

2023 | 2024

Y E A R I N R E V I E W

DEPARTMENT OF PEDIATRICS
ANNUAL REPORT



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Message from the Chair



Thank you for taking the time to learn more about the Medical University of South Carolina's Dr. Charles P. Darby, Jr., Department of Pediatrics and for reviewing our 2023-2024 annual report.

At our core, we are guided by purpose as we strive to innovate and care for children in Charleston, the state of South Carolina, and beyond. I am incredibly grateful for the extraordinary members of our Department. Ours is a truly inspiring group of individuals who come together as a whole to change what is possible. We have leaders in all fields in pediatrics serving together to transform the health of children and create beneficial outcomes that can only happen when people are connected to a mission and to each other.

It has been an impactful year for us and for our mission. We have seen new recruitments and new programs, as well as the growth of those that are already nationally recognized. I want to emphasize our recruitment of Dr. Brian Bridges to lead our

Critical Care Division, Dr. Benjamin Kuhn to lead our Gastroenterology Division, and Dr. John Pastore to lead our Hospital Medicine Division. Our multitude of educational programs are thriving and continue to advance leaders in children's health, enhanced by the innovation from our Advocacy and Health Equities teams.

Again, I thank you for taking the time to learn more about the inspiring work at MUSC's Dr. Charles P. Darby, Jr., Department of Pediatrics. I hope that this information will prove helpful and that there is an opportunity to collaborate in the future with our shared goal of improving the well-being of children everywhere.

With great appreciation,

Key Milestones Timeline

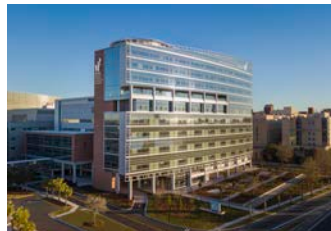


Denis Guttridge, Ph.D. starts as Director of Darby Children's Research Institute

May 2018

Ribbon Cutting Ceremony and Grand Opening of MUSC Shawn Jenkin's Children's Hospital and Pearl Tourville Women's Pavilion

Feb 2020



Neena Champaigne, M.D. starts as Division Director of Pediatric Genetics

December 2020



May 2017

Andrew M. Atz, M.D. announced as the chair of the Department of Pediatrics



April 2019

Ribbon Cutting Ceremony and Grand Opening of MUSC Children's Health R. Keith Summey Medical Pavilion in North Charleston

August 2020

Dalila Lewis, M.D. starts as Division Director of Pediatric Neurology



January 2021

Allison Eckard, M.D. starts as Division Director of Pediatric Infectious Disease





Angela LaRosa, M.D. starts as Division Director of Developmental Behavioral Pediatrics

June 2022



U.S. News & World Report 2023-2024. The first year with 5 specialties: Cardiology, Hematology/Oncology, Neonatology, Nephrology, Gastroenterology & GI surgery.

June 2023



Brian Bridges, M.D., starts as Division Director of Pediatric Critical Care

May 2024



May 2022

John Pastore, M.D., M.B.A., F.A.A.P., starts as Division Director of Pediatric Hospital Medicine



August 2022

Benjamin Kuhn, D.O., starts as Division Director of Pediatric Gastroenterology and Nutrition



Dec 2023

The MUSC Board of Trustees approved the naming of Dr. Charles P. Darby Jr. Department of Pediatrics



MUSC Department of Pediatrics Renamed

On December 7th, 2023, in recognition of Dr. Charles P. Darby, Jr.'s, lifetime of service as a pediatrician, advocate, administrator, and philanthropist, the MUSC & MUHA Board of Trustees voted to rename the Department of Pediatrics to the Dr. Charles P. Darby Jr. Department of Pediatrics in his honor. Dr. Darby's last fundraising initiative generated over \$14 million dollars for MUSC and Pediatric endeavors.

With this change, Dr. Darby and the Medical University of South Carolina have once again set a precedent by being the first department to be named after an individual who has made such incredible strides for the children of South Carolina. Dr. Darby's name is now synonymous with Pediatrics at MUSC with both the Department and the research Institute (Darby Children's Research Institute) named after him.

Dr. Darby's vision for changing what's possible for South Carolina's children began over 40 years ago with often incorporating pro-health concepts that were ahead of their time. In addition to excelling at treatment for pediatric issues, such as pediatric cardiology and juvenile diabetes, he also advocated for preventative measures on a legislative level, serving

as one of the key champions for getting the cigarette tax passed and the funds dedicated to health.

In 1987, he worked with legislators and MUSC officials to build the Southeast's first children's hospital. Realizing that it's important to surround himself with others who also have children's health and welfare as their passion, Dr. Darby worked tirelessly to establish MUSC and Shawn Jenkins Children's Hospital as not only one of the South's premier health care centers, but also position South Carolina as an international leader for pediatric research, opening the Darby Children's Research Institute in 2005.

In his journey to make MUSC's Pediatric department one of the best Departments of Pediatrics in the country, Dr. Darby's mission was summed up by his unwavering credo: "There's a lot of satisfaction in helping one child get well, but when you can magnify that and do things like create a nice facility that helps many children get well – that's beyond gratifying. I always think of children as being our most precious gift and I believe that society is judged by how well we take care of our children. What better cause is there than the health of children?"



Dr. Charles P. Darby, Jr.

COMMUNITY HEALTH AND WELLNESS



BOEING CENTER FOR CHILDREN'S WELLNESS AWARDED SIZABLE GRANTS TO IMPROVE THE WELLBEING OF SOUTH CAROLINA'S CHILDREN

The Dr. Charles P. Darby, Jr., Department of Pediatrics and the Boeing Center for Children's Wellness (BCCW) have earned a combined total of nearly \$3.3 million to help in the fight against juvenile diabetes and to improve the mental health and wellness of children in and around Charleston, and across the state of South Carolina.

Utilizing a \$1.33 million dollar award from the Duke Endowment for her project "Expansion of the MUSC BCCW School-based Wellness Initiative to Address Mental Health," Dr. Janice Key, envisions it as an important evolution of the work they've already done which has spanned decades. "We've focused on general school wellness work in Charleston County for 15 years, helping schools implement programs that improved students' nutrition, physical activity, and mental health," says Dr. Key. "During that time, we found that healthier kids had healthier academic outcomes." Their project aims to expand their current program to Berkeley County and Dorchester County school districts, as well as add in a new remote monitoring system which will help high school students who indicate they are having mental health



Dr. Janice D. Key

struggles. "Right now, kids will send out a plea on their social media, and occasionally they will say something extreme – like they are feeling suicidal. We don't want that," says Dr. Key. "We want a way to connect with them and have them communicating with a professional so we can find their need early."

In an effort aimed at curbing the rising tide of juvenile type 2 diabetes, the \$1.9 million dollar grant from the Blue Cross Blue Shield of South

Carolina Foundation as part of their Diabetes Free SC initiative, will serve to expand and enhance Dr. Kathleen Head's project: Prevention and Treatment of Diabetes Through a School Wellness Model. This project, is designed to collaborate with schools to incorporate programs and activities that promote healthy lifestyles among young individuals. The grant not only acknowledges the importance of this initiative but also underscores the urgency of addressing the alarming increase in juvenile diabetes cases.

Type 2 diabetes, once primarily seen in adults, has been growing steadily amongst school-aged children. Sedentary lifestyles, poor dietary habits, and a lack

of education about healthy choices have contributed to this upward trend. Recognizing the importance of early intervention, Dr. Head's project is built on the premise that schools can play a pivotal role in shaping healthy behaviors and promoting wellness. By integrating education about nutrition, physical activity, and overall health into the curriculum, students are equipped with the knowledge and tools needed to make informed decisions about their health.

"We try to empower the community and the school system to be the leader and the owner of the culture of wellness," says Dr. Head. "Our goal is to introduce the students to wellness activities, curriculum and policies, so that everyone can experience a wellness culture – which is something that improves their lives where they live, eat, play, and learn five days a week."

Both teams are hoping to make a big impact over their projects' 3-year time periods. "Teachers have given us wonderful feedback about the learning collaboratives that we've done in the past in Charleston County and how it's changed their practice in the classroom," says Dr. Key. "We're

excited that we're going to get to do this in two new counties."

These grants will also provide the necessary resources to build on the previous successes and expand the initiatives' reach to additional counties, ensuring that more schools and students can benefit from its positive impact. "Normally these children used to have to travel to Charleston, which is quite a barrier because they're in rural counties," says Dr. Head. "With this next phase of the project, we're partnering with MUSC's Pediatrics Endocrinology department and starting the first pediatric endocrinology telehealth program. So basically, children with diabetes will be able to connect from school to see their diabetes care team."

By educating and empowering the schools, the children, their families, and the community in a culture of wellness, both Dr. Key's and Dr. Head's projects offers a beacon of hope for a healthier future. "There's so many partners that come together to make this happen," says Dr. Head. "Once we set it up, it's sustainable. And it can benefit the students for generations to come."



