



NATIONWIDE CHILDREN'S HOSPITAL
2023-2024 ANNUAL REPORT



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 More Than

130

Years of Excellence

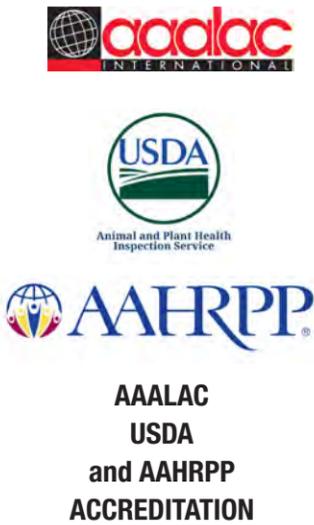


We've cared for children in Ohio and beyond for more than 130 years. As a leading pediatric health systems in the United States, our commitment to clinical care, research, education and community provides a firm foundation for all we have achieved and all that is to come.

Our story began in 1894 with nine beds and a commitment to care for every child in need. In the past 130 years we've been a dependable treasure in our community and have grown to become an international leader, helping children everywhere.



130 HONORS AND ACHIEVEMENTS



**TOP 10
NIH-FUNDED
RESEARCH
INSTITUTES**



**MORE THAN
> \$255 MILLION
IN CHARITY CARE**

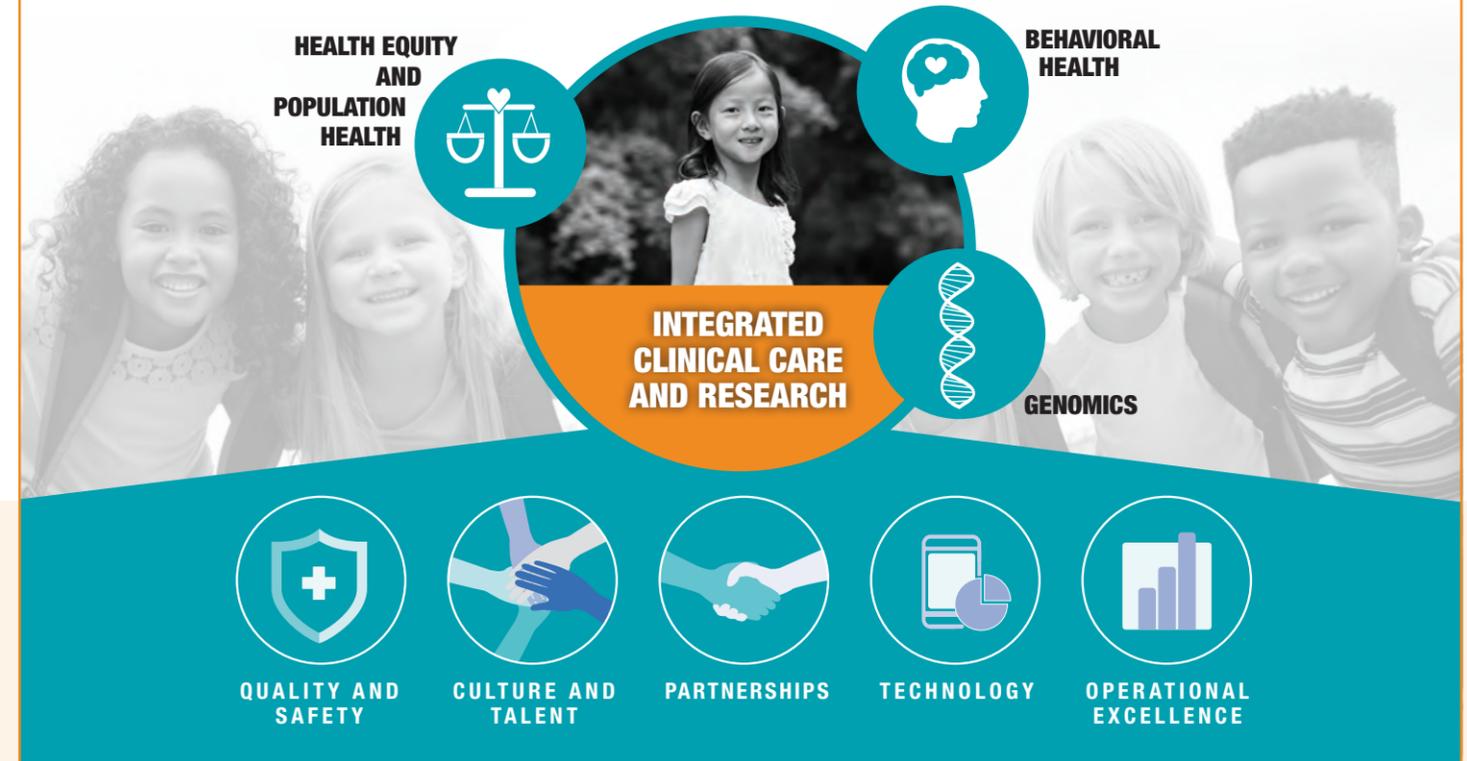


**MORE THAN
1.8 MILLION PATIENT
VISITS IN 2023 FROM
ALL 50 STATES AND
45 COUNTRIES**

Celebrating 11 years of being named to the Honor Roll of Best Children's Hospitals and ranked in all 11 specialties by U.S. News & World Report



2021-2026 LEADING THE JOURNEY TO BEST OUTCOMES FOR CHILDREN EVERYWHERE



This year marks a tipping point — two-thirds through the most ambitious strategic plan of our more than 130-year history. The five-year, \$3.3 billion commitment to transforming health outcomes for children is empowered by community support and our record of success in clinical care and research.

We are leaders in genomics, behavioral health, health equity and population health. In the pages that follow, you will learn about how we are putting action behind our intentions.

LEARN MORE ABOUT



THE STRATEGIC PLAN.



Nationwide Children’s Hospital is now one of the United States’ largest and most preeminent pediatric health care systems. We spent 2024 expanding our scope, and now we are even better positioned to lead the journey to best outcomes for children everywhere.

But we also spent time this year considering how we got here, and how our history informs our present and future. More than 130 years ago, nine dedicated women came together to found our hospital — all because children in central Ohio needed care. Nationwide Children’s cared for our first patient in 1894.

Since then, we have experienced incredible milestones, some of which we commemorated this year. Our Center for Gene Therapy was named in honor of Jerry Mendell, MD, whose 50 years of research breakthroughs have helped countless children. Our patient tower was named for Ann Isaly Wolfe, whose decades of volunteer leadership grew our hospital from an important community resource to an international pacesetter.

Philanthropy and community support have always propelled us forward. We recognized, in particular, the Nationwide Foundation’s transformational generosity. Its most recent pledge of \$100 million — the largest ever corporate foundation commitment to a children’s hospital in the United States — launched a new \$500 million capital campaign in 2024.

Most crucially, Nationwide Children’s deepened our efforts in integrated research and clinical care, behavioral health, population health and genomics. We had 1.8 million patient visits, helping children from 45 countries and all 50 states.

We have come a long way from that first patient visit more than 130 years ago. Our mission, however, remains the same: to provide care and support for every child who needs it. I am proud to introduce some of our most important accomplishments in this annual report.

TIM ROBINSON
CEO

Nationwide Children’s Hospital



As chair of the Nationwide Children’s Board of Directors, I have the unique opportunity to see the hospital both as an “insider” and as a member of the community it serves. I can tell you both views give me a tremendous amount of pride.

Nationwide Children’s perennial status as a member of the U.S. News and World Report Honor Roll of Best Children’s Hospitals along with numerous other awards for being among the best employers in the United States, are a testament to its excellence. This year, it became one of a select group of hospitals across the world that have achieved Magnet Designation from the American Nurses Credentialing Center for the fifth time.

Nationwide Children’s leadership and staff have built a health care system with worldwide impact. Remarkably, at the same time, they have created a mission-driven organization that is indispensable in the community. Its renowned efforts to develop affordable housing and create workforce pipelines have strengthened neighborhoods. The hospital has increased access to services with its nation-leading, school-based health program, and it continues to open Close-To-Home Centers so families can receive care that meets them where they are.

The hospital supports Ohio’s families and, in turn, our communities and their leaders partner with the hospital. As an example, the State of Ohio has named Nationwide Children’s its collaborator in expanding school-based care in southeastern Ohio. And the Franklin County Board of Commissioners and the city of Columbus are working with the hospital to expand housing options.

I have the honor of being part of the hospital’s supportive community and have a front-row view of Nationwide Children’s achievements — and I couldn’t be more proud. I invite you to learn more about this extraordinary health care system, and the people who make it successful, in the pages that follow.

KIRT WALKER

Chair

Nationwide Children’s Hospital Inc.
Nationwide Children’s Hospital
Board of Directors



DEAR FRIENDS AND COLLEAGUES,

As we approach a new era in our growth and achievement, we are grounded by the legacy of our organization and our enduring commitment to our community as our work extends to benefit children everywhere.

The past year has brought many developments in both research programs and clinical care. Integration of clinical care and research are at the heart of our strategic plan. As we are two-thirds through this plan, it is fulfilling to see how our efforts to grow both enterprises in an interconnected way are making an impact.

This has been an exciting year growing our *One Team*. We've added a number of senior level recruits in 2024, including three chiefs, a director for the Institute of Mental and Behavioral Health, and a chief scientific officer. You can learn more about these esteemed leaders on page 33.

These additions reflect the quality of work we are doing and support our aspirations to do more. We're excited for what the future holds and how these leaders will help us grow. We invite you to learn more about our growth this year and join us in celebrating our recent accomplishments. We value your support and collaboration as we continue our efforts to ensure that children everywhere can achieve their best possible outcome.

DENNIS R. DURBIN, MD, MSCE

*President, Abigail Wexner
Research Institute*

CATHERINE D. KRAWCZESKI, MD

*Chief Medical Officer
Physician-in-Chief
Chair, Department of Pediatrics*

OLUYINKA O. OLUTOYE, MD, PHD

Surgeon-in-Chief



*Dennis R. Durbin, MD,
Catherine Krawczeski, MD
Oluyinka Olutoye, MD, PhD
(Left to Right)*



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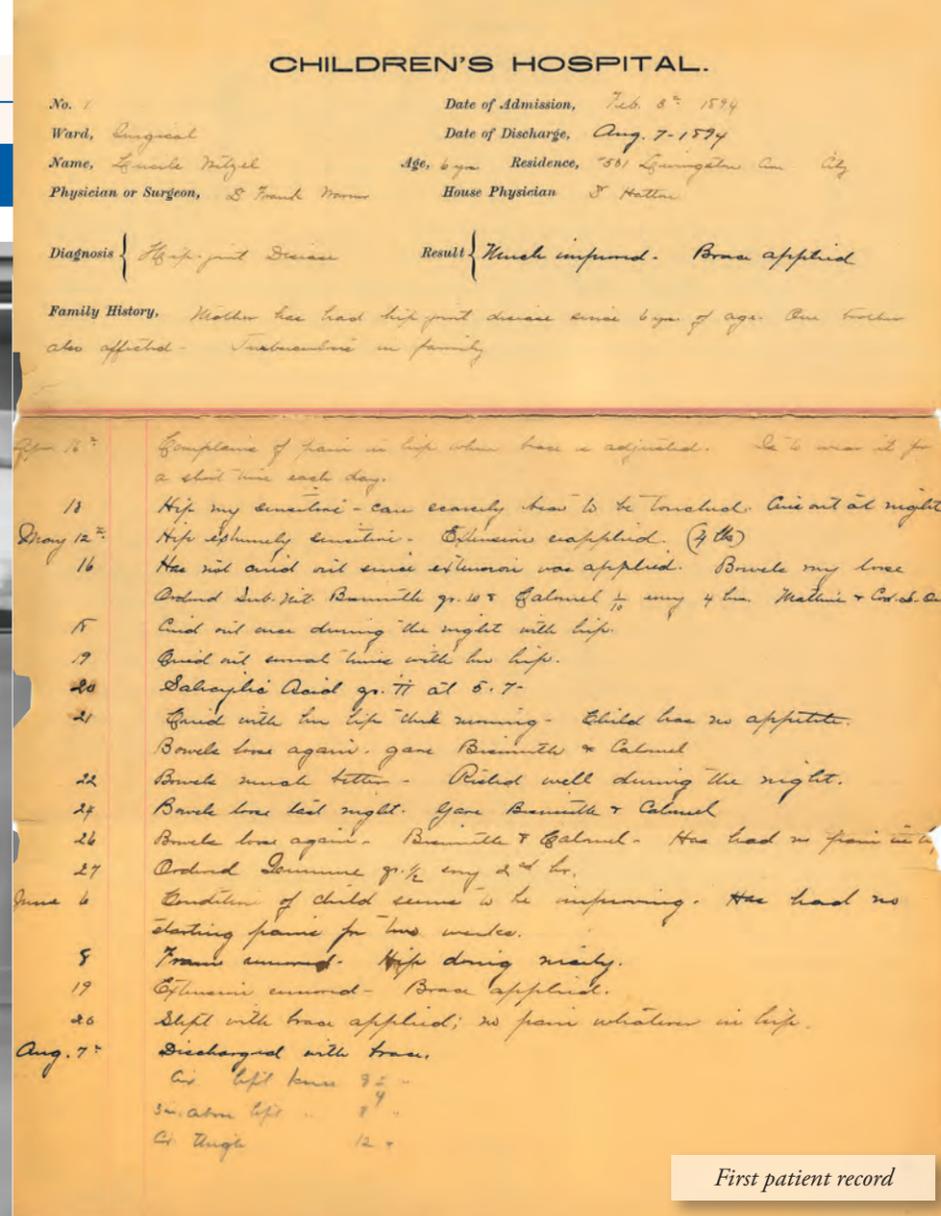
ARCHIVIST DISCOVERS FIRST PATIENT RECORD

At Nationwide Children’s we keep our history close — naming key roads around our buildings after important figures in the hospital’s history. One example is Metzel Road, which was built during the construction of the west campus expansion that included the Big Lots Behavioral Health Pavilion and Livingston Ambulatory Center.

Metzel is the name on our first patient record dated August 7, 1894 — or so we thought. In 2024, our archivist was looking for public records related to the Metzel family and coming up empty. Upon closer investigation, he raised a question that changed everything: What if the M was really a W and we had misread the doctor’s handwriting all this time?

It turned out the archivist’s hunch was correct. Patient Metzel had been Patient Wetzel all along. Thanks to this discovery, we’ve connected with members of the Wetzel family and renamed the road.

“Since joining Nationwide Children’s, I’ve enjoyed digging into detailed research projects to help make new discoveries about the hospital’s history. And most importantly, I’ve enjoyed promoting the archives to the Nationwide Children’s community and beyond. Our collection is an excellent resource, and it’s been exciting help share these treasures with others.” —John Joseph, Archivist



First patient record



Cornerstone of 2nd Children’s Hospital



Iron Lung

During the last big polio epidemics of the mid-1940s and 1950s, our hospital was a regional treatment center for both children and adults. A national respirator center was established here by the National Foundation for Infantile Paralysis, including a well-equipped pulmonary laboratory. Our dedication to treating children with pulmonary needs and investing in pulmonary research continues today.

Honoring a Legacy: Introducing the Jerry R. Mendell, MD, Center for Gene Therapy



Left to right: Kevin Flanigan, MD, director of the Jerry R. Mendell, MD, Center for Gene Therapy; Dennis Durbin, MD, MSCE, President, Abigail Wexner Research Institute; Jerry Mendell, MD; Phil Johnson, MD, first president of the Research Institute and first director of Center for Gene Therapy; Tim Robinson, CEO of Nationwide Children's

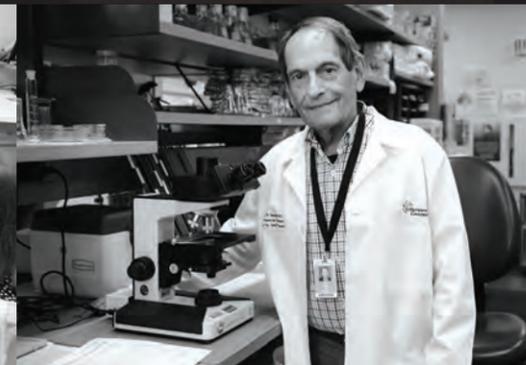
HONORING A LEGACY: INTRODUCING THE JERRY R. MENDELL, MD, CENTER FOR GENE THERAPY

The renaming and dedication of the Jerry R. Mendell, MD, Center for Gene Therapy at the Abigail Wexner Research Institute honors Jerry Mendell, MD, a pioneer in the fields of neurology and gene therapy and a catalyst for advancement in the treatment of multiple neuromuscular disorders.

Dr. Mendell's work in neuromuscular disease began more than 50 years ago when he saw his first patient with Duchenne muscular dystrophy (DMD). Thanks in part to his passion for developing new treatments for patients with neuromuscular disorders, he led the pivotal clinical trials for two of the first eight gene therapies approved by the FDA. In 2019, Zolgensma® became the first systemically delivered gene therapy approved by the FDA, for children with spinal muscular atrophy (SMA) type 1. In 2023, the FDA granted ELEVIDYS® accelerated approval, for children 4-5 years old with DMD, followed by full approval in 2024.



Dr. Mendell with Gideon, the first patient to receive gene therapy for Duchenne Muscular Dystrophy at Nationwide Children's after FDA approval.

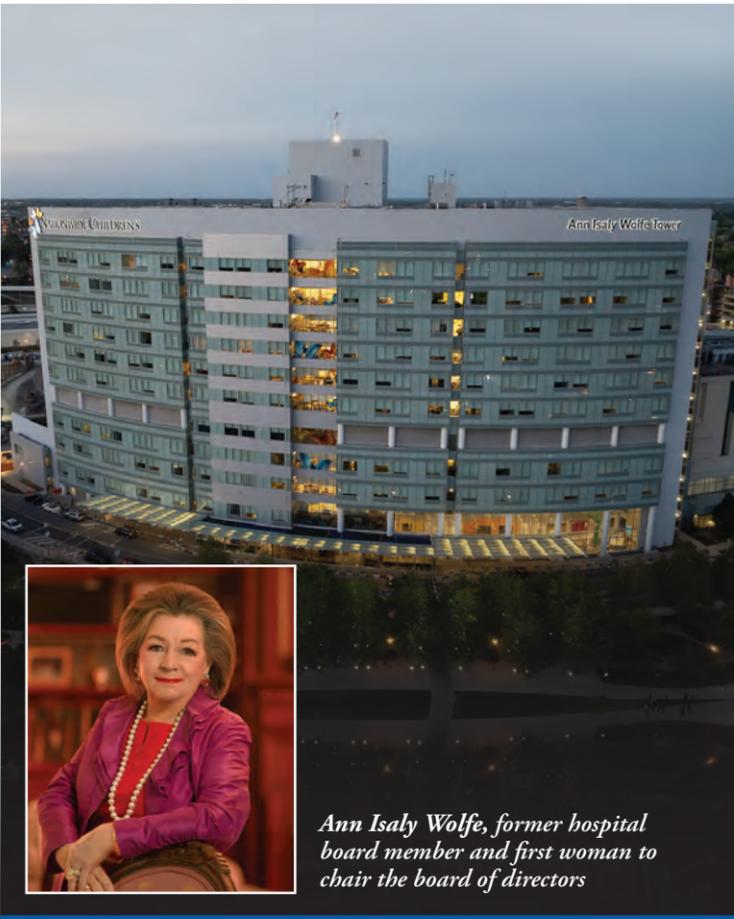


Dr. Mendell in his lab in 2017.



