the nuclear science symposium that summer. In high school, I thought I was a whiz when it came to physics. The chair of the physics department at Rice convinced me otherwise when he gave me, I think it was a 12 on my final in my freshman year. I passed the course, but I thought I probably didn't want to be a physics major anymore. So I ended up getting a degree in economics.

And of course, going to college in the late '60s and early '70s, everything was political. You had Vietnam, you had women's rights, you had birth control, you had drugs, civil rights. All of that was just this maelstrom of activity. So I got interested in politics in a big way, and was president of the college—not to be confused with the actual university, since Rice has the college system. I did that, played tennis, though not well enough to be very good at it. I was on the team at Rice, but I didn't get to play. I tried to be a tennis pro for a year and a half, and actually made decent money straight out of Rice in 1971.

But I went back to graduate school. I thought I was going to go to law school, but through a total quirk of fate, walked across the street from the UT Law School to the LBJ school, where my brother-in-law worked, and ended up going to the LBJ School. Full ride. And got my master's degree in public affairs. I thought I'd come back and get into politics. And eventually I did.

Q | When you thought about politics at that time, what did you envision?

A | Oh, if you had asked me at that time, 'Gosh, if I could grow up and be in the legislature, that would be the coolest thing in the world.' I did that at age 29. I served four terms in the House, and was chairman of the House Committee on Energy, which was interesting because I was a Republican. There were 110 Democrats, and a Democrat speaker, and yet I got appointed as chairman of the House Committee on Energy.

Q | How did that work out?

A | That was a time when people weren't as partisan as they are now, and that's a time that I would like to get back to, frankly. Which is one reason why I am a Republican and I am proud to be a Republican most of the time. But at the same time, if we don't find a way to compromise and have a little bit of a bipartisan approach, we are going to be in a world of hurt.



*Judge Emmett delivering 2015 State of the County Address.
(Credit: Richard J. Carson)*

“Yeah, I could tell you the bills I have passed, or this, that and the other. But if all of these people who have worked for me go on to do bigger and better things, then my life is good.”

For the full interview, visit TMCNews.org

So anyway, I did that. But the key story behind that...I picked a district in East Harris County. I ran against a six-term Democrat opponent incumbent who had never had a Republican opponent. And the party, everybody said, "You are a nice young guy, but good luck." Nobody would give me any money or anything. But there was one woman, who, a friend of a friend said that she wanted to help a federal candidate, a state candidate and a local candidate, and that I ought to go see her.

So I drove down and visited with her. We had tea or coffee, and she agreed to help me. Her husband had been in Congress a few years earlier. As it turned out, I was the only of her three candidates that won. So she kind of adopted me, and that woman's name was Barbara Bush. The other two candidates that she helped that year—and I love telling school kids this—her federal candidate was her oldest son, George. He ran for Congress, and he didn't win. I don't ever know what happened to him.

And then her statewide candidate was her husband's tennis partner, who ran for attorney general of Texas. And that was James Baker. So he would have been attorney general of Texas, but instead he was White House Chief of Staff and Secretary of State. All because he lost. She used to delight in telling the

story, 'Ed's my candidate. He's the only one who won.' And I would always say, 'Yeah, that's why I ended up so famous compared to those other two guys who lost.'

Later on, after running for the Railroad Commission and losing, that same year, her husband George got elected president and I got a phone call to come to Washington. So I went up as interstate commerce commissioner. And that produced one of the great scenes in Senate confirmation history. When Senator Hollings from South Carolina—who didn't like me because I was still in my 30s, didn't like my stances on truck deregulation—kept asking me, 'Why are you here?' And finally, he was running out of time, and he said, 'Let me put it to you this way. Are you the most qualified person to be on the Interstate Commerce Commission?' I said, 'Mister Chairman, no, because it would be presumptuous of me to say I am most qualified.' So he had me, he said, 'Well, if you aren't the most qualified person to be here, why are you here?' And I said, 'Because I know Barbara Bush, and they don't.'

And he just started laughing hysterically and said, 'That's the most honest answer I've ever gotten out of a witness.' But it's true. Nothing we do, we do on our own. I mean, would I have gotten elected without Barbara Bush? Yeah, but then I wouldn't have known her, I wouldn't have known her husband. Because I

did knock on 19,404 doors in that first race. But we always have to remember that we are just a small piece. What we accomplish depends on how other pieces fit in there.

Q | At your recent State of the County address, you were introduced by one of your former interns, Gabe Baker. For a young person to be so excited about the future, it must be a good feeling to see this next generation of leaders, particularly those like Gabe who you have mentored.

A | John Tower was a Republican U.S. Senator, the only Republican elected in 1961, before the Republicans won anything in Texas, and he served a long time. He was considered this staunch conservative. And of course by the end of his career he was considered a moderate, and some people didn't like him. But at the end of his career, before he died in a plane crash, he was asked, 'What's your proudest accomplishment?' He had passed all of these bills and done all of this stuff. He didn't hesitate. He said, 'Proudest accomplishment? That's easy. It's all of the people who have worked for me who have gone on to do better things.'

I thought that was just the coolest statement. I mean, that's really much more important. Yeah, I could tell you the bills I have passed, or this, that and the other. But if all of these people who have worked for me go on to do bigger and better things, then my life is good.

Q | What were some of the key points of your State of the County address?

A | The two main topics were indigent health care and transportation. And when I say transportation, I mean everything: roads, rail and water. And in a way, they are similar. My staff, where I used to work, got tired of me using the analogy—I used to talk about transportation



Judge Emmett touring Hurricane Ike aftermath with Texas Dept. of Public Safety and working to coordinate PODs. (Credit: Office of Judge Emmett)



“ We have got things going in the right direction on mental health. We’ve got people in Austin, from really conservative Republicans to really liberal Democrats, all talking about mental health. So that is going to be a big thing that I don’t want to let go of. ”

in terms of the health of a person. You can go to your doctor, and they want to know how good your circulation is. Because if the circulation is good, your health is good. Well, it’s the same way with transportation. If people and goods can’t move through a community, then it’s going to stagnate and it’s going to die. So, long-term, one of my main interests is to make decisions now that I know won’t really come into fruition for 20 or 30 years, which is why I’m chairing the TexDOT Advisory Committee right now. We are looking at how to plan for transportation that will allow for this whole region to continue to grow.

On the health care side, 20 years ago health care wasn’t a public policy issue and it certainly wasn’t something a county judge paid any attention to. But for a variety of reasons, it’s here now. And as I pointed out in the State of the County address, wealthy, well-educated people are confused enough about health care. They are looking at insurance premiums and which doctors to select, and all of that. But for other people, it’s just a maze. How do you get through it? I am a big believer in preventive care.

Establishing medical homes for people, so that they are not afraid to go get health care, and show up at the very end in an emergency room. Emergency rooms are nice, but they are expensive and they are not the ideal place for getting care. So those are the two main things: taking care of the health of the community, and the health of the economy. And they are pretty much tied together.

Another thing I talked about was TranStar, which is kind of like the Texas Medical Center. No one today would have designed something that has TexDOT and the city and the county and Metro all in it, but they did. And then this domed building down there that I inherited. But I think we ought to use it. It’s an asset.

Q | Let’s talk a bit about mental health. If you could wave a wand and make one or two things happen in the next few years, what would those be?