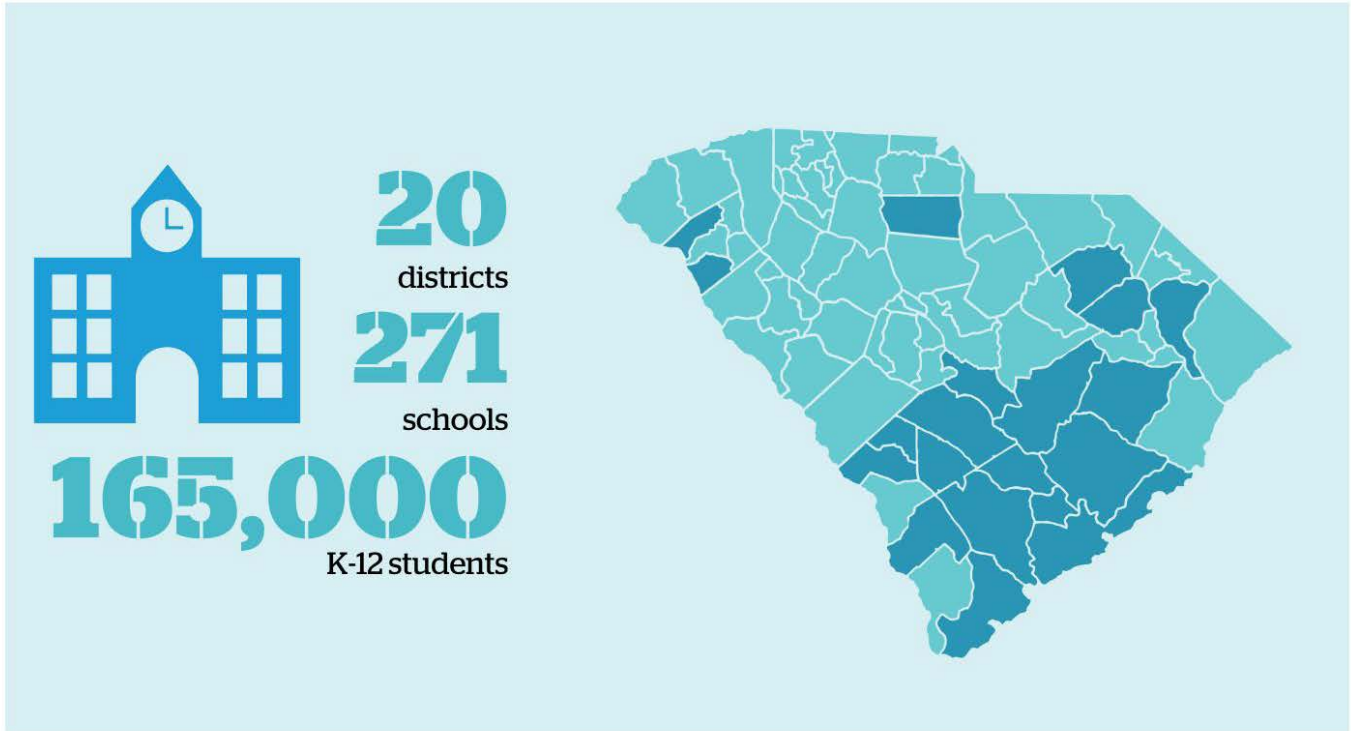
Partnering with GrowFood Carolina



Two happy taste testers

By the Numbers

2023 - 2024 State-wide Impact



\$252K

wellness funds awarded to schools



107

of schools applied for a grant to support their wellness efforts



97

adopting health care professionals



184

schools created a relaxing space for students



151

of schools had food-based gardens



119

schools increased classroom physical activity



155

schools had water drinking campaigns



119

schools used a school-wide SEL program



94

of schools had staff walking/running groups

Children's Health Advocacy

Providing More than Medical Care

An advocacy program serves several important purposes, all centered around enhancing the education of medical students and fostering a culture of social responsibility and community engagement. The ideal program helps shape well-rounded, socially conscious, and proactive healthcare professionals who are prepared to take on leadership roles in improving the healthcare system and advocating for their patients. Preparing the providers of the future is something that is Charles P. Darby, Jr. Department of Pediatrics Advocacy Program Director Stephanie Kwon, M.D.'s passion and something she has made her career mission.

Looking back over her nearly 5 years of involvement, Dr. Kwon recognizes the impact MUSC has had on her career and is especially grateful that the Department's passion for Advocacy matches her own. "Coming here, I could not have imagined the journey of where I am now," she says. "We're still kind of in the early stages of our program, but at the same time, I feel like we've done a lot in trying to make sure

that we are engaging as many people as possible. I've interviewed a lot of medical students that are interested in coming to MUSC and a lot of them have a really strong interest in child health advocacy. So, I think having a really structured program and in a way that's welcoming to all and that's not exclusive I think is really important."

Coming up on its second year, the Advocacy program's 22 residents are assigned to one of three committees: Action, Community or Education. The Action committee focuses on identifying and studying key issues facing the children of South Carolina and the legislative measures that can be taken to alleviate them. Community connects residents with both the people they will be serving as well as the services and programs that are available for those in need, many of whom may not be aware of their existence. And the Education committee creates educational programming that informs both medical professionals and the public alike of the health disparities children face and ways they can help.



All committees have two main goals in common: caring for South Carolina's children and helping residents understand their patients on a deeper level. "We have multiple different drives throughout the year - we usually kick off the year with a school supplies drive which this past year raised over \$1000 to buy school supplies for the Lowcountry Orphan Relief," says Dr. Kwon. "We've done multiple breakfasts for Ronald McDonald House and residents get to learn about how to make community partnerships - how to engage with community partners in a way that is with them instead of at them."

The program has also been directly involved in some life changing and lifesaving decisions, such as being a part of the legislative process to provide universal school meals to kids who attend public schools, as well as supporting 988, which is a suicide hotline funding initiative. "In addition, as part of injury prevention, a couple of our residents have gone through the National Child Passenger Safety program's four-day training and are some of the few providers in Shawn Jenkins Children's Hospital that are nationally certified Child Protection Safety (CPS) technicians."

Another recent Community committee event directly benefitted an initiative that is near and dear to Dr. Kwon's heart: the Food Pantry. The Food Pantry is a partnership between the Advocacy program, Women and Children's ICCE and the Lowcountry Food Bank. Families that visit the emergency room are evaluated during treatment and approached about the benefits of the food bank. Patients and their families are then sent home with a bag of shelf stable food as well as information for taking the next steps. "This year our food drive raised funds and then also had actual food donations that directly benefitted our Food Pantry that we have within the Children's Hospital," says Dr. Kwon. "Rates of food insecurity are probably close to 20 to 25% among patients seen (at the hospitalist level), so this program is an opportunity to kind of serve the whole patient not just for the reason that they're being admitted for, but also being able to set

them up with resources beyond just the food that we're able to give them."

As the program continues to grow in numbers and branch in different directions, Dr. Kwon remains as dedicated as when she began her Advocacy journey - possibly even more so. "It doesn't feel like work because you're doing good and it feels so great to be a part of it," she says. And being able to expose health providers from this generation and generations to come to advocacy at all levels benefits everyone involved. "Any touch point that you can make with the community is an opportunity to think of the patient as a whole, and to provide other services and care that goes beyond just direct medical care."



Drs. Hannah Ballock, Adam Bartholomeo, Stefan Hansen, and Katie Dharmasri on the steps of the capital



Wear Orange day to end gun violence

CLINICAL CARE



BREAKING BARRIERS

How MUSC's Heart Center Is Saving Lives and Redefining Success

Pediatric cardiac care is a field of constant innovation and dedicated expertise, where medical universities play a pivotal role in pushing the boundaries of what's possible. The Medical University of South Carolina's Dr. Charles P. Darby Jr. Department of Pediatrics stands at the forefront of these advancements, spearheading cutting-edge research and implementing specialized programs to enhance the treatment and care of young patients with congenital heart conditions.

Beyond all of the technical and research-based accomplishments, Pediatric Cardiology Chief, Eric Graham, M.D. credits something decidedly more human for the programs' success: people working together. "A lot of other surgical programs all compete with each other - they all are duplicating resources. What I think is really special about our program is that we actually work together with all of the cardiologists across the state to be the only center in South Carolina that does cardiac surgery and cardiac interventions and has a cardiac ICU," says Graham.

South Carolina has a population of four and a half million people. When patients need these high complexity interventions and surgeries, they can come to MUSC to find the latest specialized care. But since the program collaborates with cardiologists across the state, patients have the ease of being seen close to home for their routine follow up.

“What I think is really special about our program is that we actually work together with all of the cardiologists across the state to be the only center in South Carolina that does cardiac surgery, cardiac interventions and has a cardiac ICU.”

Eric Graham, M.D.
Pediatric Cardiology
Division Chief

“Because of that, we’re not competing with our neighbors – we’re working with them, collaborating to get the best possible outcomes for our children,” says Graham. This collaboration allows the program to focus the most important part: improving patients’ outcomes. MUSC’s Pediatric Cardiology has consistently ranked highly in both industry and world reports, most recently achieving #4 ranked in U.S. World and News Report in 2024.

“When you look at the society surgeons as a whole, their database has a risk adjusted mortality for all of these outcomes and ours are always among the very best,” says Graham. “But what’s really neat is that not

only are the outcomes better but the children are doing better and having shorter lengths of stay in the hospital. So, to me, that’s by far the most important thing that that we do - take excellent care of the children of South Carolina.”

Part of that care involves searching for solutions. Research is at the core of MUSC’s pediatric cardiac program, driving innovation and advancements in the field. The division is a part of the Pediatric Heart Network (PHN), a consortium of leading hospitals across the North America, and other countries that conducts research in children and families living with congenital heart disease, adults living with congenital



Dr. Eric Graham (center) checks on a patient

heart disease, and children affected by acquired heart disease. “We are one of eight core centers that are part of the PHN,” says Graham. “And we are one of only three that have been part of this group since its inception in 2001.”

Being a part of a large multi-center collaboration allows the program to get the desperately needed data to study how to make the outcomes better. “We have multi center groups that are funded by the NIH and then we also have a multiple other quality collaborative that we work on as well,” says Graham. “We’re advancing knowledge and improving the outcomes through research and quality improvement.”

Education also ranks highly on the list of the division’s accomplishments, with a robust and comprehensive Fellowship program. “We’re training the leaders of the of the future and quite a few we’ve been fortunate to be able to keep here in the US, which has served as a wonderful pipeline to grow our faculty with some of the best talent that we’ve trained here locally,” says Graham. The program currently boasts nine ACGME Fellows with three additional fellows in an advanced fellowship program for an extra year.

Dr. Graham is also proud of the division’s partnership with Project ADAM, a group that was launched to get systems into place in communities across the country to offer the best chance of survival to people who suffer Sudden Cardiac Arrest. “We have a nurse coordinator going to schools to teach students and staff how to use AED’s, automated external defibrillators, and perform CPR,” says Graham. “We are working to help the schools feel more comfortable when someone goes down to be able to use these resources to save lives in our communities. We’ve already saved some lives doing that.”

As for the future of the program, Dr. Graham sees it continuing with its incredibly successful integrated care model that emphasizes collaboration, communication, and continuity of care throughout the patient’s journey. “Shawn Jenkins Children’s Hospital just opened a few years ago and we’ve already outgrown our space,” says Graham. “We’re

full to capacity at all times, using beds in the PICU and on other floors, and we appreciate the collaboration through the rest of the SJCH that’s helped us. But we’re looking to expand and grow another eight beds for heart failure and transplant unit because we’ve gotten so busy.”

Along with the expanded hospital space comes the need for a few more helping hands. Over the past year, the division has had 2 promotions, grown by 4 faculty and 3 APP’s, with a look to the horizon to add more. By fostering collaboration, embracing innovation, and prioritizing patient-centered care, the university’s pediatric cardiac program continues to redefine the standard of care, offering hope and healing to children and families facing the challenges of congenital heart disease. “I’m proud of all of the work we’ve done so far,” says Graham. “And I’m very excited and optimistic about where we’re going.”



Pediatric cardiac surgeon, Dr. Minoo Kavarana



Dr. Sinai Zyblewski (center) consults with the care team

Pioneering Pediatric GI Care

Innovative Gastroenterology Program Sets New Standards at the Medical University of South Carolina

Unless they're experiencing an issue, not many people think about the self-contained uniqueness of the GI tract. But it's that aspect that drew the Medical University of South Carolina's Pediatric Gastroenterology Division Director Dr. Benjamin Kuhn to the field in the first place. "What I find fascinating about Gastroenterology is that the entire GI tract is technically outside the body," he says. "From your mouth to the end, it's a hollow tube that travels throughout your body: you put into what you think you need for nutrition or hydration, and your body knows what to absorb or eliminate."

It's this fascination and passion that's inspired Dr. Kuhn to tirelessly work to position the Dr. Charles P. Darby Jr. Department of Pediatrics as home to not only the most comprehensive Pediatric GI and Hepatology care center in South Carolina, but one of the best in the nation.

