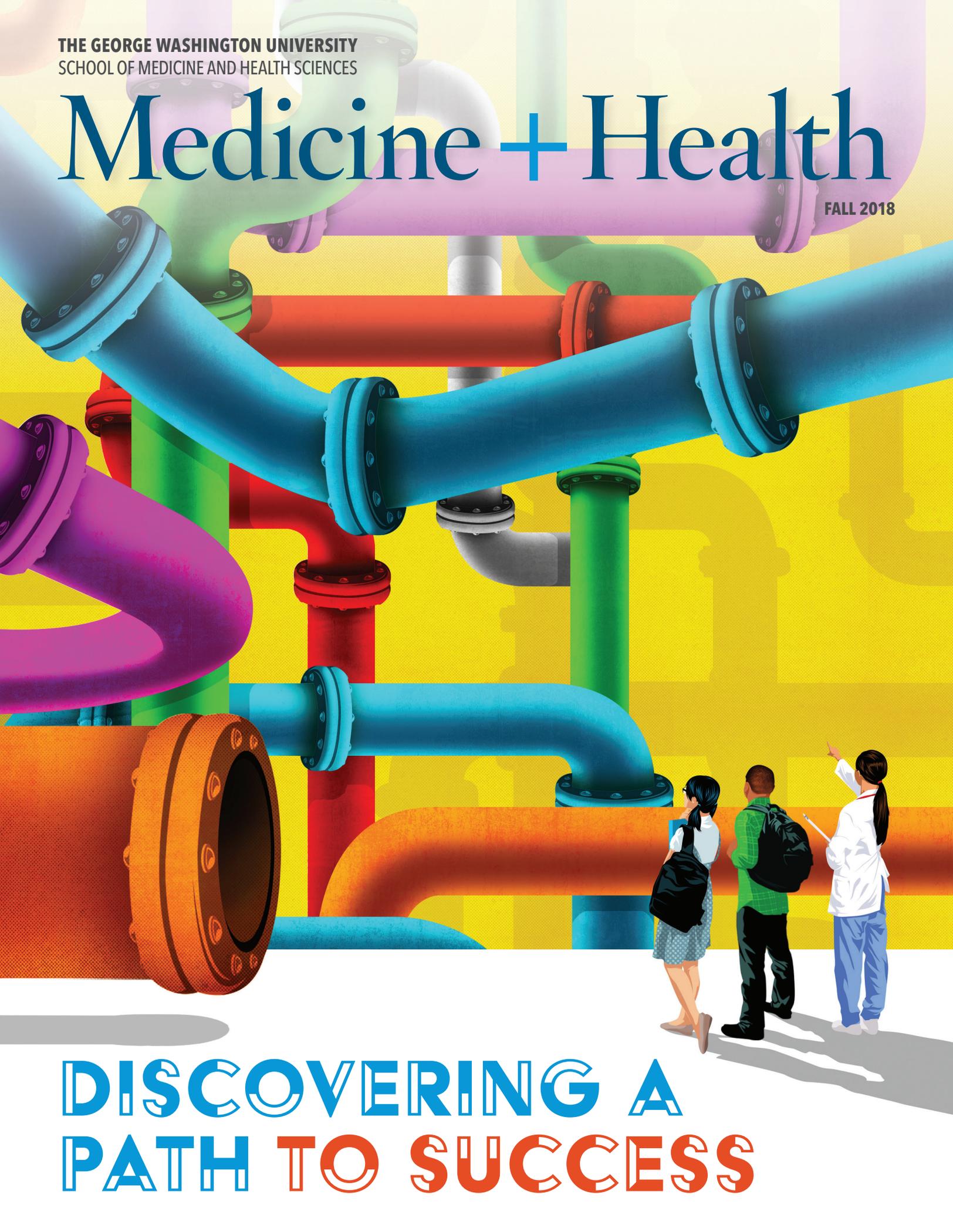


THE GEORGE WASHINGTON UNIVERSITY
SCHOOL OF MEDICINE AND HEALTH SCIENCES

Medicine + Health

FALL 2018



**DISCOVERING A
PATH TO SUCCESS**

A NOTE FROM ROSS HALL



Dear SMHS community,
Today, it is well accepted in both higher education and in business that diversity and excellence are intertwined and reinforce ideas.

While it might seem that this is a relatively new concept, the leadership of the George Washington University (GW) School of Medicine and Health Sciences (SMHS) has long understood that embracing diversity and inclusivity is essential to building a great school.

In 1884, SMHS enrolled its first female students, distinguishing itself for decades as one of the only medical schools in the nation to admit women. Since then, women have held increasing significance among our student body, and this year women account for 63 percent of the first-year MD class. Less than a decade after SMHS accepted its first female students (Ellen W. Cathcart, Sarah A. Schull, Alice J. White, and Clara Bliss Hinds), GW became the first university in the United States to award a medical degree to a Korean-American (Jaipil [aka Philip Jaisohn] Soh, MD 1892). In 2013, GW appointed the first openly gay dean of a U.S. medical school.

Today, diversity — as it relates to gender, race, ethnicity, culture, socioeconomic status, sexual orientation, gender identity, and life experiences — is core to our mission. And, inclusivity, collaboration, teamwork, and mutual respect remain hallmarks of the SMHS culture.

This year, we welcomed the most diverse MD class in our history, and we continue to attract internationally recognized faculty and researchers. In this edition of *Medicine + Health*, you will meet alumnus Mohammad Ali Aziz-Sultan and learn about his journey from Afghanistan to GW and how he became a renowned neurosurgeon and role model. You will also learn how we are expanding our efforts to create a diverse health care workforce by partnering with local high schools to help students from diverse backgrounds access careers in the health professions.

As Dean, I am committed to building a school distinguished by the depth of its diversity, ensuring that our culture supports the aspirations of all who learn and work here, and providing the most culturally competent care for our patients and their families. For more information on our efforts in this area, I encourage you to visit our website at smhs.gwu.edu.

Warmest regards,

JEFFREY S. AKMAN, MD '81, RESD '85

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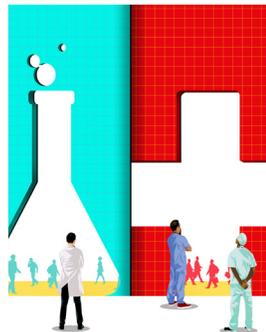
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MAKING THE ROUNDS



White Coat Ceremonies Welcome New SMHS Students

New members of the George Washington University School of Medicine and Health Sciences (SMHS) MD, physician assistant, and physical therapy programs gathered over the summer and in early fall to don their new white coats, the beginning of a journey toward the career many had dreamed about since they were children. ■



Moving On

One message resounded throughout the George Washington University (GW) School of Medicine and Health Sciences (SMHS) diploma ceremonies: Never stop learning.

Reamer L. Bushardt, PharmD, PA-C, senior associate dean for health sciences and professor of physician assistant studies at SMHS, made a charge to the graduates during the Health Sciences ceremony. "I want

you to commit today to aggressively pursue lifelong learning," he said.

He told the graduates that they should harness the knowledge they have, and be mindful of what they don't know.

During the MD Diploma Ceremony, Griffin P. Rodgers, MD, FEL '89, director of the National Institute of Diabetes

and Digestive and Kidney Diseases, shared tips he had cultivated over time. One example: "What you learn tomorrow is even more critical than what you know today."

Jeffrey S. Akman, MD '81, RESD '85, vice president for health affairs, Walter A. Bloedorn Professor of Administrative Medicine, and dean of SMHS, also addressed graduates at both ceremonies, reflecting on truth, integrity, and honor as the fundamental values for a physician. ■

Teaming Up on Integrative Health

The Maryland University of Integrative Health (MUIH) is partnering with the George Washington University (GW) School of Medicine and Health Sciences on an accelerated pathway to admission and advanced standing in two of MUIH's programs for GW graduates.

Graduates with a Bachelor of Science in Health Sciences in Clinical Research Administration, Clinical Management and Leadership, or Clinical Health Sciences will be offered a pipeline to MUIH's Master of Nutrition and Integrative Health, and Doctor of Clinical Nutrition programs.

In addition, graduates and current students in GW's Master of Science in Health Sciences' Integrative Medicine Programs who seek Certified Nutrition Specialist credentials may take up to nine credits from MUIH to become eligible for this certificate. ■

High-Threat Response Training Program Expands

In 2014, the George Washington University School of Medicine and Health Sciences (SMHS) earned a continuing training grant from the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) to establish a high-threat response training program for the whole community.

In summer 2017, the program, led by Geoff Shapiro, director of emergency medical services and tactical/operational medicine at SMHS, began offering several new courses approved and accredited by FEMA.

The courses are geared toward EMS, fire, and other first responders, though there is a course designed for "first care providers," which has been requested by other entities such as schools and businesses. The classes provide institutions with the training and tools needed to assess and change their responses to high-threat situations, such as an active shooter.

Shapiro is a principal instructor along with E. Reed Smith, MD, associate clinical professor of emergency medicine at SMHS. They also recruit adjunct faculty from across the country to assist in classes.

As the program develops, the goal is to continue offering courses and expand their reach to a wider audience, schools in particular. ■



Batting 1,000

This past July, the George Washington University Ron and Joy Paul Kidney Center screened its 1,000th person for kidney disease.

The center, established with a \$2.5 million gift from the Ronald and Joy Paul Foundation, launched in November 2015 and is designed to educate the Washington, D.C., community about kidney disease, provide patients with information about treatment options, and promote the paired kidney exchange list. The center has been hosting free health screenings since its inception. ■

What's in a Name

The George Washington University (GW) School of Medicine and Health Sciences has renamed the Department of Anatomy and Regenerative Biology. It is now the Department of Anatomy and Cell Biology.

"Considering the current teaching and research activities of the department, particularly with newly recruited faculty members, this new name better represents our collective expertise," said Sally A. Moody, PhD, chair and professor in the Department of Anatomy and Cell Biology.

The department is home to some of the GW's leading educators. As a traditional anatomy department, it directs its educational efforts toward undergraduate and graduate courses in gross anatomy, microscopic anatomy, embryology, and neuroanatomy for medical, health sciences, physical therapy, and basic science students. All faculty engaged in these courses teach aspects of the cell biology of human tissues. ■

Bone Marrow Transplant and Cell Therapies Program Expands

A new team of internationally recognized experts will lead the expanded Bone Marrow Transplant and Cell Therapies Program at the George Washington University (GW) Cancer Center.

John Barrett, MD, professor of medicine at the GW School of Medicine and Health Sciences, is leading the expansion, including the translation of clinical research efforts into novel immune cell-based therapies.

He is joined by Catherine Bollard, MD, associate center director for

translational research and innovation at the GW Cancer Center, who is a pioneer in the field of immune cell therapies, in particular, novel T-cell based treatments for pediatric and adult patients with hematologic malignancies.

The team also includes Eric Yvon, PhD, whom Bollard recruited to the GW Cancer Center from MD Anderson Cancer Center. Yvon has been appointed director of the newly established cGMP Cellular Production Facility at the GW Cancer Center. ■

MAKING THE ROUNDS

Taking on the Opioid Crisis

The George Washington University School of Medicine and Health Sciences (SMHS) is joining a national response to the opioid epidemic.

The National Academy of Medicine, in partnership with the Aspen Institute, has called on more than 35 organizations to form the National Academy of Medicine Action Collaborative on Countering the U.S. Opioid Crisis. The public-private partnership brings together entities from government, communities, health systems, provider groups, payers, industry, nonprofits, academia, and more.

All members of the collaborative are committed to sharing knowledge, aligning ongoing initiatives, and addressing the complex challenges faced by individuals, families, and communities affected by the opioid crisis. ■

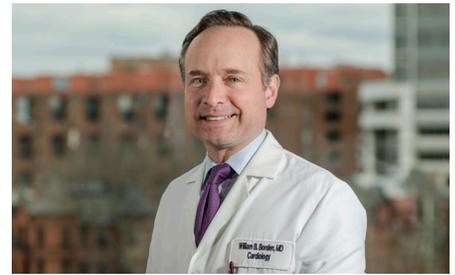
Ensuring Accountability

GW Health Network, the George Washington University's (GW) new accountable care organization (ACO), will ensure patients receive the highest quality care possible and that students learn how to use population health management.

Through the new initiative, the GW Medical Faculty Associates (MFA) and GW Hospital will "strengthen the relationships between patients and providers to promote wellness and better chronic disease management," said Kimberly Russo, MBA, MS, CEO of GW Hospital.

In addition, students at the GW School of Medicine and Health Sciences, as well as residents, interns, and fellows, will learn about the value of ACOs in class, and, once they start rotations in the hospital, will have the opportunity to see how the system works firsthand.

Lessons will be taught using specific cases seen at the hospital or



MFA via the ACO; if the data reveal a quality gap, students can use their knowledge and critical thinking to come up with a way to solve the problem.

The data mined from the ACO also will be used to look at quality measures, specifically admissions for chronic conditions, says William Borden, MD, MBA, who is leading the GW Health Network. GW Hospital sees a high rate of readmissions of patients suffering from multiple chronic conditions, he notes, and a goal of the hospital and the MFA is to use ACO principles and data to identify ways to best help patients and keep those readmissions to a minimum. ■

A Picture OF GRATITUDE



“The doctors at GW couldn’t have been more generous in showing me what goes into what they do, in order to help people in more efficient, less invasive ways. Helping each other is all this earth is about. It’s not about me; it’s about what’s instilled in me to give back to thank those who are helping others.”

Sheila Delauter, grateful patient

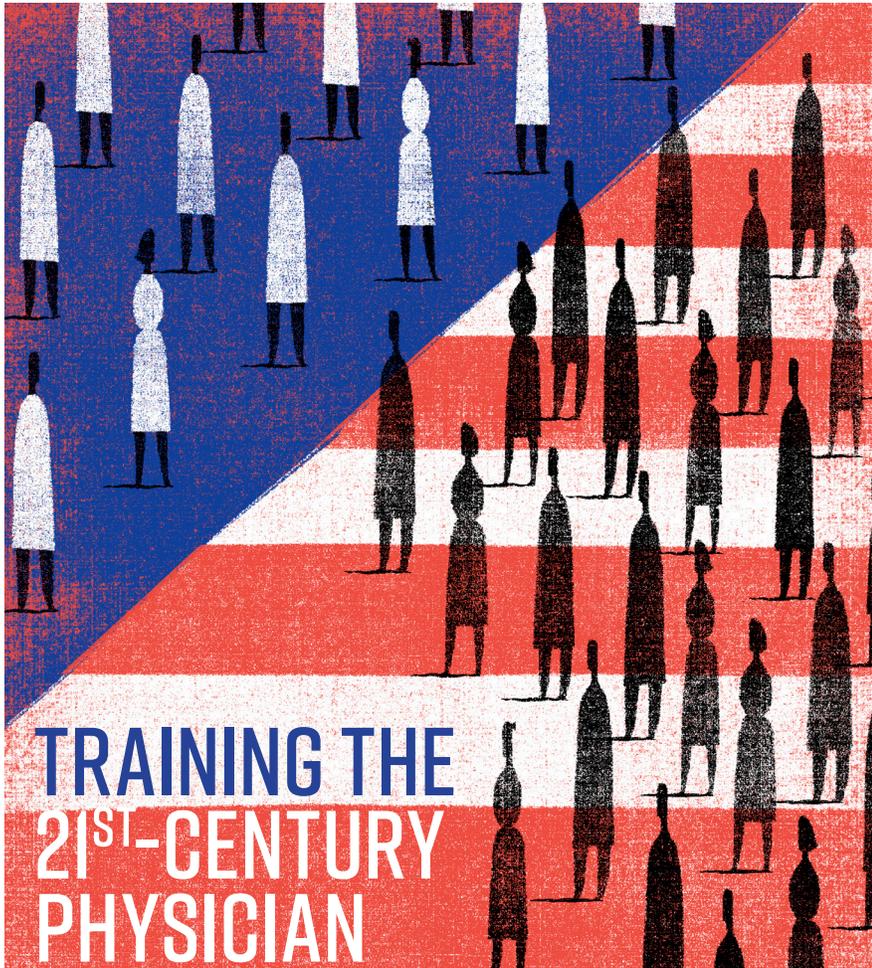
If you, like Sheila (pictured above, right), are thankful for your experience at GW, either as an alumnus, a member of the faculty or staff, or a patient, please consider supporting the School of Medicine and Health Sciences philanthropically.

To learn more about how you can support the School of Medicine and Health Sciences with a gift in your will, trust, or other estate plan, please visit go.gwu.edu/plannedgiving or call 877-498-7590.

THE GEORGE WASHINGTON UNIVERSITY

WASHINGTON, DC

DAR3380



TRAINING THE 21ST-CENTURY PHYSICIAN

BY ASHLEY RIZZARDO

It's one thing to be a clinician; it's another to be a "clinician-citizen." In the autumn of 2014, the George Washington University (GW) School of Medicine and Health Sciences (SMHS) committed to integrating clinical public health into MD education and thus working toward graduating clinician-citizens.

