

3 MAGICAL HANDS

Johns Hopkins University researchers use brain-implanted electrodes to enable a patient to move prosthetic fingers.

5 TAPPING INTO THEIR HUMANITY

Patient experience coach Jade Hewitt helps staff members understand the impact of empathetic care.

7 TRANSFORMATIVE SPACE

Neurosurgery and biomedical engineering join forces to devise neurosurgical tools in redesigned historic operating rooms.

INSIGHT

WEARABLE TECHNOLOGY FOR THE OR
Orthopaedic surgeons are testing the ability of smartglasses to improve surgery.

Dome

A publication for the Johns Hopkins Medicine family

Volume 67 • Number 3 • April 2016



Life Without Heroin

Johns Hopkins fights an epidemic with personalized treatment.

Robert Brooner, director of Addiction Treatment Services, counsels patients in the program he developed.

CHRIS MYERS

TERRELL THOUGHT HE KNEW how to kick his heroin habit. He'd stay in his bedroom a week or more, vomiting and sweating until the opioid left his system. But then he'd walk out the front door of his mother's house, where he was living, and back into trouble. Dealers in his Baltimore neighborhood would slap his back, slip a packet of the drug into his palm. No charge, they'd say. Just hold it in case you want it.

Within days, he would be using again. "I'd say I did that maybe 100 times," says Terrell, whose name, like others in this story, has been changed. "I was in that cycle for more than 20 years. I was either trying to get clean or trying to get my next fix—one or the other."

Now, Terrell is married, holds down a full-time job and lives in his own apartment. He credits much of his success to Addiction Treatment Services (ATS), an innovative personalized treatment program at Johns Hopkins Bayview Medical Center.

Terrell enrolled in ATS 11 years ago, after his fiancée at the time broke off the relationship because of his drug use. He figures he's lapsed maybe three times in the last five years, but he doesn't give up. He's

(continued on page 4)



VIDEO
EXTRA

See a video and read about a mother and daughter who are thriving, with help from the Center for Addiction and Pregnancy: hopkinsmedicine.org/dome.



Learn more about the strategic priority for **PATIENT- AND FAMILY-CENTERED CARE** online at hopkinsmedicine.org/strategic_plan.

21st-Century Medicine That Is Respectful and Compassionate

PAUL B. ROTHMAN, M.D.
DEAN OF THE MEDICAL FACULTY
CEO, JOHNS HOPKINS MEDICINE



One of our strategic priorities is to become the national leader in providing and teaching patient- and family-centered care. That tradition began 123 years ago, when the founders of our medical school insisted that physicians learn to listen carefully to—and consider—patients' accounts of their own illnesses. Although technology should make it easier than ever to partner with our patients, some clinicians worry that humanistic medicine is becoming harder and harder to practice.

Many in the medical profession are wrestling with how to ensure that we balance cutting-edge medicine and lifesaving technologies with the need for a human touch and listening to what a patient wants and values.

On one hand, the central precept of the profession is compassion. Many of us enter the field of medicine to help our patients and their families relieve suffering. However, there are factors that impinge on humanism in the practice of medicine, including:

- The time required to study and master vast quantities of highly technical information
- The time constraints of a busy practice
- The distancing effect of increasingly sophisticated technologies
- Increasing bureaucracy and documentation
- Burnout or disillusionment

The good news is that medical training has been trending in a more humanistic direction over the past decade in our attempts to produce a more compassionate workforce. Change in medical schools' selection criteria produces more caring physicians. For example, at Johns Hopkins, we look not only at MCAT scores but also at the candidates' interests and activities, their commitment to the world around them, and the qualities highlighted in their letters of support.

In addition, there have been positive changes to both the medical school curriculum and the residency model. Under our revamped Genes to Society curriculum, students begin speaking with patients in the clinic in the first month of medical school and focus on the impact that social, community and environmental issues have on the health of individuals. We've also made great strides in our residency training. Work hours have been reined in for interns and residents, and we require our trainees to participate in service projects to help them develop empathy and the ability to relate to people of different backgrounds.

The new, state-of-the-art Capacity Command Center at The Johns Hopkins Hospital improves our ability to manage the flow of our patients, making sure that each individual receives the specific care needed while also allowing more patients access to our services.

At the same time, we are moving toward exclusively single-patient rooms in all of our hospitals, in part so that patients' conversations with their doctors are more private.

Health care providers have also adopted policies to preserve the intimacy of the physician/patient relationship, including setting up exam rooms to keep the note-taking laptop out of the way so the doctor can still face and make eye contact with the patient.

As physicians, it behooves us to get patients involved in the healing process—to try to understand their goals and find the path that best meets their needs. Caring doctors are better doctors. They practice safer medicine, earn more trust from patients and get them more engaged in their own health care, leading to better outcomes. To lead this change, we must be creative in managing the demands associated with the practice of medicine while fulfilling our firm commitment to knowing our patients and understanding their needs.

Portraits of Determination

Employee wellness programs offer health education and support.

IF YOU WANT TO LOSE WEIGHT, KICK THE CIGARETTE HABIT OR JUMP INTO A FITNESS regimen, consider investigating one of Johns Hopkins Medicine's many employee wellness programs. Available through human resources departments throughout the enterprise, benefits include health screenings, health education seminars, tobacco cessation programs, ways to reduce cardiovascular risk and exercise programs.

And, if you lack inspiration, let Tyrone Johnson supply it.

Johnson discovered that becoming a "big loser" requires big-time motivation—and help from wellness teams at The Johns Hopkins Hospital and Johns Hopkins Bayview Medical Center.

Five years ago, unhealthy eating habits and lack of exercise had caused the medical gas technician at Johns Hopkins Bayview to take medication for diabetes and high blood pressure. At 6 feet tall, he weighed 337 pounds—a statistic he was determined to change.

"If the body's not fit, the spirit isn't either," he says. With the support of Johns Hopkins' nutrition and weight management programs, multiple health screenings, lessons in mindful eating and his enthusiastic colleagues, he lost 140 pounds.

When his weight further dropped to 185, Johnson cut back on his cardio training and picked up weights three times a week. Now, in addition to the walking he does for his job, the 63-year-old Baltimore resident works out at the Johns Hopkins Bayview gym most weekdays. He hasn't needed diabetes medication for almost two years.

"I don't feel good if I overeat," he says.

"Once your healthy habits are embedded, you know when you're getting off balance. And the people around me help keep me consistent. I know everyone by name over at the wellness center."

—Linell Smith



Aided by wellness experts at The Johns Hopkins Hospital and Johns Hopkins Bayview Medical Center, Tyrone Johnson dropped more than 140 lbs.



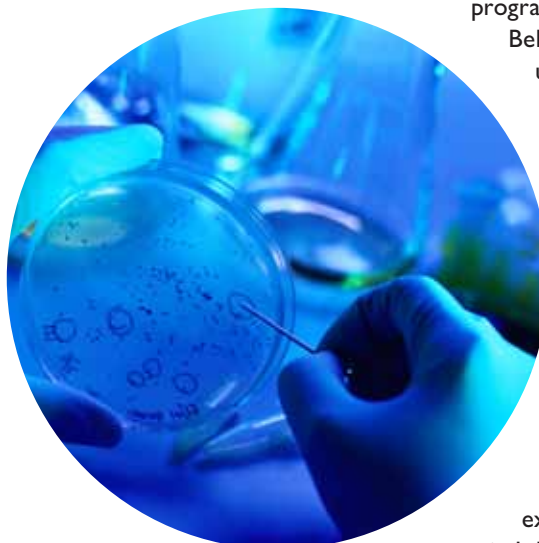
For more inspiring employee stories and to learn about various programs, visit hopkinsmedicine.org/dome.