Case in point to Dr. Kuhn's division building accomplishments: the July 2023 arrival of South Carolina's only Pediatric GI Motility Specialist, Dr. Nancy Swiader. "When patients struggle with intestinal motility issues, the symptoms can range from being unable to eat or swallow food to difficulty with bowel movements," says Kuhn. "When the motion of the intestines is not right, lots of problems can ensue."

Especially complicated cases can require the attention of a Pediatric GI Motility Specialist, which Dr. Kuhn says is a highly technical role both expertise wise as well as technology wise. "The ability to test and measure the motility or the motion of the GI tract, as well as evaluate and manage patient care and keep up with advancements year over year is incredibly valuable," he says. "There's a certain threshold

required for patients to undergo that degree of testing and expert care and it's incredible that we can now offer it here at MUSC."

Up until this point there has been an unmet need for this specialty in Charleston, as well as the entire state of South Carolina, which has led to the MUSC investing in the latest in motility assessing equipment as well as hiring two nursing specialists trained in Pediatric Motility at Nationwide Children's Hospital. "People were calling even before Dr. Swiader got started, and the lineup of patients to be scheduled for motility procedures is already scaling faster than we anticipated," says Kuhn. "But Dr. Swiader is dedicated to caring for her patients and we have the capacity to serve all of the needs in a short period of time."

Dr. Kuhn is equally proud of the division's pioneering foray into a new and exciting treatment at the Pediatric Inflammatory Bowel Disease Center: pediatric intestinal ultrasound. Managed by Carmine Suppa, M.D., MUSC will be one of only three sites in the United States to offer this innovative and non-invasive testing modalities. "Ultrasound is emerging as one of the top methods to detect changes in the bowel brought on by inflammatory bowel disease," says Kuhn. "It's really attractive because it's not painful, it doesn't require anesthesia or sedation, and doesn't require a bowel prep. It can be done in office during a visit and be a quick, non-painful way to



Dr. Benjamin Kuhn

evaluate someone's disease activity. The hope is that its utilization will replace some of the need for repeat colonoscopies."

Dr. Suppa, who is one of the few practitioners in the state trained to be able to perform this procedure, is International Bowel Ultrasound (IBUS) certified – a grueling 1+ year program that involves training domestically and abroad. Joining him is a second recently hired pediatric inflammatory bowel disease specialist, Dr. Kristen Capone, effectively doubling the center's treatment capacity.

In order to offer its comprehensive general pediatric gastroenterology care to a wider area, the Department's GI & Nutrition division is expanding its multidisciplinary clinic care to both Murrel's Inlet and Okatie, S.C. "There are a few hotspots in South Carolina and Myrtle Beach is one of them," says Kuhn. "Up to 25% of the patients that we see in our Charleston based clinics come from the Myrtle Beach area."

Even though they may not be new to MUSC, Dr. Kuhn is still happy to expound on the specialty services of some of the core members of the division. "We have the only Pediatric Liver Transplant center in the State of South Carolina, helmed by Dr. Nagraj Kasi," says Kuhn. "And Dr. Candi Jump, D.O., has just been nominated for the prestigious NASPGHAN Foundation Teri Li Young Educator Award." And even though Dr. Kuhn would rather talk about the people on his team, he has also made a big impact, not only through his recruiting efforts, but by creating MUSC's Center for Eosinophilic Disorders. The center provides comprehensive medical care to children with eosinophilic disorders, such as eosinophilic gastritis (EG), eosinophilic gastroenteritis (EGE), eosinophilic colitis (EC) and eosinophilic esophagitis (EoE) – EoE being the most common of these and affecting 1 out of every 2,000 people.

When asked about his vision of the future, Dr. Kuhn goes back to the central belief that has guided him since his first days at MUSC and the Dr. Charles P.

Darby Jr. Department of Pediatrics: "My main focus is and has been to build a team of talented people. Because the landscape of medicine changes over the course of time. But if you have a talented team that has a proven track record of achieving good outcomes, the chance of success is great. I think some of these services that we currently offer reflect that, and there's so much more on the horizon."



Pediatric IBD cases are estimated to increase by 50% by 2030



Dr. Benjamin Kuhn

International Recognition

MUSC Health Immunology Center Designated as a Jeffrey Modell Diagnostic & Research Center for Primary Immunodeficiencies

By Kat Hendrix, Ph.D.

When Kelli Williams, M.D., MPH, a Pediatrician at the Medical University of South Carolina, got the letter inviting her to be Center Director for the Jeffrey Modell Diagnostic & Research Center at MUSC Health, the first thing she did was to text her mentors. “I thanked them for their support and guidance and giving me the ability to impart this care and impact the lives of patients with primary immunological diseases,” says Williams who is subspecialized in Allergy and Immunology. “Ever since I came to MUSC, I’ve wanted to build a program that provides the patient-centered care these patients require and deserve. It’s an extraordinary opportunity to establish a program on par with the cream-of-the-crop in the world. And it means a lot to me personally to know that others in the field recognize what we’ve been doing and want us to keep doing it,” says Williams.

The MUSC Health center joins the Jeffrey Modell Foundation (JMF) network of over 400 programs at academic medical institutions in 87 countries with 42 located at major children’s hospitals across the United

States (US). The Foundation’s goal is to facilitate early, precise diagnosis of primary immune deficiency disorders (PIDDs) in children and adults and their appropriate, meaningful treatment.

“This distinction makes it clear to the world that MUSC Health is a Center of Excellence and a ‘go to’ referral location for very sick and specialized patients with rare immunologic conditions. For patients in the southeastern US with these rare diseases, this is the place to come for care,” says Williams.

According to the National Institute for Allergy and Infectious Diseases (NIAID), there are now over 400 known rare, genetic disorders that impair the immune system and affect an estimated 500,000 people in the US. Primary immunodeficiencies may be diagnosed in infancy, childhood, or adulthood, depending on their severity, and some PIDDs are fatal. Patients with PIDD lack a fully functional immune system, making them vulnerable to chronic, debilitating, and potentially lethal infections and putting them at high risk for several types of cancer.

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Kelli Williams, M.D., MPH

While stem cell and bone marrow transplants can be curative in some cases, patients also often need complex regimens of prophylactic antimicrobials and other treatments including immunoglobulin replacement therapy. “Immune disorders often affect multiple organ systems, and this can be complicated from a clinical management standpoint. It requires a lot of grit from a staffing standpoint to offer multi-disciplinary care. Additionally, it takes a lot of effort and time to fight with insurance companies to cover the costs of the care these patients need,” says Williams.

Although Williams was already recognized as one of the Foundation’s 915 Expert Physicians worldwide, leading a designated JMF center will provide additional financial support and allow MUSC Health to expand services.

In addition to treatment, JMF funding will also be used to improve PIDD diagnosis and testing and the clinic’s ability to meet the high referral demand. “We’ve hired a program coordinator to give patients easier access to the multi-disciplinary care they need. The coordinator can help them get all or most of their visits scheduled on the same day or consecutive days, which is important because many patients drive long distances to see us.”

Next steps also include hiring a full-time, dedicated immunology nurse and additional physicians who have specialized training in immunology. “We get referrals from hospitals all around the region,” says Williams. “The challenge is getting our patients—children and adults—seen more quickly. My goal is to create a faster flow for getting them seen, tested, and diagnosed.”

As part of the JMF network, the MUSC Health center will also have more opportunities to collaborate with institutions around the world on multi-center research projects. This is a great benefit for patients who can often secure early access to cutting-edge therapies through research participation.

Fortunately, the field of immunological treatment is currently experiencing rapid growth. “We’re able



Dr. Kelli Williams

to practice more ‘precision medicine’ because of improved genetic testing that allows us to identify the genetic defect causing a condition. Drug companies are then able to produce therapeutics that can target particular pathways,” explains Williams. “The genetics of clinical immunology has really exploded recently. It’s an exciting time to be a clinical immunologist because we have a greater understanding of what is causing diseases and can be creative with the therapeutic options we offer patients.”

It’s common for PIDD patients to try multiple different treatments over time. Some may not work for them at all, while others may work for a period of time before tapering off or have intolerable side effects. For these reasons, and because PIDDs are rare diseases, patients are often interested in trying a new therapy in the hope that it will be a good fit for them.

For her part, Williams hopes to help as many people with a PIDD as she can reach. “I want referring providers to know that when they refer a patient to me, I will use every tool in my very specialized skill set to help diagnose and treat them,” says Williams. “We are experienced in taking care of rare immunologic diseases and we want the whole state, and the Southeast region, to know that we are providing world-class care for these complex patients here at MUSC Health.”

RESEARCH



RESEARCH LEADERS JOIN FORCES

Clinical and translational research leaders join forces to remove traditional barriers and accelerate progress against rare and dangerous childhood diseases

by Shawn Oberrath

Understanding and repairing the deepest mysteries of pediatric diseases are big tasks for both basic and physician scientists, but at MUSC Children's Health these two groups are working together to discover more treatment options and help patients recover.

Shawn Jenkins' Children's Hospital and the R. Keith Summey Medical Pavilion provide the highest level of pediatric care in South Carolina and the whole Southeast region. Both facilities have provided a backdrop for comprehensive care that allows for the research to happen on site.

Nearby at the Darby Children's Research Institute (DCRI) scientists study childhood diseases from the lab bench. The DCRI was created from the vision of Dr. Charles P. Darby Jr. to be a center of innovative and collaborative pediatric research and is one of just 15 dedicated pediatric research institutes in the country.

Against this backdrop, Andrew Atz, M.D., chair of the MUSC Dr. Charles P. Darby, Jr. Department of Pediatrics, selected heads of both clinical and basic research who could collaborate meaningfully and connect the dots between the clinic and the lab bench.

"At MUSC Children's Health, we are imagining what's possible for each child by providing the expertise every child needs and deserves," Atz said. "History has shown that the best way to optimize patient care is to take what we learn in research labs and apply it to enhance that care."

"We have the unique opportunity to identify where the barriers are and then figure out how to best bridge the gap between basic scientists and clinicians."

Denis Guttridge, Ph.D.
Director, Darby Children's
Research Institute

With that in mind, Atz recruited John Costello, M.D., MPH, Vice Chair of Clinical Research for the Department of Pediatrics and Director of Research for the Children's Heart Center, and Denis Guttridge, Ph.D., Director of the DCRI. These two leaders represent the pediatric clinical and basic research worlds, respectively, which at some institutions live far apart both physically and figuratively. But thanks to Atz's strategic recruitment and support, MUSC gained two leaders who are experts in their own worlds and have teamed up to craft a united vision.

This leadership duo have propelled research at MUSC toward better, safer treatments for childhood diseases that can be severe and even life-threatening. And more than just sharing a vision, both leaders are implementing ways to boost faculty, researchers, fellows and residents over traditional barriers that can hold research back.

"Together we have a pulse on both what's happening on the clinical side and what's happening on the basic science side," Guttridge said. "And we have

the unique opportunity to identify where the barriers are and then figure out how to best bridge the gap between basic scientists and clinicians."

Between basic and clinical research rests a bridge: translational research.