The next phase of the clinical public health curriculum, according to Lawrence "Bopper" Deyton, MD '85, MSPH, senior associate dean for clinical public health at SMHS, takes form in the Patients, Populations, and Systems course series, which began in the fall of 2018.

In 2014, SMHS incorporated clinical public health into the MD curriculum with topical lectures, integration of public health into case-based learning, and clinical public health summits — experiential learning opportunities in which students could use their biomedical sciences knowledge as they addressed pressing public health issues. At the end of their first semester, for example, students participate in the HIV summit, engaging with experts at all levels of HIV/AIDS research and policy to learn how they as clinicians can help create an AIDS-free generation.

The Patients, Populations, and Systems course series will now incorporate and expand upon these lectures and summits.

"This puts all the information in the context of why it's important for practicing clinicians to understand and be able to use the principles of public health, population health, and health policy," Deyton says.

The three-semester course series will extend throughout the pre-clinical phase of the MD program. The courses are designed "to facilitate students' ability to integrate basic sciences, clinical care, evidence-based practice, and population health into systems-based practice to promote the health of individual patients and their communities, and to improve the conditions and systems that affect them," explains Karla Bartholomew, PhD, JD, MPH, PA, director of the Patients, Populations, and Systems courses.

The course series will take full advantage of GW's unique location in the nation's capital with presentations by local, national, and international leaders in public health, health systems and policy, and community health. The courses will also provide students with the opportunity

to apply what they learn through weekly interactive class sessions, small group case discussions, and the clinical public health summits.

"Through these courses, we want students to recognize that patients and their health exist in a context and that health care occurs within a broader set of systems," Bartholomew says. "We also want students to understand what these concepts will mean to them in their role as clinicians, so we are creating opportunities for students to apply their learning to real-world situations throughout the course series."

Additionally, students will gain the knowledge and skills to go beyond the clinical setting, with sessions that include policy and advocacy, community engagement, health disparities, and translation of research for diverse audiences. Students will also learn about health systems; topics will include quality and safety, big data and informatics, and access and patient-centered care.

"This course is really at the cutting edge of how medical schools are trying to prepare the next generation of clinicians," Deyton says. "This is how SMHS is teaching students to be successful as 21st-century physicians." ■

NEW CLINICAL ROTATION SITES

BY KATHERINE DVORAK

To ensure diverse clinical experiences for students and residents, and to present them with the opportunity to help a wide range of patients, the George Washington University (GW) School of Medicine and Health Sciences (SMHS) recently broadened its clinical rotation site offerings.

SMHS has added six new sites across Washington, D.C., Virginia, Maryland, and, in one case, Maine.

“We want to make sure students and residents are well-prepared to take care of diverse patient populations, and we believe that exposing the students and residents to different hospitals that have unique patient populations is beneficial for their careers,” says Richard Simons, MD, senior associate dean for MD programs and professor of medicine at SMHS.

He added that currently the Washington, D.C., region has four medical schools competing for clinical training sites in the District, so finding sites outside city limits is important for SMHS.

The VA Maine Healthcare System, in Camden, Maine, is one of the farthest from the Foggy Bottom Campus, at a distance of more than 600 miles, but it offers an unparalleled experience for ophthalmology residents, says Harold Frazier, MD, interim associate dean for graduate medical education at SMHS. Residents at the site have greater exposure to a robust anterior eye surgery program, he adds. Previously, residents rotated at the VA in Martinsburg, Virginia, but changes in faculty and opportunities there prompted a switch to the new site.

Closer to the District is a rotation site at Anne Arundel Medical Center in Annapolis, Maryland. This site, says Simons, is open to students and offers an array of services. “It’s a very sophisticated hospital and has an excellent commitment to patient safety and quality improvement,” he says. “It’s one of the best-performing hospitals in the state of Maryland.”

Currently, students are participating in an internal medicine rotation at the site. Because Anne Arundel does not yet have internal medicine residents, it allows medical students to work one-on-one with the attending physician. Simons says GW also hopes to build additional clerkship capacity with Anne Arundel in other areas.

Residents and students further will be able to support underserved residents of Maryland and the District through rotations at clinics run by the Mary’s Center. The community health center was founded in 1988 and serves populations with limited access to health care at nine clinics in the District and Maryland.

“It’s a unique exposure for [students and residents] because they’re working with underresourced and underserved communities in a primarily Spanish-speaking population,” explains Frazier.

The Office of Graduate Medical Education is always looking for unique opportunities for residents, he says, relying on the expertise and knowledge of the residency program directors when it comes to the addition of new rotation sites.

Another unique population available to residents is at the Goodwin House in Alexandria, Virginia, where they have an opportunity to assist terminally ill patients. Residents will be part of a palliative medicine rotation, helping those who are likely much sicker and older than at a typical rotation. This will expand their exposure and competency when it comes to palliative care, Frazier notes.

Simons adds that SMHS is both filling the need for more clerkships and looking to enhance students’ and residents’ experiences.

Mary Washington Hospital in Fredericksburg, Virginia, is offering students the opportunity to participate in a pediatric clerkship. SMHS also has existing clerkships at the DC VA Medical Center in areas such as internal medicine, and has added new slots for the surgery clerkship and neurology resident rotations.

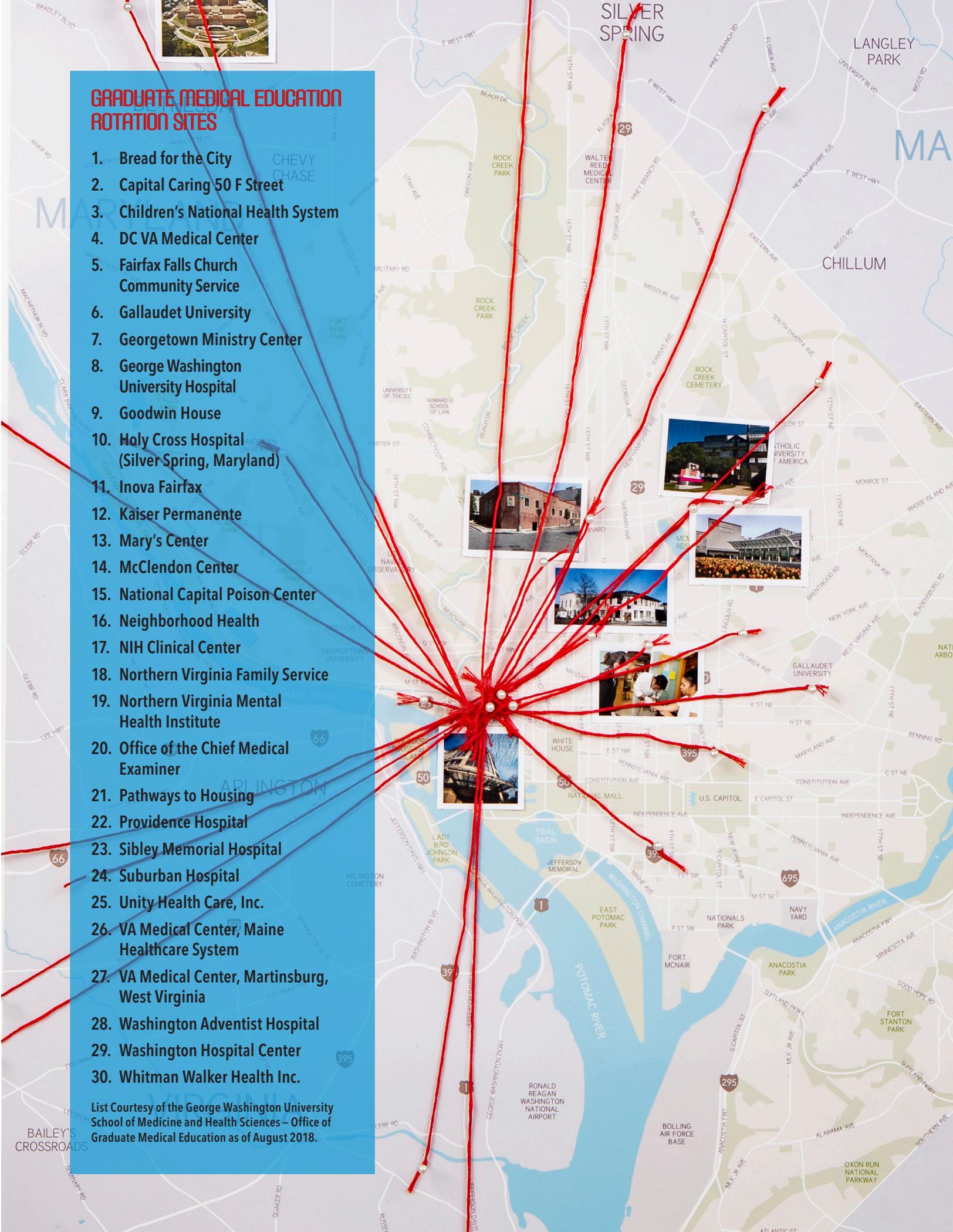
In addition, GW has an existing contract for physician assistant students to rotate at United Medical Center (UMC). As of April 1, the GW Medical Faculty Associates (MFA) began providing physicians and advanced practice providers to staff UMC’s adult emergency services, where, this summer, the MFA took charge of its hospitalist services.

Robert Shesser, MD, MPH, chair of the Department of Emergency Medicine and professor of emergency medicine at SMHS, adds that GW is working on agreements for student and resident rotations during this academic year. ■

GRADUATE MEDICAL EDUCATION ROTATION SITES

1. Bread for the City
2. Capital Caring 50 F Street
3. Children's National Health System
4. DC VA Medical Center
5. Fairfax Falls Church Community Service
6. Gallaudet University
7. Georgetown Ministry Center
8. George Washington University Hospital
9. Goodwin House
10. Holy Cross Hospital (Silver Spring, Maryland)
11. Inova Fairfax
12. Kaiser Permanente
13. Mary's Center
14. McClendon Center
15. National Capital Poison Center
16. Neighborhood Health
17. NIH Clinical Center
18. Northern Virginia Family Service
19. Northern Virginia Mental Health Institute
20. Office of the Chief Medical Examiner
21. Pathways to Housing
22. Providence Hospital
23. Sibley Memorial Hospital
24. Suburban Hospital
25. Unity Health Care, Inc.
26. VA Medical Center, Maine Healthcare System
27. VA Medical Center, Martinsburg, West Virginia
28. Washington Adventist Hospital
29. Washington Hospital Center
30. Whitman Walker Health Inc.

List Courtesy of the George Washington University School of Medicine and Health Sciences – Office of Graduate Medical Education as of August 2018.



GW HOSPITAL SELECTED TO OPEN NEW HOSPITAL AND HEALTH COMPLEX IN SOUTHEAST D.C.



BY KATHERINE DVORAK

In an effort to improve health equity and health care access and to bring research and technology to Wards 7 and 8 in Washington, D.C., the George Washington University Hospital (GW Hospital) signed a letter of intent to oversee the opening of a new hospital and health complex in Southeast D.C.

The complex will be located on the campus of St. Elizabeths East through a partnership between GW Hospital and the District of Columbia.

“It will be the first public-private partnership to join in meeting the health care needs of the District, and the first new hospital to open in Washington, D.C., since the opening of GW Hospital’s Foggy Bottom location almost 20 years ago,” D.C. Mayor Muriel Bowser said during a press conference in August. “This new hospital and health complex will bring our care closer to the homes and into the community of many of our patients.”





The new complex, slated to open in 2023, may include urgent care, outpatient surgery, diagnostic imaging, and physician offices, and it is designed to improve access and outcomes that will benefit all D.C. residents, said GW Hospital CEO Kimberly Russo, MBA, MS.

“We are proud to partner with the GW School of Medicine and Health Sciences [SMHS] and the GW Medical Faculty Associates to provide academic research-based care,” she said. “Our mission at the GW Hospital is to provide the highest quality care, advanced technology, and world-class service to our patients in an academic medical center dedicated to education and research.”

The hospital’s bed count will be finalized after an assessment of community needs, but is tentatively expected to be between 100 and 125. In addition, the southeast location will work in coordination with the Foggy Bottom Campus, which will continue to provide tertiary critical care services.

“As the first medical school in the District of Columbia, we are proud to be an important part of the history of this great city and an important part of the fabric of this community,” said Jeffrey S. Akman, MD ’81, RESD ’85, vice president for health affairs, Walter A. Bloedorn Professor of Administrative Medicine, and dean of SMHS.

“Throughout our history, GW has responded to the growing needs of our own community and society at large through our commitment to finding solutions to local, national, and global problems. GW looks forward to working with the District on the final agreement with the goal of improving health care and achieving health equity with the residents of Wards 7 and 8 and the entire District of Columbia,” he said. ■

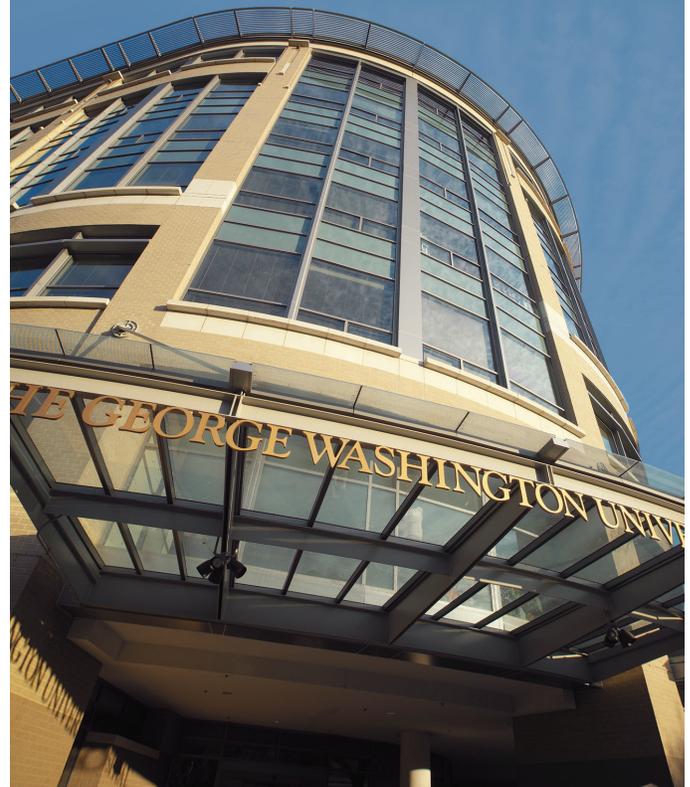
DISTRICT APPROVES CONSTRUCTION OF HELIPAD AT GW HOSPITAL

District of Columbia Mayor Muriel Bowser has signed a bill that will allow the George Washington University Hospital (GW Hospital) to pursue construction of a helipad at its Foggy Bottom facility.

The approval follows unanimous votes in support of the bill from the D.C. Council and its Committee of the Whole this past summer. The helipad will expand access to the hospital’s lifesaving critical care services, including its Level I Trauma Center care and comprehensive stroke care.

“We are thrilled to have official approval to add this vital enhancement in health care access to the D.C. area,” says Kimberly Russo, MBA, MS, CEO of the GW Hospital. “We would like to thank everyone who assisted us through this important pursuit, including our patients, their loved ones, our community partners, and city and federal government representatives, as well as all of our employees and providers.”

Construction on the helipad is expected to begin in 2018 and completion is scheduled for spring 2019.





IN SUPPORT OF HEALTHY EATING AND EXERCISE

BY CAROLINE TRENT-GURBUZ

Weight loss, as propagated on countless reality television shows, podcasts, and news articles, should be easy: Burn more calories than you ingest. In real life, that simple formula feels more theoretical than practical, yet there is one X factor that Ginger Winston, MD, associate professor of medicine at the George Washington University (GW) School of Medicine and Health Sciences, has been exploring: the impact of personal support systems.

“My research focuses on behavioral interventions aimed at reducing the prevalence of obesity,” she says, adding that in Washington, D.C., roughly 22 percent of the population is obese, but nationwide, that number expands to 39 percent. “I [place] a particular emphasis on the role of social networks, for example, friends, family, coworkers, in promoting weight loss.”

She can trace her initiation into obesity-based research to a general medicine fellowship at Columbia University, where she focused on cardiovascular disease. “It was at that time that I started to develop an interest in obesity because I could see how the increase in the prevalence ... was linked to the increase in prevalence of diabetes and cardiovascular disease,” she says.

From there, she went to Cornell University, where, with the help of an investigative research supplement, Winston studied the influence of friends and family on eating and exercise behaviors among African-American and Hispanic adults in Harlem and the South Bronx in New York City. “That work just increased my interest,” she recalls. “We were able to see that participants in our study who had network members who were helpful with their eating and exercise goals actually lost more weight compared with those who had network members who undermined their goals. And that brought me to the work I do now.”

The field isn’t necessarily new, she adds; there has been research into social networks over the years. But the results on efficacy have been mixed. “That may be because sometimes family and friends can be helpful, and sometimes they can undermine what our behavior goals might be,” she explains.

