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WINTER 2020

Monroe Carell Jr. Children's Hospital at Vanderbilt

Closer to home

More locations mean more options for patients

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THE START OF A NEW YEAR often marks a time of reflection and looking forward with intention. The core of our mission and daily work at Monroe Carell Jr. Children's Hospital at Vanderbilt is to serve all children, and their families, through the delivery of specialized medical and surgical programs. This vision was set forth by the late Ann and Monroe Carell Jr. in the earliest phases of planning for this hospital, now nearly 20 years ago, and is integral to how we plan both small and big projects.

Last year was a big year for us! Thanks to the successful Growing to New Heights capital campaign, we opened the first of our expansion floors mid-summer. In December, we opened our surgical clinic location in Murfreesboro. These added spaces have allowed us to begin the process of geographically co-locating patients by disease, further enhancing our specialized care. Once again, we were ranked in all 10 specialties in the *U.S. News & World Report's* Best Children's Hospitals rankings. Even as we celebrated these successes, we walked the final weeks and days with our leader, colleague and friend, Luke Gregory, Children's Hospital CEO, as his chapter with lymphoma came to a close in October.

Luke Gregory

Luke believed in the mission of this hospital with his whole being. He worked diligently to facilitate all of our activities — clinical care that was both excellent and innovative, research and education. He helped to launch new programs and projects, including the expansion and the off-site surgical center.

Luke lived his life grounded in faith, family and purpose. For nearly 10 years, his purpose was ensuring the excellence and growth of our hospital. He believed in the phrase "Monroe Carell Jr. Children's Hospital is more than a place….it is the people committed to providing healing and hope." He was very proud of all the people who work in this hospital. Those of us closest to him grew from his mentoring and daily doses of wisdom. And, throughout his journey with cancer, he drew hope for himself from our patients and the courage they display every day. Luke truly made a difference in the lives of children in our city, our state and our region. It was a privilege to work with Luke in our service to children and their families. This issue of *Hope* is in his memory.

Sincerely,

Meg Rush, MD, MMHC
President

Steven Webber, MBChB, MRCP
Pediatrician-in-Chief, Chair of the Department of Pediatrics and James C. Overall Professor

Jeffrey Upperman, MD
Surgeon-in-Chief and Chair of the Department of Pediatric Surgery

John W. Brock III, MD
Senior Vice President of Pediatric Surgical Services, Monroe Carell Jr. Professor, Surgeon-in-Chief Emeritus

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The Children's Hospital Advisory Board is an advocacy, fundraising and advising group. Members educate constituents in the community and do outreach to secure resources to support the mission of Children's Hospital. Learn more at ChildrensHospitalVanderbilt.org/advisoryboard.

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Brookelyn Baker, 10, a heart transplant patient, spends time at home with her alpaca.

CLOSER TO HOME

More locations mean more options for patients

photograph by John Russell

Monroe Carell Jr. Children's Hospital at Vanderbilt opened in 2004 as the first freestanding children's hospital in Middle Tennessee. Prior to that, Vanderbilt's pediatric care was provided on a smaller scale within the larger Vanderbilt University Adult Hospital.

Nashville's, the state's and the region's populations have experienced skyrocketing growth in recent years. That also means people living farther away from the city, and driving longer distances, factors which don't always make the trip into Nashville for health care convenient for families juggling work, school, extracurricular activities and family life. Children's Hospital understands how life has changed for many and wants to ensure that quality, compassionate care for children, adolescents and young adults is available where families need it.

Children's Hospital now has 20 satellite locations in addition to its flagship hospital in Nashville. Nearly 35% of the specialized clinical care pediatric patients receive is delivered at one of these community locations. In addition to care, Children's Hospital is touching the community in many other ways — advocacy programs like sports safety and automated external defibrillator education; supporting neonatal intensive care units and newborn nurseries; outpatient surgery closer to home; and after-hours clinics.

"Children's Hospital has always been committed to growing our programs to meet the needs of our community and region. Moving into the freestanding hospital 16 years ago was a pivotal moment that marked the beginning of our journey to continually refine and plan for optimizing how we serve children and families — part of that is meeting families where they are," said Meg Rush, MD, MMHC, president of Children's Hospital. "We offer all services under one roof, but we also have been intentional about taking our services to both nearby as well as more distant communities, making our specialty programs more accessible to families."

Meeting Families Where They Are

More clinics across the state mean shorter travel for care

By Nancy Humphrey

Brookelyn Baker, 10, enjoys being outdoors at her home, especially with her pets — two alpacas, rabbits and a dog. Several times, Brookelyn and her parents, Melissa and Bryan Moffitt, have made a 90-minute drive from their home in Clarksburg, Tennessee, to Monroe Carell Jr. Children's Hospital at Vanderbilt in Nashville. The 107-mile trip to Children's Hospital saved her life after a diagnosis of heart failure, requiring a heart transplant, which now requires follow up clinic visits.

But Children's Hospital hopes to make clinic visits easier for patients like Brookelyn so they can have more time for the things they love, like taking care of their animals. Children's Hospital has been working to bring its pediatric care closer to where families live, work and play so they will have more opportunities to get the same quality of care, designed for infants, adolescents and young adults, near home. One of those clinics in Jackson, Tennessee, where Children's Hospital offers pediatric cardiology services, is only 33 miles from where Brookelyn and her family live.

A life-saving journey

Brookelyn was the picture of health until Christmas break 2018 when she had what her parents believed was the flu. She recovered and then developed disabling joint pain.

Over a period of weeks, Brookelyn and her parents saw her pediatrician in Huntington, Tennessee, and made two trips to Children's Hospital to try to determine why she continued to have the joint pain that was often so painful she couldn't walk.

Her pediatrician at first thought it was reactive arthritis from her bout with the flu, but nothing was confirmed even after a round of tests in the emergency room.

Her pain got a little better, then a few weeks later, worsened. In February, her physician sent her to Thomas Graham, MD, chair of Pediatric Rheumatology at Children's Hospital. Shortly before her appointment she became short of breath and felt like her heart was racing, Melissa recalls.

"Dr. Graham listened to her heart and tried to check her hip joints. When he had her lie down on the table, she shot up like a daggum rubber band," Moffitt recalls. "She couldn't breathe and felt like she was smothering. That's when Dr. Graham started putting the pieces together."

Brookelyn was sent to Children's Hospital's pediatric cardiology team where she was diagnosed with Kawasaki Disease, a rare disease that causes inflammation in the walls of blood vessels in the body and can damage the coronary arteries, the vessels that carry blood to the heart. If caught early it can be treated, but Brookelyn did not have textbook symptoms. By the time of diagnosis, her heart was damaged beyond repair. Her breathing difficulty was from fluid around her heart and lungs.

She was treated with medication for a couple of weeks to see how much heart function could be regained, and felt better after the fluid was removed. But Brookelyn continued to have very irregular rhythms and her heart function was poor. David Bearl, MD, MA, her cardiologist, told her family it was best to immediately put her on the list for a new heart.

"It was incredibly scary to go from having no idea what was going on with her to finding out she would need a heart transplant," Melissa said. "We walked into the rheumatology appointment with Dr. Graham talking about where we would eat lunch when we were done, and then we were broadsided by all this information and finding out her heart function was minimal."

In March 2019, after signing the consent forms to list Brookelyn on the nationwide registry for a new heart, Melissa and Bryan left her at the hospital with her grandfather and began a quick trip home to see their other children. They planned to tell Brookelyn about the transplant when they returned to Nashville the next day.

They got within 30 minutes from home and Bearl called to tell them the unbelievable news they had a heart for Brookelyn. The couple instantly returned to Nashville.

"Literally, there was probably a three-hour period from when he told me (she would need a transplant) until the time he called me to say, 'we have a heart, they're going after it tonight and she's going in for surgery first thing in the morning,'" Melissa said. "It was insanely fast. Brookelyn didn't even know the word 'transplant' had been mentioned. And we figured we had a few weeks at least to talk to her about it, but it was bam, bam, bam, with no time to get used to the idea."

The Moffitts told Brookelyn as soon as they got back to her hospital room. "She was a little upset at first, but surprisingly was like, 'OK,' and went right back to what she was doing," Melissa said. "She really didn't have time to be scared about it. They rolled her back about six hours later and she just went with it."

Brookelyn's transplant in March 2019 and her recovery couldn't have gone any better, Melissa said. "She has not had the first issue with anything. She's right back to where she was before she got sick. She's getting very big for her britches," Melissa laughs. "I think this has given her a new fire."

Brookelyn was seen at Children's Hospital for her post-transplant visits, but now, on a more routine schedule, she

should be able to see Bearl in Jackson, Tennessee, about 33 miles from their home and where Melissa works as a neonatal nurse. Bearl sees patients in Jackson one week out of every month.

"We realized that more communities were requesting our presence," said Kris Rehm, MD, vice chair of Outreach Activities and medical director of Hospital Operations for Children's Hospital. She also leads the Division of Pediatric Outreach Medicine, which provides a home for faculty who primarily work away from the main campus.

Children's Hospital now has 20 locations throughout Tennessee, and one in Madison, Alabama, where patients can be seen for specialty care or after-hours care for illnesses when a pediatrician's office is closed for the day.

"Anything we can do to help families, we need to do. Maybe a parent can work a half day before taking her child to see Dr. (Jay) Wellons (a neurosurgeon) in Alabama or Dr. (David) Bearl in Jackson. Maybe a parent can work all day and bring his child to an after-hours clinic at a time when it's convenient. As a working mom, I appreciate the opportunity to have care options as convenient as we can possibly make it," Rehm said.

Expanding the footprint

In 2017, Children's Hospital began to focus heavily on creating after-hours clinics, primary care and subspecialty care, all in locations away from the VUMC campus. Children's Hospital physicians also work with inpatients at Williamson Medical Center and provide newborn nursery services at three community hospitals: Sumner Regional in Gallatin, Tennessee, Vanderbilt Wilson County in Lebanon and NorthCrest in Springfield.

Children's Hospital also has a level IV NICU, the highest state and national rating an NICU can earn, reflecting the hospital's expertise in treating the most complex problems facing the tiniest and sickest infants. The hospital has brought that expertise to the community, and now manages neonatal intensive care units at four regional hospitals.