Dr. Mendell and grateful patient Donavon Decker, who spoke at the center naming event.

Transformational Gifts



Ann Isaly Wolfe, former hospital board member and first woman to chair the board of directors

ANN ISALY WOLFE TOWER: RECOGNIZING DECADES OF IMPACT

Nationwide Children's has dedicated and renamed the existing hospital tower in honor of Ann Isaly Wolfe, former hospital board member and first woman to chair the board of directors.

Wolfe guided the hospital through major expansions, including the addition of the Outpatient Care Center and education building that now bears her name. Known for her commitment to philanthropy, Wolfe chaired three fundraising campaigns that generated nearly \$1 billion for Nationwide Children's. She's been instrumental in the hospital's growth from an important community resource to one of the world's best pediatric health systems.



HISTORIC 10-YEAR, \$100 MILLION COMMITMENT FROM THE NATIONWIDE FOUNDATION

Nationwide Children's is honored to receive a historic 10-year commitment of \$100 million from the Nationwide Foundation. In 2006, the Nationwide Foundation's transformational gift of \$50 million was recognized through the renaming of Columbus Children's Hospital to Nationwide Children's Hospital. Since then, the Nationwide Foundation has made numerous philanthropic contributions, including annual gifts of \$10 million through the Nationwide Foundation Pediatric Innovation Fund.

The Nationwide Foundation's commitment represents the largest ever corporate foundation commitment to a children's hospital in the United States and will enable Nationwide Children's to realize its long-term strategic plan aimed at transforming health outcomes for children locally and around the world.



\$25 MILLION GIFT FROM THE CHLAPATY FAMILY

Longtime donors Joe and Linda Chlapaty have donated \$25 million to support the recently launched Institute for Mental and Behavioral Health Research at Nationwide Children's Hospital. The gift will help fund innovative research, endowed faculty to recruit nationally renowned researchers, and construction for new facilities.

The Chlapatys have cumulatively given more than \$30 million to Nationwide Children's hospital during the past four decades to support areas including this latest gift for behavioral health research, craniofacial and plastic surgery, child abuse prevention, suicide prevention, innovation in pediatric practice and more.

Joe Chlapaty joined the Nationwide Children's Board of Trustees in 2008 and has led the finance committee through periods of tremendous growth. Linda Chlapaty is on the board of The Center for Family and Safety Healing at Nationwide Children's.



CATHERINE KRAWCZESKI, MD, NAMED CHIEF MEDICAL OFFICER AND PHYSICIAN-IN-CHIEF AT NATIONWIDE CHILDREN'S

Catherine Krawczeski, MD, the hospital's physician-in-chief since 2022, will now also serve as Nationwide Children's chief medical officer. Dr. Krawczeski will continue in her positions as physician-in-chief and chief of the Department of Pediatrics at Nationwide Children's, and chair of Pediatrics at The Ohio State University College of Medicine.

In this newly combined role, Dr. Krawczeski will continue to develop physician leaders while ensuring the overall quality of medical services and providing both clinical and academic perspectives to support the hospital's vision and strategy.

"Nationwide Children's is a unique organization. Our 'One Team' culture provides a strong foundation for and influence on the organization. Our commitment to child health and wellness and to improving outcomes for all children is unsurpassed. I am grateful to be a part of the leadership team and to extend my role in that team to help provide the most innovative and highest quality of care to all children."

—Catherine Krawczeski, MD



DEEPENING OUR COMMITMENT TO QUALITY AND SAFETY

Related to Dr. Krawczeski's appointment to chief medical officer, Nationwide Children's has established its first chief quality officer position. A national search has begun to fill this important role. The chief quality officer will be a critical member of the chief executive officer's leadership team and will define and lead the organization's internationally esteemed quality and safety programs.

Building on our strong foundation, this new role will enable continued growth and ongoing support of our commitment to providing children with their best possible outcomes.

QUALITY AND SAFETY SNAPSHOT

Center for Clinical Excellence

The Center for Clinical Excellence oversees and advances the quality program, including the SCOPE (safety, clinical outcomes, population health, equity experience) framework. This team is responsible for the Zero Hero safety program, which originated at Nationwide Children's.



LEARN MORE

60%
reduction

60% reduction in CLABSI in 2024* compared to 2023 to a new rate of 0.5 infections/1,000 line days, our **lowest CLABSI rate ever**.

*data through August 2024

0.2 *per*
10,000

Adverse drug events (ADE) that reach the patient and cause harm are at our **lowest rate** ever at **0.2 per 10,000 dispensed doses**. Nationwide Children's is recognized by Solutions for Patient Safety as a top-performing hospital for ADE.

0.7/100
EET days

Our unplanned extubation rate has been sustained at a **low rate** at **0.7/100 ETT days** hospital-wide with a Neonatal Network rate of just under 1.0,* a remarkable accomplishment given the challenges required to minimize events in an unsedated, unrestrained and often very mobile infant.

CLINICAL PATHWAYS SUPPORT EXCELLENCE IN CARE

Nationwide Children's Clinical Pathways are peer-reviewed, evidence-based best practice recommendations for managing and treating medical conditions. By sharing our clinical pathways freely, we support standardized care and best outcomes for children everywhere — even if they are being treated somewhere else. Our Clinical Pathways Program continues to grow with a total of 97 pathways across both outpatient and inpatient care settings. The pathways are available on both the intranet and the internet and average over 100 accessed views per day. Recent data has shown that nearly 70% of pathway eligible hospitalized patients are on a clinical pathway.



LEARN MORE

"Our Clinical Pathways complement clinical judgment. Developed by leading physicians, nurses, pharmacists and other allied health practitioners, these tools can be used with confidence that the information is relevant, current and expert."

— Ryan Bode, MD, Associate Chief Quality Officer and Interim Associate Chief Medical Officer



In 2023, Big Lots Behavioral Health Services had

274,695 outpatient behavioral health visits providing care for **41,642** unique patients

38 licensed inpatient psychiatric beds

16 staffed Youth Crisis Stabilization Unit beds

13,133 inpatient psychiatry and Youth Crisis Stabilization Unit patient days



THE INSTITUTE FOR MENTAL AND BEHAVIORAL HEALTH RESEARCH: USING SCIENCE TO MEET THE NEEDS OF CLINICIANS AND FAMILIES

The Institute for Mental and Behavioral Health Research is located in the state-of-the-art Big Lots Behavioral Health Pavilion. The mission of the institute is to conduct innovative translational, clinical and epidemiological research focused on the etiology, prevention and treatment of mental, emotional and behavioral disorders. In addition to collaborative efforts across the Nationwide Children's campus, institute members collaborate with The Ohio State University (OSU) Department of Psychiatry and Behavioral Health and the OSU Institute for Behavioral Medicine Research.

"I am excited about the opportunity to use research to meet the needs of behavioral health clinicians here at Nationwide Children's and across the world. I'm interested in testing ideas and approaches in the real, messy realities where families and clinicians need us to meet them."
— Eric Youngstrom, PhD, Director, Institute for Mental and Behavioral Health

With 25,000 square feet of research space and additional space in development, the institute has flexibility for growth and offers ample room for staff and trainees. Embedded within the institute is the Center for Suicide Prevention and Research.

INTEGRATING BEHAVIORAL HEALTH INTO PRIMARY CARE

When Nationwide Children's began integrating behavioral health services into primary care, we knew it was a good idea. After analyzing our data two years later, we had hard evidence that we were making a huge impact on the mental health of children.

Integrating behavioral health into primary care clinics increased behavioral health utilization by 143% compared to 12% in nonintegrated clinics. With integration, 93% of initial behavioral health visits happen on the same day.

"Integrating four psychologists in primary care clinics had a more significant impact on access and utilization than 60 new behavioral health providers." — Cody A. Hostutler, PhD, Department of Pediatric Psychology and Neuropsychology



THE KIDS MENTAL HEALTH FOUNDATION

Since starting in 2018 as On Our Sleeves, The Kids Mental Health Foundation has made an impact for kids everywhere. We hosted Operation: Conversation with U.S. Surgeon General Dr. Vivek Murthy, addressed how children's mental health impacts us in our homes, at school and in the workplace, and participated in a White House discussion about representation of children's mental health in the entertainment industry. We've also created free resources for parents, caregivers and educators, making a difference for children across the United States.

Since 2018 we've

- Connected with >18 million people through free tools and resources.
- Reached 3 million classrooms with free educator curriculum and videos.
- Partnered with dozens of youth service organizations and children's hospitals to reach kids across the country.
- And so much more...

"We are so proud to be able to empower millions of adults with the upstream evidence-based tools they need to support the mental health and wellness of children. We hope one day, mental health will be a part of every child's upbringing and conversations about mental health will be treated in the same way as physical health." — Ariana Hoet, PhD, Executive Clinical Director, The Kids Mental Health Foundation



Proudly Founded by Nationwide Children's Hospital

We know that our children’s health doesn’t just happen in the hospital or doctor’s office. It happens where kids live, learn and play. That’s why, with many partners, we have created a trailblazing model of improving well-being beyond our walls.

Healthy Neighborhoods Healthy Families is an initiative that brings important programs and services to the community to impact positive health outcomes. Healthy Neighborhoods Healthy Families efforts are focused on five key areas: affordable housing, economic development, health and wellness, education and community enrichment.

AT SCHOOL: LARGEST SCHOOL-BASED HEALTH GRANT IN OHIO’S HISTORY TO IMPROVE ACCESS FOR APPALACHIAN OHIO CHILDREN



Mary Kay Irwin,
EdD, Senior
Director

The Appalachian Children’s Health Initiative is a more than \$64 million investment that includes dozens of projects in 36 communities across 20 Appalachian counties in Ohio. Much of the focus is on providing health services in schools, making this the largest investment in school-based health services in the state of Ohio.

Nationwide Children’s Hospital prepared the grant proposal for the program on behalf of the Appalachian Children Coalition to improve children’s access to the care they need where they spend most of their time — in school. The new or expanded services, including primary care, behavioral health and preventive care, will reach nearly 375,000 youth, families and community members. Each project varies based on community needs.

“We know that children can reach their full potential in the classroom when they are healthy, live in a safe and stable environment, and have access to the resources they need. By partnering with schools, we are helping many children access important care they would otherwise not receive. If we want to improve health outcomes for all children, we must work together and meet families where they are.”

— Mary Kay Irwin, EdD, Senior Director, School Health Services at Nationwide Children’s

IN THE NEIGHBORHOOD: FREE TAX CLINICS HELP A RECORD NUMBER OF FAMILIES CLAIM \$4 MILLION IN TAX REFUNDS



Nick Jones,
Vice President,
Community Wellness

In 2020, Nationwide Children’s, partnering with United Way of Central Ohio, launched a free tax return clinic to help improve the economic health of households in the community — 54 families took part. In 2024, more than 1,000 had their tax returns filed for free, claiming almost \$1.8 million in refunds.

“We’re proud to have the best program in the country for volunteer tax preparation at an academic medical center. The money returned to these families enables them to provide rent, groceries, health care and transportation — all of which are linked to better health outcomes for children.”

— Nick Jones, Vice President, Community Wellness

Nationwide Children’s also collaborated with United Way of Muskingum, Perry and Morgan Counties to set up Volunteer Income Tax Assistance (VITA) Tax Clinics in 2023 through an Ohio Department of Health grant. These tax clinics helped 350 families file returns resulting in \$387,111 in refunds.

1,661
TOTAL RETURNS

\$4
MILLION
TOTAL REFUNDS

\$1.4
MILLION
CHILD TAX CREDITS

\$978,000
IN EARNED
INCOME TAX CREDITS



AT HOME: HEALTHY HOMES WORKS TO ENSURE FAMILIES HAVE ACCESS TO AFFORDABLE HOUSING

Housing has been the cornerstone of Nationwide Children’s neighborhood work since 2008. Healthy Homes, our affordable housing initiative, is a collaboration with Community Development for All People. Since 2008, 800 homes have been improved through the program. Healthy Homes offers home repair grants, increases home ownership and provides rental housing. All of these services are kept affordable by aligning them with area median income guidelines.

HEALTHY HOMES IS NOW THE **LARGEST CHILDREN’S HOSPITAL-BACKED HOUSING EFFORT** IN THE UNITED STATES.

Learn more about all of Healthy Neighborhoods Healthy Families’ initiatives at NationwideChildrens.org/HNHF

**HEALTH EQUITY AND INCLUSION AT
NATIONWIDE CHILDREN'S**

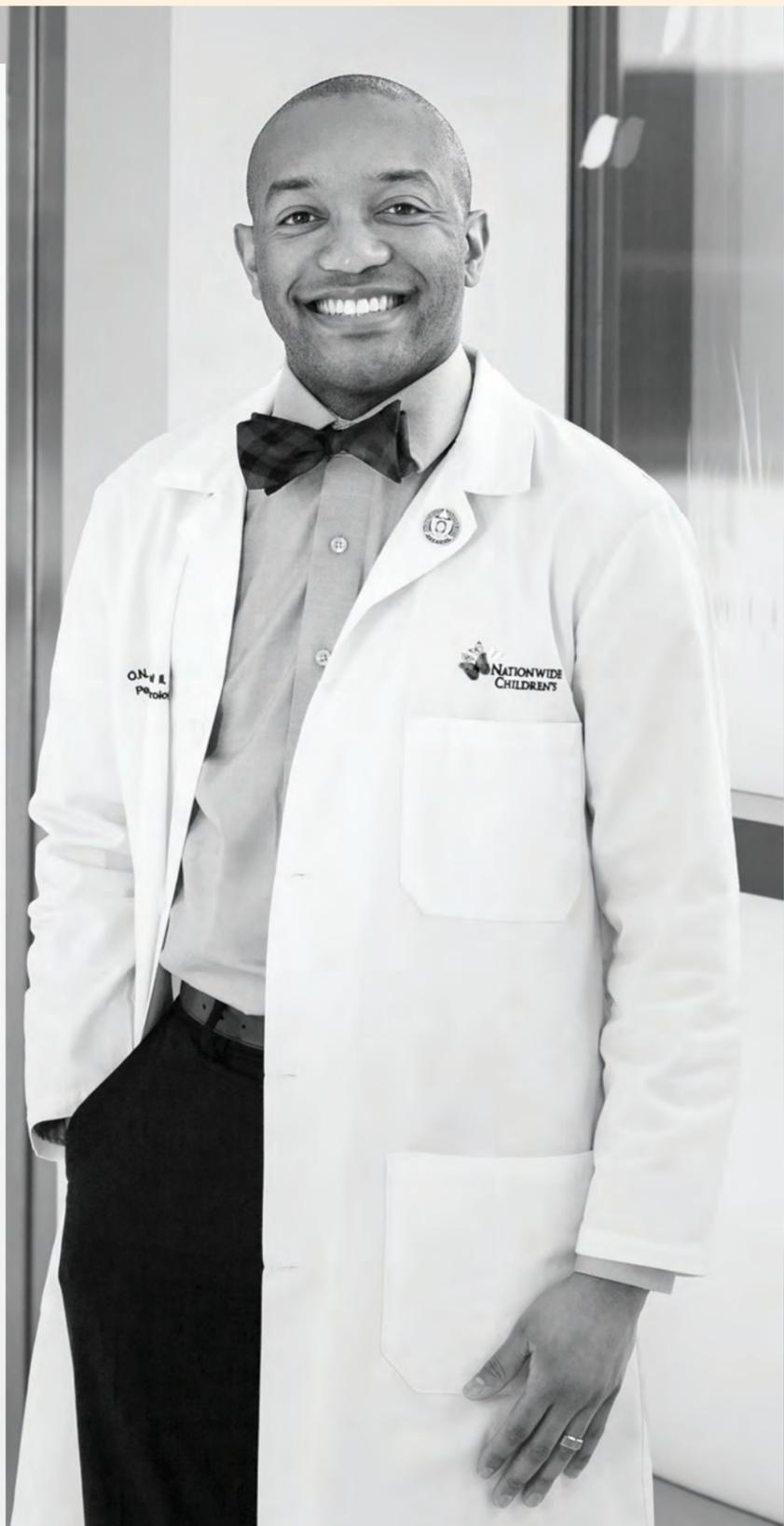
From our founding more than 130 years ago, Nationwide Children's has been committed to ensuring the best outcomes for every child. Being champions for *all* children is in our DNA. It is clearer than ever that we must stand for health equity for them, their families and for all members of our team.

More than 50,000 patients at Nationwide Children's every year speak a first language other than English. Approximately 54% of our patients are covered by Medicaid. Our work for health equity extends to every patient and family.

"We have been actively engaged in this work for a long time. In 2020, we expanded on our commitment to health equity through the Stand Against Racism, Stand for Health Equity initiative. Now, we're expanding and recommitting again to health equity for all the groups that need us to stand with and for them."

— O.N. Ray Bignall, MD, Chief Diversity, Equity and Inclusion Officer

The Stand at Nationwide Children's is the organization-wide commitment to health equity. It is also part of the embodiment of our *One Team* values that make Nationwide Children's a uniquely collaborative, innovative and supportive place to work. Through The Stand, we address the causes and impacts of disparity. The Stand works through clinical care, research, community investment, staff relationships and every other aspect of Nationwide Children's to achieve health equity.

**HEALTH EQUITY RESEARCH
AT NATIONWIDE CHILDREN'S**

As a leader in health equity research, our projects aim to understand and define health disparities and test solutions to promote health equity.

