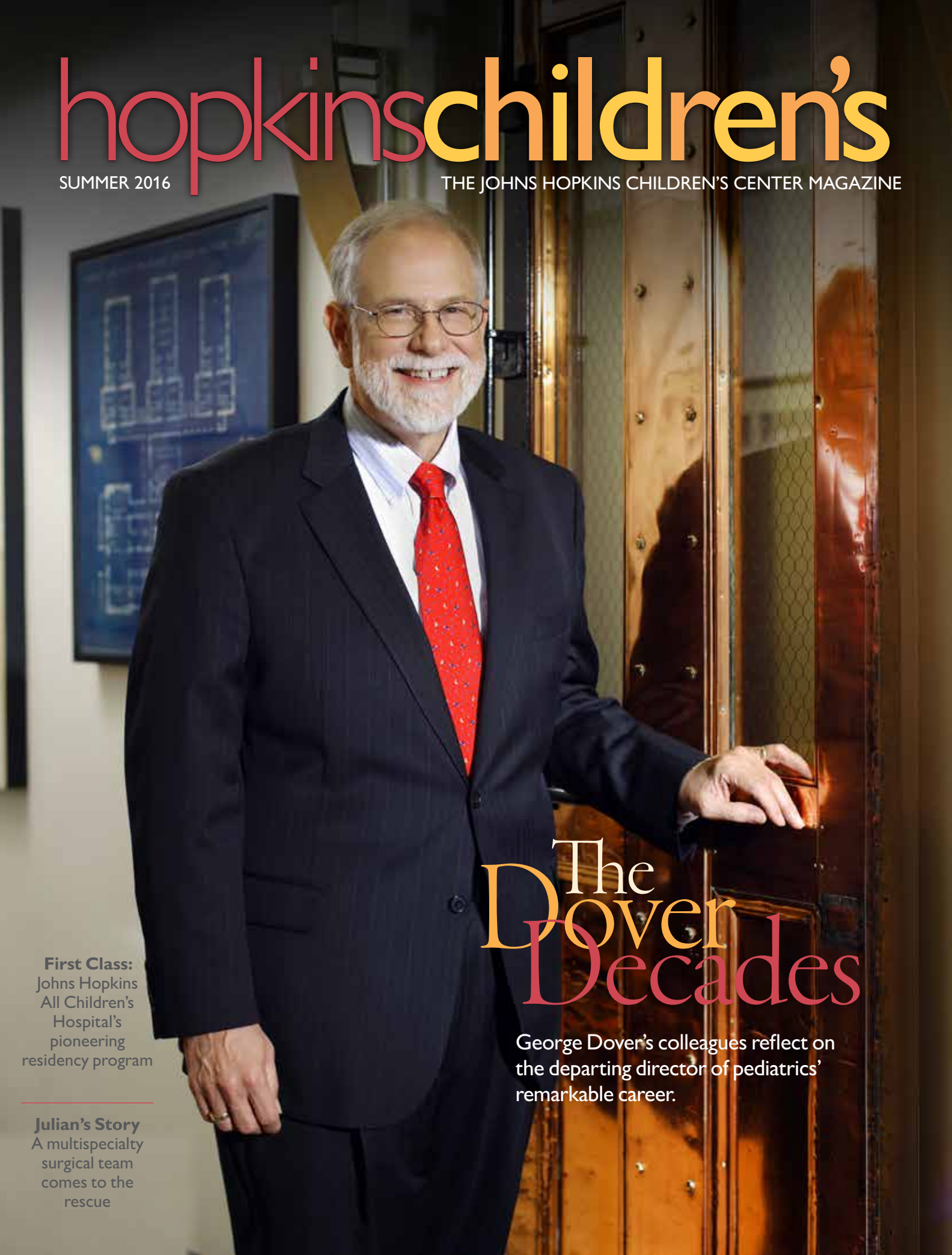
hopkinschildren's

SUMMER 2016

THE JOHNS HOPKINS CHILDREN'S CENTER MAGAZINE



The Dover Decades

George Dover's colleagues reflect on the departing director of pediatrics' remarkable career.

First Class:
Johns Hopkins All Children's Hospital's pioneering residency program

Julian's Story
A multispecialty surgical team comes to the rescue

A Gift For Our Residents


David J. Hackam, M.D., Ph.D

Dear Friends,

We mark a milestone in the extraordinary history of the Johns Hopkins Children's Center with the departure of our longtime director and Pediatrician-in-Chief, George J. Dover, M.D., who is stepping down from his dual role as the Given Foundation Professor and director of the Johns Hopkins School of Medicine Department of Pediatrics and co-director of the Johns Hopkins Children's Center.

When asked which mission this institution might attach to his name, George chose the Harriet Lane Pediatric Residency Program—an area he has cared for deeply throughout his own training, clinical practice, research and leadership here at Johns Hopkins.

During his 20-years of leadership as pediatrician-in-chief, our pediatric residency program has remained one of the best in the nation. Its former trainees continue to be among the world's foremost researchers, educators and clinicians in pediatric medicine and its specialties. Many of today's national leaders in pediatric medicine trained here at Johns Hopkins.

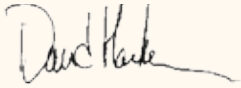
I have had the distinct honor of working alongside George as co-directors of the Children's Center, and I know first-hand how treasured our residency program is to him. A former Harriet Lane Resident and Pediatric Hematology Fellow himself, he carves out an entire day of each week, Fridays, to spend with the residents. But this is only part of the story. George literally sees each of the trainees as his own medical children, and the residency as his large and productive family. And when he speaks about his trainees, he adopts a glow and a pride that is typically reserved for close family members. The growth of the residency program, and its accomplishments, are what George sees as his greatest collective contribution to Johns Hopkins and also to the field of pediatrics.

Please join me in honoring his legacy by contributing to the newly established George J. Dover, M.D., Pediatric Residency Leadership Fund. This fund will help enhance and strengthen our Harriet Lane Residency program for a new era of medicine and generation of trainees, and allow us to expand our teaching curriculum in advocacy, diversity/cultural competence, preventive and personalized medicine, among other goals.

Your gift honors Dr. Dover's legacy and will help strengthen our pediatric training programs to the enduring benefit of ill and injured children and their families. Gifts can be sent in using the enclosed envelope or by visiting hopkinschildrens.org/DoverFund.

If you have any questions, or would like to learn more about our efforts to honor Dr. Dover, please call 410-361-6493 or email hopkinschildrens@jhmi.edu. ■

Thank you,



David J. Hackam, M.D., Ph.D.
Garrett Professor of Pediatric Surgery;
Chief of Pediatric Surgery, The Johns Hopkins University;
Pediatric Surgeon-in-Chief, The Johns Hopkins Hospital;
Co-Director, Johns Hopkins Children's Center, The Johns Hopkins Hospital

Grateful that her newborn daughter survived open heart surgery and a long intensive care stay at Johns Hopkins Children's Center, LeeAnn Goodson, at right, vowed to become a nurse. Seven years later she joined the same staff, including critical care specialist Kristen Nelson, who cared for her child (see page 47).

FEATURES

Cover photo by Keith Weller

DEPARTMENTS

What I Learned

George J. Dover, M.D.
Co-Director, Johns Hopkins Children's Center
Given Foundation Professor of Pediatrics

Interestingly, when I arrived here in 1972 to interview for the pediatric residency program, I walked out of my hotel through torrential rain to a cab and asked the driver to take me to Johns Hopkins Hospital. Looking stunned, he asked me twice to repeat my destination, which I did. He then drove me directly across the street to the hospital. I suppose I could blame the rain and poor visibility but, needless to say, I was ill prepared just getting here. Now, looking back over the past 44 years I realize that initial moment may be among the most instructive of my career. How?

After I crossed the street and walked through the doors into my intern year, the quality of the comradery and collaboration among the residents here in taking care of children became abundantly clear. Also, as time went by I was incredibly impressed with the knowledge and, more importantly, the wisdom of mentors like pediatrician/geneticist Barton Childs and geneticist Ned Boyer, metabolism expert Saul Brusilow, and pediatric hematologist Bill Zinkham. All were major influences on me during my house staff and young faculty days in hematology.

After I was assigned to be the clinical hematologist at Baltimore City Hospital, now Johns Hopkins Bayview Medical Center, I was exposed to Harold Harrison, a giant in endocrinology and another new mentor. And when Dr. Zinkham decided to step down as director of the Division of Pediatric Hematology, I moved cautiously into a leadership position in the small division I had been raised on. That led to more administrative work, more exposure and leadership opportunities in both the Department of Pediatrics and the School of Medicine.

The interesting thing is that rather than carefully planning each step, I relied on my love for science, learning and teaching to plot my course. I learned that my transformation from a medical student who didn't know much at all about academic medicine to a competent clinician during residency and then an academic faculty member was all due to very strong mentors as role models. I also learned more from my mentees, residents, fellows, and colleagues than I could teach them. And putting yourself in a collaborative environment with such remarkable colleagues and teachers and allowing your career to evolve, I learned, just might be as important as being prepared. ■

JOHNS HOPKINS CHILDREN'S CENTER

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To read more on the clinical services and programs covered in *Hopkins Children*'s, visit **www.hopkinschildrens.org**.

How you can help

Call 410-361-6493

If Only Walls Could Talk

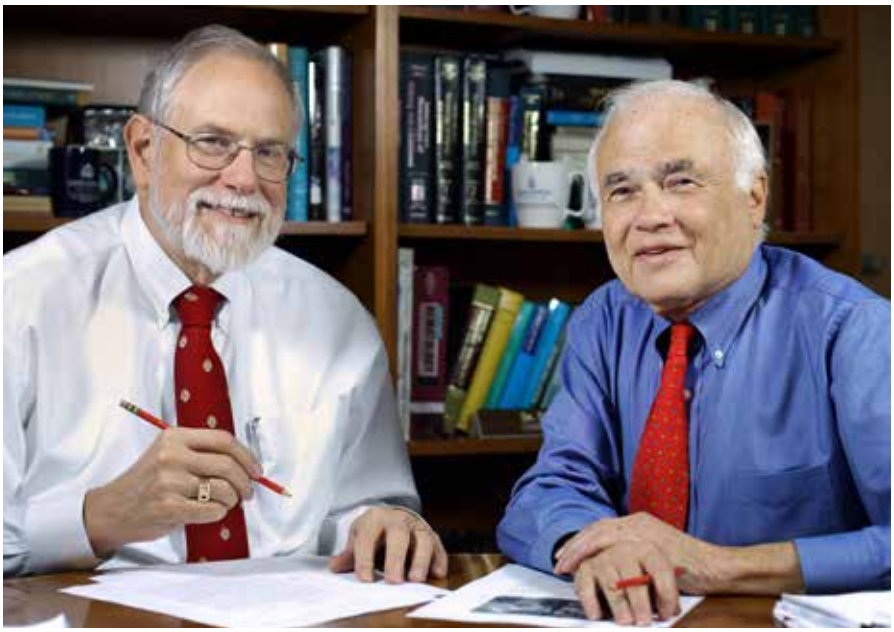
by Wesley Peters

JERRY WINKELSTEIN KNOWS his history, having spent nearly 40 years practicing in the Johns Hopkins Children's Surgical and Medical Center (CMSC) building. A former physician and chief of the Division of Pediatric Allergy & Immunology, Winkelstein began his career a year after the CMSC opened in 1964 and retired near its closure in 2012. Retirement, however, hasn't kept Winkelstein out of practice, who strives to record the history of the CMSC through the book, *If Only Walls Could Talk: The Johns Hopkins Children's Center 1964-2012.*

He's not alone in his efforts to commemorate the former home of the Johns Hopkins Children's Center, either. The book, which he co-edited with Director of the Department of Pediatrics George Dover, contains a rich half-century history of groundbreaking pediatric medicine in 33 chapters written by various division chiefs and staff.

"Each chapter illustrates the progress of pediatrics, highlighting new faculty, new developments, and a constantly evolving science," says Dover.

When the CMSC opened, it was staffed by 62 Department of Pediatrics faculty members. When it closed, 187 faculty members moved their offices into the new Charlotte R. Bloomberg Children's Center building. Having nearly tripled in size during those 48 years, the center had learned to reckon with new global health threats such as sexually transmitted diseases and superbugs. Both the medical technology and the ability to treat new diseases evolved, bringing Johns Hopkins into a new century of pediatric medicine.



With red pencils in hand, co-editors George Dover, left, and Jerry Winkelstein.

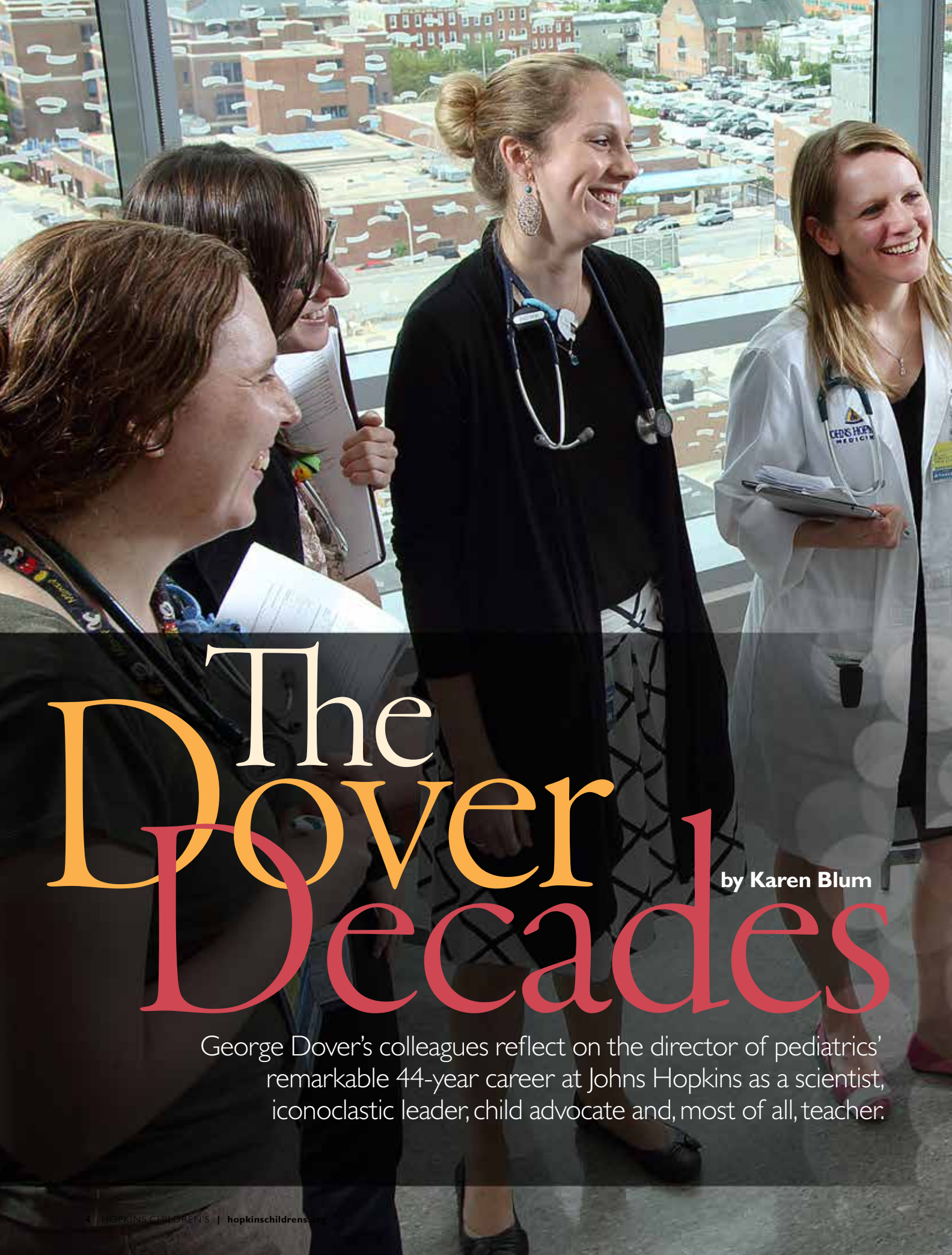
The scholarly text isn't confined to the science, however. Winkelstein's inspiration for such an extensive project—he began compiling and editing chapters four years ago—came from a symposium for CMSC physicians and staff in 2011, right before the center closed. After hearing countless stories from division chiefs about their time in the CMSC, Winkelstein feared that these storytellers and their accounts might be forgotten.

"Medicine has a short-term memory," he claims. "While we've seen incredible scientific development in the past fifty years, incoming residents will probably never know who made the discoveries and progress they rely upon. I want to give those people a chance to tell their stories." ■

To obtain a copy, call 410-361-6493.

The Birth of Children's Surgery

In the *Birth and Evolution of Children's Surgery at The Johns Hopkins Hospital (1889-1991)*, former chief of general pediatric surgery J. Alex Haller, Jr., provides an overview of pediatric surgery at Hopkins from its inception to 1964. Prior to that time all pediatric surgery was done by the general surgery department, literally operating under the notion that children were essentially "little adults." Haller, who trained under surgeon Alfred Blalock of "Blue Baby operation" fame, had an evolution of thought that children might indeed need their own surgical specialists. Haller's book reveals what followed. To obtain a copy, email mat.edelson@gmail.com ■



The Dover Decades

by Karen Blum

George Dover's colleagues reflect on the director of pediatrics' remarkable 44-year career at Johns Hopkins as a scientist, iconoclastic leader, child advocate and, most of all, teacher.

"The opportunity to learn more science and then apply it usefully was really what got me started." – George Dover, M.D.