A | I think one of them is already happening, and that is that people are no longer viewing mental health as different from physical health. That’s a huge change, just in perception. And that’s where someplace like the Texas Medical Center, or the member institutions at least, can ultimately play a bigger role. Because why should a disease of the brain be treated any differently than a disease of any other organ? So I think we are there. That magic wand may not have fully been waved, but it’s on its way.

But the bigger issue, and it applies to mental health and several other categories, is that we have got to get a realization that investing in things now is really the conservative, smart thing to do, because it saves so much money down the road. And it will allow people to have productive lives, which will generate all kinds of good things, economic or otherwise, for society.

Q | How would you describe the Texas Medical Center?

A | I describe it to people as being the best collection of medical facilities, period. Sometimes I talk about it, and I don’t mean this to sound as negative as it might at first, but it’s an accidental occurrence. I mean, yes, some very generous people made some generous donations back in the beginning. But who could have known that it would develop into the 56 institutions that it is now?

If we were sitting here today and it didn’t exist, I doubt anyone would design it that way. But the fact that it has developed, I consider it to be an absolute gift. Now we need to take advantage, and all of us need to be part of nurturing the Texas Medical Center and its institutions so that the institutions, and the whole medical center, can really grow into its full potential.

Q | Looking forward, what do you get most excited about looking at the next five or 10 years?

A | We have got things going in the right direction on mental health. We’ve got people in Austin, from really conservative Republicans to really liberal Democrats, all talking about mental health. So that is going to be a big thing that I don’t want to let go of. I do want to solve the Astrodome dilemma, and make use of that asset. And again, being repetitive, I hope to get some decisions made, not just by me but by the decision-making bodies, to build certain transportation facilities so that when I’m living in my cabin up in the East Texas woods, people down here can be moving around because someone made a decision long ago.

Q | That’s a beautiful quilt you have hanging here in your office. Can you tell us about it?

A | My wife is part of a quilting group that has met for many years, and when I went to Washington in ’89, she was going to make a quilt to hang behind my desk in the Interstate Commerce Commission. And this was finally finished six years ago, so it didn’t quite work out. It’s a Baltimore album quilt, and that’s why you have the federal eagles in the corners, and they are always supposed to tell a story.

So, birds and flowers became the theme. And we both went to Bellaire High School, so that’s where the cardinal is from. Baltimore Oriole, because we were living in Maryland at the time, and going to the Orioles games. Gwen was born in Louisiana, so the pelican. State bird of Texas is a mockingbird. Robins were always a favorite of mine as a kid, and we just needed something colorful, so we added the blue jay, and of course, the Rice owl. And then the flowers, you have the black-eyed Susan, which is the state flower of Maryland, and then the yellow roses and blue bonnets. And then you have the Texas Flag, and the Scottish flag because we used to go there every year. And that leaves that one bird, a canary, and no one ever knows what that’s for.

I am the only person you will ever meet who gets signed jerseys from the Norwich Canaries soccer club. A friend of mine is one of the minor owners of the Canaries, so I started following them years ago.

Q | One last question. What advice would you give someone who is beginning their career in public service?

A | The advice I always give, that I still do, is to read books about people who have been here and done this. Not just the real famous ones. You read and you come across things and you learn from what they did. And you learn from the mistakes that people made, too. So I tell people just absorb as much as you can from people that you know, and from people you can read about.

Secondly, there was an old gentleman named Bill Heatly in the Legislature, who when I first went up in my 20s, he was exactly the kind of person that I didn’t like. Old-line, conservative Democrat, West Texas, nothing about it matched up. And I guess he kind of sensed that because he took me aside one day and said, ‘Look, I know you don’t like me, but I’m going to give you some advice. Never permanentize an enemy.’ Now, I don’t know that ‘permanentize’ is a word, but he and I got to be pretty good friends after that, because you start thinking about it and you are going to vote on something one day and be on opposite sides. And then the next day, you may want to be on the same side. But if I have made you such a personal enemy that you aren’t willing to work with me, or vice versa, then we aren’t going to accomplish anything. And I have always remembered that. It was such great advice. ■

Enhancing Community Care

Project ECHO, a new telehealth program at Baylor St. Luke's, is increasing access to quality health care by educating and empowering community providers

BY SHEA CONNELLY

“One minute I thought I was dying, a year later I was cured of the disease. It's just a blessing. Amen for ECHO.”

— JOHN ROCKS
Patient Cured of Hepatitis C through Project ECHO

After a litany of routine tests in 2012, John Rocks heard news he never expected: “You have hepatitis C.”

Rocks learned he was infected with the virus after being treated for high blood pressure. With no insurance, his options were limited—until a chance encounter at a local doctor's office led him to CHI St. Luke's Health-Baylor St. Luke's Medical Center's new telehealth program, Project ECHO.

Project ECHO seeks to increase the accessibility of quality health care by allowing Baylor St. Luke's experts to use video conferencing to mentor and train providers in communities throughout Texas, as well as a number of communities in Louisiana.

“Project ECHO originally started at the University of New Mexico,” said Norman Sussman, M.D., director of Project ECHO, and associate professor of surgery at Baylor College of Medicine. “The founder, Sanjeev Arora, M.D., faced a problem that many of us in medical centers face—getting access to patients who are underserved in receiving the best health care in terms of distance, finance and capability.”

When Sussman and his colleagues became aware of the project, they knew Baylor St. Luke's would be an ideal place to begin their own Project ECHO to better treat patients suffering from illnesses, like hepatitis C, that often require specialist care. Tracking down

those patients with hepatitis C was not a difficult task. Wayne Gosbee, outreach coordinator at Baylor St. Luke's, had been providing free hepatitis C screening to patients for years. It was the next step—what to do when a patient tested positive—that proved complicated.

Prior to the launch of Project ECHO a little over a year ago, patients diagnosed with hepatitis C, either by Gosbee or by their own primary care physicians, would be referred to the experts at Baylor St. Luke's for further treatment. Unfortunately, many of those patients would end up without further treatment, unable to make the trip to the Texas Medical Center for a variety of reasons, including a lack of funds, an inability to take time off of work, or even just sheer distance.

“There was a gap in care,” said physician assistant Renita Madu, one of the community care providers participating in Project ECHO. “Hepatitis C or cirrhosis would just be something they had until they had to go to the ER.”

Now, thanks to Project ECHO, Gosbee has a host of providers throughout Texas and Louisiana to whom he can refer hepatitis C-positive patients.

“Wayne finds the patients and says, ‘Where do you live? Oh, there's a clinic nearby,’ and he refers them there,” said Sussman. “We communicate with that clinic and work on co-managing the patients. Number one, we're getting patients treated closer to home. There's no need to come here. Number two, the community providers become so sophisticated that they start to manage patients without us.”

That is the true beauty of Project ECHO. As Sussman and his colleagues emphasized, the goal is not to provide direct patient care, but to enhance



From left, Norman Sussman, M.D., director of Project ECHO, and patient John Rocks met for the first time after Rocks was cured of hepatitis C. Pictured with Renita Madu, the physician assistant who directly treated Rocks, and Project ECHO associate director Saira Khaderi, M.D.

“This is more telementoring than telemedicine. We’re teaching them how to treat these complex diseases they didn’t realize they could treat.”

— SAIRA KHADERI, M.D.

*Associate Director of Project ECHO and
Assistant Professor of Surgery at Baylor College of Medicine*

patient care through the providers in the community.

“This is more telementoring than telemedicine,” said Saira Khaderi, M.D., associate director of Project ECHO and an assistant professor of surgery at Baylor College of Medicine. “We’re teaching them how to treat these complex diseases they didn’t realize they could treat. We’re reaching out to however many sites, but each one of those sites is treating 10 patients and it continues to expand from there.”