One such project is Integrated Care for Kids (InCK). The \$14.5 million effort with nearly 50 regional partners is poised to improve the health, well-being and future outcomes of vulnerable children in Licking and Muskingum counties. InCK is funded by the federal Centers for Medicare and Medicaid Services and led by Nationwide Children's with guidance from the Ohio Department of Medicaid and community stakeholders.

Another project, the Targeted Investment and Meaningful Engagement (TIME) study, aims to understand the experiences of Black women related to housing, neighborhood conditions, structural racism and reproductive health, to highlight how discriminatory policies have affected birth outcomes. The study focuses on the Linden neighborhood in Columbus, Ohio.

Beyond leading investigator-initiated studies, the Center for Child Health Equity and Outcomes Research is a resource for health equity that undergirds the research conducted throughout Nationwide Children's. The center's faculty supports every investigator in thinking about research approaches, inclusive study design and connection to the community the research is intended to benefit.

"The Abigail Wexner Research Institute has always been a full partner with the hospital in health equity. We have scientists who are working to obtain data, do the research, test interventions and understand challenges to health equity."

— Deena Chisolm, PhD, Director, Center for Child Health Equity and Outcomes Research





Pictured: Rick Miller (president, Nationwide Children's - Toledo), Kent Bishop, MD (chief medical officer, ProMedica), Robert Mills, MD (chief medical officer, Nationwide Children's - Toledo), Angela Mingo (vice president of development and corporate affairs, Nationwide Children's - Toledo), Erin McPartland (executive director, Maumee Valley Habitat for Humanity) and Wendi Huntley (president, Connecting Kids to Meals) participating in a panel discussion on ways local organizations are collaborating to advance child health in northwest Ohio.

NATIONWIDE CHILDREN'S - TOLEDO

Nationwide Children's - Toledo gives children in the northwest Ohio region broader local access to procedures and therapies, reducing the need to travel for treatment. Our Toledo team is dedicated to partnering with patients, families and the community to make a positive impact on child health.

COMMITTED TO COLLABORATION. COMMITTED TO TOLEDO.

Nationwide Children's commitment to population health is not limited to central Ohio neighborhoods. We understand the power of population health initiatives to improve child health beyond the acute care we can give in our clinics and hospitals.

Toledo's children currently face a range of issues, including housing, child hunger and access to health care. By continuing to educate the community on the challenges these children are facing and exploring ways we can collaborate on a common goal, we are one step closer to making a bigger impact.

We are committed to collaboration, and we are committed to Toledo. Together, we will continue to transform the lives of children, families and communities we serve.

Housing
#1

Housing and shelter remain the #1 requested category for the United Way of Greater Toledo

Source: United Way of Greater Toledo 211 Community Data

Hunger
1 out of every 4

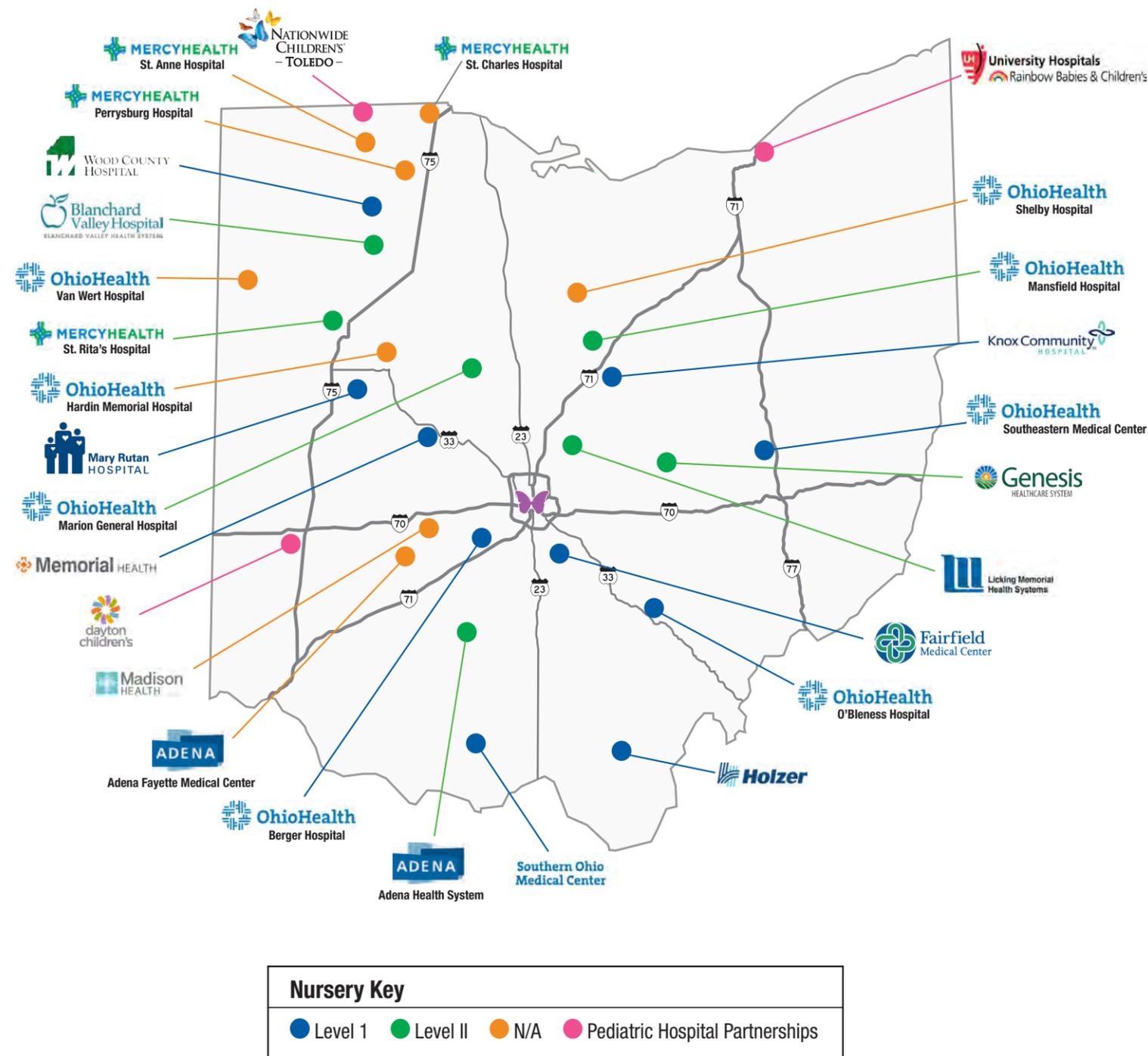
children in Lucas County is food insecure

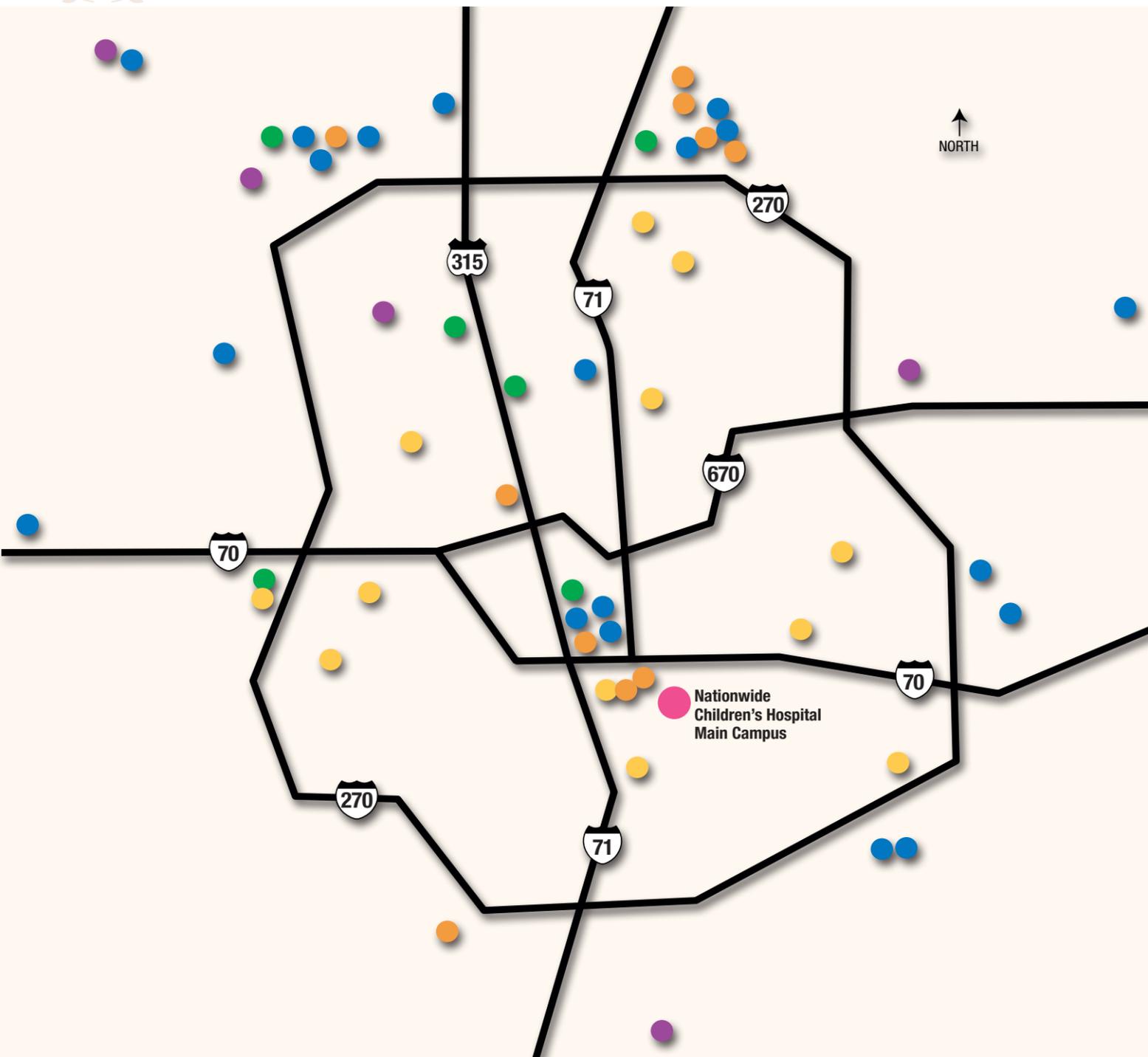
Source: Connecting Kids to Meals

Health
32%

of parents in Lucas County reported their child had more than one health condition in 2023.

Source: 2022-2023 Lucas County Community Health Assessment





- 18 *Close To Home*SM Centers
- 6 Neonatal Network Locations
- 11 Other Locations
- 12 Primary Care Centers
- 5 Affiliate Pediatric Practices
- 11 Laboratory Service Centers Co-located with *Close To Home*SM and Other Locations

>450,000
OFF-SITE
*outpatient
diagnostic/
therapy visits*
in 2023

>1 MILLION
SQ. FEET
*of off-site space
including
outpatient and
support buildings
in Ohio*
as of 2023

>6,000
CASES
*in the
Westerville
Surgery Center*
in 2023



NATIONWIDE CHILDREN'S HAS THE
LARGEST NEONATAL NETWORK IN THE UNITED STATES.

AS PART OF THE \$3.3 BILLION STRATEGIC PLAN, EXPANDED FACILITIES AND PROGRAMS REQUIRE ADDITIONAL FACILITIES TO SUPPORT OUR MORE THAN 1.8 MILLION PATIENT VISITS EACH YEAR.



MASTER FACILITIES PLAN : 2021-2026 CAMPUS ZONES AND PLANNED EXPANSION

- 1** Livingston Orthopedic & Surgery Center
- 2** Research Building IV
- 3** Research Building V
- 4** Inpatient Tower
- P** Parking Garage
- C** Conference Center

Blue Zone: Ambulatory Outpatient **Orange Zone:** Research **Tan Zone:** Inpatient **Purple Zone:** Acute Outpatient **Yellow Zone:** Planned Inpatient Expansion



NEW HOSPITAL TOWER EXPANSION: GROWING WITH PURPOSE

Construction on the new hospital tower has started. Intended to be a larger companion to the existing 12-story tower, the building will feature two floors below ground and 14 floors above. Completion of the tower is anticipated for 2028. The new tower will host a state-of-the-art neonatal intensive care unit and an expanded emergency department.



LIVINGSTON ORTHOPEDIC AND SURGERY CENTER OPENS

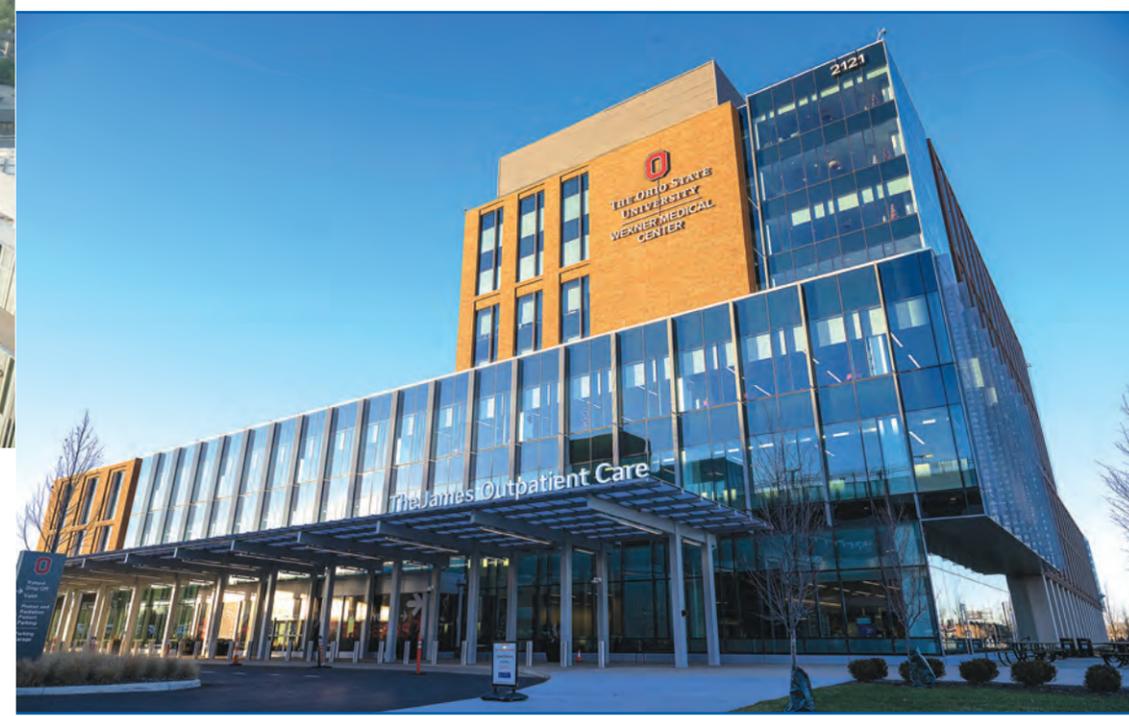
Nationwide Children’s has opened the doors of the new Livingston Orthopedic and Surgery Center, an innovative pediatric center providing convenient, comprehensive outpatient surgical services, orthopedics, sports medicine, rheumatology and dentistry with on-site imaging, sports and physical therapies and more. The beautiful facility hosts an 11,000 square foot rehabilitation gymnasium, the Honda Center for Gait Analysis and Mobility Enhancement, six general operating rooms and four dental operating rooms.



WORLD-CLASS FACILITIES FOR LIFE-CHANGING RESEARCH

Research at Nationwide Children’s continues to grow and flourish. Over the last decade, National Institutes of Health funding awarded to investigators at Nationwide Children’s has quadrupled.

The amount of child health research space on our campus has also tripled. The Wexner Institute for Pediatric Research (Research Building I) opened in 1987 with 136,580 square feet of dedicated research space. In the years since, we opened two additional research buildings. Now, with the addition of Research Building IV, a companion to Research Building III, dedicated research space across campus reaches more than 750,000 square feet. The two buildings, shown in the photo above, function as one complex, connected on each floor and by a common entrance hall and central staircase.



PROTON CENTER OPENS

Nationwide Children’s and The Ohio State University have brought the first proton therapy treatment facility to central Ohio. The facility first opened in late 2023 and offers the most advanced technologies available, including FLASH proton therapy. As of late-2024, an estimated 3,000 patients have benefitted from this new offering in the region.

LEADERSHIP APPOINTMENT HIGHLIGHTS



Chris Bartlett, PhD

Chris Bartlett, PhD, Associate Chief Data Sciences Officer for Biomedical Informatics

Dr. Bartlett, a principal investigator in the Steve and Cindy Rasmussen Institute for Genomic Medicine at Nationwide Children’s, has been appointed associate chief data sciences officer for biomedical informatics. In this role, Dr. Bartlett will work closely with Chief Data Sciences Officer Peter White, PhD. He will serve as chair of a multi-site research data governance committee and oversee significant high-profile projects using third-party datasets. He will also provide leadership over Nationwide Children’s real-world evidence (RWE) research portfolio, positioning the institution to secure external funding and lead new RWE research projects.



Antonio Cabrera, MD

Antonio Cabrera, MD, FAAP, FAHA, FACC, FHSA, Chief of Cardiology and Heart Center Co-director

Dr. Cabrera has joined Nationwide Children’s as division chief of Cardiology and co-director of The Heart Center. Dr. Cabrera has also been appointed professor of Pediatrics at The Ohio State University and holds the Nationwide George H. Dunlap Endowed Chair in Pediatric Cardiology. Previously, Dr. Cabrera served as the L. George Veasy Presidential Professor at the University of Utah and co-director of the Heart Center at Intermountain Primary Children’s Hospital in Salt Lake City, Utah. Vascular Diagnostics Center team for the establishment of the first-of-its-kind center at the NIH.



Melissa Graves

Melissa Graves, President of The Center for Family Safety and Healing

Melissa Graves has been named president of The Center for Family Safety and Healing at Nationwide Children’s. Graves is a nationally recognized leader with more than 20 years of experience guiding nonprofit organizations focused on vulnerable children and families. Since 2018, she has served as CEO for Journey Center for Safety and Healing in Cleveland which assists 15,000 women, children and families experiencing child abuse and domestic violence each year. During her tenure at Journey Center, the organization launched the first successful child advocacy center in Cuyahoga County.