The Teacher

On an unseasonably warm December morning, the Eudowood Conference room is buzzing with activity. While a handful of pediatric residents and faculty gather for their weekly case conference, 15 female residency applicants, most sporting black business suits, nervously seat themselves around a long table dominating the room. At the center of the table sits George Dover, director of the Johns Hopkins Department of Pediatrics, leaning back in a chair in his navy blue blazer and bright purple tie. He exchanges pleasantries with the group while energetically tapping away at his cell phone, sipping from a white coffee mug featuring the Children's Center façade.

Third-year resident Michelle Gontasz summarizes the case: a large 20-year-old male presenting with high fevers over the past three weeks and a history of pulmonary stenosis, a heart valve disorder, for which he had been implanted with an artificial valve. He also has some intermittent cough and vomiting. As chief resident Liz Jalazo writes the symptoms on a white board, Dover ponders the board, hands folded, in between asking pointed questions: "Was the cough waking him at night? What is his level of activity, and what has the shortness of breath done?"

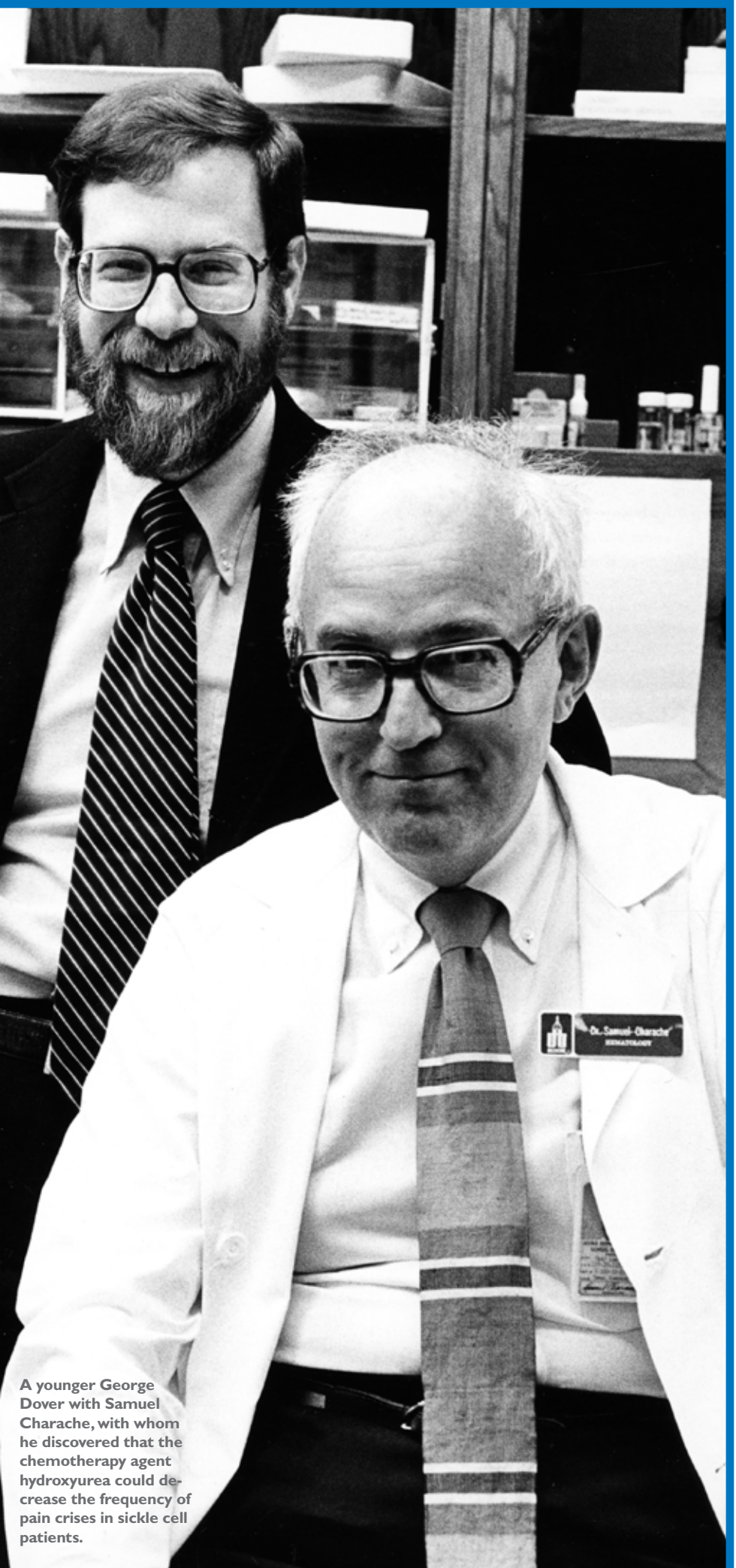
The group agrees the patient has an infection, most likely endocarditis, triggering a debate among Dover, infectious diseases expert Julia McMillan, and her colleague Pranita Tamma, over what course of antibiotics they can give to treat the infection for which the patient will be most compliant a nd will cause the least amount of complications. Meanwhile, they agree to hold off on therapy while they order more tests to confirm the diagnosis.

From there, Dover addresses the visiting residency applicants, now returning to the room from a tour of the building. "I was in your shirts and shoes over 40 years ago when I applied here," he reassures them, explaining how the residency program prides itself on representing diversity ethnically, geographically, and in clinical areas of interest. He also explains how pediatrics is rapidly changing.

"By the time a child is born, and certainly by 3-to-5 years of age, you probably know whether they're going to be obese, whether they will be hypertensive when they grow up, whether they're going to have strokes or atherosclerotic disease," he says. With a push to make medicine more cost-effective, "you're not going to wait for a child to grow up and have atherosclerotic disease and have a mild myocardial infarction; that will be malpractice. You are going to be responsible from the beginning to think about early treatments for adult diseases."

In an animated moment, he swings his chair to one side, accidentally tapping one of the women with his foot. Without missing a beat, he invokes self-deprecating humor: "Oh, I'm sorry—I usually do this," he jokes. "That's why they don't sit next to me." Laughter erupts around the room.

Watching the 69-year-old Dover holding court it's hard to fathom that he'll be stepping down in June after 20 years as pediatrician-in-chief and nearly 40 years on the faculty. Or that except for a few twists of fate, he might not have wound up here at all.



A younger George Dover with Samuel Charache, with whom he discovered that the chemotherapy agent hydroxyurea could decrease the frequency of pain crises in sickle cell patients.

The Restless Scientist

"There's a randomness to life that you cannot control," Dover says during a sit-down interview, explaining his career path.

He was born and raised in Shreveport, La., the oldest of six children, and remembers the late 1950s and '60s well: "I began to get exposed to things that we now think are mementos of history, you know, Motown and rock and roll. Elvis Presley was somebody from the bordering state of Mississippi who was a peculiarity in those days."

He also carries painful memories of his mother being diagnosed and bedridden with multiple sclerosis in her 40s, spending countless hours with doctors, which along with his love for science would influence his career choices later in life.

"I know a lot of people who talk about being passionate about healing people... and although I am passionate about that, I have to say that my primary driver was the science," he says. "The opportunity to learn more science and then apply it usefully was really what got me started."

Dover earned his bachelor's degree from Washington and Lee University in Virginia, where he designed his own independent dual major in biology and art and architecture. He then returned south to study medicine at Louisiana State University Medical School, where he was most attracted to scientific studies being conducted by child psychiatrists. It was these young faculty who spent the most time speaking with Dover about changes in medicine, how the brain works, and how drugs work in the brain. He held summer jobs in mental health institutions and did night shifts on a hospital psychiatric floor. Do-

> Once you really began to look at this disease (sickle cell disease), it was filled with mystery. How is it that you could walk around being totally normal with no symptoms whatsoever and within hours be deathly ill?
>
> — GEORGE DOVER, M.D.

ver's mentor at the time said if he wanted to be a good child psychiatrist he would first need intense study of pediatrics, so he chose the specialty for his residency. While most LSU students stayed closer to home, Dover traveled up and down the East Coast looking for programs of interest. One that struck him was a community psychiatry residency at Johns Hopkins.

"I thought if I was going to be a child psychiatrist it would be more important that I take more outpatient training than inpatient training," he says, "and so I really only applied at Hopkins because of that."

Dover liked the people he interviewed with and the training opportunities, but he didn't think he would match for residency because Johns Hopkins had waitlisted him for an interview back when he applied to medical schools. So he placed it second on his list: "I'm sure the only reason I even got an interview was because my mentor had been a roommate of the chairman of the department."

Jerry Winkelstein, a former director of pediatric allergy and immunology at Johns Hopkins, remembers it differently. As a chief resident in pediatrics in 1971, Winkelstein sat on the internship selection committee, and says of 150 contenders Dover was the group's No. 1 pick.

"He clearly was the most outstanding applicant," Winkelstein says, "but in his application he stated that he was going to do one year of pediatrics and then go into child psychiatry, and we didn't want to waste a position on someone who wasn't going to do their whole residency with us."

After some discussion, Winkelstein adds, "we decided that no one could be sure what they were going to do [in their career] so we gave him the internship."

Dover was pleasantly surprised to have matched with Johns Hopkins, and—with both he and his wife looking to establish independent roots away from their families—made the move. When he arrived, however, the psychiatry program that initially piqued his interest had been disbanded. Then he discovered he liked taking care of sick patients.

He was deeply impressed by the scientific talents of mentors like pediatric endocrinologist Robert Blizzard, nephrologist and metabolism specialist Saul Brusilow, and William Zinkham, the founder of pediatric hematology at Johns Hopkins. The budding physician scientist in Dover wanted in on oncology, an area of medicine that appeared to be changing as some children with acute leukemias were going into remission. After residency, he was invited to stay on for a pediatric hematology/oncology fellowship, where he became increasingly interested in the underpinnings of sickle cell disease.

"Once you really began to look at this disease, it was filled with mystery," Dover says. "How is it that you could walk around being totally normal with no symptoms whatsoever and within hours be deathly ill?"

Zinkham introduced Dover to genetic researcher and cardiologist Ned Boyer, who was studying how fetal hemoglobin, the protein carrying oxygen in red blood cells, normally converts to adult hemoglobin. At the time, it was understood that sickle cell disease patients inherited two mutated genes for hemoglobin. As a result, the hemoglobin made before birth stuck around instead of being switched off; those with higher fetal hemoglobin levels were less ill.

Barton Childs, a pediatrician and geneticist, encouraged Dover to look for potential modifier genes that would explain why patients with sickle cell presented differently. Dover went on to study the genetic control of fetal hemoglobin in patients with sickle cell anemias and thalassemia, another inherited blood disorder. He developed unique microscopic and cell-sorting laboratory techniques to look at individual red cells and measure fetal hemoglobin, while building a base of some 400 patients with sickle cell disease.

In another fateful event, Dover was invited to review experiments out of the University of Illinois demonstrating that fetal hemoglobin could be regulated by drugs in primates. He admired the researchers' animal model but was skeptical that a drug could turn on fetal hemoglobin. Then, at their meeting, a colleague he admired stood up and talked of success driving up fetal hemoglobin in animal models using a chemotherapy agent called 5-azacytidine. "I know where I was sitting, I know what room I was in and I remember it as clearly as an hour ago," says Dover. "That was what changed my career."

Shortly after—and serendipitously—Johns Hopkins internist and adult sickle cell specialist Sam Charache told Dover he was ready to use powerful drugs to knock out the immune system in one of his adult patients because he was running out of options. Dover remembered his colleague's story and suggested trying 5-azacytidine first. It worked.

Thus started clinical trial collaborations between the two testing this and other drugs, including another chemotherapy agent called hydroxyurea. In 1995, the two and others published the definitive trial in the *New England Journal of Medicine* showing that hydroxyurea could decrease the frequency of pain crises in sickle cell patients. Today, it's still the most commonly used sickle

cell disease-modifying therapy, and Dover still displays on his office wall a black and white 8 x 10 photo of John Paul, the first patient to enroll in their hydroxyurea trials.

Around the same time, Frank Oski, then the Children's Center director, became ill and needed to take time off. His duties initially were split among Dover, pediatrics administrator Ted Chambers and three others, with each responsible for a different piece of the job. Dover oversaw the research component. While the group worked fairly well in Chambers' opinion, a search began for a new leader.

The Iconoclastic Leader

Michael Johns, dean at the time, asked Dover to serve as interim director, but Dover wasn't sure he wanted the job. After all, he had a thriving research program. Serving in the role he began to like it, but his perception was that the institution wouldn't hire from within. He began to explore positions at other institutions, but the more he looked at other jobs, the more he liked the interim job he already had. "So," he says, "I sat back and let things happen."

The Dover Years

1995

Pediatric hematologist George Dover, with hematologist Sam Charache, reports that hydroxyurea, a common cancer drug, can alleviate excruciatingly painful sickle cell crises.

1996

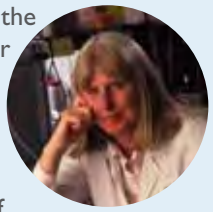
George Dover becomes the new director of the Department of Pediatrics and the Children's Medical and Surgical Center, where he will oversee a heightened focus on patient safety and patient- and family-centered care, the eventual construction of a new pediatrics outpatient building and a new hospital.

1997

The CMSC is verified by the American College of Surgeons as the State of Maryland's premier provider of pediatric trauma care. The official state designation follows two years later.

1999

Pediatric cardiologist **Anne Murphy** and colleagues discover the molecular basis for cardiac "stunning," a form of heart failure that occurs in children after undergoing heart-bypass during open-heart surgery.



1999

A prescient visionary who spoke of individualized medicine decades before the term became a buzzword, pediatric geneticist **Barton Childs** publishes his seminal work, *Genetic Medicine: A logic of disease*. The book later became the basis for the new Johns Hopkins University School of Medicine curriculum "Genes to Society."

2000

Oncology researchers, including **Donald Small**, discover a new family of genes that contribute to the process of malignancy, shedding light on the causes of an aggressive childhood cancer, Burkitt's lymphoma.

2000

Pediatric surgeons perform Johns Hopkins' first pediatric lung transplant.

2001

Building on research originated by pediatrician Janet Hardy, neurovirologist **Robert Yolken** finds in-utero exposure to infectious pathogens like herpes simplex virus type 2 are linked to schizophrenia in later life.

2004

George Dover leads a campaign for a new building to replace the outmoded CMSC.

They did when Oski told Johns that Dover should be his permanent successor. Chambers recalls the conversations in the room: "He was the consummate Hopkins person. He was a stellar researcher, he had won teaching awards, he had a full panel of sickle cell patients, he met the criteria, which was the ultimate in a Hopkins faculty member, in that he had changed medicine. He was famous nationally and internationally for that."

The dean took Oski's recommendation seriously "and that's how it really happened. It wasn't because it was a convenient choice; it's because he was the best of the best," Chambers says.

Reflecting on his qualities as department director since then, Dover's colleagues agree. They are quick to cite his passions—for children, for families, for scientific progress. He's a dynamic leader, they say: a straight shooter, a person of action and forward motion. He highly values nurses' perspective and the residency program. He's likeable, he has a good sense of humor, and he can keep a group of disparate people in line.

"He challenges everyone around him to think more deeply, more broadly, more strategically, more clinically, to think in just different ways," Chambers says. "He's always looking at the next frontier to be pushing toward."

2006

Neonatologist **Christoph Lehmann** leads the design of an online tool for ordering chemotherapy and other IV drug combinations in children that reduces medical miscalculations and the risk of medical errors.

2007

Pediatric immunologist **Robert Wood** begins groundbreaking research to show that giving children with food allergies increasingly higher doses of milk, egg, or peanut over time retrains the immune system to better tolerate the allergen.

2008

A family-centered approach to care is formalized, making parents official members of their child's healthcare team.

2009

Pediatric geneticist **Ronald Cohn** directs Johns Hopkins' first residency training program in human genetics.

2010

The first academic division for pediatric quality and safety is started under Director Marlene Miller.

2011

All Children's Hospital in St. Petersburg, Fla., joins Johns Hopkins Medicine. Pediatrician **Jonathan Ellen** is named physician-in-chief.

2011

Of all pediatric professors at Johns Hopkins, 50 percent are women.

2011

Pediatric oncologists and neurosurgeons move closer to finding new ways to combat brain tumors in children, including understanding how to reprogram out-of-control tumor cells to prevent and eradicate them.

2011

The FDA approves an antiviral cocktail for children with hepatitis C based on a study led by pediatric hepatologist **Kathleen Schwarz**.

2012

In April, pediatric patients move from the CMSC building into the new Charlotte R. Bloomberg Children's Center, ending an era of patient care in the CMSC.

2015

Pediatric tuberculosis expert Sanjay Jain reports Hopkins' successful treatment of a child with drug-resistant TB, the first such detailed account of a child diagnosed and treated in the United States.

> "George is of a generation that learned to listen to mothers and to the cues that mothers are giving about the health or illness of their child, and it's a real art. When you watch George with a family, it's magical." —TED CHAMBERS

Judith Rohde, director of pediatric nursing, says one of her former bosses was an iconoclast "and I would really put George Dover in that category, too. By iconoclast I mean someone who attacks the status quo and who's willing to always try new things and challenge the way it's done."

"George actually gets really excited about anybody's progress in any field," adds James Casella, director of pediatric hematology. "If somebody made a nice finding, even one that was in competition with him, he would be really excited about it. Some get jealous, but George would see the ideas."

How did such traits translate into actual achievements? During Dover's two-decade tenure, he recruited new academic division directors for all of the specialty divisions, raised departmental NIH funding from $6 million to $30 million, and expanded the reach of Johns Hopkins pediatrics to clinics across the state and into Pennsylvania, to Johns Hopkins Bayview Medical Center and to Johns Hopkins All Children's Hospital in St. Petersburg, Fla. He also oversaw a capital campaign that raised $125 million for the new Charlotte R. Bloomberg Children's Center building, of which he was an early proponent. Indeed, there had been talk about the need to replace the Children's Medical & Surgical Center (CMSC) building since Dover was a young faculty member.