Basic science research generates new knowledge that doesn't necessarily address a clinical issue, as explained by Costello, but translational research is done with a specific patient problem in mind, like pediatric cancer or a type of heart disease. Clinical research involves direct interactions with patients, such as drug trials, behavioral studies and analyses of patient data and surveys.

In an ideal situation these research avenues feed into each other so that discoveries at the lab bench lead to solutions at the bedside — from cell culture to animal models to clinical trials. New samples and knowledge from trials can be sent back to the lab for further refinement, creating a virtuous cycle of new knowledge, safer drugs and better outcomes



Dr. John Costello and former cardiology fellow,
Dr. Stephanie Santana

for patients. For this cycle to function well, the partnership between scientists and clinicians is essential — physicians lead clinical trials, but they need to work with scientists to determine if and how a treatment worked. And scientists need physicians to funnel the best research into clinical trials and open up new options for patients.

“This partnership is absolutely critical from the very first result in the lab to the possibility of a clinical trial,” Guttridge said.

With their passion for uncovering treatment options for the rarest and most dangerous childhood diseases, Guttridge and Costello are determined to surpass any such obstacles between their divisions, and the key is to start working together early. They have thus championed multiple initiatives to gather colleagues and resources and create an environment where the clinical and translational arms of research can work together cohesively.

“We have the unique opportunity to identify barriers and then figure out how to best bridge the gap between basic scientists and clinicians,” Guttridge said.

Both leaders emphatically agree that the goal of better treatments for patients is the most important driver of their hybrid collaborative model. But there are other benefits as well — new and innovative findings are crucial for career development and retention of clinicians and researchers and for efficient use of resources. There can also be opportunities for outside funding and the inherent reward of “cracking” diseases that currently have no answers.

Guttridge explained that as a top research hospital, MUSC needs to be engaged in research at all levels to find the next cure for the next disease, from nephrology to cardiology, neurology to infectious disease, and emergency medicine to cancer. And this high level of effort must be driven by clinical trials and by the science that propels treatment options into the clinic.

“These types of interactions don’t happen just anywhere,” Guttridge said. “They have to come from the very top, and our department chair fosters that environment.”

One game-changing initiative that has ignited passion amongst MUSC’s pediatric researchers is a competitive internal grant program that awards two \$100,000 grants for promising research projects — one translational and one clinical. This pilot funding gets projects started and aims to launch them to the next level — securing external funding for larger projects and even more impactful research. Importantly, the internal grant funding is made possible by many generous donors dedicated to philanthropic support of MUSC, highlighting another pillar of the ongoing cooperative efforts.

Researchers are then able to present their findings at the Department of Pediatrics and Darby Children’s Research Institute Symposium, an annual symposium held each spring. The Symposium has become



Dr. Denis Guttridge

another important tool for Guttridge and Costello, and they've placed a lot of effort into improving it by including a blend of presentations by both clinical and basic science investigators.

In keeping with the goal of cross-pollination between disciplines, Guttridge invites nationally recognized experts to speak at the DCRI, and he makes it a point to invite all the clinicians and clinical investigators to hear those presentations and exchange ideas with the visiting professors. This is one more example of giving people time to be in the same room at the same time, whether they are fellows, clinical investigators or foundational scientists.

With new initiatives under way, Guttridge and Costello will refine their hybrid collaborative model and continue to foster a collegial environment for researchers and clinicians across the board. For example, they hope to set up laboratory training for residents and fellows, continue to integrate local meetings and symposia, and build an open environment for teamwork.

They will also perform targeted recruitments of clinical scientists and research faculty to enhance the ranks of outstanding researchers already at MUSC, joining company with outstanding researchers such as Jezabel Rodriguez-Blanco, Ph.D. and Casey Langdon, Ph.D.

Guttridge hopes that eventually the institute will be able to support research across every discipline. "The vision is that with the collaborations we make with physicians we can fulfill their needs and grow so that the research can benefit the whole clinical enterprise," he said.

"Research is not easy," Costello added. "But we're trying to create an environment that will cultivate relationships and also provide infrastructure, space and supportive personnel to make it as graceful as possible for all of our investigators to be successful."

Research Faculty



Denis Guttridge, Ph.D.
Director, Darby Children's Research Institute

John Baatz, M.D.

Dieter Haemmerich, Ph.D.

Martin Kang, Ph.D.

Casey Langdon, Ph.D.

Jill Newman, M.S.

Susan Reed, DDS

Jezabel Rodriguez Blanco, Ph.D.

Inderjit Singh, Ph.D.

Bobby Thomas, Ph.D.

David Wang, Ph.D.

MUSC Pediatric Cancer Researcher Awarded Grant to Understand Medulloblastoma Relapse

By Leslie Cantu

One of the most prestigious pediatric cancer foundations in the U.S. has awarded a grant to a Medical University of South Carolina researcher to continue her pursuit of the causes of medulloblastoma relapse.

Jezabel Rodriguez Blanco, Ph.D., who has a dual appointment at MUSC Hollings Cancer Center and the Darby Children's Research Institute at MUSC, will receive \$800,000 over four years from Alex's Lemonade Stand Foundation for Childhood Cancer.

"It's an honor to have one of these grants," said Blanco.

For her, solid scientific work is always in service to the patients who need new discoveries. Her lab is dotted with photos of pediatric cancer patients, a daily reminder of the reason for her work. Unfortunately, she said, the number of pictures is growing, as is the number of children with medulloblastoma.

"That pushes us to work a little bit harder and to make sure that what we are doing is not just to publish a paper and get a grant," she said. "It is to make a difference for those that need that difference."

With this grant, Blanco will work on medulloblastoma, the most common type of malignant pediatric brain tumor and one of the major causes of cancer-related death in children.

Her previous work showed how targeting a protein called Glioma-associated oncogene homolog, or GLI, on the Sonic Hedgehog signaling pathway could shrink the medulloblastoma tumor and make it less likely to relapse. The results were exciting, and the

mice implanted with tumor cells previously exposed to a GLI inhibitor were doing well. But she and her team decided to keep monitoring them, far longer than they typically would.

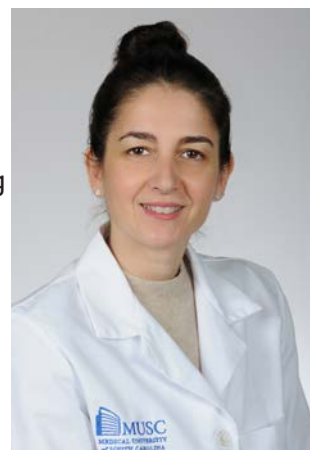
"It was looking good," she said. "But some mice had a relapse – it just took way longer. When we waited enough time, we saw that the tumors were still coming back in about 50% of the animals."

The tumors came back several weeks later. This suggests that if treatment were translated for pediatric cancer patients, these patients might similarly eventually relapse. And because children should have many decades of life ahead of them, recurrence might even come in early adulthood.

"Even if we believe the tumor is gone in the child after treatment, there is always the possibility of it returning at any point in their lives. Consequently, children and their families live with the constant fear of a potential relapse," Blanco said.

Besides the chance of tumor relapse, treatments for children with medulloblastoma are extremely harsh. These therapies, which were developed for and tested mostly on adults, can have serious long-term side effects for growing children.

Blanco described meeting a young woman in her 20s who had survived medulloblastoma but deals with a



Jezabel Rodriguez Blanco, Ph.D.

number of long-term side effects, including serious neuroendocrine and cardiovascular complications, in addition to increased chances of developing secondary cancers, because of the treatments she was given.

“She’s alive. But she will deal with the consequences of the treatment for the rest of her life,” said Blanco, who is working both to prevent relapse and to target the cancer more effectively so that patients have fewer side effects.

Childhood cancers are different than adult cancers, she pointed out. Adult cancers are usually the results of mutations that have built up over time. But most childhood cancers come when genes that are responsible for rapid cell multiplication during embryonic development aren’t switched off at the right time.

“In the case of a kid, it’s normally just one mutation – normally an oncogene that was involved in development and for some reason at the end of the development, when it was supposed to be switched off, it didn’t. It kept on being active,” Blanco said.

“When we analyzed those tumors, we saw an enrichment in cells that resemble healthy brain components. These cells should not be in residual tumors, and we wonder if they are somehow fueling tumor regrowth. We are in the midst of figuring out if this is the case.”

The Hedgehog pathway that she studies is a signaling pathway that’s important in the development of the nervous system. There are three hedgehog molecules – so named because when they were first discovered, a mutation along the pathway led to a fuzzy, hedgehog-like appearance on fruit fly larvae – that trigger the activation of this pathway. To differentiate them, each ligand was given a specific name – the other two were named for actual hedgehogs, while the Sonic Hedgehog ligand was named for video game character Sonic the Hedgehog.

In her last study, when the mice relapsed after a long period, her team discovered an unexpected

population of treatment-resistant tumor cells that somehow resembled healthy cells of the nervous system. Likely, the similarity of these tumor cells to brain cells allowed them to evade therapies.

“When we analyzed those tumors, we saw an enrichment in cells that resemble healthy brain components,” she said. “These cells should not be in residual tumors, and we wonder if they are somehow fueling tumor regrowth. We are in the midst of figuring out if this is the case.”

In addition to the highly proliferative tumor cells, brain tumors also have small pools of cells that share similarities with the neurons, astrocytes and oligodendrocytes present in healthy brain tissues. These cells, which normally help with the functioning of the central nervous system, in tumor settings could be helping malignancies to persist after therapies. The mechanisms allowing them to evade therapies and facilitate the recurrence of the tumors remain unclear.

The [Alex’s Lemonade Stand grant](#) will allow Blanco to continue this investigation. She’ll be testing a combination of drugs to see if they will prevent relapse. She is hopeful that by targeting the drivers of the treatment-resistant cells, this therapy will not only banish the tumors, never to return, but also produce minimal side effects because of the more targeted approach.

“In theory, it should be less toxic than the standard of care that we are using,” she said. “We’re trying to help. We want children with cancer to have options; the options they actually deserve.”



MUSC Researcher Receives FDA Approval for Neuroblastoma Relapse Prevention Drug

Jacqueline Kraveka, D.O., remembers the moment that she discovered the topic that would fuel her research passion: “It was when I did my training in Miami at Nicklaus Children’s Hospital and I was rotating in pediatric oncology,” she recalls. “We had an 18-year-old with neuroblastoma who was in for a transplant. He really didn’t have a lot of family and was there by himself a lot – we talked quite a bit and I got to know him well. I elected for six weeks of neuroblastoma research during residency and discovered we were using his bone marrow cells. I saw that you could detect the presence of neuroblastoma in the cells before relapse, which unfortunately he did, and ended up passing away.”

This impactful experience led Dr. Kraveka to devote a large portion of her research career to neuroblastoma treatment and relapse prevention, a decades long journey that is heavily responsible for the recent Food and Drug Administration (FDA) approval of a drug to prevent relapse in high-risk neuroblastoma patients.