EDUCATION

JHU and Biopharma Joint Training: A First

The Johns Hopkins University has formed a joint training program with MedImmune, an international drug company. Believed to be the first of its kind between a major university and a biopharmaceutical company in the United States, the Johns Hopkins-MedImmune Scholars Program will prepare Johns Hopkins graduate students for careers in biopharma and biomedicine. A subsidiary of AstraZeneca, a large pharmaceutical company, MedImmune is best known for developing treatments for respiratory disease and for producing FluMist, a nasal spray flu vaccine.

As many as 15 students from the Ph.D. programs in the school of medicine and Whiting School of Engineering will begin the program next year. Taught by university professors and MedImmune scientists, they will gain research experience through thesis projects conducted jointly in Johns Hopkins and MedImmune labs.



Advances in Mind Control

Johns Hopkins researchers enable a patient to move prosthetic fingers by using brain-implanted electrodes activated by thought.

PHYSICIANS AND BIOMEDICAL engineers from Johns Hopkins recently reported what they believe is the first successful effort to wiggle fingers individually and independently of one another using a mind-controlled artificial “arm” to control the movement.

The proof-of-concept feat, described in the *Journal of Neural Engineering*, represents a potential advance in technologies to restore refined hand function to those who have lost arms to injury or disease, the researchers say. According to the Amputee Coalition, more 100,000 people living in the U.S. have amputated hands or arms.

The young man on whom the experiment was performed was not missing an arm or hand, but he was outfitted with a device that essentially took advantage of a brain-mapping procedure to bypass control of his own arm and hand.

“We believe this is the first time a person using a mind-controlled prosthesis has immediately performed individual digit movements without extensive training,” says senior author Nathan Crone, professor of neurology at the Johns Hopkins University School of Medicine. “This technology goes beyond available prostheses, in which the artificial digits, or fingers, moved as a single unit to make a grabbing motion, like one used to grip a tennis ball.”

For the experiment, the research team recruited a young man with epilepsy already scheduled to undergo brain mapping at The Johns Hopkins Hospital’s



“Thinking” about finger movements caused electrical activity in the brain, which moved the prosthetic digits.

“WE BELIEVE THIS IS THE FIRST TIME A PERSON USING A MIND-CONTROLLED PROSTHESIS HAS IMMEDIATELY PERFORMED INDIVIDUAL DIGIT MOVEMENTS WITHOUT EXTENSIVE TRAINING.”

—NATHAN CRONE

Epilepsy Monitoring Unit to pinpoint the origin of his seizures. While brain recordings were made using electrodes surgically implanted for clinical reasons, the signals also control a modular prosthetic limb developed by the Johns Hopkins University Applied Physics Laboratory.

Prior to connecting the prosthesis, the researchers mapped and tracked the specific parts of the subject’s brain responsible for moving each finger, then programmed the prosthesis to move the corresponding finger.

First, the patient’s neurosurgeon placed an array of 128 electrode sensors—all on a single rectangular sheet of film the size of a credit card—on the part of the man’s brain that normally

controls hand and arm movements. The computer program the Johns Hopkins team developed had the man move individual fingers on command and recorded which parts of the brain “lit up” when each sensor detected an electric signal.

Researchers also measured electrical brain activity involved in tactile sensation by outfitting the patient with a glove with small, vibrating buzzers in the fingertips that went off individually in each finger. The researchers measured the resulting electrical activity in the brain for each finger connection.

After the motor and sensory data were collected, the researchers programmed the prosthetic arm to move corresponding fingers based on which part of the brain was active. They turned on the prosthetic arm, which was wired to the patient through the brain electrodes, and asked him to “think” about individually moving thumb, index, middle, ring, and pinkie fingers. The electrical activity generated in the brain moved the fingers.

Initially, the mind-controlled limb had an accuracy of 76 percent. Once the researchers coupled the ring and pinkie fingers together, the accuracy increased to 88 percent.

Crone cautions that application of this technology to those actually missing limbs is still some years off and will be costly, requiring extensive mapping and computer programming.

—Vanessa McMains

PEOPLE

#TimeForBaltimore

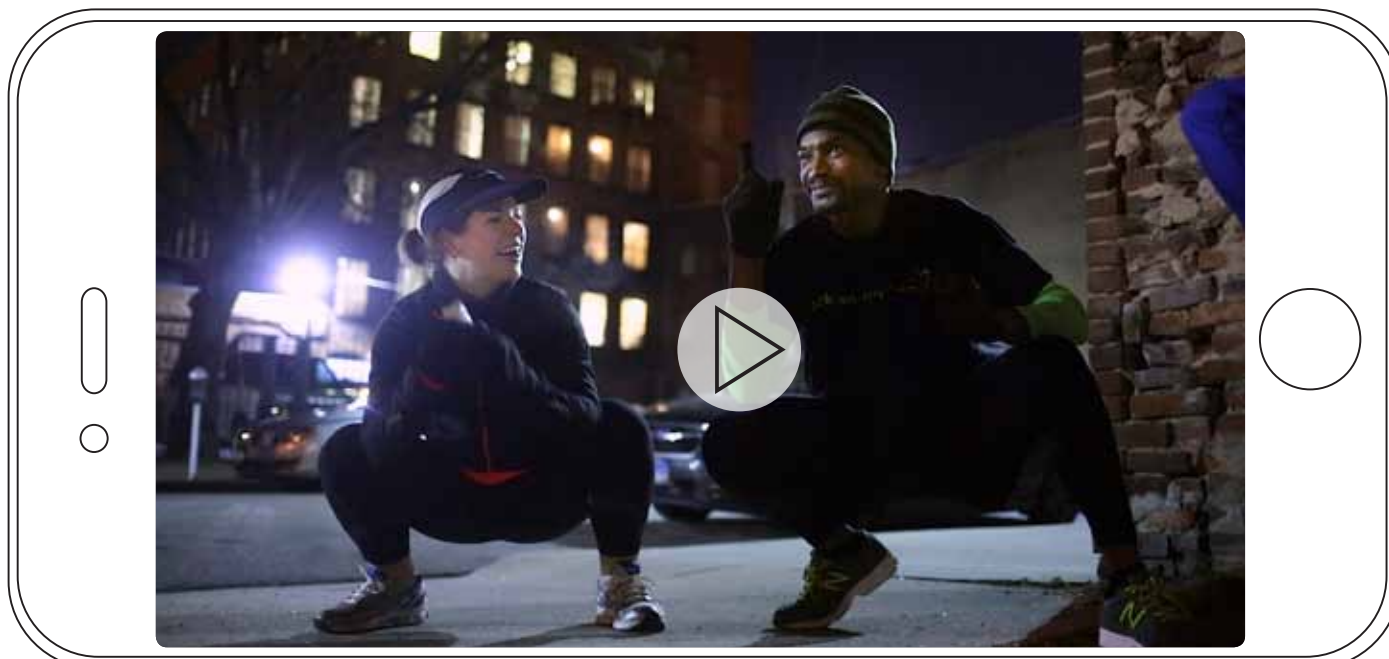
Video Series Spotlights Employee Volunteers.