Beth Kozel, MD, PhD

Beth Kozel, MD, PhD, Division Chief of Genetic and Genomic Medicine and Director of Constitutional Genomics Translational Research

Dr. Kozel has joined Nationwide Children’s as the hospital’s division chief of Genetic and Genomic Medicine and director of Constitutional Genomics Translational Research in the Steve and Cindy Rasmussen Institute for Genomic Medicine. She is also a principal investigator in the Institute for Genomic Medicine. Dr. Kozel is a clinical geneticist with extensive experience in genetics, vascular and matrix biology. Her recent research focuses on designing methods for genetic modifier discovery in rare disease cohorts, specifically Williams Syndrome and isolated supra-aortic stenosis. She previously directed the multidisciplinary Williams Syndrome Center at Washington University School of Medicine and St. Louis Children’s Hospital. In 2023, Dr. Kozel was co-awarded the 2023 National Institutes of Health Director’s Award, as a member of the Vascular Diagnostics Center team for the establishment of the first-of-its-kind center at the NIH. Vascular Diagnostics Center team for the establishment of the first-of-its-kind center at the NIH.



Catherine Krawczeski, MD

Catherine Krawczeski, MD, Chief Medical Officer

Nationwide Children’s physician-in-chief will now also serve as Nationwide Children’s chief medical officer. Dr. Krawczeski will continue her positions as physician-in-chief and chief of the Department of Pediatrics at Nationwide Children’s, and chair of Pediatrics at The Ohio State University College of Medicine. In this newly combined role, Dr. Krawczeski will continue to develop physician leaders while ensuring the overall quality of medical services and providing both clinical and academic perspectives to support the hospital’s vision and strategy.



Jennifer Muszynski, MD

Jennifer Muszynski, MD, Associate Chief Clinical Research Officer for Research Informatics

Dr. Muszynski, a critical care physician and a principal investigator in the Center for Clinical and Translational Research at Nationwide Children’s, has been appointed associate chief clinical research officer for research informatics. In this new role, Dr. Muszynski will champion the data science needs of clinician-researchers, not only to serve as a vital link between clinical research and data sciences but also to significantly contribute to the advancement of data science applications in clinical research, strengthening the integration of clinical insights in data-driven decision-making.



Jason Newland, MD, MEd

Jason Newland, MD, MEd, Chief of Infectious Diseases

Dr. Newland has joined Nationwide Children’s as the division chief of Infectious Diseases and an associate investigator in the Center for Child Health Equity and Outcomes Research. He is also a tenured professor at The Ohio State University and holds the Cramblett Endowed Chair in Pediatric Infectious Diseases. Dr. Newland is an infectious diseases specialist with extensive experience in professional care and education. His research interests are focused on the establishment and impacts of antimicrobial stewardship programs in children’s hospitals, helping to create guidelines for antibiotic use to treat infections appropriately while minimizing antibiotic-related complications as well as antimicrobial resistance.



Ahna Pai, PhD

Ahna Pai, PhD, Director of the Center for Biobehavioral Health

Dr. Pai, a pediatric psychologist, was named director of the Center for Biobehavioral Health. Her research has focused on treatment and medication adherence related to pediatric oncology and transplantation. She has received numerous awards and honors, most recently being named a fellow of the Society of Behavioral Medicine. She is also a member of several professional organizations including the Children’s Oncology Group, the American Society for Transplantation and Cellular Therapy, and the International Psychosocial Oncology Society. Dr. Pai is currently a principal investigator or co-principal investigator on \$3.1 million in grant funding. To date, she has mentored more than 40 graduate students and postdoctoral fellows.

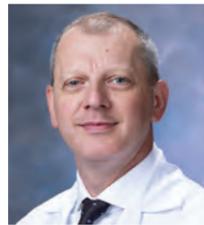
LEADERSHIP APPOINTMENT HIGHLIGHTS



Joanne Turner, PhD

Joanne Turner, PhD, Chief Scientific Officer

Dr. Turner has joined Nationwide Children’s and the Abigail Wexner Research Institute as chief scientific officer. Dr. Turner was the executive vice president for research and a professor at the Texas Biomedical Research Institute in San Antonio, Texas. Prior to that role, she was on the faculty at The Ohio State University for 14 years, rising to the rank of tenured professor in the Department of Microbial Infection and Immunity. Dr. Turner’s research focuses on immunity to mycobacterial infection in relation to aging. She has been funded by the National Institutes of Health continuously for 20 years, acquiring \$12 million in grant funding during her career to date, and was the first woman at Ohio State to receive a prestigious research program project grant (P01) from the NIH.



Can Yerebakan MD, PhD

Can Yerebakan, MD, PhD, Associate Chief of Cardiothoracic Surgery and Director of the Congenital Cardiothoracic Surgery Fellowship

Dr. Yerebakan has been appointed associate chief of the Department of Cardiothoracic Surgery and director of the Cardiothoracic Surgery Fellowship in The Heart Center at Nationwide Children’s. He is also a principal investigator in the Center for Cardiovascular Research in the Abigail Wexner Research Institute at Nationwide Children’s. Dr. Yerebakan has conducted pioneering experimental work in regenerative therapies for congenital heart disease with first time application of autologous umbilical cord stem cells for right heart regeneration. He is interested in improving the outcomes of children with hypoplastic left heart syndrome.



Eric Youngstrom, PhD

Eric Youngstrom, PhD, Director of the Institute for Mental and Behavioral Health Research

Dr. Youngstrom, a nationally renowned psychologist specializing in the relationship of mood and psychopathology, and the clinical assessment of children and families, is the inaugural director of the new Institute for Mental and Behavioral Health. He is the first recipient of The DiMarco Family Endowed Chair in Mental and Behavioral Health Research at Nationwide Children’s. His research focuses on improving clinical assessment instruments for differential diagnoses, and on predicting a child’s treatment progress — especially for bipolar disorder. These areas of study will greatly complement our current research conducted in the Center for Biobehavioral Health, Center for Suicide Prevention and Research, and Behavioral Health Services.

AWARD HIGHLIGHTS



Gail Besner, MD

Gail Besner, MD, Named Allen Distinguished Scholar in Pediatric Research

Gail Besner, MD, chief of Pediatric Surgery and principal investigator in the Center for Perinatal Research in the Abigail Wexner Research Institute at Nationwide Children’s, was named the 2024 Allen Distinguished Scholar in Pediatric Research. The award is given in honor of former Nationwide Children’s CEO, Steve Allen, MD, and his role in growing the AWRI into a preeminent research institution.

Dr. Besner’s research focuses on eliminating necrotizing enterocolitis (NEC), a debilitating and deadly condition affecting infants born preterm. In NEC cases, intestinal tissues become inflamed, and in severe cases, there is ischemia and death of the involved intestines. She and her collaborators Steven Goodman, PhD, and Michael Bailey, PhD, developed a novel probiotic delivery system that harnesses the durability of biofilms to improve the administration of probiotics to protect the intestines and the brain from injury. It has been licensed to Scioto Biosciences, where Drs. Besner, Goodman and Bailey are all scientific founders of the company.



Jerry Mendell, MD

Jerry Mendell, MD, King Faisal Prize Laureate in Medicine, Time 100 Health

Jerry Mendell, MD, senior advisor to the Abigail Wexner Research Institute at Nationwide Children’s, is the 2024 recipient of the King Faisal Prize for Medicine for his contributions toward the screening, diagnosis and treatment of neuromuscular diseases, including spinal muscular atrophy, Duchenne muscular dystrophy and limb girdle muscular dystrophy. Dr. Mendell is the first researcher from Nationwide Children’s to be recognized with this award. Dr. Mendell was also named one of TIME’s 100 Most Influential People in global health this year.

GRANT HIGHLIGHTS

HRSA Grant for Maternal/Infant Health – Healthy Start Initiative

The Health Resources and Services Administration (HRSA) awarded Nationwide Children’s Hospital a \$4.7 million grant for the implementation of the Healthy Start Initiative, striving to improve the health of moms and babies in three Appalachian Ohio counties. The hospital’s award is the only Ohio Healthy Start award exclusively serving rural Appalachian families. In this area of the state, infant mortality rates are higher than statewide and national averages, according to the Ohio Department of Health and Centers for Disease Control and Prevention. Barriers that contribute to infant health disparities in these counties include economic well-being, housing affordability, access to childcare and rural landscape challenges such as broadband access and transportation.

P50 Award for Wellstone Muscular Dystrophy Network Designation

Nationwide Children’s researchers received a P50 grant from the National Institute of Child Health and Human Development to establish a Wellstone Muscular Dystrophy Specialized Research Center. The Wellstone Muscular Dystrophy Research Program was established by the NIH, in 2003, in honor of the late Senator Paul D. Wellstone.

The Nationwide Children’s Muscular Dystrophy Specialized Research Center consists of three cores that will share expertise and resources with the Wellstone and broader muscular dystrophy research communities, as well as three projects that will address questions raised or left unanswered by current therapies. The Administrative Core, led by Dr. Kevin Flanigan, will be responsible for outreach and engagement with the patient and research communities. The Cell Line and Tissue Bank Shared Resource Core, led by Nicolas Wein, PhD, will provide patient-derived cell lines to researchers at Nationwide Children’s and across the Wellstone network, catalyzing the development of new therapies for a wide variety of disease-causing mutations. The Training Core, led by Scott Harper, PhD, provides funding for the annual Nationwide Children’s/ The Ohio State University Myology Course, a unique program that provides an intense introduction to the study of muscle diseases for 60 trainees from across the globe each year.

One project, led by Paul Martin, PhD, will utilize a novel bicistronic AAV vector to prevent muscle disease and build new muscle function as a therapy for patients with limb girdle muscular dystrophy type R9. A second project, led by Dr. Flanigan, will develop vectors containing U7 small nuclear RNAs reprogramed with antisense sequences directed toward splice sites or splice enhancements to restore dystrophin expression. The third project, led by Nizar Saad, PhD, will study circulating extracellular vesicles to identify novel biomarkers and develop a new generation of gene therapies that increase transduction efficiency, increase dystrophin expression, and reduce the development of humoral immunity against adeno-associated virus gene therapies.

2023 EXTERNAL AWARDS

FUNDING IN MILLIONS BY SOURCE

■ Program	\$1.7
■ Industry	\$12.4
■ Other	\$33.0
■ Federal Other	\$58.7
■ NIH Prime	\$69.5



2023
\$175.3



More Than

130

Years of Excellence

Department, Section and Research Institute

Reports

A LETTER FROM THE DEAN OF THE OHIO STATE UNIVERSITY COLLEGE OF MEDICINE



Dear Friends,

We are incredibly fortunate to have one of the nation's leading academic pediatric medical centers right here in our own community. Nationwide Children's Hospital is a remarkable institution, consistently honored by U.S. News & World Report as one of the "Best Children's Hospitals" throughout the past decade. I am profoundly thankful for the strong collaboration we at The Ohio State University College of Medicine have with this outstanding hospital.

The people and programs at Nationwide Children's play a pivotal role in helping us achieve our ambition of being a leading college of medicine that transforms the health of our communities through inclusive and innovative education, discovery and care. Our learners are deeply passionate about this ambition. They aspire to make a meaningful impact on the world, with many specifically dedicated to improving the lives of children.

Among our 2,767 faculty members in the College of Medicine, 858 reside at Nationwide Children's and its Abigail Wexner Research Institute. Each year, children and families from around the world benefit from the clinical care and research expertise of our faculty and scientists located there. Likewise, our learners benefit from the rich educational experience these faculty members provide.

Here are some wonderful highlights about our educational partnership from the past year:

- 211 third-year medical students completed core rotations in Pediatrics.
- 46 fourth-year medical students completed 126 rotations (both required and elective) in Pediatrics.
- 9 first-year medical students completed a summer research experience at Nationwide Children's.
- 70 first- and second-year medical students are completing their longitudinal clinical placements at Nationwide Children's sites, where 52 Pediatrics faculty members serve as longitudinal practice preceptors.
- 15 of our graduating medical students (8%) went into Pediatrics and 10 selected Medicine/Pediatrics as their specialty.
- Our residency programs in Combined Internal Medicine/Pediatrics and Child Neurology, both in partnership with Nationwide Children's, are considered top 10 programs as ranked by physician reputation across the country.

The Ohio State University College of Medicine faculty who work at Nationwide Children's are making leading-edge discoveries and translating them into solutions for children everywhere. I could not be prouder of their work and commitment to our patients, families and learners. Together, we are transforming the health of our communities and educating the pediatric health care leaders of tomorrow.

Sincerely,

Carol R. Bradford, MD, MS, FACS

Dean, The Ohio State University College of Medicine

Leslie H. and Abigail S. Wexner Dean's Chair in Medicine

Vice President for Health Sciences, The Ohio State University Wexner Medical Center

Professor of Otolaryngology – Head and Neck Surgery

DEPARTMENT OF PEDIATRICS

The mission of the Department of Pediatrics at Nationwide Children's Hospital and The Ohio State University is to achieve excellence in teaching, research, academics, advocacy and administrative service. With great energy and enthusiasm, we promote the well-being of children, discover new knowledge to bring optimal child health and provide evidence-based, efficient and compassionate medical care to our patients and their families.

The department comprises 27 clinical divisions that work alongside five additional clinical departments and 14 surgical departments. Department of Pediatrics faculty members have formal appointments in The Ohio State University College of Medicine.

Our faculty has an unwavering commitment to excellence and aspires to the highest levels of professionalism, humanism, diagnostic acumen, clear communication and compassion. We educate and mentor more than 350 third- and fourth-year medical students from The Ohio State University and train approximately 300 residents and subspecialty fellows each year. Our Center for Faculty Development oversees a robust program that strives to engage, support and educate our more than 700 faculty. An important contribution of our department and hospital is discovering and disseminating of new knowledge related to child health and health care delivery.



A LETTER FROM THE CHAIR, DEPARTMENT OF PEDIATRICS



Dear Colleagues,

At Nationwide Children's Hospital, we are leaders in innovation, clinical care and research. Our strategic plan reinforces our commitment to integrating clinical care and research to benefit children in central Ohio and throughout the world. Our training programs offer outstanding clinical and academic experiences in an environment that supports professional growth and development. We foster diversity, inclusion, and equity among our faculty and trainees through numerous programs, initiatives and investments.

We are proud to have recruited several senior faculty in the past year as leaders, including Antonio Cabrera, MD, chief of Cardiology and co-director of The Heart Center; Beth Kozel, MD, PhD, chief of Genetic and Genomic Medicine, Jason Newland, MD, MEd, chief of Infectious Disease; and Can Yerebakan, MD, PhD, associate chief of Cardiothoracic Surgery. These new leaders exemplify our mission and commitment to academics and providing the best in clinical care.

This year I was also honored to extend my leadership as the chief medical officer. In this combined role, I look forward to helping our *One Team* provide the most innovative and highest quality care to all children.

At Nationwide Children's, we know that health happens everywhere. While the care we provide in our clinics makes a life-changing impact for many, we are also invested in improving child health outside our walls. Through advocacy, population health and health equity initiatives, we meet patients and families where they need us most. From school-based health services to improved housing to the integration of behavioral health in primary care, we are leading the nation in a population health approach to *Best Outcomes* for children everywhere.

This edition of the annual report highlights achievements worth celebrating and teams who make it all possible. I am proud to lead this committed, compassionate and driven team. Join me in celebrating our past achievements, our current commitments to excellence and our future successes.

Catherine Krawczeski

Catherine Krawczeski, MD

Chief Medical Officer and Physician-in-Chief at Nationwide Children's

Ann I. Wolfe Endowed Chair in Pediatric Leadership

Professor and Chair, Department of Pediatrics, The Ohio State University College of Medicine

DEPARTMENT OF PEDIATRICS VICE CHAIRS



Ryan S. Bode, MD, MBOE
Senior Vice Chair, Pediatrics



Elizabeth Bonachea, MD
Vice Chair, Diversity and Inclusion



Dennis Durbin, MD
Vice Chair, Research



Linda Cripe, MD
Vice Chair, Promotion and Tenure



Rebecca Wallihan, MD
Vice Chair, Education

2023 – 2024 NATIONWIDE CHILDREN'S RESIDENCY PROGRAM NATIONWIDE CHILDREN'S HOSPITAL | THE OHIO STATE UNIVERSITY COLLEGE OF MEDICINE

PEDIATRICS RESIDENCY PROGRAM DIRECTOR

Dr. Rebecca G. Wallihan

INTERNAL MEDICINE/ PEDIATRICS RESIDENCY PROGRAM DIRECTOR

Dr. Allison Rossetti

ASSOCIATE PROGRAM DIRECTORS

PEDIATRICS

Dr. Chris Jones
Dr. Rena Kasick
Dr. Kristin Crichton
Dr. Mary Kay Kuzma
Dr. Alexander T. Rakowsky
Dr. Suzanne M. Reed
Dr. Claire A. Stewart

INTERNAL MEDICINE/ PEDIATRICS

Dr. Vig Doraiswamy
Dr. Lucas McKnight

PEDIATRIC RESIDENTS CHIEF RESIDENTS

Dr. Sara Delap
Dr. Brandi Heinz
Dr. Evan Ingram
Dr. Alexandra Wenig
Dr. Matthew Wysong

PL-4

Dr. Jacqueline Yurkoski

PL-3

Dr. Vedika Agrawal
Dr. Kaleb Boggs
Dr. Alison Brittain
Dr. Fiona Chambers
Dr. Phillip Cheng
Dr. Julia Plourde Ciarlo
Dr. Ryan Ciarlo
Dr. John Crececius
Dr. Catherine Davis
Dr. Ahmani DoDoo
Dr. Emily Engelhardt
Dr. Emily Ernest
Dr. Kaitlyn Foreman
Dr. Vinchelle Hardison
Dr. Taylor Hartlaub
Dr. Grace Hendrickson
Dr. Hannah Hughes (Datz)
Dr. Audrey Hull
Dr. S Basil Jafri
Dr. Dena Lowing

Dr. William McAllister
Dr. Evan Meiman
Dr. Candice Melkerson
Dr. Elizabeth Murray
Dr. McKenzie Nelson-Schmidt
Dr. Michelle Pfeffer
Dr. Albert Phillips, II
Dr. Sebastian Powell
Dr. Emily Rowland
Dr. Ali Sawani
Dr. Na'il Scoggins
Dr. Hannah Simmons
Dr. Jennifer Springer
Dr. Claire Tanager
Dr. Vanessa Thiel
Dr. Jonathan Wheeler
Dr. Joshua Yell
Dr. Morgan Zlotolow