“Neuroblastoma is one of the most common solid tumors we see but also has one of the worst prognoses. About half of children who are diagnosed with this tumor have high-risk neuroblastoma, and survival is only about 50%,” says Dr. Kraveka. She treats patients at Shawn Jenkins Children’s Hospital as part of the Pediatric Hematology/Oncology team and does research as part of the Medical University of South Carolina’s Darby Children’s Research Institute in addition to Hollings Cancer Center. “We have to treat [neuroblastoma] aggressively: these kids go through sometimes 5 cycles of chemotherapy, they have surgery, they go through stem cell transplant, they go through immunotherapy and despite all that more than 1/3 of children still relapse.”

The FDA approved treatment, Eflornithine, or DFMO, is an antiparasitic that was originally approved for African sleeping sickness. But Dr. Kraveka’s involvement with the Beat Childhood Cancer Research Consortium, along with founder Giselle Sholler, M.D., led to research that showed DFMO also blocks an enzyme that feeds MYCN, a protein overexpressed in neuroblastomas. The impact of DFMO on children battling the deadly disease is literally life altering.

“It’s a medicine that the kids have to take by mouth for two years, but it’s really well tolerated,” says Dr. Kraveka. US WorldMeds, who has released DFMO under the name IWILFIN, reported that 84% of patients had no relapse by four years after immunotherapy, compared with 73% of patients in a control group. In addition, 96% of the children who received DFMO were still alive, compared with 84% of the children in the control group.

“What’s great is that now it’s approved, DFMO is going to be considered standard care for young patients once they finish treatment,” says Dr. Kraveka. Families and kids that previously had to travel to get post treatment medication can now have it prescribed anywhere, which is a huge relief during the high stress period.



Dr. Jacqueline Kraveka

Exciting as this is, Dr. Kraveka is not slowing down on her fight with cancer. She is currently involved with studying DFMO's use with several different tumor types, as well as adding an antibody during the chemo phase which targets GD2, a substance that neuroblastomas have on their surface. She is also deeply involved in sequencing and targeted therapy – developing treatments based on a tumor's unique genetic expression and being able to deliver precision medicine for better outcomes.

“I would like to see a world where no child ever has to die from cancer, where we can make our treatments less toxic and our kids are surviving,” she says. “I’ve always said that my goal is to one day make that happen and then be a travel planner or party planner, because I enjoy both.”

Dr. Kraveka consulting with a young patient



Darby Children's Research Symposium Day

An Innovative Tradition

Each spring for the past 16 years the best and the brightest among the Medical University of South Carolina's research community have gathered to share ideas and discuss pathways to a brighter future for children's health. The Darby Children's Research Institute (DCRI) Research Symposium, originally a single day event, recently expanded to two days of fellowship and keynote speakers organized around a central topic.

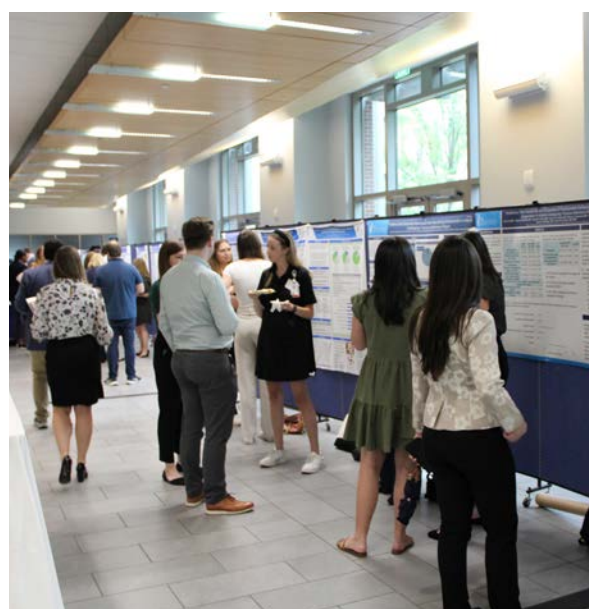
This year's symposium, held on May 9-10th, 2024, drew together a record number of pediatric researchers, clinicians, and attendees, from around the state and nationwide, both in person and virtually. The theme, Insights into the Pathophysiology and Social Factors Impacting Childhood Disorders, highlighted the advancements and innovations in pediatric medicine that are paving the way for more personalized and effective treatments for children. This year's co-chairs were Katherine Chetta, M.D., Denis Guttridge, Ph.D., Dieter Haemmerich, Ph.D., and Jacqueline Kraveka, D.O.

"We were really excited to talk about precision medicine in pediatric research," says symposium co-chair Denis Guttridge, Ph.D. "That's where medicine is currently and where it's going to continue - using research to tell us how diseases occur and how can we develop new therapeutics to target those specific diseases?" Planning for next year's symposium has already begun, and Dr. Guttridge's hopes for future symposiums is that they can build on the successes of past years, with collaboration and innovation driving forward the field of pediatric medicine to provide every child with the best possible care tailored to their unique needs.

"A lot of people come together to make this happen," says Dr. Guttridge. "I'm really proud about this because for me personally, I've wanted to build a community. This symposium is a good example of how to do just that. And building a scientific community is going to translate to better care for the patients."



Dr. Guttridge, Charles P. Darby IV, and Dr. Costello at the 2024 DCRI day



Poster presentation during the symposium opening ceremony

Key Grants Awarded

Alex's Lemonade Stand

PI: Jezabel Rodriguez-Blanco, Ph.D.

Uncovering the signaling mechanisms allowing medulloblastoma progenitor cells to orchestrate tumor relapse

Medulloblastoma is the most common brain tumor in children. Despite the use of very aggressive treatments, 30% of these tumors will eventually grow back. The purpose of this project is to develop combination therapies aimed at not only blocking the growth of medulloblastoma tumors, but at preventing them from growing back in the future.

Pediatric Heart Network—NIH/NHLBI

Contact PI: Andrew Atz, M.D.; Site Co-PI's: Eric Graham, M.D. and John Costello, M.D.

This network Grant provides funding for investigators, coordinators, and infrastructure assist to support the conduct of multicenter clinical trials in infants, children, and adults reflected with congenital heart disease.



Adding samples to the centrifuge



Dr. Guttridge overseeing lab activities

The Duke Endowment

PI: Janice Key, M.D.

Dr. Key and the MUSC Boeing Center for Children's Wellness (BCCW) received a 3-year grant from The Duke Endowment for the expansion of the MUSC BCCW School-based Wellness Initiative to address mental health.

The MUSC BCCW School-based Wellness Initiative is an implementation method that has promoted evidence-based strategies targeting nutrition, physical activity, and social-emotional wellness in schools for over ten years. In 2021 we piloted the expansion of our Initiative to address the mental health needs of students.

The Duke Endowment

PI: Ronald Teufel, M.D.

Helping kids breathe easier is the focus of the second project, “To Develop and Implement an Asthma Management Program for Vulnerable Children in Rural South Carolina Using Virtual Care Technology,” lead by Ron Teufel, M.D.

Dr. Teufel’s project aims to improve asthma outcomes in those rural South Carolina areas in need through a four-step approach: 1. Work with the local practices to identify their higher risk patients with asthma; 2. Do a brief asthma education within the practice and supply screening tools; 3. Enroll selected patients into a mobile health app that will both track and help heighten awareness of symptoms; 4. Schedule a telehealth visit with a certified asthma educator.

Department of Defense

PI: Bobby Thomas, Ph.D.

Targeting a novel adaptive stress response pathway for therapeutic intervention in alpha-synuclein-induced dementia

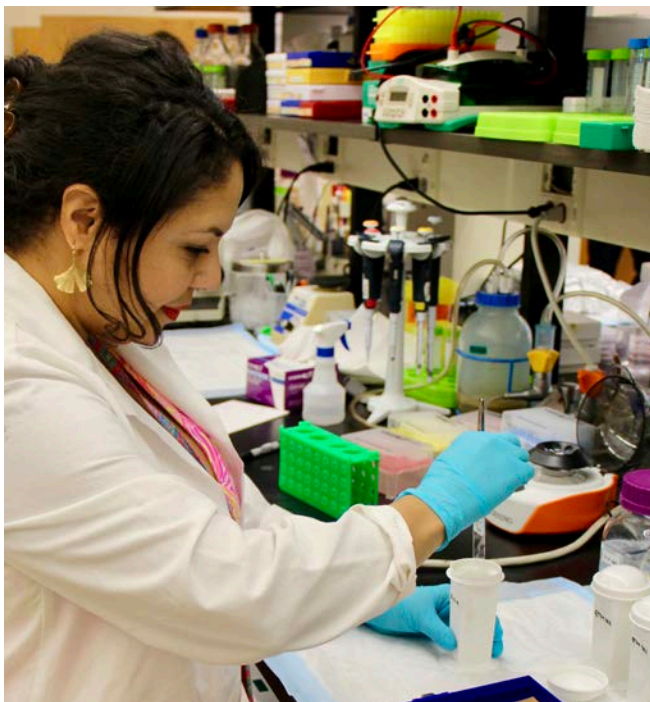
These studies will impact the field by validating Bach1 as a novel therapeutic target by improving our understanding of Bach1-mediated signaling pathways and identifying novel targets for therapeutic intervention relevant to human PD and DLB. The studies will test novel non-electrophilic Bach1 inhibitors as potential therapeutic agents for PD and DLB that could drive their clinical development, which is a significant unmet need.

RO1

PI: Bobby Thomas, Ph.D.

Molecular Mechanisms of Oxidation Resistance 1 in Parkinson’s disease and Lewy Body Dementia

This study proposes to examine the role of Oxidation resistance 1 (Oxr1) in the development and progression of Parkinson’s disease (PD) and Lewy Body Dementia (DLB) using rodent models of a-synucleinopathy. The study will improve our understanding of Oxr1-mediated neuroprotective pathways observed in PD and DLB to identify the new target(s) for therapeutic intervention.



Ongoing research in the fight against medulloblastoma



Preparing samples for testing



Studying breast milk cells

Pediatric Biorepository

Among the many hurdles pediatric researchers face at the start of a new study, one of the most daunting can be the collection of biospecimens. If researchers follow a traditional route, which involves searching for test subjects, obtaining proper authority, and collecting the specimens, the process could take years to gather enough material.

In an effort to fast track his researcher's efforts, Darby Children's Research Institute (DCRI) head Denis Guttridge, Ph.D., created the Pediatric Biorepository. Focusing on collecting, processing and storing biospecimens that are discarded after surgeries and procedures, the Biorepository can amass a broad spectrum of samples without requiring a lot of effort on the donor's part.

The Biorepository stores tissue in a monitored deep freeze state which means the samples can be viable for decades. Researchers can consult with Biorepository manager Cameron Leyer to discuss the type of samples needed, how many, what kind of data are they looking for, does the repository have what they need or will it have to be outsourced?

The Biorepository currently has approved protocols with five pediatric divisions: Neurosurgery, Cardiology, NICU, Gastroenterology, and Nephrology, but would love to welcome more. And just over the horizon, the future hopes to see an expansion outside of MUSC to collaborate with outside researchers and collect and share samples from populations around the state.