HEARTS AND SOLES

Several mornings a week, Abby Ferretti joins other runners for multimile loops through still-dark Baltimore streets. Some of the athletes are military veterans who are living at the Maryland Center for Veterans Education and Training.

Others, like Ferretti, are volunteers with Back on My Feet, a national nonprofit that organizes running groups to help homeless people improve health and achieve goals.

Ferretti, art director in the Marketing and Communications Department of Johns Hopkins Medicine, stops at an intersection to wait for the others. “Nobody runs alone,” she explains. See how Ferretti makes #TimeForBaltimore: hopkinsmedicine.org/dome.



BRADY ANDERSON

Life Without Heroin

(continued from page 1)

currently taking methadone daily to quell his cravings and attending group counseling sessions at Johns Hopkins Bayview once a week. He wants to taper off the medication, though he intends to continue counseling.

The program, designed by clinical psychologist Robert Brooner, the director of ATS, and Van King, its medical director, creates individualized treatment plans that are frequently reviewed and modified to meet changing patient needs. Brooner and King work closely with patients, as do clinical psychologists Michael Kidorf and Jessica Peirce and psychiatrist Neeraj Gandotra. Nurses, social workers and professional counselors also provide care to about 350 patients in the program at any given time.

Brooner says most insurance plans, including Medicaid, cover the treatment, which also receives some state and federal funding. The cost is in line with other addiction programs in Maryland, he says.

Yet nationwide, only a handful of other treatment centers offer a similar level of personalized treatment, says Gandotra. That may change as the heroin crisis worsens.

Overdose deaths topped 10,574 in 2014, up from 3,036 in 2010, according to the National Institute on Drug Abuse. In Maryland, 578 people died from heroin overdoses in 2014, more than double the number in 2010, according to the state Department of Health and Mental Hygiene. Baltimore was hardest hit, with 192 heroin-related deaths in 2014. And many more lives are shattered by a drug that strips away loving relationships, ambition and common sense.

The epidemic has commanded the attention of city politicians. In 2014, Baltimore's mayor convened a task force to address addiction in the city. Its recommendations, released in July 2015, include an embrace of the ATS approach.

"All treatment should be individualized, based on the needs of the person and adapted to a person's changing needs as they progress through treatment," reads the report. "Treatment non-adherence should not be considered a failure on the person's part, but an indication that the program should reassess its approach."

How ATS Works

Patients do not need to detoxify in an inpatient program before admission to ATS. They usually start by attending group and individual counseling sessions between two and five days a week, while taking methadone or other medications to ease withdrawal symptoms and reduce craving for opioids. Patients can also be treated for psychiatric problems that often exist alongside addiction, such as depression and post-traumatic stress disorder.

For their part, patients must participate in required sessions and urine drug testing. Over time, they are expected to decrease drug use, develop drug-free social networks, and find employment and adequate housing.

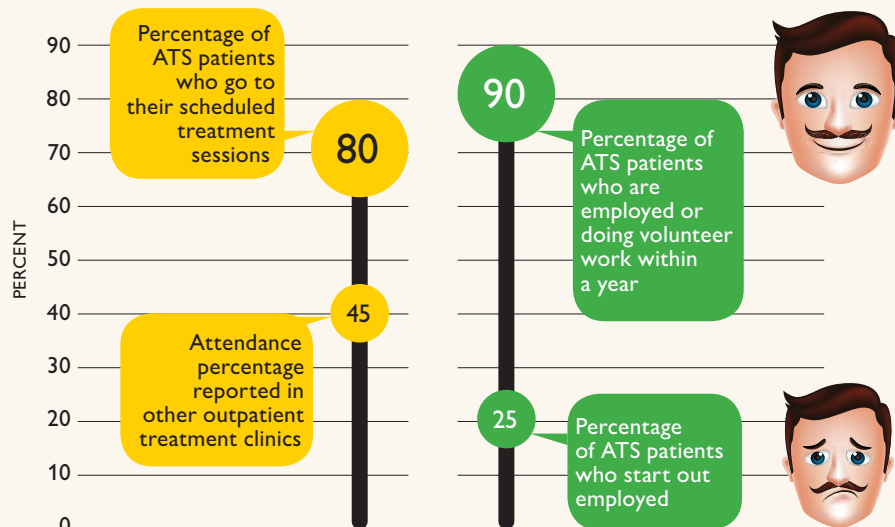
BREAKING THE GRIP OF HEROIN

Read more patient stories, and learn why this deadly drug is so alluring.

See a video and read about a mother and daughter who are thriving, with help from the Center for Addiction and Pregnancy: hopkinsmedicine.org/dome.



ADDICTION TREATMENT SERVICES (ATS) PATIENT SUCCESS RATES



"They hold you accountable," says Jacob, who has been with ATS and heroin-free for five years. He is now married, with a job and children. He's taking college courses. With each milestone, "you get more freedom," he says. Jacob is now eager to "get off that last little bit" of medication, he says.

"I'm working with my doctor on a strategy, which is that I'll still see him and I'll participate in therapy even more because that medication is a crutch," Jacob explains. He also keeps Brooner's cell number handy, though he hasn't called it in a while.

ATS provides abundant support and reinforces success with rewards that include reductions in mandatory counseling, opportunities to take medications at home instead of in the program and even department-store gift cards. The rewards, Brooner says, keep patients in the program while they build lifestyles that support abstinence.

Success rates for treatment programs are difficult to measure because patients rarely report back once they leave. But research conducted by Brooner and his colleagues shows that even modest treatment-based incentives and gift cards can increase attendance and, therefore, success.

According to the psychologist, about 80 percent of ATS patients go to their scheduled treatment sessions, compared with the 40 to 50 percent attendance reported in other outpatient treatment clinics. In addition, about 90 percent of patients are employed or doing volunteer work within a year, even though 75 percent of ATS patients start out unemployed, Brooner says.

If patients slip—producing a drug-positive urine test, for example—they aren't discharged from the program. Instead, treatment services intensify. ATS patients say the personalized approach delivers the results that eluded them with methadone clinics and inpatient detoxification.

"Of all the programs I've been to, nobody's been able to help me like they do here," says Ruth, who has been with ATS for a decade. "I want to continue coming to this group, probably for the rest of my life."

Ruth is working toward an associate degree and caring for her elderly mother—a life that seemed out of reach before ATS. "I've OD'ed on heroin," she says. "I pawned valuable family jewelry. I've had strangers stick needles in my arm. I've slept with people for drugs. You do things that you never thought you would do. You're in that moment, and you think you need those drugs."

Ruth's friend Laura has been with ATS more than 20 years and still attends counseling sessions twice a week. "I tell everyone, 'When I die, they're going to give me my last fix of methadone in my coffin.' I'm not leaving this program, and that is the truth."

Brooner tells his patients they should be proud of their successes, not ashamed of their disease. "There's more to recovery from this disorder than stopping drug use," he tells them. "It's about creating a meaningful life and living it."

"You can live, and live well, with substance use disorder," he says. "You can get back to having a life worth living."

—Karen Nitkin



Addiction treatment programs at Johns Hopkins Medicine: hopkinsmedicine.org/substance_abuse_center/treatment/programs.

AT SUBURBAN HOSPITAL, TREATMENTS FOR TEENS

A Montgomery County high school student, injured playing lacrosse or football, switches to heroin when post-surgery painkillers run out. Another one sneaks pills from her mother's medicine cabinet. A third has been drinking heavily at parties and is beginning to experiment with heavier drugs.