PL-2

Dr. Emily Adler
Dr. Kaia Amoah
Dr. Nichole Anderez
Dr. Sarah Callahan
Dr. Melissa Cregan
Dr. Maxim Dragoun
Dr. Samuel Dressler
Dr. Madison Dudon
Dr. Austin Dukes
Dr. Grace Dukes
Dr. Patrick Dusza
Dr. Shaymaa Elhadidy
Dr. Olivia Grondalski
Dr. Charu Gupta
Dr. Ashley Hardee
Dr. Kyle Hendrix
Dr. Lauren Hoffman
Dr. Nicole Jewett
Dr. Alexis Juergensen
Dr. Monica Kim
Dr. Valerie Kirtley
Dr. Andriana La Mantia
Dr. Katherine Lehman
Dr. Alexis Lester
Dr. Gina Livecchi
Dr. Reagan Lyman
Dr. Megan McConathy
Dr. Megan McPhee
Dr. Richard Miller
Dr. Garrett Muckleroy
Dr. Elizabeth Otto Nourse
Dr. Rachel Nguyen
Dr. Abena Obeng
Dr. Amy Parikh

Dr. Ana Quintero
Dr. Laura Roberts
Dr. Jasmine Robinson
Dr. Alicia Rodgers
Dr. Nicole Schottenstein
Dr. Julie Tomolonis
Dr. Kari VanEvery
Dr. Christine Wang
Dr. Michael Young

PL-1

Dr. May Alarmanazi
Dr. Carlos Arias Bermudez
Dr. Robert Burks
Dr. Nicole Clayton
Dr. Sergio Steven Cobos
Dr. Mara Cohen
Dr. Patrice Collins
Dr. Diego Cruz Vidal
Dr. Prapti Dalal
Dr. Audrey Davis
Dr. Steven Dick
Dr. Serena Dow
Dr. Holden Elkhmmas
Dr. Isaac Esplin
Dr. Victoria Fahy
Dr. Maria Fleiderman
Dr. Evelyn Gartstein
Dr. Madelyn Green
Dr. Claire Gwilt
Dr. Julia Halley
Dr. Emerald Hanson
Dr. Hunter Holsinger
Dr. Allanah King
Dr. Claire Kovalchin
Dr. Hannah Loeb
Dr. Dianne Mancheno
Dr. Anne Mason
Dr. Marcella Orozco
Dr. Abigail Parro
Dr. Mallory Parsons
Dr. Keith Pierzchala
Dr. Maria Riley
Dr. Darius Rowe
Dr. Austin Rush
Dr. Ezgi Saylam
Dr. Emma Schwendeman
Dr. Laura Shine
Dr. Cameron Snapp
Dr. Kelly Spatorico
Dr. Hannah Stephen
Dr. Carmen Stone
Dr. Neil Sykes
Dr. Alexandra Tomasko

Dr. Rachele Wanser
Dr. Rebecca Waugh
Dr. Olivia Wiant

INTERNAL MEDICINE- PEDIATRIC RESIDENTS CHIEF RESIDENTS

Dr. Suranjana Dey
Dr. Nathan Parisi

PGY-4

Dr. Suranjana Dey
Dr. Anna Downs
Dr. John Gambriel
Dr. Brandon Liebau
Dr. Mariel McGuinness
Dr. Temitayo Olojo
Dr. Nathaniel Parisi
Dr. Stephen Ream
Dr. Jeanette Schnierle
Dr. Sarah Sprauer

PGY-3

Dr. Kathryn Andrews
Dr. Neemesh Desai
Dr. Jenna Hatab
Dr. Andrea House
Dr. Geoffrey Houtz
Dr. Lauren Ledingham
Dr. Ellen Lubbers
Dr. Megan McCrohan
Dr. John Reynolds
Dr. Hannah Smith

PGY-2

Dr. Nicole Chang
Dr. Victoria Charpentier
Dr. Meaghan Holzworth
Dr. Benjamin Jacob
Dr. Thomas Mason
Dr. Eleftheria Matsa
Dr. Grant Robertson
Dr. Caroline Skulski
Dr. Joshua Spegman
Dr. Samuel Stanley

PGY-1

Dr. Jennifer Adouli
Dr. Brady Buchanan
Dr. Simran Chahal
Dr. Hannah Chi
Dr. Wayde Dazelle
Dr. Lydia Hanson
Dr. Rachel Levenseller
Dr. Jong Lim
Dr. Spencer Miller
Dr. Dana Paine

Department of Pediatrics
ADOLESCENT MEDICINE

The Section of Adolescent Medicine at Nationwide Children’s Hospital provides general and specialty care for adolescents. The staff includes experts in all aspects of health care for adolescents, with an emphasis on comprehensive primary care, reproductive health care, eating disorders, LGBTQ+ youth, substance abuse, health care for incarcerated and unstably housed youth, and adolescents with complex health problems.

Faculty



Andrea E. Bonny, MD
Chief

Maria D. Ash, MD, MA(Ed)
Elise D. Berlan, MD, MPH
Ashley M. Ebersole, MD, MS
Fareeda W. Haamid, DO
Cynthia M. Holland-Hall, MD, MPH
Casey C. Levy, MD, MPH
Erin R. McKnight, MD, MPH
Heather L. Stewart, MD
Hunter J. Wernick, DO, MS

2023 – 2024 Fellows

Anna M. Carleen, MD
Jordi M. Friese, MD
Alexander S. Golec, MD
Kristen E. Reilly, MD, MSW
Amy Zawacki, MD

Highlights From the Past Year

This year has been one of growth and expansion for the Section of Adolescent Medicine. The team has reformatted our eating disorders clinic to reflect best practices in care and the latest evidence-based medicine practices for this population. Formerly known as Balanced Energy and Nutrition, the Medical Management of Disordered Eating and Eating Disorders (MDEED) is an updated approach to caring for adolescents with eating concerns.

In 2024, our Adolescent Medicine team has added two clinics to our regional *Close-to-Home*™ Centers: Medical Management of Disordered Eating and Eating Disorders in Dublin and an Adolescent Medicine Gynecology Clinic in Hilliard.

Supporting Best Outcomes Through Research and Collaboration

Among the many research studies our team participates in, Andrea Bonny, MD, has a new R21 grant funded by the National Institutes of Health this year. Dr. Bonny is the site-principal investigator in a large multicenter studying polycystic ovary syndrome (PCOS) in adolescents across the United States. The study is led by Melanie Cree, MD, from Colorado Children’s Hospital. The study represents collaboration not only among hospitals but also among specialties, with adolescent medicine and endocrinology experts working together to describe presenting phenotypes, natural history and response to therapy among youth with PCOS.

Leaders in Adolescent Medicine – Beyond Hospital Roles

Faculty in the Section of Adolescent Medicine are active in many professional organizations and active leaders in mentoring and academic work. Some highlighted roles from the team:

- Maria D. Ash, MD, MA(Ed) and Hunter J. Wernick, DO, serve on the Abstract Committee for the North American Society for Pediatric and Adolescent Medicine.

- Elise D. Berlan, MD, MPH, sits on the executive committee of the American Academy of Pediatrics Council on Adolescent and Young Adult Health, is the American Academy of Pediatrics liaison member on the Committee on Clinical Consensus-Gynecology for the American College of Obstetricians and Gynecologists, and served in an advisory capacity to the Centers for Disease Control and Prevention and the Food and Drug Administration in 2023.
- Andrea E. Bonny, MD, is an associate editor for the *Journal of Pediatric and Adolescent Gynecology*, the flagship journal of the North American Society for Pediatric and Adolescent Gynecology.
- Ashley M. Ebersole, MD, serves on the Substance Use Committee for the Society of Adolescent Health and Medicine.
- Fareeda W. Haamid, DO, served on the board of directors for the North American Society for Pediatric and Adolescent Gynecology.
- Cynthia M. Holland-Hall, MD, MPH, serves on the executive committee of the American Academy of Pediatrics Council on Adolescents and Young Adults, the Adolescent Medicine sub-board of the American Board of Pediatrics, the Planning Group for the American Academy of Pediatrics Practical Pediatrics Courses, and is the Adolescent Medicine Special Interest Group leader for the North American Society for Pediatric and Adolescent Gynecology.
- Erin R. McKnight, MD, MPH, served on the National Academies of Sciences, Engineering and Medicine’s planning committee for a workshop on family-focused interventions to prevent substance use disorders in adolescents and serves on the Substance Use Committee for the Society of Adolescent Health and Medicine.
- Heather L. Stewart, MD, serves as a Lieutenant Colonel in the Indiana Air National Guard, and served on the Networking and Career Development Committee for the Society of Adolescent Health and Medicine 2024 Program Planning Committee.

Selected Publications

- Ash MD, Watson IS, Matera LE, Ebersole AM, Stewart HL, Price E, Taylor J, Berlan ED, Bonny AE.** An exploration of contraceptive choice pathways in adolescents and young adults. *J Pediatr Adolesc Gynecol.* 2024 Jul 11:S1083-3188(24)00241-9. Epub ahead of print.
- Hogue A, Brykman K, Guilamo-Ramos V, Ilakkuvan V, Kuklinski MR, Matson P, **McKnight ER, Powell TW, Richter L, Walker-Harding LR.** Family-focused universal substance use prevention in primary care: advancing a pragmatic national healthcare agenda. *Prev Sci.* 2024 Feb;25(2):307-317.
- Hyzak KA, Bunger AC, Herrmann SA, Kerlek A, Lauden S, Dudley S, Underwood A, **Berlan ED.** Development of an implementation blueprint to scale-up contraception care for adolescents with psychiatric conditions in a pediatric hospital. *Glob Implement Res Appl.* 2023 Jun;3(2):147-161.
- McKnight ER, Ebersole A, Gallup J, Haamid FW.** Developing a sustainable quality improvement program in an academic center: The experience of an adolescent unit. *Pediatr Qual Saf.* 2024 Jun 11;9(3):e742.
- Underwood AL, Hyzak KA, **Ebersole A, Bunger AC, Berlan ED.** Assessing perspectives on an intervention connecting adolescents in outpatient psychiatry care to contraceptive counseling in the United States. *Perspect Sex Reprod Health.* 2024 Jun;56(2):171-181.



Grants Awarded
JULY 1, 2023 – JUNE 30, 2024
\$546,451

>>> Fast Facts: July 2023 – June 2024

Downtown Adolescent Medicine Clinic Visits:	5,654	Juvenile Justice Adolescent Medicine Clinic Visits:	2,117
Dublin Adolescent Medicine Clinic Visits:	545	Young Women’s Contraceptive Services Clinic Visits:	1,338
East Broad Adolescent Medicine Clinic Visits:	423	Total Adolescent Medicine Clinic Visits:	12,105
Eating Disorders Adolescent Medicine Clinic Visits:	1,912	Inpatient Consults:	51
Hilliard Adolescent Medicine Clinic Visits:	116		

Department of Pediatrics
ALLERGY AND IMMUNOLOGY

The Division of Allergy and Immunology at Nationwide Children’s Hospital provides comprehensive services for the diagnosis and treatment of patients with allergic and immunologic diseases from birth through age 21. Clinical activity includes an active outpatient clinic, food allergy treatment center, several multispecialty clinics, an urgent referral clinic and inpatient consultation services. The division is also actively involved in both basic science and clinical research.

Faculty



Mitchell H. Grayson, MD
 Division Chief



Rebecca Scherzer, MD
 Section Chief



Benjamin T. Prince, MD
 Associate Division Chief for Research

Elizabeth A. Erwin, MD
 Farah N. Khan, MD, MS
 Kelsey Lecerf, MD
 Irene J. Mikhail, MD
 Peter J. Mustillo, MD
 Margaret Redmond, MD
 Kasey Strothman, MD
 David R. Stukus, MD

2023 – 2024 Fellows

Courtney Cotter, DO
 Rebecca Koenigsberg, DO
 Victoria Nguyen, DO
 Adam Pearlstein, DO

Highlights From the Past Year

Continued Growth and Excellence in Care

Our division has continued our important designations:

- World Allergy Organization (WAO) Center of Excellence
- Jeffrey Modell Diagnostic and Research Center for Primary Immunodeficiencies

We are also proud to host providers from other major children’s hospitals at our Food Allergy Treatment Center. Our world-class Food Allergy Treatment Center is dedicated to evidence-based and personalized food allergy management for patients, families, our community and beyond. In the past three years, we have consulted with more than 2,500 new patients and performed more than 1,300 oral food challenges. Our Food Allergy Treatment Center continues to grow. It offers cutting-edge treatments for our patients with food allergies, including oral immunotherapy for milk, egg, peanut, cashew, walnut and sesame, and hosts clinical trials for novel treatments.

Commitment to Research

Researchers in the division have received a preliminary patent for Neuregulin-1 as a potential therapeutic to reduce mortality to respiratory viral infections. Our faculty conduct research within our division and through collaborations with the Center for Perinatal Research (bronchopulmonary dysplasia) in the Abigail Wexner Research Institute and The Ohio State University Department of Biomedical Informatics (effect of allergies and asthma on respiratory antiviral immune responses).

Other active studies in our division include:

- A phase 3, double-blind, placebo-controlled, randomized study to assess the efficacy and safety of epicutaneous immunotherapy with DBV712 250 µg in 4-to-7-year-old children with peanut allergy (VITESSE)
- A randomized, double-blind, multicenter, active-controlled, parallel-group study to evaluate the efficacy and safety of fluticasone propionate/albuterol sulfate fixed-dose combination on severe asthma exacerbations in patients with asthma

National Leadership and Collaboration

All of our faculty serve on committees and working groups within our national organizations. Leadership positions and committee involvement by our faculty include:

- Editor-in-Chief for *Annals of Allergy, Asthma & Immunology*, a premiere journal with its editorial office based in our division
- American Academy of Allergy, Asthma, and Immunology Board of Directors
- Social Media Medical Editor for the American Academy of Allergy, Asthma and Immunology
- American College of Allergy, Asthma, and Immunology Board of Regents
- ACGME Allergy and Immunology Review Committee
- American Board of Allergy and Immunology Continuous Assessment Program Test Writing Committee
- American Academy of Allergy, Asthma, and Immunology Fellows-In-Training Exam Committee
- American Academy of Pediatrics Section of Allergy and Immunology Executive Committee

Selected Publications

Gupta P, Kazmi W, Penna GD, Bupathi S, **Khan FN**. Social media and the allergist. *Curr Allergy Asthma Rep*. 2024 Aug;24(8):425-431.

Gustafson B, Britt RD Jr, Eisner M, Narayanan D, **Grayson MH**. Predictors of recurrent wheezing in late preterm infants. *Pediatr Pulmonol*. 2024 Jan;59(1):181-188.

Kraft MT, Coletta C, **Mikhail I, Prince BT, Scherzer R**, Eisner M, **Mustillo P**. The sensitivity of food allergy skin testing soon after food-induced anaphylaxis. *J Allergy Clin Immunol Pract*. 2024 May;12(5):1384-1386.e2.

Lanier K, **Scherzer R**, Coletta C, Ogbogu PU, Risma KA, **Redmond M**. Factors influencing career choice of allergy and immunology fellows-in-training: A work group report of the AAAAI Program Directors Assembly Executive Committee. *J Allergy Clin Immunol Pract*. 2024 Mar;12(3):627-632.e4.

Redmond M, Scherzer R, Hardy C, Macias C, Samora J, **Stukus D**. In-office amoxicillin to increase graded-dose challenges at initial evaluation for penicillin allergy. *J Allergy Clin Immunol Pract*. 2023 Jul;11(7):2190-2195.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024
\$721,121

>>> Fast Facts: July 2023 – June 2024

Main Campus Allergy Clinic Visits:	4,947	Lewis Center Allergy Clinic Visits	2,315
Immunology Clinic Visits:	547	Westerville Allergy Clinic Visits:	921
Complex Asthma-Allergy Clinic Visits:	154	Total Clinic Visits:	9,554
Hilliard Allergy Clinic Visits:	670	Inpatient Consults:	97

“IHM is an innovative way to get important information to help manage patients.”

– Curt Daniels, MD



THE HEART CENTER

Implanted Hemodynamic Monitoring in Patients With Fontan Circulation

Pulmonary artery pressures obtained with the CardioMEMS™ system may be clinically useful.

In a new study, researchers from The Ohio State University and Nationwide Children’s Hospital report on the use of invasive implanted hemodynamic monitoring (IHM) in patients with Fontan circulation. The findings suggest that IHM pressures in these patients are more closely associated with mortality and liver function than pressures measured by cardiac catheterization.

In patients with Fontan circulation, IHM using the CardioMEMS™ HF system allows for serial, noninvasive assessment of pulmonary artery pressures in non-fasting, non-sedated patients. The system has been shown to reduce heart failure hospitalizations in patients with acquired heart failure, but is less studied in patients with congenital disease, the study authors say.

Nationwide Children’s and Ohio State’s Adult Congenital Heart Program is likely the largest in the country to utilize IHM with CardioMEMS™ in people with Fontan circulation, according to the authors. The team hopes that by sharing their experiences, they can help other programs use it.

The team conducted a retrospective study of 18 patients with Fontan circulation referred for IHM placement at their center from 2015 to 2022. In this cohort with relatively advanced Fontan circulatory failure, IHM did not reduce heart failure hospitalizations, however, results suggest that IHM pressures could be more sensitive in predicting clinical outcomes or guiding treatment decisions.

“Because of their unique anatomy and physiology, it is challenging to obtain regular, accurate data from these patients, but knowing hemodynamics guides our use of advanced heart failure therapies and timing for heart transplant,” says senior author Curt Daniels, MD, professor of Internal Medicine and Pediatrics at Nationwide Children’s and The Ohio State University. “We have found that IHM is an innovative way to get important information to help manage patients.”

REFERENCE:

Marshall WH 5th, **Rajpal S, Mah ML, Armstrong AK, Salavitabar A**, Hickey J, Metzger R, Sisk T, **Daniels CJ**. Early Experience and Lessons Learned Using Implanted Hemodynamic Monitoring in Patients With Fontan Circulation. *Journal of the American Heart Association*. 2023 Dec 8:e031836. Epub ahead of print.

Marshall V WH, **Mah ML**, DeSalvo J, **Rajpal S, Lastinger LT, Salavitabar A, Armstrong AK**, Berman D, Lampert B, **Wright LK**, Hickey J, Metzger R, **Nandi D, Gajarski R, Daniels CJ**. Novel uses for implanted haemodynamic monitoring in adults with subaortic right ventricles. *Heart*. 2023 Nov 7:heartjnl-2023-323206. Epub ahead of print.