For Madu, Project ECHO has provided an opportunity to expand her skill set far beyond what she learned in school. Madu works as a physician assistant at a federally qualified health center affiliated with Baylor St. Luke’s.

“Project ECHO provided a way of getting the test from Wayne Gosbee and having access to these specialists who know so much about these medications,” said Madu. “I didn’t get trained specifically for hepatitis C, I was just general medicine. It was a way of broadening my knowledge base. It’s taught me a lot, and increased my confidence level. It’s a big deal.”

Madu is the provider responsible for treating John Rocks. After Rocks’ hepatitis C diagnosis, he had no idea where to turn. At the time, he barely even knew what hepatitis C was, let alone what his prognosis would be. Internet searches only increased his despair.

“I found out it will kill you—they called it ‘the silent killer,’” Rocks said. “I thought I was up a creek without a paddle. No money, no insurance. I’d just turned 50 years old, and to find out I had this disease? It was a shocker.”

Rocks suspected he contracted the virus from a blood transfusion after a motorcycle accident in the ‘80s. Having

read a lot of dire information about hepatitis C online, Rocks headed to a local doctor’s office, where he spoke frankly with the receptionist.

“I said, ‘Well, ma’am, I don’t have any insurance. If there’s no cure, this is just like throwing my money away,’” he recounted. “She said, ‘You know what? Call this number.’”

The phone number belonged to Wayne Gosbee. After Gosbee confirmed Rocks’ hepatitis C diagnosis, he was referred to Madu’s clinic for further treatment and his case proceeded like any other in Project ECHO.

Lizette Escamilla, Project ECHO coordinator, sends email blasts to all providers connected with the program, like Madu, to let them know of scheduled hepatitis C clinics and to ask for patients to present. She sends forms to the providers, which cover information such as past medical history, time of diagnosis, any secondary complications and complete blood counts.

“I create the agenda and the providers are placed in the queue to present their cases one by one. We’ve had from 12 to 20 up on the screen for hepatitis C,” said Escamilla. “One presents at a time, but everyone else is listening as well. They’re able to give comments and ask questions.”

Patients remain completely anonymous throughout the process. Baylor St. Luke’s physicians are not provided their names or any other identifying information. They simply consult based on the medical details providers share with them.

“It isn’t like they give us information and we just say, ‘Do this,’” said Sussman. “We’re engaging in a conversation. After one or two cases, [Madu] was telling us what she wanted to do. She



Project ECHO physicians sit in a conference room at Baylor St. Luke’s, consulting with community providers over teleconference. (Credit: Baylor St. Luke’s)

became so confident in managing this, and now she can teach others.”

With Rocks’ blessing, Madu presented his case during one of the clinic teleconferences. Based on the advice of Baylor St. Luke’s doctors, Madu put him on a 90-day regimen of an oral medication to treat hepatitis C. By the time 90 days were up, Rocks no longer showed any signs of hepatitis C.

He is the first patient with the Project ECHO to be cured, but if all goes according to plan, this is only the beginning. In addition to hepatitis C, Project ECHO also currently offers clinics in hepatitis B, advanced liver disease, infectious disease, and cardiology, with plans to expand further.

“In the summer and fall, we’re going to open up other clinics like nephrology, pulmonary, rheumatology,” said Escamilla. “We’re also working to offer behavioral health services. We’re talking with many physicians who are generous with their time and would like to volunteer to lead a Project ECHO clinic.”

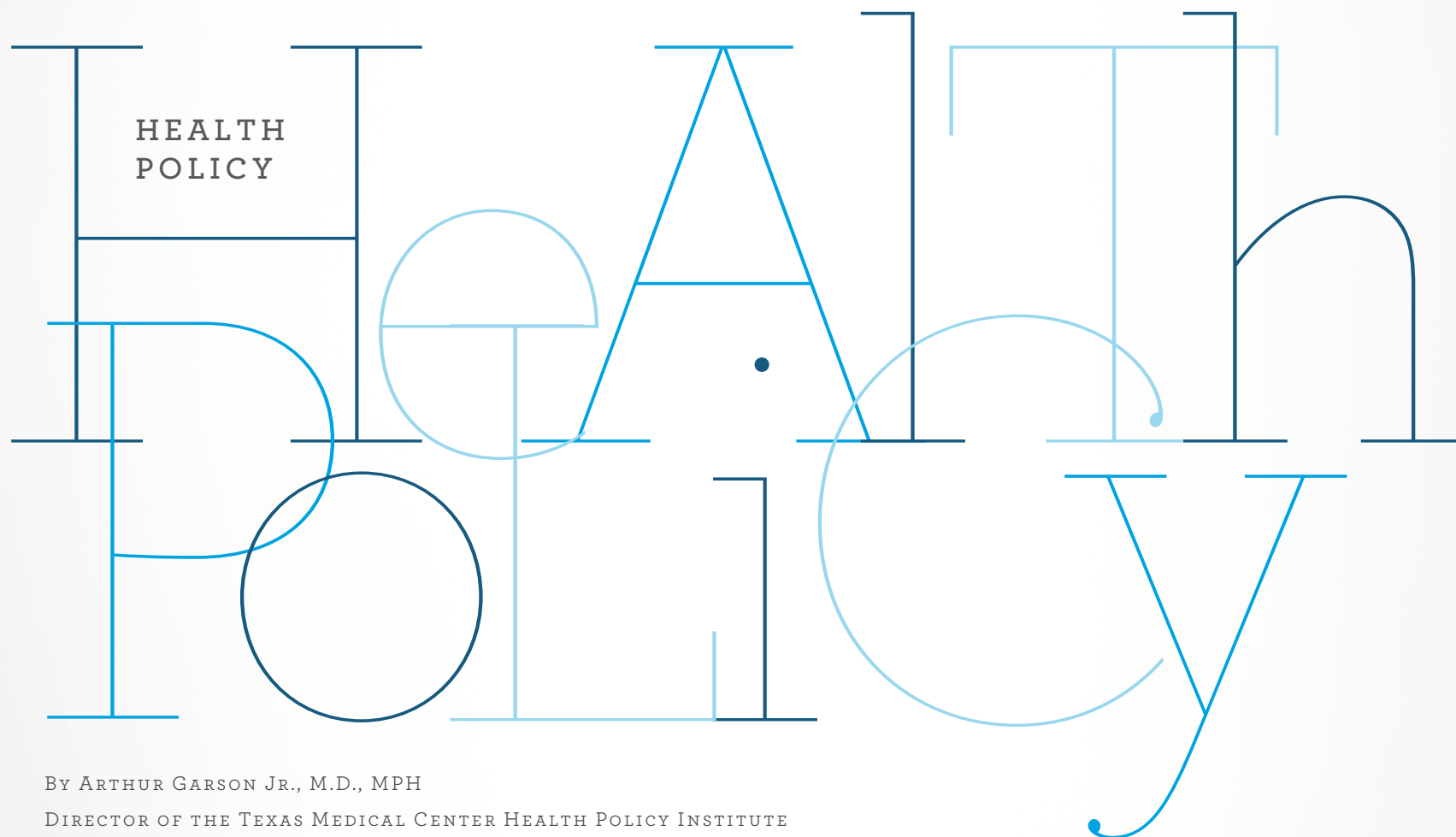
As the program looks to expand, Rocks’ experience has everyone at Project ECHO excited for the future. Though Rocks didn’t know it at the time, the moment that receptionist placed Wayne Gosbee’s phone number in his hand proved to be life-changing.