Being supportive can be as easy as offering a few words of encouragement, or it may require more engagement, such as joining in on exercise or not bringing unhealthy food into the

home. Exercise support is “a big one that people find helpful, when the network member says, ‘Yes, I want to walk with you,’ or ‘I want to join you at the gym,’” Winston says. “It may also be simply avoiding things that are not helpful that ... helps people stick with their behavior change.”

Behavior changes, she adds, aren’t one size fits all, either. At the GW weight management practice, Winston, along with two other physicians, designs plans based on each patient’s specific barriers to healthy eating and exercise.

“For example, people may have challenges with eating related to stress, or they might find themselves eating throughout the course of the day and snacking when they’re at work and not hungry and not really realize they’re doing that,” she says. “Everyone is a little bit different, so what I recommend is first trying to isolate what a particular person’s eating challenges might be, and then [continuing] from there.”

Her general advice includes being present while eating — in other words, turning off the television, closing the book, flipping over the cellphone — planning meals, avoiding unhealthy snacking, and reducing stress. For those with families, her more recent research has shown that including children in behavioral interventions may have a positive effect.

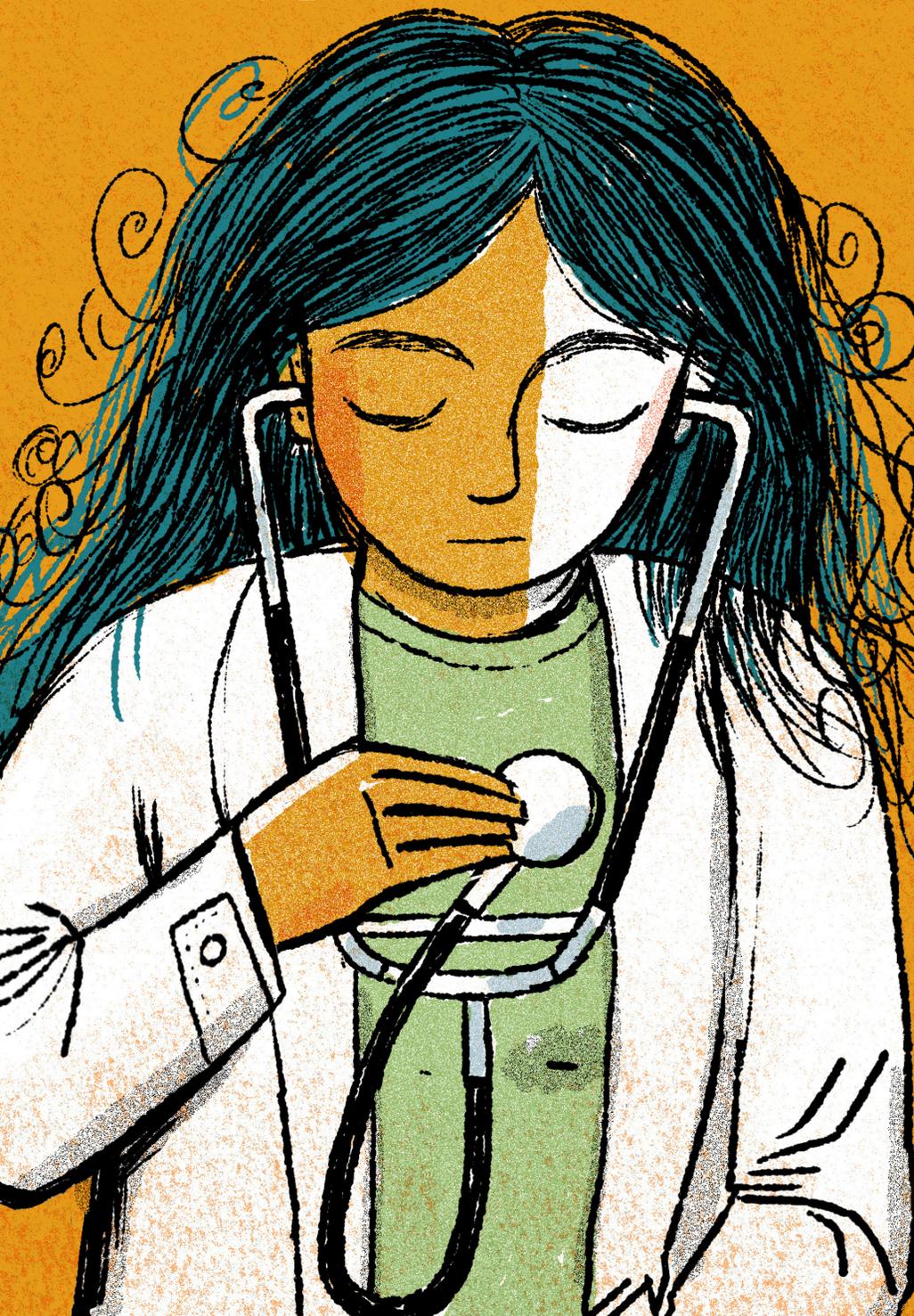
“Within the child support group, adherence with eating behavior changes increased as the frequency of child support increased, so there was some evidence that the more often the children were engaging in their supportive behavior, the more often the parents were engaging in their positive behavior change,” she said. “Another interesting finding, which we didn’t expect, was the adults in our study who lost more weight [also] reported less chaos and disorganization in their home environment.”

Often, Winston adds, researchers tend to focus on just the individual, and not necessarily the social network and home. Keeping in mind the level of organization in a patient’s home life could help in tailoring behavioral interventions. It could also be an element in her next research project.

“[We] will hopefully take a look at having the household family be a support agent for adults trying to make behavior change to lose weight,” she says. ■

WHEN SELF SHOULD COME FIRST

BY CAROLINE TRENT-GURBUZ



Becoming a doctor — and a mother — had always been part of Kathleen Ogle’s life plan. As it turned out, her path to both goals included detours and roundabouts, divorce, financial struggle, and a devastating miscarriage, but she emerged. Furthermore, she emerged with a George Washington University (GW) School of Medicine and Health Sciences (SMHS) degree in hand, a laudable career in emergency medicine, and a healthy son, Kole.

“One of my more recent epiphanies,” says Ogle, MD ’08, assistant professor of emergency medicine at SMHS, “is that by having my medical education and training, I now have the resources to find little ways to take care of myself, and ultimately, that makes me a better mother. It makes me a better teacher. It makes me a better doctor.”

For a profession steeped in compassion, medicine tends to draw practitioners more inclined to devote their entire store of kindness to their patients, leaving little for themselves. SMHS, with support from faculty, students, and alumni, plans to change that.

A BALANCING ACT

In May 2008, Katherine Chretien, MD, associate dean for student affairs and professor of medicine at SMHS, was a new mother when she found herself gearing up for an additional “labor of love,” as she says: an online group blog, Mothers in Medicine, that could serve as a resource and community for physician mothers. In the years since, those blog posts — which now number in the thousands — have morphed into Chretien’s first book, “Mothers in Medicine,” a collection of essays written by clinician moms tackling every aspect of life, including work-life balance, infertility, divorce, childrearing, and support systems.

“I felt like [the blog] was such a treasure trove of advice, like there was

gold in there, sprinkled throughout,” Chretien says. “The goal is to help women in medicine and to provide it all in one place.”

Terry Kind, MD, MPH, assistant dean of clinical education and professor of pediatrics at SMHS, whose chapter in the book focuses on answering common questions — “I’m a mother, should I go into medicine?” or its counterpart, “Can I go into medicine if I want to be a mother?” — found her answers in commonsense wisdom that both Ogle and Chretien echo: choose a specialty that inspires passion; ask and accept help from family, friends, and colleagues; and practice self-care.

“Physicians have a demanding, stressful job by nature. If the original ideals of why someone such as myself would go into [medicine] get squelched along the way, then it’s just stress and not the balance in the job itself of serving others,” she says.

Finding an outlet, whether it’s exercise, as Kind prefers, or taking a few minutes to sit down and have lunch, is crucial for not only mitigating stress, but also ensuring a healthy emotional balance.

“Having an emotional reserve and self-care is essential to doing your job well and still being invested without getting burned out,” Chretien says. “The importance of self-care and wellness, in all of medical education and medicine, is becoming more and more important and recognized as critical.”

TAKING THE FIRST STEPS

By nature, clinicians are prone to holding themselves to an impossibly high standard, one that the professional culture appears to uphold.

“We can tell our students as much as we want that it’s important for them to take care of themselves, but if they then go out on rotations, go out on the wards, and see people running themselves ragged and not stopping to have a bite to eat and getting home way after their kids are in bed on a regular

basis, that sends a pretty clear message to them about what is expected and what is acceptable,” explains Kaylan Baban, MD, MPH, assistant professor of medicine at SMHS. Ideally, she adds, changing the culture among the faculty and alumni to one that emphasizes self-care as an important part of professionalism would spread virally and “benefit our students because they’ll see that role modeling.”

Effecting that kind of change — and ensuring that self-care happens on a daily basis, not just when it feels needed — can help slowly turn the cultural tide to one of more sympathetic norms. And it starts at GW.

Currently, there are numerous wellness programs that Baban, along with Ray Lucas, MD, senior associate dean for faculty affairs and health affairs and associate professor of emergency medicine at SMHS, is working to consolidate under one umbrella. Internal residents, for example, have participated in retreats and a lecture series on mind-body tools, and Baban, Chretien, and Cynthia Powell, MA ’07, clinical instructor of psychiatry and behavioral sciences at SMHS, are beginning to incorporate mindfulness, including personalized wellness and resilience action plans, into the curriculum for medical students. Chretien co-chairs the school’s Wellness Committee, which also has a student chair and is composed of dedicated students, staff, and faculty. Among their initiatives has been “Pumpkins and Pals,” when students brought in their dogs for an informal pet therapy session, and Chretien and other faculty have babysat students’ children so the budding clinicians could enjoy a night out, free of responsibility.

Wellness has also spread to the health sciences, with Howard Straker, PA-C, MPH, assistant professor of physician assistant (PA) studies at SMHS and a longtime practitioner of mindful meditation, folding

“Having an emotional reserve and self-care is essential to doing your job well and still being invested without getting burned out,” Chretien says.

mindfulness into the PA curriculum. His initiative is still in its early stage, but close to half of PA students have volunteered to participate in the five-session seminar.

“This generation of students understand the importance of health and exercise ... but they haven’t necessarily added on the mental part to it,” Straker says. “Taking care of [yourself] is really important, and it has to be practiced because our natural inclination is to want to do something for other people.”

The MD Class of 1985 has also delved into wellness with the creation of its Wellness Fund, designed to support practicing and budding physicians. The idea sprang from the classmates’ 30th reunion, when a core group of friends realized that physician health was integral to caring for others.

“The class ... has raised money, which has been used by the alumni foundation to fund some wellness projects, but we’re hoping to do more,” says Gail Rousseau, MD ’85, adding that the fund has also brought a wellness expert to GW. The steering committee also plans to launch a pilot program of medical and non-medical talks whose topics will include fly-fishing, medical missions in Africa, painting, and cross-country motorcycle riding.

“There is a real need for physicians to be healthy in order to have the personal resources to be able to help others,” says Rousseau. “We go into medicine because of altruism and wanting to give our all to help others, but it’s come at a cost. ... We all have an interest in having physicians be healthy, happy, and productive, for the good of the individual and the patient and the good of society.” ■

AN INSIDE JOB

Immunotherapy Looks to Harness the Body's Defense and Cure Cancer from the Inside Out

BY STEVE GOLDSTEIN

As little as two decades ago early adopters of immunotherapy, looking to harness the body's immune system to fight disease, toiled in the shadow of the holy trinity of cancer therapy — surgery, chemotherapy, and radiation therapy. Now, the immunological approach to cancer treatment has undergone a research renaissance. Times certainly have changed.

Following news of remarkable recoveries, this once-overlooked avenue to a cure for cancer has captured the public's imagination. Oncologists have embraced immunotherapy as an important advancement, and the focus now is on refining those therapies to increase the cure rate and ameliorate potential adverse side effects.

One of the most exciting developments on the immunological front is T-cell therapies for lymphoma. T-cells are a type of lymphocyte produced or processed by the thymus gland (the T comes from thymus) that actively participate in the immune response. Typically, the most widely reported among these new treatments is CD19 CAR T-cell therapy. Doctors attach chimeric antigen receptors (CAR) to T-cells and reintroduce them in the patient to seek out cancer cells and produce chemical compounds that destroy them.

A research team led by Catherine Bollard, PhD, associate center director for translational research and innovation at the George Washington University (GW) Cancer Center, has developed a different therapeutic approach called TAA-T, which is a multi-antigen specific T-cell product that may prove to be superior in many ways to the recently FDA-approved CD19 CAR T-cell therapy.

"If you've got a tumor cell, there are several ways to kill it," says Bollard, who also serves as professor of pediatrics at the GW School of Medicine and Health Sciences (SMHS) and director of the Center for Cancer and Immunology Research at Children's Research Institute, part of Children's National

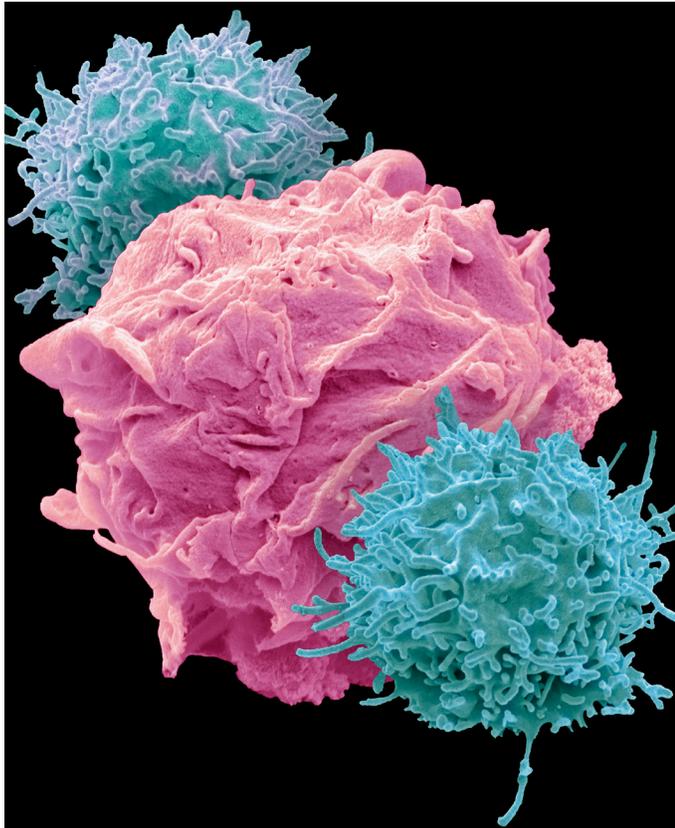
Health System (Children's National). The CD19 CAR T-cell technique, she explains, involves genetically engineering a T-cell — adding an artificial receptor — so that it recognizes and kills the tumor.

TAA-T requires no genetic engineering. Tumor-killing T-cells, present naturally in everyone, are harvested from the patient and fed with cytokines or other chemicals in the lab where technicians grow their numbers to millions. They are then re-infused into the patient. Bollard says the entire process used to take three to six months, which dimmed its luster. Now it can be completed in less than two weeks, "so it's a much more nimble process," she notes.

Genetic modification, on the other hand, is expensive and heavily regulated and thus a cumbersome process. TAA-T has none of these disadvantages. Moreover, CAR T is limited to recognizing proteins on the surface of the tumor cells, and that is very restricting, Bollard explains. "There are only a limited number of proteins on the surface of tumors (or 'extracellular antigens') you can target with CAR T," she says, "whereas our TAA-T can target what is known as intracellular antigens — proteins within the tumor cells — and there are many more of these cancer-specific proteins that can be targeted. In addition, because CAR T targets only one antigen, the patient can develop a resistance to the therapy."

The minimal toxicity of TAA-T is perhaps its most significant advantage. Patients undergoing CD19 CAR T-cell therapy sometimes experience cytokine release syndrome, or CRS, which is caused by a large, rapid release of cytokines and cellular by-products into the bloodstream when the cancer cells are destroyed. Symptoms can vary from the relatively mild — fever, nausea, headache, rash, rapid heartbeat, low blood pressure, and trouble breathing — to the more severe. According to Bollard, CD19 CAR T-cell therapy is associated with "appreciable toxicities including neurotoxicity and, in some cases, death."





ARMING THE IMMUNE SYSTEM

Humans' immune systems feature a variety of white blood cells – including macrophages, dendritic cells, and several types of lymphocytes – each with a different method for protecting the body from foreign invasion or disease. These types of white blood cells circulate to every part of the body, providing protection from cancer and other diseases.

Macrophages are white blood cells that swallow and digest foreign particles and signal other immune system cells to go into action.

Dendritic cells present the foreign cells to the immune system.

Lymphocytes include B-cells, T-cells, and natural killer (NK) cells:

- B-cells make antibodies that tag foreign or abnormal cells so other parts of the immune system can destroy them.
- T-cells directly attack cancer cells and signal other immune system cells to defend the body.
- NK cells find, bind to, and kill foreign invaders or damaged cells in the body.