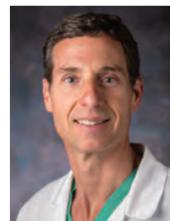
Department of Pediatrics
THE HEART CENTER

The Heart Center at Nationwide Children’s Hospital combines all clinical and research disciplines under one umbrella to meet our mission: to improve outcomes by discovering the causes of heart disease and develop novel therapies for our patients, focusing on each as an individual and providing the state-of-the-art care that all patients deserve, regardless of age. We support the mission of Nationwide Children’s to provide our services in a safe environment focused on family-centered care.

Faculty



Antonio G. Cabrera, MD
*Heart Center Co-director
Division Chief*



Mark E. Galantowicz, MD
*Heart Center Co-director
Cardiothoracic Surgery Chief*



**Robert J. Gajarski, MD,
MHSA**
Section Chief



Vidu Garg, MD
*Heart Center Co-director
Director, Center for
Cardiovascular Research*

Julie Aldrich, MD	Jessica L. Bowman, MD	Tara Cosgrove, MD, MBOE, LSSBB	Jennifer Gauntt, MD
Aimee K. Armstrong, MD	Amulya Buddhavarapu, MD	Linda H. Cripe, MD	Stephen A. Hart, MD
Lamya Atweh, MD	Sergio A. Carrillo, MD	Clifford L. Cua, MD	Emily A. Hayes, MD
Carl H. Backes, MD	Steven C. Cassidy, MD	Curt J. Daniels, MD	Erin Hehr, MD
Amee Bigelow, MD, MS	Kristin M. Chenault, MD	Richard P. Fernandez, MD	Kan N. Hor, MD
Benjamin A. Blais, MD	Marco Corridore, MD	Jill A. Fitch, MD	Hannah Jacobs, DO

Anna N. Kamp, MD, MPH	Catherine D. Krawczeski, MD	Kaitlin E. L'Italien, MD	Deipanjani Nandi, MD, MSc
John Kelly, MD	Rajesh Krishnamurthy, MD	Eric A. Lloyd, MD	Kathryn D. Nardell, MD
Naomi J. Kertesz, MD	Rohan Kumthekar, MD	May Ling Mah, MD, MS	Julie C. O'Donovan, MD
Omar M. Khalid, MD	Lauren Lastinger, MD	Patrick I. McConnell, MD	Trisha Patel, MD
Sarah Khan, MD	Anthony Y. Lee, MD	Christopher T. McKee, DO	Saurabh Rajpal, MD
John P. Kovalchin, MD	Marc Lee, MD	Aymen N. Naguib, MD	Leon Przybylowski, DO

Daniel G. Rowland, MD	Brittany Shutes, MD	Karen M. Texter, MD	Lydia Wright, MD, MSc
Arash Salavitar, MD	Toshiharu Shinoka, MD, PhD	Andrew Tran, MD, MS	Andrew R. Yates, MD
Rida Salman, MD	Janet M. Simsic, MD	Stephanie Tseng, MD	Jessie Yester, MD, PhD
Louisa Sethi, DO	Corey A. Stiver, MD	Peter D. Winch, MD, MBA	Cody M. Young, DO

Highlights From the Past Year

National and International Reputation

In the past year, the center continued delivering outstanding outcomes. The Heart Center’s accreditations were renewed for Electrophysiology Lab by the Intersocial Accreditation Commission and for the Adult Congenital Heart Disease (ACHD) program by the Adult Congenital Heart Association. Our team also undertook eight transplants and a record number of VAD hours from July 2023 through June 2024. Additional highlights include:

- Serving as the the live case site for the Pediatric and Congenital Interventional Cardiovascular Society (PICS) in 2021, 2022, 2023 and 2024.
- Ongoing coordination of SERVE (Self-Expanding RVOT Valve Evidence) Registry.
- Completing of hybrid cardiac catheterization lab renovations.
- Designing and enabling work for interventional cardiac MRI (iCMR) suite to include a new low-field 0.55T scanner.
- Developing of an ACHD Heart Center Failure Clinic.
- Ongoing development of Heart Center Extended Reality Program, which has led to multiple international presentations, publications, current single-center and multi-center studies and novel application.
- Ongoing preclinical work in iCMR using a commercial low field scanner for real-time imaging during interventions in collaboration with The Ohio State University.
- Hosting the Perinatology Conference in 2024.
- Expanding the Cardiology Clinic in 2024, which increase overall space by nearly 50%.
- Completing the Project Adam Ohio heart-safe designation heart safe designation on over 50 schools in the past year, bringing our total to 80 schools throughout the state. We designated Flying Horse Farms as the first heart safe camp in Ohio. We also worked with partners in Smart Heart Sports Coalition and the Ohio legislature to enact a law requiring AEDS and SCA training in all schools and youth sports venues in the state.

Commitment to Discovery

Through The Heart Center, clinicians and scientists work together to match questions developed at the bedside with answered evidence at the bench side.

- Rohan Kumthekar, MD, published his translational research in device development the describing feasibility of percutaneous epicardial pacing under direct visualization. He was also awarded a Phase 1 NIH grant from the NHLBI to further evaluate the utility of his device for epicardial ablation applications.
- Mingtao Zhao, DVM, PhD, and team published an article in *Circulation* describing the use of induced pluripotent stem cell technology and single-cell genomics to elucidate abnormal cardiac cell development in hypoplastic right heart syndrome.
- A new, four year, \$2.6 million NIH R01 grant was awarded to Vidu Garg, MD, to investigate mechanisms and therapeutics for congenital aortic valve stenosis.
- Kan Hor, MD, teamed up with medical centers around the country and was awarded a \$3.6 million NIH grant to improve heart disease detection in children with Duchenne Muscular Dystrophy using advanced imaging and machine learning.
- We have continued device trials in the cardiac catheterization lab, including a new trial of a bioresorbable closure device for atrial septal defects and enrollment in a study of a stent for infants and children that can be dilated to adult size.
- 135 articles published by faculty in peer-reviewed journals.

The lymphatic disorders program has continued to see an expansion in referrals, with about 20 cases so far in 2024 including from regional centers WVU, Cleveland Clinic, Vanderbilt and Norton Children’s (Louisville). Experience with modern diagnostic techniques, including intrahepatic MRL and 3D rotational lymphangiography continues to expand. Our 11 MRLs performed year-to-date already exceed our yearly average of 10, and lymphatic intervention cases continue to increase.

Program Growth and Collaboration

In the past year, we have welcomed five new recruits to the center: Antonio Cabrera, MD, Division Chief of Cardiology and Co-director of The Heart Center; Erin Hehr, MD, and Hannah Jacobs, DO, imaging staff; Leon Przybylowski, DO, general cardiology staff; and Louisa Sethi, DO, cardiac intensivist.

Training the next generation of cardiovascular researchers is supported through the NIH/NHLBI T32 postdoctoral training program (led by Drs. Garg and Backes), the NIH/NHLBI R25 undergraduate training grant (co-led by Dr. Garg), and an American Heart Association-funded Institutional Award for Undergraduate Student Training (led by Dr. Garg).

Our team also continues to collaborate with other centers and organizations. Selected highlights include:

- Deipanjan Nandi, MD, MSc, and Emily Hayes, MD, will lead our team efforts as one of three sites studying a novel gene therapy in adults with heart failure secondary to Duchenne muscular dystrophy (total award ~\$650,000).
- The Pediatric and Adult Advanced Cardiac Therapies (PAACT) team will also participate in the national clinical trial of mavacamten in pediatric obstructed HCM patients (total award ~\$380,000).
- Jessie Yester, MD, PhD, is the site principal investigator for the nationwide Barth Syndrome Registry, led by Reina Tan and Colin Phoon from NYU Langone.

Professional Involvement and Recognition

Our acute care cardiologists continue to hold leadership roles and participate in various national committees. Julie Aldrich, MD, leads the PAC3-sponsored clinical practice guideline for infective endocarditis. Stephen Hart, MD, serves as a co-chair on the PAC3 Database Committee. Corey Stiver, MD, is chair on the Conquering CHD Policy Committee and Tate Cosgrove, MD, MBOE, LSSBB, is the co-lead for the PAC3 Quality Improvement Course.

Additional recognition highlights include:

- The Heart Center received the gold award for the ELSO and ECMO Centers of Excellence.
- Lydia Wright, MD, MSc, is the co-leader of academic output for the ACTION collaborative, alongside Matt O'Connor from CHOP.
- We now have nine ACHD board-certified physicians, more than any other ACHD accredited center.

Selected Publications

Argo MB, Barron DJ, Eghtesady P, Yerebakan C, DeCampi WM, Alsoufi B, Honjo O, Jacobs JP, Paramanathan T, Rahman M, Lambert LM, Jegatheeswaran A, **Carrillo SA**, Husain SA, Ramakrishnan K, Caldarone CA, Karamlou T, Nelson J, Mannie C, Romano JC, Turek JW, Blackstone EH, **Galantowicz ME**, Kirklin JK, Mitchell ME, McCrindle BW; Congenital Heart Surgeons Society Critical Left Heart Obstruction Work Group. Outcomes after hybrid palliation for infants with critical left heart obstruction. *J Am Coll Cardiol*. 2023 Oct 3;82(14):1427-1441.

Butts RJ, Toombs L, Kirklin JK, Schumacher KR, Conway J, West SC, Auerbach S, Bansal N, Zhao H, Cantor RS, **Nandi D**, Peng DM. Waitlist outcomes for pediatric heart transplantation in the current era: An analysis of the Pediatric Heart Transplant Society Database. *Circulation*. 2024 Jul 30;150(5):362-373.

Morgan RW, Reeder RW, Bender D, Cooper KK, Friess SH, Graham K, Meert KL, Mourani PM, Murray R, Nadkarni VM, Nataraj C, Palmer CA, Srivastava N, Tilford B, Wolfe HA, **Yates AR**, Berg RA, Sutton RM; ICU-RESUS and Eunice Kennedy Shriver National Institute of Child Health and Human Development Collaborative Pediatric Critical Care Research Network (CPCCRN) Investigator Groups. Associations between end-tidal carbon dioxide during pediatric cardiopulmonary resuscitation, cardiopulmonary resuscitation quality, and survival. *Circulation*. 2024 Jan 30;149(5):367-378.

Salavitabar A, Eisner M, **Armstrong AK**, Boe BA, Chisolm JL, Cheatham JP, Cheatham SL, Forbes T, Jones TK, Krings GJ, Morray BH, Steinberg ZL, Akam-Venkata J, Voskuil M, Berman DP. Percutaneous balloon-expandable stent implantation to treat transverse aortic arch obstruction: Medium- to long-term outcomes of a retrospective multicenter study. *Circ Cardiovasc Interv*. 2024 Jul;17(7):e013729.

Yu Y, Wang C, Ye S, Xu Z, Lin H, **Texter K**, Shukla V, Ghadiali S, Ma Q, **Garg V, Zhao MT**. Abnormal progenitor cell differentiation and cardiomyocyte proliferation in hypoplastic right heart syndrome. *Circulation*. 2024 Mar 12;149(11):888-891.



Grants Awarded
JULY 1, 2023 – JUNE 30, 2024
\$2,484,990

>>> Fast Facts: July 2023 – June 2024

Heart Center Clinics		Heart Center Procedures	
Main Campus and <i>Close to Home</i> SM Center Visits:	19,636	Cardiac Catheterizations:	522
Regional Clinics Visits:	2,799	Cardiac Surgeries:	399
Total Clinic Visits:	22,435	Electrophysiology Procedures:	161
Heart Center Diagnostics		Heart Transplants:	8
Cardiac CTs:	375		
Cardiac Monitoring:	3,652		
Cardiac MRIs:	719		
Echocardiograms:	16,536		
Electrocardiograms (EKGs):	17,795		
Exercise Stress Tests:	853		

Department of Pediatrics
CARDIOLOGY

Cardiology is a section of the Department of Pediatrics and an integral part of The Heart Center at Nationwide Children's Hospital. See page 43 for complete details.

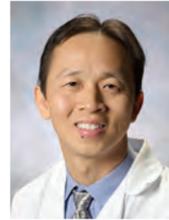
Faculty



Antonio G. Cabrera, MD
Division Chief



Robert J. Gajarski, MD, MHSA
Section Chief



Kan N. Hor, MD
Associate Division Chief for Research

Julie Aldrich, MD
Aimee K. Armstrong, MD
Amea Bigelow, MD, MS
Carl H. Backes, MD
Benjamin A. Blais, MD
Jessica L. Bowman, MD
Amulya Buddhavarapu, MD
Steven C. Cassidy, MD

Tara Cosgrove, MD, MBOE, LSSBB
Linda H. Cripe, MD
Clifford L. Cua, MD
Curt J. Daniels, MD
Richard P. Fernandez, MD
Jill A. Fitch, MD
Vidu Garg, MD
Jennifer Gauntt, MD
Stephen A. Hart, MD

Emily A. Hayes, MD
Erin Hehr, MD
Hannah Jacobs, DO
Anna N. Kamp, MD, MPH
John Kelly, MD
Naomi J. Kertesz, MD
Omar M. Khalid, MD
John P. Kovalchin, MD
Catherine D. Krawczeski, MD

Rohan Kumthekar, MD
Lauren Lastinger, MD
Anthony Y. Lee, MD
Marc Lee, MD
Kaitlin E. L'Italien, MD
Eric A. Lloyd, MD
May Ling Mah, MD, MS
Deipanjan Nandi, MD, MSc
Kathryn D. Nardell, MD

Trisha Patel, MD
Leon Przybylowski, DO
Saurabh Rajpal, MD
Daniel G. Rowland, MD
Arash Salavitarbar, MD
Louisa Sethi, DO
Brittany Shutes, MD
Janet M. Simsic, MD
Corey A. Stiver, MD

Karen M. Texter, MD
Andrew Tran, MD, MS
Stephanie Tseng, MD
Lydia Wright, MD, MSc
Andrew R. Yates, MD
Jessie Yester, MD, PhD

2023 – 2024 Fellows
Adult Congenital Heart Disease

Subeer Wadia, MD

Advanced Noninvasive Cardiac Imaging

Megan Gunsaulus, MD

Advanced Interventional Cardiology

William Fogarty, DO

Pediatric Cardiology

Jennifer Barbadora, MD

Zac Daniels, DO

Jaclyn Giafaglione, MD

Chukwuemeka Igwe, MD

Matt Laubham, DO

Macala Maney, MD

Angela Onorato, MD

Rachel Tonnis, MD

Matt Wiet, MD



Department of Pediatrics
CHILD AND FAMILY ADVOCACY

The Section of Child and Family Advocacy, housed within the Center for Family Safety and Healing at Nationwide Children’s Hospital, is home to a team of board-certified child abuse pediatricians and advanced-practice nurse practitioners who are nationally recognized child maltreatment experts with an emphasis on physical abuse, sexual abuse and medical child abuse. The Center for Family Safety and Healing is dedicated to the well-being of children and families. Together with partners and communities, the center supports victims of family violence and advocates for social change to prevent abuse. As a national leader in this important work, a team of more than 120 professionals representing medicine, behavioral health, social services, law enforcement, prosecution and children services are co-located at the center to address the complex issues of family violence.

Faculty



Megan M. Letson, MD, MEd
Chief

Farah W. Brink, MD
 Kristin G. Crichton, DO, MPH
 Catherine M. Huber, MD
 H. Michelle Greene, DO
 Jennifer J. Tscholl, MD

2023 – 2024 Fellows
Child Abuse Pediatrics
 Nara Cho, MD
 Mica Goulbourne, MD
 Amber Hussain, MD

Combined Child Abuse
Pediatric and Pediatric
Emergency Medicine Fellow
 Luke Hartman, MD

Highlights From the Past Year

In this past year, the Section of Child and Family Advocacy remained committed to improving the lives of children affected by child maltreatment. Our Child Assessment Center is accredited through the National Children’s Alliance, and our Child Abuse Pediatrics Fellowship program has received continued accreditation from the Accreditation Council for Graduate Medical Education. Many of our faculty serve in national leadership roles, including with the American Board of Pediatric Subboard of Child Abuse Pediatrics and the Ray E. Helfer Society. Additionally, Dr. Kristin Crichton was appointed as an Associate Program Director for the General Pediatrics Residency Program.

Expansion and Collaboration to Meet Community Needs

The Child Assessment Center is working with the Survivor Advocacy Outreach Program (SAOP) to establish a satellite Children’s Advocacy Center in Athens, Ohio. This work enables our team to provide specialized services to an underserved community. In early 2025, families in this community will begin to receive forensic interviewing and medical services locally.

Our Fostering Connections Program collaborated with the National Youth Advocate Program’s (NYAP) La Jornada program to deliver medical services to children under the care of the Office of Refugee Resettlement’s Unaccompanied Refugee Minors program. Focused on the most vulnerable minors, including those who entered the U.S. without a parent or guardian due to violence or abuse, our team worked with La Jornada to address their medical needs in a safe, temporary foster home.

Improving Care and Advocacy Through Research

This year, Farah Brink, MD, was appointed as the Associate Division Chief of Research for our Division. Dr. Brink’s research focus is utilizing machine learning in the radiologic evaluation of physical abuse. Members of the section have received funding to pursue the following areas of research:

- Dr. Brink received the EndCAN Research Award to develop a deep machine learning approach to improve estimation of physical abuse in emergency departments.
- Dr. Brink and Fellow Luke Hartman, MD, received the Center for Clinical Translational Research Intramural Research Grant to conduct a statewide assessment of the association between child maltreatment and ingestions.
- Dr. Brink is the site investigator for a multicenter study (Institute for Translational Medicine & Therapeutics – Translational Biomedical Imaging Center Grant) using diagnostic imaging in child maltreatment.

Selected Publications

Brink FW, Lo CB, Rust SW, Puls HT, Stanley R, Galdo B, Lindberg DM. Pilot study using machine learning to improve estimation of physical abuse prevalence. *Child Abuse Negl.* 2024 Mar;149:106681.

Fredin B, **Letson MM**, Rust SW, **Crichton KG**. Physical abuse re-reporting during the COVID-19 pandemic: The kids are not okay. *Child Abuse Negl.* 2023 Nov;145:106393.

Murnan AW, **Tscholl JJ**, Ganta R, Duah HO, Qasem I, Sezgin E. Identification of child survivors of sex trafficking from electronic health records: an artificial intelligence guided approach. *Child Maltreat.* 2023 Aug 6:10775595231194599. Epub ahead of print.

Samuel D, O’Malley F, **Brink FW**, **Crichton KG**, Duffy B, **Letson MM**, Michaels NL. Characterizing child maltreatment fatalities among child victims with disabilities in the United States, 2010-2019. *Child Abuse Negl.* 2023 Oct;144:106354.