"By the time I came on (as director) it was absolutely clear that the CMSC building had way outlived its ability to manage what was then evolving as state of the art," he says. "We had all kinds of work-arounds."

Also, from 1995 to 2012, admissions had increased from about 5,000 per year to over 9,000, and the acuity of the patients seen had become much greater. A parent would sleep on a chair-bed next to a child in rooms containing two to six patients at a time. There were inadequate teaching conference rooms, and with the advent of electronic patient ordering, the house staff were forced to use converted closets and storage areas to type orders and discuss or sign out patients.

Dover says two catalysts pushed the building forward. First, the ventilation and plumbing systems were beginning to fail, and there weren't good fixes for them. Second, Edward Dunn, then president of the hospital board, said someone had complained about how difficult it was to get patients to radiology. Dover replied, "Oh yeah, you have to go right through the garbage area to get there." Dunn didn't believe it, so Dover took him on the CMSC elevators and traced the path from the ED past garbage bins to radiology. Dunn became a strong advocate, as did JHH President Ron Peterson and then-JHM Dean/CEO Ed Miller, who really began to look closely at what the next priority was going to be.

Dover soon found himself with an added role, as a fundraiser, telling the story of the Children's Center to groups around the country. Former JHU President Bill Brody called Dover one Christmas Eve to say magnate and philanthropist Michael Bloomberg would be making a significant gift toward the building now named for his late mother.

"That was a tremendous advantage in really bringing the designs we had to full potential," Dover says. Another bonus: The Harriet Lane Home Foundation, The Eudowood Foundation and The Robert Garrett Fund that had helped build the CMSC building threw their support behind the new construction. Along the way, a parcel of land became available across the street, at 200 N. Wolfe St., which thanks to a partnership between The Johns Hopkins Hospital, the School of Medicine and JHU Trustee David Rubinstein, in 2006 became the David M. Rubinstein Child Health Building. It houses the Harriet Lane Clinic, faculty offices and the bulk of pediatric subspecialty outpatient clinics.

Prior to construction, a consultant had suggested building a children's hospital half the size of the CMSC, saying children weren't going to the hospital any more; they were getting too healthy. "That struck me as very odd because everyone else was building bigger and bigger children's hospitals around the country," Dover recalls. "Plus, we were getting busier and busier. It was a real struggle to convince [the administra-

On rounds with his residents, George Dover stresses that with advances in diagnostic technology pediatricians still need to continue to listen to patients and their parents to provide the best possible care.

tion] to build a children's hospital the size we have now."

The Charlotte R. Bloomberg Children's Center building, which opened in 2012, is about the same size as the CMSC as far as beds, but it's laid out more efficiently and with all single family rooms, Dover says: "This is not a bigger children's hospital from the standpoint of bed capacity; it's bigger because of what we could now bring to the families and to the physicians and staff as far as a first-rate facility." Even with that, bed capacity has been about 90 percent or higher, even on some weekends, causing Dover and colleagues to think creatively about how to expand the existing beds or build facilities elsewhere on campus to defray some pediatric beds.

The Child Advocate

At the root of Dover's efforts, colleagues say, is his advocacy for children. Medicine has become so scientific and so data driven over the years that there's a fear that new breeds of pediatricians have lost the ability to listen to parents, says Chambers: "George is of a generation that learned to listen to mothers and to the cues that mothers are giving about the health or illness of their child, and it's a real art. When you watch George with a family, it's magical."

Indeed, while walking the halls of the hospital, says Chambers, it's not unusual to see an African-American woman come forward "and almost weep at seeing him, because he's treated so many kids with sickle cell disease for so long, and seen them month after month throughout their growing up period. Sometimes it's the child who is now an adult."

One former patient is George McGowan, 28, a business management consultant for Booz Allen Hamilton in Washington. Diagnosed with sickle cell disease at birth, McGowan was a patient until age 17 or so. He reconnected with Dover last fall, when he began volunteering at the Children's Center as a mentor for teenage patients transitioning to the adult sickle cell program.

Dover not only was knowledgeable about the disease "but also knew how to relay the information [well] to your parents," McGowan says. Dover and Casella are "really caring and protective about the patients. It's almost like ownership of that child—that was something that makes them stand out from other doc-

tors. Dr. Dover would always follow up with my mom, who had his direct pager or cell number. She could always contact him and try to manage my health as best as possible."

Dover impressed and inspired students and residents, too. Pediatrician Travis Ganunis, a part-time faculty member at Johns Hopkins who practices at Pavilion Pediatrics in Lutherville, Md., says watching Dover during a pediatrics rotation in medical school sold him on the field.

"He was a guy who loved to teach," he says. "It would be 6 o'clock at night, and the residents wanted to go home but he would take us back to the lab and look at [patients'] blood under the microscope with enthusiasm, regardless of how late we would round. As a medical student it was just fantastic because you're sucking up this knowledge."

But the memory that sticks out most in his mind is watching Dover's sickle cell clinic visit with a new family. An inner-city East Baltimore mother had come to the clinic with a baby newly diagnosed with sickle cell disease and a son about 5 years old. As Dover spoke with the mom about the implications of disease for the infant, somehow it came out that the older child had had a birthday within the last day or so.

"It sounded like maybe there was a party at home with cupcakes but he didn't get any birthday presents and was upset by this," Ganunis says. "It became clear to us it was probably because the mom had no money to buy a present." Meanwhile, the mother tried to quiet her son so she could speak with Dover.

Then, at the end of probably an hour and a half session, Ganunis says, Dover reached into his own pocket and in a subtle way pretended to pull a $10 bill from the older boy's ear. He gave it to the boy and made a big production of saying it was for his birthday and he should pick out a special present.

"It was just the most touching moment ever to see somebody at that level do something that was such a genuinely nice thing to do as a pediatrician," Ganunis says. "It just made so much sense."

The Collegial Colleague

These days, Dover spends the bulk of his time in meetings but says he has always relished two parts of the job. One is working with faculty.

"I'd come here with no idea what research was," Dover recalls. "I don't think I'd ever been in a medical library before, and this place gave me the most phenomenal opportunities imaginable to make a difference, so I decided chairmen ought to help other people…. I think my legacy should be measured by the accomplishments of the faculty who I worked for, who have not only had a phenomenal impact in an unbelievable number of areas of research, but they developed the best training program in the country in our residency. And they've practiced the state of the art and beyond in clinical care."

A practice he picked up from his predecessor Frank Oski, Dover meets with each faculty member for at least an hour each year to go over their accomplishments and plans. Proudly pointing to department photos atop a bookcase, he says, "After 20 years I can look up there and see a lot of people who I think I've helped with their careers or protected them from the things they shouldn't be doing. When I get introduced at committee meetings, I always say that I work for the faculty."

Casella agrees: "When you're in the room with George, you feel like there's nobody else in the world. He can focus in on what you're talking about extraordinarily well, relate to it and be very supportive and motivating."

His second great love is the residency program, what he describes as the mortar that holds the institution together: "Their presence continually reminds us of our responsibility to educate the next leaders in pediatrics, but at the same time they keep us young, they keep us thinking about things that we would have taken for granted that they don't."

Ganunis, who was a chief resident in 1999-2000, says Dover always showed up on time for their meetings, even if it meant "walking out of other, probably higher-level important meetings. He really committed his time to us and whatever needs we had... and was very supportive in terms of helping us accomplish our jobs. That was golden time he would carve out and respect regardless of anything else that was happening."

"He always has been loyal to the residency program and made sure that it took priority when there were other demands being placed on the department," adds McMillan. "For me, personally, that's been the hallmark of his leadership. He's understood what was needed to train the very best pediatricians and made sure that we had the support to be able to do that."

For Rohde, Dover has worn his many hats well, weaving an invaluable legacy for Children's Center staff: "I hope we

Described as "gregarious" in nature, George Dover may have met his match in former pediatric surgery director Alex Haller.

can learn from his vast experience and not lose that before he heads out to not being a chairman. He's got a lot of valuable learning and legacy that we all need to hold on to."

Dover, however, is hardly done. Next steps include a move to St. Petersburg, Fla., to work with Johns Hopkins All Children's Hospital in an untitled advisory role for a year to "accelerate their transformation into a first-rate academic facility," he says. "There's a lot of things up here that I've learned over the years that I think can help them." After that, he'll return to Baltimore to work at Johns Hopkins "in whatever capacity the dean and new directors wish for me to do," he says, and spend time with his eight grandchildren, travel with his wife, and continue to keep his toes dipped in the sea changes occurring in pediatrics, which seems to excite him the most.

"As I look to the future, pediatrics will be transformed in the next decade because I think we're going to be given responsibility for not only taking care of acute and chronic illnesses in children but we're going to really be given the opportunity to help prevent and reverse problems seen in adults," says Dover. "My personal belief is that almost all adult diseases have their antecedent in children. Now, science is proving me correct." ■

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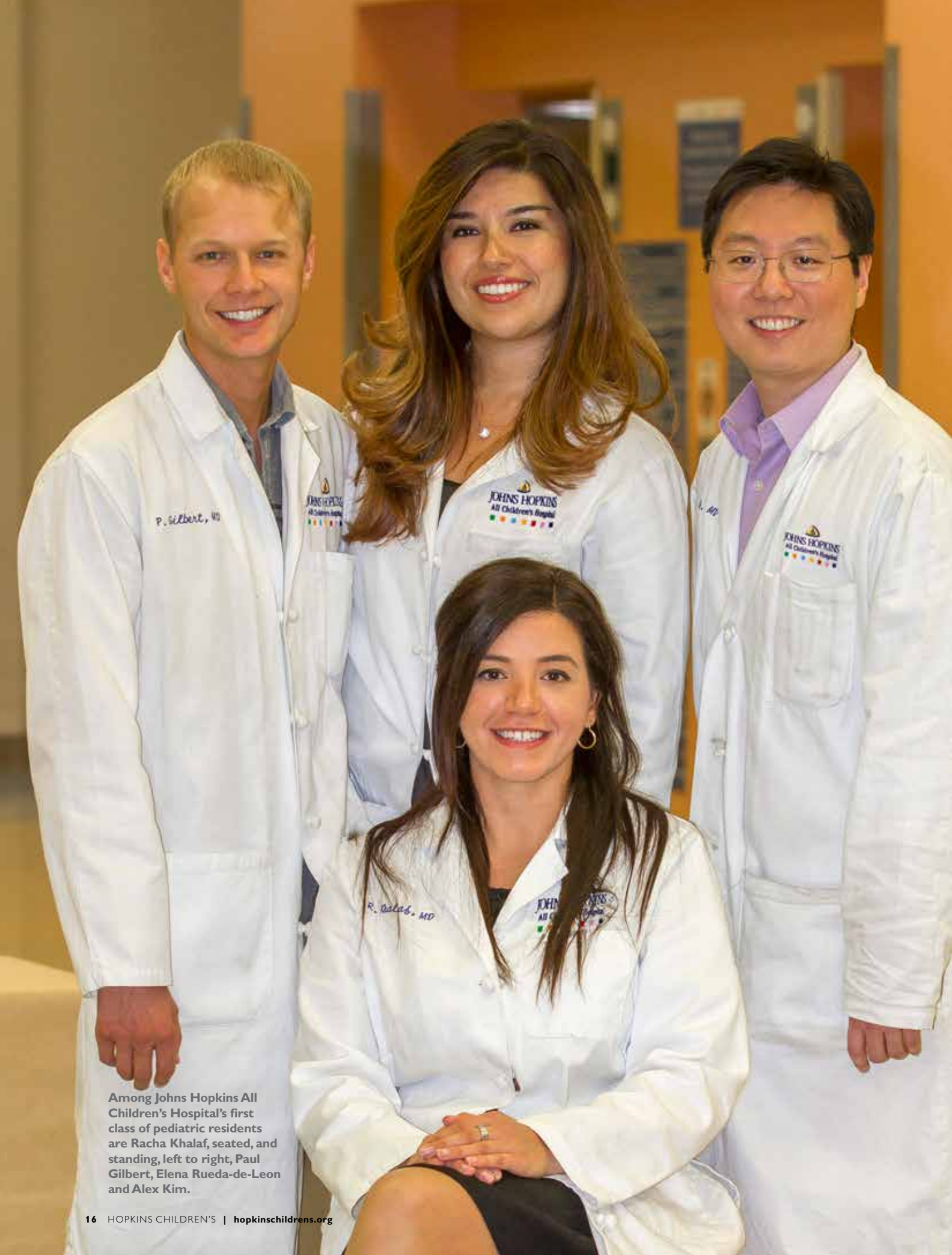
>
> — GEORGE DOVER, M.D.



Among Johns Hopkins All Children's Hospital's first class of pediatric residents are Racha Khalaf, seated, and standing, left to right, Paul Gilbert, Elena Rueda-de-Leon and Alex Kim.

The First Class

by Gary Logan
Photography by Allyn DiVito

In developing a brand-new pediatric residency program under the Johns Hopkins banner, Johns Hopkins All Children's Hospital faced a daunting challenge in maintaining the institution's long and rich history in training and producing exemplary physician clinicians, researchers and teachers. How did it fare?

In 2008, Elena Rueda-de-Leon was in the middle of her doctoral program in molecular cancer at Duke University when her father—a computer scientist she calls her "biggest mentor"—got sick, prompting her to rush home to South Florida. But as his advocate , she was "not impressed" with what she saw as complacent care at the local hospital: "Medicine there needed more compassion," she says. His treatment preoccupied her and pushed the ever-inquisitive thinker to rethink her career goals. She put her doctorate degree on hold and applied to a new medical school at Florida International University (FIU), a program she found enlightening. "I was seeing every aspect of medicine—surgery, pediatrics and geriatrics—and I realized I loved working with kids." Then, during her third year at FIU, Rueda-de-Leon attended a residency fair where she heard about another brand-new program at Johns Hopkins All Children's Hospital in St. Petersburg, Florida, which had just integrated with Johns Hopkins Medicine. She was impressed with the Johns Hopkins imprimatur but wondered how a new residency program would work in a hospital with no senior residents. Students need role models and mentors—how would she learn, practice medicine, and become the teacher and leader she wanted to be?

A few years earlier some 1,000 miles north in East Baltimore, Julia McMillan, then the associate dean for graduate medical education in the Johns Hopkins Department of Pediatrics, had been contemplating the same circular questions. She, too, knew that All Children's reputation was that of a superb regional pediatric hospital staffed by experienced physicians who provided excellent clinical care. While residency programs affiliated with local university medical schools rotated through the hospital, it did not rely on physicians in training to manage patients day to day.

"All Children's was and still is a hospital unlike this one—it can run very well without residents," says McMillan. "So how do you

> "The residents who have come to this program are a distinct phenotype. I say that because you wouldn't have applied for this program and wouldn't have interviewed if there wasn't a component of entrepreneurship, of being a risk taker." — RAQUEL HERNANDEZ, M.D.

create a program and give residents responsibility where you have the luxury of residents not being responsible for everything in the hospital? It was both an incredible challenge and a wonderful opportunity."

Indeed, it was an opportunity McMillan relished, the type of task she had wanted to take on even before arriving at Johns Hopkins 20 years earlier. She could bring all of her experience, expertise and imagination into play to achieve something truly impactful in pediatric medical education.

"You have to remember that this was something I had been thinking about for my entire career," reflects McMillan. "How would I create a residency program if I didn't have any constraints?"

McMillan knew there would be speed bumps—and some road blocks—ahead, though she was comforted by knowing she would not be the sole architect. It had long been Johns Hopkins' custom to collaborate vigorously in such circumstances, and the herculean chore of creating a sister hospital's new residency program was no exception. How would Johns Hopkins All Children's clinically minded leaders respond to the program? How would the program market itself and attract candidates? Who would want to apply and why? What would be the expectations of the Rueda-de-Leons of the world? For McMillan, the potential obstacles were dizzying, and overcoming them would require many sharp and seasoned minds both in St. Petersburg and Baltimore. One of them, just down the hall from her office, was George Dover.

As someone who had experienced Johns Hopkins as a pediatric resident, fellow, faculty member, division chief and department director—as well as a physician scientist who had made groundbreaking discoveries in the treatment of sickle cell disease—Dover had truly lived the institution's high academic standards. Others included Roy Ziegelstein, the Johns Hopkins University School of Medicine vice dean for education, who co-directed Johns Hopkins' innovative Aliki Initiative—which stresses the importance of residents knowing patients as individuals in order to provide optimal care. Key, too, was continuity of care expert Janet Serwint, who succeeded McMillan as director of Johns Hopkins' pediatric residency program.

Even more invested as architects of the plan were faculty members at Johns Hopkins All Children's itself, where the residency program would be implemented. That contingent included the hospital's president, Jonathan Ellen, former chairman of the Department of Pediatrics and Neonatology at Johns Hopkins Bayview Medical Center, who was leading Johns Hopkins All Children's academic transformations and culture change. The program's hands-on manager was Raquel Hernandez, director of medical education, who was a former Johns Hopkins pediatric resident, fellow and faculty member who knew the value both Johns Hopkins' campuses, north and south, brought to the challenge at hand. Her right hand was David "DJ" Hall, associate director of medical education, a former chief resident at Mayo Clinic—and the son of a coal miner—who in deciding on a career in residency education was searching for an opportunity just like this. So, if Johns Hopkins All Children's needed an eclectic and experienced transformative force with fresh ideas and veteran perspectives to design and launch its residency program, it had one. But could they pull it off?

An Anxious Exercise

There are some 200 pediatric residency programs in this country, but there are far more applicants than open spots. Students, after becoming familiar with programs through their rankings and advisers' recommendations, apply in the summer before their senior year, are invited for interviews from October to January, and match in March. Applicants can only match at one program—and some don't match at all. Needless to say, it's an anxious exercise.