In Phase I clinical trials with Bollard's TAA-T therapy, researchers are now seeing 75 percent efficacy, especially in acute myeloid leukemia, which the trials with CAR T have thus far been unable to achieve. "We're just beginning to increase the number of patients [in the trials], both adult and pediatric," says Bollard. "We were initially collaborating with [Johns] Hopkins because the program at GW wasn't up and running, but with Kieron's arrival at GW we are now ready to move this therapy forward at GW for the treatment of other forms of lymphoma and even multiple myeloma."

Kieron is Kieron Dunleavy, MD, professor of medicine at SMHS and director of the lymphoma program. "We are excited for Kieron to lead the novel T-cell therapy studies at GW," Bollard says. "We obviously see GW as a huge player in this because of Eduardo [Sotomayor, MD, director of the GW Cancer Center and professor of medicine at SMHS], Kieron, and Mitch [Smith, MD, PhD, associate center director for clinical investigations at GW Cancer Center], who are all internationally renowned lymphoma physicians."

Dunleavy came to GW in May 2017 after nearly 15 years at the National Institutes of Health working on lymphoma therapies and trials. "My goal is to improve the cure rate for the most common form of lymphoma, called diffuse large B-cell lymphoma. There are lots of exciting therapies in development, and they are really changing the face of lymphoma," he says.

Because all cancer tumors have proteins on their surface, Bollard's lab "trains" the T-cells by loading "trainer cells" called antigen-presenting cells with pieces of the proteins (peptides) that are expressed by the tumor cell. Then the researchers mix these peptide-loaded training cells with T-cells from the patient or a healthy donor. The T-cells are stimulated by the tumor peptides to reproduce in the laboratory, growing to large enough numbers that they can then be infused back into the patient. "These [enhanced] T-cells," explains Bollard, "will then kill the tumor target, get stimulated, and continue to replicate in the patient."

"In some ways it's like a cancer vaccine," she explains, "but you're doing the job of the vaccines in the lab."

Adult trials began in the fall of 2016, and pediatric patients joined the study in April 2017. "We started with patients who'd had a bone marrow transplant," says Bollard. "What we want to do with Kieron is to incorporate patients who are ineligible for transplants or who weren't going to have a transplant, and combine it with other immunotherapies — for instance, adding checkpoint inhibitors."

Checkpoint inhibitors are molecules that block immune checkpoints, which are receptors or ligands that modulate the immune response. In many cancers, tumor cells express these checkpoints to "put the brakes on" the immune system. Blocking the immune checkpoint thus releases the brakes.



“Tumors are clever,” Bollard says with a wry grin, “and they try to resist attack from the immune system. We’ve always treated cancer with different drugs. My feeling now is we should treat cancer with different immune therapies. And as long as you don’t increase toxicity to crazy levels, it’s really enhancing the immune therapy to increase efficacy.”

Bollard opens her computer and pulls up a graphic that displays the huge number of immunotherapy projects going on around the world. It’s nearly as vast and dense as a chart of stars. For years, she explains, oncologists have thought of cancer as a disease that needed to be treated by drugs. “Those of us who were proponents of the immune system being our best defense against cancer were looked at with a pretty dim view,” she says.

“Whether or not these cells are the be-all and end-all, what this means is that the community is now understanding that the immune system is really our first line of defense against cancer,” says Bollard. “We should be harnessing it early in the disease process and not waiting until we’ve killed off the immune system with multiple lines of chemotherapy and/or radiation, and then trying to get the immune system to help us.” ■

CHIMERIC ANTIGEN RECEPTOR (CAR) T-CELL THERAPY

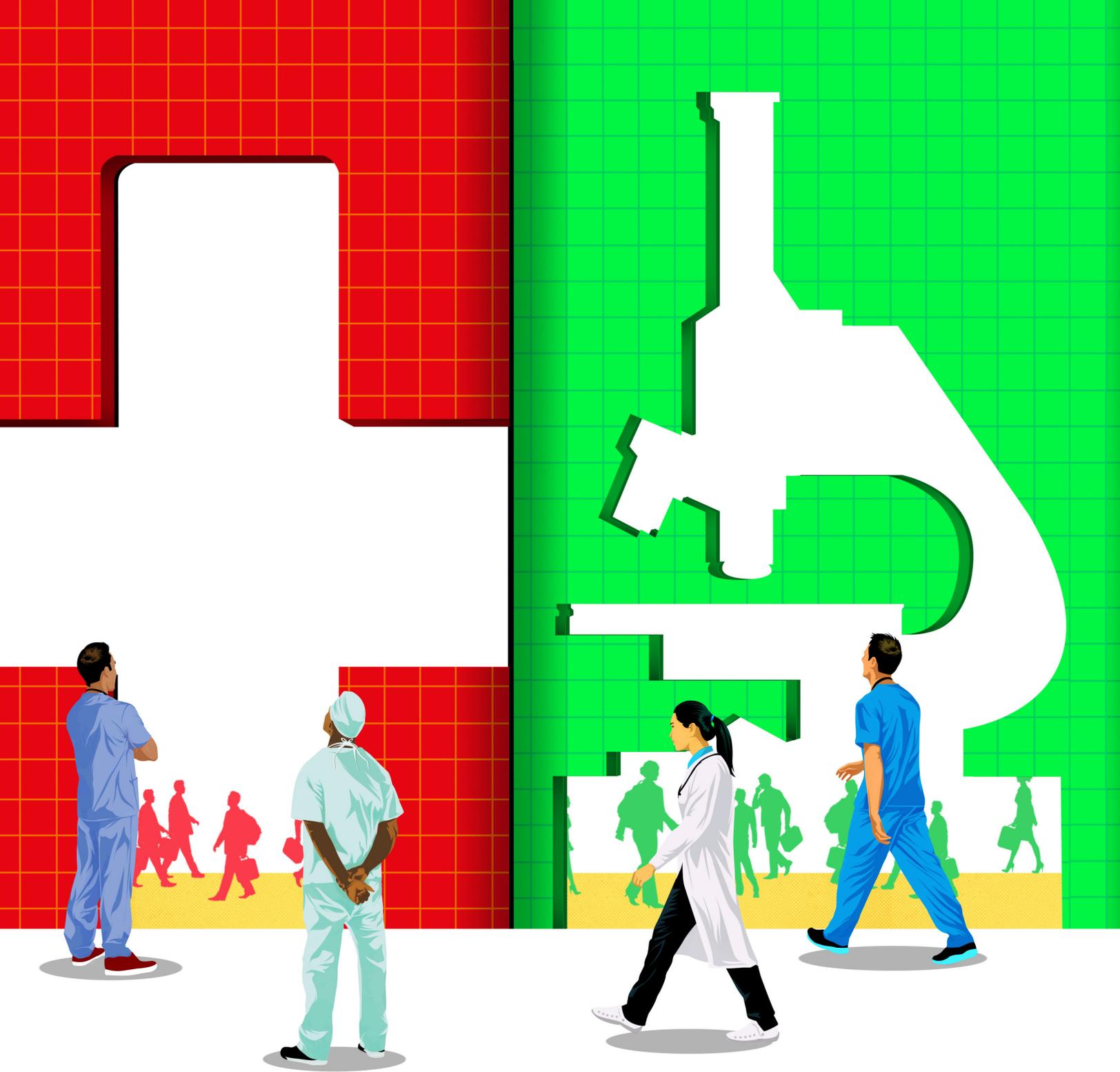
The concept of engineering chimeric antigen receptors dates back about 20 years, and it has been touted as a treatment for a range of cancers. Two CAR T-cell therapies were approved by the FDA in 2017, and since then the number of immunotherapy trials has ballooned.

Cytokine Release Syndrome, or CRS, occurs after CAR T-cell treatment. Symptoms such as fever, nausea, headache, or trouble breathing can range from mild to severe or even life-threatening. According to the National Cancer Institute, the more effective the CAR T-cell treatment is, the more likely a patient is to experience CRS because the therapy has destroyed so many cancer cells the body is littered with cellular debris. The rapid release of cytokines into the blood from the immunotherapy can send the immune system into a tailspin.



DISCOVERING A PATH TO SUCCESS

BY KATHERINE DVORAK | ILLUSTRATION BY TAYLOR CALLERY



Compassionate is the first word that comes to mind when her family thinks about her, says Daviana Robles-Monge, a freshman at T.C. Williams High School in Alexandria, Virginia. Kindness is important to her, helping people and offering a shoulder to lean on whenever and wherever she can, and that is what's leading her toward the health sciences.

GRANT SUPPORTS REGIONAL HEALTH CARE WORKFORCE NEEDS



With the support of a grant in excess of \$3.1 million from the Health Resources and Services Administration, a multidisciplinary team led by faculty and research staff

at the George Washington University (GW) School of Medicine and Health Sciences and supported by scholars from the GW Graduate School of Education and Human Development, has developed an educational pipeline program to address health inequities and inadequate diversity among the health professions in metropolitan Washington, D.C., region. The program leverages regional partnerships with public schools, community colleges, and health care employers to create seamless training and workforce development opportunities for area students.

"The importance of building a health care workforce that better represents the diverse population we serve and the value of a culturally competent workforce are well described," said Reamer Bushardt, PharmD, PA-C, DFAAPA, senior associate dean for health sciences and professor of physician assistant studies at GW SMHS and principal investigator. "Our research team has studied the barriers that students from disadvantaged backgrounds in our region face in completing the educational requirements for high demand health care careers. We are now applying proven solutions to break down these barriers, so our region can benefit from a talented pool of students who are passionate about serving their communities and improving health."

The project assembles a sustainable educational infrastructure and workforce pipeline through a regional, multi-institutional integrated network. Additionally, students gain specialized training in health equity, community engagement, and evidence-based strategies to combat public health challenges, such as obesity, asthma, and opioid-related disorders. ■

"Ever since I was little, I knew I wanted to do something in health care. Recently, surgery has been one of my main goals, especially pediatrics," Robles-Monge says confidently, her wide smile revealing a bright set of braces at odds with her mature demeanor.

It's an impressive goal for a young teen, but one more attainable than ever thanks to the new Governor's Academy of Health Sciences at T.C. Williams High School, which was established through a partnership between Alexandria City Public Schools and the George Washington University (GW) School of Medicine and Health Sciences (SMHS).

But Robles-Monge isn't the only young person whose dreams of higher education and a medical career are buoyed by SMHS. Visit the GW Foggy Bottom Campus on a hot day in July and you'll see white coat-clad teens roaming Ross Hall, conducting research in labs, or learning to draw blood and performing CPR in the Clinical Learning And Simulation Skills (CLASS) Center, all participants in various pipeline programs offered throughout the school.

In addition to the larger programs, SMHS hosts a variety of smaller, more specialized offerings, such as the Students Attending Thoracic Surgery program, run by Keith Mortman, MD, associate professor of surgery. Originally created to teach high school students about the dangers of smoking, the curriculum has grown to include educating students about health care professions.

Then there's the Rodham Institute's Health Education and Leadership Program (HELP), which was designed to support children of GW Medical Faculty Associates staff, many of whom come from underserved communities in Wards 7 and 8.

This program is year-round and consists of a weeklong session during spring break, a back to school program, and monthly professional development and service opportunities on Saturdays throughout the year. Students receive direct skills-based instruction from industry professionals, faculty, graduate medical education trainees, and medical students. One hundred percent of HELP alumni have graduated from high school.

Other programs, such as Camp Cardiac, offer a sample of the medical school experience to high school academic all-stars interested in exploring careers in medicine. The weeklong camp, led by medical students, steeps participants in the workings of the heart, providing an excellent starting point for those interested in medicine.

SMHS is laboring to create pipelines to success as unique and individualized as the high school and college students who participate in them. Whether that success is measured as being the first in their family to enter college, discovering a health care career suited to their passion, or earning a coveted white coat, it's the responsibility of SMHS to give future generations the opportunity to achieve their dreams.



Virginia Gov. Ralph Northam joined Gregory C. Hutchings Jr., PhD, superintendent of Alexandria City Public Schools; George Washington University (GW) President Thomas LeBlanc; GW Vice President for Health Affairs, Walter A. Bloedorn Professor of Administrative Medicine, and Dean of the School of Medicine and Health Sciences (SMHS) Jeffrey S. Akman, MD; T.C. Williams High School Principal Peter Balas; and participating students on Oct. 5 for a ribbon cutting celebration for the new Governor's Health Sciences Academy at T.C. Williams High School. The academy gives high school students the opportunity to pick from seven health sciences career pathways (biomedical informatics, emergency medical services, medical laboratory sciences, nursing, pharmacy, sports medicine, and surgical technology) and earn up to 18 college credits from SMHS.

"It's important for every institution of higher learning to help develop the group of young people who will replace us one day," says Yolanda Haywood, MD, RESD '87, BS '81, senior associate dean for diversity and inclusion, associate dean for student affairs, and associate professor of emergency medicine at SMHS.

UPWARD BOUND

Although not all students seek health care careers, they all have the potential for success in whatever path they choose. Success that's supported through one of the oldest pipeline programs offered at SMHS: Upward Bound.

The program, based at SMHS for more than two decades and the only one housed within a university medical school, began with the passing of the Economic Opportunity Act of 1964.

Upward Bound serves D.C. public school students in Wards 5, 6, and 7, and parts of Ward 8, as well as those in neighboring Prince George's County, Maryland. It offers tutoring sessions, a Saturday academy during the school year, and a six-week summer immersion program. It provides an added layer of support for students as they prepare for and navigate through college. It helps students explore their interests across all careers and industries.

In addition to classes in English, mathematics, science, computers, and SAT preparation, Upward Bound students participate in college readiness workshops and travel to visit other universities. But the program also offers students a glimpse at the abundant variety within the academic world. When they graduate from GW's Upward Bound program, students have

learned to suture, toured basic science laboratories, and been paired with medical and health sciences student-mentors.

The program also gives students information about health issues that they can take home to their family and community, says Grace Henry, EdD '12, director of the SMHS Office of Diversity and Inclusion and adjunct assistant professor of medicine.

Inez Denton, a senior at Gwynn Park High School in Prince George's County and an Upward Bound participant, notes the importance of the support the program offers. "If you don't have a strong foundation at home, you come here and you have someone to talk you through college and things that are necessary for life."

DC HEALTH AND ACADEMIC PREP PROGRAM (DC HAPP)

The help of a mentor can go a long way toward making the unimaginable accessible, according to Aida Roman. A second-year MD student at SMHS, Roman moved to the United States from Peru when she was 16. She had to learn about different health care professions on her own, just as she had to work through the college application process without help. A mentor, she says, would have made it all easier. That is why she spent her summer with the DC HAPP program, to offer the guidance that might have made her own journey a little easier.

"I always feel compelled to give back, and this is my way to do that," she says.

The program, coordinated by the SMHS Office of Diversity and Inclusion, works to increase access to health careers and expand diversity in the medical field. It launched

in 2009 with funding for two years through a congressional grant administered through the U.S. Department of Education. Although it was successful, when the grant ended, so too did the program. In 2015, however, SMHS found the funds to bring it back. Since its return, 34 out of 35 DC HAPP alumni from the 2015 and 2016 cohorts have gone on to attend a two- or four-year college.

Participating high school students have the opportunity to spend time in the CLASS Center, where they get hands-on experience in a variety of areas, including intubation, drawing blood, and even assisting in a mock birthing process. They also earn CPR certification and learn about health care careers at organizations including the DC VA Medical Center, Children's National Health System (Children's National), and the Booz Allen Innovation Lab.

"The students don't necessarily know if becoming an MD is going to be the right fit for them, and we're able to expose them to a variety of careers in health care," says Jinny Jang, MA '17, assistant director of the Office of Diversity and Inclusion at SMHS.

GOVERNOR'S ACADEMY OF HEALTH SCIENCES

The Governor's Academy of Health Sciences at T.C. Williams High School, endorsed by the commonwealth of Virginia, opened its doors in the fall of 2018 for its inaugural class of 103 students who want to enter the health care field, no matter which path or profession they choose.

"We are excited to explore a diverse array of health care careers available to the academy students. By uncovering their individual strengths and interests, we can help them set clear educational goals and network with professionals in the respective field," says Reamer L. Bushardt, PharmD, PA-C, senior associate dean for health sciences at SMHS. "These students represent the future of our regional health care workforce, and GW is making a strategic investment in each one of them."

Academy students spend their first and second years learning about health sciences professions and medical terminology before choosing one of seven career pathways: surgery, nursing, biomedical informatics, sports medicine, emergency medicine, pharmacy, or medical laboratory sciences.



"The students are excited to have this opportunity," says Laura Evans, RN, MSN, an academy instructor who teaches courses in medical terminology and anatomy. "It's been rewarding to see how hard the students have been working already."

Through the academy, students have many options as they look to the future. They can earn certification to enter the health care workforce, matriculate into community college, or transfer to SMHS through a guaranteed admissions agreement. Students interested in the health sciences are eligible to apply for the academy, and they take typical high school classes, such as math, English, history, and a foreign language, alongside college-level science and health care courses.