Currently, Children's Hospital's neonatologists and neonatal nurse practitioners provide care at the Level II NICUs at Maury Regional Medical Center in Columbia, and Tennova Healthcare in Clarksville. Additionally, teams deliver care at the Level III NICU at Jackson Madison County General Hospital, in the western part of Tennessee.

More recently, Children's Hospital entered into a partnership with Erlanger Children's Hospital in East Tennessee, to assist in management of its Level III/IV NICU.

"Many of the physicians and nurse practitioners in these NICUs trained at Vanderbilt and bring our protocols and expectations for excellence with them," said Susan Guttentag, MD, director of the Division of Neonatology and Julia Carell Stadler Professor of Pediatrics. "We recruit others into our practice who have demonstrated that they share our same ideals. Together, we strive to offer the same care in these communities as if these patients were here at Children's Hospital, but closer to home, which reduces the stress on the parents of our fragile patients."

Infants at the satellite NICUs who need more intensive care can be transported to Nashville by the Children's Hospital Neonatal/Pediatric Transport team.

The outpatient arm also continues to expand. Children's Hospital now has five after-hours clinics with locations in Mt. Juliet, Hendersonville, Spring Hill, Brentwood and Smyrna, also home to a Vanderbilt-run primary care practice. Children's Hospital's new surgery and clinics facility in Murfreesboro also features an urgent care clinic, with extended weekday hours.

Because illnesses like fever, sore throat and asthma don't keep regular business hours, the after-hours clinics, open nights and weekends 365 days a year, provide families the option to get treatment when their pediatrician's office is closed.

"These clinics are rapidly approaching 30,000 visits a year and we're seeing more children a lot closer to their homes," Rehm said.

The specialty clinics allow Vanderbilt subspecialists to provide care in those locations during the day.

"We are able to bring the most specialized care that our patients need, closer to home. We have some presence in almost every part of the state," Rehm said.

The need to expand these services remains a top priority of the Children's Hospital leadership team, she added.

"It's easy for us to come here to this large and beautiful building with a large parking garage. It's easy for us to navigate this complicated system, but it's pretty overwhelming for families who need to see multiple providers in multiple specialties."

Rehm said Children's Hospital will continue to augment what's needed at each of its outreach locations.

"We will look at expanding services at existing locations based on the needs of our patients. When we bring in new faculty, they will have outreach as some part of their obligation. It's part of who we are." hope

Kris Rehm, MD, works with a team of Vanderbilt pediatricians and nurses who bring care to children in communities across the state.

JOHN RUSSELL

JOE HOWELL

Time to Play

Pediatric care is often just around the corner

By Christina Echegaray

The first time 8-year-old Silas Roupp broke his arm in April 2019, he was re-enacting a scene from an old Tom & Jerry cartoon episode, where Butch, the bulldog, chases Tom, the cat.

In this case, the part of Butch was played by Jesse, Silas' new puppy, and Silas was Tom, and he was flying high in his backyard swing, when suddenly he fell off, landing on the ground. He knew immediately that something was wrong with his arm; it was broken.

His parents, Susan and Jeremy Roupp, drove Silas, with his 5-year-old sister, Elin, in tow, to the Emergency Department at Monroe Carell Jr. Children Hospital at Vanderbilt in Nashville — about a 40-minute drive. Doctors confirmed Silas broke his arm in two places and would need a full-length arm cast up to his shoulder.

What the Roupps didn't know, at the time, was that en route to Nashville from Gallatin they drove down Vietnam Veterans Parkway right past the Vanderbilt Children's After-Hours Clinic in Hendersonville, which also houses an orthopaedic clinic — about 12 minutes from their home.

"I had no idea the clinic was located there, and Silas even goes to school across the street," Susan said. "We were across from this awesome little clinic the whole time and we didn't know it was there."

The Children's Hospital Hendersonville location is one of five after-hours locations and one of about 20 Children's Hospital satellite locations based in communities throughout Tennessee, including one in Madison, Alabama — all in an effort to meet families where they live, work and play with the same quality, specialty pediatric care available on the main Children's Hospital campus in Nashville.

"Most families are excited to find out that they can avoid driving into Nashville to receive care. They are surprised to find out that we can provide the same care at our satellite locations that they would receive by coming to the Children's Hospital downtown," said Megan Johnson, MD, a pediatric orthopaedist for Children's Hospital who has cared for Silas.

Silas wore a cast for about a month, then got a brace. He was able to go to the Hendersonville clinic for his follow-up appointments.

"We didn't have to go back downtown anymore, and no one had to take a half-day off from work or miss school. They could X-ray him, take his cast off — all right across the street from his school," Susan said.

Little did the Roupp family know that they would be making even more visits to the orthopaedic clinic. In July, three months after he broke his arm, Silas was riding his scooter, protecting his head with a helmet. He fell, breaking the same arm again. The Roupps did have to return to the Nashville campus because this time Silas needed surgery to have a rod put in his arm.

"Those two times — in April and July — are the only times we've had to go to Nashville," Susan said. "Otherwise the clinic in Hendersonville and Dr. Johnson have taken care of everything else. He's probably had 10 to 12 appointments. That would not be easy when you live in Gallatin if you had to go all the way Nashville to see a specialist. In Hendersonville, they know you by name — granted we go there enough. They're caring and loving and will even hand him a popsicle."

At the end of the school year in first grade, Silas had to write a book about himself, which he titled "The day I broke my arm."

And he made a special dedication: "I dedicate my first book to my doctors because they fixed my arm so I could feel better."

Susan wants everyone in nearby Gallatin and other close communities to know about the Children's Hospital clinics in Hendersonville, which could save families from a trip to Nashville. She even jokes, "You could put up a billboard at the Vietnam Veterans Bypass with a photo of Silas with his arm in a cast and the words, 'Broke your arm? Turn here.'"

Johnson was surprised to find out Silas wrote about his care and dedicated it to the team. He brought the book to a follow-up appointment to show her.

"We know that having something like a broken bone is not fun, but we aim to make our patients' experience a fun and happy one," said Johnson. "I'm so glad he could get the care he needed close to home so that there was minimal disruption to his life and his family's life." hope

Sneak Peek: New surgery and clinics facility begins operations

Monroe Carell Jr. Children's Hospital at Vanderbilt has opened its new $27.2 million state-of-the art surgery and clinics facility in Murfreesboro, Tennessee, significantly expanding pediatric specialty care, outpatient surgery and imaging services to children in Rutherford and surrounding counties.

The new 37,000-square-foot facility is Children's Hospital's first standalone outpatient surgery center outside its main campus in Nashville and is aimed at bringing care closer to where patients and families live and work.

The single-story facility, located at 2102 West Northfield Blvd. in Murfreesboro, features 22 multispecialty clinic rooms, urgent care services, a suite of operating rooms, imaging capabilities such as MRI, X-ray, and ultrasound, and audiology booths for hearing tests and procedural areas.

Board-certified physicians, nurses and surgeons see patients at the new facility for several specialties, including gastroenterology, general surgery, orthopaedics, otolaryngology, audiology and urology.

"With the opening of our new cutting-edge facility, we're meeting families where they are, closer to home, to provide clinical and surgical care specifically designed just for pediatric patients," said John W. Brock III, MD, Senior Vice President for Pediatric Surgical Services, Monroe Carell Jr. Professor and Surgeon-in-Chief Emeritus. "With busy family lives, between work, school and extracurricular activities, we know that the trip into Nashville isn't always easy. Now, these families will have the same excellence of services and nationally ranked care that we provide at the main campus of Monroe Carell Jr. Children's Hospital at Vanderbilt."

Prior to the opening of the new facility in mid-December 2019, an estimated 200 children have traveled from the area each day to the Children's Hospital campus in Nashville. Now, fewer families will have to make that trip. Children's Hospital pediatric otolaryngology, urology and GI specialists also perform outpatient surgeries in Spring Hill.

The surgical suite has three outpatient operating rooms, 14 pre- and post-operation bays, an isolation room, an IV start room, consultation rooms and a dedicated surgical patient exit area in the back of the building to make post-surgery discharges and pick up easy for families.

Children's Hospital will staff the facility with about 80 employees, including doctors, nurses and additional staff with hopes to expand further in the future. A full-time Certified Child Life Specialist, trained in child development, will also be on hand to help children and teens feel comfortable in a medical environment.

The new facility was made possible by generous philanthropic support, including gifts from Katherine "Kitty" and the late Matt Murfree III with their family, The Christy-Houston Foundation, Inc., the late Bernard Wehby, Raiderthon at Middle Tennessee State University, and Lisa and John W. Brock III, MD.

– by Christina Echegaray

We Are Growing

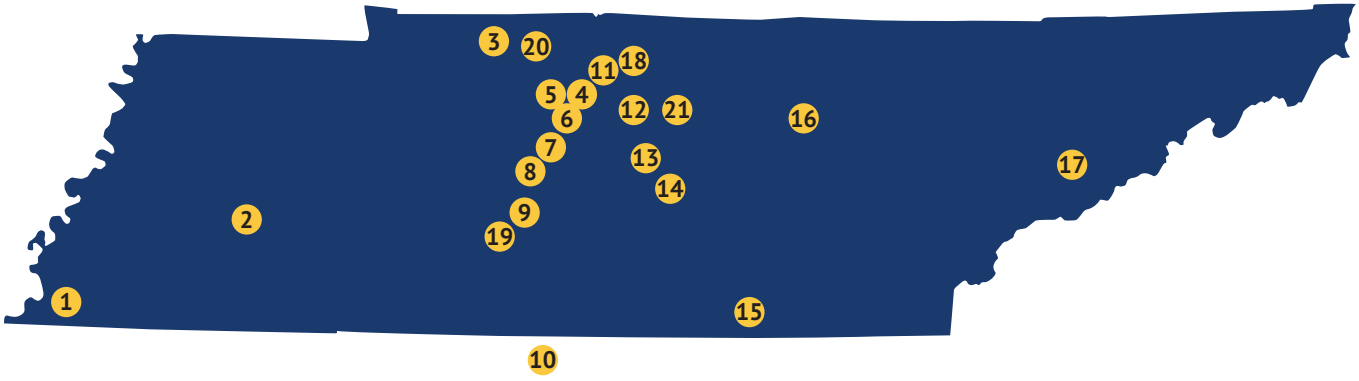
Access to pediatric care in the community

Quality and convenience matter for families when it comes to children's health care. Monroe Carell Jr. Children's Hospital at Vanderbilt has been steadily expanding its footprint of specialty clinics, outpatient surgery and affiliated partnerships for neonatal intensive care and newborn nurseries. Children, from the tiniest infants to young adults, can access the same nationally ranked pediatric care available at the main Children's Hospital campus, closer to home in many parts of Tennessee. Children's Hospital is ranked in 10 out of 10 pediatric specialties in *U.S. News & World Report's* annual Best Children's Hospital rankings and is one of 24 facilities nationwide (out of 191) to be ranked in all 10.