"I remember trembling as I opened my envelope," recalls Serwint on her match day. "The uncertainty is hard—it's a big step, your next step. There's great relief once you know what that next step is going to be."

So, what do applicants look for in a program? There are multiple personal and career considerations, including curricula, future job prospects, medical school debt, geography and family factors. But students' highest priorities, say members of the group, tend to be the substance and spirit of the program, the program's potential for shaping future pediatricians. What would be the structure of the program? What would residents do in years one, two and three?

"Does this place form pediatricians in the view I have of what a pediatrician is? Is this a place where the next stage of my career could be supported—in public policy, in advocacy, in a subspecialty?" says Michael Barone, director of medical student education in the Johns Hopkins Department of Pediatrics. "And the biggest factor—What is the chemistry between the residents and the faculty?"

Serwint adds: "People want to make sure a program has the right fit. Will you

like your colleagues? Is this a place where you can thrive?"

These are among the multiple questions the program designers had to ask themselves in crafting an academic curriculum for a hospital that had just begun to dip its toes in academic waters. To get at the answers, they held a pair of retreats in the very place where they hoped students would thrive—Johns Hopkins All Children's. With a facilitator on hand posting contributors' sticky notes on easels lining the walls, the transformative force fleshed out McMillan's draft and turned it into a plan. Among its features:

• Twelve would be the ideal number of residents for the new program's first class.

• The program would be education based rather than service based, emphasizing individual learning.

• The first year would be dedicated to inpatient care in the Emergency Department, neonatal intensive care unit (NICU) and pediatric intensive care unit (PICU), as well as on the medical-surgical floors, to build residents' confidence in taking care of sick children in the hospital.

• Rotations would be longer than traditional rotations—six to eight weeks instead of four.

• The second year would focus on outpatient care—where most pediatricians practice—and subspecialty clinics, such as cardiology and pulmonary, to enlighten career interests.

• Third-year residents would return to the inpatient units as supervisors, giving Johns Hopkins All Children's first class of seniors opportunities to teach, lead and oversee the care of sick children. Residents would also have more elective time guided by faculty members and tailored to their career goals.

A 90-minute draft and six-bullet blueprint. That's it?

"Hardly," laughs McMillan, noting that there were many other elements—like the Aliki model and an emphasis on personalized medicine—utilized in a formula that would have to be nuanced to meet the needs of residents. For instance, with no senior residents and a limited number of experienced teachers, the first class would largely have to lead and teach themselves. Also, because the new curriculum had not been tested, it would have to be a flexible, evolving model tweaked to relate to the residents' real-life experiences in the program. So, why not give some ownership of the curriculum itself to its users—the residents themselves?

As a former pediatric resident, fellow and faculty member at Johns Hopkins in Baltimore, Raquel Hernandez, director of medical education at Johns Hopkins All Children's, recognized the value both campuses brought in designing its residency program.

Another issue was the emphasis on learning hours rather than service hours taking care of patients, which could translate into the perception of a "tastes great, less filling" residency program. Yes, McMillan explains, the first class would be seeing fewer patients, but over time, they would need to take greater responsibility for those patients.

"Both George [Dover] and I saw it—the residents were at risk of becoming passive observers if we didn't figure out a way to change the culture so that they truly had responsibility for patients," says McMillan. "But culture change was made even more difficult because we're starting with interns who can't possibly be responsible independently for patients, so culture change and independence had to be introduced gradually, incrementally."

Hernandez, who as Johns Hopkins All Children's residency director would be on the front lines implementing the program, agrees. "From the beginning, I was very excited because of this huge opportunity, but then we sat down and recognized that a lot of people were skeptical about what we were thinking in implementing an educationally driven versus service driven program," she says. "My mind shifted to 'Wow, we really have to focus on culture change and engaging faculty as much as we can to make this work.'"

That culture change had already been taking place since the 2011 integration of collaborative clinical and research activities between Johns Hopkins' Baltimore and St. Pete colleagues, ongoing academic faculty development and curriculum events for physicians at Johns Hopkins All Children's, and recruitment of more academically oriented faculty members to the hospital. And following the retreats, academic missionary Hernandez met with some 300 pediatricians at the hospital and

in the community to preach the pluses of the proposed residency program. Many, she notes, were galvanized by the opportunity to teach residents. So, while the hospital may not have had a deep bench, it did have the right pieces and players in place. The other challenge, of course, was attracting top-notch applicants to this newborn residency program with a brand name but no track record that could compete with top academic programs nationwide. How was that going to happen? There was a risk it wouldn't, suggests Serwint: "Raquel needed to convince some very competitive students, who could have gone elsewhere, to be part of this first class."

The Face of the First Class

Interestingly, as Johns Hopkins All Children's residency program was being designed, the portrait of its ideal applicant was beginning to reveal its face. Even before Elena Rueda-de-Leon had applied to the program, its designers instinctively knew her goals and interests, her vision of an impactful career in pediatric medicine. Indeed, they had identified her DNA because it was what they envisioned after months of brainstorming and calculating not only who this innovative program would be best for but who would be best for the program.

What they saw was someone who would be immensely curious, an entrepreneur—an overly ambitious one—an innovator with abundant imagination, a daredevil of sorts, a visionary leader. You had to not only put yourself out there but want to put yourself out there—in fact, you would have to insist on it. In short, to be attracted to this pliable program with no history and succeed in it, this person had to be both a leader and a builder, a carpenter and a craftsman who could help form and frame the program. Rather than build it and they will come, the Johns Hopkins All Children's mantra was come and together we'll build it. They wanted trailblazers.

"The residents who have come to this program are a distinct phenotype," says Hernandez. "I say that because you wouldn't have applied for this program and wouldn't have interviewed if there wasn't a component of entrepreneurship, of being a risk taker."

"They have to be mature, compassionate and passionate, self-starters who can motivate people," says Ellen. "We're trying to create leaders here."

So who did they attract, and what did the applicants see in the program?

Until the residency fair, Rueda-de-Leon had not heard of Johns Hopkins All Children's. But when she arrived, she immediately connected with the curriculum and the opportunity to help shape it. Despite some pushback from fellow FIU medical school students and administrators who encouraged her to consider a "more solid" program, she was sold.

"With the prestige of the name and having a bit of a say in how the curriculum was being developed, I started thinking this would be great," says Rueda-de-Leon. "It would give me a chance to be a leader."

Hints of Paul Gilbert's passion for leadership are found in the first line of his CV, noting that he was salutatorian of his Ft. Wayne, Indiana, high school and had led its 270-member marching band. But in reviewing his high school curriculum—science, science and more science—one sees a bit of Doogie Howser in the drum major as well. Indeed, he jokes that he failed microbiology on purpose so he could take it twice, when in reality he took it again so he could teach the course as the school's first student teaching assistant, which, in his mind, "was really cool."

So, of course, many teachers nudged him toward medicine, so much so that he found himself observing heart surgery at 15, shadowing doctors in the local ER at 16, and taking EMT courses on weekends at 17. In his bedroom each night, he leafed through *The Johns Hopkins Guide to Symptoms and Remedies*, cementing his dreams to attend medical school there one day. Working summers as a baby sitter and camp counselor, and volunteering as a Big Buddy mentor at Purdue, pushed him toward pediatrics. "I was sold; I loved working with kids. At that point, I knew I was going to med school at Hopkins and working with children."

Indeed, Gilbert did attend medical school at Johns Hopkins, where a rotation at All Children's placed another vision in his path: "I was blown away by the faculty, how everyone was so nice, so welcoming, so wanting us to learn. It was an amazing place to learn." So applying for residency there was a no-brainer for Gilbert despite the risks—or perhaps because of the risks.

"I had no idea what was going to happen because we would be the first class, one without senior residents," says Gilbert. "But they embraced that. They said, 'We're going to bring you guys in and if you want to change something, improve something, you can do it. If you have an idea, let's make it work.'"

What also appealed to Gilbert was the program's approach of individualizing learning and customizing the curriculum to residents' career interests. Still, uncertainties filled his head. There was no question that graduating from medical school at Johns Hopkins would put him in a great position to launch a career in medicine. But the untested All Children's program, even with the Johns Hopkins name, came with no such assurances.

"I felt I didn't know whether after three years I would be able to get a job or build scholarship, or whether those three years would be a struggle and a fight, or an amazing learning opportunity because what they were trying to sell had never been done before," says Gilbert. "So it was scary—it was very scary."

Growing up in war-torn Lebanon, Racha Khalaf followed a much different path to Johns Hopkins All Children's. The chaos in her country coupled with the loss of her father—an ice cream factory owner she affectionately called "Willy Wonka"—to a heart attack at the age of 47 steered her toward a profession. "From that point on, I became interested in medicine," says Khalaf. "I wanted to be a doctor who could save other people. It was a dream I aspired to achieve."

In 2002 Khalaf, then 14, and her family emigrated to Orange County, California, where she found herself in the first class of a new high school International Baccalaureate program that

> “I had no idea what was going to happen because we would be the first class, one without senior residents. But they embraced that. They said, ‘We’re going to bring you guys in and if you want to change something, improve something, you can do it.’” — PAUL GILBERT, M.D.

students could help shape and, in so doing, develop leadership skills. Next, in another first, she went to a brand-new medical school at the University of Central Florida.

“I think it takes a little bit of courage and willingness to be flexible to be able to go to a new program,” she says. “I think I’m driven, but I’m also the calm during a storm—I’ve gone through so much change in my life that I’ve learned to adapt and not get overwhelmed by whatever the situation is. I know things can always change very quickly, in the blink of an eye, so you have to be prepared.”

Despite his grandmother’s daily prompting to become a doctor, New Yorker Alexander Kim wasn’t sure medicine was for him. But following his parents’ encouragement to find his own path, he designed a pre-med track at Dartmouth that led him to the University of Virginia School of Medicine and an interest in understanding patients from their genetic potential as well as their cultural and societal surroundings.

“So you not only take a standardized, evidence-based approach to care but also a more humanistic approach, one that has a good balance between this is what we do for this disorder and this is what we do because this person has this disorder,” says Kim, explaining a personalized medicine philosophy very much in sync with Johns Hopkins All Children’s new residency program. The pediatrics piece came in because Kim saw both the joy and impact of the specialty.

“Pediatricians have this skill where they can make their work look like fun,” says Kim. “The other awesome thing is that taking care of kids is like throwing a tiny stone into a pond and watching the ripples reach out. You have the opportunity to act at a very crucial time in a person’s life and realize the potential of decades and decades of increased life span and quality of life.”

So for Kim, a career in pediatric medicine was clear. But why did he set his sights on Johns Hopkins All Children’s and rank it No. 1 instead of one of the other 20 residencies to which he had applied? He says it was the flexibility of the program, the Johns Hopkins connection, a cutting edge children’s hospital transitioning to an academic center with good ties to the community and, most importantly, the people.

“With any job, we look for the right people—you’ve got to find your tribe, so to speak,” says Kim. Apparently, he found his.

What drew him to Johns Hopkins All Children’s new residency program, says Paul Gilbert, was its individualized learning approach, which allowed him to customize the curriculum to his career interests.

> "The other awesome thing is that taking care of kids is like throwing a tiny stone into a pond and watching the ripples reach out. You have the opportunity to act at a very crucial time in a person's life and realize the potential of decades and decades of increased life span and quality of life."
>
> – ALEXANDER KIM, M.D.

First Year for the First Class

So how did this first class, this tribe of 12, fare?

All the interns interviewed said they valued the first-year NICU experience and emphasis on learning over serving. Khalaf called it a "fantastic rotation," citing the close, one-on-one working relationship with the attendings and unlimited opportunities. "My co-intern and I got dibs on every single procedure, every learning opportunity they could provide—it was ours for the taking."

"Wonderful" was the word Gilbert used to describe his experience: "NICU staff members were on board with us learning while taking care of patients. I think it was the unique balance I was looking for. You are here to take care of patients, but your primary goal is to learn and be a productive member of the hospital, to promote care and see what kind of changes you can make to improve care."

Also appreciated was the emphasis on individual learning plans.

"We talk a lot about goals: what is accomplishable and what should you be thinking about now," says David Hall. "How are the decisions you're making today and over the next six months going to affect your ability to get a fellowship?"

Gilbert agrees. "We can see where we have deficits, what we need to learn and what we think is going to help us in this rotation in our future career," he says.

The flexibility of the education-based program was cited repeatedly. Rueda-de-Leon noted that she was allowed to carve out some space for research her first year, an uncommon intern experience. So when she wasn't focusing on inpatient care, she was with co-resident Jacquelyn Crews analyzing data from eight high schools in the community that were being taught hands-only CPR.

"We saw in pre- and post-test scores a dramatic increase in students' knowledge," says Rueda-de-Leon, who presented their research at the American Academy of Pediatrics annual conference in October 2015.

Similarly, Gilbert's entrepreneurial smile widens when he talks about being able to create a new elective for the program—a summer camp health care elective for second-year residents.

"A lot of the other programs say, 'Here's our residency, and you're going to fit in,'" says Gilbert. "This residency is more of an open, fluid and dynamic object where you can come in and change it and make it match where you're going to be in medicine."

For Kim, who envisions a career in genetics, the opportunity to push personalized medicine was a big plus. For him and others, so, too, was the program's patient- and family-centered care approach central to the residents' inpatient experience. In managing an international anorexia patient in the hospital, for example, Khalaf coordinated care conferences with case management, clinical staff, international services, nutrition and social work to ensure that the patient and family connected with all related services.

"Following the Aliki model, you see fewer patients but spend more time ensuring your patients have better outcomes by looking at both medical and social issues and trying to ensure that whatever brought them into the hospital does not happen again," says Khalaf.

Adds Ellen, "We expect all the residents to go back to their patients and families twice a day after rounds to get to know the family, sit down and talk to them, and to be very mindful in teaching them about the patient experience."

The first class also sings the praises of the fall and spring didactic sessions off campus, which focus on issues such as the business of medicine, clinical epidemiology, and ethics in research and patient care. Residents also point to the option of taking elective subspecialty rotations in Baltimore. In fall 2015, Rueda-de-Leon, Kim and Khalaf completed their respective rotations in cardiology, genetics and gastroenterology at the Johns Hopkins Children's Center.

Johns Hopkins All Children's weekly simulations were cited, too, as well as its abundance of mentoring programs in, among other areas, career development, individual learning plans and research. Khalaf proudly notes that her proposed study investigating nutritional supplementation via percutaneous gastrostomy tubes in patients with cystic fibrosis represented the first resident-approved IRB proposal at the hospital. She credits, in large part, gastroenterologist Michael Wilsey, her research mentor.

"On every one of my rotations, I've had strong mentors like Dr. Wilsey—they always want to know my educational goals and try to help me accomplish those goals," says Khalaf.

But Johns Hopkins All Children's first class experience on the St. Petersburg peninsula was not all smooth sailing. Eager to apply the latest clinical approaches but also respectful of the seasoned community practitioners attending to their patients in the hospital, at times these young innovators had to reign in their ideas. Rather than flowing with incremental culture change, they sometimes ran smack into it.

"We had to feel our way because we were this team that came in with a different focus on family-centered care and evidence-based medicine that believed you don't just do something because that's the way it's been done for years," says Gilbert. "Instead of a sprint to effect change, it's more like a marathon."

But such transparency—and challenging the status quo—is critical to evolving the program, says Hall, who noted that the residents did indeed effect change. In the Emergency Department, they asked for busier shifts and their own phones so nurses could contact them directly, and they pushed for an initiative to improve quality of care from the Emergency Department to hospital floors. Also, they wanted to cover their NICU patients, but also labor and delivery.

"These things have less to do with the structure of their rotations and more to

"Following the Aliki model, you see fewer patients but spend more time ensuring your patients have better outcomes," says resident Racha Khalaf.

do with things like patient safety, ability to own education, to be more of a team player," says David Hall. "They bring back high-level things and own it because they're interested in being leaders."

Overall, Hernandez is quite satisfied with how the first class has collaboratively and proactively faced the challenges, citing comments like those from a community pediatrician who wrote: "I've never worked with a resident [Paul Gilbert] who spent so much time to call and talk to me about a patient of mine. I can tell you I will remember this for a number of years."

Apparently, so will Rachel Dawkins, medical director of Johns Hopkins All Children's new continuity clinic.

"The residents are constantly reading and asking questions, keeping me on my toes," says Dawkins. "They're hard-working, very smart and dedicated: they're go, go, go all the time. Sometimes I say to Alex [Kim], 'You can't stay here—you have to go home.'"

Nurses have chimed in too, noting that the residents seek them out with updates if they miss a patient on morning rounds; they follow up in the afternoon, too. They also make strong efforts to recognize nurses' contributions.

"I hear questions asked in my direction a lot, which is really nice to hear," says Johns Hopkins All Children's pediatric nurse Holly Ball. "Wow, they really want to know what I think. They really value my opinion and incorporate it into their plan."

"Rather than say, 'I'm the physician and you're the nurse,' these residents have partnered with the nurses," says nurse manager Amanda McCollom. "It's true—they're phenomenal."

Most impressive regarding the residents' performance, Hernandez says,

Jonathan Ellen on the First Class

Jonathan Ellen, M.D.

Your first thought about designing this program?
That our whole system is built around licensed, board-certified physicians taking care of patients, so we could conceive a new residency program without the concern of covering services—we could do it solely on the basis of what was necessary to train. That's also consistent with the ACGME's (Accreditation Council for Graduate Medical Education's) push to train residents as learners rather than as service providers.

Is this notion of individualized learning plans part of that ACGME push?
Yes. After a certain level of core competencies is achieved, the ACGME wants residents to develop their own tract of learning that reflects their passions and interests. We want residents to have the space to consider their learning plan, and support that by training and judging residents' competency by milestones rather than rotations. Strong mentoring, we felt, was important in this learning model too, so the residents have both peer and faculty mentors in areas like career, education and research.