Shubkin CD, Sieplinga K, Hunter RJ, **Crichton KG**. Transforming pediatric education in response to Dobbs v. Jackson: empowering adolescents to manage their reproductive choices. *Acad Pediatr.* 2024 Apr;24(3):381-384.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$676,840

>>> Fast Facts: July 2023 – June 2024

Child Assessment Center Visits:	1,037	Non-Accidental TBI Clinic Visits:	107
Child Assessment Team Clinic Visits:	216	Sharon Woods Foster Care Clinic Visits:	272
Eastland Foster Care Clinic Visits:	204	Total Clinic Visits:	3,402
Foster Care Clinic Visits:	1,566	Inpatient Consults (Child Abuse Team):	504

Department of Pediatrics
CLINICAL INFORMATICS

The Division of Clinical Informatics at Nationwide Children’s Hospital aims to transform health care through design, implementation and optimization of information and communication systems. Our goal is to enhance patient care activities with safe and reliable information systems, improve individual and population health outcomes through the use of technology and digital tools, enable innovation and research across the institution, and empower our patients and families with the tools they need to engage effectively with their health care team and our health care system.

Faculty



Jeffrey M. Hoffman, MD
Chief



Alysha J. Taxter, MD, MSCE
Associate Division Chief for Research

Aarti R. Chandawarkar, MD
 Juan D. Chaparro, MD, MS
 Jennifer A. Lee, MD
 Ethan Mezzoff, MD
 Kathryn E. Nuss, MD
 Shama Patel, MD
 Laura Rust, MD, MPH
 Emily Sentman, MD
 Shravani Vundavalli, MD

2023 – 2024 Fellows

Faraaz Chekeni, MD
 Naveed Farrukh, MD
 Jason Lo, MD
 Zachary Schirm, MD

Highlights From the Past Year

The Division of Clinical Informatics has had another successful year supporting our organization’s commitment to improving patient care through optimizing information and communication systems.

Through collaboration across the hospital, we are proud to support numerous research and clinical collaborations, including the following:

- Pediatric Clinical Decision Support (CDS) Collaborative: A multicenter initiative to evaluate both the positive and negative impacts of electronic CDS systems to improve effectiveness, facilitate interoperability and sharing between sites, and develop mitigation strategies to combat alert fatigue. This effort is led for our division by Juan Chaparro, MD.
- Neonatology Artificial Intelligence (NeoMind-AI) Collaborative: A multicenter initiative to leverage the power of AI to enhance the quality and precision of clinical care for neonates to create more personalized, efficient and effective care for newborns. This effort is led for our division by Shama Patel, MD.
- Pediatric Rheumatology Care and Outcomes Improvement Network (PR-COIN): Collects patient- and provider-reported outcomes, alongside clinical data as a part of routine clinical care, to increase knowledge, facilitate quality improvement efforts and improve patient care for children with juvenile arthritis. This effort is led for our division by Alysha Taxter, MD.

Our division’s involvement in external grants is typically as consultants to investigators in other divisions. New grants with which we are involved include:

- “Addressing Social Determinants of Health in Pediatric Patients with Rheumatic Disease” funded by the Columbus Medical Research Foundation awarded to Dr. Taxter.
- “Bytes to Bedside: Collaboration Development for Translational Clinical Decision Support” (multicenter) funded by the National Institutes of Health through Wake Forest University Health Services awarded to Dr. Chaparro.
- “EHR Implementation of PARENT Health Coach Program in Primary Care” (multicenter) funded by the National Institutes of Health through Seattle Children’s Hospital awarded to Shravani Vundavalli, MD.

Leading Through Professional Excellence

Members of our team are active leaders in a number of professional organizations including the American Medical Informatics Association and the American Academy of Pediatrics. Highlighted leadership roles are as follows:

- Aarti Chandawarkar, MD, was elected to the American Medical Informatics Association (AMIA) board of directors, following completion of her service as chair of the AMIA Academic Forum.
- Dr. Chaparro serves on the executive committee and as the education subcommittee chair for the American Academy of Pediatrics’ Council on Clinical Information Technology. He also serves on Epic’s Travel Advisory and Infectious Diseases Steering Boards.
- Jeffrey Hoffman, MD, serves on the board of directors and as clinical informatics sub-board chair for the American Board of Preventive Medicine, the American Board of Medical Specialties certification board for clinical informatics physicians in the United States. He also serves on Epic’s Provider Wellness steering board.
- Dr. Taxter serves on the Registries and Health IT committees for the American College of Rheumatology. She also serves on Epic’s Pediatric Rheumatology steering board.
- Dr. Vundavalli was elected as a member-at-large to the AMIA primary care informatics working group.

Selected Publications

Brown CM, Dillon B, Toth C, Decker E, Alexander RN, **Chandawarkar AR**, Bester S, Ricket E, Snyder DA. Quality improvement to eliminate disparities in developmental screening for patients needing interpreters. *Pediatr Qual Saf.* 2023 Aug 7;8(4):e679.

Monroe BS, Rengifo LM, Wingler MR, Auriemma JR, **Taxter AJ**, Ramirez B, Albertini LW, Montez KG. Assessing and improving WIC enrollment in the primary care setting: A quality initiative. *Pediatrics.* 2023 Aug 1;152(2):e2022057613.

Mougey EB, Judy WC, Venkatesh RD, Berg E, **Lee JA**, Rosen JM, Li BUK, Koster A, Maiden K, Gao Z, Franciosi JP. Equity and inclusion in pediatric gastroenterology telehealth: A study of demographic, socioeconomic, and digital disparities. *J Pediatr Gastroenterol Nutr.* 2023 Sep 1;77(3):319-326.

Sezgin E, **Chekeni F**, **Lee J**, Keim S. Clinical accuracy of large language models and google search responses to postpartum depression questions: cross-sectional study. *J Med Internet Res.* 2023 Sep 11;25:e49240.

Sinha S, Bedgood M, Puttagunta R, Kataria A, Bourgeois F, **Lee JA**, Vodzak J, Hall E, Levy B, Vawdrey DK. Variation in pediatric and adolescent electronic health data sharing practices under the 21st Century Cures Act. *J Am Med Inform Assoc.* 2023 Nov 17;30(12):2021-2027.

Department of Pediatrics
COMMUNITY PEDIATRICS

The Section of Community Pediatrics at Nationwide Children’s Hospital includes community physicians in Pediatrics and Internal Medicine who are affiliated with Nationwide Children’s. The hospital actively engages each physician group through multiple communication methods and educational opportunities. Children’s Practicing Pediatricians (CPP) is one example. This is a long-standing group of community pediatric practices that works collaboratively on a regular cadence with multiple service lines at Nationwide. Nationwide Children’s supports a group of community pediatricians that work part-time in Administration at Nationwide Children’s as well. This enhances communication, improves relationships, and allows for prompt attention to questions when needed. We work collaboratively to take care of our shared patients.

In addition, many of these physicians participate in the Pediatric Education in Community Sites (PECS) program. This provides Nationwide Children’s pediatric residents with a unique outpatient experience. Beginning in their first or second year, each resident is assigned to a weekly half-day continuity experience in a private practice. This offers thorough exposure to general pediatric practice and reinforces the relationship between Nationwide Children’s and the community physicians.

Faculty



Robert W. Snyder, MD, FAAP
Chief

- | | | |
|--------------------------|------------------------------|-------------------------|
| Wahida B. Abaza, MD | Lauren C. Bar-Lev, MD | Cynthia J. Black, MD |
| Collin J. Abbott, MD | Carrie J. Barnes-Mullett, MD | Kathleen D. Blake, MD |
| Nikola T. Al-ain, MD | Brent M. Barson, DO | Stephanie L. Bland, DO |
| Alanna J. Albano, DO | Ryan M. Barson, MD | Kimberly K. Blazer, MD |
| Benjamin P. Almasanu, DO | Courtney R. Bartsch, MD | Denise L. Blocker, MD |
| Nardia S. Ataman, MD | Heather A. Battles, MD | Richard J. Breen, MD |
| Jennifer E. Bachman, MD | Sarah A. Behrens, MD | Steven R. Brown, MD |
| Taylor A. Ballenger, MD | Anne M. Bever, MD | Michelle S. Buendia, MD |

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|--------------------------|---------------------------|--------------------------|-------------------------|
| Kyle Burghgraef, MD | Katelyn Carlson, DO | Omolara Y. Dairo, MD | Bradley E. Dickson, MD |
| Jennifer L. Burkam, MD | Benjamin W. Cole, MD | Gracia De Jong, MD | Jonathan A. Digby, DO |
| Bethany J. Caldwell, MD | Kathleen A. Costlow, MD | Amy E. Deibel, MD | Dawn C. Dillinger, DO |
| Mitchell R. Camp, MD | Sidney L. Couling, MD | Traci A. DeVoe, MD | Kent W. Doherty, DO |
| Jennifer H. Campbell, MD | Elizabeth A. Crickard, DO | Praveena V. Dhawale, MD | Dennis M. Doody, MD |
| Ali M. Carine, DO | Ann M. Croft, MD | Michael T. DiBartola, MD | Julie M. Dunlea, MD |
| Jennifer B. Carlos, MD | Brooke A. Crum, DO | Kevin M. Dickerson, MD | Nicholas J. Eastman, MD |

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|--------------------------|----------------------------|-------------------------|------------------------|
| Kimberly A. Eilerman, DO | Brad E. Fuller, MD | Kathryn L. Ginocchi, MD | Jacob H. Gregerson, MD |
| Maureen M. Faust, DO | Kathleen T. Fulop, MD | Jumana C. Giragos, MD | Dana L. Hamilton, DO |
| Emily T. Ferguson, MD | Raju R. Gaglani, MD | Charles M. Goddard, MD | John S. Heintz, MD |
| Lenora A. Fitton, DO | Barbara B. Galantowicz, MD | Erin L. Goist, MD | Megan E. Heitzman, MD |
| David D. Fosselman, MD | Sean M. Gallagher, MD | Michelle C. Golla, MD | Elizabeth M. Jacob, MD |
| Patricia A. Francis, MD | Monica C. Gilbert, MD | Anna C. Gray, MD | Enaas F. Kasheer, MD |
| Michael R. Franks, MD | Paul D. Gilbert, MD | Emily K. Gray, MD | Andrew M. Keller, MD |

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|---------------------------|--------------------------|-----------------------------|-------------------------|
| Sara M. Kelly, MD | Andrew S. Korcal, MD | Elizabeth A. Little, MD | Derek A. McClellan, MD |
| Megan A. King, DO | Justin K. Krueger, MD | William W. Long, MD | Meera R. Mehta, MD |
| Cheryl K. Kirkby, MD | Lisa A. Krumm, MD | Tricia W. Lucin, MD | George M. Messick, MD |
| Adam M. Kirkland, MD | Vijay S. Kumbar, MD | Eileen M. Maher, MD | Bruce P. Meyer, MD |
| Elizabeth L. Kirkland, MD | Robert C. LaMonte, MD | Michele V. Mahoney, MD | Cameron K. Miller, MD |
| William E. Knobloch, MD | Kristina M. Lehman, MD | Jason W. Mailloux, MD | Alana C. Milton, MD |
| Irene P. Koesters, MD | Michael J. Leymaster, MD | Jennifer J. Mastruserio, MD | Stacy L. Morran, MD |
| Stephen C. Koesters, MD | Bradley A. Lisko, MD | Trevor P. Maurer, MD | Matthew J. Morrison, MD |

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|----------------------------|-----------------------------|----------------------------|----------------------------|
| Adrienne H. Mott-Young, MD | Britney N. Onuma, MD | Brad T. Pfau, MD | Barbara B. Rayo, MD |
| Mark A. Muresan, MD | Lilliam I. Ortiz, MD | Laura D. Phillips-Chou, MD | Teresa R. Recker Gross, DO |
| Jessica A. Nash, MD | Laura E. Osthaus, MD | Domenico Pietropaolo, MD | Robert D. Reis, MD |
| Julie N. Newsom, MD | Jennifer K. Overbey, MD | Phyllis J. Polas, DO | Patricia A. Ryan, MD |
| Jacqueline M. Nicodemo, MD | Claire M. Pappa, MD | Danielle S. Pottinger, MD | Purbi S. Sahai, MD |
| Mary-Lynn Niland, MD | Rachael T. Pappa, DO | Rachel E. Pratt, MD | Timothy R. Savage, MD |
| Autumn M. O’Brien, MD | Divya S. Parikh, MD | M. B. Pugh, MD | Erin K. Schaffner, MD |
| Adebomi A. Omikunle, MD | Jacqueline S. Pennywitt, MD | Blake J. Randolph, MD | Elizabeth A. Schloss, MD |

- | | | | |
|----------------------------|--------------------------------------|-------------------------|-----------------------------|
| Eileen H. Sheets, MD | Kathleen C. Stiles, MD | Kristin E. Thompson, MD | Diana T. Wagner, MD |
| Katherine T. Shevelson, MD | Nazhat Taj-Schaal, MD | John D. Toth, MD | Olivia N. Westhoven, MD |
| Phillip N. Simon, MD | Ellen R. Tamburello, MD | Bonny M. Tsai, MD | Jennifer M. Whipp, DO |
| Rebecca M. Slaunwhite, MD | Katrina S. Tansky, MD | Ahmed J. Turjoman, MD | Matthew M. White, MD |
| Robert W. Snyder, MD | Amy Rachelle A. Teleron-Khorshad, MD | H. S. Tyson, MD | Melissa J. Winkie, MD |
| Donna L. Sterling, MD | Timothy A. Teller, MD | Nicole R. Van Steyn, MD | Melissa D. Winterhalter, MD |
| Nicholas S. Stevens, MD | Mark A. Thoma, MD | Sean M. Vellucci, MD | Lindsay A. Wylie, MD |
| Wendy K. Stevens, MD | | Victoria N. Vinsant, MD | Misha D. Yajnik, MD |

- Michelle E. Yaw, MD
Rachael E. Zanolli-Morocco, DO

Department of Pediatrics

COMPLEX CARE

The Division of Complex Care at Nationwide Children’s Hospital provides comprehensive, coordinated care to children and adults with neurodevelopmental disabilities. In our Complex Health Care Program, we are a primary care medical home for many patients. For those who already have a medical home in the community, we provide consultative expertise in neurodevelopmental care alongside their other specialists. The Cerebral Palsy Program is an interdisciplinary program devoted to providing state of the art lifespan care for individuals with cerebral palsy. The Comprehensive Pediatric Feeding and Swallowing Program offers a variety of services, including evaluation and longitudinal management for children with feeding difficulties as well as an intensive feeding program. Our faculty participate in the Interdisciplinary Leukodystrophy Clinic, the Metabolic Bone Clinic and the Salivary Gland Disorders Clinic at Nationwide Children’s. We also provide medical care to the residents of the Heinzerling Community. In addition to our outpatient programs, Complex Care has an inpatient service to provide medical supervision and care to our patients who require hospitalization.

Faculty



Garey Noritz, MD
Division Chief



Laurie Glader, MD
Associate Division Chief

Rukshana Ahmed, MD

Erica Braswell, MD

Derek Fletcher, MD

Praveen Goday, MD

Elizabeth Lucas, MD

Tsovinar Sorkin, MD

Katherine Steingass, MD

2023 –2024 Complex Care Fellow

Ryan Mifflin, MD

Highlights From the Past Year

This year was one of milestones and new achievements for the Division of Complex Care. We surpassed 10,000 visits for the first time, highlighting our growing capacity to care for patients in central Ohio and beyond. Our inaugural fellow in Complex Care Pediatrics completed his first of two years of training. This is one of just a few such programs in the country that provides comprehensive education in the care of children with medical complexity. We also expanded our inpatient consultation services to provide adjunct care for children with medical complexity across the spectrum of specialty teams.

Improving Patient Care Through Research

Our Comprehensive Cerebral Palsy Program is a founding site of the Cerebral Palsy Research Network (CPRN), a collaboration of clinicians, researchers, people with cerebral palsy, and their families dedicated to optimizing the lifelong health and wellness of people with cerebral palsy and their families through high quality research, education and community programming. We participate in CPRN’s clinical registry and a number of national quality improvement projects and have faculty members on the Board and Steering Committee.

Highlighted studies from our division also include:

- A phase 3, randomized, double-blind, placebo-controlled study to assess the efficacy, safety, and tolerability of valbenazine for the treatment of dyskinesia due to cerebral palsy, Dr. Noritz, site PI.

- Screening and classifying pain in adults with cerebral palsy across centers, Elizabeth Lucas, MD, site PI.
- Using priority-based patient reported outcome measures to facilitate shared decision making in cerebral palsy, Dr. Glader, site PI.

Selected Awards and Professional Leadership Positions

Our associate division chief, Laurie Glader, MD, was recognized as a Buckeye Shining Star at the Women in Medicine and Science Annual Celebration by The Ohio State University College of Medicine. Dr. Glader is also the first vice president of the American Academy for Cerebral Palsy and Developmental Medicine and sits on the Steering Committee of the Cerebral Palsy Research Network and the Scientific Advisory Committee of the Cerebral Palsy Foundation.

Our division chief, Garey Noritz, MD, was recognized with the Bruce P. Meyer Family Art of Medicine Award from Nationwide Children’s Hospital and a Citizenship award from the Department of Pediatrics at Nationwide Children’s Hospital. Dr. Noritz is also the chair of the Council on Children with Disabilities of the American Academy of Pediatrics and a member of the Cerebral Palsy Research Network’s Board of Directors.

Praveen Goday, MD is a member of the Committee on Nutrition of the American Academy of Pediatrics, a Board Member of the American Society for Parenteral and Enteral Nutrition (ASPEN), and a Board Member of the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN) Foundation.

These honors exemplify our commitment to excellence in patient care, education and national collaboration.

Selected Publications

Huth K, Hotz A, Emar N, Robertson B, Leaversuch M, Mercer AN, Khan A, Campos ML, Liss I, Hahn PD, Graham DA, Rossi L, Thomas MV, Elias N, Morris M, **Glader L**, Pinkham A, Bardsley KM, Wells S, Rogers J, Berry JG, Mauskar S, Starmer AJ. Reduced postdischarge incidents after implementation of a hospital-to-home transition intervention for children with medical complexity. *J Patient Saf.* 2023 Oct 1;19(7):493-500.

Murayi JA, Evenson E, Verkin-Siebert D, Fisher M, Bartosiewicz S, Baade M, Manville K, **Goday PS**. Thickness of commercial blenderized formulas adversely affects successful delivery via enteral feeding pumps. *Nutr Clin Pract.* 2023 Dec;38(6):1354-1359.