Innovative Tissue Culture Facility at DCRI Offers Same-Day Delivery

Imagine getting to a critical junction and realizing that the last bottle of media has already been used. For many projects, this could spell disaster and the end of months, or years, of hard work. At MUSC's Darby Children's Research Institute (DCRI) Tissue Culture Facility (TCF), researchers can not only choose from a wide variety of materials, but they can also have it delivered the same day they order it.

The TCF is the brainchild of DCRI director Dr. Denis Guttridge, whose vision was to have this resource available for not just his researchers, but all researchers at MUSC. Understanding the critical nature of timely access to biological materials, the facility offers an unprecedented same-day delivery service. This service is particularly beneficial for urgent clinical trials, immediate patient care needs, and time-sensitive research projects. By leveraging advanced logistics and efficient processing systems, the facility ensures that cultures are dispatched and delivered within hours of the order being placed.

Researchers can now obtain the necessary cell lines or tissues without delay, enabling quicker experimentation and faster publication of results

accelerating scientific discoveries and improve patient outcomes. For healthcare providers, the immediate availability of cultured tissues can enhance the treatment planning and personalized medicine approaches, offering patients faster access to advanced therapies.

In addition to the incredible speed, researchers will also get the cell lines at the lowest possible price – a benefit of the TCF's partnership with University of North Carolina Chapel Hill's tissue culture facility, who ensure that each culture meets the highest standards of purity and viability. This lower cost is extremely helpful for investigators who are constrained by grant budgets.

Looking ahead, the facility plans to continue as a support system of the research community and hopes to expand its range to collaborate with other research institutions, promising to further advance the field of tissue culture and regenerative medicine. The TCF's innovative approach underscores MUSC's and DCRI's commitment to pioneering medical science and improving health outcomes worldwide.



Dr. Jezabel Rodriguez-Blanco takes a closer look at a slide



Cell culturing at the lab

EDUCATION



INSIDE THE SUCCESS OF MUSC'S PEDIATRIC RESIDENCY PROGRAM

Thinking back over the years that he's been at MUSC, Dave Mills, M.D. can remember two major events that have stood out during the nearly two-decade span: the opening of the new Shawn Jenkins Children's Hospital and the outbreak of a global pandemic. And as luck would have it, both happened pretty much simultaneously. "Shortly after I took over as the Medical Residency Program Director, we moved to the newly opened Shawn Jenkins Children's Hospital. So that was like all hands on deck, figuring out how to obviously get our patients over there, but also how to adapt resident education to a new building and a new environment,"

he says. "But then the pandemic hit, and it was like 'alright here's another big challenge!' and we had to pivot over to the virtual learning environment and figure out how to keep people safe."

These events have not only impacted Dr. Mills' early days as Residency Program Director but also played a pivotal role in how he views the process of helping shape the next generation of physicians and navigating the ever-evolving landscape of medical education and healthcare. "You never know what curve balls are going to be thrown your way!"

Dr. Mills first came to MUSC in 2005: "I came



Residents gather at a conference

to do my residency and never left,” he jokes. He gradually became more involved from an educational standpoint, becoming an Associate Program Director under Dr. Michael Southgate in 2013, and assuming the Program Director role in 2019.

During those years, the medical field witnessed rapid transformations, from technological advancements to shifts in healthcare policies. Dr. Mills has been a steadfast leader in adapting the residency program to these changes. Whether implementing innovative teaching methodologies, incorporating cutting-edge technologies into the curriculum, or adjusting the program structure to meet accreditation requirements, Dr. Mills has ensured that residents receive the most relevant and up-to-date training.

“Honestly, I tell all our applicants that if they come to our program, I can pretty much guarantee them two things: #1. they’re going to have a really fun experience here, which I think that speaks to all the people that we have within our residency program as well as the faculty and the amazing people all across the department that we have,” he says. “#2. and I feel pretty comfortable saying this - that if they come here to practice, they should be able to leave this program and do anything that they want to in the field of Pediatrics after they leave.”

Residents can further explore their different career opportunities through optional dedicated tracks within the program that offer more education in three areas: Advocacy, Global Health and Medical Educational. “All three of those tracks are incredibly popular, and I think that just speaks to our ability to really individualize people’s education based on their interests,” says Dr. Mills.

One of the key strengths of Dr. Mills’ program is the emphasis on mentorship, encouraging faculty members to guide and support residents as they navigate the challenges of medical training. “We try to align residents with mentors as early on in the process as possible, like as soon as they identify their career path or before they even start with us as a resident,” he says. To encourage peer to peer support and camaraderie, residents are divided into houses,

in a similar vein to Harry Potter, designed to bring residents together in smaller groups where they can work and learn side by side, as well as bond through fun activities and events.

Another aspect that sets the program apart is the Clinical Coaching program consisting of volunteer Pediatric faculty members who observe residents in different clinical environments. “The coach works with the resident to set specific goals to help grow their clinical skills. Then the coach will observe the skills related to those goals and give feedback immediately on the spot on how they did and how to improve those skills moving forward,” says Dr. Mills. “We’re one of only 15 programs in the country that offers a coaching program, and I think it makes a difference to give residents someone who is truly in their corner.”

The program’s success speaks through the achievements of its participants. “Historically 50% of our graduates go into primary care and about 50% match into some of the best fellowship programs across the country, so I think that track record really speaks to the breadth of clinical experiences that residences get during their three years with us,” says Dr. Mills. “We have had residents who have gone on to advocate for children’s health on a national level as well as a Global Health track graduate who has gone on to work for Doctors Without Borders and work overseas for underserved countries.”

Whatever path they choose, Dr. Mills wants residents to know that they are all in this process together. “I’m a strong believer in a culture of positivity and having a true family feel throughout the entire program. I want every resident to know how much we care about their education and their professional development as individuals,” he says. “If you come here, you’re going to be welcomed with open arms and truly treated like a member of somebody’s extended family.”

And how would he sum up his time at MUSC and his 5 years as Residency Program Director? “It’s been quite the journey since I stepped into this role, but honestly – I’ve loved every minute of it.”

Pediatrics Residency Incoming Class

Matched	16	18	17	17	19
URM Matched	3	1	0	5	3
Total Applicants Applied	1004	1015	1110	1173	1083
Total Applicants Interviewed	214	285	221	196	182
Total Number Interviewers	55 Faculty completed interviews	59 Faculty completed interviews	54 Faculty completed interviews	59 Faculty completed interviews	45 Faculty completed interviews
Season Type	inperson recruiting	virtual recruiting	virtual recruiting	virtual recruiting	virtual recruiting
Number of Schools Represented	10	12	16	15	15

2020

2021

2022

2023

2024

MedPeds Residency Incoming Class

Matched	4	4	4	4	4
URM Matched	0	0	2	2	2
Total Applicants Applied	252	256	257	247	296
Total Applicants Interviewed	43	57	60	54	56
Total Number Interviewers	43 Faculty completed 86 interviews	7 Faculty completed 114 interviews	9 Faculty completed 120 interviews	7 Faculty completed 108 interviews	10 Faculty completed 112 interviews
Season Type	inperson recruiting	virtual recruiting	virtual recruiting	virtual recruiting	virtual recruiting
Number of Schools Represented	4	4	4	2	4

MUSC Peds Residency Program Total Residents in Program, 2024 — 52

- inperson recruiting — All applicants interviewed with 2 Peds faculty
- virtual recruiting — All applicants are interviewed by two faculty members for a 20 minute interview and a 20 minute session with Program Director, Dr. Mills
- 2021 we have an extra resident because we took one resident from Tufts as its Peds program closed

MUSC Med-Peds Residency Program Total Residents in Program, 2024 — 16

Growing the Field of Future Pediatricians While Still Keeping a Small Family Feel

When Dr. Charles P. Darby Jr. Department of Pediatrics Chair Andrew M. Atz, M.D., talks about his department, he can't help but get excited. "Pediatrics continues to optimize our mission: imagining what's possible for each and every child," he says. "And we do that by being fully committed to our tripartite mission which is taking great clinical care of the patients in front of us, doing meaningful research to make the outcomes of our future patients better, and providing a training environment to replenish the field to at some point replace us."

This latter aspect is especially important in the face of current trends: in March 2024, the Association of American Medical Colleges said that the U.S. will face a doctor shortage of up to 86,000 physicians by 2036. That shortage extends even more so to pediatrics. According to STAT News, close to 30% of pediatric residency programs did not fill their positions, and while the number of programs and the number of positions available in pediatrics has steadily increased over the last 10 years, the number of U.S.-trained M.D. seniors going into pediatrics has decreased by 6% year over year.

"I think everybody values education, but we take it incredibly seriously," says Dr. Atz. "At MUSC, we've always filled our residency positions. In fact, on March 17th – which was match day this year – it was our first year of an expanded program. Now we have 16 Categorical Pediatrics training spots per year, all of which filled."

Historically, at the end of the program, there was almost an exact 50/50 split amongst those Categorical trainees, with 50% going into pediatric subspecialty fellowships and 50% going into community based primary care. Since 2014, the Department has opened a Pediatric Gastroenterology Fellowship, a Pediatric Hospital



Medicine Fellowship, a Pediatric Nephrology Fellowship and starting in fiscal year '26, will offer Pediatric Infectious Disease and Pediatric Critical Care Fellowships – in effect, doubling the number of offerings from 10 years ago.

"We feel like it's our responsibility to train both pediatricians to go into the community, because there really is an overall lack of pediatricians in the state of South Carolina, and a real lack of pediatric subspecialists," says Dr. Atz.

Another point of pride is the diversity of the trainees and how it corresponds to the patient population. Diversity goes beyond race, ethnicity, and language. Patients who are veterans, of different religions, live in rural areas, or are disabled may have unique and specific life experiences. Doctors who understand something about those experiences can provide more effective and personalized care.

"Historically we generally filled most of our training programs with people that had lived in South Carolina or were close to the southeast," says Dr. Atz. "But in the intern class that we just have starting next July, fully 50% of the new people are coming from outside the southeast US, which really shows that we have are attractive to people all over the country."

And it'll be over 21% underrepresented in medicine trainees in the intern class, which we're proud of."

So, with programs around the country reporting a decrease in filled residency spots, what makes MUSC's Pediatrics Residency Program so special?

"So, the secret sauce is something that I can't actually explain," laughs Dr. Atz. "But I can say we have the things that you have to have in order to be able to attract any physician. We have a patient base that is complex enough that you'll really be able to see a full spectrum of pediatric problems. And we've focused on the aspects that help us improve faculty hiring and retention. The average attrition rate for physicians across clinical departments is about 8% a year and we've never had more than 2% a year leave. Our internal environment is more supportive, we've put significant effort into wellness and resilience efforts, and we try to be very open, inclusive, and transparent about pretty much everything."

For Dr. Atz, while the future of medicine is always changing, his core directive as Department Chair will remain the same. "When people ask me what as chair am I most focused on, I have always said is trying to keep our fairly large sized department and Children's Hospital still feeling like a very small family," he says. "It makes a difference when you realize that all of the people you come in contact with on a regular day are focused on taking care of children – we're just a different bunch. We find that mission to be incredibly rewarding."