What about this personalized medicine aspect?
We do emphasize precision medicine, which recognizes multiple determinants of illness and wellness. It relates to the Aliki model, which says we want our residents to know their patients better. The final key, following the thinking of people like [Johns Hopkins] pediatric geneticist Barton Childs, is to study the disease in a patient and not the patient in a disease. If you look at four kids with asthma, you may find four different patterns of asthma with four different sets of determinants and four different illness/wellness cycles and responses to therapy. It's not important that you see enough patients to do the same thing for everybody but that you study asthma enough so you know how to treat the differences.

What has been the biggest challenge?
Reorienting the faculty to the way we envision training with a focus on fewer patients with higher levels of intensity, the idea of understanding heterogeneity instead of rote memorization and routine. In that regard, we now have a designing curriculum program for our faculty, along with workshops on teaching, a cohort of educational scholars, mentorship and curriculum evaluation training.

Your impressions of this first class?
They're dynamic leaders—not wallflowers—who have helped shape this program, which is what we wanted. When things don't go well, they tell us. They've pointed out places that need improvement. My hat goes off to Raquel Hernandez and [former medical education director] Chad Brands for being able to recruit these people from all over the country and the world.

What does the program mean for Johns Hopkins All Children's?
That we can create environments in which we challenge each other to provide the best care, to ask critical questions, make demands of ourselves and change medicine in the long run. Our residents can change our community and ultimately change medicine for the better. ■

were the words of an auditor from the Accreditation Council for Graduate Medical Education (ACGME) following his site visit in June 2015.

"He sat down and looked at me and said, 'You know, this is a really interesting program. This is a program that makes me want to do training again,'" recalls Hernandez. "It took me by surprise—I can't think of anything more complimentary a program director could hear from an ACGME site visitor."

Hall agrees, citing a dramatic shift in perspective among early critics.

"Those most skeptical have come back to say 'wow.' They had no idea how strong those residents would be at the end of the first year," says Hall. "The residents are excited to come in every day, passionate about living that life of patient advocate—they questioned things in a deeper way than residents typically would at the end of a first year."

But are they on a path to confidently and competently manage patient care upon graduation from the program? Will they be fully prepared for independent, unsupervised practice? Having completed only his first year, Gilbert reflects a common response.

"It's amazing when I look back because I'm only an intern and I'm seeing patients on my own, making decisions on my own, putting a plan out there on my own, and I feel comfortable with that," says Gilbert. "A lot of that comes from their trusting us, putting us out there and letting us fly on our own."

Interestingly, residency today, the Johns Hopkins All Children's program stresses, is not all about individual performance. Achieving core competencies, like medical knowledge and professionalism, is important, but perhaps the even more important core competency is teamwork.

Elena Rueda-de-Leon cites the flexibility of the education-based residency program, which allowed her to carve out time for research while caring for patients and their families.

"We've all become aware that medicine has become more complex, so every health professional is an important stakeholder and a critical part of the team," says Serwint.

That may be the most telling feature of the first class and its greatest strength—the ability to work together. In part, that was achieved through a scrupulous selection of candidates whose personalities complimented each other and who shared a vision of making a difference in pediatric medicine. The flexibility and transparency of the program helped connect them too. They all say they not only worked closely together but played together too, collectively checking out the local restaurants, the Dali museum, Tampa Bay Rays baseball games or just spontaneously deciding to walk toward the water, which in St. Pete is pretty much in any direction.

"The cohesiveness is there. We work so well together, help each other out, vent to each other," says Gilbert.

So, Elena Rueda-de-Leon, was Johns Hopkins All Children's a good match?

"I still can't believe I'm here," she says. "I keep trying to pinch myself." ■

For more information, visit ome.allkids.org/residency.

> "The most skeptical have come back to say 'wow.' They had no idea how strong these residents would be at the end of the first year. The residents are excited to come in every day, passionate about living the life of patient advocate—they questioned things in a deeper way than residents typically would at the end of a first year." — DAVID "DJ" HALL, M.D.

Julian's Story

by Wesley Peters

The Colon family, with Julian at lower left

THE 6-YEAR-OLD SON of two active-duty soldiers separated by service underwent removal of a life-threatening tumor by a multidisciplinary surgical team at the Johns Hopkins Children's Center.

Deployed in Afghanistan, Army Specialist Jayson Colon had been away from his family during life-changing events, like the birth of his second child. Then he came home to Syracuse, New York, in fall 2015 and switched roles with his wife, Alexis, who was assigned to advanced infantry training with the Army in Arizona. Having survived a war, what came next for the new stay-at-home dad he could never have anticipated—his 6-year-old son, Julian, was diagnosed with an unusually extensive and complex tumor in his chest, heart, lungs and neck, and likely needed surgery. Alone with another serious battle on his hands, Jayson began anxiously searching for a surgeon experienced in resecting such complex tumors. Meanwhile, he couldn't stop thinking about how his wife across the country was taking the news.

"I know how it feels to be helpless," Jayson says, "being away from home when you need to be there."

As it turns out, help and three surgeons, not one, were about to come to the rescue of Julian and his family—and in a somewhat serendipitous way. Around the time Julian was beginning to experience symptoms, including unexplained exhaustion and a loss of feeling in his left arm, Julian's grandmother, Diana Colon, met a man named Todd Frady from Baltimore through the online game Words with Friends.

"We played back and forth and started having this kind of rapport, talking about family," says Frady.

When Diana learned that Julian had been diagnosed with a tumor and likely needed surgery, she mentioned it to Frady, who, unbeknownst to her, was director of access services at Johns Hopkins. Frady responded, "I'm sure your physician will work out fine, but if you need a second opinion, I work at Johns Hopkins."

Soon after that Julian, his father and his grandmother, thanks to Frady and Katie Swan, director of operations for the Department of Surgery, found themselves at the Johns Hopkins Children's Center. Their first consultation was with pediatric surgeon Eric Jelin.

While an upstate New York cardiologist had identified a small section of a tumor and diagnosed it as a neurofibroma, a benign tumor that forms in the myelin sheath of the peripheral nervous system, Jelin discovered Julian had an unusual tumor growing in his chest that was making its way toward his heart, lungs and neck. Indeed, the tumor had weaved itself around several vital organs. Rather than a neurofibroma, Jelin saw on imaging a ganglioneuroma compressing Julian's trachea and spinal cord, which explained the loss of strength and feeling in his left arm. He not only needed surgery, he needed it right away.

"Seeing his deviated airway on the first CT scan got us moving," Jelin says. "His entire airway could've collapsed had we waited any longer."

The "we" included neurosurgeon Allan Belzberg, a peripheral nerve specialist, and pediatric cardiac surgeon Luca Vricella, as Jelin knew the removal of Julian's tumor would require the expertise of several disciplines of surgery and likely two or more staged surgeries, all with risks. In the first surgery, for example, there were the risks of nerve injury paralysis and airway collapse.

"We needed a bypass team on standby in the OR in case his airway collapsed," Jelin says. "That became our primary concern during the initial operation."

To reduce such risks, specialists in pediatric radiology, pathology and cardiac anesthesiology joined the team. Neuromonitoring specialists, who periodically test neurological response during surgery, were also needed to ensure the surgeons weren't severing Julian's critical nerves. With the team assembled, Jelin was satisfied: "Quickly after Julian walked through the door, we were fully engaged and prepared for the operation."

Julian's father agreed: "I knew we were

in good hands."

A Multi-Specialty Approach

During the first surgery, Jelin performed a thoracotomy, or incision in Julian's chest, to allow Belzberg and Vricella to gently resect the tumors from the spine and the heart. Vricella recalls concerns during the heart resection.

"That may have been the most delicate part of that operation, considering some of the risks," says Vricella. "Cardiac injury, lung injury and bleeding from the aorta were all possible during the cardiac dissection."

Fortunately, Vricella managed to avoid these complications. By the end of the first six-hour operation, the team had successfully scooped out the tumor, removing the majority of tumor tissue from Julian's body to relieve pressure from the boy's lungs and heart. Now, only a small amount of the tumor remained in Julian's neck, though that mass was dangerous and hastened the second surgery.

Meanwhile, Julian awoke in the pediatric intensive care unit to find his mother waiting for him. Alexis had been able to obtain emergency leave from Fort Huachuca in Arizona to be with Julian and her family in Baltimore. They stayed at the Ronald McDonald House in Baltimore and enjoyed trips to the Maryland Zoo and the National Aquarium. The family took turns supporting Julian, and Jayson found himself handling the "night shift" while Julian slept.

"I'm used to not getting any sleep," Jayson says, reminded of his time in combat. "As long as I was up by his side, that's OK."

Together, the family felt more intact now but was still concerned, as Julian had to undergo that second operation.

In that procedure, Jelin protected vital structures while Belzberg removed the tumor. Possibilities for complications remained as abundant as the first operation, with surgeons closely monitoring for signs of stroke, airway injury, and bleeding from the carotid artery and jugular vein. Belzberg fortunately avoided damage to the brachial plexus, which would have resulted in arm dysfunction.

"There was one moment when I resected the tumor and realized that touching one of his nerves would paralyze his left arm," Belzberg says. "That's how closely this tumor was linked to his nervous system."

After four hours of strenuous resection, Jelin and his team concluded the surgery. Over the course of the two operations, they'd managed to remove 95 percent of the tumor, leaving only 5 percent of harmless tissue encasing a nerve. That nerve, which Belzberg identified as vital to the function of Julian's left arm, was left alone.

"We operated under the assumption that the tumor was benign," Jelin explains. "The mass we left in his body is certainly harmless, though we will continue to monitor it."

At Julian's follow-up appointment one month after his surgery, pediatric surgeon Eric Jelin checks his range of motion.

Neurosurgeon Allan Belzberg.

The surgeons exited the operating room to report the good news to Julian's family. Julian's grandmother and parents rejoiced at the news. The surgeons also shared in the celebration, ecstatic after two successful surgeries.

Veterans Day Followup

A month later, the Colon family visited the Johns Hopkins Children's Center again for Julian's follow-up appointment. It had not occurred to him, says Jayson, that he had scheduled the appointment for Veterans Day.

"To me, it's just another day; you don't expect anything in return – it's my job, my duty, and I'm here to serve," says Jayson. "I didn't expect anything today, but now I'm overwhelmed to see my son in good health."

The family had reason to celebrate. Julian's postop appointment went well, with Belzberg and Jelin reporting that Julian was healing well. Belzberg jokes that Julian, so rambunctious and energetic, is hard to keep still during check-ups. Imaging also confirmed that the

Pediatric cardiac surgeon Luca Vricella

Patient Access: Making the Experience Better

Katie Swan got the call from Todd Frady one Friday night last fall. The patient was a 6-year-old boy from out of state with a complex disorder that would likely need the management of multiple specialists. The boy, named Julian, lived in Syracuse, New York, and needed to be seen as soon as possible. The parents, he added, were both active-duty soldiers; the father had just returned from Afghanistan, and the mother was preparing for deployment. The story struck close to home for Swan, whose own son had been deployed.

The next morning, Swan, director of operations for the Department of Surgery, called the boy's father and by Monday morning had his signed release to obtain Julian's medical records. On Tuesday morning, her email account was filled with records from medical facilities in upstate New York. Yes, Frady was right, she realized in reviewing the records, this child needed consultation with multiple surgical specialists. But who first?

> "I can't cure them, but I can make their experience better." – KATIE SWAN

She asked one of her favorite physicians, surgical oncologist Mark Duncan, for a recommendation. Perusing the records, he suggested pediatric cardiac surgeon Luca Vricella, whom he called at a conference in Chicago. Vricella said, yes, he should be involved, but he suggested general pediatric surgeon Eric Jelin, also at a conference, as a good starting point. By the time the sun set that day, Julian was scheduled to meet the following Friday with Jelin, who would consult with Vricella and neurosurgeon Allan Belzberg.

"So, before the end of the day on Tuesday, we had this multidisciplinary review of records remotely," says Swan. "It was amazing."

"Katie and the surgery patient access group moved a mountain in getting Julian here and into the hospital," says Frady.

Sometimes serendipity or a personal connection plays a hand in getting medical records and patients to the right doctors at Johns Hopkins swiftly, Swan says.

residual tumor, devascularized during surgery, would not have the ability to grow quickly, if it all. Still, such a drastic operation leaves challenges.

"He favors his left side a little bit and still has pain at night," Belzberg says. "He's getting physical therapy now to restore range of motion in his arm. There's a small difference in hearing between his left and right side, something we'll want to continue to monitor."

Despite these difficulties, Julian shows strong signs of healing. Belzberg extends his hand and Julian squeezes it firmly, affirming the boy's vitality. His hand is no longer cold but warm with a pulse, a relief to everyone in the room.

"His recovery from surgery has been excellent," Jelin says. "In terms of post-operative complications, I think we're out of the woods."

After the follow-up, Jelin and Belzberg accompanied the Colon family to the Johns Hopkins Veterans Day Ceremony outside of the Children's Center. Frady also joined the family at the ceremony, gratified with Julian's outcome.

"What's really great about this is that Johns Hopkins helped two active-duty soldiers care for their child. If I'd known we were capable of that, I would've gotten them here sooner," says Frady. Reflecting on the random connection with Julian's grandmother, he adds: "Just consider the chances of meeting someone online. Then consider the odds that they need your help, and you're connected to the hospital. You'd expect to see that in a movie, but in real life?" ■

See video: "Caring for the Courageous: Julian's Story"

General pediatric surgeon Eric Jelin

> "His recovery from surgery has been excellent. In terms of post-operative complications, I think we're out of the woods."
> – ERIC JELIN, M.D.

Access gurus Todd Frady and Katie Swan

But in all cases, she adds, it's the empathy and resolve of staff members in access services and operations that meet the needs of patients and families, especially those traveling long distances from outside of Maryland. Although they don't place their hands on patients, Swan notes, they consider themselves members of the health care team, and they mobilize their brain power and compassion to make the patient's experience as efficient and stress-free as possible. That's why Swan put her concierge hat on and met Julian and his family when they arrived, gave them her cellphone number and told them to call whenever they needed anything, helped them find low-cost housing when Julian was admitted, and obtained comp tickets for the National Aquarium and the Maryland Zoo, among other activities in Baltimore during their stay.

"Being in the hospital can be a scary experience—they need their go-to person," says Swan. "Our job is to make it easier for patients to get to us, and then to focus on the patient experience while they are here. I can't cure them, but I can make the experience better." ■

—GL

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pediatricrounds

Pediatric neurosurgeons Alan Cohen and Shenandoah Robinson

A "Couple" of Neurosurgeons Bring Multiple Dimensions and Each Other to Johns Hopkins

by Christy Brownlee

ALAN COHEN, THE NEW director of the Johns Hopkins Division of Pediatric Neurosurgery, recently gave the Presidential Address at the American Society of Pediatric Neurosurgeons' annual meeting about the art of healing, which he condensed into three Hs: humility, humanity, and humor. Throughout his career, he has tried to focus not only on treating the disease but also healing the child. This includes the empathetic care he tries to deliver to his patients and their families as well as donning sequined jackets and pants to sing karaoke with his patients as his alter-ego, "Dr. Elvis."

Along with the art of healing, Cohen is also extremely focused on its science. In addition to furthering the excellent clinical care and training that has made the division among the best in the country, Cohen—who joined the division this spring along with his wife and fellow pediatric neurosurgeon, Shenandoah Robinson—plans to bring in new technologies that he and others have developed to make neurosurgery safer, particularly for the youngest patients.

One of these advances is three-dimensional printing. By creating models based on a patient's own unique anatomy, Cohen says, surgeons can practice the procedures before the real surgery, where the stakes are much higher.

"Models enable surgeons to see the three-dimensional relationships among the blood vessels, cranial nerves and other neural structures to find the best possible approach," he explains. "It's like a batter taking a practice swing. By practicing the surgery before going into the operating room, we can make the procedure safer."

Three-dimensional models will also revolutionize training for residents and fellows, he adds. Because of duty hour restrictions, trainees have less time to learn. But they still need to gain the same experience, and practicing on realistic models can help fill the learning gap.

Another area that Cohen hopes to focus on in his new role is minimally invasive surgery. As chief of pediatric neurosurgery at Rainbow Babies in Cleveland, and then at Boston Children's Hospital, he developed a minimally invasive surgery research program, creating new techniques and microsurgical tools that allow significantly smaller exposures to access areas deep in the brain.

"With advances in optics, miniaturization and computerized guidance systems, we can get to difficult areas more safely, with less manipulation of the brain," he says. "In many cases, that can reduce the morbidity and the potential for complications."

In addition to launching a new minimally invasive surgery laboratory in Hopkins' Carnegie Building, Cohen says he's looking forward to building on the collegial and multidisciplinary care approach already in place, working with experts in pediatric neurology, orthopedics, oncology, physical medicine and rehabilitation, and other areas.

"Working as a team enables us to do far more than anyone could do individually," he says. "The sum is greater than any of the individual parts." ■

Pushing ECMO's Boundaries

by Gary Logan

JOHNS HOPKINS PEDIATRIC burn/trauma surgeon Dylan Stewart remembers 7-year-old Reese Burdette well — indeed, as it turns out, he couldn't forget her. Seriously burned in a house fire in 2014, she suffered significant injuries — including an infection and bleeding in her lungs—from smoke inhalation so bad that she rapidly deteriorated and suffered a cardiac arrest during her first week in the pediatric intensive care unit (PICU). Stewart told the girl's parents she would likely die and her only hope was ECMO, or Extracorporeal Membrane Oxygenation, a pediatric heart-lung bypass treatment that would provide oxygen for her body and hopefully allow her lu ngs to rest and heal. But ECMO, he warned the parents, is not designed for patients like Reese. That's because ECMO requires anticoagulation therapy, which puts patients with open burns at significant risk of bleeding and infections. In addition to her lungs, Stewart was particularly concerned about severe burns on Reese's left leg that would likely get infected were she placed on ECMO. Yet she seemed to have no other options.