Access to more than 400 physicians trained in 30 pediatric and surgical specialties in partnership with more than 300 community pediatricians

20 multispecialty clinic locations, which include two for outpatient surgery, one urgent care and five after-hours

Neonatal intensive care and newborn nurseries at six community hospitals across Tennessee



1. Memphis
2 Jackson
3. Clarksville
4. Matthew Walker Comprehensive Health Center, Nashville
5. One Hundred Oaks, Nashville
6. Main Campus, Nashville
7. Brentwood
8. Franklin
9. Spring Hill (two locations)
10. Madison, Alabama
11. Hendersonville
12. Mt. Juliet
13. Smyrna
14. Murfreesboro (two locations)
15. Chattanooga
16. Cookeville
17. Knoxville
18. Gallatin
19. Columbia
20. Springfield
21. Lebanon

Partnerships in care for newborns

Claire Slone, MSN, APRN, NNP-BC, has the best of both worlds with her job as a neonatal nurse practitioner for the Division of Outreach Medicine at Monroe Carell Jr. Children's Hospital at Vanderbilt.

A few days a month she keeps her skills sharp tending to high-risk patients in the Neonatal Intensive Care Unit at Children's Hospital. "These babies are the sickest of the sick, the smallest of the small," she said.

The rest of the time she works at Sumner Regional Medical Center in Gallatin, Tennessee, caring for high-risk newborns, attending high-risk deliveries, consulting with the local pediatric practice, and, intermittently, working with two other community hospital nurseries who have a partnership with VUMC.

Slone, who lives in Mt. Juliet, Tennessee, works several days a month from 8 a.m. until noon at Sumner Regional, seeing a caseload of newborn high-risk babies in the nursery. She and the other nurse practitioners and newborn hospitalists also share on-call duties and are available to see high-risk babies delivered by obstetricians 24/7. She lives about 35 minutes from Sumner Regional.

The arrangement works out well for the families who deliver their babies at Sumner Regional. In the past, many babies who had IVs or needed oxygen would have been sent to Vanderbilt for more nuanced care. Now, under the expert supervision of the Outreach Medicine Team, they can stay closer to home.

Slone says, "It's great for the families and the community. Any time a family has a sick baby, regardless of how minor the issue is, it's very stressful and traumatic for them. It's an added stress when the family is informed that their baby is being transferred (to Vanderbilt) via ambulance. The parents are then faced with driving to and from Nashville just to see their child and that's really difficult. I'm glad we can keep babies close to home in their own communities."

The arrangement also has its perks for Slone, the mother of three children — an 11-year-old daughter and twin boys, 8.

"I'm able to be around a lot more," she said. "My father had cancer and passed away over the summer. For the year he was ill, I was able to work in an on-call fashion and also have family time, versus being in Nashville at Children's Hospital where I would physically have to remain in the hospital during my shift.

"It works out well for my family. I'm at home cooking dinner and helping with homework. My husband also works from home, so if I am called in, I can immediately walk out the door and head back to the hospital," she said.

During a recent on-call day, Slone went to her children's school and helped administer the flu vaccine, then was home with them after school with her phone by her side at all times, waiting for a call that might come from Sumner Regional.

Slone started her career at Vanderbilt as a nurse in 1995. After earning her nurse practitioner degree and moving out of town for a short time, she's been back at Vanderbilt since 2002.

She also takes call a few days a month for high-risk babies born at Vanderbilt Wilson County's nursery in Lebanon, Tennessee, just minutes away from her home. Vanderbilt now also has a partnership with NorthCrest Hospital in Springfield, Tennessee, where a member from the Outreach Medicine Team will be in-house 24/7 for nursery and delivery coverage.

Slone and the Outreach Medicine Team of neonatal nurse practitioners and newborn hospitalists are credentialed at all three hospitals: Sumner Regional, Vanderbilt Wilson County and NorthCrest, to allow flexibility for the team in case someone is on vacation or has a family emergency.

"This arrangement is an example of how Vanderbilt is morphing to meet the needs in our communities by partnering with community hospitals and local pediatricians who want more time to see patients in their offices. It looks very different today for pediatric practices in communities than it did even 10 years ago. I'm glad we can help meet this need," Slone said.

– by Nancy Humphrey

Claire Slone, MSN, APRN, NNP-BC, a Children's Hospital nurse practitioner, finishes a newborn exam during her shift at Sumner Regional Medical Center.

SUSAN URMY

SUSAN URMY

A Chance to Heal Outside the Hospital

Portable device lets heart transplant candidates go home

By Christina Echegaray

For nearly a month, 15-year-old Trinity Scott sported a black canvas messenger bag, the type any teenager might wear, filled with favorite books, lip gloss or school supplies. Her bag even had a name, "Alice."

But far from any ordinary bag, what was inside was literally keeping her alive. a ventricular assistance device (VAD), an implantable medical device that helps circulate blood throughout the body and serves as a bridge to heart transplantation. The bag also meant she didn't have to stay confined to a hospital room.

Trinity recently became Monroe Carell Jr. Children's Hospital at Vanderbilt's first pediatric heart patient to leave the hospital with a portable VAD while she waited for a heart transplant. As she waited for her heart, she stayed at the Ronald McDonald House, three blocks from Children's Hospital, which allowed her family to rest and feel like they were in "a home away from home." The day before Thanksgiving, Trinity got her heart.

"The biggest reason to discharge the patient is to try to really normalize life while they are waiting for a heart trans-

plant. In some ways, to be hospitalized can be a burden on the patient from both a mental and physical standpoint," said David Bearl, MD, MA, Trinity's pediatric cardiologist at Children's Hospital and medical director of the Pediatric Ventricular Assist Device Program. "From a rehab standpoint, we know the better the condition a patient is in, going into a heart transplant, the better they rehab post-transplant, have a shorter intubation time and shorter ICU stay — all because they are healthier going into transplant."

Trinity's parents, Melanie and David White, were hesitant at first to leave the hospital while their daughter was on the VAD. Extensive conversations with the VAD team, Nancy Jaworski, APRN, VAD coordinator, and Bearl, made the family more comfortable with idea.

"We were worried she would have an arrythmia she couldn't get out of, and if we would recognize something was wrong," Melanie said. "Nancy made us feel really comfortable. She taught us to change her dressing and gave us classes on the VAD and gave us tests. Being in the hospital gets exhausting. 'Alice' allowed us to get a reprieve."

"They have bent over backwards for us, and they said if you need anything or have any questions, just call," added David. "They made us feel at ease and educated us on what we needed to do."

The VAD team had been waiting to find a family that would be a good fit to be discharged with the portable device, called HeartWare, which is virtually silent and undetectable unless the alarms sound to indicate there is an issue. The White family could have gone home to East Tennessee but chose to stay close until they were confident with the device or until a new heart arrived. The heart came before the family ever had a chance to go back home.

Portable VADs have been available for adults at Vanderbilt University Medical Center for nearly two decades. The first non-portable LVAS (left ventricular assist system) was implanted in 1986 in an adult at VUMC, according to Vanderbilt archives.

VAD technology is newer for the pediatric population. Children's Hospital has used inpatient VADs for about 15 years. The VAD team is working to evaluate patients sooner since evidence shows that VADs help improve the health of patients as a bridge to transplant. When the heart doesn't have to work as hard, other body systems have time to recover.

In Trinity's case, she had cardiomyopathy, a disease of the heart muscle that makes it harder for the heart to pump blood to the rest of the body. The Whites knew eventually she would need a transplant, but the decline in her heart function was sudden. Cardiomyopathy can be known as a "silent killer," due to an increased risk of sudden cardiac death.

Months prior, Trinity had even been playing softball. Medication had helped sustain her heart. But then her heart began to fail. She was passing out at home and at school.

"The biggest reason to discharge the patient is to try to really normalize life while they are waiting for a heart transplant."

"We always knew she would need a transplant, but we didn't think this fast. She just went downhill really fast," Melanie said.

The blood in her enlarged heart was also not flowing correctly, and the improper blood flow was putting increased pressure on her lungs. The pulmonary hypertension would make her ineligible for a heart transplant. Medication wasn't helping. The cardiac team decided it was time to try a VAD.

"We knew she was probably a heart transplant candidate, but we needed to give her lungs a chance to recover. Her lungs responded exactly the way we thought they would (with the VAD)," Jaworski said.

As Trinity improved on the VAD, discussions began about letting her leave the hospital with the device. Jaworski helped the family get all the training they needed to understand the device, care for it and understand what each alarm means. For families who do go back to their communities, Jaworski would also train the patient's school nurse and work with the local pediatrician.

Bearl and Jaworski said they hope more families will be able to go home on a VAD, if the situation is right for a family and a strong family support system is in place.

"This is a partnership, and we'll have to spend time building trust with families, because this is not nothing," Jaworski said. "You really have to build a relationship with the patient and family so that they actually trust you enough to do what you're recommending." hope

What is a Ventricular Assist Device (VAD)?

This device helps the heart pump blood throughout the body. Once the device is implanted and attached to the left, right or both ventricles of the heart, the system is powered by wires leading to external batteries carried in a portable pack.

A patient may need a VAD if he or she has a weakened heart or heart failure. This means the heart can no longer pump the amount of blood the body needs to work properly.

A VAD can help patients who:

- Have heart failure that doesn't get better with medicine or other treatments
- Have heart failure and are waiting for a heart transplant
- Have heart failure but can't have a heart transplant
- Are recovering from heart surgery or a heart event

ANNE RAYNER

Angel Carter, RN, program coordinator for Project ADAM, performs AED training for teachers at Maplewood High School in Nashville.