“One minute I thought I was dying, a year later I was cured of the disease,” he said. “It’s just a blessing. Amen for ECHO.”

The value of Project ECHO goes far beyond delivering care to underserved communities. It’s empowering providers in those communities, giving them the knowledge and the confidence to help the people they serve in ways they may not have believed possible. Madu grew teary-eyed as she spoke of the moment she told Rocks he was cured of hepatitis C.

“To tell someone with an infectious disease, ‘It’s cured, it’s gone. You don’t have the virus in your system,’ it makes you feel good inside,” she said. “And now he can think long-term again about his life.” ■

HEALTH POLICY



BY ARTHUR GARSON JR., M.D., MPH

DIRECTOR OF THE TEXAS MEDICAL CENTER HEALTH POLICY INSTITUTE

THE “DOC FIX” MAY NOT BE WHAT YOU THINK IT IS; the term has become synonymous with a change in how doctors are paid. On April 14, Congress approved a new way to pay doctors.

Why is change needed? The majority of doctors are paid “fee-for-service” (FFS): every time a doctor sees a patient, or interprets a test or performs an operation, the doctor is paid for that service. It is human nature, whether with doctor payments or the number of parking tickets issued by policemen, towards the tendency to do more services.

The U.S. Congress recognized the issues in FFS and in the Balanced Budget Act of 1997, and there was a cap placed on the total amount paid to physicians by Medicare—not to an individual physician—with a total of \$40.2 billion in that year. Then, by a formula, this cap was increased (or decreased) yearly. This change in the yearly amount paid to physicians became known as the “Sustainable Growth Rate,” or SGR. The SGR was based on a number of factors, including the actual change in fees by physicians, the real gross domestic product, and the number of Medicare beneficiaries. If the change in spending in the year before exceeded the projected SGR, the amount paid to physicians in the next year would decrease. There was no method for a review—what if the formula was wrong?

What happened? Every year, we doctors exceeded the amount that was available and the formula

indicated that the amount paid to physicians needed to be decreased. Either the doctors did too much or the formula was wrong. Probably some of both—but interestingly, from the late 1990s on, everyone, including Congress, agreed the formula was wrong and did not predict the increased use of services needed by an aging population.

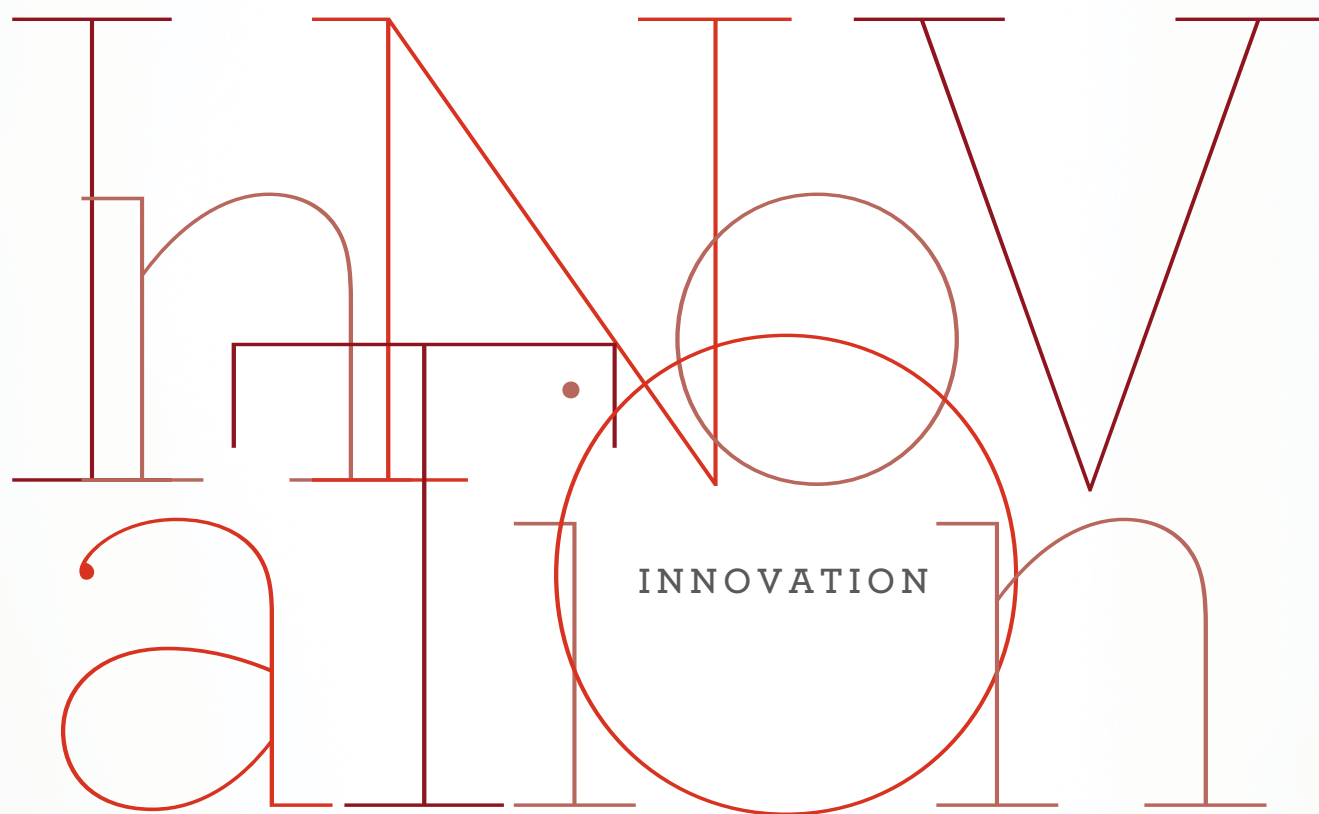
So why not just fix it? Since more money was required, Congress needed to find the money—or decrease the amount paid to physicians. Every year, when the Medicare budget has been under review, the doctors lobby to be sure the amount paid does not decrease. This lobbying has become a “necessary evil.” Since no one knows what would happen without the extensive lobbying, it continues. The lobbying is absurdly expensive; in fact, the SGR change (or “fix”) has become one of the very top issues for physician groups: according to McClatchyDC, the American Medical Association spent \$19.7 million last year on lobbying, and contributed \$1.7 million to favorable candidates; the American College of Radiology spent more than \$5.5 million. Do the math—there are perhaps more than 200 different physician groups generating well over \$1 billion EVERY YEAR into the pockets of

lobbyists. One might wonder if the lobbyists are perfectly happy to see this issue continue. Imagine if all that money was spent helping to fund the “fix”! I am not happy to see it continue—it must be fixed.

But every year to date, Congress has “kicked the can down the road” because they can’t find the money (around \$210 billion over 10 years) and surely don’t want to enact the other arm of the dilemma—decreasing physician payments by 21 percent.

So it is a big deal that Congress created “the Doc Fix.” One part of the law is, instead of a massive decrease in fees (i.e. 21 percent), physicians will receive a 0.5 percent increase for each of the next five years. Imagine if Congress in 1997 had said that they would increase fees by about one-sixth the rate of inflation for five years. But now that physicians are faced with a huge reduction or a paltry increase, they are OK with the increase. Remember Old Coke and New Coke? We didn’t realize how wonderful Old Coke was until we faced the alternative. ■

—This story column first appeared in the Houston Chronicle



BY WILLIAM F. MCKEON

EXECUTIVE VICE PRESIDENT AND CHIEF STRATEGY AND OPERATING OFFICER OF THE TEXAS MEDICAL CENTER

INNOVATION IS A “PROCESS OF TRANSLATING AN IDEA OR INVENTION INTO A GOOD OR SERVICE THAT PROVIDES VALUE.”