GW SUMMER PROGRAM ADVANCING RESEARCH ON CANCER (GW-SPARC)

Armando Ruiz-Justiz, a sophomore at the University of Puerto Rico, says he knows many people who have suffered from cancer, and it is an area of care that he has been interested in pursuing for a long time.

After his summer as a participant in GW-SPARC, his path forward has more clarity. "This is going to open up my career opportunities in the future, including when I apply to an MD or MD/PhD program," he says.

Open to undergraduates who are underrepresented in the biomedical sciences, GW-SPARC exposes students to cutting-edge research and education on health care disparities.

Students perform research in GW Cancer Center laboratories focused on cancer immunology and immunotherapy, cancer biology, and cancer engineering and technology.

"Our goal is to support these students in their completion of a STEM bachelor's degree and support them in their goals for graduate work," says Alison Hall, PhD, associate dean for research workforce development at SMHS. Achieving that, she adds, will boost the diversity among the pool of students pursuing biomedical research PhDs.

"That's the intention of this program, and I hope graduates will join our PhD and MD programs. We hope to add programs like this at GW in the future to accomplish our goal of diversifying scientific research," she adds.

Ruiz-Justiz was his mentor during the program, Rohan Fernandes, PhD, assistant professor of medicine at SMHS, made him feel like a part of the team, and not just a student. Ruiz-Justiz spent the summer coding nanoparticles with a protein and then introducing them into tumor cells to try to get a response.

Just a few weeks into the experience, Ruiz-Justiz adds that the program exceeded his expectations. "It's more than a research program," he says. "We get to hear from other students' mentors, we get to participate in a book club, there are seminars we attend. There's so much going on."

MEDICAL LABORATORY SCIENCES SUMMER IMMERSION

With the prospect of a 16 percent growth in the field in the next six years, the medical laboratory sciences are an exceptional choice for students interested in a scientific career.

It's why leaders in the SMHS health sciences programs are eager to offer prospective students the chance to dip their toes in this area of study through the Medical Laboratory Sciences Summer Immersion.

The program immerses students in the laboratory skills and techniques essential for success in any scientific career path.

"Every day they are doing various lab techniques focused on disease and disease diagnosis," says Marcia Firmani, PhD, interim chair of the Department of Biomedical Laboratory Sciences, director of the Medical Laboratory Sciences blended and graduate programs, and assistant professor of biomedical laboratory sciences. "They also get a group study project that they work on throughout the week, and on the last day of the program they present on the disease."

Every summer there are about 48 students per section, with one section running in June and one in July, says Firmani. The program is open to high school students and local community college students.

"These students are very interested in medicine and health sciences," Firmani says. "We are trying to attract more students to come to GW and get their bachelor's degree in medical laboratory sciences."

MENTORED EXPERIENCE TO EXPAND OPPORTUNITIES IN RESEARCH (METEOR)

Physicians who also work as researchers can bring vital viewpoints to the medical workforce. They are a crucial part of health care, but they are also an underrepresented one.

The METEOR program offers incoming SMHS MD program students from underrepresented backgrounds a summer research experience, with the goal of sparking an interest in medical research early in their training. Students pursue a six-week pre-matriculation summer research internship with SMHS mentors to guide them along the way.

This past summer, clinical partner Children's National also launched a version of METEOR geared toward underrepresented high school students. Students take part in weekly team meetings with their mentorship teams, have shadowing opportunities, and attend a summer student lecture series.

"Through this experiential mentored research experience, augmented with an inquiry-based curriculum, college preparation, and other experiences, we hope to stimulate students to pursue careers in the biomedical sciences," says Rachel Smilow, program lead for the Center for Translational Science at Children's National. ■



FILLING THE GAPS IN ACADEMIC MEDICINE

BY KATHERINE DVORAK

This year, for the first time, the George Washington University (GW) School of Medicine and Health Sciences (SMHS) hosted the Building the Next Generation of Academic Physicians (BNGAP) Academic Medicine Regional Conference, collaborating with institutions including Georgetown University, Howard University, Children's National Health System, and the University of Maryland.

Geared toward those traditionally underrepresented in academic medicine, the conference aimed to encourage attendees to consider academic medicine as a career option and offered them resources to further explore that career, according to Chavon Onumah, MD, MPH, assistant professor of medicine at SMHS.

Onumah organized the event, which was held Sept. 21-22, with support from the SMHS Office of Diversity and Inclusion and the SMHS Department of Medicine.

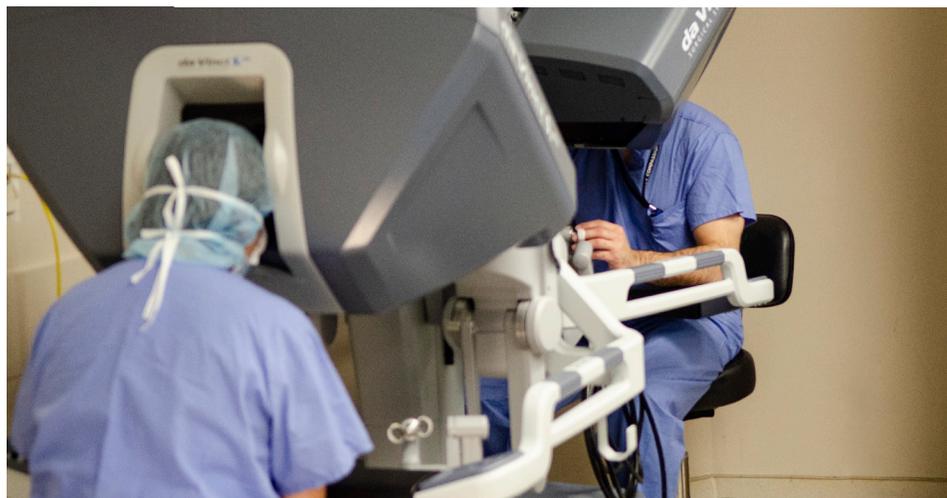
GW hosted dozens of students, fellows, and residents on the Foggy Bottom Campus, where they participated in sessions offering information on career opportunities in academic medicine, educational and research scholarship, and finding an academic residency, as well as a lunch hour panel discussion and a "speed mentoring" session.

"Early on in my career, I didn't get the experience this program offers. I have had to pave my way as time has gone on," Onumah says. "So for these students or residents, this will help them prepare for an academic medical career and other roles. You don't always know what your career might look like, but knowing the options and how to best prepare yourself early on is so valuable." ■

The Masters of Machines and Minimalism



BY CAROLINE TRENT-GURBUZ





The robots, multilimbed and wielding nimble metal fingers, are intricate and imposing. One, the intuitive da Vinci robot, towers over the surgical table, its four hands ready to twist and tilt. The other, the more petite and pliable Medrobotics Flex robot, is capable of navigating to places in the body previously unreachable by the human hand. Both are the new standard of care, and yet each is subject to surgeons, the masters at the controls.

“Robotics are a tool ... that if used right, could augment the ability of surgeons to perform more complex surgery,” explains Gaby Moawad, MD, RESD ’11, associate professor of obstetrics and gynecology at the George Washington University (GW) School of Medicine and Health Sciences (SMHS). “[It] is like you have a calculator. There are lots of people who can do math really quickly, but using the calculator would enhance your ability to do calculus quicker. That’s robotic surgery.”

At GW Hospital, robotic surgery and its partner, minimally invasive surgery, are enabling the institution to swiftly move ahead of trend: The hospital has performed 3,000 robotic surgeries, the most in the region, and it was the first to have the Medrobotics Flex robot and use it for colorectal surgeries.

Robot vs. Robot

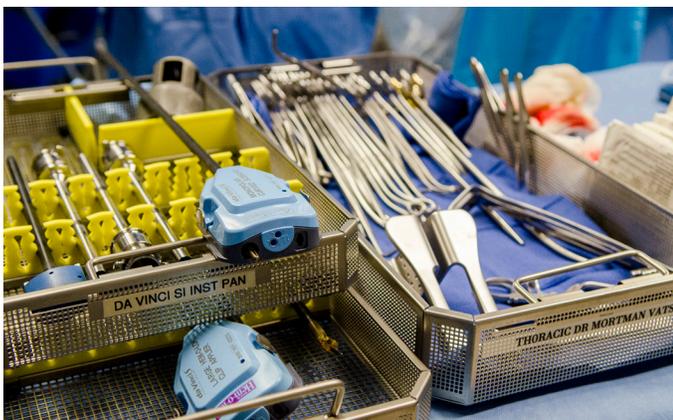
Although it’s easy to become enamored with the idea of robots, Vincent Obias, MD, chief of the Division of Colon and Rectal Surgery and associate professor of surgery at SMHS, is quick to point out that they are merely an extension of the surgeon. The da Vinci robot, the go-to for abdominal, colorectal, thoracic, and gynecologic surgeries, requires the surgeon to sit in a console and control each of the four arms using fingers, hands, and feet.

Take an abdominal surgery: First, Obias makes a small incision to insufflate, or distend, the abdomen so there’s space to work; then, he makes additional small incisions to put in place the trocars, or sharp-tipped pins with a hollow tube and a seal through which instruments are inserted; once those are secure and the patient is in position, Obias docks the robot.

“We can [then] break scrub and walk a few feet away to where the console is, [where we] control the robot,” he says.

There, Obias has the advantage of 3D stereoscopic vision, which allows for better visualization, and each arm has tremor control, ensuring improved precision, critical for surgeries in





which millimeters matter and meticulousness is paramount.

The robot also boasts what thoracic surgeon Keith Mortman, MD, associate professor of surgery at SMHS, calls “seven degrees of freedom.”

“We can essentially rotate 360 [degrees]; I haven’t figured out a way to actually rotate my wrist 360 degrees,” he says. “So the robotic instruments can move in ways that the human wrist can’t, and when you’re working in a very tight space, that’s really where the utility of the robot comes into play.”

And when it comes to tight spaces, the Medrobotics Flex robot, commonly used for head and neck and colorectal surgeries, is in its element.

“Instead of having a rigid camera that we place through the mouth, it’s a flexible camera that allows us to get into different areas that we wouldn’t have been able to before,” says Arjun Joshi, MD, associate professor of surgery.

Because of that improved access, Joshi, a head and neck surgeon, can better treat certain diseases. Previously, while removing tumors on the tonsils or at the base of the tongue, he would have to split the jaw. He also is now better able to treat certain types of cancer, as the robot makes access to hard-to-reach tumors easier.

Practice Makes Perfect

As with most other tools, however, using the robot requires training and practice. Most secondary training includes a fellowship, simulations, cadaver dissections, and proctored cases until surgeons are credentialed to perform robotic surgeries solo.

Once a surgeon has mastered the robots, it’s essential, Moawad says, to keep training and maintaining skills.

“If you ran a marathon last year, you can’t just sign up and say, ‘Tomorrow I’m running a marathon because I ran it last year.’ You need to train for it,” he says. “So training is very important, and the maintenance of skills is very important. If you don’t do it very frequently, you’re not going to be as efficient; you’re not going to maintain your mastership level that you acquired during training.”

It’s the Little Incisions That Count

Although many surgeons subscribe to the wonders of robotic techniques — including the youngest generation just entering the field — minimally invasive surgery (MIS) is equally important in the world of advanced surgical methods.

Minimally invasive surgery is the parent of robotic surgery, or, as Obias explains, “robotics is minimally invasive surgery, but not all minimally invasive surgery is robotics.” In other words, depending on the procedure and the surgeon’s assessment, minimally invasive procedures performed by hand could be better or more appropriate than those done using the robot.

“MIS, or minimally invasive approaches for any kind of surgery, is now mainstream,” says Khashayar Vaziri, MD, associate professor of surgery at SMHS. “The more complex operations still take some more advanced training, but the majority of routine operations performed in any field, whether it’s general surgery, vascular surgery, thoracic surgery, [or] colorectal surgery ... are almost all being performed in a minimally invasive fashion.”

At GW Hospital, he adds, the majority of complex operations, such as gastrectomies for cancer, complex hernia repairs, and bariatric surgeries, are done minimally invasively. The field itself is also witness to advancements, in addition to robots. “Now we also have advanced tools, advanced sealing devices, advanced staplers,” Vaziri says. “All of these advances in surgical instruments and visualization are geared toward the minimally invasive realm.”

What’s key to MIS as a whole, including robotic surgery, is minimizing the need for large incisions. In thoracic surgery, for example, incisions in the chest are more painful than elsewhere on the body because the chest wall has more nerve fibers.

“So we know that the small incisions hurt less, and there’s plenty of data now that show the amount of [pain medication] patients need afterward is less, both subjectively and objectively,” Mortman says.

Additionally, with chest surgeries, smaller incisions heal faster, which means surgeons can remove drainage tubes faster, and hospital stays are therefore shorter — and that’s where the true value of minimally invasive procedures lies: with the patient.

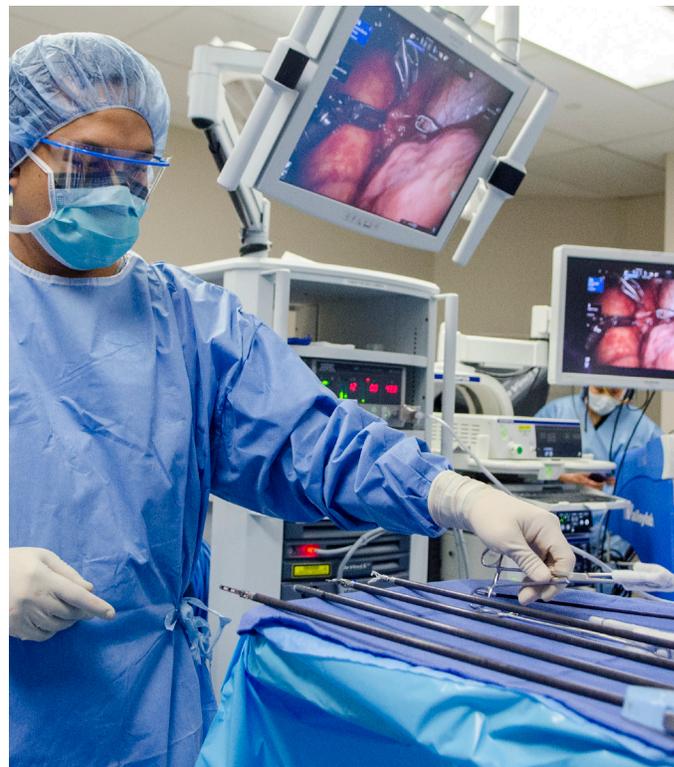
“Being able to [perform surgery] through the little incisions with these advanced technologies is better for the patient because many times, the visualization is better for the surgeon,” Vaziri explains. “The patients will have less pain, they’ll be hospitalized for a shorter period of time, their overall recovery will be shorter, and their return to a normal life and work will be faster without compromising the integrity of the operation.”

No one, he adds, wants to have an operation, so the less traumatic the physicians can make surgical intervention, the better.

What Lies Ahead

As minimally invasive and robotic surgeries become the method of choice for most surgeons, particularly those at GW Hospital, the question remains: What will these techniques look like in the future?

Right now, the da Vinci robot and the Medrobotics Flex robot are the most readily available tools on the market. But the field is rapidly expanding as new companies enter



the robot market, such as Google and Johnson & Johnson. Enhanced visualization is also a new target for surgeons. GW Hospital, for example, is currently home to Precision VR, a 3D virtual reality tool primarily used by neurosurgeons to plan surgical pathways with patients’ specific pathologies. Mortman, however, has incorporated the technology into thoracic surgeries, which has inspired potential new visual tools.

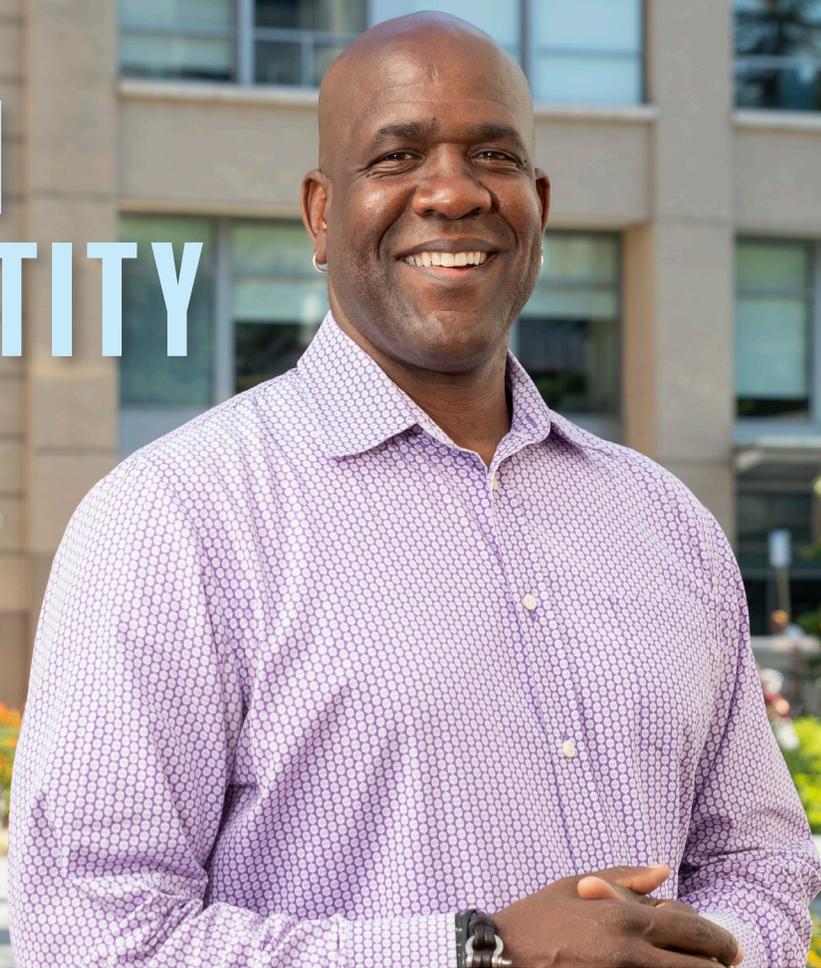
“Is there a way to [take] the virtual reality images that we use and then overlay them with the robotic cases?” Mortman asks. “Can we actually pull up the VR images into the robot, so if there’s a question, as we’re actually doing the operation with the robot, about the anatomy — how big is the mass, what’s the relationship with the mass to this major blood vessel — can we overlay the virtual reality images to help us out in real time?”