Live, work, play safely

Children's Hospital's Project ADAM chapter puts AEDs in the community

By Jessica Pasley

High school friends can be a repository of information: from favorite foods and most recent crushes to goals for the future, biggest fears and even how to use an Automated External Defibrillator (AED).

The last item on the list proved to be a matter of life and death for Brooke Kowalkowski, 17, who was diagnosed with Long QT syndrome, a heart rhythm condition that can potentially cause fast, erratic heartbeats that can trigger a sudden fainting spell or seizure. In some cases, the prolonged, irregular heartbeat can cause sudden death.

Luckily, the Spring Hill, Tennessee, teen has not been reluctant to share her condition with friends and teach them about the family's AED, a portable electronic device that when properly applied can stabilize potentially life-threatening heart rhythms, including sudden cardiac arrest.

While at the neighborhood pool on May 22, 2019, Brooke began having trouble breathing and passed out. Her friends were alert to the situation and called her mom.

"I told them instantly to call 911," recalled Sandy Kowalkowski, who was not home. "The second thing I said was that someone needed to run to the house and grab our AED and get back to the pool.

"While someone went to get the AED, a gentleman noticed what was happening and began to do compressions and another woman assisted him. By then the kids had returned with the AED."

According to Brooke, a friend used the AED to shock her daughter twice. Once the EMS arrived, Brooke received additional shocks and continued chest compressions. After a faint pulse was detected, she was intubated, taken to a local hospital and then transported to Monroe Carell Jr. Children's Hospital at Vanderbilt.

"Through the years, all of our kids' friends have known what an AED is and where we keep it," said Kowalkowski. "We have always tried to educate and raise awareness the best that we could."

During Brooke's two-week recovery at the hospital the family began discussing the importance of educating the community at large about AEDs and training to properly use the device.

They were not aware that Children's Hospital was steps ahead of them. Since 2017, Children's Hospital has been an affiliate of Project ADAM (Automated Defibrillators in Adam's Memory), a national organization committed to preventing sudden cardiac arrest in children and teens through advocacy, education and preparedness. The free program works with schools and communities throughout the region to ensure they are not only equipped with AEDs but also trained in prevention measures.

Project ADAM Middle Tennessee is one of several programs supported by Children's Hospital that reaches beyond the walls of the facility to meet patients and families where they live, work and play in an effort to provide useful, sustainable tools for a healthier community.

And it's working, according to Project ADAM's medical director, English Flack, MD, assistant professor of Pediatric Cardiology.

"The program has been much more successful than what I thought it would be," admitted Flack. "It has a lot to do with the enthusiasm that the schools have brought to it. We have reached more schools, teachers, coaches and students than I imagined. We want to empower people in the community that they can save a life. AEDs are not 100%, but they are another tool to assist in a person's chances of survival."

For Flack, meeting survivors saved by AEDs is all the evidence she needs to know that Project ADAM Middle Tennessee is making a difference. To date, the program has teamed up with 41 counties, and both public and private schools.

Tennessee law mandates that all public schools provide at least one AED on the property. It recently updated the legislation becoming the only state in the country to require all schools with AEDs to conduct an annual CPR and AED drill and training to evaluate the school's preparedness.

Angel Carter, RN, program coordinator for Project ADAM, is a hands-on partner with area schools to help them achieve the Heart Safe School status. Once a school or community center has demonstrated the implementation of a thorough AED

program, including ongoing AED maintenance checks, establishment of a response plan, including a designated and trained response team, and a successful AED drill has been completed, they are designated as a Heart Safe School. She also works with youth athletic recreational leagues and community centers to provide education on AED use and CPR training.

"Our primary mission is to help schools prepare for a cardiac emergency on their campus," said Carter. "It's all about providing an appropriate response to a cardiac emergency. We know the importance of receiving aid within minutes of an event."

Data from the American Heart Association shows the incidence of non-hospital related cardiac arrest is greater than 350,000 per year. Estimates suggest that approximately 7,000 of those victims are younger than 18 years old.

"The average survival rate is less than 11%," said Carter. "It is critical that a patient get CPR and have an AED used within three to five minutes of their event to potentially double or triple their chances of survival.

"Survival rates decrease by 10% with each minute of delayed defibrillation," Carter added.

Brooke is now a senior at Summit High School in Spring Hill, Tennessee, and is doing well. Her family recently held a neighborhood AED education event that attracted local medical personnel and members of Project ADAM.

"Brooke is a great example of how we want to branch out beyond the hospital, beyond the school setting," said Flack. "It's an extension of where we want Project ADAM to go in terms of awareness. It's an example of how expanding health initiatives can impact the community at large." hope

Go for Gold

Children's Hospital, State of Tennessee team up for youth sports safety

Alex Diamond, DO, MPH, director of the Program for Injury Prevention in Youth Sports (PIPYS) and associate professor of Orthopaedic Surgery and Pediatrics, wants every Tennessee youth sports league (community and school-based) to have the resources needed to improve and follow state-recommended safety protocols that keep young athletes safe.

Diamond, a national advocate for youth sports safety, co-founded Safe Stars, a collaboration between the Tennessee Department of Health and PIPYS that launched May 2018. As the nation's first statewide safety rating system for all types of sports leagues, it's another example of how Monroe Carell Jr. Children's Hospital at Vanderbilt experts are expanding the care of patients beyond the walls of the hospital.

"When it comes to youth sports, there is no single governing authority that says how health and safety should be managed," said Diamond. "We want to take things we know work, things that are proven through research or are current best practice and deliver those directly to the youth leagues to implement. Although there is more structure in place for school-based sports, getting them the same information and strategies is critical as well."

Diamond is thrilled to see communities take ownership and play a strong role in making a difference.

"This is really a game changer in the realm of youth sports. It is setting the standard for how we think about addressing safety at the youth sports level and makes Tennessee a leader in providing a safe, healthy and happy experience for all of our young people participating in a sporting activity."

Safe Stars' goal is to provide resources and opportunities for every youth sports league to enhance their safety standards. The criteria for achieving recognition as a Safe Stars league has been developed by a committee of health professionals dedicated to reducing sports-related injuries among youth.

Safe Stars awards bronze, silver and gold star safety ratings to leagues that meet certain criteria through an application process. There are more than 30 gold star programs across the state. The free program focuses on preventing death and disability, highlighting the importance of heart safety and concussion education, injury prevention and appropriate sportsmanship for parents, children and coaches. Topics also include opioid prevention and mental health issues.

The bronze designation covers the most important safety protocols: emergency action plan, background checks on all coaches, constant presence of a CPR/AED certified coach, severe weather policy, anaphylaxis emergency plan and coaches being trained to recognize and manage concussion and sudden cardiac arrest incidents. Leagues that meet two more safety protocols get a silver rating. Those that achieve four more are awarded a gold rating. The Star rating remains in effect for three years, after which a league must re-apply.

More than 40 Tennessee-affiliated organizations have signed on to endorse the program, including statewide medical societies, professional sport teams, colleges and universities and government agencies.

"There are lots of discussions about how to expand our reach, not only across the state, but what are the opportunities to take this to the national level?," Diamond said.

"I try to be realistic because change takes time. But I will always keep pushing because it's important for our families, and communities, and our young athletes are seeing the benefit."

– by Jessica Pasley

WHOLE-HEARTED CARE

New 10th floor focuses on cardiology care

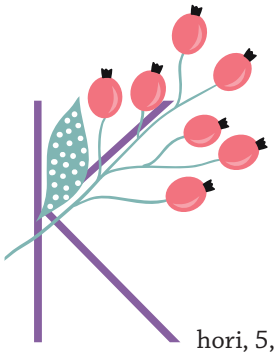
Tomara Norton was brushing her teeth in her East Tennessee home when she received a call from Monroe Carell Jr. Children's Hospital at Vanderbilt.

She thought the Sept. 21, 2019, call would be about her missing ID, which she had left at the hospital the day prior.

It wasn't. A match had been found for her daughter, Khori's, heart transplant.

"When he said he was a member of the transplant team and that they'd found a match, I literally almost fell to the floor. I just started crying. They were happy tears, of course," recounted Norton.

written by Kelsey Herbers
photograph by John Russell



Khori, 5, had spent the last three months on the transplant list at Children's Hospital's Pediatric Heart Institute after suffering heart failure following a "double switch" surgery — or a rerouting of blood flow from one side of the heart to the other and switching the heart's major arteries — for a rare defect discovered at birth. The surgery was her second open-heart surgery since she turned 2.

Her arrival to Children's Hospital in June 2019 aligned with the opening of its newly added 10th floor, which moved all inpatient pediatric cardiology services, including the cardiac intensive care unit (ICU) and the cardiology step-down unit, onto the same floor for the first time in the hospital's history.

The 10th floor opened as the first phase of the hospital's second expansion since 2004. The expansion involved a nearly three-year, $150 million construction project to create an additional four floors on top of the hospital — a project made possible by generous community support through the Growing to New Heights Campaign, a $40 million philanthropic effort including gifts from the Carell family, the Country Music Association and many other donors and community partners.

Khori, affectionately described as both sweet and sassy by her mother, received her heart transplant Sept. 22. She spent four hours in surgery, followed by three days in the cardiac ICU. By the third day, she was up and walking, and she was discharged on Oct. 1 — just nine days after surgery.

She was back to mothering her baby dolls and sporting her infamous high-heeled shoe collection in no time.

"I wasn't worried this time. I know how easily Khori bounces back," said Norton. "It's harder when you don't know if your child can make it through something like a transplant, but Khori had already made it through two surgeries and has done so well. I just knew in my heart that she was going to be OK."

The number of pediatric heart surgeries performed by Vanderbilt surgeons has nearly doubled over the last decade, including an increase in heart transplants. Thanks to the new dedicated space on the hospital's 10th floor, the Pediatric Heart Institute has the flexibility to provide the best care for all cardiology patients — even amid a flux in volume.

The Big Leagues

The Children's Hospital's Cardiology and Heart Surgery program is the ninth largest program in the country and the second largest in the Southeast relative to the number of pediatric heart operations performed, which averages around 500 annually. The hospital's reputation as a leader in pediatric cardiology has led to an expanded care area that draws patients from 13 regional states, and the number of referrals received from providers across the country has spiked.

"Everyone is used to thinking of us as a good regional program," said David Bichell, MD, William S. Stoney, Jr. Professor of Cardiac and Thoracic Surgery and chief of Pediatric Cardiac Surgery. "Our national growth is like moving from being on a minor league baseball team to playing in the big leagues."