The gyroscope, the iPhone, the Segway—each spark wonderment and serve as reminders of our limitless ability to reach beyond convention.

The Texas Medical Center has a rich history of discovery and invention. Many innovations in clinical care were pioneered on our remarkable campus and translated through education to physicians throughout the world.

Today, an entirely new set of health care tools have arrived that did not exist 20 years ago. Genomics, stem cells, micro-sensors, nanotubes and cellular technologies offer new opportunities to move from reactive, palliative care to preemptive, real-time personalized medicine.

Most discoveries or advances in care are rarely the result of a single individual effort, but rather derived from a collision of people sharing ideas. These engines of creativity have changed throughout history, but have all created space for the exchange of ideas.

Today, incubators and accelerators have become the ideal venue to not only share ideas, but also dedicate resources to nourish startup companies.

As a result of the TMC Strategic Plan, innovation was determined as the greatest area of opportunity for

driving collaboration across the medical center.

The top priority was to develop dedicated space for our member institutions. TMCx, a new health care accelerator for the Texas Medical Center, was built and opened in late 2014.

The TMCx accelerator is unique in that the startup companies are not required to give up any equity to participate in the program. All TMCx services—including rent, a comprehensive curriculum, a rich network of advisors, and a dedicated team of experts focused on supporting the startups’ growth—are provided for free to companies selected to participate. The most compelling aspect of TMCx is that it resides on the campus of the largest collection of medical minds and assets in the world.

Earlier this year, 22 startup companies were selected from a pool of over 260 applicants to join the accelerator program. The inaugural class of startups is comprised of life science, medical device and digital health companies from around the country, and the world.

The excitement and support across the medical center is palpable as everyone recognizes that we have the opportunity to make Texas the premier destination for life sciences. These are early days and we have much to do, but the “wildcatter spirit” is alive and kicking at the Texas Medical Center. ■

“Today, incubators and accelerators have become the ideal venues to not only share ideas, but also dedicate resources to nourish startup companies.”

Betting on Biomedical Ventures

Looking to the future, UTMB expands its Collaborative Innovation & Entrepreneurship Program to reach faculty, clinicians and students throughout Texas

BY ALEXANDRA BECKER



Stanley J. Watowich, Ph.D., gives the opening remarks at UTMB's Collaborative Innovation & Entrepreneurship Program's "pitch day."

“You can have the best idea in the world for a new device or drug that could really transform the industry, really help patients, but you also have to know how to make a profit. The reality is that you can't have your product out there if it can't survive in the market.”

— STANLEY J. WATOWICH, PH.D.

Department of Biochemistry & Molecular Biology, Sealy Center for Structural Biology and Sealy Center for Vaccine Development at The University of Texas Medical Branch at Galveston

Imagine a protein-based biomaterial that would accelerate wound healing for trauma patients or soldiers injured in war. Or how about tools focused on the early detection and prevention of some of the deadliest forms of cancer, novel agents that can protect stem cells and promote survival of those cells into a diseased tissue or organ, or a vibrational vest engineered for patients suffering from chronic airway diseases like cystic fibrosis?

The list of cutting-edge innovations currently being developed by researchers, clinicians, faculty and students in the Texas Medical Center is vast—and their potential to revolutionize health care and advance quality of life is endless. Yet despite their promise, the majority of these products will never make it out of the lab and into the hospital room, battlefield or home.

“You can have the best idea in the world for a new device or drug that could really transform the industry, really help patients, but you also have to know how to make a profit. The reality is that you can't have your product out there if it can't survive in the market—that's the primary reason many of these great ideas are failing. Understanding product development is vital,” said Stanley J. Watowich, Ph.D., associate professor for the Department of Biochemistry & Molecular Biology at the Sealy Center for Structural Biology and Sealy Center for Vaccine Development at The University of Texas Medical Branch at Galveston (UTMB).

Watowich is also the director of UTMB's Collaborative Innovation & Entrepreneurship Program—a UT System-funded initiative designed specifically to help biotech pioneers keep their products alive in the ever-increasingly complex and competitive marketplace.

Launched in 2014 in collaboration with the University of Texas McCombs School of Business in Austin, the Rice University Bioengineering Department, and successful entrepreneurs and leaders in the biotechnology and biomedical field, the program provides an in-depth understanding of the pathway to commercializing great ideas and creating successful startup companies and biotechnology ventures.

The program currently supports two courses: “Successful Entrepreneurship,” geared towards established biomedical professionals in the Texas Medical Center, on UT campuses, and at all Texas institutions, and “BioVentures,” which is set up as a mentorship program for TMC graduate and medical students.

The professional course runs 12 weeks and is administered primarily via online resources and forums.

“We wanted this to be as flexible as possible because all of our participants in that course have full-time jobs. We don't want them to have to stop their clinical practice because they are trying to learn how to get their ideas out there,” explained Watowich.

In contrast, the BioVentures course, targeted at medical students, residents and postdocs, is an immersive course in which teams of students work with local successful entrepreneurs to develop a startup company and strategic business plan that can convert a patent-protected idea into a commercial product. Students take the lead in developing and running this course.

“Both classes require participants to develop a plan that will bring an idea to the biomedical market—and defend how this plan produces a viable company,” Watowich said. “It's complex and involves understanding how a patent works, navigating the regulatory pathways and the FDA, researching

“In the biotech industry, only about one in 100 companies ever goes on to make significant profit—we’re hoping to give these Texas-based ventures much better odds than that.”

— STANLEY J. WATOWICH, PH.D.

how to get ideas to the market, and conducting primary market research to determine if there even is a market for their proposed product. The goal is to help individuals make decisions to either start a company with their ideas or help them re-work their ideas into something that will be successful in the market. We want to make sure we are helping people move ideas forward—even if that means allowing them to fail quickly so they can regroup before investing too many resources.”

The outcomes of both classes are the same, with each student leaving the course with an executive summary of a business plan and an idea of what their next steps will be. All of it culminates in one final event known as “pitch day”—a graduation of sorts where the men and women behind the ideas pitch their venture to a room full of Texas-based entrepreneurs and investors.

“The pitch includes their product overview, the risks involved, the financial backing needed to achieve defined milestones, and what they expect to accomplish in the first year or two—all delivered within the space of about eight minutes,” Watowich said. “It’s a chance to get some initial exposure, and more importantly, real-world feedback.”

The program was recently granted additional funding to add new resources based on recommendations from recent graduates. By Summer 2015, three additional components will be offered, including one-on-one opportunities for new companies to work with McCombs Business School

faculty to create a detailed strategic business plan, a course geared specifically toward regulatory training and navigating the FDA, and individualized mentorship training to write successful proposals for non-dilutive funding.

“We’re trying to develop an ecosystem to increase the number of companies being formed and also the likelihood that those companies will attract early seed-funding necessary for success,” Watowich said. “Then, these startups could be ready to go into accelerators and incubators like TMCx or JLABS with a strong business plan and some outside money. In the biotech industry, only about one in 100 companies ever goes on to make significant profit—we’re hoping to give these Texas-based ventures much better odds than that.”