It’s an idea that has also occurred to Moawad, who is developing a way to include augmented reality in his surgeries. He asks, “For example, what is the length of incision that you need to do? How deep should you go to find the pathology? What are the margins of excisions that are safer? That’s the role of augmented reality and artificial intelligence, to make surgery simplified.”

Regardless of method, it’s clear that robotic and minimally invasive surgeries aren’t just the future; they’re also the present — and they inspire passion in the surgeons who perform them.

“I love it,” says Obias. “I love being on the cutting edge.” ■

A SEARCH FOR IDENTITY



BY KATHERINE DVORAK

Assistant professor. Researcher. Author. These are just some of Robert Turner's current roles. But that wasn't always the case.

He once viewed himself as only one thing: a professional football player.

"I adopted that role, and it shaped ... how I saw myself and how others saw me," says Robert Turner, PhD, assistant professor of clinical research and leadership at the George Washington University (GW) School of Medicine and Health Sciences (SMHS).

One day, however, that identity evaporated. Turner was in his late 20s when the general manager of the San Francisco 49ers called him into his office and told him he had been cut from the team. His professional sports career was over. The GM followed the news with a question, "Where do you want to go now?"

Turner didn't have an answer. "Every part of my life was planned out to continue doing what I was doing. All of a sudden, in one moment, the ceiling came crashing down," he says.

There was one thing Turner did know, if not in that exact moment: the importance of advancing his education. He decided to study sociology, and he earned his PhD from the Graduate Center, City University of New York, in 2010.

Today, Turner sits in his office at 2100 Pennsylvania Ave., the recipient of a prestigious National Institutes of Health (NIH) K01 grant, and confident in his new direction.

It's his experiences as an athlete, Turner says, that fuel his work at SMHS. The key goal of his grant, from the NIH's National Institute on Aging, is to better understand the neurocognitive and psychosocial risks presented to individuals who have experienced traumatic brain injury, compared with those who have not. He is measuring athletes' cognitive function and how it may change over time, and coupling those data with their personal attitudes and beliefs about health and mental health.

Turner says he also hopes to replicate the study with veterans to see if the pathology of brain injuries is different in that population compared with athletes, as well as to better understand how people's social networks affect their attitudes toward medicine and mental health.

When Turner was 28, he suddenly faced an unclear future for the first time. But today, he has his sights set on new opportunities. He published his first book, "Not for Long: The Life and Career of the NFL Athlete." He is building his own research team at GW. And he's helping athletes navigate a world that doesn't always have a place for them once the final whistle blows. ■

FACULTY NEWS



Robert H. Miller Named Vice President for Research

Robert H. Miller, PhD, senior associate dean for research, Vivian Gill Distinguished Research Professor, and professor of anatomy and cell biology at the George Washington University School of Medicine and Health Sciences (SMHS), has been named the university's new vice president for research.

"Bob's outstanding track record as both a researcher and a leader of the academic research enterprise made him the ideal candidate for the vice president position," said Provost and Executive Vice President for Academic Affairs Forrest Maltzman.

Miller will retain his position as the senior associate dean for research at SMHS, a position in which he has overseen an unprecedented increase in the school's research profile, growth facilitated by outstanding faculty hires whom Miller helped to recruit, and by ensuring the school's faculty have the support to focus on its research.

"Bob Miller is a great choice to serve as the university's new vice president for research. He has been an amazing partner in the development and execution of a vision to enhance the research mission in SMHS while also working collaboratively with faculty and deans across the university," said Jeffrey S. Akman, MD '81, RESD '85, vice president for health affairs, Walter A. Bloedorn Professor of Administrative Medicine, and dean of SMHS. ■

Mary Ann Stepp

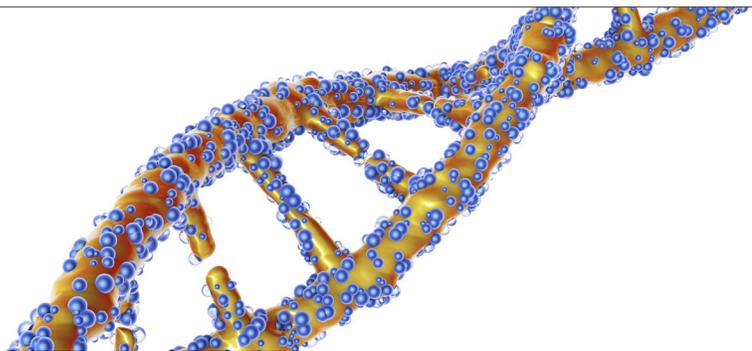
Each year, the International Ocular Surface Society invites a noted researcher in the field of ocular surface disease to deliver the Keynote Award Lecture at its annual meeting. This year, the honor went to Mary Ann Stepp, PhD, professor of anatomy and cell biology and of ophthalmology at the George Washington University School of Medicine and Health Sciences.

Stepp's lecture, "Intraepithelial Corneal Nerves and Dry Eye: Too Many, Too Few, or Too Depolarized?," focused on the relationship between intraepithelial corneal nerves and sensory axons in the eye when it comes to dry



eye, allergies, and aging, and how the ocular surface community will play a role in leading efforts in research.

The International Ocular Surface Society met in Hawaii this year to discuss how to address new knowledge and skills for treating ocular surface disorders and to promote networking among participants. ■



Chiappinelli Awarded Grant to Improve Identification of Novel Cancer Therapeutic Targets

George Washington University (GW) Cancer Center researcher Katherine Chiappinelli, PhD, was awarded a prestigious grant from the G. Harold and Leila Y. Mathers Foundation.

The research project, "Epigenetic Modification and Expression of Retroelements in Cancer Development," is funded by a two-year, \$300,000 grant.

Chiappinelli, an assistant professor of microbiology, immunology, and tropical medicine at the GW School of Medicine and Health Sciences, through the project, will define epigenetic

determinants of repetitive elements' ("junk DNA") control during tumor progression and lay the groundwork for understanding interactions between these elements and the host immune system.

The G. Harold and Leila Y. Mathers Charitable Foundation's mission is to advance knowledge in the life sciences by sponsoring scientific research and applying learnings and discoveries to benefit humankind. The award includes a subcontract with Kathleen Helen Burns, MD, PhD, professor of pathology at Johns Hopkins Medicine. ■

Moving into the Lead

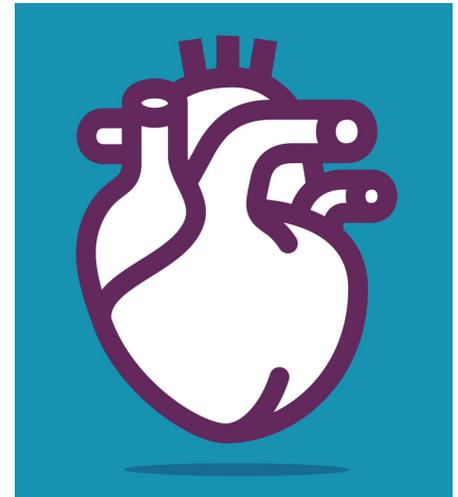
The George Washington University (GW) School of Medicine and Health Sciences (SMHS) is pleased to announce three new interim leaders at the school.

Jeffrey Berger, MD, MBA, now serves as the interim chair of the Department of Anesthesiology and Critical Care Medicine. In this role, Berger leads a department of more than 75 board-certified anesthesiologists, critical care intensivists, and pain medicine physicians in addition to more than 50 advanced practice providers, residents, and fellows. Berger previously led graduate medical education at SMHS.

Michael I. Bukrinsky, MD, PhD, has been appointed interim chair of the Department of Microbiology, Immunology, and Tropical Medicine. In this role, he leads the department as it conducts innovative, fundamental, basic, and translational research on HIV/AIDS and neglected tropical diseases.

Harold A. Frazier II, MD, was named interim associate dean for graduate medical education at SMHS. In this position, Frazier oversees the training of all residents and fellows at the school and participating institutions, such as GW Hospital, the GW Medical Faculty Associates, and Children's National Health System. ■

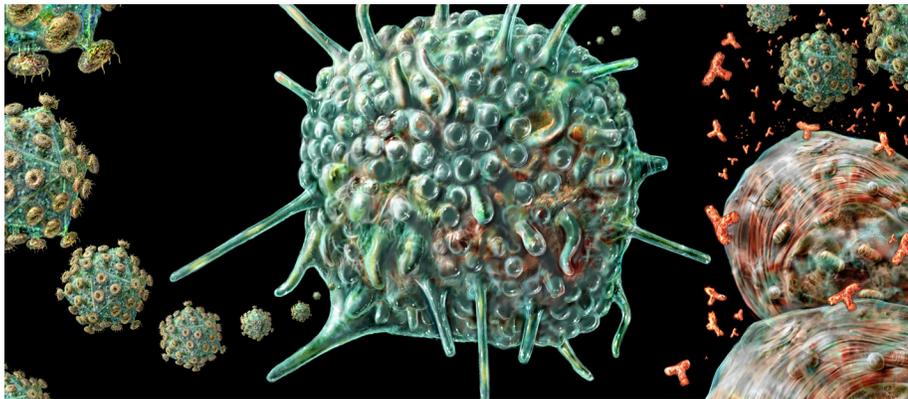
Empowering Patients with the Right Kind of Knowledge



William Borden, MD, associate professor of medicine and health policy at the George Washington University (GW) School of Medicine and Health Sciences, published commentary in the journal *JAMA Cardiology* to accompany a study on the public reporting of percutaneous coronary intervention (PCI) outcomes.

The study found that reporting of PCI outcomes was largely irrelevant and inaccessible to patients. It also did not impact physician decision making, failing in its main objectives. However, Borden believes PCI outcome reports, as well as other medical information, can be improved by focusing on the decisions patients make as a result of the data being provided.

"Perhaps the best approach moving forward is to combine data that focuses on procedural outcomes, as well as holistic disease outcomes. As a patient, I care about the results of a procedure, and even more, I care about the outcomes of my entire course of treatment," said Borden, who is also chief quality and population health officer at the GW Medical Faculty Associates. ■



GW Serves as Site for HIV Vaccine Trial

The George Washington University (GW) School of Medicine and Health Sciences (SMHS) is one of only two sites chosen for the first clinical trial of the eOD-GT8 60mer HIV vaccine candidate, sponsored by the International AIDS Vaccine Initiative (IAVI).

David Diemert, MD, associate professor of medicine at SMHS, will serve as the principal investigator for the site and Jeffrey Bethony, PhD, professor of microbiology, immunology, and tropical medicine at SMHS, will direct specimen processing and biorepository efforts for the trial at GW.

The HIV vaccine candidate was

developed with support from the Bill and Melinda Gates Foundation, the Center for HIV/AIDS Vaccine Immunology and Immunogen Discovery, and Scripps Research. It is intended to stimulate the immune system to initiate a key first step in the generation of potent proteins, known as broadly neutralizing antibodies (bNAbs), against HIV.

"Evidence has shown that bNAbs are likely the most promising way to protect against HIV infection," said Diemert. "They have been shown to effectively neutralize many diverse strains of the virus in the laboratory." ■



Distinguished Teachers

Two top-notch George Washington University School of Medicine and Health Sciences (SMHS) teachers – Scott Cohen, MD, associate professor of medicine, and Aviva Ellenstein, MD, PhD, assistant professor of neurology – received this year’s prestigious

Distinguished Teacher Award, given annually to MD program faculty members who exhibit exceptional ability in education.

The winners are determined by nominations from the faculty and selection by past recipients, who are members of the Society of Distinguished Teachers.

Cohen, according to Alan Wasserman, MD, chair of the Department of Medicine and Eugene Meyer Professor of Medicine at SMHS, is a “star” in nephrology, a teacher who not only imparts knowledge in an innovative way, but also makes the kidney interesting.

Terry Kind, MD, MPH, assistant dean of clinical education and associate professor of pediatrics at SMHS, spoke of Ellenstein’s unique approach to complex material. She employs physical demonstrations and singing, techniques that delight her students, added Henry Kaminski, MD, chair of the Department of Neurology and Meta Amalia Neumann Professor of Neurology at SMHS. ■

Tamsulosin Not Effective in Kidney Stone Passage

The latest research into finding medications to aid the passage of ureteral or kidney stones has shown that tamsulosin is not effective for patients. Previously approved to help men experiencing an enlarged prostate, tamsulosin is an Alpha-1 blocker that, in small studies, had been found to be a promising aid in passing kidney stones.

A recent multicenter clinical trial funded by the National Institute for Diabetes and Digestive and Kidney Diseases revealed no significant support for the use of tamsulosin for kidney stones. The study, conducted by Andrew Meltzer, MD, associate professor of emergency medicine at the George Washington University (GW) School of Medicine and Health Sciences (SMHS), and Patrick Mufarrij, MD, assistant professor of urology at SMHS, was published in JAMA Internal Medicine. It found no significant effect of patient-reported passage or capture of the stone. ■

DC CFAR Pilot Award Supports Study Charting Endothelial Health

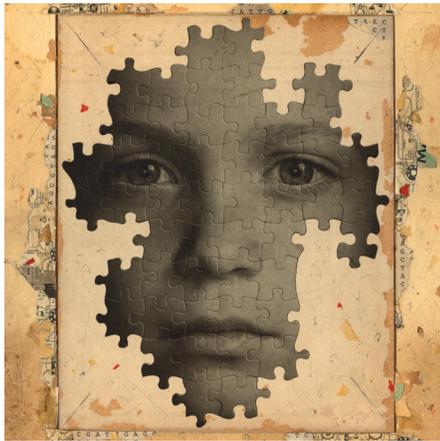
Sabyasachi Sen, MD, PhD, associate professor of medicine at the George Washington University School of Medicine and Health Sciences, recently received a 2018 DC Center for AIDS Research Pilot Award for his study titled “What Is the Impact of Current HIV Medication Regimens on Endothelial Dysfunction?”

Sen will examine blood-derived cells called endothelial progenitor cells as a way to study endothelium, the innermost lining of blood vessels that controls blood pressure. High blood pressure is associated with many serious health issues such as heart and

kidney disease. The study will look at whether the presence of newer classes of HIV medication, such as integrase inhibitors and entry inhibitors, improves endothelial cell health more than older classes of medications.

The Pilot Awards Program is a competitive program that provides pilot funds to HIV/AIDS investigators to assist them in the development of their NIH-funded research careers. This program is designed to encourage novel research by early-stage investigators and established investigators in other fields who wish to transition into HIV/AIDS research. ■





Examining Molecular Mechanisms of Male Bias in Autism

Neurodevelopmental disorders, such as autism spectrum disorder and intellectual disability, are more prevalent in males than females. However, the underlying molecular mechanisms of why this difference occurs are a mystery.

Chiara Manzini, PhD, assistant professor of pharmacology and physiology at the George Washington

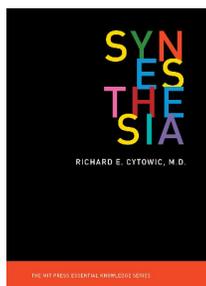
University (GW) School of Medicine and Health Sciences and the GW Institute for Neuroscience, is leading a study into what makes males more susceptible to autism and intellectual disability with the help of a grant in excess of \$2 million from the National Institute of Neurological Disorders and Stroke at the National Institutes of Health.

Manzini and other researchers at GW will study the CC2D1A gene and its role in the development of autism in males versus females. ■

Bookshelves

Katherine Chretien, MD, associate dean for student affairs and professor of medicine, George Washington University (GW) School of Medicine and Health Sciences (SMHS), edited "Mothers in Medicine: Career, Practice, and Life Lessons Learned," (Springer, 2018).