Nearly 85% of the Pediatric Heart Institute's patients are under 1 year old, according to Michelle Acton, RN, MSN, manager of patient care services for Pediatric Cardiology, and the majority have a congenital heart defect, which has a 1-in-100 prevalence. Because these defects often require multiple surgeries, many children return throughout childhood and even into adulthood for continued specialized care.

BY THE NUMBERS

For 2019

486	29	15,398	16,000	801	305	22
surgeries	cardiologists/ cardiac surgeons	outpatient visits	echocardiograms	cardiac catheterizations	electrophysiology studies	heart transplants

"Prior to the 1970s, many children with heart problems didn't survive. Now, patients are not only surviving, but they're becoming adults with congenital heart disease. That means we need to be there for these adults also," said Scott Baldwin, MD, Katrina Overall McDonald Professor of Pediatrics, director of the Division of Cardiology and co-director of the Pediatric Heart Institute.

Growth in patient volume has also led to growth in staff, with the number of cardiologists more than doubling since 2004 from 12 to 26. Even with the space on the new 10th floor, the Children's Hospital has an average of more than five cardiac patients each day who are housed on a non-cardiac floor. The program already has plans for further expansion.

Because cardiology is one of the few divisions that provides everything from inpatient to outpatient care for both children and adults, having all services housed on the same floor makes it easier for teams to work together.

"Having all of our services housed in one place has always been a dream," said Baldwin. "It just makes sense when the day-to-day care of our patients is dependent on interactions with multiple divisions."

A Flexible, Family-Centered Approach

Prior to June, the cardiac ICU was located on the Children's Hospital's fifth floor while the cardiology step-down unit was located on floor seven. Patients often moved back and forth between the units as they recovered from surgeries or encountered unexpected problems.

The new 10th floor consists of 38 beds split into three pods: Pod A houses 15 beds for cardiac ICU patients, Pod C has 15 beds for the cardiology step-down unit, and Pod B, which bridges the ICU and step-down unit, provides eight beds that can be flexed to accommodate both patient populations, providing extra space for either unit when censuses are high.

The setup proves especially helpful for accommodating the program's seasonal spikes. Patient census is highest during the late spring and summer, as school-age children often schedule their surgeries during summer break.

"What happened was that we didn't have a 'one ICU fits all,'" said Bichell. "We needed to have a bigger ICU in the summer and a smaller one in the winter. The new space on the 10th floor gives us the ability to expand and contract."

The flexibility also means a patient can be transferred between the ICU and step-down care teams without ever changing beds, allowing for enhanced continuity of care and a more seamless care experience in an already familiar environment.

For families, the new floor also offers a warm, home-like feel with larger rooms, generous views of the city and rooming-in space that offers a curtain for privacy. Each room is equipped with two sleeping surfaces.

The new features represent a continued emphasis on the importance of involving families as members of the child's care team.

"This has always been a place that realizes we're taking care of patients, but we also have families attached to those patients. That's a part of our mission, and I think this newest, greatest thing that we've built is keeping that same goal in mind," said Acton.

The new unit has a dedicated pharmacy, ECMO (or extracorporeal membrane oxygenation) capabilities and updated technology to make care more efficient. Twenty-three rooms are equipped with mobile, critical care booms (a medical equipment column) to allow more flexibility in caring for patients, and the technology is set up for future enhancements.

Both units also have the potential and training to care for

Unparalleled imaging eliminates surprises

Advances in imaging technology have made it easier than ever to detect heart defects before they become problematic and to plan for surgeries before entering the operating room.

Using advanced echocardiography in Monroe Carell Jr. Children's Hospital at Vanderbilt's Pediatric Heart Institute, cardiologists can identify congenital heart disease 20 weeks into a pregnancy and place the baby on the operative schedule before birth. Diagnosing the problem early means surgeons and families have more time to prepare and make informed decisions.

Surgeons now also have the aid of three-dimensional echocardiography, allowing them to construct 3D-printed models of complex hearts to examine complicated pathways and plan corrective procedures. Prior to advances in imaging, those plans had to be determined during the procedure itself.

"We have really innovative imaging techniques that no one else has, to figure out the safest and easiest way to fix things. We don't open up anybody's chest and find surprises anymore. It's safer and results in us being able to do exactly the right thing at exactly the right time," said David Bichell, MD, William S. Stoney, Jr. Professor of Cardiac and Thoracic Surgery and chief of Pediatric Cardiac Surgery.

The newest addition to the imaging toolbox is virtual reality (VR), where surgeons can "fly into" a patient's heart at a microscopic level using a VR headset to determine their exact steps for upcoming procedures. The technology, created by previous Children's Hospital cardiology patients and families through Project Heart, is still in development but is already being used for more complex procedures.

"Cardiac imaging is a big deal before birth, after birth, before surgery and after surgery," said Bichell. "I think virtual reality and other imaging technologies that are currently on the edge of development will become the standard in the future."

other acute specialty populations if needed when the census is low.

"It's higher tech, it's easier to see the information we need to see minute to minute, and it's better equipped for some of the changes that are on the horizon," said Bichell.

Collaboration and Innovation

Having all cardiac specialties housed in the same space also makes it easier for the cardiac ICU and step-down units to communicate and collaborate. Because they share the same patients, the relationship has always been strong, but their new shared work environment provides more visibility into the other's needs.

Sharing a space allows team members to see one another regularly, providing increased opportunities to ask questions and share ideas on cases. Student rounds are also enhanced, as students can see patients in both units to better understand the full inpatient cycle.

"We get really innovative thinkers and smart, energetic people, and it increases the whole morale of what we're doing. You feel like you're a part of the future. That makes Vanderbilt a pretty awesome place to do what we do."

"The proximity of having everyone on the same floor means more people are around to hear, share and experience these patients. Students can see not only how patients look in the ICU, but also their whole process through the hospital up until they're ready to go home. I think it's better that way for education and collaboration," said Bichell.

While teams share a regular weekly meeting to discuss new cases and needs, the cardiologists, surgeons, anesthesiol-

Children's Hospital's reputation as a leader in pediatric cardiology has led to an expanded care area that draws patients from 13 regional states, and the number of referrals received from providers across the country has spiked.

ANNE RAYNER

ogists, intensivists and other ancillary services rely on each other to make the best decisions for patients daily.

Beyond clinical collaboration, the setup is ideal for sharing new ideas, an important component for fueling research and innovation.

"We're not only here to fix baby hearts in a way that we've been doing for a long time, but we're here to figure out new ways to do so. We're figuring out new ways to detect heart problems before it's too late, new ways to intervene and ways to reduce the number of surgeries a child may need," said Bichell.

"We get really innovative thinkers and smart, energetic people, and it increases the whole morale of what we're doing. You feel like you're a part of the future. That makes Vanderbilt a pretty awesome place to do what we do," Bichell added.

Current research focuses at Vanderbilt include understanding the genes that regulate how the heart forms to identify where problems arise, genetic differences that may predict how a patient will react following surgery and identifying factors that can determine whether a patient will survive a transplant.

"Our mandate is to 'move the ball down the field' in terms of improving the care we provide, not just settle for being the best we can be today," said Baldwin. "We need to define the future for optimized care of congenital heart disease patients, and this is done through research."

Paving the way forward, however, still isn't as rewarding as providing successful outcomes for the tiniest patients.

"When an infant has a heart problem, that's a bigger event in someone's life than a wedding or a graduation," said Bichell. "There's nothing that frames all of that better than having these children grow up and come back and send you Christmas cards. When they send me pictures of themselves on the soccer team, they might not have had that opportunity if they hadn't had a whole team thinking about them as an infant. What's more gratifying than that? How many jobs have that as a result?"

Personalizing care for congenital heart disease through genetics

With nearly $3 million in funding from the National Institutes of Health, researchers in the Division of Cardiology at Monroe Carell Jr. Children's Hospital at Vanderbilt have embarked on a five-year journey to study how genes affect heart surgery outcomes in children with congenital heart disease (CHD) with a goal of improving care.

"The overall goal of our research center is to improve clinical outcomes by implementing personalized medicine, a key institutional strength," said Prince Kannankeril, MD, MSCI, professor of Pediatrics in the Division of Cardiology and principal investigator for the study. "Our goal is to build an evidence base of actionable genetic variants that predispose children to serious postoperative complications to improve the care of patients with CHD."

CHD is the most common human congenital malformation and is a leading cause of infant mortality in the United States. Roughly half of children with CHD require surgical repairs, placing them at risk for postoperative complications, such as arrhythmias.

By identifying genetic variants that affect adverse outcomes after CHD surgery, cardiologists can perform pre-operative genotyping and incorporate genetic and clinical risk factors into individualized treatment plans.

To achieve these goals, the research team established an ongoing cohort of more than 2,500 children undergoing surgical procedures for CHD with detailed phenotypic information and DNA samples. They hope to expand the consented biobank to more than 3,500 patients and more than 5,000 operations by the end of the funding cycle.

This research is supported by grant HD-084461.

A Floppy-eared Future

For Norton and Khori, the four-hour journey to Nashville was overwhelming at first, but the dedicated staff in the Pedi-Heart Institute quickly became like family. Khori even made friends with country music artist Kix Brooks, co-chair of the Growing to New Heights Campaign, during her time in the hospital.

"The nurses here love Khori. She's like a celebrity. She's the queen of 10C," said Norton. "They spoiled her more than we spoil her."

Khori particularly connected with Taylor Bay, RN, a nurse resident, over their secret handshakes and dance routines.

"Khori is not like any other 5-year-old I have ever met. She has a spunky and sassy attitude that can brighten anyone's day, and if that doesn't do it, then her love for music artist Luke Combs or TikTok (a video-sharing phone app) sure will," said Bay. "Khori and her family have made such a positive impact on my life and my job. I am forever grateful this sweet, strong, amazing little girl and her family crossed my path."

For Norton, the best thing about the care Khori received was the peace of mind knowing that she was always in good hands.

"We never had to worry about whether Khori would be OK, even if we had to run to the grocery store," said Norton. "We love this place, and I wouldn't pick another hospital for her to be at."

Now that Khori's inpatient stay is over, she has big plans for her arrival home.

"What are we going to do when we get home?" Norton asked Khori on her final day in the step-down unit.