The program’s inaugural courses last year produced four early-stage ventures, and as of 2015, UTMB has opened the program to all University of Texas campuses across the system. Watowich says their ultimate goal is to offer the course to anyone in Texas with a viable biotech idea—no matter their organizational affiliation.

“Even though this program is funded through the UT System, we are targeting any institution in the Texas Medical Center, and moving forward, any organization across Texas,” Watowich said. “We want to elevate as many startups as possible and increase everyone’s knowledge so the entire state can benefit.” ■



Students of UTMB’s Collaborative Innovation & Entrepreneurship Program present their biomedical ventures and business plans to a panel of Texas-based entrepreneurs and investors at TMCx.

Captains of Industry

As the newest member of the Texas Medical Center, the University of St. Thomas has partnered with Houston Methodist Research Institute to train the future leaders of the city's biotechnology boom

BY ALEXANDRA BECKER



LEFT: University of St. Thomas Visiting Professor of Biology Edward Nam leads the Master in Clinical Translation Management class during an evening session. RIGHT: The inaugural Master in Clinical Translation Management class, from left to right: Richard Le, Rosemary Tran, Maria Babu, Heather Vasquez, Homer Quintana, Perla Rodriguez, Amy Ewbank and Dr. Edward Nam.

“Each year, new entrepreneurs will graduate from the University of St. Thomas, focused and passionate about developing exciting discoveries made in Houston Methodist laboratories and clinics into real technologies that will benefit our patients.”

— MARC BOOM, M.D.
President and CEO of Houston Methodist Hospital

Twice a week, a handful of students—seven, to be exact—settle into a small classroom situated within the University of St. Thomas’ nearly 70-year-old campus with one shared goal: to become the pioneers of Houston’s next big industry. Because for all its brilliant history defying boundaries—be it capitalizing on Spindletop’s 1901 gusher, traveling 238,900 miles to bounce on the dusty surface of the moon, or successfully transplanting that first fragile heart—Houston is still far from reaching its potential on the biotechnology frontier.

Branded as the application of biological systems to create new products or processes, the biotechnology industry bridges the gap from scientific discoveries in the lab to FDA-approved therapies administered at the bedside. Robust on the nation’s coasts yet

all-but-absent at its heart, the industry requires extensive know-how of the clinical translation process, including navigating regulatory requirements and intellectual property laws, commercialization and market potential, product-specific business modeling, and proficiency in manufacturing and clinical trial requirements—a skill set surprisingly deficient in the Houston workforce despite the wealth of resources brimming within the Texas Medical Center.

“What we realized is that everything is set in Houston for a viable biotech sector to grow,” said Dominic Aquila, D. Litt. et Phil., provost and vice president for academic affairs at the University of St. Thomas. “The intellectual capital is here from the Texas Medical Center, there is even financial capital—what’s been missing is the expertise to take

all of these elements, all these wonderful ideas, this great opportunity for financing, and pull them all together to develop companies that can bring products from the bench to the bedside in an effective and efficient way.”

Enter the Master in Clinical Translation Management (MCTM) degree, a two-year professional program offered by the University of St. Thomas in collaboration with Houston Methodist Research Institute, which provides students a solid foundation for navigating the biotechnology industry. Its multidisciplinary coursework includes comprehensive overviews covering the sciences and principles of entrepreneurship and management, as well as the industry-specific knowledge and tools necessary for succeeding in clinical translation endeavors.

“It takes an especially well-trained individual to know this field,” Aquila explained. “This is not something a typical M.B.A. or commercialization degree can prepare you for. With biotech products, the stakes are high—it’s life and death—and you’re dealing with the FDA, which is responsible for ensuring the products that get into the marketplace help humans thrive and be healthy. There has to be a higher standard.”

Through the program’s partnership with Houston Methodist Research Institute, students spend time working alongside Houston Methodist scientists on their current case studies and clinical projects, gaining real-world experience in the clinical translation process while also helping the Institute move some of their numerous projects forward.

“For the University of St. Thomas, I think it’s a very valuable partnership for us to be able to work with Houston Methodist Research Institute, and in particular the team that they have there that has helped develop this whole program in clinical translation,” Aquila said. “Our students will have this education in a very important disciplinary area as we work as a community to think about how we develop a viable and vibrant biotech industry.”

Houston Methodist President and CEO Marc Boom, M.D., added, “It is vitally important Houston Methodist forge academic partnerships like this because they can benefit our patients and the Houston and Texas economies. Each year, new entrepreneurs

will graduate from the University of St. Thomas, focused and passionate about developing exciting discoveries made in Houston Methodist laboratories and clinics into real technologies that will benefit our patients.”

The collaboration is part of the University of St. Thomas’ ongoing efforts to partner with local and national organizations to expand their network and ultimately broaden opportunities for their students. In recognition of their commitment to these partnerships, as well as their growing STEM offerings including their newly resumed nursing program and the MCTM degree, the University of St. Thomas was officially designated a member of the Texas Medical Center earlier this year.

“I think these programs, along with our traditional rigorous coursework, make us good citizens of the Texas Medical Center,” said Aquila. “We’ve had a long tradition of graduating students who do very well in medical school and the health care field, and we look forward to contributing to the overall mission of the Texas Medical Center.”

The MCTM program, which enrolled its first seven students in January 2015, is looking for students with a strong undergraduate background in science or business, although anyone with a keen interest in the industry is encouraged to apply. It is designed for professionals and meets after working hours to accommodate most schedules.

The creation of the MCTM degree is timely considering the current momentum throughout the TMC to cultivate a thriving biotech industry. From the TMCx accelerator program within the TMC’s Innovation Institute to JLABS @TMC and other university-affiliated professional programs, the growing industry will be ready and willing to place these graduates at the helm.

“To me, this program is the best of all possible worlds for someone who has a certain business sense about them, but also wants to make a real difference,” said Aquila. “If you’re in a company, or you start your own company, and you manage to get life-saving products to the market in an efficient way—who can put a price on that?” ■



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JANE GRANDE-ALLEN, PH.D., Isabel C. Cameron Professor of Bioengineering at Rice University, has been named a fellow of the American Heart Association in recognition of her contributions to the field of vascular biology through investigations into heart-valve disease. Grande-Allen's Integrative Matrix Mechanics Lab analyzes heart-valve tissue composition and behavior to pinpoint why, how and where cells come together and respond to disease.



KEN MATTOX, M.D., distinguished service professor at Baylor College of Medicine Department of Surgery and chief of staff at Ben Taub Hospital, was named the second vice president of the American College of Surgeons at the organization's Clinical Congress Update, held Oct. 2014 in San Francisco. He has been an active member of the ACS since becoming a Fellow in 1975, serving on several committees, sub-committees and on the Board of Governors.



DEBORAH JOHNSON, PH.D., dean of the Graduate School of Biomedical Sciences at Baylor College of Medicine, has been named one of Houston's 50 most influential women of 2014 by Houston Woman Magazine. Each honoree is nominated by a subscriber of the magazine and then selected by the staff of the publication. Johnson and other honorees were celebrated at an afternoon tea in January at the St. Regis Hotel, co-hosted by Houston Woman Magazine and Chevron, and are being featured in a special edition of the magazine.



ANTONIOS MIKOS, PH.D., Louis Calder Professor of Bioengineering and Chemical and Biomolecular Engineering and a professor of chemistry, materials science and nanoengineering at Rice University, has been named a fellow of the American Institute of Chemical Engineers (AIChE) in recognition of his professional accomplishments and contributions. His research group at Rice's BioScience Research Collaborative specializes in the synthesis, processing and evaluation of new biomaterials for use as scaffolds for tissue engineering, as carriers for controlled drug delivery and as nonviral vectors for gene therapy.