The Addiction Treatment Center (ATC) at Suburban Hospital has been helping teens fight substance use since the 1980s, says its director, Beth Kane Davidson. "We're known in the community as the place to



Beth Kane Davidson, director of the Addiction Treatment Center at Suburban Hospital

go when there is a concern about a young person," she says.

To reach adolescents who are experimenting with alcohol and drugs, ATC offers four-hour and nine-hour education programs highlighting the risks of substance use and avoidance strategies.

Teens with more serious substance use behavior are eligible for ATC's treatment program. It lasts four to six months, starting with counseling sessions two to three times per week and becoming less frequent over time. Clients are expected to transition to a support group, such as Narcotics Anonymous.

A key part of the program, says Kane Davidson, is helping teens find alternatives to the euphoria of drug use. One took up skydiving, she says. Others find more down-to-earth pleasures, such as a weekend hike. "We want our patients to fully engage in their daily lives," says Kane Davidson. "That's what sobriety is about. Alcohol and drugs disengage them."

"ADDICTION RECOVERY IS A PROCESS, NOT AN EVENT."

—BETH KANE DAVIDSON

Modeling a Culture of Caring

How one patient experience coach champions empathy.

AS THE PATIENT CHOKED BACK TEARS, her words tumbled out:
"I know the doctors think I'm a junkie, but I was clean for 20 years until the night after my son was killed in a car crash. I'm here because a friend gave me a freebie to cheer me up, and I got high and overdosed. I'm so disappointed in myself."

The woman's prolonged previous history of drug abuse made it difficult for caregivers to find her veins for blood draws. Though her nurses had asked doctors to insert a peripherally inserted central catheter (PICC) line for quick, painless access, they had refused, concerned that the line would

make it easier for the patient to resume using drugs. Now the patient was pleading her case to two new visitors.

Jade Hewitt, a Johns Hopkins Hospital patient experience coach, recently recalled this scene (with some of the details changed to protect the patient's identity). As the patient broke down, Hewitt embraced her. "I'm so sorry," she said, adding that she couldn't imagine what she'd been through. A support

staff member who had accompanied Jade into the room stood frozen, unable to relate to the patient.

Later, Hewitt tried to put things in perspective. "I've been trying to lose weight my whole life, but if someone put a doughnut on my desk, I'd probably eat it," said Hewitt. "For me, it's about food; for this patient, it's about drugs." With this analogy, recalls Hewitt, the colleague's face softened.

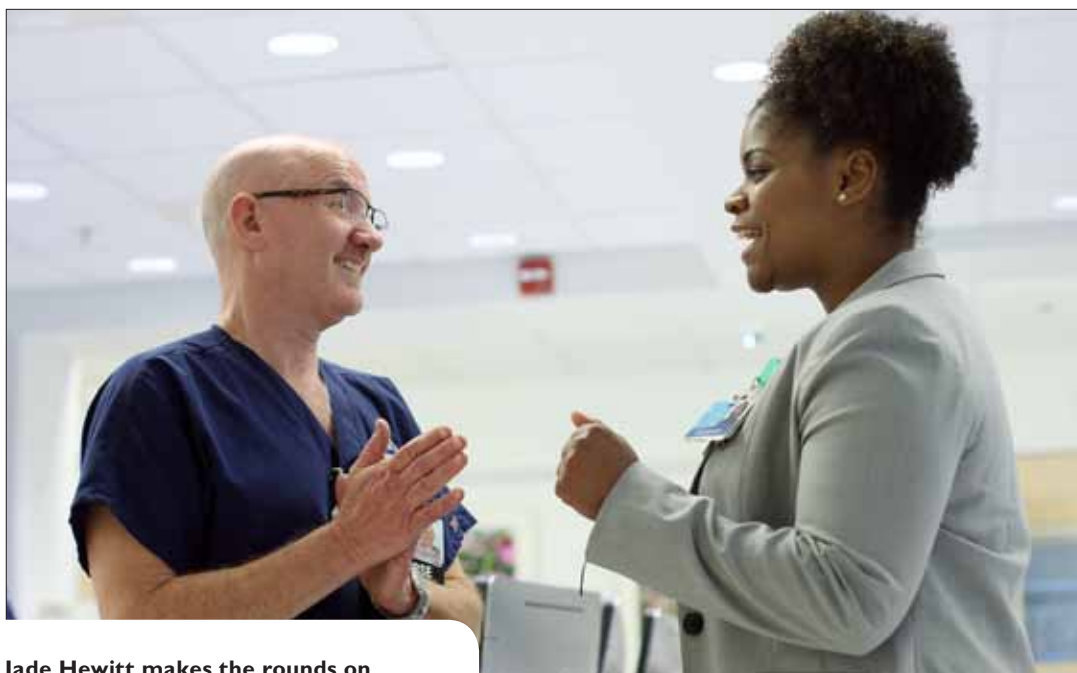
Discussions like these are part of Hewitt's daily work. She is a patient experience coach on the inpatient medicine units, one of six staff members allotted for this newly created position. The goal: to teach staff members ways to better understand and communicate with patients and how to approach problems together.

Lisa Allen, Johns Hopkins Medicine's chief patient experience officer, says there's a need for people who can coach physicians, nurse managers and front-line staff members on empathic behavior. "I look for people who are warm, open, driven by purpose, and really great at communicating and building relationships," she says.

Each coach—covering inpatient and outpatient

"IT'S ABOUT DIGGING DEEPER TO KNOW THE THINGS THAT MAKE THAT PATIENT A PERSON."

—JADE HEWITT



Jade Hewitt makes the rounds on the Nelson units, with, from top to bottom, nurse David McMaster, clinical technician Aleshia Pattonon, nurse Elizabeth Atchison, nurse Elsbeth Markie and clinical customer service representative Shardae Rawlins.

medicine, neurology, Gyn/Ob, oncology and surgery units—plays a slightly different role, based on his or her expertise and the team's needs, says Allen. The Johns Hopkins Hospital's patient experience/service excellence staff will soon number 14. Some will spend part of their day in the Emergency Department, ensuring a smooth transition for patients from the ED to the units.

Since hiring the patient experience coaches in April 2015, Allen says the hospital's HCAHPS scores have improved. (The Hospital Consumer Assessment of Healthcare Providers and Systems Survey measures patients' perspectives of their hospital care.) "We got a score of 91.9 percent in discharge communication, up from 88.8 percent last year. This puts us in the top 10 percent nationally. We also scored 82.2 percent in nurse communication, the highest score in five years."

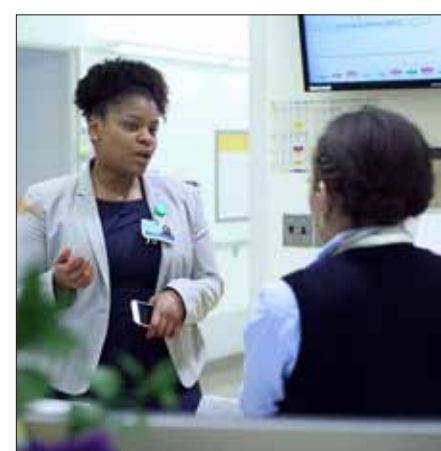
Hewitt began working at the hospital in 2012 as a clinical customer service coordinator, the central point of contact for patients, families and health care teams in a patient care unit. A graduate of Morgan State University, she previously worked in a similar role at Memorial Sloan Kettering Cancer Center. She aims to convey the importance of providing a hospital stay "where patients feel we care about them," she says. "It's about digging deeper to know the things that make that patient a person."