Khori, without hesitation: "Get a puppy."

Her preference? "A baby puppy with floppy ears." hope

Upperman Set to Lead Pediatric Surgery into the New Decade

written by Christina Echegaray
photograph by John Russell

As he starts to settle in his new office at Monroe Carell Jr. Children's Hospital at Vanderbilt, Jeffrey Upperman, MD, FAAP, FACS, reflects on the influences that eventually led him to what he calls, "possibly the biggest job of my life."

Upperman arrived at Children's Hospital in November 2019 from Children's Hospital Los Angeles (CHLA), where he had been since 2006, achieving national recognition as an expert in trauma, disaster preparedness and injury prevention. He oversaw the CHLA's American College of Surgeons Level 1 Pediatric Trauma Center and served as tenured professor of Surgery at the University of Southern California.

He serves as only the second Surgeon-in-Chief in Children's Hospital's history.

Upperman said over his career he had admired Nashville and Children's Hospital for their successes, opportunities and future potential, and knew it was a place he'd love to live and work someday.

"Monroe Carell Jr. Children's Hospital at Vanderbilt has always had a special place in my heart," said Upperman, who is also chair of the Department of Pediatric Surgery.

On this day in his office, he speaks about himself, but as a leader, he said, he prefers to listen. It's part of his 90-day plan to meet, listen and hear doctors, nurses, leaders and staff at Children's Hospital to take an inventory of strengths and areas of improvement to help set a vision for the coming months and years for the nationally ranked facility.

"I look forward to working with the Children's Hospital leadership team to come up with an agenda that will catapult us in the next decade as a top children's hospital," he said.

"I see an absolute powerhouse of people, and the spirit and character of the people stand out for me. Children's Hospital is uniquely positioned to be a juggernaut in children's health care for the greater Southeast area. I am excited by the potential and the real possibilities," Upperman said.

He's patient, driven and eager to see Children's Hospital succeed as a national pediatric surgery center and be a leader in disaster and trauma preparedness.

That patience and ambition stem from his younger, boyhood days. As a child growing up in Plainfield, New Jersey, Upperman recalls a snow day from school and when he was building a snow castle. He remembers seeing his mom, Marilyn Upperman, trek the street through a foot of snow.

She had just finished a triple shift as a frontline

nurse at the local hospital, staying overtime to ensure there was enough staff during the snow storm to care for patients. He asked her if she was tired.

"'Yes, but you have fun, and dinner will be ready when you come in,' she told me," Upperman said. "She always made it happen. Then she went back to work again the next day. What I got from my mom was professionalism, compassion and resilience."

Instilled with a tremendous work ethic, by his mom and his dad, Arthur Upperman, who worked in construction, and a bit of competitive nature always aimed at outperforming his five older brothers, Upperman knew at age 5 that he wanted to be a doctor as well as an Olympic track athlete. He even mapped out colleges that would allow him to pursue both passions.

"When you put my mom, a nurse, and my dad, a housing contractor, together, you, of course, give birth to a surgeon — people who work with their hands and people who work with people," he laughed.

Growing up in a household with lots of siblings, there were no secrets, including school grade performance. Upperman had long aspirations to be on the track team at his high school, a team coached by his older brother. But a parent-teacher conference with his mom and brother revealed he was earning a C in math, sidelining him for a semester from running until his grade improved.

"You can imagine how many Cs I got after that, and in fact, you can imagine how many Bs I got," he said.

His drive and determination, even more ingrained that day, guided his passion and will, eventually leading him to run track and earn dual degrees in human biology and sociology at Stanford University. That's also where he met his wife, Bevanne Bean-Mayberry, MD, a women's health clinician and researcher.

After graduating with a bachelor's degree in human biology and a master's degree in sociology, he went on to earn a medical degree from New Jersey Medical School. For years he had known he wanted to be at an academic medical center doing surgery while also serving in an administrative role.

He did his internship and residency at University Hospital in New Jersey and completed a fellowship in pediatric surgery at Children's Hospital of Pittsburgh. For a time, he also served as interim director of the Benedum Pediatric Trauma Program, learning how to be "an administrator in scrubs."

While in Pittsburgh, Upperman, who is now a retired lieutenant colonel in the United States Army Medical Corps, was deployed to the Middle East to serve as chief of Surgery during operation Iraqi Freedom 2 in 2004.

When he returned, he was recruited to CHLA, where he fine-tuned his skills as a leader, trauma director and surgeon.

"There I got to manage a cohort of doctors in aligning their thoughts, passions and feelings to serve the mission of injured children and families in Southern California. But with trauma you also have to have a unique relationship with the community," Upperman said. "A trauma program must consist of all the 911 trauma and emergency room cases, but also injury prevention and emergency preparedness, while we're always trying to understand how to do all that better."

He also further honed his disaster and trauma research interests in the organizational preparedness of health care workers, intestinal inflammation, sepsis and pediatric trauma. Many of those focus areas have received significant funding support from the National Institutes of Health, the Robert Wood Johnson Foundation and the Department of Health and Human Services.

As a researcher, Upperman has published over 180 peer-reviewed publications, 200 abstracts and 20 book chapters.

Additionally, he serves as a sworn member of the National Advisory Committee for Children in Disasters for the Assistant Secretary for Preparedness and Response. He is a member of the Scientific Advisory Council of the American Red Cross. He was a panel member on the Institutes of Medicine panel on Prepositioning Antibiotics for Anthrax in 2012. He has served as a permanent member of the pediatrics study section in the Eunice Shriver National Institute of Child Health and Development.

Upperman and his wife of 26 years have three sons, Jeffrey Jr., 22, Joshua, 20, and Joseph, 18, and a dog, Buster.

In his spare time, he still enjoys running and fitness. He loves reading how-to books and biographies, and he considers himself an amateur cook. hope

Snapshot

HOMETOWN:
Plainfield, New Jersey

FAMILY
Wife, Bevanne Bean-Mayberry, MD; three sons: Jeffrey, 22, Joshua, 20, and Joseph, 18, and dog Buster, a mixed boxer

FAVORITE BOOK:
Proverbs

FAVORITE MUSIC:
classical and classic jazz

FAVORITE SAYING:
"Experience the Promise"

INTEREST AND HOBBIES
Running, fitness, reading how-to books and biographies and listening to music

LONGEST DISTANCE RUN:
11 miles

pioneers of hope

At Monroe Carell Jr. Children's Hospital at Vanderbilt, our work extends beyond patient exam rooms. We are also searching for discoveries to offer better treatments, provide quality care and train the next generation of clinicians. The profiles here represent only a sampling of the tireless work performed daily to make Children's Hospital a place of unwavering hope. In each issue, we also include a profile to highlight our longstanding partnership with our community pediatricians who help ensure all children receive the best care each and every day.

Pediatric cardiologist **English Flack, MD**, reaches for a thank you note pinned to the bulletin board in her office, and tears well in her eyes as she recalls the patient whose mother sent the note with flowers.

"One of my dear patients I took care of in the NICU and throughout her long stay had progressive pulmonary vein stenosis, which we don't have a cure for. The relationship that the cardiac ICU and I had with the family turned out to be the most miraculous situation ever," Flack said. "I wish we had a cure for it, and I wish she had survived, but she died before her second birthday. Her mom sent me flowers on Easter. That family was so gracious and thankful. That's just one family of many who have been through the worst times of their lives in our presence and in our hospital, but they continue to give to us, which I think is incredible."

Flack treats patients with congenital heart defects, which affect 1 in 100 children. Walking with families and children through their medical journey, whatever the outcome might be, is the best part of her job, she said.

"Congenital heart disease affects people of all backgrounds. It is very innocent in that it often blindsides families, and I felt drawn to pediatric cardiology for the simple reason that it's a child and it's no one's fault," Flack said.

"It's that, combined with the resilience of children. It clicked in medical school when I saw a little boy running down the hall with chest tubes and he had just had a major heart surgery. Adults don't do that. The possibilities that I saw, and the resilience of the children are so amazing."

Flack grew up in Orangeburg, South Carolina, graduated from Wofford College in 2000, and earned her MS and her MD from the Medical University of South Carolina, conducting heart failure research along the way.

"I just had a pull to science, biology and medicine that had been there for as long as I remember. I was one of those kids in kindergarten who, when asked what I want to be when I grow up, said 'a doctor.'"

ANNE RAYNER

She came to Monroe Carell Jr. Children's Hospital at Vanderbilt in 2007 for her pediatrics residency, followed by a pediatric cardiology and advanced imaging fellowship. She then joined Vanderbilt's faculty and is an assistant professor of Pediatrics. Flack is the Project Adam — Middle Tennessee medical director. Project Adam is a 16-state initiative to place automatic external defibrillators in schools. The Vanderbilt affiliate has been in existence for two years.

"Our community was not as prepared as other places in our

state or in the nation. The purpose of our affiliate was to bring our community up to speed, and now we have become so strong in Tennessee, we've surpassed other places in the nation. Our schools are well equipped with AEDs," she said. "Tennessee was the first state in the nation to pass legislation for schools performing drills and we're trying to spread that from Tennessee outward. AEDs are important, but you have to know what to do with them. Preparedness and making our schools 'heart safe' has been a huge focus for us."

She and her husband, Jonathan, have three daughters, ages 10, 5 and 2. Flack enjoys running, cycling and outdoor activities with her family. With careful attention to schedules and working within support teams at home and at Children's Hospital, she can achieve a delicate balance.

"We prioritize family time when we are not working," she said. "I don't do anything as an individual at work or at home. At work, I'm not the only person taking care of one patient. Everything is done as a team. That's what has kept me at Children's. I take care of very complex patients, but I have 25 members on my team of colleagues who help me."

– by Kathy Whitney

Bryan Dejanovich and his team care for the tiniest and most frail patients that come to Monroe Carell Jr. Children's Hospital at Vanderbilt even before they pass through the hospital's doors.

Dejanovich, BSN, RN, MBA, is director of the Neonatal/Pediatric Transport team at Children's Hospital, supervising a crew of more than 40, including registered nurses, respiratory therapists and advanced emergency medical technicians. Since August 1974, when a retrofitted bread truck named "Angel" made its first trip, the transport team has grown and now has four modern ambulances, three that can transport twins.