A premature infant

Education: Training Program Growth

Categorical Pediatric Residency:

Starting FY 25 adding two spots over the next 3 years for a total of 6 new residency positions, growing from 42 to 48 total residents.

Program Director: Dr. Dave Mills

Child Neurology Residency:

Expanding from 5 to 10 residents.

Program Director: Dr. Dalila Lewis

Pediatric Cardiology Fellowship:

Expanding from 9 to 12 fellows.

Program Director: Dr. Sinai Zyblewski

Pediatric Nephrology Fellowship:

New fellowship program in FY24 with one current fellow expanding up to 3 total.

Program Director: Dr. Katherine Twombly

Pediatric Infectious Disease Fellowship:

New fellowship program is seeking ACGME approval that anticipates its first fellow in FY26. There will be one fellow accepted per year and three fellowship spots in total.

Program Director: Dr. Stephen Thacker

Pediatric Critical Care Fellowship:

New fellowship program seeking ACGME that anticipates its first fellow in FY 26 and will add one per year for three fellowship spots in total.

Program Director: Dr. Rustin Meister

Summary of Programs

Pediatric Residency



David Mills, M.D.
Program Director

PGY1

Clifton Dietrick, M.D.
Emily Downs, M.D.
Elena Goldstein, M.D.
Alexus Gonzalez, M.D.
Sofia Goyonaga, M.D.
Carolyn Gregorie, M.D.
Taylor Jeansonne, M.D.
Emma Kunkleman, D.O.
Margaret LaPorte, M.D.
Keila Magafas, M.D.
Zachary Mayo, M.D.
Maria Montalvan Padilla, M.D.
Vanessa Navas, M.D.
Megan Peterson, D.O.
Helena Quach, M.D.
Sierra Stumpff, M.D.

PGY2

Jessica Bauer, M.D.
Haley Burdge, M.D.
Caroline Conroy, M.D.
Natalie Eidson, D.O.
Stephanie Hayden, M.D.
Merritt Grossnickle, M.D.
Emily Ireland, D.O.
Laken Johnson, M.D.
Mary Elizabeth Klopp, D.O.
Sarah Lants, M.D.

Cindy Lee, D.O.

Keegan McKim, D.O.
Megan Murphy Jones, M.D.
Samantha Russell, D.O.
Michael Ryan, M.D.
Lucy Tomb, M.D.
Jaimie Vilavinal, M.D.
Allison Willis, M.D.

PGY3

Sabrina Archibald, D.O.
Hannah Ballock, M.D.
Katherine Dharmasri, D.O.
Bailey Dunn, M.D.
Jackleen Glodener, M.D.
Melanie Gray, M.D.
Corinne Karch, M.D.
Liza Larranaga, D.O.
Michael O'Brien, M.D.
Sarah Olson, M.D.
Ashley Perdue, M.D.
Natalie Pudalov, M.D.
Erica Rubin, D.O.
Danielle Ruggieri, M.D.
Allison Steinauer, M.D.
John Watts, M.D.
Rachel Wyand, M.D.
Emilee Young, D.O., M.D.

Med/Peds Residency



Sarah Mennito, M.D.
Program Director

PGY1

Sean Cosh, M.D.
Arica Gregory, M.D.
Emily Hargous, D.O.
Margaret Reilly, M.D.

PGY2

Brooke Hisrich, M.D.
Austin Lewis, M.D.
Linnea Mitchem, M.D.
Danielle Rangel Paradela, M.D.

PGY3

Thomas Brenzel, M.D.
Ari Faber, M.D.
Andrew Gentuso, M.D.
Megan Kern, M.D.

PGY4

Nancy Hagood, M.D.
Nelson Reed, M.D.
Maggie Roth, M.D.
Jake Seltman, M.D.

Child Neurology Residency



Dalila Lewis, M.D.
Program Director

PGY3

Florian Capobianco, M.D.

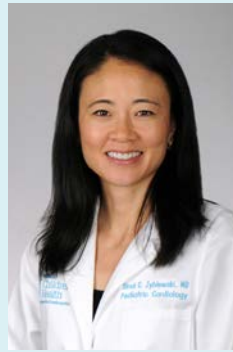
PGY4

Katherine Horman, M.D.

PGY5

Ariel Heller, M.D.

Cardiology Fellowship



Sinai Zyblewski, M.D.
Program Director

PGY4

William Harris, M.D.
Faith Middleton, M.D.
Kathryn Wershing, D.O.

PGY5

Tatyana (Tanya) Lemelman, M.D.
Hiral S. Mehta, M.D.
Lily Suh, M.D.

PGY6

Jennifer Hook, M.D.
Elridge (Trey) Schwartzenburg, M.D.
Anthony Mayen, M.D.

PGY7

Charles (Barron) Bryant, D.O.
Alexander (Zander) Hutchinson, M.D.
Angela Monafó, M.D.

Pediatric Hospital Medicine Fellowship



Daniel Williams, M.D.
Program Director

Chief Residents

Virginia Pedigo, M.D.
Dean Phillips, M.D.

PGY4

Maggie Haj, M.D.
Camille Carre, M.D.

PGY5

Stephen Ballis, M.D.
Marina Dantas, M.D.

Gastroenterology Fellowship



Candi Jump, M.D.
Program Director

PGY4

Timothy Marshall, M.D.

PGY5

Patrick Morency, M.D.

PGY6

Hamza Khan, M.D.

Emergency Medicine Pediatrics Fellowship



Olivia Titus, M.D.
Program Director

PGY4

Kaitlyn Boggs, M.D.
Thomas Andrew Brooks, M.D.

PGY5

Hannah Kitchell, M.D.
Emily Kleiman, M.D.
Jaya Ruffin, M.D.
Leslie Thompson, M.D.

PGY6

Christopher Daly, M.D.
Elizabeth Greer, M.D.
Missy Lalich, M.D.

Hematology/Oncology Fellowship



Shayla Bergmann, M.D.
Program Director

PGY4

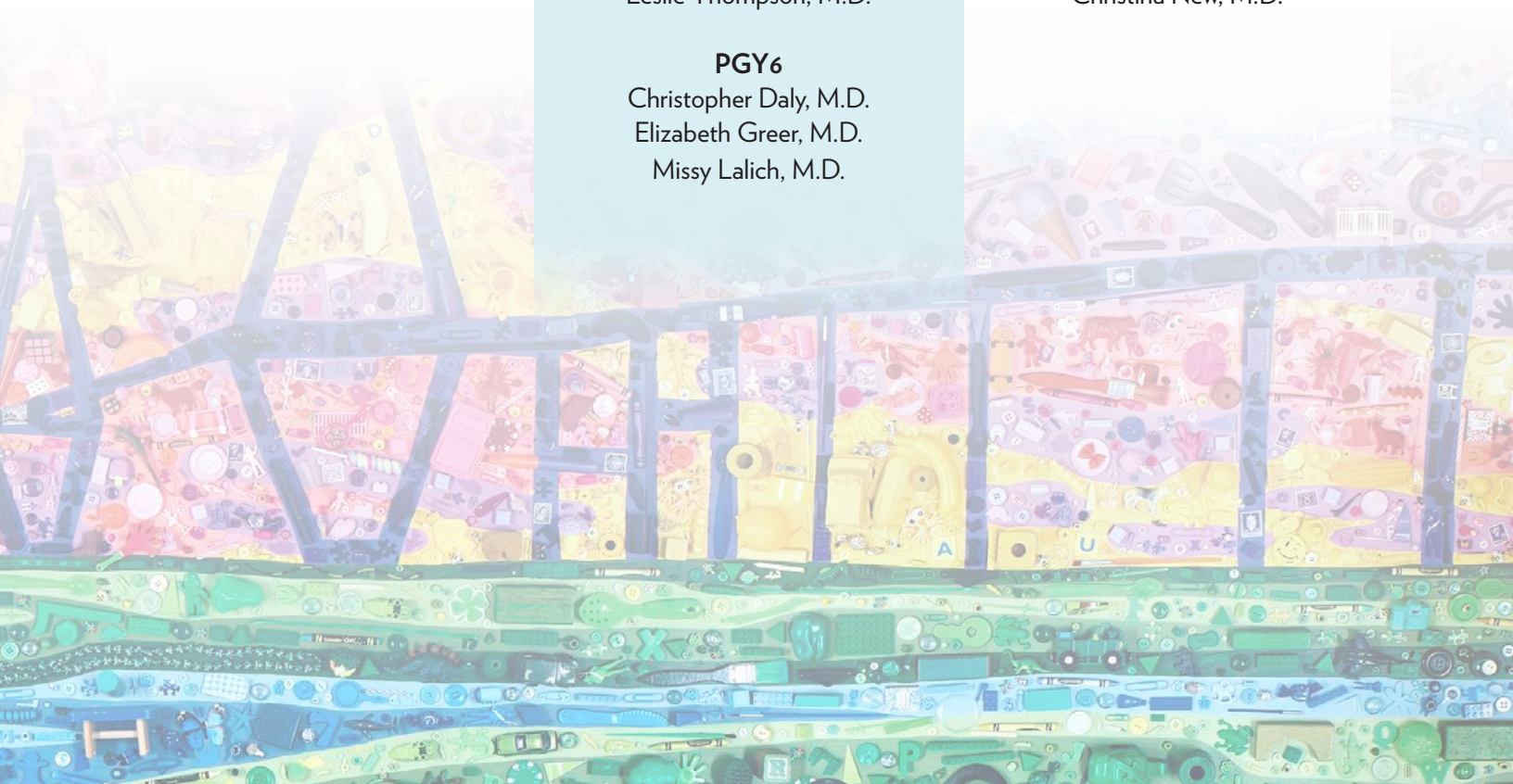
Sabrina Rainey, M.D.
Chris Ferrante, M.D.

PGY5

Osama Abuhasheesh, M.D.

PGY6

Christina New, M.D.



Neonatal-Perinatal Fellowship



David Annibale, M.D.
Program Director

PGY3

Jeff King, M.D.
Tammy Tran, M.D.,
Christine Woodburn, M.D.

PGY5

Jerica Gee, M.D.
David Rueff, M.D.
Clifford Hegedus, M.D.

PGY6

Lauren Walker, M.D.
Austin Rutledge, M.D.

Rheumatology Fellowship



Natasha Ruth, M.D.
Program Director

PGY4

Chelsea Reynolds, M.D.

PGY5

Aditi Shaily, M.D.

Nephrology Fellowship



Katherine Twombly, M.D.
Program Director

PGY4

Gina Aeckersberg, M.D.



CLINICAL SERVICES



Pediatric Clinical Services

Adolescent Medicine



Elizabeth Wallis, M.D. (Div. Chief)

Mary Abel, M.D.

LaKeshia Craig, M.D.

Janice Key, M.D.

Marissa Kemp, NP

Pediatric Cardiology



Eric Graham, M.D. (Div. Chief)

G. Hamilton Baker, M.D.

Varsha Bandisode, M.D.