STEPHANIE L. KEARNEY, M.B.A., M.H.A., administrator for the Baylor College of Medicine Department of Surgery, has been selected to the board of directors of the Association of Academic Surgical Administrators and was named co-chair of the Education Conference Planning Committee. The Association of Academic Surgical Administrators is dedicated to promoting, enhancing and creating opportunities for the professional growth of administrator and physician leaders in the field of academic surgery administration.



BERT O'MALLEY, M.D., professor and chair of the Baylor College of Medicine Department of Molecular and Cellular Biology, was named the recipient of the Endocrine Society's Outstanding Innovation in Science Award. The award was established in 2013 and recognizes endocrinologists who have demonstrated innovation in scientific endocrine research or practice in support of the field of endocrinology, patients and society at large. O'Malley's innovative discoveries of the molecular pathways underlying steroid hormone action have had an extraordinary impact on the endocrinology field.

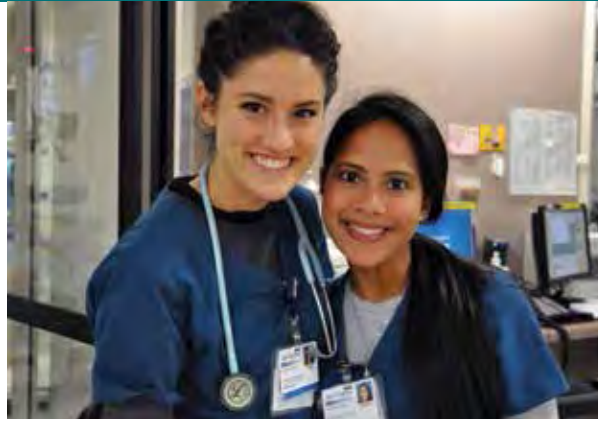


RICHARD LEWIS, M.D., professor at the Baylor College of Medicine departments of ophthalmology, pediatrics, medicine, and molecular and human genetics and in the Huffington Center on Aging, received a Secretariat Award at the annual meeting of the American Academy of Ophthalmology, held in Chicago late last year. An ophthalmologist at the Cullen Eye Institute and the Alkek Eye Center, Lewis is also a consultant in genetic eye disorders to the Kleberg Genetics Center at Texas Children's Hospital and to the adult genetics services at the Baylor-affiliated hospitals. He pioneered the mapping of X-linked ocular diseases, and his clinical practice of retinal and uveal diseases includes hereditary eye disease and the ocular manifestations of systemic hereditary disease.



AMY SMITH, M.A., MT-BC, CCLS, a board-certified music therapist at Texas Children's Hospital, received the prestigious 2014 Arthur Flagler Fultz Research Grant from the American Music Therapy Association. The grant will support Smith's study, "The Effects of Live Contingent Singing on Preterm Neonates with Bronchopulmonary Dysplasia," which will examine the impact of a live music therapy intervention on the physiologic and behavioral responses of preterm infants with a chronic lung condition. The results from the study will provide important information on the potential impact of music therapy on the overall wellbeing of infants with chronic and long-term hospitalization needs.

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At **Houston Methodist**, the care, compassion and clinical expertise that our nurses exhibit each and every day provides a true reflection of our organization's commitment to Leading Medicine. This Nurses Week, we are proud to recognize our nursing professionals for their significant achievements and countless contributions to our health care team. Through the exceptional care they deliver to patients and their families, Houston Methodist nurses greatly impact thousand of lives — and in the process, they continue to leave an indelible mark on our hospital's longstanding history of nursing excellence. *For this, and so much more, we say thank you!*

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Approval for 19.25 hours of continuing education pending. Applicable disciplines include: occupational and physical therapists, speech-language pathologists, nurses, case managers and social workers.

Date: June 4-7, 2015

Location: TIRR Memorial Hermann and The Westin Houston Downtown

To register please visit: tirr.memorialhermann.org/brain-injury-rehab



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Rice Students Work to Ease the Pain of Needle Injections

If the Rice University freshman engineering design team Comfortably Numb has it their way, children will be less fearful and feel less pain when they go to the doctor's office for a shot.

The trio of freshmen has created a device to ease the pain of an injection. Their device numbs the skin prior to a shot by producing a rapid chemical reaction to cool the patient's skin.

The team, made up of computer science major Greg Allison, bioengineering major Andy Zhang and mechanical engineering major Mike Hua, currently has a functioning prototype that has shown to produce a measurable numbing effect in 60 seconds, which in turn reduces the pain from an injection.

"Our (lab) device is 3-D-printed and consists of two sealed chambers containing the chemical ammonium nitrate and water," Hua said. "A simple twisting motion moves the chambers into alignment to allow the chemicals to flow

through the chamber to produce a rapid endothermic reaction. We then numb the skin by contacting the device's metal surface to the patient's skin."

The team said that current solutions are either ineffective, because they don't numb well enough, or they take too long. The team noted that a commonly used medicated topical patch takes about an hour to work. "Our solution works on the order of seconds and minutes," Zhang said.

"We are targeting anyone who has to get an injection, which is nearly everyone," Allison said. "But the device is especially applicable to people who are more susceptible to pain," such as the elderly and children, he said. He also said it's intended for use during procedures "where you have to get shots in more sensitive areas of the body, such as the face or the groin."

The team also recognized that other applications of this project could be

“At the end of the day, what we're creating is a self-contained device with a very cold contact surface, and there are many applications for that.”

— GREG ALLISON

Computer Science Student at Rice University

ear piercings, swelling reduction and tattooing, although they are currently not addressing them at this phase.

"At the end of the day, what we're creating is a self-contained device with a very cold contact surface, and there are many applications for that," Allison said.

"We looked into all sorts of methods for numbing, both quick and long-term, chemicals, using ice packs—which is similar to what we're using now," Hua said. "We explored everything that surrounded the problem before we even began brainstorming."

Some of the solutions the team researched were very technical and

required a materials science degree or skills the freshmen hadn't yet learned. "That's kind of the amazing thing about our project because we don't have these incredibly refined skills in certain areas; that meant that we had to think of very simple solutions," Allison said. "Being limited in that way led to something that is very novel and innovative but at the same time simple and elegant. ■

— David Ruth, Rice University



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Memorial Hermann Expands Orthopedic and Spine Network

In a move to increase access to convenient, high-quality and comprehensive orthopedic care, Memorial Hermann has acquired Houston Orthopedic and Spine Hospital (HOSH), a highly regarded orthopedic and spine hospital in the region. The hospital, renamed the Memorial Hermann Orthopedic & Spine Hospital, strengthens the Memorial Hermann Health System's orthopedic and spine services in the Greater Houston area.

Centrally located in Bellaire, Texas, near The Galleria, Memorial Hermann Orthopedic & Spine Hospital joins Memorial Hermann's already well-established and wide-reaching network of orthopedic, spine and joint replacement facilities and services, which includes three Memorial Hermann IRONMAN Sports Medicine Institutes and seven Memorial Hermann Joint Centers. The Joint Center that previously operated out of Memorial Hermann-Texas Medical Center will move to Memorial Hermann Orthopedic & Spine Hospital.