The ambulances have specialized equipment for transporting the tiniest of premature babies, including advanced ventilation and a cooling system for children with brain injuries.

Dejanovich's passion for transport dates to the start of his career as a paramedic in his home state of Michigan. After six years of serving the Ann Arbor community and putting himself through nursing school at the University of Michigan, he came to Vanderbilt in 2010 as a nurse resident. His first job was in the pediatric Emergency Department, where he met his wife, Molly. He then joined the Neonatal/Pediatric Transport team, rising to clinical staff leader, and spent a lot more time with neonatal patients.

"The patients are very sick," he said. "It was just a totally different population than I had never taken care of. I really enjoyed going to hospitals and working with the babies who were just delivered…getting them stabilized, bringing them back here. That's my favorite part."

Dejanovich briefly left Vanderbilt in 2014 and earned his Master of Business Administration from Western Governors University, returning in 2016 in his current role.

"I like the pace of this," he said. "I like that you can see a lot of patients in your shift. These patients are sick, and they're looking for knowledgeable people who can come help them and continue what they've started to get the patients here. I think it really comes down to trying to help continue high-quality care of the patient while they are getting here."

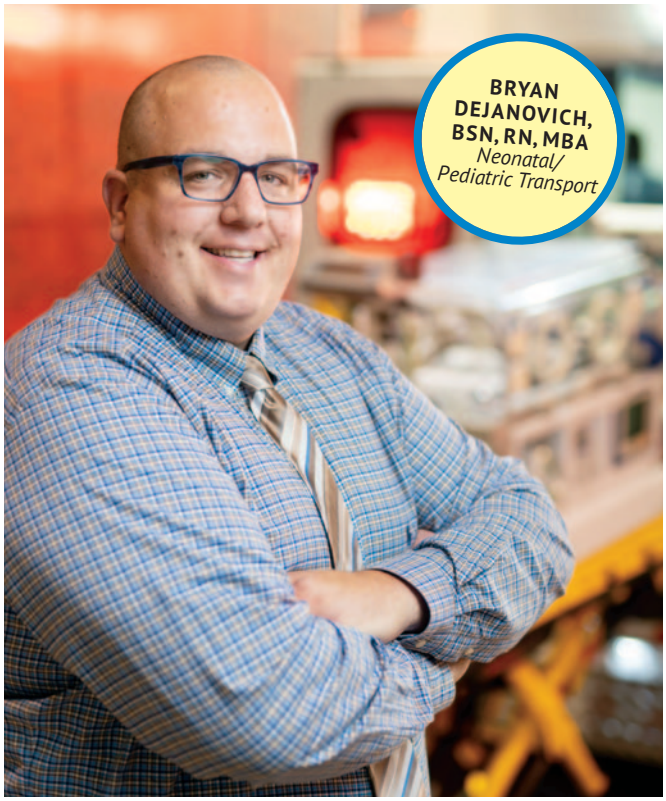
Dejanovich's team handled 1,585 calls for service in 2018, transporting patients all over Tennessee and Kentucky, in addition to occasional trips to northern Alabama and even Missouri.

"We're offering Vanderbilt's level of care to any of these hospitals that might need it," he said. "We've had steady growth. As the hospital grows, we're growing as well."

The team commonly treats premature babies, even assisting with some deliveries. Babies with cardiac issues and children with asthma and other respiratory issues round out the largest number of patients served.

Its outreach efforts include assisting with neonatal transport in the Florida area impacted by Hurricane Michael in 2018.

When Dejanovich isn't at work, he's spending time with his wife, Molly, and son, Connor, 5, and daughter, Ella, 3.



JOHN RUSSELL

"Both kids have started ice skating at Ford Ice Center, so we enjoy taking them ice skating," he said.

Dejanovich and his wife are active in their children's school, St. Joseph Catholic School in Madison. The family enjoys trips to Walt Disney World and regularly goes on cruises.

"During our time off, we're always looking for fun events around Nashville," he said. "It can be going to an apple orchard or a Nashville Predators game. We enjoy going out as a family."

– by Matt Batcheldor

Were a family or referring physician to search online for a pediatric stroke specialist at Monroe Carell Jr. Children's Hospital at Vanderbilt, the results would return one name: **Lori Jordan, MD, PhD.**

Director of the Pediatric Stroke Program, she is one of only a handful of child neurologists in the world with formal, subspecialty training in cerebrovascular neurology. Jordan is quick to clarify that she works as part of the pediatric neurovascular team devoted to treating this unique population of patients.

Jordan earned her B.S. in biology from the College of William and Mary in Virginia, received her medical degree from the University of Oklahoma and her PhD in clinical investigation from the Johns Hopkins Bloomberg School of Public Health. She completed residencies in pediatrics and pediatric neurology as well as a fellowship in cerebrovascular neurology (stroke) at The Johns Hopkins Hospital. In 2011, she joined Vanderbilt's faculty as an assistant professor in the Division of Pediatric Neurology in the Department of Pediatrics.

JOE HOWELL

Jordan has expertise in ischemic stroke, brain hemorrhage, vascular malformations and the neurological complications of sickle cell disease.

As she treated children with stroke during her residency, she began to realize there was a lack of medical literature on outcomes, which, for children, can be life altering. There was only one pediatric stroke fellowship in the world at that time, so she instead did an adult stroke fellowship and researched how the mechanisms of stroke applied to children.

"By the end of that year, I realized some of what I was learning was applicable, but really more research and data was needed. And I did two things: got involved with International Pediatric Stroke Study group, which was just forming, and I enrolled in a PhD program."

Jordan wanted to understand the concepts behind research, statistics and study design, and today her clinical research program focuses on predicting and improving outcomes after pediatric ischemic and hemorrhagic stroke and on stroke prevention, particularly in sickle cell disease. She is also an investigator for the Vanderbilt Kennedy Center.

"The children and their families drew me into the field. Children are amazing. They will have a serious medical illness and will come out of it and soldier on and want to recover, wanting to go play, run and get back to life," Jordan said. "Their drive to recover is so strong that I thought these are kids I want to help, and I found it an important problem to work on."

Jordan enjoys following her patients long term, watching them grow and live their best lives.

"Every year in May, I get super excited and proud when a few of them go to college, and many times I will have followed them from when they were very young."

How frequently she monitors her patients depends on their recovery and the cause of their stroke. Some children will have no ongoing problems after their initial stroke, but others have complications such as epilepsy, hemiparesis (weakness on one side) and cognitive difficulties.

Jordan enjoys spending time with her husband, Taylor, who works in The Center for Technology Transfer and Commercialization at Vanderbilt University. They are often found on the sidelines cheering on their two athletic children, ages 15 and 12. Her patients are never far from her mind, though.

"It's hard to put into words how amazing and inspiring a lot of the patients' families are. Parents of children with seri-

ous illness and ongoing disabilities are just fantastic. They are tireless in their support of their children and their desire to see them improve and find the best treatments."

– by Kathy Whitney

Lisa Lowe, MD, remembers announcing to her sixth-grade class that she was going to be a pediatrician. Her family was always fully supportive of her dream, but her high school physics teacher was another story.

"He said, 'Oh, you'll come back here after four years of college with an engagement ring, and you won't do it,'" she laughed. "Well, I made sure he got an invitation to my college graduation and to my medical school graduation. Then, ironically, when I moved back to Murfreesboro, I saw his children as my patients."

After completing an undergraduate degree at Middle Tennessee State University in her hometown of Murfreesboro, Tennessee, Lowe earned a medical degree at Quillen College of Medicine in Johnson City, Tennessee. She completed her pediatric residency at Sacred Heart Children's Hospital in Pensacola, Florida.

Remaining close to family has always been a top priority, so in 1987, Lowe returned to Tennessee to join Murfreesboro Medical Clinic. At that time, she was not only the first full-time female pediatrician at the long-established practice, but also the first full-time female pediatrician in the entire city. That fact didn't fully register at the time, she said.

"I didn't think of myself as doing anything unusual until some of the later partners said, 'Wow, you were a real trailblazer,'" Lowe said. "When I was about to have my first child, the four male partners at that time were like, 'What? You're going to have a baby?' That wasn't something they'd ever had to think about before."

Murfreesboro Medical Clinic is now the largest multispecialty, physician-owned practice in Rutherford County, and during her 32 years at the practice, Lowe has endeavored to be a mentor for other women and for younger clinicians who've come on board. She's also enjoyed several generations coming to her for care.

"I'm at the stage where I have parents who were my patients bringing in their children for me to care for," she said. "I even have patients now who are the grandchildren of my initial patients. It's flattering because those families don't have to make the choice to come to me. I do like to think that I've been a good resource for them, and that I helped educate them about how to be a good parent and a productive member of this crazy world we live in."

Lowe has also had a front row seat to watch the construction of Monroe Carell Jr. Children's Hospital at Vanderbilt's new 37,500-square-foot surgery and clinics facility in Murfreesboro — a stone's throw away from her office.

ANNE RAYNER

"We can see it from our clinic's front door," she laughed. "It's been fun to watch it go up. We've always had a great working relationship with Vanderbilt. Traveling is especially challenging for families with a special needs child, so having the new facility so close to us is wonderful for patients who won't have to make a trip to Nashville if we need to refer them to specialists."

Lowe has often been called a unicorn because she's lived in the same city most of her life, and she doesn't mind the label at all. Her husband, Mark Parsley, is also a Rutherford County native and works as an elementary school teacher leading the Science, Technology, Engineering and Mathematics Lab at John Pittard Elementary. The couple raised their children, Phillip, 30, and Claire, 26, in Rutherford County, and between years of supporting local sports, being active in parent-teacher organizations and fellowship with church members, there's likely few people in Rutherford County they don't have a connection to.

"Being a part of the community is such an important part of being a good pediatrician," she said. "I'm lucky I got to come back to my hometown to practice, and I love it that people say hi to us just about everywhere we go. To me, that's the way it should be."

– by Jill Clendening

Wrapped in the Arms of Friends

For 47 years, pediatric patients at Monroe Carell Jr. Children's Hospital at Vanderbilt have been wrapped in the arms of Friends.

Over that time, the 3,700-member Friends of Monroe Carell Jr. Children's Hospital at Vanderbilt, a volunteer organization, has supported the hospital through fundraising, outreach and patient and family support programs.