"She had already suffered a lot of complications in the PICU," says Stewart. "She kept bleeding into her chest and she had a fair amount of bleeding in her burns. We couldn't ventilate her, so our last possibility was ECMO."

The parents agreed. Stewart was hopeful and tried to be confident that Reese would survive. He was comforted by Johns Hopkins' long history in providing ECMO to patients in the mid-Atlantic region and its best practices approach to keep up with advances in ECMO care. He also knew that the four-bed ECMO program in The Charlotte R. Bloomberg Children's Center building that opened in 2012, staffed by deeply experienced and highly skilled intensive care physicians, nurses and respiratory therapists, offered the latest innovations in ECMO technology. Since ECMO was launched at Johns Hopkins in 1980, it has garnered a reputation as one of the premier ECMO programs in the country. Still, Reese's lung damage was so severe that Stewart doubted a good outcome. What happened next would astonish not only Stewart, the Hopkins ECMO team and PICU staff, but the ECMO community nationwide.

Prior to Reese's experience, the longest period of time a patient at Hopkins had been treated with ECMO was 45 days. Reese was on traditional ECMO for 60 days. Then, due to heart failure in her right ventricle, she was supported by a ventricular assist device (VAD) with an inline oxygenator — a make-shift lung of sorts because Reese still needed oxygen — for another 491 days. In total, Reese was managed by the ECMO/VAD team for 551 days.

"That length of support has never been done," says critical care medicine specialist Kristen Nelson, director of Johns Hopkins' pediatric VAD program. "Reese has become very well-known at ECMO and VAD meetings across the country."

So how was Reese able to survive that journey? There were many factors

In the ECMO/VAD suite, from l to r, PICU medical director Ivor Berkowitz, ECMO director Melania Bembea, and ECMO/VAD coordinator John Young.

at play. One was the ECMO team's use of smaller and more biocompatible circuits and pumps that allow patients to undergo ECMO therapy without the necessity of anti-coagulation therapy, reducing the risk of life-threatening bleeding for patients with burns like Reese.

Another factor was what Stewart calls "meticulous ECMO maintenance" and "phenomenal infection control." Says Stewart, "The fact that the cannulas stayed in for as long as they did without her getting an infection is a testament to her care in the PICU."

ECMO/VAD coordinator John Young concurs, citing 24/7 monitoring of Reese's status, which swung like a pendulum. Amazingly, he adds, with each new day she was defying the odds in the academic literature that predicted increased risk of mortality each day after 30 days on ECMO.

Yet another factor was creative thinking by staff. As the ECMO team was planning to transition Reese back from her central cannulation for her VAD to peripheral ECMO cannulation, they discovered that her renal dialysis catheter had become colonized with bacteria and needed to come out. Could she continue on dialysis through a central line?

Young knew that a device called a Hemolung, which gives the lungs a rest by reducing carbon dioxide in the blood by mechanics, was one option, but none were available. Looking at the anatomy of the Hemolung, he realized that the ECMO team had existing components that could be reconfigured to allow a similar dialysis interface with the VAD circuit.

Providing that innovative support for Reese allowed the team to get her up and into physical therapy. In December 2015, she was determined to have good biventricular heart function and was taken off the VAD. In March 2016, she was discharged after a total stay of 662 days in the PICU. Lessons learned?

"Now we know we can do more than we thought we could do, especially for patients with lung disease," says Nelson. ■

A Novel Approach for Severe CDH

GENERALLY, MILD TO MODERATE cases of congenital diaphragmatic hernia (CDH) — in which a hole in the diaphragm prompts abdominal organs to move into the chest, resulting in abnormal prenatal growth of the lungs and pulmonary hypertension — have been well managed with a mainstay postnatal approach: closure of the defect in the diaphragm at birth, which returns the organs to the abdominal cavity and allows the lungs to grow. Studies show survival of 67 to 90 percent of these patients, although not without the risk of neurodevelopmental, nutritional and pulmonary function morbidities.

"These newborns need to be stabilized and managed very carefully by the neonatologist to avoid respiratory injury," says Johns Hopkins pediatric surgeon Eric Jelin. "In less severe cases we can usually get by with gentle ventilation to avoid damaging the lung. Once the baby is stable, we can fix the defect, though the patient may have some developmental and feeding issues."

But what about the severe cases of CDH, those where the liver herniates well into the chest and poses an even greater risk of complications? In the 1990s, open fetal CDH repair was attempted mid-gestation but found to be flawed, resulting in the death of the fetus.

Now the Johns Hopkins' Center for Fetal Therapy, under the direction of perinatologist Ahmet Baschat, offers a minimally invasive approach in utero that holds promise for reducing the mortality and morbidity of the more severe cases of CDH. In a recent case of right-sided CDH, which carries disproportionate high morbidity and mortality, Baschat and Jena Miller of the fetal surgery team accessed the trachea of the fetus at 26 weeks gestation, percutaneously and under ultrasound guidance, through a tiny, 3 millimeter fetoscope. They then deployed a tiny balloon in the trachea, plugging the lumen and allowing the lungs to grow and abdominal organs to drop. Using the same technique four weeks later, they pulled the balloon out so that the baby would be born without any airway obstruction.

The procedure does come with risks, mainly premature rupture of membranes and preterm labor. For the potential complication of preterm labor prior to elective balloon removal, a multidisciplinary team is on standby 24/7. How did this patient do?

"The great news about this case is that we were able to get the balloon in and keep it in for the appropriate period of time, and the child went to term," says Jelin. "Our patient did require an anti-reflux operation, which we do laparoscopically, and a feeding tube, which is very common for these patients. He still has a low oxygen requirement but he's growing and getting better."

Visit the center's website. hopkinsmedicine.org/fetal_therapy. ■

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A Center for Treating Complex Craniofacial Anomalies

Multiple pediatric subspecialists combine algorithmic care, the latest technology and science to achieve the best outcomes.

PEDIATRIC CRANIOFACIAL SURGEON Anand Kumar's heart goes out to newborns with Pierre Robin Sequence, a congenital condition marked by a severely small mandible and a cleft soft palate, putting them at high risk of airway obstruction, as the tongue frequently falls to the back of the throat. Also, the typical small opening in the roof of the mouth may cause choking or regurgitation of liquids through the nose. Needless to say, the condition brings breathing and feeding difficulties, too. These patients, stresses Kumar, need prompt multidisciplinary care.

For newborns in the Johns Hopkins Children's Center's neonatal intensive care unit (NICU), appropriate consultation most often happens immediately or soon after birth. However, some referrals from other hospitals without craniofacial specialists have been delayed due to miscommunication on either end. Often the confusion is around who the patient with these anomalies should see—ENT, genetics, plastics, pulmonary.

To ensure appropriate and expeditious referrals in these cases, Kumar and colleagues led the development of a condition-specific algorithmic care model for craniofacial patients. When a referring hospital describes a newborn with a suspected small jaw and cleft palate, for instance, the NICU physician-on-call searches such signs and symptoms on the algorithm and sends one email that connects with all of the appropriate subspecialists.

"I like the algorithm because it touches on many specialties and is team based not person based," says Kumar. "Referring physicians from other hospitals like it too—they're calling back with new patients because they felt we did a nice job the first time around getting their patient in and appropriately treated. They're telling us algorithmic care is improving our outcomes and patient satisfaction."

Low-dose CT scanners interfaced with 3-D cameras enhance the planning of procedures for craniofacial surgeons like Anand Kumar.

The other piece of that equation is the Johns Hopkins Cleft and Craniofacial Center, where team members diagnose, treat and study anomalies like Pierre Robin Sequence. Relying on the latest technology, including low-dose CT scanners interfaced with 3-D cameras, they have enhanced their diagnostic capability to virtually plan surgical procedures and provide the most appropriate and safest care. Using a dental cone beam CT, for example, they're able to produce precise 3-D images of a patient's teeth, soft tissues, nerve paths and bone at lower radiation compared to conventional CT.

Because Johns Hopkins craniofacial specialists like Kumar are also scientists focused on advancing care through research—Kumar's research includes cranial bone regeneration—they constantly look for and develop innovative therapies for conditions like neonatal airway obstruction. Traditional treatments for the disorder involve the use of breathing and feeding tubes and bone grafting procedures, which pose risks of blood loss and tissue damage, among others. Following the center's distraction osteogenesis protocol, Kumar and colleagues reduce these risks by manipulating the jawbone and inserting a device to gradually move it forward, bringing the obstructing tongue with it from the back of the throat. The device is initially adjusted, followed by a three-month healing period, and then removed to allow the patient to heal hardware-free.

"By moving bones slowly over time, the technique avoids soft tissue damage and promotes bone formation with no permanent hardware," says Kumar. For more information, visit hopkinsmedicine.org/cleft. ■

–GL

Printing the Heart

PEDIATRIC CARDIAC SURGEON and biomedical engineer Narutoshi Hibino began his study of tissue engineering in Japan and continued his research in the United States when he arrived at Yale a decade ago. After completing fellowships at the Children's National Medical Center in Washington, D.C., and Nationwide Children's Hospital in Ohio, he joined the faculty at Johns Hopkins Children's Center, where we sat down with him for a brief update on his current activities.

Tell us about your research.

I began my research studying the cells' role in generating cardiac tissue, but over time my team and I found that we don't need to grow cells when implanting artificial devices such as vessels into the heart because cardiac cells will grow over these new structures. It's incredible. Currently we're focusing on 3-D printing to design and implant artificial vessels into the hearts of patients with congenital heart disease.

How did you get interested in 3-D printing?

3-D printing, which has become popular in medicine lately, gives the surgeon the opportunity to make a model of the patient's heart, and print and implant the new structure in a way that works with the patient's unique anatomy. Surgeons face a real challenge when tailoring unique structures, such as vessels, under the pressure and time constraints of surgery. Our hope is that 3-D printing can help solve those problems.

Does the heart accept that new structure?

Yes, though we are constantly trying to improve printing materials. The plastic in 3-D printing is too hard, not pliable enough. Other materials have proven to have their own limits. We continue to look for the ideal fit.

What's next?

We are trying to bring our vision for medicine closer to the reality of medicine. I hope that in the future we can start generating cardiac tissue, which is far more difficult than 3-D printing. My goal is to improve outcomes and quality of life for my patients, and that's what fuels and inspires the work that I do in my lab day in and day out. ■

—GL

In his lab, pediatric cardiac surgeon Narutoshi Hibino.

Julia McMillan: The Teacher

by Gary Logan

THERE'S A COOL CALM in Julia McMillan. She listens intently to questions coming her way in her 8th floor Bloomberg Children's Center corner office, deflects nothing and breathes everything in, percolates a response and then delivers it filter free, with eyebrows raised and a smile.

One senses she appreciates a genuine exchange. She can relate well with a Grand Rounds audience but she may be best one-on-one, connecting candidly with a colleague or student, a life-long learner like herself, a teacher like herself. Indeed, aside from everything else she has become in pediatrics over the past four decades—nationally known leader in academic medicine, infectious disease specialist, physician scientist, author and editor, speaker—she is a teacher at heart. Looking at her history, how could she not be?

McMillan's first teacher was her father, an internal medicine practitioner in small town Southern Pines, NC, population 6,000 around the time 8-year-old Julia joined him on Sunday afternoon house calls. It was a time when there were no electronic medical records, no Medicare or Medicaid, an era when doctors like her father were personal physicians for their patients. For McMillan, from her view on the front seat of her father's car or living rooms where she'd pet collies, it would turn out to be a life-influencing experience.

"It was a way of getting to understand what a doctor could be for his or her patients," says McMillan. "Of course, there were certain houses where we knew they would give us cookies, or they had a nice dog we wanted to play with."

In high school, however, English literature would resonate more for McMillan than an academic path to medicine. She also found herself stirred by her teachers, who took the time to get to know her. In them McMillan started to see a teacher in herself.

"In a small town, teachers have a personal relationship with you," says McMillan. "They were members of our community—we'd pass them on the street, see them in the grocery store. They were great influencers."

Moving on with these mentors in mind, McMillan enrolled as one of 945 students at Salem College in Winston-Salem, NC, where she would major in English lit. The valedictorian of her high school class, she had wanted to attend the University of North Carolina (UNC), which along with most prestigious universities at the time did not accept women. But when UNC changed its policy McMillan transferred to the school, where she graduated in 1969. From there she headed north to Manhattan and a staff position with the *New York Review of Books*, but feeling a bit miscast: "I couldn't stop thinking I wanted to be a teacher."

> "To watch somebody go from a medical student to a pediatrician over a period of three years, you build some investment in that person."
>
> – JULIA MCMILLAN, M.D.

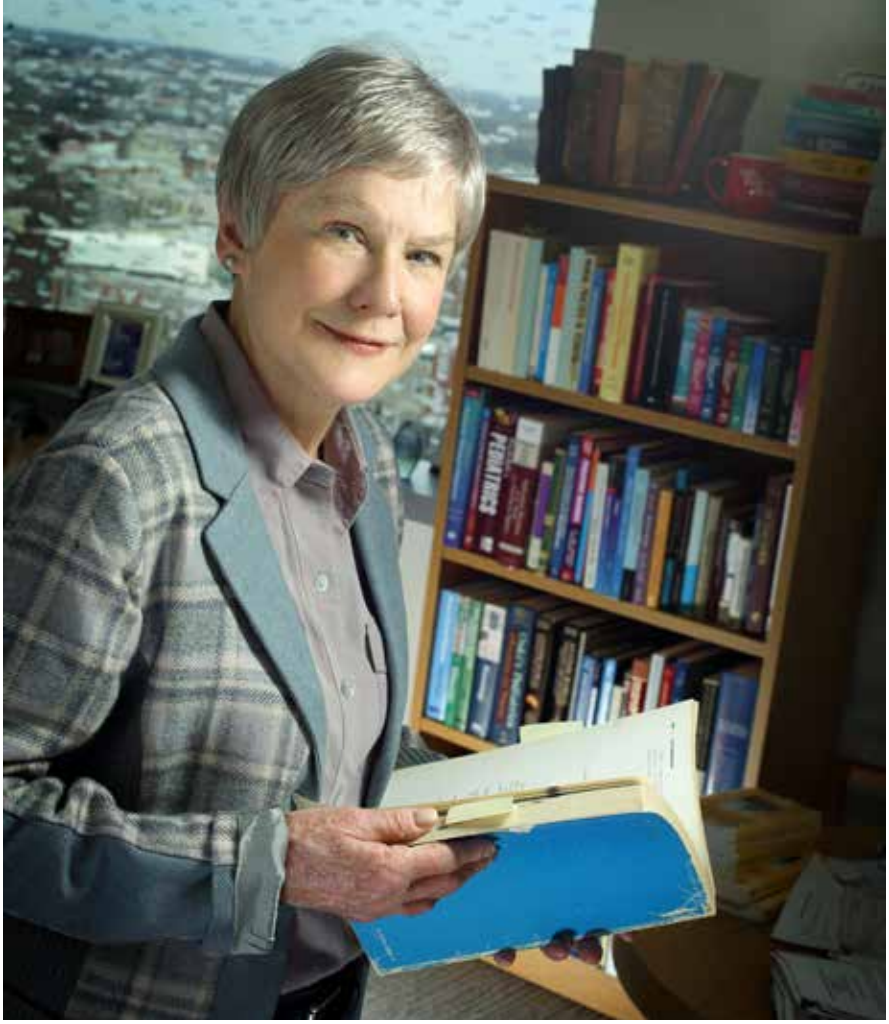
So, her next stop was a graduate teaching program at UNC in 1970, where McMillan enjoyed the seminars but not her first real classroom experience with eighth-graders. Teaching still very much on her mind but not in a public school, McMillan headed home one weekend for a career consultation with her first teacher, her father. Of course, a livelihood in medicine—but as a nurse, not a doctor—had occurred to her, too. Why not become a physician instead, her father suggested.

Like a lot of women in that time and place, McMillan says, she expected to get married as a young woman and have children, which might not fit with the demands of a doctor. But what was a casual suggestion by her father swiftly morphed into a career choice.

"Suddenly my mind changed—I could be like him, I could take care of patients," says McMillan. "Just because I'm a girl and may eventually get married and have children doesn't mean I can't do all those things."

McMillan did get married and moved to Syracuse, where her husband worked, and attended medical school at the State University of New York's Upstate Medical Center. Next came a pediatrics residency, where she met another career-changing role model, Frank Oski. Feeling the need to develop deep expertise in one area, McMillan then completed a fellowship in infectious diseases and joined the faculty. Then she discovered her career would be taking yet another path, this one unexpected.

"Dr. Oski came into my office and said I should get more involved with



Lifelong learner and teacher, Julia McMillan, in her office.

the residency program," says McMillan. "Little did I know he had already transferred all of the residents' files over to my secretary and basically made this decision that I was going to help run the residency. So, I did."

Four years later, McMillan took the helm of the Hopkins residency program after Oski was named chair of pediatrics at Hopkins. Recalling her first Friday case conference, McMillan Immediately realized she had stepped into a rich new academic world: "I can still tell you the resident who was presenting, Alicia Neu [now pediatric nephrology director at Johns Hopkins], who gave the most beautiful, complete and thoughtful presentation of a patient I had ever heard. And I thought, 'Man, if this is the kind of people I would get to work with and to help train, it would just be such a privilege.'"

Indeed, what mostly permeated the Hopkins air, she adds, was a palpable belief of being the best, which had special meaning for the residency program.

"The determination that Hopkins has to be better and better at whatever you're doing, applies to the faculty's desire to make the residency program excellent," says McMillan.