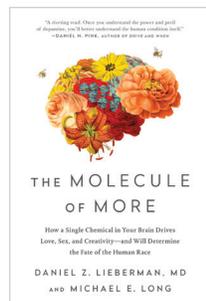
Walter Crinnion, ND, adjunct faculty GW SMHS, co-authored Clinical Environmental Medicine, (Elsevier, 2018). Along with co-author Joseph Pizzorno, Crinnion discusses the identification and natural treatment of diseases caused by common pollutants.



Richard E. Cytowic, MD, RESD '81, clinical professor of neurology at SMHS, recently published Synesthesia, (MIT Press 2018), a

concise primer on the neurological trait that involuntarily couples senses in otherwise normal individuals, linking voices or music with vision, or connecting taste with the sensation of physical touch. Colored hearing and alphabets are common expressions of the trait.

Daniel Z. Lieberman, MD, professor of psychiatry and behavioral sciences at SMHS, and Michael E.



Long, a lecturer at Georgetown University, published "The Molecule of More: How a Single Molecule in Your Brain Drives Love, Sex, and Creativity

– and will Determine the Fate of the Human Race," (BenBella Books, 2018). The book offers an explanation for variety of behaviors previously thought to be unrelated, such as why winners cheat, why geniuses often suffer with mental illness, why nearly all diets fail, and why the brains of liberals and conservatives truly are different.

SMHS faculty members **Henry J. Kaminski, MD**, chair of the Department of Neurology and Meta Amalia Neumann Professor of Neurology, and **Linda Kusner, PhD**, associate professor of pharmacology and physiology, co-edited the third edition of Myasthenia Gravis and Related Disorders, (Spring International, 2018). The book addresses clinical presentation of muscle-specific receptor tyrosine kinase related myasthenia gravis and identification of potential new antigens. Kaminski and Kusner also teamed up as author and illustrator of "The Planet of Magical Food,"

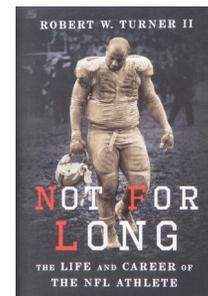


a children's book that follows a glazed donut, a refined pizza, and a chubby pastrami sandwich across two continents as they work together to fulfill the final

wishes of a woman separated from her love by war and time.

Anton Sidawy, MD, MPH, FACS, Lewis B. Saltz Professor and Chair of the Department of Surgery at SMHS, served as editor of, Rutherford's Vascular Surgery and Endovascular Therapy, 9th Edition, (Elsevier, 2018). The book has become the definitive text for information about the diagnosis and treatment of circulatory disease. The ninth edition features 40 new chapters in a shorter, more focused format with a summary for each chapter that provides quick access to key information.

Robert Turner, PhD, assistant professor of clinical research and leadership at SMHS, published "Not for Long: The Life and Career of the NFL Athlete." ■



Sullivan's Travels in Emergency Care

BY KATHERINE DVORAK

As an EMT in college, Natalie Sullivan, MD, would rush her patients through the outer doors of the ambulance bay and into the bright lights of the emergency room, but from there she could go no further. Each time, her desire to stay with the patient was strong — she couldn't shake the urge to play a greater role in their care.

Now, Sullivan waits on the other side of those doors, ready to care for any patient who comes into the emergency room at the George Washington University (GW) Hospital.

"I was always wondering about the next step, and I always wanted to be a part of the patients' continuing care ... to help see them through," says Sullivan, an emergency medicine resident at the GW School of Medicine and Health Sciences.

Sullivan says her experience at GW so far has been both humbling and exciting. Finding a diagnosis and bonding with patients and their families during a difficult time is very rewarding, she says.

But often there are struggles, too. "Sometimes it's a really difficult case, but it's also a very formative experience and helps you become a better doctor," she says.

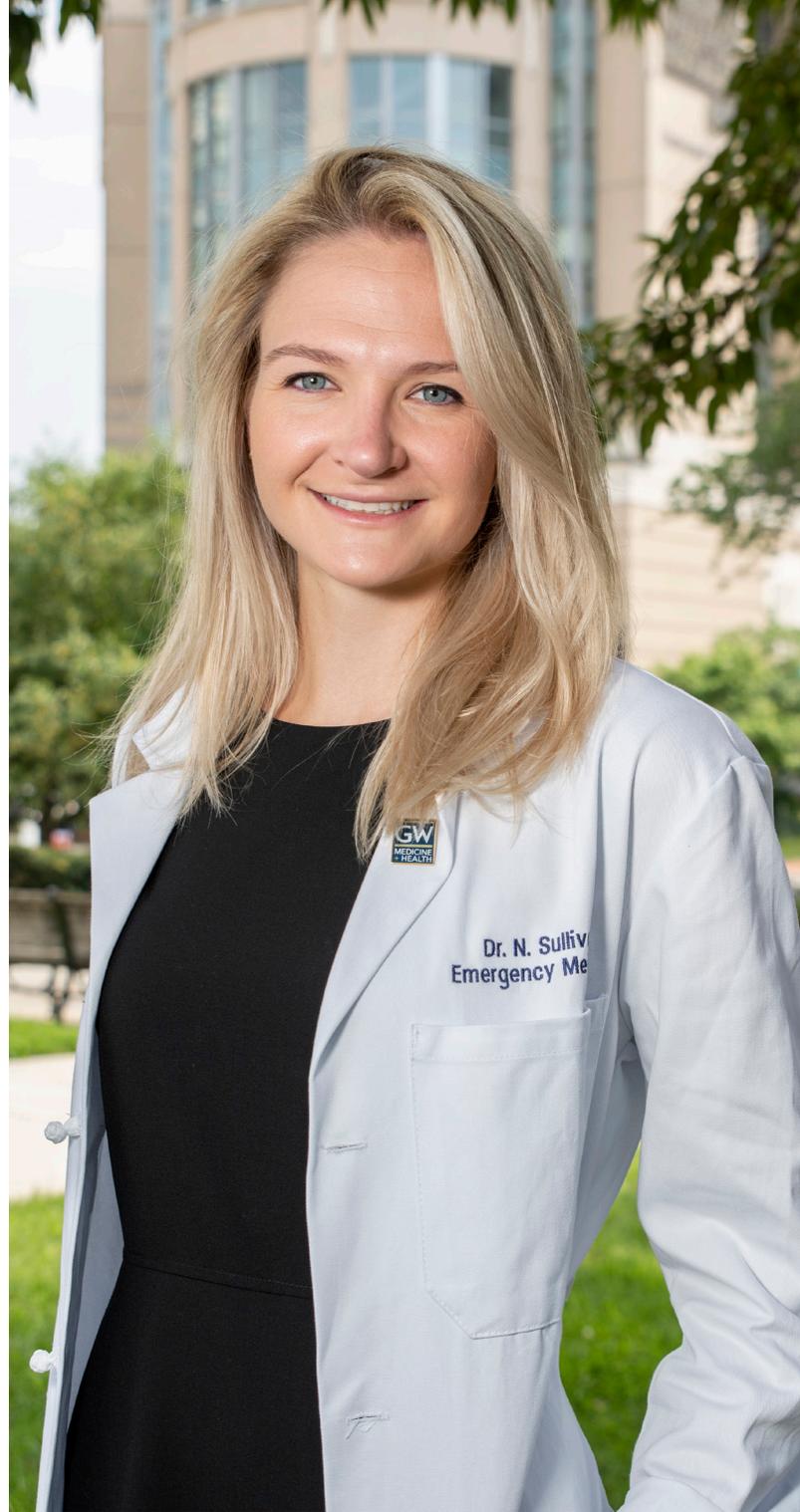
The Massachusetts native names her mother, a nurse practitioner, as an influence on her career path.

"Like many doctors, from a young age I knew I was interested in medicine," she says. "And because I had that interest young, I started seeking different experiences that had to do with medical care."

Those experiences included early involvement with emergency care. In addition to volunteering as an EMT in college, Sullivan took a year off between her undergraduate degree and medical school at Tufts University to work as an emergency department technician.

Even when she's not in scrubs, Sullivan is still working, serving as a co-medical director for the GW Emergency Medical Response Group (EMeRG), a student-run and student-operated volunteer EMS agency on the Foggy Bottom Campus.

"It's something I'm really passionate about. EMeRG is a group of young people who are enthusiastic about medicine. I really enjoy working with a group that's so committed to what they're doing and ... it's so much fun to show up and do whatever they need me to do," she says.



That dedication to the field has been noticed by the SMHS Department of Emergency Medicine, whose faculty awarded Sullivan the "Intern of the Year" award over the summer. When asked about the award, she remains modest, praising her "outstanding and hardworking" fellow interns and showing appreciation for the guidance she receives from the faculty.

"I really appreciate their support," Sullivan says. "It's motivated me to keep working hard and to live up to the expectations they have." ■



THE SHARP FOCUS OF MOHAMMAD ALI AZIZ-SULTAN

BY THOMAS KOHOUT | PHOTOGRAPHS COURTESY OF BRIGHAM AND WOMEN'S HOSPITAL AND MOHAMMAD ALI AZIZ-SULTAN, MD '99

The family photo, faded and slightly worn, tells a story. The muted tones recall a sunny day in Kabul, before the family fled the Soviet invasion of Afghanistan. Leaving everything behind — money, possessions, privilege, and professions — the family escaped with 10 others in the back of a pickup truck. Dour faces stare into the camera, all except that of one boy, who smiles broadly without a hint of anxiety, as only a 6-year-old can.

“I’m the one with the goofy smile,” laughs Mohammad Ali Aziz-Sultan, MD '99, who is now a lifetime away from the boy with the sunny disposition who stood in the Afghan capital as his homeland slid into decades of chaos and war. “I guess I thought it was some sort of game we were playing.” But it wasn’t a game.

The weeklong journey over rough and dusty roads into Pakistan ultimately would lead the family beyond borders, across continents, and over oceans. For Aziz-Sultan, the odyssey would lead to unimaginable success as a renowned neurosurgeon trained in both cerebrovascular and endovascular surgery and gifted in the high-stakes game of aneurysm repair and stroke care.

Aziz-Sultan is the Chief of Vascular/Endovascular Neurosurgery at Brigham and Women’s Hospital and an Associate Professor of Neurosurgery at Harvard Medical School. He is also the director of the microsurgical laboratory, and the co-director of the Comprehensive Stroke Center at

Brigham and Women’s Hospital. Those academic credentials flow directly from his George Washington University (GW) School of Medicine and Health Sciences (SMHS) medical degree. Arriving at this point, however, was a journey, not a jaunt. The memory of each roadblock or detour along the way serves to guide Aziz-Sultan back to his earliest desires for a life of medicine and healing.

Led by his parents, who abandoned prominent careers as MD/PhD OB/GYNs, the family endured a succession of moves after fleeing to Pakistan. Aziz-Sultan; his older brother, Ajmal; and their parents traveled to Germany, where they lived in a cramped apartment. From there, a former colleague of Aziz-Sultan’s parents, John Haswell, MD, whom they had met years earlier at a medical conference, tracked the family down and sponsored them to come to the United States. They landed in Vincennes, Indiana, a rural farming community in the southwestern part of the state.

It was a small, close-knit community when Aziz-Sultan arrived in the early 1980s, and, he jokes, the area was light on diversity. “There was one African-American family and zero foreign families when we arrived,” Aziz-Sultan recalls. He adds that a family of central Asian refugees was a novelty, but the community was extraordinarily welcoming. “This three-to four-year period of my life ... it was the most loving place. I never saw anything but love, appreciation, and support.”

When the family moved again, this time to Alexandria,

Virginia, where employment opportunities were greater, Aziz-Sultan fell easily into the common pitfalls of suburban America. With his parents away from home for long hours working multiple jobs, he spent much of his free time “hanging out.”

That lack of direction, and underwhelming undergraduate grades, stalled his medical school admissions efforts. Aziz-Sultan found himself on GW’s waiting list, wondering if his dream of being a doctor was over.

He had one particularly poor semester. “I carried those grades with me in my back pocket,” he recalls. “I literally folded up that report card and carried it in my wallet. Any time that I thought about doing something that wasn’t focused on my final goal, I would reference it, as a reminder of the consequences of losing focus.”

What he needed was a window of opportunity, and it came in the form of an understanding admissions officer who chose to take Aziz-Sultan at his word. The SMHS dean of admissions at the time was John F. “Skip” Williams Jr., MD ’79, RESD ’83, MPH. “He took a chance on me,” recalls Aziz-Sultan. “I ... told him that given the opportunity, I would not let him down.”

Impressed by his determination, Williams plucked the young Aziz-Sultan off the waiting list, opening the way to medical school.

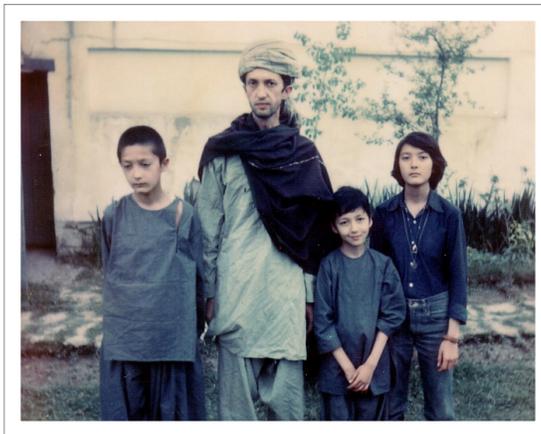
Once on campus, Aziz-Sultan began to reinvent himself. He loved medicine and being immersed in a community of talented, supportive students and faculty. He recalls rotating through different clinical settings and witnessing patients battling serious illnesses. “It wakes you up. You see yourself,” he says. He also realized that, by committing himself to medicine, he was committing himself to providing that same level of compassion and empathy he once received as a child refugee. “Suddenly, it’s more than grades. It’s more than school. It’s literally like falling in love. You become infatuated and develop a sort of tunnel vision,” he says. “The heart is there, the mind is there, the purpose is there. It draws you in deeper and deeper.”

Given a second chance, Aziz-Sultan set his sights on the top. For him, that meant neurosurgery. He dedicated his time in medical school to achieving that goal. Postgraduate work featured a neurosurgical residency at the University of Miami, with endovascular fellowships in radiology and neurologic surgery, and a fellowship in skull-based and cerebrovascular surgery at the Barrow Neurological Institute in Arizona.

At that time, microsurgery was in its heyday. The specialty was revolutionized in the late 1960s with the invention of the

surgical microscope, offering neurosurgeons a small window into the brain. Peering into a microscope, neurosurgeons could travel down the fissures between the lobes of the brain to find the affected vessels, where they could place a tiny clip over an aneurysm, a little bubble that forms on the vessels of the brain.

“[Surgically repairing aneurysms] took me seven years to learn,” Aziz-Sultan says. While he was honing those skills, the fields of radiology and endovascular surgery began to emerge. “People were starting to make real gains in the field in the mid-2000s ... taking catheters through the femoral artery, just like the cardiologists.”



Guiding catheters into the brain, physicians could seek out aneurysms and place tiny coils in the vessel to stabilize the area. These new procedures enabled surgeons to do in an hour or two what once took 15 hours to accomplish. Every new technique or piece of equipment, however, encroached a little further on the microsurgical domain. As the endovascular field blossomed, a turf war erupted, pitting microsurgeons against endovascular surgeons, clips

versus coils. Aziz-Sultan, seven years into his training, decided that rather than join the microsurgical resistance and fight the endovascular revolution, he would instead study it.

“What do you do?” he asks. “Are you all this field or all that field? Or are you somebody who takes new ideas from different places and tries to incorporate them and come up with something even better? Innovation has to do with bringing together different thought processes. It has to do with diversity, diversity of background, diversity of gender, diversity of thought, diversity of everything.”

At Brigham and Women’s Hospital, Aziz-Sultan and his team paired tactics and techniques from radiology and neurosurgery with those of endovascular surgery to create an innovative, one-stop shop for stroke and aneurysm repair. “We created a hybrid operating room where we can operate through a microscope and use biplane angiography at the same time, and [tackle] unique cases that weren’t possible before,” he says.

“Innovation has nothing to do with holding on to what you have, and putting up walls because you’re a neurosurgeon and a radiologist is coming to take your job,” insists Aziz-Sultan. “It has to do with opening your mind and being malleable. That’s the most important thing that I’ve learned so far, and it’s the key to what has let me thrive in my specialty. I learned these principles by my life circumstances, as a refugee kid from Afghanistan.” ■

IT TAKES TWO: SMHS ALUMNUS “MEMO” SANCHEZ PAIRS MEDICINE WITH CREATIVITY

BY CAROLINE TRENT-GURBUZ



It's a phrase that Guillermo “Memo” Sanchez, MSHS '13, MPH '13, PA-C, tosses out casually: “Creativity and the hard sciences don't have to be mutually exclusive.

“One of my favorite things about medicine is the many outlets through which we can use our clinical knowledge throughout our careers,” he explains. “Whether it

is working for a booming startup in California improving delivery of care, functioning as the team doctor on a Mount Everest expedition, or leading a team to monitor tuberculosis surveillance at the Centers for Disease Control and Prevention [CDC], I've seen physician assistants, nurse practitioners, and physicians do incredible things with their careers. After all, clinical knowledge outside the hospital is extremely valuable, and you can be endlessly creative in how you apply it.”