"Memorial Hermann has achieved unprecedented growth and success over the last decade in our orthopedic and spine service lines, which has allowed our System to meet the growing demand in our community," said Dan Wolterman, President and CEO of Memorial Hermann. "HOSH has an outstanding clinical reputation, as well as a dedicated employee base and a strong medical staff that adds tremendous value to Memorial Hermann's highly regarded orthopedic and spine services."

To ensure a seamless transition for all patients, Memorial Hermann Orthopedic & Spine Hospital will operate under business-as-usual status with full integration of HOSH employees.

"It is an honor to become part of a health system that has set such a high standard for patient experience and quality care in the Houston area for more than 100 years," said Hank Blum, M.D., who has served as Governing Board Chair of HOSH since its inception. "It is an exciting time for our hospital and we look forward to continuing and expanding our well-earned and awarded reputation for excellence in orthopedics, joint and spinal care."

Operating since 2006, the surgical hospital has 64 beds and 10 operating rooms, all of which will be licensed under Memorial Hermann-TMC.

"We are thrilled to welcome the physicians and staff at HOSH to Memorial Hermann," said Craig Cordola, Regional President at Memorial Hermann. "They have established an outstanding clinical reputation within the community for their advanced specialty services. We look forward to working together as a single entity with a common vision and goal: to advance the health of the Greater Houston area and provide the very best care to our patients." ■

— Kathryn Klein
Memorial Hermann-
Texas Medical Center

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Symposium, Baylor St. Luke's
Medical Center**
Tuesday, 7:30 a.m.-4:00 p.m.
Denton A. Cooley Auditorium at
Texas Heart Institute
Green Elevators to Level B1
6770 Bertner Ave
ocr@stlukeshealth.org
832-355-3710

**11-13 George H.W. Bush China-U.S.
Relations Conference**
Monday-Wednesday
Hotel ZaZa
5701 Main Street
haigwood@tamhsc.edu
979-436-9106

Re-Evolution Summit VI
Wednesday-Friday, 8:00 a.m.-5:00 p.m.
Houston Methodist Research Institute
6670 Bertner Ave
cme@houstonmethodist.org
713-441-4971

Meet With...National Cancer Institute
Tuesday, 10:00 a.m.
TMCx
2450 Holcombe Blvd, Suite X
kweikel@its.jnj.com
713-261-0814

11-15 Intensive Bioethics Course
Monday-Friday
Houston Methodist Hospital
6565 Fannin
cme@houstonmethodist.org
713-441-4971

14 Hiring Red, White & You! Hiring Event
Thursday, 9:00 a.m.-1:00 p.m.
The National Center for
Human Performance
2450 Holcombe Blvd
hiringredwhiteandyou4veterans.com

**21 Xconomy – Xponential Cities:
Houston 2035**
Thursday, 8:00 a.m.-6:30 p.m.
TMCx
2450 Holcombe Blvd, Suite X
kgirton@xconomy.com
713-253-1979

**12 Closing the Health Care Gap:
Innovating. Redesigning. Inventing.**
Tuesday, 6:00 p.m.-7:30 p.m.
Rice University – Ley Student Center
6100 Main Street
diane.h.nguyen@rice.edu
713-348-3056

**James T. Willerson, M.D.,
Cardiovascular Seminar:
Liang Xie, Ph.D.**
Thursday, 4:00 p.m.-5:00 p.m.
Denton A. Cooley Auditorium at the
Texas Heart Institute
6770 Bertner Ave
Green Elevators to Level B1
vsweed@texasheart.org
832-355-9144

**29 Inaugural Houston Methodist
Underwood Center
Digestive Diseases Symposium**
Friday, 7:30 a.m.-5:30 p.m.
Houston Methodist Research Institute
6670 Bertner Ave
remartin2@houstonmethodist.org
713-441-4948

FOR MORE EVENTS, VISIT TMCNews.org



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Concentration
of **MEDICAL
PROFESSIONALS**
in the World

Pioneering
**MEDICAL
DISCOVERIES**

Houston's Texas Medical Center, globally recognized for excellence in adult and pediatric care, should also be known as the destination for hosting medical meetings. Just as the TMC has state-of-the-art medical facilities, our convention campus offers first class meeting facilities. The Greater Houston Convention and Visitors Bureau (GHCVB) has partnered with the Texas Medical Center to provide an unparalleled set of resources to ensure that conventions and special events are a success here in Houston.

How it works: The GHCVB Destination Sales staff will handle all of the logistics and negotiations required for hosting conferences and will work in tandem with the TMC to pair the best professionals for each event.

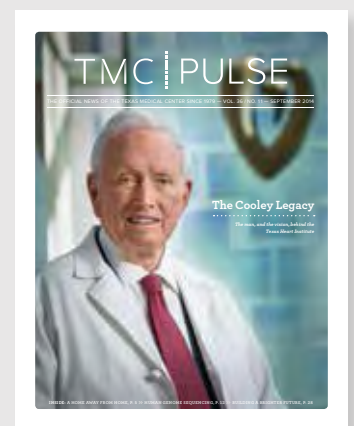
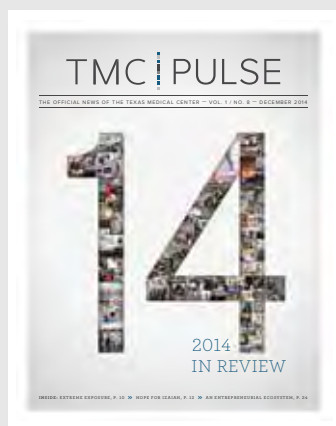
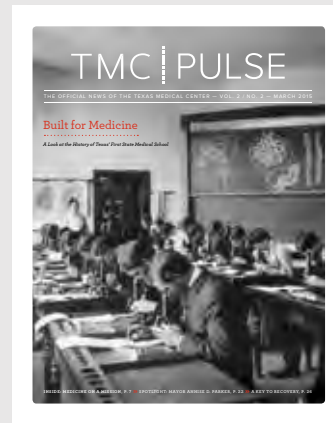
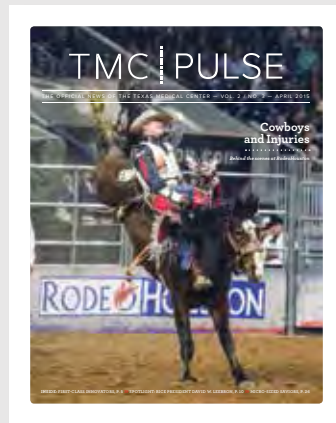
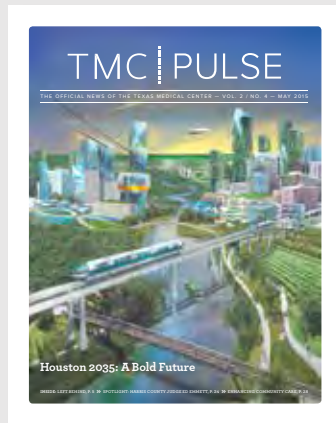
If you are part of a professional medical association, such as AMA, ADA, AHE or ASCO, our Destination Sales staff encourages you to promote Houston as a future meeting destination and let us do the rest!

**We are here to assist you every step of the way.
Please contact our Destination Sales Team at 713-437-5285 to get started.**

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THE FUTURE OF MEDICINE

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What a Year!



WE ARE HONORED AND GRATEFUL THAT YOU CHOSE TO SUPPORT US IN THE INAUGURAL YEAR OF TMC PULSE. We look forward to working with you in our next year as we continue to share the inspiring stories of the Texas Medical Center community.