At Hopkins, McMillan the infectious disease specialist also found a school of public health in her sandbox. Public health docs would cross Wolfe Street and present at pediatrics grand rounds, join ward rounds in the Children's Center, and see patients in the Harriet Lane Clinic, which in McMillan's mind infused pediatricians in training with a sense of public health responsibility in everything they did. Hopkins emphasis on community service, which she experienced firsthand through the medical home model in the Harriet Lane, also impressed her.

But as much as Hopkins had impressed McMillan, McMillan had impressed Hopkins. Her new colleagues quickly saw in her a master clinician and a superb, forward-thinking educator. George Dover, director of the Department of Pediatrics, notes that McMillan had an acute ability to forecast and incorporate changes in pediatric medicine into the residency program: "Julia has been for a long time one of the thought leaders in adapting residency training to a complex new medical environment."

Janet Serwint, who was named residency director in 2012 when McMillan was appointed executive vice chair of pediatrics, agrees: "She was very much an advocate of blending subspecialty work for both the outpatient and inpatient experiences, which she implemented here at Hopkins and nationally."

But most impressive, Serwint adds, was McMillan's advocacy of the residents and her calm under fire in managing what can be a very stressful job.

"Dealing with residents' concerns about the long hours and the many demands, you need to treat all residents the same," says Serwint. "She always remained very calm and level headed, and very wise."

Former chief resident Michael Barone echoes Serwint: "Julia was the first person to actually allow me to reflect on how I was doing, what I was doing, and my goals. I remember her telling me, 'You know, you're doing a really good job,' which was something I had never heard before in medicine. Needless to say, it was uplifting."

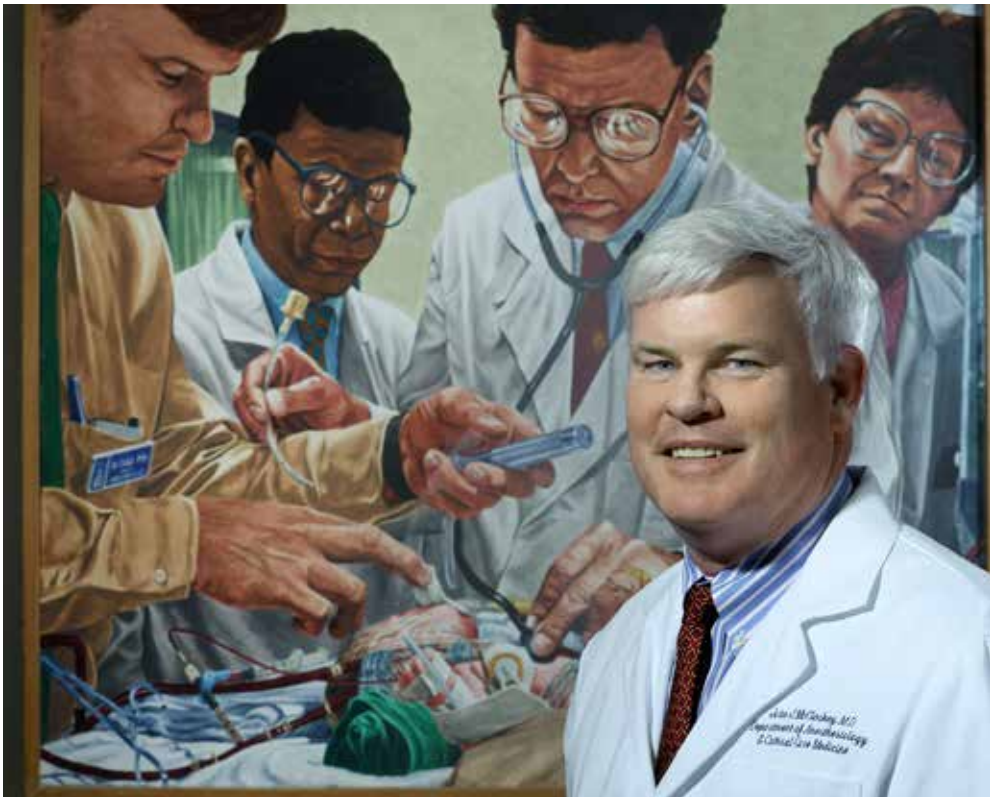
McMillan takes it all in stride. Rather than cite her own accolades, of which there are many, she simply acknowledges "the privilege of working with strong pediatricians who have gone on to be leaders in lots of ways around the country." Indeed, it's that extended family she helped nurture, not rewards, that resonates in her.

"To watch somebody go from a medical student to a pediatrician over a period of three years, you build some investment in that person," says McMillan. "Lots of people and patients participate in what happens to them, but I feel a little bit of ownership, too."

McMillan did retire in January 2016, although she says she still feels very much part of Johns Hopkins Children's Center. So, what was it like working there? Cool and calm, McMillan doesn't flinch: "It was the best job in the whole world." ■

Q&A with John McCloskey

Johns Hopkins Children's Center new director of pediatric anesthesia and critical care medicine is no stranger to the institution. He was a resident in both pediatrics and anesthesia at Hopkins, then a fellow in pediatric anesthesia here before joining the faculty as an instructor in 1990. Here he talks about what pointed him toward pediatric anesthesia and Hopkins.



As an anesthesiology fellow at Johns Hopkins, John McCloskey found himself in an artistic rendering (at far left) of renowned pediatric anesthesiologists David Nichols and Mark Rogers, along with then fellow Kyle Walker.

What got you interested in medicine and anesthesia?

I'll tell you why—I'm the oldest of 10 children. So, that was sort of my first pediatric residency. Also, I came from a medical family. My mom and grandmother were nurses, and my dad was an adult intensivist, which is how I got interested in the specialty.

What led you to Johns Hopkins?

I would say my dad and Mark Rogers, who founded the PICU here and revolutionized anesthesia and critical care medicine at Johns Hopkins and across the country. After listening to a presentation by Rogers at one of the Society of Medicine meetings, my dad mentioned to him my interest in critical care medicine. Rogers replied "Have him look into it and see what happens." So I did.

Any observations during your residencies and fellowship here?

What most impressed me was the intellectual curiosity of the place, the ability to answer any question that one would have about medicine—not only within the Department of Pediatrics but beyond it, too. There are no boundaries here.

Can you give us an example?

If we had a clotting issue with a patient we could consult with Bill Bell, an adult hematologist and the world's expert on clotting. It was easy to interact across a variety of disciplines here, and that's still present to this day. That's unique to Hopkins and one of the things that really attracted me about coming back.

How would you characterize the division?

Well, we're recognized as one of the foremost divisions in pediatric anesthesia and critical care medicine. We've had great people here, including Mark Rogers and David Nichols, and we still have great people like Ivor Berkowitz, director of our PICU, and Myron Yaster, who heads our pediatric pain service. We also have a hard-working group of younger, smart and dedicated people.

And the focus of faculty today?

Much of it is on quality improvement, looking at how we can do things better. Through research we're trying to improve the management of the patient with difficult airway. We're also making great inroads to pediatric regional anesthesia—our pediatric pain management program is well known nationally. On the critical care side, we're internationally known for our CPR research and neuro critical care research. We're also doing a lot of work on delirium.

And what do you do for relaxation?

My favorite activity is sailing, so certainly it's nicer being close to the bay. I'm more a cruiser than a competitor, though I like the bumps and having the sheets in my hands. ■

Our Man in Bangladesh

Pediatric pulmonologist Eric McCollum takes on global child respiratory health.

by Wesley Peters

"Global health is a marathon," Eric McCollum begins. "Not a sprint."

McCollum, a pediatric pulmonologist at Johns Hopkins Children's Center, could call his career a marathon, as well. The distance that he's covered, bringing innovative respiratory medicine to countries around the world, suggests he's been practicing much longer than he has. Certainly Eric McCollum isn't new to medicine, but he'll need new pages in his passport soon.

Beginning his global health career in 2003, McCollum spent his final year of medical school volunteering at a Leprosy Mission Hospital in Uganda. While he calls the work intriguing, an infectious disease specialist from Spain steeped in the international health field, Jamie Ollé, changed McCollum's career trajectory. Working with HIV patients before antiviral therapy became readily available in Africa, McCollum admired the older doctor's work.

"He was doing really amazing work with little resources," McCollum says about Ollé. "That taught me how to work without funding, which is crucial in this field."

The next ten years whisked McCollum across the globe, from the Dominican Republic to Malawi and eventually Bangladesh. The different cities and countries sound like the haunts of an international spy, but these countries need medicine rather than espionage. McCollum's work in these different locations included fighting pediatric AIDS, pneumonia and other respiratory illnesses that affect children in highly polluted areas. His contributions helped countless children in low-resource settings.

In 2011, McCollum returned stateside and began a three-year fellowship with pediatric pulmonary medicine at Johns Hopkins. Its East Baltimore campus quickly became a conduit in his global endeavors, allowing McCollum to travel between Malawi and Bangladesh where he continued to contribute to clinical settings. Realizing his pulmonary specialty was underrepresented in these countries where respiratory illness was high, McCollum became a faculty member in 2015 and transferred to Bangladesh full-time.

A watershed moment for McCollum came during a return trip to Uganda, when he saw that health workers had finally received adequate resources and funding. The work that Ollé had started, inspirational for McCollum at the beginning of his career, had developed into a corps of pediatricians focused on fighting HIV. Such an experience helped McCollum identify some of the challenges facing global health, especially for children with respiratory illness.

In Bangladesh, Eric McCollum, at far right, with colleagues Nuran Naher and Nabidul Haque Chowdury from Johns Hopkins Bloomberg School of Public Health.

"In Bangladesh right now the standard of care in the hospital is to put children with bronchiolitis, severe asthma and pneumonia on oxygen, but their mortality is high," says McCollum. "We're working on lower-tech, high-flow interventions for community health centers that deliver both pressure and oxygen, which reduce the work of breathing."

McCollum adds, "There are groups of kids who have access to care but the quality of care needs improvement. There're always groups of kids who just don't have access to care, too."

Even if improvements occur at a slow pace—marathon pace, in some cases—McCollum knows his work makes a difference around the world. ■

people&philanthropy

CMNH Pays Tribute To MIX 106.5 Radiothon Deejay Maria Dennis

by Amanda Leininger

IN BALTIMORE, THE annual MIX 106.5 Radiothon benefiting the Johns Hopkins Children's Center is a beloved and time-honored tradition. Each year, the entire team at MIX 106.5 joins together to rally the Baltimore community around our patients, families and staff, and each year they pull through like never before. Each member of the MIX team—from the promotions director to the sales team, to the DJs to the front desk staff—plays an integral role in helping us raise much-needed funds that are a lifeline for our hospital.

While every team member at MIX deserves high accolades for their commitment to help our patients, the Children's Center had the honor of recognizing Maria Dennis as Children's Miracle Network Hospitals' 2016 English Radio Person of the Year. A longtime co-host of the MIX 106.5 Radiothon, Dennis has a large and loyal following among the children and families who have known her throughout her years.

"Maria is all that is affectionate, encouraging and reassuring," says Johns Hopkins Children's Center co-director George Dover. "We think of her as a member of our Johns Hopkins family."

After years of advocating on the air for the needs of Johns Hopkins' pediatric patients, Dennis found herself on the receiving end of the medical powerhouse. Two weeks after wrapping up the 2014 Radiothon, she was diagnosed at The Johns Hopkins Hospital with acute lymphoblastic leukemia, a pediatric form of leukemia. Dennis, a then-leading DJ on the radio station's popular morning show, openly shared her story on the air, rallying the Baltimore and Johns Hopkins Children's Center communities to her side and in the fight.

Throughout her medical care, which included chemotherapy and a bone marrow transplant, Dennis returned to the airwaves periodically to report on progress and hope. With her cancer at last in remission, she returned to the Radiothon in 2015. "Throughout," says Dover, co-director of the Johns Hopkins Children's Center, "her selflessness and continued compassion and love for our patients remained unwavering. She opened up to children and families about her experience as a patient while making sure to highlight her true heroes—the children and their families."

MIX 106.5 DJ Maria Dennis

Dennis was honored by Children's Miracle Network Hospitals at its annual cause innovation conference, Momentum, in Orlando, Florida, the week after the 2016 Radiothon. While there, she led a best practice session to help other radio stations and hospitals grow their Radiothon programs, and was recognized on stage in front of all attendees for her efforts.

The longest-running Children's Miracle Network Hospitals' Radiothon in the country, the 27th annual MIX 106.5 Radiothon benefiting Johns Hopkins Children's Center took place Feb. 17–18, where the entire on-air team broadcasted live from the lobby of The Charlotte R. Bloomberg Children's Center building. This year's event raised more than $1.1 million to help our patients and families, bringing the total raised over the past 27 years to over $19 million.

Save the date: Our 28th annual MIX 106.5 Radiothon will be held Feb. 22–23, 2017. If you would like to become involved in our 28th annual event, please email hopkinschildrens@jhmi.edu.

Harriet Lane House Staff Honor Director George Dover

by Gary Logan

HOW DO YOU ENCAPSULATE a 44-year career in academic medicine marked by major scientific breakthroughs, prestigious teaching awards and top leadership positions at Johns Hopkins Medicine? Some 140 current and former faculty members, house staff, and pediatric residents found some unique ways—some serious, some amusing, but all affectionate—April 30th in honoring George Dover, who stepped down June 30 after two decades as director of the Department of Pediatrics and co-director of the Johns Hopkins Children's Center.

In the airy atrium of The Charlotte R. Bloomberg Children's Center building, reunion was in the atmosphere as the reception took place during the Pediatric Academic Societies annual meeting, this year in Baltimore. So-called Harriet Laners, veterans of the residency program, near and far, joined in to celebrate Dover's long career, initially through humor.

Parodying the Denver Developmental Screening Test pediatricians use to measure a young patient's milestones, former chief residents presented "The Dover," noting Dover's culinary skills, love of Elvis Presley, dapper bowties and jaunty hats, among other characteristics revealed during his early developmental days at Johns Hopkins. The lampooning didn't stop there but the night was mostly an authentic appreciation for Dover's characteristics as a leader, teacher and colleague.

Former chief resident Megan Tschudy, for example, called Dover the "ultimate champion for education," citing his consistent presence at Wednesday Grand Rounds and Friday morning reports and case conferences, and, following the thinking of pediatrician/geneticist Barton Childs, always asking, "Why this child, why this disease, why this time?" She added that during his tenure as director some 1,000 pediatric residents and fellows trained at Johns Hopkins Children's Center and acknowledged his influence by awarding him the Alexander "Buck" Schaffer Award for Outstanding Teaching of House Officers. Dover is also the recipient of the George J. Stuart Award for outstanding clinical teaching, given by the senior medical students at Johns Hopkins.

"You've always stressed that we're here to add to life, not to dwell on what we can get from life," said Tschudy. "On behalf of the patients, residents, faculty and staff, we thank you for what you have added to every stage of development here in our lives."

Pediatric residency director Janet Serwint, acknowledging Dover's temperament, translated the meaning of the letters of his name for her, fellow faculty members, staff members and residents. George Dover, she explained, is **G**enerous with his time, a tireless **E**ducator, an **O**ptimistic leader, a **R**esearcher extraordinaire, a **G**regarious colleague, and highly **E**mpathetic with patients and family. Noting that in academic medicine, the term "triple threat" is used to distinguish leaders, Serwint added, "Dr. Dover is more of a quintuple threat, not only known for his work in clinical care, education and research, but also as an amazing mentor and a leader who stresses reflection as a tool to reinforce learning."

Serwint added that the George J. Dover, M.D., Pediatric Residency Leadership Fund he established as his legacy to the Johns Hopkins Children's Center will strengthen the residency program for many new generations of physicians in training: "We'll be using these funds in many ways to support our diversity recruitment, coaching and curriculum development."

Julia McMillan, who worked with Dover for 22 years and recently retired as executive vice chair of pediatrics, agreed that Dover will leave a lasting imprint on the residency program. The amount of time he gave families as a clinician, she added, is another hallmark.

"He didn't leave the clinic until very late at night, much to the chagrin of residents, because he needed to give patients and families whatever they needed," said

McMillan. "It's really important to remember that part of George as we celebrate his unbelievable leadership as a director of the Children's Center and the Department of Pediatrics."

Former chief resident Cozumel Pruette cited Dover's early advocacy for a new home for the Children's Center, which became The Charlotte R. Bloomberg Children's Center when it opened in 2012. "Dr. Dover changed the face of Johns Hopkins pediatric medicine," said Pruette. "It was an incredible privilege to learn from him."

Another former chief resident, Michael Barone, now director of medical student education in pediatrics, described Dover as an engaged director intensely interested in the paths of both residents and faculty members. "He wanted to know about every hill and valley, every success and every failure, and he wanted to be involved," said Barone. "He is a person who loves to give credit to others, to help elevate them."

Barone added that Dover believed critical to leaders' success were self-awareness and empathy, two qualities Dover himself exemplifies. "He laughs when times are good and shows that emotions are part of being human, especially at times of loss," Barone said. "George has a very big personality, but most of us know that at his inner core is deep-seated compassion and caring for everyone who surrounds him."

In acknowledgement of his years of positive influence on the pediatrics faculty and staff, Barone and Serwint announced the establishment of the George J. Dover Faculty Mentoring Award, to recognize a faculty member each year for excellence in mentoring. The inaugural recipient of the award, George Dover, was humbled by the announcement.

"I had this job for 20 years, and I stayed here for 44 years because of what I'm looking at now, the phenomenal people who make up the faculty, the house staff and the training program, the fabric of this very special place," Dover said. "What really made this the best job in the world was the privilege of having the opportunity to steward some of the best and brightest people who have gone on to do incredible things for children and their families. Thank you all very much." ■

At the Harriet Lane reunion, from left to right, former chief residents Megan Tschudy, Kristen Johnson and Veronica Gunn; residency director Janet Serwint, pediatrics director George Dover, former executive vice chair of pediatrics Julia McMillan, and former chief residents Cozumel Pruette and Michael Barone.