Terry Nelson, assistant director of nursing for the Department of Medicine, attests to Hewitt's positive impact. Hewitt ensures that communication boards in every room have current information about attending physicians and when to expect the next medication.

She also provides service excellence training and shares the latest HCAHPS scores with staff. "Jade is one of us," adds Nelson. "She's visible and sensitive to both patients and staff members, and celebrates our successes."

Hewitt also educates people that things don't always turn out the way patients like. The patient who desperately wanted the PICC line, for example, never received one because of the doctors' concerns. But Hewitt continues to cite the experience to discuss the power of empathy. "When patients reach out," she says, "we have a small window to connect with them." It's a moment, adds Hewitt, that offers a chance to validate a concern—and work to resolve it.

—Judy F. Minkove



IN BRIEF

Summer Best Dressed Sale



The Johns Hopkins Hospital Women's Board continues to build on its success with its fall Best Dressed Sale by hosting a one-day summer Best Dressed Sale to benefit patient care. The event will take place on **Wednesday, May 4, from 9 a.m. to 6 p.m.** at the Evergreen Carriage House, 4545 N. Charles St. Merchandise includes

new and gently worn designer, dressy, casual, prom, sports attire and shoes for women and men. New accessories will also be sold. Proceeds from last year's fall and summer sales funded nine projects to support patient care, including ultrasound equipment to study prenatal neurodevelopment. The Women's Board is also accepting donations of unwanted clothes and accessories in good condition. Learn more about the sales and the projects they support at womensboard.jhmi.edu.

Stages of Acceptance

Johns Hopkins palliative care doctor Madeline Leong tackles big issues in her new play, *Life Support*.

THIS TIME, KARL IS NOT GETTING what he wants.

The hard-charging businessman is used to getting his way. He traveled to Baltimore for a bone marrow transplant he thought would cure his cancer. But he's getting sicker, and now his young doctor, Rachel Li, is approaching his hospital bed with an official-looking document.

"The form is ... in case of an emergency," Li says. "It appoints a health care agent."

Karl reads aloud: "If my death from a terminal condition is imminent—" He flings the papers to the floor, furious. "What is this? Pulling the plug? I'm perfectly healthy."

When the scene ends, Madeline Leong, who has been watching the actors rehearse in a rented room of the Bromo Seltzer Arts Tower, applauds. The tensions between patient and provider are exactly what she hoped to capture in *Life Support*, the play inspired by her emotionally wrenching experiences as a palliative care doctor at The Johns Hopkins Hospital.

It appears to be the first play in the institution's history penned by a Johns Hopkins doctor and performed on various Johns Hopkins stages.

Life Support will be staged through May 1 at The Johns Hopkins Hospital, Johns Hopkins Bayview Medical Center and the Johns Hopkins University School of Nursing. Leong hopes it will spark awareness and discussion about palliative care, a fast-growing medical specialty at Johns Hopkins and nationwide.

The simple and profound mission of palliative care is to relieve pain and distress for people with serious illnesses. Palliative care can be provided alongside curative treatments, such as chemotherapy. It is not limited to people who are close to death, although hospice is a form of palliative care specifically for patients near the end of life.

Both palliative care and hospice provide symptom relief and help patients achieve realistic goals, explains Thomas Smith, director of palliative medicine.

Smith says palliative care improves patient satisfaction, enhances quality of life and lowers health care costs. Yet many people, like those in *Life Support*, equate palliative care with giving up.

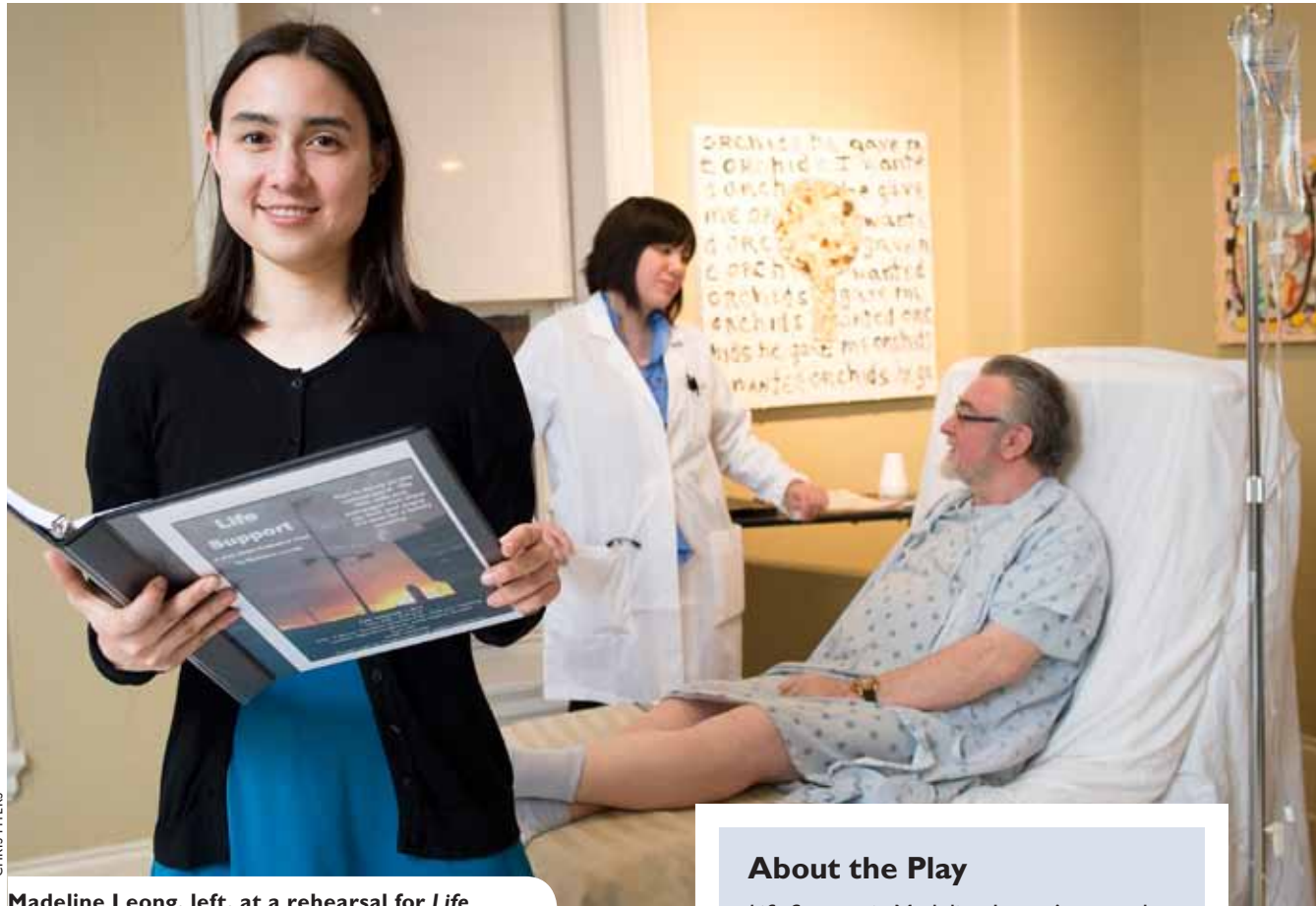
In the play, Karl, 65, and his 35-year-old fifth wife, Lori, angrily resist filling out a Maryland advance directive that would outline treatment preferences and name a health care agent. "My husband is a fighter," Lori insists to Li. "He fights every day! And you bring doom and gloom."