Katerina Boucek, M.D.

Jason Buckley, M.D.

Nicole Cain, M.D.

Shahryar Chowdhury, M.D.

John Costello, M.D.

Dennis Delany, M.D.

Geoffrey Forbus, M.D.

Stephanie Gaydos, M.D.

Heather Henderson, M.D.

Anthony Hlavacek, M.D.

Lanier Jackson, M.D.

Kimberly McHugh, M.D.

Deani McVadon, M.D.

Laura Murray, M.D.

Arni Nutting, M.D.

Scott Pletzer, M.D.

Reshma Reddy, M.D.

John Rhodes, M.D.

Andrew Savage, M.D.

Mark Scheurer, M.D.

Carolyn Taylor, M.D.

Sinai Zyblewski, M.D.

Heather Adame, Ph.D.

Vanessa Adams, NP

Hailey Crider, NP

Rachel Friend, NP

Angela McKeta, PA

Molly Naylor, NP

Frances Woodard, NP

Pediatric Allergy & Immunology



Kelli Williams, M.D. (Sect. Chief)

Emily Campbell, M.D.

Child Abuse Pediatrics



Christopher Pruitt, M.D.

(Interim Chief)

Colleen Bressler, M.D.

Shemika Champion, NP

Lisa Erin Julian Hart, NP

Kelli Maddox, NP

Katherine Fabrizio, NP

Ashleigh Petrides, NP

Mallory Sessions, NP

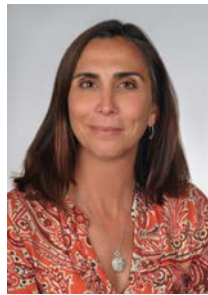
Stephanie Petersen, NP

Pediatric After Hours Care



Shana Bondo, M.D. (Sect. Chief)
 Margarita Abella, M.D.
 Cameron Anderson, M.D.
 Maureen Burke, M.D.
 Rebecca Cafiero, M.D.
 Marissa Blanco Knowlton, M.D.
 Kristen Kyler, D.O.
 Leah McBee, M.D.
 Megan McGeary, M.D.
 Sandi McKenzie, M.D.
 Megan Redfern, M.D.
 William Russell, M.D.
 Nikki Yourshaw, M.D.
 Katherine Chike-Harris, NP

Developmental & Behavioral Pediatrics



Angela LaRosa, M.D. (Div. Chief)
 Dale Gertz, M.D.
 Michelle Lally, M.D.
 Michelle Macias, M.D.
 Silvia Pereira-Smith, M.D.
 Julia Garcia, NP
 Meghan West, NP



Laura Carpenter, Ph.D. (Sect. Chief)
 Catherine Bradley, Ph.D.
 Kasey Hamlin-Smith, Ph.D.
 Margaret Hudepohl, Ph.D.
 Jordan Klein, Ph.D.
 Mary Kral, Ph.D.
 Allie Megale, Ph.D.
 Rosmary Ros-Demarize, Ph.D.

Pediatric Critical Care



Brian Bridges, M.D. (Div. Chief)
 Joshua Arenth, M.D.
 Austin Biggs, M.D.
 Melissa Evans, M.D.
 Elizabeth Mack, M.D.
 Elizabeth MackDiaz, M.D.
 Whitney Marvin, M.D.
 Rustin Meister, M.D.
 Rhodes Proctor Short, M.D.
 Patrick Snyder, M.D.
 Alice Walz, M.D.
 Allison Whalen, M.D.
 Elizabeth Zivick, M.D.
 Leah Buffington, NP
 Tacorey Campbell, NP
 Patricia Meiers, NP
 Mallory Stavrinakis, NP

Pediatric Emergency Medicine



William Scott Russell, M.D.
 (Div. Chief)
 Keith Borg, M.D.
 Jennifer Braden, M.D.
 Colleen Bressler, M.D.
 Carrie Busch, M.D.
 Benjamin Jackson, M.D.
 Ian Kane, M.D.
 Ash Kumar-Veerawamy, M.D.
 Kathy Lehman-Huskamp, M.D.
 Matthew Moake, M.D.
 Amanda Price, M.D.
 Christopher Pruitt, M.D.
 Margaret Rinaldi, M.D.
 Christopher Stem, M.D.
 Olivia Titus, M.D.
 Christine Corley, NP
 Jessica Nguyen Fisher, NP
 Whitney Merrick, NP

Pediatric Endocrinology



Remberto Paulo, M.D.
(Interim Div. Chief)
Elizabeth Fudge, M.D.
Ladan Davallow Ghajar, M.D.
Amy Kakkanatt, M.D.
Jadranka Popovic, M.D.
Liz Brady, NP

Pediatric Infectious Diseases



Allison Eckard, M.D. (Div Chief)
Adeline Koay, MBBS
Jason Lake, M.D.
Lauren Powell, D.O.
Stephen Thacker, M.D.

Pediatric Gastroenterology



Benjamin Kuhn, D.O. (Div Chief)
Rathna Amarnath, M.D.
Janaina Anderson, M.D.
Kristin Capone, M.D.
Rayna Grothe, M.D.
Candi Jump, D.O.
Nagraj Kasi, M.D.
Carmine Suppa, D.O.
Nancy Swiader, D.O.
Jordan Whatley, M.D.
Jennifer Beall, NP
Kelley Deaton, NP
Leslie Lane, NP
Karen O'Brien, NP

Pediatric Hematology/Oncology



Michelle Hudspeth, M.D.
(Div. Chief)
Christina Abrams, M.D.
Shayla Bergmann, M.D.
Anca Dumitriu, M.D.
Ashley Eason, M.D.
Frances Frigon, M.D.
Jennifer Jaroscak, M.D.
Jacqueline Kraveka, D.O.
Sandeepkumar Kuril, M.D.
Andrew Picca, D.O.
Victoria Sexton, Psy.D.
Lori Burton, NP
Deborah Disco, NP
Earleisha Felder, NP
Jessica Gardner, NP
Mary Johnson, NP
Kristine Meister, NP
Courtney Miller, NP
Anne Webster, NP
Emily Young, NP

Pediatric Genetics



Neena Champaigne, M.D.
(Div. Chief)
Kristen Lancaster, M.D.
G. Pai, M.D.
Lauren Thompson, M.D.

Pediatric Sleep Medicine



Wendy Lyn Estrellado-Cruz, M.D.
(Sect. Chief)
Meher Farooq, M.D.

Pediatric Nephrology



Katherine Twombly, M.D.
(Div Chief)
Ali Annaim, M.D.
Kelly Garrity, M.D.
Anita Perez, M.D.
David Selewski, M.D.
Naajah Hughes, NP

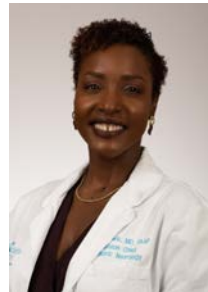
Neonatology



David Annibale, M.D. (Div Chief)
John Cahill, M.D.
Alison Chapman, M.D.
Katherine Chetta, M.D.
Dorothea Jenkins, M.D.
Lakshmi Katikaneni, M.D.
Frances Koch, M.D.
Laura Lach, M.D.
Kimberly Lee, M.D.
Ashley Osborne, M.D.
Julie Ross, M.D.
Heidi Steflik, M.D.
Carol Wagner, M.D.
Christina Baxter, NP
Jessica Benes, NP
Beth Bohara, NP
Margaret Conway-Orgel, NP
Carmen Dooley, NP
Kristin Elmore, NP
Bethany Evans, NP
Bresney Fanning, NP
Jessica Fragile, NP
Madeline Gandy, NP
Danielle Hall, NP
Stephanie Hall, NP
Jessica Harrison, NP
Kylie Hopkins, NP
Tamatha Huneycutt, NP
Sarah King, PA
Ashley Klumb, NP
Kiersten Lebar, NP
Meredith Ledbetter, NP

Tyner Lollis, NP
Patti Long, NP
April Martinez, NP
Amber Monroe, NP
Laura Myers, NP
Laura Orr, NP
Heather Ryle NP
Amanda Saurez, PA
Jessica Shearer, NP
Alanna Shiflett, NP
Cameron Shiflett, NP
Carlene Speaks, NP
Lindzie Smarch Durham, NP
Lauree Stark, NP
Jillian Tortorigi, NP
Katherine Vincent, NP

Pediatric Neurology



Dalila Lewis, M.D. (Div Chief)
Sonal Bhatia, M.D.
Barbra Giourgas, M.D.
Mariana Grossi Bessa Szuchmacher, M.D.
Thomas Koch, M.D.
Salvatore Rametta, M.D.
Purabi Sonowal, M.D.
Kathryn Taylor, D.O.
Amanda Watts, PA
Leigh Tollison, NP
Alison Rookard, NP
Savannah Wawner, PA

Pediatric Palliative Care



Conrad Williams M.D. (Sect. Chief)
Kirstin Campbell, M.D.
Shannon D'alton, NP
Aminah Fraser-Abdur Rahim, NP
Cara Reh fuss, PA

Pediatric Hospital Medicine



John Pastore, M.D. (Div. Chief)

David Bundy, M.D.

Stephanie Kwon, M.D.

Patricia McBurney, M.D.

Sarah Mennito, M.D.

David Mills, M.D.

Elizabeth Oddo, M.D.

Kelly Roelf, M.D.

Andrea Summer, M.D.

Ronald Teufel, M.D.

Daniel Williams, M.D.

Pediatric Primary Care – General Pediatrics



William Basco, M.D. (Div. Chief)

Angela Allevi, M.D.

Michelle Amaya, M.D.

Erin Balog, M.D.

Kathryn King, M.D.

Kristina Gustafson, M.D.

Kathleen Head, M.D.

Timothy Horgan, D.O.

Timothy Lukenbill, M.D.

Claire MacGeorge, M.D.

James McElligott, M.D.

Jenny Nordby, M.D.

Ashley Perdue, M.D.

John Reigart, M.D.

Sara Ritchie, M.D.

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Christine San Giovanni, M.D.

Pediatric Primary Care – Children's Care Network



Henry Lemon, M.D. (Div. Chief)

Brenda Alvarado, M.D.

Christine Canivan, M.D.

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Carol Jones, M.D.

Maritere Nazario-Tapia, M.D.

Rachael Zweigorn, M.D.

Deborah Marrington, NP

Jessica Rodriguez-West, NP

Pediatric Pulmonology



Shean Aujla, M.D. (Div. Chief)

Emily Campbell, M.D.

Chung Lee, M.D.

Sylvia Szentpetery, M.D.

Cheryl Kerrigan, NP

Pediatric Physical Medicine and Rehabilitation



Scott Benjamin, M.D. (Sect. Chief)



Natasha Ruth, M.D. (Div. Chief)

Mileka Gilbert, M.D.

Emily Vara, D.O.

Unless otherwise credited,
articles written by Jennifer Ware.

Photography by Sarah Pack

Final design by Rich Lee,
Hannah Daniel, Jennifer Ware
and Chris Berge of Berge Design.

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