Dover Portrait, Like the Man, Priceless

AS THE PHRASE GOES, a picture is worth a thousand words. And when it comes to departing Johns Hopkins Pediatrician-in-Chief George Dover, whose official portrait and character were revealed by colleagues on May 13, they are all good words.

"Few people can say they really changed the course of a disease, and George is one of them," said Dean/CEO Paul B. Rothman, referring to Dover's finding with hematologist Samuel Charache that the chemotherapy agent hydroxyurea significantly decreases the painful crises associated with sickle cell disease. "Countless children in this country owe their lives and wellness to George Dover."

Added Ronald R. Peterson, president of The Johns Hopkins Hospital, "George, you've had quite the ride—world-class scientist, compassionate clinician, revered teacher, unwavering leader. Your leadership will carry forward the eminence of pediatrics at Johns Hopkins for centuries to come."

Judy Rohde, director of pediatric nursing, concluded: "Dr. Dover, you have been a tireless advocate for programs essential to the Johns Hopkins Children's Center, including safety rounds and the practice of patient- and family-centered care. Your compassionate personal outreach every day to families and staff during times of distress, your constant engagement and enthusiasm, energy, and walk-around presence in the Children's Center has never ceased."

Also at the portrait dedication, attended by more than 300 faculty and staff members, Pediatric Residency Program Director Janet Serwint announced the establishment of the George J. Dover, M.D., Pediatric Residency Leadership Fund. "This fund will help enhance and strengthen our pediatric residency program for generations of future trainees, and allow us to expand our teaching curriculum and advocacy for diversity, cultural competence, population health and personalized medicine," Serwint said.

Supporting Johns Hopkins Medicine's tradition of celebrating the work of esteemed leaders with a portrait, Griffith Energy Services, Inc. commissioned Dover's portrait by local artist Lisa Egeli, who is known for capturing her clients' likeness and personality with convincing clarity. The portrait will hang in The Charlotte R. Bloomberg Children's Center building alongside the portraits of his predecessors. ■

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George Dover, director of the Department of Pediatrics, and his wife, Barbara.

Martha Quinn
New Senior Director of Development

Martha Quinn, who comes to Johns Hopkins following six years of progressive development leadership positions at Children's National Health System in Washington, D.C., has been named the new senior director of development for the Johns Hopkins Children's Center. In her new role, Quinn will lead the Children's Center development team in securing major philanthropic support to arm physician-scientists with the best ability to improve children's health.

"I am extremely honored to be selected for this position and excited about the opportunity to lead the Johns Hopkins Children's Center development effort, and to build even stronger relationships with our supporters," Quinn says.

In her most recent role at Children's National, Quinn was the senior director of development for the Joseph E. Robert, Jr., Center for Surgical Care and the Sheikh Zayed Institute for Pediatric Surgical Innovation. In that capacity, she raised leadership gifts for 10 divisions within the center, including all surgical specialties and urology, as well as pediatric medical device innovation. She also led a $7 million campaign to build the Bunny Mellon Healing Garden dedicated to the First Ladies of the United States, an institutional project to transform 7,200 square feet of gravel roof deck into an oasis of healing for all patients. Quinn previously served as director of development for the Center for Cancer and Blood Disorders, and worked for the Johns Hopkins' Whiting School of Engineering and MedStar Health's Franklin Square Hospital. ■

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Team Sadie Racing to the Finish Line

SADIE ELIZABETH ABELL, born to Jason and Amy, lived three days at the Johns Hopkins Children's Center before succumbing to group B streptococcal septicemia. In her three days at Johns Hopkins, Sadie endeared herself to her doctors and nurses, and Jason and Amy knew they needed to do something to honor her life.

Jason and Amy established Sadie's Gift to ensure her memory lives on. Through Sadie's Gift, hundreds of individuals have joined together over the past nine years, raising an incredible $700,000 for pediatric simulation training here at Johns Hopkins.

This 10th and final year, Team Sadie has set an ambitious goal: to bring total fundraising to $1 million. They need your help to do so. Join Team Sadie and run any race in the Baltimore Running Festival on Saturday, Oct. 15, 2016, or make a donation to any of their runners at www.SadiesGift.org.

While Team Sadie will be closing the book on their time running together, Sadie's legacy will live on and the team is committed to finishing the way they began: strong. If you would like additional information on running or donating, please contact Jason Abell at jason@sadiesgift.org.■

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Rales Center Initiative Launched

IN COMMUNITIES ACROSS THE GLOBE, health and education are considered two of the most important human needs that, if left unfulfilled, can lead to persistent poverty. In November 2015, with the dedication of the Rales Health Center and the official launch of the READY program at KIPP Baltimore, a public charter school in West Baltimore, there was a significant step forward toward closing the achievement gap. There was an incredible showing of support from Johns Hopkins University leadership, government officials and KIPP representatives at the event, rallying around the importance of helping students from economically disadvantaged areas achieve their full academic potential.

At the launch, KIPP students with, from left to right, Ron Daniels, Johns Hopkins University president; Maryland congressman Elijah Cummings; Maryland senator Benjamin Cardin; Joshua Rales, president and trustee of the Norman and Ruth Rales Foundation; Mitchell Rales, trustee of the Norman and Ruth Rales Foundation.

Headquartered at the Johns Hopkins Children's Center, the Norman and Ruth Rales Center for the Integration of Health and Education is offering a wraparound, fully integrated model of school-based health and education. The center's signature program, called READY—Rales Educational and Health ADvancement of Youth—soft-launched in August in two Baltimore KIPP schools, KIPP Harmony Academy and KIPP Ujima Village Academy, which serve 1,500 elementary and middle school students.

The Norman and Ruth Rales Center is committed to raising an additional $1 million to move its mission of boosting health and academic achievement for Baltimore city youth forward, as well as studying the impact of this model for potential replication in schools across the country. Join these efforts by supporting the most innovative school-based health center in the country with a gift that will be matched 5-to-1 by the Norman and Ruth Rales Foundation. ■

For more information, email aspitznagel@jhmi.edu or call 410-361-6397.

Watch the Rales Center dedication.

Honors and Awards

Claude Migeon Honored for Excellence in Pediatric Endocrinology

Johns Hopkins pediatric endocrinologist Claude Migeon has received the International Award from the European Society for Pediatric Endocrinology for excellence in pediatric endocrinology and as one of the most outstanding scientists in the field. Previously, Migeon received the Judson J. Van Wyk Prize from the American Pediatric Endocrine Society in recognition of a career dedicated to scientific excellence, integrity and the health of children. A former director of the Division of Pediatric Endocrinology at Johns Hopkins, Migeon trained more than 100 pediatric endocrinologists. A leading researcher in the study and care of patients with abnormalities of sex differentiation and congenital adrenal hyperplasia, his studies have explored the molecular basis of androgen insensitivity syndrome and the role of the sex-determining region of Y in testis determination. He trained in pediatric endocrinology under Lawson Wilkins, considered a father of pediatric endocrinology, who in 1938 had established at Johns Hopkins the nation's first pediatric endocrine clinic.

Tina Cheng Receives AAP 2015 Education Award

Johns Hopkins pediatrician Tina Cheng, director of the Division of General Pediatrics and Adolescent Medicine at the Johns Hopkins Children's Center and director of pediatrics at Johns Hopkins Bayview Medical Center, is the 2015 recipient of the American Academy of Pediatrics (AAP) Education Award. The award recognizes a member of the academy whose educational contributions have had a broad and positive impact on the health and well-being of infants, children, adolescents and young adults. "The AAP's recognition of Dr. Cheng's contributions spotlights both her tireless advocacy for change in the practice of pediatrics for children and families living in challenging environments, and her innovative approaches to teaching," says George Dover, director of the Department of Pediatrics. "She is developing and evaluating models of primary care that address child health disparities and early-life stressors, including entrenched poverty, which can lead to serious health issues, such as diabetes, hypertension and substance abuse."

Barbara Fivush, former director of the Division of Pediatric Nephrology at Johns Hopkins, is the recipient of the American Academy of Pediatrics Section on Nephrology 2016 Henry Barnett Award. The award was presented to Fivush, now the director of the Office of Women in Science and Medicine at Johns Hopkins, at the Pediatric Academic Societies meeting in April.

Nancy Hutton, a specialist in pediatric palliative and end-of-life care, has received the 2015 American Academy of Hospice and Palliative Medicine Project on Death in America Palliative Medicine National Leadership Award. Hutton directs Harriet Lane Compassionate Care, the pediatric palliative care program at Johns Hopkins.

A NICU Mom Returns

LeeAnn Goodson remembers the moments following her daughter's birth in 2009 like they were yesterday. Gabriella was pale and frail, just over 5 pounds, her heart unable to sufficiently pump blood through her tiny body. Her tricuspid valve had not fully formed, doctors told the young mother, causing blood to flow backward into her atrium, a condition called tricuspid regurgitation. At the same time, Gabriella's blood pressure was climbing dramatically, placing her at high risk of rapid and irregular heartbeats and heart failure—she needed surgery right away. Rather than take Gabriella home to the new nursery she had prepared, Goodson sat outside the OR worrying whether her daughter would even survive. She remembers asking critical care specialist Kristen Nelson what she as a mom could do.

"Dr. Nelson told me to 'hold on to hope,'" Goodson says. "She said, 'Hope is a powerful thing. Believe in your little girl; she's a fighter.'"

Goodson did just that at Gabriella's side throughout her three-month stay in the neonatal intensive care unit (NICU). It was not an easy journey but a life-changing one, not only for Gabriella but her mom too. Goodson hated being in hospitals—growing up she saw them as a place where people died. But through her 90 days in the NICU, she saw a side to hospitals she had never experienced—the miracle of medical science and the passion of health care professionals—which dramatically changed both her perception and direction in life.

"It was seeing Gabriella at critical points that were life threatening, then seeing how medical interventions can help turn the tables around," Goodson says. "I wanted to be a part of that, to be able to have that impact on the lives of other people. So on the day of discharge I said out loud to my husband, 'I'm going to come back here and work one day.'"

Indeed, one month after Gabriella was discharged in May 2009, Goodson started taking prerequisite science classes for nursing school. But when she entered the nursing program at Cecil College the following fall, she began to question whether she had the energy to follow the path she had chosen. After all, she was now the mother of three young children, including infant Gabriella, who had already undergone two open heart surgeries.

"Nursing school also brought back a lot of memories and questions," says Goodson. "Did I have the strength to go through this? Is this what I really want to do? At the end of the day, the answer was always yes."

Goodson graduated from nursing school in 2012 and, with a bachelor's degree in psychology also under her belt, began working part time as a nurse in a psychiatry unit at a local hospital. But her heart, she knew, was at a children's hospital special to her and her daughter. Also, she was interested in pediatric intensive care nursing. So Goodson applied for a position in the Johns Hopkins NICU, was hired and began her 16-week orientation in January 2016.

LeeAnn Goodson, at right, now a nurse in the same NICU where critical care specialist Kristen Nelson cared for her newborn child seven years earlier.

What was it like returning to the Johns Hopkins NICU? "Amazing," says Goodson, noting that the new NICU that opened with The Charlotte R. Bloomberg Children's Center building in 2012 is much quieter and more spacious than the former NICU. It was an emotional return, too, as Goodson saw familiar faces among the staff, as well as moms like herself sitting next to tiny newborns in their isolates. Like her, Goodson knew, they were questioning every decision being made for their child, asking for guidance from the NICU doctors and nurses. Now Goodson saw the value of her experience as a parent in taking on the role of a nurse.

"As a parent in the NICU, I held on by a thread and longed to hear the voice of the nurse speak of the progress my baby made for the day," says Goodson. "Now as a nurse, I have the chance to be that voice, but also to sit with a parent's feelings when there are no words strong enough to bring comfort. I've come full circle." ■

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For more on LeeAnn Goodson's life-changing journey at Johns Hopkins Children's Center, watch this video.

Leading the Way

Patient mom Sue Mead channels her experience to help create a transparent family-centered care environment.

by Gary Logan

THERE ARE ANY NUMBER of activities members of the Johns Hopkins Pediatric Family Advisory Council (PFAC) can engage in. Planning agendas for monthly meetings, working with physicians to improve communications with patients and families, providing a parent's perspective on dining options for patients, to name but a few. Interestingly, longtime PFAC member Sue Mead may have done it all—and more.

Channeling her own experience as a patient mom—her daughter Julia was diagnosed with a brain tumor in 2006—Mead joined the 12-member steering committee formed by Pediatrician-in-Chief George Dover in 2007 to rejuvenate and formalize patient- and family-centered care at Johns Hopkins Children's Center. Then, over the course of nearly a decade, she and her colleagues built a new foundation for family-centered care called the PFAC, in which parents and hospital staff together could prioritize issues and create initiatives to address them. Among the most impactful projects was the development of a parent journal, *Your Voice Matters*, led by Mead, to support parents of hospitalized children and help them navigate an unfamiliar and, at times, daunting system during an unpredictable time in their lives.

"From our own experience we know that having your child in a hospital can be extremely frightening and stressful, and that parents tend to feel powerless and lost," says Mead. "We wanted to create a 'hospital 101' guidebook that would help them find their way and connect with hospital services, as well as serve as a journal for parents to log their own feelings during their child's hospital stay."

Spearheading and participating in such initiatives, Mead met with an array of faculty and staff and saw the challenges firsthand they face in providing care for patients. In so doing, she gleaned a new appreciation for staff and saw greater opportunities for parents to work with them to improve communication and care for patients.

New Parent Advisor Sue Mead, front and center, with family-centered care "Trifecta" colleagues Rebecca Trexler, left, and Tricia Willis.

That thinking prompted Mead to join the PFAC's executive committee, which gave her greater influence in setting the council's agenda and steering its course. In December 2015 she took on an even more transformative role—that of Parent Advisor for the Children's Center, which gave her and the parents she represents a seat at the table at the highest levels across the institution. Working closely with Mead are her PFAC executive committee colleagues Tricia Willis and Rebecca Trexler, forming what they jokingly refer to as "The Trifecta" of family-centered care at the Children's Center. Willis, a highly respected veteran nurse at the Children's Center, serves as a patient/family advocate and liaison between the PFAC and pediatrics leadership, ensuring that the PFAC receives sufficient support for its initiatives. Trexler, a former clinical coordinator in the pediatric intensive care unit, coordinates with patient relations to resolve patient concerns.

With new Parent Advisor Sue Mead and the Trifecta in place, the PFAC is moving ahead with its current priorities, including a peer mentoring program and recruitment of new members, which now numbers around 50 parents and staff. ■

Interactive Musical Planetarium Brings Calm, Spurs Creativity

Art naturally has the capacity to calm patients and families during a hospital stay, a belief Bloomberg Philanthropies took to heart when commissioning abundant artwork for The Charlotte R. Bloomberg Children's Center building, which opened in 2012. Among the pieces are abstract parent-child rhinos, large-scale pufferfish and a cubist cow jumping over the 28 phases of the moon. Thanks to another group of donors and technology collaborators, the building recently introduced another art form custom-made for pediatric patients—a highly interactive audiovisual digital display that may bring some therapeutic value too.

"In planning this building, we dreamed of it as a place of healing, a place of imagination where children and their parents could participate in healing," says George Dover, co-director of the Johns Hopkins Children's Center. "Art and music, we now learn, are an integral part of that healing."

Dover was referring to the Interactive Musical Planetarium installed May 10 in the ground floor lobby of the building. Created especially for the Johns Hopkins Children's Center by French artist and musician Adrien Garcia, the program is designed to inspire patients to play and express themselves by creating musical and visual art through movement. How? A cameralike sensor built into a giant egg-shaped digital screen interprets and displays in real time their movements in whimsical forms. A hand-held tablet allows patients to program sounds and utilize the system from their hospital bed.

How did patients react to the interaction? Patients at the ribbon cutting, some confined to wheelchairs, were entertained and mesmerized as they waved their arms and hands like orchestra conductors to create cascading waves, digital star bursts and swirling constellations, among myriad forms limited only by the imagination. Creative thinking was clearly at work.

"Each child, regardless of his or her particular condition, will be able to express their own creativity through their body movements," says Dover. "This is something quite revolutionary for children here and around the world."

Judy Rohde, director of nursing for the Children's Center, noted potential therapeutic value in the high-tech planetarium, especially for patients recovering from surgery.

It's like paint coming out of your fingertips, say young artists interacting with the musical planetarium.

"We see this innovative art installation as a tool to encourage children to move, both through the use of the installation and the interactive tablets," says Rohde. "This will help children get up and moving after surgery as they get closer to discharge."

The first of its kind in the United States, the interactive planetarium will be linked to a similar installation at Necker-Enfants Malades Hospital in Paris, France. The two planetariums will be connected by a virtual private network, allowing patients in Baltimore and Paris to send each other recorded versions of the musical and visual experiences they create.

Collaborators and supporters of the Interactive Musical Planetarium include Art dans la Cité, the Stavros Niarchos Foundation, Future Tech, Samsung, Dell and Johns Hopkins pediatric nursing. The Interactive Musical Planetarium is produced and managed by Art dans la Cité, www.artdanslacite.eu. ■

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JOHNS HOPKINS
CHILDREN'S CENTER

Hopkins Children's
Office of Communications & Public Affairs
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Baltimore, MD 21231

The Charlotte R. Bloomberg Children's Center

- Opened in 2012
- 205 private rooms with sleeping accommodations for parents
- Acoustical ceiling tiles and rubber flooring help create a quiet healing environment
- Supersized sculptures and literary themed art distract from the hospital experience
- Family amenities like on-demand meals, family lounges and multiple play rooms
- Expanded easy-to-access Pediatric Emergency Department
- Dedicated pediatric trauma bays
- 40-bed Pediatric Intensive Care Unit
- 45-bed Neonatal Intensive Care Unit
- 10 state-of-the-art pediatric surgical suites