The group recently committed to support two crucial pediatric programs at Children's Hospital: Diabetes and Palliative Care. The group's most recent gift helped support two Children's Hospital programs: The Program for Children with Medically Complex Needs and Pediatric Cancer.

The group's other past efforts and contributions include support for a pediatric ambulance, the Music Therapy Program and a nurses' station in the hospital's recently opened Pediatric Heart Institute on the 10th floor. Friends continually supports a bereavement committee, a grant program addressing immediate hospital needs and Flashes of Hope, a program that creates powerful portraits of children fighting cancer and other life-threatening illnesses.

"The Friends contributions and support for Children's Hospital over the years have been truly remarkable. From philanthropic efforts to thousands of volunteer hours by Friends members, the group has made a lasting impact on children, families and our pediatric programming," said Steven Webber, chair of the Department of Pediatrics, pediatrician-in-chief and James C. Overall Professor.

"Friends has given several transformative gifts over the years, supporting vital clinical programs and advancing research in prematurity, behavioral health support in hemoatology-oncology and for complex medical care. The latest gift will allow us to provide those same program enhancements and discoveries for children with diabetes and for children entering our palliative care program."

The Children's Diabetes Program at Vanderbilt is one of the largest in the country, caring for almost 3,000 children and young adults with diabetes from Tennessee and eight surrounding states at the Vanderbilt Eskind Pediatric Diabetes Clinic and five other off-site locations. About 85% of patients treated in the program have the autoimmune form, Type 1 diabetes.

Support from Friends will allow the three young clinician scientists to advance their research to improve the tools used to treat Type 1 diabetes, care for the children and their families and develop methods to predict, prevent, reverse and cure the disease.

Pediatric palliative medicine is a specialty that focuses on quality of life and helps children with serious medical conditions and their families live their best life. It looks at the whole person — physical, emotional, spiritual and psychological — and addresses anything that detracts from a child's ability to just be a child, despite their illness.

They work with children with a variety of serious medical conditions including cancer, congenital heart disease and genetic conditions, some of which are survivable but others that are not.

There are currently two physicians and a nurse practitioner on Children's Hospital's pediatric palliative care team. Children are seen in the hospital, in outpatient clinics and at home. The Friends gift will allow the growth of an interdisciplinary team, so they can provide more comprehensive care to the children and families they serve.

Friends president Leigh Rogers said the two programs are both deserving.

"Our thoughts, after meeting with the hospital leadership, were that these are two compelling programs involving patients: those with diabetes who come here from all over Tennessee and other states for the best treatment in this region and palliative care for children diagnosed with serious illnesses, allowing them to live their best lives possible with their medical conditions," Rogers said.

– by Nancy Humphrey

From left are Friends of Monroe Carell Jr. Children's Hospital at Vanderbilt members Vera Lee, past president, Wendy Gatto, president-elect, and Leigh Rogers, president, with Steven Webber, MBChB, MRCP, chair of the Department of Pediatrics.

SUSAN URMY

LEARN MORE

Go to **ChildrensHospitalVanderbilt.org/hope** to find out how you can make a difference.

Eldredge Tunes Up Support for Pediatric Cancer

While Brett Eldredge is known by many as a chart-topping country music artist, the patients and families at Monroe Carell Jr. Children's Hospital at Vanderbilt get to know him as an advocate and friend. Eldredge has been making time to visit patients at Children's Hospital for years and even filmed a promotional video for his hit "Love Someone" in the hospital's Seacrest Studio with the help of a few young patients.

Together with his family, Eldredge has established the Brett Eldredge Family Foundation to support childhood cancer initiatives and research at Children's Hospital. The Eldredge family not only gives of their own time and resources, but their foundation has also fundraised through Eldredge's 2018 holiday tour and a fundraising collaboration with Balsam Hill.

– by Paige Turner

CAYCE LONG

Giving Champions

SUBMITTED PHOTO

Monroe Carell Jr. Children's Hospital at Vanderbilt has been fortunate to have great champions within the Nashville business community for years. New to the list of supporters is CBRE's Nashville office. The commercial real estate company engaged their team over the holiday season to give back through hosting a corn hole tournament, bake sales and a gift-wrapping station to raise funds for the hospital. The company also created its own fundraising campaign page, a new giving option at Children's Hospital, to raise donations and awareness for the hospital and its programs. Through a competition to see which department can raise the most, CBRE is taking employee giving to a whole new level. The fundraising initiative is a part of CBRE Cares, the company's corporate giving and volunteer organization that gives back to the community. To learn more about creating your personal fundraising page for Children's Hospital, visit Give.VanderbiltHealth.org/CHfundraiser.

– by Paige Turner

First-Class Care

To honor child life specialists worldwide, Children's Miracle Network Hospitals® partner Delta Air Lines created the Child Life Specialist of the Year award. Sarah Beth Gray of Monroe Carell Jr. Children's Hospital at Vanderbilt was the first to receive the recognition.

Serving in the Department of Radiology, Gray was instrumental in creating the Patient Awake While Scanned (PAWS) program that empowers patients to complete MRI scans without receiving general anesthesia and has served as a model for other hospitals. Delta presented Gray with airfare tickets and the Child Life department with a gift to help purchase additional movie goggles and headphones worn by PAWS MRI patients to allow them to watch a movie during their scan.

– by Paige Turner

Tailoring treatment for heart defect

The nonsteroidal anti-inflammatory drug indomethacin is routinely used to treat patent ductus arteriosus (PDA), a persistent opening between the aorta and pulmonary artery that is a common complication in preterm infants. Clinical response and toxicity to indomethacin are highly variable. About 1 in 4 infants treated with indomethacin requires subsequent surgical ligation, and adverse effects include kidney and gastrointestinal dysfunction.

Prince Kannankeril, MD, MSCI, a pediatric cardiologist at Monroe Carell Jr. Children's Hospital at Vanderbilt, and colleagues sought to identify risk factors for indomethacin failure — indomethacin treatment followed by surgical ligation — in preterm infants with PDA. They investigated clinical factors and four candidate genetic variants in a multicenter cohort of 144 preterm infants who received indomethacin to treat PDA.

In the journal *Pharmacogenomics*, the researchers report that gestational age, surfactant use and a variant in the gene CYP2C9, which encodes a protein that metabolizes indomethacin, were each associated with indomethacin failure.

The study identifies clinical and genetic predictors of indomethacin response, which will help tailor treatment of PDA in preterm infants.

This research was supported in part by grants from the National Institutes of Health (HL132805, HL109199, HL128386, HD084461) and from the Burroughs Wellcome Fund.

– by Leigh MacMillan

Study: Acid reducers may pose risk for children

Proton pump inhibitors (PPIs) — such as Prilosec, Protonix and Nexium — have long been among the most prescribed medications in the country to help reduce stomach acid.

The use of these medicines among children is on the rise and so are potential side effects, which is sparking concern according to a recent study published in *Pediatrics*.

The study, led by Sara Van Driest, MD, PhD, assistant professor of Pediatrics at Monroe Carell Jr. Children's Hospital at Vanderbilt, examined DNA from patients up to 3 years old at the time of PPI exposure.

"PPIs are commonly used in children to treat gastrointestinal disorders, and we are seeing an increase in the number of adverse infection events associated with their use," said Van Driest, the principal investigator of the study.

There is a specific enzyme in the body, CYP2C19, that helps break down these medications. The enzyme works differently in each person —slow, normal, fast or sometimes not at all — impacting the ability of the medication to be safely metabolized.

Because CYP2C19 inactivates PPIs, genetic variants that decrease the enzyme's function may increase the medicine levels in the body leading to more infection events. Stomach acid naturally protects the body from dangerous organisms that can be found in water and food. Reducing stomach acid may increase an infant's risk of these kinds of infections.

The study included 670 PPI-exposed infants, both healthy and those with chronic health conditions, with varying levels of enzyme function.

The team hopes its findings will help clinicians make the best decisions on prescribing PPIs in children.

Van Driest's team included members from the Department of Pediatrics, Biomedical Informatics, Medicine and Pharmacology from Vanderbilt, as well as one member of the Nemours Children's Health System in Florida.

– by Jessica Pasley

New test aids in quicker treatment decisions for sepsis

A new test to determine whether antibiotics will be effective against certain bacterial infections is helping physicians make faster and better prescription treatment choices.

"Randomized Clinical Trial Evaluating Clinical Impact of RAPid Identification and Antimicrobial Susceptibility Testing for Gram-Negative Bacteremia (RAPIDS-GN)," is the largest study to evaluate the clinical impact of rapid blood culture diagnostics in the management of patients with Gram-negative bacilli bloodstream infections.

The results demonstrate that providing rapid, accurate drug susceptibility information to physicians could improve the care of patients with sepsis, a potentially life-threatening condition caused by the body's response to an infection.

Ritu Banerjee, MD, PhD, associate professor of Pediatrics at Monroe Carell Jr. Children's Hospital at Vanderbilt, and her colleagues sought a way to shorten the wait time until the appropriate medication could be started to treat the infection.

Conventional testing can take two to three days before the bacteria in the blood and its drug resistance are fully identified. Utilizing the rapid testing method gave medical teams final results in about 12 hours.

"This was a very positive result. It was proof that faster actionable results led to timelier, targeted antibiotic therapy," Banerjee said. "The hope is that this, in turn, leads to better patient outcomes, less unnecessary broad-spectrum antibiotic use, and less emergence of drug resistant organisms."

The research was supported by the National Institute of Allergy and Infectious Diseases of the National Institutes of Health under Award Number UM1AI104681.

– by Jessica Pasley

It's the People Who Make the Difference

When Cooper Cook was 8 weeks old, he was diagnosed with a rare type of cancer called infantile fibrosarcoma and underwent surgery. Now cancer-free, Cooper is a healthy 11-year-old. Cooper's mom says, "Monroe Carell Jr. Children's Hospital at Vanderbilt is an amazing facility, but it's really the people who make all the difference in a child's care."

Help us ensure the best people provide the best care for years to come by supporting Monroe Carell Jr. Children's Hospital at Vanderbilt.

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Ranked among the nation's best

Monroe Carell Jr. Children's Hospital at Vanderbilt is once again named among the nation's Best Children's Hospitals in *U.S. News & World Report's* annual rankings. Children's Hospital, a regional comprehensive pediatric care center, achieved national rankings for 10 out 10 pediatric specialty programs.