Yet palliative care is about giving hope, not taking it away, says Rab Razzak, director of outpatient palliative medicine. "It's about helping people make decisions based on their goals," he says. "The starting point is what the patient wants."

For example, says Smith, a patient might say she wants to stay alive to see her granddaughter graduate from college. Others might want to relieve a specific symptom. Or die at home. Or reconcile with a sibling.

Palliative care experts ask and listen. What is your understanding of your situation? How much do you want to know? Have you thought about a time when you could be sicker? What brings you joy?

The palliative care program at Johns Hopkins Medicine began in 2007 in the Johns Hopkins Kimmel Cancer Center. It now includes inpatient consults,



Madeline Leong, left, at a rehearsal for *Life Support*, her play about palliative care. Behind her, actors Elizabeth Ung and Rodney Bonds practice their lines.

outpatient care and provider education throughout Johns Hopkins. An 11-bed inpatient palliative care unit is scheduled to open in The Johns Hopkins Hospital in November.

Leong, 30, says Karl and his family are not modeled after anyone she has treated. "The thing that's definitely real is some of the reactions I write about," she says. "Just the other day, I said the word 'hospice,' and the person was not ready to hear that."

By the end of the play, Karl has figured out what he wants. "If there's no cure, I would like to see my home one last time," he says. But the conflict doesn't end quite yet. Like palliative care itself, the play has no heroes or villains, no easy answers.

"I think there's something about live theater," says Smith, who attended an early reading of the play. "You're there. It's immediate. It forces you to think about difficult issues. The play shows you a clinician who is trying her best and learning as she goes."

—Karen Nitkin

LIKE PALLIATIVE CARE ITSELF, THE PLAY HAS NO HEROES OR VILLAINS, NO EASY ANSWERS.

About the Play

Life Support is Madeline Leong's second play. Her previous work, *Stage IV*, was performed at Baltimore's Mobtown Theater in 2013. *Life Support* is funded by the Arnold P. Gold Foundation. The cast includes Elizabeth Ung as Rachel Li, Rodney Bonds as Karl Evans, Ann Turiano as Lori Evans and Eric Paul Boelsche as Pembroke Evans. Brent Englar directs, and Brian Kraszewski is the stage manager.

Life Support will open at 7:30 p.m. on April 14 at Johns Hopkins Bayview Medical Center. Performances will also be held in The Johns Hopkins Hospital's Tilghman Auditorium at 3 p.m. on April 16, April 17 and May 1, and at 8 p.m. on April 27 and 29. The play will be performed at the Johns Hopkins University School of Nursing at 7:30 p.m. on April 28. Go to galentheater.com for dates and locations, and to reserve free tickets.

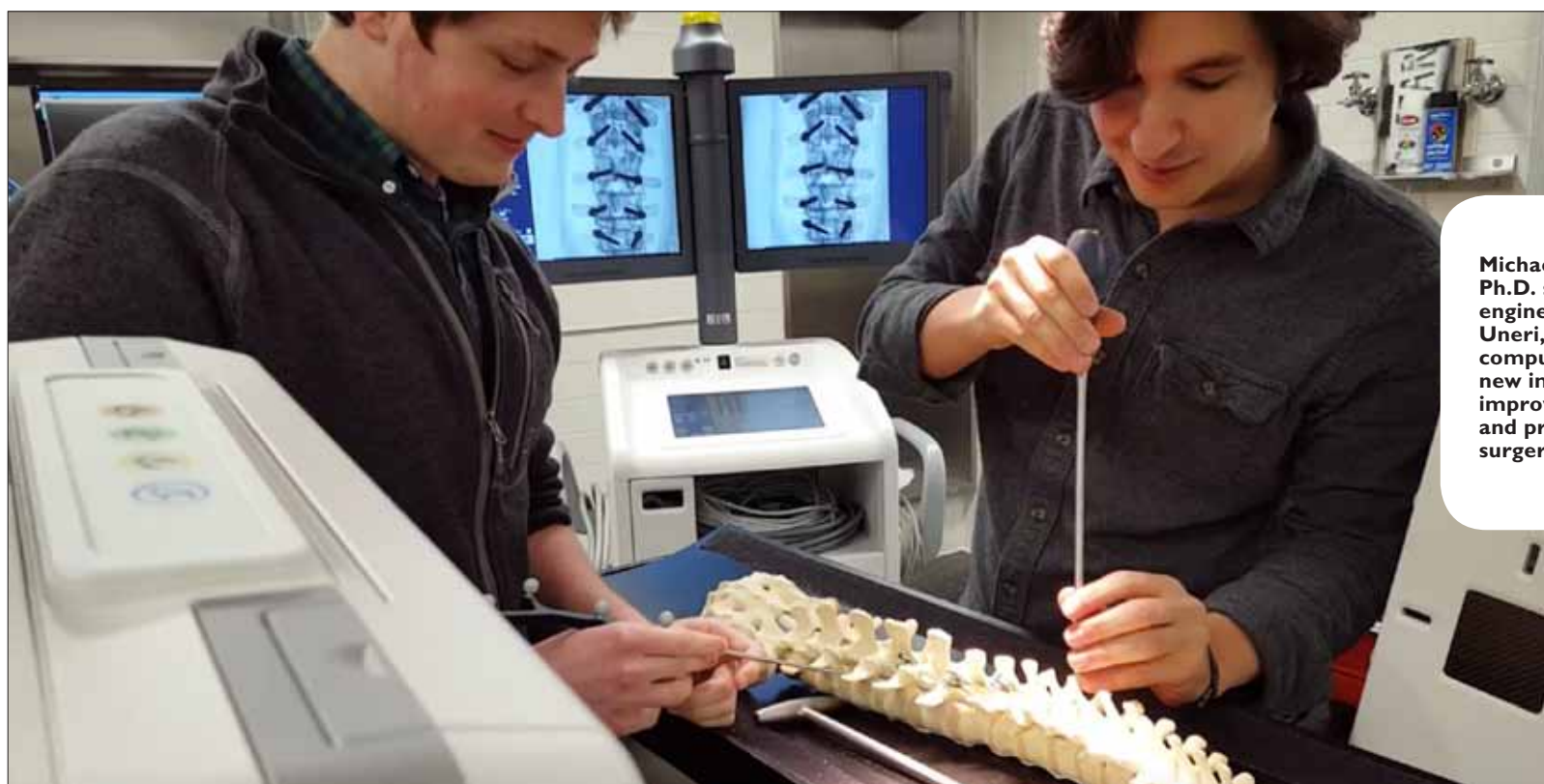
IN BRIEF

Social Innovation Lab Event



A group from this year's Social Innovation Lab cohort is developing the B'more Healthy Teaching Kitchen to engage the community in lifelong healthy eating habits through hands-on cooking lessons. From left, research fellow Paul Akre, M.D./Ph.D. student Shannon Wongvibulsin, medical student Helen Knight and research technician Justin Lee.

Since 2013, Johns Hopkins University students have joined with community experts to tackle pressing social issues in a group known as the Social Innovation Lab (SIL). To raise awareness about its innovative efforts, SIL is hosting an event on **Thursday, April 21, from 6 to 8 p.m. at The Johns Hopkins Hospital's Chevy Chase Bank Conference Center**. The forum will showcase a cohort of emerging social ventures led by Johns Hopkins students and Baltimore-area residents. These entrepreneurs will talk about their approaches to health, education and economic challenges. One team, for example, will show how it is improving the way orthotic devices are made and distributed to those in need. To RSVP, visit silforum2016.splashthat.com.