That pull toward creativity has led Sanchez away from traditional health care practice to writing, traveling, and, unexpectedly, public health. “We packed up our things and moved from Washington, D.C., to Atlanta so I could pursue an opportunity with the Office of Antibiotic Stewardship at the CDC,” Sanchez says about himself and his wife, Jacqueline Sanchez, PA '14, CERT '14. “The mentorship available and the work you get to do there are wonderful. I ended up loving it so much that my career focus has shifted entirely to public health.”

After several years of working at the CDC in the Office of Antibiotic Stewardship, the trained dietitian and award-winning essayist accepted a fellowship with the Epidemic

Intelligence Service, a two-year postdoctoral training program for health professionals interested in applied epidemiology.

Sanchez pre-matched to the Alabama Department of Public Health, where, as a disease detective, he investigates outbreaks, identifies the likely causes, implements control measures, and collects and shares evidence for prevention of disease.

Presently, he says, he's thrilled to have the opportunity to broaden his public health experiences and improve his epidemiology and leadership skill sets. At the same time, however, he continues to embrace all things artistic.

“Both in my professional and personal lives, I value having a creative outlet and the intrinsic rewards that come with creating something new and unique,” he says. “My most recent endeavors include photography and videography.”

Through @twogoroundtheworld, for example, the Instagram account he shares with his wife, Sanchez chronicled their six-month journey trotting the globe, hitting hot spots that included driving the Great Ocean Road in Australia and trekking up to Everest Base Camp in Nepal. Sanchez, in pursuit of his new hobbies, packed his drone for the journey. In one video, he flies it over the streets of Istanbul, capturing the domes of famous landmarks Hagia Sophia and the Blue Mosque, as well as the sparkling waters of the Bosphorus Strait, which separates the Asian and European sections of the well-known city.

“Having worked in a large urban emergency room, and seeing how quickly good health can be taken away from you, I was very motivated to learn firsthand about other cultures, to travel to the places I've always wanted to go, and to creatively capture my stories and experiences in photos and video,” he says.

Ultimately, Sanchez has found that working in medicine has made his art better, and that his art makes him a better clinician for his patients.

His distinctive approach to life, and the natural pairing of medicine and art, is possible for anyone, Sanchez adds. Take advantage of the opportunities that arise as health care delivery evolves to incorporate new and perhaps unconventional ideas, he suggests. “Don't be afraid to take an imaginative approach toward employment. It's easier than ever for individuals to pursue nontraditional medical career paths.”

To do what you love and to love what you do, Sanchez concludes, is the ultimate goal. ■





However, she wasn't certain she wanted to study medicine until she completed her biology and psychology classes.

"My journey is predominantly academically and internship-based," says Zemel. "I am going to be the first physician in my family."

The interest, Zemel explains, stems from high school and college science classes that discussed cell biology. "I really enjoy learning about the small intricacies of how cells work, the cell cycle, cell division, and what happens when it goes wrong," she says. "It's just amazing how something on a small scale can create large havoc and how we are working on making so many advances in the field."

Hailing from Olney, Maryland, Zemel completed her undergraduate degree summa cum laude at the University of Maryland, College Park, where she majored in physiology and neurobiology. She was accepted to SMHS the summer following her sophomore year through the GW Early Selection Program.

"I picked GW because it has a great curriculum that incorporates clinical experience from the get-go," says Zemel.

Before her first year at Maryland, she had an opportunity to complete an internship at the National Institutes of Health. That summer, Zemel split her time between the Eunice Kennedy Shriver National Institute of Child Health and Human Development and the Office of Legislative Policy and Analysis (OLPA).

"I shadowed physicians as well as conducted research to learn about and make a difference in the lives of those suffering from debilitating illnesses," she says. "Being involved in the policy perspective with OLPA was also exciting, and I learned a lot. They were both incredible experiences."

When asked about her favorite courses in medical school following her first year, Zemel doesn't hesitate. "The hematology and oncology courses fascinated me from both a clinical and a cellular perspective," she says. "I can't wait to learn even more about it."

Zemel had the opportunity to stay on campus during the summer of 2018 to complete a W.T. Gill Summer Fellowship, allowing her to do research at the Katzen Cancer Research Center (Katzen Center) under Robert Siegel, MD '77, associate center director for education, training, and network development at the GW Cancer Center, medical director of the Katzen Center, and professor of medicine at SMHS. The fellowship provides stipends for select summer research internship opportunities at GW, Children's National Health System, and the Washington, DC VA Medical Center.

As she continues through medical school, Zemel is looking forward to becoming a practicing clinician. She is also interested in getting involved with more research or exploring the medical field through the political system — she's leaving every door open. ■

First IN THE FAMILY

BY ASHLEY RIZZARDO

Many people who go into medicine have been dreaming about it since they were very young — one or both parents may have been physicians, for example. Some, however, realize their passion for medicine without having such early exposure. Rachel Zemel was one of the latter.

Zemel, a second-year medical student at the George Washington University (GW) School of Medicine and Health Sciences (SMHS), was always interested in the health sciences.

CLASS NOTES



Joshua D'Angelo, DPT '13, was among this year's nine George Washington University alumni honored with a 2018 Alumni Achievement Award for their significant career accomplishments and service to the university.

D'Angelo, who received the Recent Alumni Achievement Award, is a physical therapist practicing at Inova Physical Therapy Center and is co-founder and president of Move Together, a nonprofit that increases access to quality rehabilitation medicine. The organization's clinic development program fosters creation of sustainable rehab clinics in the places that need them most. D'Angelo

also co-created the first global physical therapy day of service, uniting more than 10,000 physical therapy clinicians and staff to help them give back to their communities, and recently co-founded MovementX, a mobile physical therapy company.

Presented annually, the Alumni Achievement Awards and Recent Alumni Achievement Awards are given to graduates who have contributed notable accomplishments in their fields.

The awards were presented during Colonials Weekend, Oct. 26-28, an annual university-wide celebration for alumni, families, students, and friends. ■

1970s

Andrew T. Filak Jr., MD '78, was appointed interim senior vice president of affairs and dean of the College of Medicine at the University of Cincinnati (UC). He is the founding chair of the UC Department of Medicine and recently received the Daniel Drake Medal – the college's highest honor. The annual award recognizes living faculty or alumni for their outstanding and unique contributions to medical education, scholarship, and research.

1990s

Charles F. Keller, MD '98, was promoted to chief physician officer and vice president of medical affairs for Mercy Medical Center in Des Moines, Iowa.

Rachel A. Ruotolo, MD '99, was honored as a Woman of Distinction by Nassau County Executive Laura Curran at the "Just Desserts" Mother's Day event, which recognized women who make a difference in the lives of others. Ruotolo has been a partner at Long Island Plastic Surgical Group since 2010. A board-certified plastic surgeon who specializes in pediatric craniofacial surgery, she also routinely participates in medical missions to treat adults in developing countries.

2000s

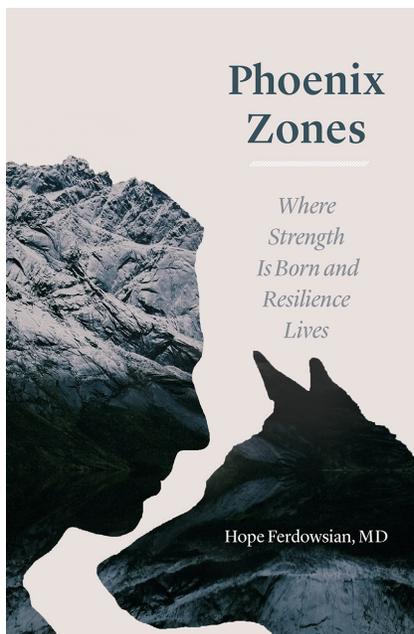
Shafkat Anwar, MD '05, BA '01, pediatric cardiologist at St. Louis Children's Hospital and Washington University Heart Center, was named co-director of the 3D Printing Center at the Barnes-Jewish/Christian HealthCare Institute of Health at Washington University School of Medicine. He also serves as an assistant professor of pediatrics and of cardiology at the Washington University School of Medicine.

Jeremia D. Bernhardt, MD '06, was elected president of the Washington Academy of Family Physicians in Bellevue, Washington. He is also the director of Swedish Cherry Hill Clinic and a practicing primary care physician at the Swedish Medical Center.

2010s

Tanika J. Miller, AA '12, CERT '11, was promoted to laboratory supervisor at Expertus Labs Inc. in Longwood, Florida.

Timothy C. Wagner, MD '13, recently graduated from the Cleveland Clinic's orthopaedic surgery residency and also received the Cleveland Clinic's Excellence in Teaching Award.



Hope R. Ferdowsian, MD, RESD '06, MPH, FACP, FACPM, published the book "Phoenix Zones: Where Strength Is Born and Resilience Lives." She serves as associate clinical professor at the University of New Mexico School of Medicine and as a physician at the University of New Mexico Specialty Extension Services. Ferdowsian has spent years traveling the world working with people and animals who have endured trauma – war, abuse, displacement. In her book, she combines stories from survivors with the latest science on resilience to illustrate the link between violence against people and animals, and the biological foundations of recovery, peace, and hope. ■

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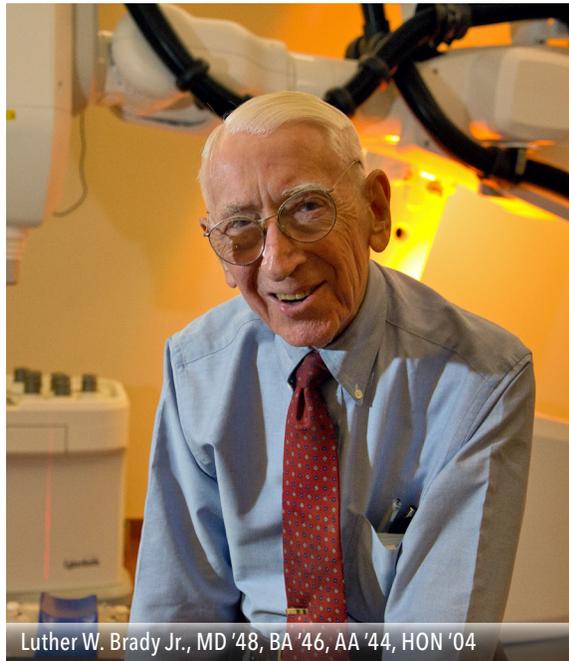
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Louis DePalma, MD, BA '01, professor of pathology and director of clinical pathology, succumbed to cancer Sept. 6, 2018, at his home in Bethesda, Maryland. A specialist in blood diseases and cancers of the immune system, particularly in the diagnosis of leukemias and lymphomas, as well as disorders of hemostasis, DePalma worked at the National Institutes of Health and Children's National Health System before joining the George Washington University School of Medicine and Health Sciences faculty in 1989.

Professor Emeritus of Medicine Irene G. Tamagna, MD, passed away March 25, 2018, less than two months shy of her 103rd birthday. Tamagna, who joined the medical faculty of the George Washington University (GW) in 1948, overcame tremendous obstacles in her quest to become a physician. Twice her medical education was put on hold as she fled Nazi occupation, leaving both her Austrian homeland and later Italy. Tamagna and her husband, Frank – whom she married while living in Italy – settled in the United States. Here Irene completed her medical education at the Women's Medical College of Pennsylvania, followed by a residency and cardiology fellowship at the New York Post Graduate and Columbia University Medical Centers.

After joining GW, Tamagna taught hypertension and clinical medicine for more than three decades while becoming a leader in the fight against poliomyelitis, opening one of only nine polio Respiratory Centers in the country. In 2002, Tamagna and her family established the Irene Tamagna Lecture on Hypertension.

Tamagna is survived by her two daughters and their husbands, Ellen Tamagna, MD '71, and Victor Hogen, and Jane Tamagna and Lonnie Darr; five grandchildren and their spouses; and three great-grandchildren.



Luther W. Brady Jr., MD '48, BA '46, AA '44, HON '04

Renowned radiation oncologist, passionate advocate for the arts, and George Washington University (GW) alumnus **Luther W. Brady Jr., MD '48, BA '46, AA '44, HON '04**, died July 13, 2018. He was 92.

A GW Board of Trustees Emeritus and a member of the GW School of Medicine and Health Sciences Council of Advisors, Brady held all of the university's highest honors, including a GW President's Medal, a Distinguished Alumni Achievement Award, and an Honorary Doctor of Fine

Arts. Despite his many accomplishments, Brady took pleasure in citing the profound influence GW had on his life and distinguished career.

"At a very critical time in my youth, GW gave me direction," Brady recalled in a 2015 interview with *Medicine + Health*. "It embedded in me the sense of responsible action. ... It imbued in me the sense to innovate and to participate in research and to be a teacher."

Brady, a faculty member at Drexel University College of

Medicine for more than 50 years, was a pioneer of nuclear medicine. He was instrumental in the initiation and establishment of modern radio-oncological treatments for eye tumors and cervical cancer.

Throughout his life, Brady's affection for art served as a counterbalance to long hours spent in the laboratory, the classroom, and the clinic. That love of art led Brady in 2001 to endow the Luther W. Brady Art Gallery in GW's Media and Public Affairs building. ■

IN MEMORIAM

1940s

Bernard A. Harrison, MD '48, AA '44
Robert M. Naiman, MD '46, BA '43

1950s

Donald W. Cox, MD '57, RESD '58
Clarence "Clare" E. Everhart Jr., MD '52
Jack M. Jensen, MD '53

1960s

Charles D. Ebert, MD '64
Alan E. Freeland, MD '65
Roger Jan Gemmen, MD '65
Kenneth R. Hansen, MD '64
John R. Mountjoy, MD '66

1980s

Leon C. Larson, BS '83
David Hanson Shivers, BS '86

1990s

Stephen J. Greenhouse, MD, RESD '96
Julio R. Lopez-Atienzo, MD '92
Joel Jaime Saenz, BS '97

2000s

Brenna K. Clougherty, MD '08

2010s

Christopher A. Mulloy, CERT '13
SSG Daniel H. McCoy Jr., BSHS '18



Dear fellow alumni,

I became a doctor because I wanted to help people, which I do each day as an interventional cardiologist at New York City's Lenox Hill Heart and Vascular Institute. I followed the footsteps of my late father, Allen Oboler, MD, who also was an interventional cardiologist.

When I was a young girl, my dad would take me with him to the hospital and his office, where his patients would tell me, "Your dad saved my life." Saving lives seemed like a great job.

I feel fortunate to have had the opportunity to pursue my goal of saving lives through the education I received at the George Washington University (GW) School of Medicine and Health Sciences (SMHS). However, the cost of medical school continues to escalate, impacting decisions of younger generations who want to follow the same path.

The Association of American Medical Colleges reports that in 2017, the mean debt of a medical student attending a private institution was more than \$206,000. Debt of this magnitude can influence a young physician's decision to pursue career choices that might not match their passion. These prohibitive costs may also discourage other, highly qualified students from even entering the medical field.

This is why my husband, Louis Jaffe, and I established the H. George Mandel, PhD, Endowed Memorial Scholarship to provide an annual need-based scholarship for a medical student in his or her final semester at SMHS.

I enjoyed my time at GW and value my SMHS education, which is why I support scholarships. My husband and I want to ensure that future generations of medical students can provide top-notch care without the concern of crushing debt.

I invite you to consider making a gift to SMHS to support our students and the future of medicine. For more information visit: smhs.gwu.edu/give.

Warmest regards,

Lara S. Oboler, MD '95
2018 SMHS Council of Advisors, Co-Chair

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Ellsworth Uveitis & Retina Care

Jeanne G. Holzgrefe, MD '96, PhD, MPH
Assistant Clinical Professor of Psychiatry and Behavioral Sciences, GW SMHS; Chevy Chase Psychiatric Services

Floyd Alexander Katske, MD '76, RESD '77
Clinical Assistant Professor of Urology, David Geffen School of Medicine, UCLA

Jay E. Katzen, MD '72, B.A. '67
Ophthalmologist, the Eye Center

Kerry L. Kuhn, MD '73, RESD '77, BA '70, FACOG
Private Practice; Senior Vice President of VitalMD

Gerald S. Lazarus, MD '63
Dermatology

John C. Pan, MD '70, RESD '74
Founder, Center for Integrative Medicine, GW SMHS

Smita H. Patel, MD, DFAPA
Assistant Clinical Professor of Psychiatry and Behavioral Sciences, GW SMHS

Rakesh C. Sahni, MD
Maryland Cardiology Associates

Art B. Wong, MD '67
Founder, Emergency Physicians Medical Group, PC

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An Inside Job

Engineering chimeric antigen receptors dates back about 20 years, and it has been touted as a treatment for a range of cancers. Two CAR T-cell therapies were approved by the FDA in 2017. Catherine Bollard, MD, has developed a different therapeutic approach called TAA-T, which is a multi-antigen specific tumor-killing T-cell product that could prove to be superior in many ways to current FDA-approved T-cell therapies. Read more on page 14.