Michael Ketcha, left, a Ph.D. student in biomedical engineering, and Ali Uneri, a Ph.D. student in computer science, work on new imaging methods to improve the quality, safety and precision of spine surgery.

ROGER STEWART

Back to the Future

New laboratory for neurosurgery and biomedical engineering facilitates research partnerships in historic building.

ON THE SEVENTH FLOOR OF THE JOHNS Hopkins Hospital's venerable Carnegie Building, in what once was a postoperative recovery room, biomedical engineering graduate students now gaze at computer screens as they devise innovative neurosurgical tools.

Not far from them is a foosball table that researchers and their neurosurgical collaborators use to unwind. Nearby, a giant TV screen is on 24/7, linking the laboratory to its undergraduate counterpart in Clark Hall on the Homewood campus.

It is hard to imagine such a synergistic connection between biomedical engineering students and neurosurgeons occurring in a hospital, much less in the vintage operating rooms where landmark 20th-century surgical procedures were pioneered. Yet this newly named Carnegie Center for Surgical Innovation is a unique laboratory that the departments of Neurosurgery and Biomedical Engineering hope will transform neurosurgery in the 21st century—and make it even safer.

Over the past year, renovation has already altered much of the 10,000 square feet that once housed 10 operating rooms in the 88-year-old Carnegie Building. Every Johns Hopkins master neurosurgeon, from Walter Dandy (1886–1946) to Henry Brem, today's department director, performed surgical miracles there. Achievements, such as Dandy's invention of diagnostic procedures to make brain tumors visible on X-rays

and Brem's implantation of chemotherapy-infused GLIADEL wafers into the brain after removing a tumor, made Carnegie the epicenter of neurosurgical advances.

Transforming these operating rooms into the Carnegie Center for Surgical Innovation was the brainchild of neurosurgery professor Jean-Paul Wolinsky and biomedical engineering professor Jeff Siewerdsen. Collaborating closely for six years, the two have developed operative and imaging devices that enhance the ability of neurosurgeons to perform spine operations more accurately and less invasively.

Now they have a chance for more partnerships. Not only are top faculty members and postgraduate students from the school of medicine working in the new lab, but so are candidates from the master's program at the Whiting School of Engineering's Center for Bioengineering Innovation and Design. Graduate and undergraduate biomedical engineering students on the university's Homewood campus are involved as well.

Discussions about the new laboratory began four years ago, when The Johns Hopkins Hospital's main operating rooms were moved from Carnegie, which was built in 1927, to the new Zayed and Bloomberg clinical towers. Wolinsky and Siewerdsen proposed increasing the collaborations between their departments by converting some of the vacated space into a joint neurosurgery and biomedical engineering education and research center. Fueled by National Institutes of Health-funded research, this hospital-based,

joint neurosurgery and biomedical engineering lab is unique in North America, co-localizing a critical mass of engineering and surgical expertise.

It is also singular in how it showcases elements of its storied past. In the postanesthesia care room, where patients were taken immediately after surgery—and where today's research students now focus on screens scrolling with code, equations and 3-D images—20 patient monitoring panels still line the walls. Into these were plugged a variety of postoperative devices—from electrocardiograms to oxygen hookups and vacuum suctioning equipment.

“Working in a lab surrounded by the visible history of Hopkins surgery helps the engineers to understand that at the end of all their research is a person,” says Siewerdsen. “For us, that's very powerful. Not many engineers get the experience of being embedded in an area where real stuff took place. Every room here has a story.”

The directors also preserved some unique features in the old operating rooms. For instance, when Dandy performed his landmark diagnostic procedures in the 1930s and '40s, he used a six-point compass, painted on the tiled floor, to help him align patients' heads with an X-ray machine. That plain, low-tech tool remains visible amid the latest advances in mobile CT scanners and surgical navigation—a juxtaposition that calls attention to the arc of Johns Hopkins' technological innovations over the past 80 years.

One major theme for the lab's researchers—clinicians and engineers—is ORQA, or operating room quality assurance. The acronym refers to new methods for imaging in the operating room to improve safety, prevent errors and enhance surgical quality. It also applies to future surgical training at the center, where anatomy can be taught using high-tech simulations for dissections rather than cadavers.

Wolinsky says that enhancing the already established collaboration between neurosurgery and biomedical

“NOT MANY ENGINEERS GET THE EXPERIENCE OF BEING EMBEDDED IN AN AREA WHERE REAL STUFF TOOK PLACE.”

—JEFF SIEWERDSEN

Jeff Siewerssen, far left, and Jean-Paul Wolinsky confer with students in the new Carnegie lab.



ROGER STEWART

engineering is “not the end of the story.” All of the new equipment on which the lab is working, from imaging devices to surgical equipment and robotic innovations, also could be “highly marketable,” he notes.

The Carnegie Center for Surgical Innovation is closing the gap between the scientists at Homewood and in East Baltimore. “This really is a great example of the ‘one university’ concept championed by Johns Hopkins University President Ron Daniels,” says Siewerdsen. “This space gives researchers from several departments a focal point in the hospital with proximity to surgeons, identifying key clinical problems and working together to translate innovative solutions to clinical use.”

—Neil A. Grauer

Learn more about the center: carnegie.jhu.edu

Learn about the history of neurosurgery at Johns Hopkins Medicine: bit.ly/JHMneurosurgeryhistory

Bloomberg Distinguished Professor



Rexford Ahima, M.D., Ph.D., an internationally renowned endocrinologist, has been appointed the Bloomberg Distinguished Professor of Diabetes; director of the Division of Endocrinology, Diabetes and Metabolism; and leader of the Diabetes Initiative in the school of medicine. Previously a professor of medicine at the University of Pennsylvania; director of the obesity unit in its Institute for Diabetes, Obesity and Metabolism; and director of the Penn Diabetes Research Center's Mouse Phenotyping, Physiology and Metabolism Core, Ahima will continue his research in a new laboratory on the Johns Hopkins Bayview Medical Center campus.

Women in Medicine

The Johns Hopkins Hospital has received the American Medical Women's Association (AMWA) 2016 Heller Outstanding Branch Award, the organization's highest national honor, for work that the hospital's AMWA branch has undertaken within the community and the school of medicine to foster the association's mission to advance women in medicine and improve women's health.

EAST BALTIMORE



Namandje Bumpus, Ph.D., associate professor of pharmacology and molecular sciences, is among 105 young scientists to receive a Presidential Early Career Award for Scientists and Engineers. The award, announced by President Obama, is the U.S. government's highest honor for researchers in the early stages of their independent research careers. Bumpus studies drug metabolism, the process by which proteins that are primarily present in the liver biochemically modify a medication that a person is taking—determining both the duration and intensity of the drug's effects on the individual.



J. Raymond DePaulo, M.D., professor and director of the Department of Psychiatry and Behavioral Sciences, has been elected chair of the National Network of Depression Centers. The network currently includes 21 top academic medical centers.



Harry "Hal" Dietz, M.D., professor of medicine and genetics, director of the William S. Smilow Center for Marfan Syndrome Research, and a Howard Hughes Medical Institute investigator, has received the American Heart Association's 2015 Research Achievement Award for his lifesaving discoveries related to the cause and treatment of aortic aneurysm.



Jennifer Fairman, M.A., assistant professor of art as applied to medicine, has won the *Popular Science* magazine/ National Science Foundation's 2016 People's Choice

Visualization Challenge Award for her illustration of the work of **Jie Xiao, Ph.D.**, associate professor of biophysics and biophysical chemistry, and her laboratory colleagues on the arrangement of proteins at the site where *E. coli* bacterium divides. The illustration that won the award is entitled "The FtsZ ring: a multilayered protein network."



Barbara Fivush, M.D., associate dean of women in science and medicine and a professor of pediatrics, has received the American Academy of Pediatrics' 2016 Henry Barnett Award. This lifetime achievement accolade recognizes her decades of work in pediatric nephrology in improving the care of children with chronic kidney disease.

Jordan Green, Ph.D., associate professor of biomedical engineering, ophthalmology, oncology, neurosurgery, and materials science and engineering, has received a Presidential Early Career Award for Scientists and Engineers from President Obama. Green's Biomaterials and Drug Delivery Laboratory focuses on biomaterials, drug delivery, gene therapy, nanobiotechnology and cell engineering.

Geetha Jayaram, M.B.B.S., M.D., M.B.A., associate professor of psychiatry and behavioral sciences and co-director of the Short Stay Unit, has received the 2016 Kun-Po Soo Award from the Council on Minority Mental Health and Mental Health Disparities of the American Psychiatric Association. The award recognizes Jayaram's significant contributions toward understanding the impact of Asian cultural heritage in areas relevant to psychiatry.

Susan Lehmann, M.D., associate professor of psychiatry and behavioral sciences and clinical director of the Division of Geriatric Psychiatry and Neuropsychiatry, has been named the 2016 Educator of the Year by the American Association for Geriatric Psychiatry.

Donna Magid, M.D., M.Ed., professor of radiology and radiological science, orthopaedic surgery, and functional anatomy and evolution, has received the Association of University Radiologists' 2016 Nancy O. Whitely Award for her research related to radiology education. Magid, director of undergraduate medical student education in radiology, the school of medicine's radiology elective and its horizontal strand in diagnostic imaging, also received the Whitely Award in 2007.

Guy McKhann, M.D., founding director of the Department of Neurology and first head of the Zanvyl Krieger Mind/Brain Institute, has received the Dean's Distinguished Mentoring Award. The honor recognizes McKhann's influential mentoring of individuals who have gone on to establish independent, distinguished careers in academic medicine.

Modupe Savage, M.S.N., M.B.A., N.E.A.-B.C., R.N., has been named assistant director of nursing for the Office of Workforce Planning and Nurse Recruitment. A 15-year Johns Hopkins Hospital veteran, she previously served as nurse manager on the Hospitalist-Halsted 2/ Osler 2 unit.



MATCH MADNESS: After years of considering which field of medicine to pursue, 105 Johns Hopkins fourth-year medical students learned where they will begin their residency programs this summer. Match Day occurred on March 18 at medical schools throughout the country. At Johns Hopkins, the festivities took place in the Anne and Mike Armstrong Medical Education Building, where students gathered with family members, friends and mentors. Following a dramatic countdown, students opened

their envelopes to find out which hospital and specialty program accepted them. Top specialties for Johns Hopkins students included internal medicine, general surgery, emergency medicine and psychiatry. Twenty-six will head to The Johns Hopkins Hospital; two will go to Johns Hopkins Bayview Medical Center; and two will train at the Wilmer Eye Institute. To learn more about Match Day at the school of medicine and at Johns Hopkins All Children's Hospital, visit hopkinsmedicine.org/dome.

JOHNS HOPKINS BAYVIEW MEDICAL CENTER

Anita Everett, M.D., associate professor of psychiatry and behavioral sciences and director of community and general psychiatry, has been elected president of the American Psychiatric Association, the world's largest psychiatric organization.



Constantine "Kostas" Lyketos, M.D., M.P.H., professor and director of psychiatry and behavioral sciences, has received the American Psychiatric Association's 2016 Jack Weinberg Memorial Award in Geriatric Psychiatry in honor of his leadership and outstanding work in clinical practice, training and research into geriatric psychiatry.

Maxine Robinson, D.Min., B.C.C., has received her certification as a chaplain with the Association for Professional Chaplains.

JOHNS HOPKINS ALL CHILDREN'S HOSPITAL



Douglas Myers, M.B.A., C.P.A., has been named vice president and chief financial officer. For the past five years, Myers served as chief financial officer and executive vice president of Children's National Medical Center in Washington, D.C. He has more than two decades of experience as a chief financial officer at health care institutions, including service as chief operating officer at Children's Hospital and Research Center in Oakland, California, and Texas Health Resources in Dallas.



Prabhu Parimi, M.D., has been named director of the Johns Hopkins All Children's Maternal, Fetal & Neonatal Institute and chief of the Division of Neonatology at ACH. He will lead the integration of the neonatal program's clinical care with research initiatives and education of pediatric residents and future fellows. Parimi previously served as director of the division of neonatology, medical director of the neonatal intensive care unit and neonatal medical home, and professor of pediatrics at the University of Kansas Medical Center and was the KU site principal investigator for the NICHD Neonatal Research Network.



Nominations Open for the Johns Hopkins Medicine Clinical Awards for Physicians and Care Teams

The Johns Hopkins Medicine Clinical Awards for Physicians and Care Teams recognize those who embody the best in clinical excellence. Nominate a colleague or team of colleagues whose clinical work is exemplary. Nominations are open to The Johns Hopkins Hospital, Johns Hopkins Bayview Medical Center, Howard County General Hospital, Sibley Memorial Hospital, Johns Hopkins All Children's Hospital and Johns Hopkins Community Physicians. You can submit your nomination from Monday, April 11 through Friday, May 13 online at hopkinsmedicine.org/clinical-awards.

Dome

Published 10 times a year for members of the Johns Hopkins Medicine family by Marketing and Communications.

The Johns Hopkins University School of Medicine
The Johns Hopkins Hospital
Johns Hopkins Bayview Medical Center
Howard County General Hospital
Johns Hopkins HealthCare
Johns Hopkins Home Care Group
Johns Hopkins Community Physicians
Sibley Memorial Hospital
Suburban Hospital
All Children's Hospital

Editor
 Linell Smith

Contributing Writers
 Neil A. Grauer, Vanessa McMains, Judy F. Minkove, Karen Nitkin, Linell Smith, Patrick Smith

Copy Editors
 Abbey Becker
 Judy F. Minkove

Designer
 Max Boam

Photographer
 Keith Weller

Dalal Haldeman, Ph.D., M.B.A.
Senior Vice President,
Johns Hopkins Medicine
Marketing and Communications

Send letters, news and story ideas to:
 Editor, *Dome*
 Johns Hopkins Medicine
 Marketing and Communications
 901 S. Bond St., Suite 550
 Baltimore, MD 21231
 Phone: 410-502-9602
 Email: lsmit103@jhmi.edu

Read *Dome* online at hopkinsmedicine.org/news/publications/dome

© 2016 The Johns Hopkins University and The Johns Hopkins Health System Corporation.

Follow Johns Hopkins Medicine

Facebook:
[facebook.com/JohnsHopkinsMedicine](https://www.facebook.com/JohnsHopkinsMedicine)

Twitter:
twitter.com/HopkinsMedicine

YouTube:
[youtube.com/user/JohnsHopkinsMedicine](https://www.youtube.com/user/JohnsHopkinsMedicine)