Petkus KD, **Noritz G, Glader L**. Examining the role of sublingual atropine for the treatment of sialorrhea in patients with neurodevelopmental disabilities: A retrospective review. *J Clin Med.* 2023 Aug 11;12(16):5238.

Sarmiento CA, Gannotti ME, Gross PH, Thorpe DE, Hurvitz EA, **Noritz GH**, Horn SD, Msall ME, Chambers HG, Krach LE. Adults with cerebral palsy and chronic pain experience: A cross-sectional analysis of patient-reported outcomes from a novel North American registry. *Disabil Health J.* 2024 Jul;17(3):101546. Epub 2023 Nov 13.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$62,277

>>> Fast Facts: July 2023 – June 2024

Inpatient Discharges:	240	Inpatient Consults:	54
Observation and Outpatient-in-a-Bed Discharges:	23	Complex Health Care Clinic Visits:	3,960
Average Length of Stay*:	11.43	Cerebral Palsy Clinic Visits:	981
Average Daily Census*:	7.52	Dublin Feeding Evaluation Clinic Visits:	4,724
Patient Days*:	2,744	<i>*Excludes observation and outpatient-in-a-bed patients</i>	

Department of Pediatrics
CRITICAL CARE MEDICINE

The Division of Critical Care Medicine at Nationwide Children’s Hospital provides in-house faculty coverage of the pediatric intensive care units (PICUs) 24 hours a day and is dedicated to the care of children who have, or are at risk for, life-threatening illnesses across the spectrum of pediatric disease. This service also contributes actively to the vital missions of research and advanced training in the field of pediatric critical care medicine. The service typically cares for about 3,000 patients per year, covering the 54 PICU beds at Nationwide Children’s and contributing to the coverage of the 20-bed cardiothoracic ICU. Therapies such as extracorporeal membrane oxygenation, high frequency oscillatory ventilation, and continuous renal replacement therapies are available at all times. We continue to boast one of the lowest severity-adjusted mortality rates of any PICU in the country. We also staff the Assessment and Consultation Team (a multidisciplinary rapid response team) and the Code Blue team at Nationwide Children’s.

Faculty



Mark W. Hall, MD, FAAP, FCCM
Division Chief



Nadeem Khan, MD, FAAP
Section Chief



Jennifer A. Muszynski, MD, MPH, FCCM
Associate Division Chief for Research

Onsy S. Ayad, MD, FAAP
Amee M. Bigelow, MD
Katherine E. Bline, MD
Margaret A. Chase, MD
Melissa G. Chung, MD
Megan C. Daniel, MD
Maria H. Estrada, DO, FAAP

Richard P. Fernandez, MD
Jill A. Fitch, MD, FAAP
W. Joshua Frazier, MD
Jennifer M. Gauntt, MD
Samantha W. Gee, MD, FAAP
John Jennings, MD
Todd J. Karsies, MD, MPH

Catherine D. Krawczeski, MD
Anthony Y. Lee, MD, FAAP
Ada T. Lin, MD, FAAP
Eric A. Lloyd, MD
Marlina E. Lovett, MD
Jeffrey E. Lutmer, MD
Tensing Maa, MD, FAAP

Jennifer M. MacDonald, MD, PhD
Christopher P. Montgomery, MD
Nicole F. O’Brien, MD
Lauren Sanchez, MD
Claire A. Stewart, MD, MEd
Tsovinar Sorokin, MD, MS
Markita L. Suttle, MD

Joseph D. Tobias, MD
Hunter Wynkoop, MD
Andrew R. Yates, MD

2023 – 2024 Fellows
Courtney Alvis, MD
Jordan Brauner, MD
Natalie Capretta, DO
Juan Cardenas Fimbres, MD

Ian Francis, MD, PhD
Elizabeth Grogan, MD
Justin Julian, MD
Cynthia Moffitt, MD
Iman Nizami, MD

Kailey Remien, DO
Kortney Weeks, MD
Laura Wingert, MD

Highlights From the Past Year

Continued Growth

In the past year, the Pediatric Intensive Care Units at Nationwide Children’s saw approximately 3,000 admissions. Markita Suttle, MD, serves as the division’s Director of Critical Care Health Equity. She leads the multidisciplinary Critical Care Health Equity team for the PICU that is focused on faculty, trainee and staff education and conducts projects designed to make the PICU experience more equitable for patients, families, faculty, trainees and staff.

We also welcomed Lauren Sanchez, MD, to the Critical Care Medicine faculty. In addition to her outstanding clinical work in the pediatric ICU, Dr. Sanchez studies burnout and resilience in PICU staff, faculty and trainees.

Commitment to Discovery

The Division of Critical Care Medicine remains a leader in pediatric critical care research, with numerous faculty leading single- and multi-center studies. Nationwide Children’s remains a key member of the National Institutes of Health-funded Collaborative Pediatric Critical Care Research Network (CPCCRN), serving as the central site for the network’s flagship PRECISE study. Division Chief Mark W. Hall, MD, is a national leader in the field of immunobiology research and serves as the principal investigator for the CPCCRN network’s groundbreaking multi-center trial of personalized immunomodulation in pediatric sepsis.

The Division faculty also continue to be leaders in the Pediatric Acute Injury and Sepsis Investigators (PALISI) research network, in which Jennifer Muszynski, MD, MPH, FCCM, leads a multi-center observational study of the role of red blood cell transfusion in children with septic shock and Dr. Hall leads a multi-center observational study of the risk factors for critical illness and injury-induced immune suppression. Dr. Muszynski serves as the Vice Chair of the Scientific Steering Committee for the PALISI network.

Our division published 96 peer-reviewed articles in the past year and our work is supported by funding through various research grants. Faculty within the center received five newly funded research grants in the past year:

- Dr. Katherine Bline newly received a K12 award from the NIH’s Pediatric Critical Care and Trauma Scientist Development Program to support her work to understand the role of myeloid-derived suppressor cells in the host response to critical viral respiratory infections.
- Nicole O’Brien, MD, received an R56 award from the NIH to support her “Determining Mechanisms of Cerebral Blood Flow and Metabolism Derangements in Pediatric Cerebral Malaria (FLOW)” project.
- Tensing Maa, MD, FAAP newly received an innovation grant from the Ohio Bureau of Workers Compensation (BWC) to create a virtual reality training platform to prevent employee injury due to workplace violence. She also continued to serve as the Principal Investigator for an Ohio Medicaid-funded research project involving virtual reality to teach cultural humility when caring for LGBTQ+ youth.
- Dr. Muszynski continued to receive R01 funding from the NIH to support her “Transfusion and Organ Dysfunction in Pediatric Septic Shock (TROPICS)” study.
- Dr. Hall continued to receive RL1 funding from the NIH to support his participation in the NICHD’s Collaborative Pediatric Critical Care Research Network; PL1 funding from the NIH to support his “Personalized Immunomodulation in Pediatric Sepsis-Induced Multiple Organ Dysfunction (PRECISE)” study; R01 funding from the NIH to support his “PediAtric ReseArch of Drugs, Immunoparalysis and Genetics during MODS (PARADIGM)” study.

Additional research highlights include:

- Dr. Hall continues to lead the nation’s only multi-center clinical trial of personalized immunomodulation in children with sepsis.
- Dr. O’Brien continues to use transcranial Doppler ultrasound technology to gain valuable insights into the pathophysiology and treatment of children with cerebral malaria.
- Dr. Muszynski continues to lead a multi-center study into the role of red blood cell transfusion in the care of children with septic shock.
- Christopher Montgomery, MD, continues to study how *Staphylococcus aureus* evades the host immune response, providing critical information that will inform future vaccine development.
- Todd Karsies, MD, co-leads a multi-national project to understand variability in the biology and clinical care of children with critical bronchiolitis.

Professional Involvement

Our clinical staff and researchers’ involvement in professional organizations underscores their commitment to advancing their fields and fostering collaborative innovation. Selected highlights include:

- Dr. Hall is the current Chair of the Critical Care Sub-board of the American Board of Pediatrics. He is also the Past Chair of the Pediatric Section of the Society of Critical Care Medicine.
- Dr. Muszynski is the Vice Chair of the Scientific Steering Committee for the PALISI research network.
- Marlina Lovett, MD, is the Secretary/Treasurer for the Pediatric Neurocritical Care Research Group, the largest international consortium focused on advancing knowledge and improving neurologic outcomes for critically ill children with acute neurological illness and injury.
- Dr. Maa is Co-Chair of the International Network for Simulation-based Pediatric Innovation, Research, & Education (INSPIRE) network.
- Dr. Karsies is the Co-Chair of the “Bronchiolitis: Advancing Care and Outcomes Network” subgroup of the PALISI research network.
- Jill Fitch, MD, serves as board member for the Central Ohio Pediatric Society as well as a member of the Board of Directors of the Ohio chapter of the American Academy of Pediatrics.
- Samantha Gee, MD, FAAP, serves as a Board of Trustees member for the Air Medical Physician Association (AMPA).

Selected Publications

Akande M, Spencer SP, Moore-Clingenpeel M, Jamieson N, **Karsies T**. Impact of respiratory bacterial codetection on outcomes in ventilated infants with bronchiolitis. *Pediatr Infect Dis J*. 2024 Feb 1;43(2):117-122.

Blinc KE, Wilt AL, Alexander RN, Andrews AN, Mertz SE, Ye F, Steele LM, Wolfe AL, Mejias A, Ramilo O. Myeloid-derived suppressor cells and T cell populations in children with Multisystem Inflammatory Syndrome. *Pediatr Res*. 2024 Apr;95(5):1288-1294.

Hargrave E, Alexander R, Leeper CM, Leonard JC, Josephson CD, Steiner ME, Spinella PC, **Muszynski JA**; MATIC Investigators and PALISI BloodNet. Massive transfusion in pediatric patients on extracorporeal membrane oxygenation: A secondary analysis of the massive transfusion in children (MATIC) study. *ASAIO J*. 2024 Sep 1;70(9):803-807.

O’Brien NF, Moons P, Johnson H, Tshimanga T, Musungufu DA, Ekandji RT, Mbaka JP, Babatila LK, Mayindombe L, Giresse B, Mwanza S, Lupumpaula C, Chilima JS, Nanyangwe A, Kabemba P, Kafula LN, Phiri T, June S, Gushu MB, Chagaluka G, Chunda-Liyoka CM. Transcranial Doppler ultrasound velocities in a population of unstudied African children with sickle cell anemia. *EJHaem*. 2023 Nov 29;5(1):3-10.

Schlapbach LJ, Watson RS, Sorce LR, Argent AC, Menon K, **Hall MW**, Akech S, Albers DJ, Alpern ER, Balamuth F, Bembea M, Biban P, Carrol ED, Chiotos K, Chisti MJ, DeWitt PE, Evans I, Flauzino de Oliveira C, Horvat CM, Inwald D, Ishimine P, Jaramillo-Bustamante JC, Levin M, Lodha R, Martin B, Nadel S, Nakagawa S, Peters MJ, Randolph AG, Ranjit S, Rebull MN, Russell S, Scott HF, de Souza DC, Tissieres P, Weiss SL, Wiens MO, Wynn JL, Kisson N, Zimmerman JJ, Sanchez-Pinto LN, Bennett TD; Society of Critical Care Medicine Pediatric Sepsis Definition Task Force. International consensus criteria for pediatric sepsis and septic shock. *JAMA*. 2024 Feb 27;331(8):665-674.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$3,278,689

>>> Fast Facts: July 2023 – June 2024

PICU Admissions:	3,140	Inpatient Discharges:	3,235
Average Length of Stay*:	3.98	Number of Beds:	54
Average Daily Census*:	35.28	<i>*Excludes observation and outpatient-in-a-bed patients</i>	
Total Patient Days*:	12,879		

Department of Pediatrics

DERMATOLOGY

The Section of Dermatology at Nationwide Children’s Hospital sees outpatients from birth through age 18 for both common and rare disorders of the hair, skin and nails.

Faculty



Patricia M. Witman, MD
Chief



Esteban Fernandez Faith, MD
Associate Division Chief
for Research

Katya Harfmann, MD
Joy Lynn Mosser-Goldfarb, MD
Elham Zayed, MD

Highlights From the Past Year

We provide a comprehensive, collaborative team approach to the diagnosis and management of skin, hair and nail disorders in children, and we are committed to a family-centered, comprehensive approach to achieve the best possible clinical outcomes and quality-of-life for the children we treat. Our goal is simple: To provide state-of-the-art team care that is seamless for our patients and families and to ensure the best possible results.

Commitment to Discovery

Over the past year, we’ve made significant strides in various areas. Our pilot study on using virtual reality as a means of distraction anesthesia for laser procedures is currently underway. We were also awarded a \$50,000 intramural grant. Faculty members have published nine peer-reviewed articles, showcasing our commitment to advancing knowledge. Additionally, we have established active collaborations with the Pediatric Dermatology Research Alliance, further enhancing our research capabilities.

Professional Involvement

Our faculty members are distinguished leaders in their respective fields, holding prominent positions in various professional organizations. Selected highlights of the key positions our faculty hold include:

- Esteban Fernandez Faith, MD, is chair of the meetings committee for the Pediatric Dermatology Research Alliance and medical director of the American Academy of Pediatrics Ohio chapter for understanding health care disparities and health equity in atopic dermatitis patients.
- Joy Lynn Mosser-Goldfarb, MD, serves on the executive committee of the Society for Pediatric Dermatology as the VP of workforce and specialty advocacy, and also is chair of the section of pediatric dermatology for the Association of Professors of Dermatology.
- Patricia M. Witman, MD, is chair of the meetings committee for the Society for Pediatric Dermatology.

Selected Publications

Bitterman D, Bitterman D, Sink J, **Harfmann K**, Hogeling M, Lauren CT, Morel KD, Castelo-Soccio L, Silverberg NB. Survey of pediatric dermatologist views on treatment for alopecia areata. *JAAD Int*. 2023 Aug 10;13:71-73.

Gautam A, Frieden IJ, Shah SD, **Witman PM, Harfmann K**, Bradley F, Blei F, Pope E, Alsumait A, Gupta D, Covelli I, Streicher JL, Cotton C, Tollefson M, Nguyen H, Hunt R, Buros A, **Fernández Faith E**. Clinical characteristics of infantile hemangiomas with aggressive, persistent, and destructive ulceration. *Pediatr Dermatol*. 2023 Nov-Dec;40(6):996-1002.

Kozy BJ, Alexander RN, **Fernandez-Faith E**. Referral patterns and diagnostic concordance in pediatric skin disorders. *J Pediatr Health Care*. 2024 Jun 13:S0891-5245(24)00027-0. Epub ahead of print.

Wyant WA, Hammoud MM, **Mosser-Goldfarb J**, Strafford K, Tyler K, Korman AM. Recommendations for optimizing preference signaling in the dermatology residency application process. *Arch Dermatol Res*. 2023 Dec 27;316(1):62.

>>> Fast Facts: July 2023 – June 2024

Canal Winchester Dermatology Clinic Visits:	482	Westerville Dermatology Clinic Visits:	886
Dermatology Clinic Visits:	9,095	Total Clinic Visits:	12,991
Dublin Dermatology Clinic Visits:	2,528	Inpatient Consults:	215

Department of Pediatrics

DEVELOPMENTAL AND BEHAVIORAL PEDIATRICS

The mission of the Division of Developmental and Behavioral Pediatrics at Nationwide Children's Hospital is to achieve best outcomes for children with developmental and behavioral needs through equitable, evidence-based, family-centered care with a focus on interprofessional practice. Outpatient services include comprehensive care delivered by developmental and behavioral pediatricians and advanced nurse practitioners in partnership with pediatric psychology, speech pathology, social work and other health care professionals. Areas of expertise include the evaluation and management of autism spectrum disorders, complex ADHD and developmental delay. Additional focus areas include myelomeningocele, neonatal follow-up, Down syndrome and Williams syndrome. The division often provides care in collaboration with programs through Nationwide Children's Behavioral Health Services.

Faculty



Garey Noritz, MD
Division Chief



Daniel L. Coury, MD
Associate Division Chief
for Research

Elizabeth Barnhardt, DO
Ranee Jostpile, MD
Anita R. Narayanan, MD
Patricia L. Nash, MD
Katherine Steingass, MD
Mark Wells, MD

2023 – 2024 Fellows

Kendall Abbas, MD
Lauren Misik, MD
Linda Solamen, MD

Highlights From the Past Year

Commitment to Excellence Through Clinical Programs

Our commitment to excellence for our patients is exemplified by our program structure. Our collaborative programs make the most of our *One Team* approach, ensuring that experts from many disciplines are connected, eliminating silos and simplifying care for families.

The Down Syndrome Program engaged in an extensive strategic planning process in collaboration with stakeholders inside and outside of Nationwide Children's, including patients and their families. This reimagined program, led by Patricia Nash, MD and Murugu Manickam, MD, from Genetics, will partner with families to achieve the fullest potential for children and young adults with Down syndrome through comprehensive medical, behavioral and developmental care.

Elizabeth Barnhardt, DO is one of the co-directors of the interdisciplinary Williams Syndrome program, overseeing the Child Development and Behavioral Health aspects of the program with Rebecca Lyren, PhD from Psychology. Our program is one of 10 nationally and aims to provide the full range of state of the art medical, developmental and surgical care.

Elizabeth Barnhardt, DO, leads the SPEED Clinic (Supporting Primary Care Pediatricians through Engagement and Embedded DBP), a consultative program at Northern Lights Primary Care Center. A primary goal of this clinic is to empower primary care pediatricians through collaborative care of children with developmental disabilities through the provision of timely diagnostic evaluations for autism and developmental disorders. This clinic serves a diverse population including many Somali and Nepali families.

Advancing Practice Through Quality Improvement, Education and Research

Anita R. Narayanan, MD, is our medical director for quality improvement (QI). QI initiatives in our division are currently aimed toward:

- Improving screening for suicidal ideation
- Transitioning to adult care for developmental and behavioral pediatric patients
- Reducing environmental stressors faced by our patients
- Reducing missed appointments

The Division of Developmental and Behavioral Pediatrics hosts a robust, competitive fellowship program led by Katherine Steingass, MD, who also serves as medical director of the Myelomeningocele Clinic. The fellowship is integrated with The Ohio State University's Leadership Education in Neurodevelopmental Disabilities (LEND) program at the Nisonger Center. Elizabeth Barnhardt, MD, serves as core faculty at the Nisonger Center.

This year, Dr. Barnhardt received the OSU Michael V. Drake Institute for Teaching and Learning and Implementation Grant for her project title "Identifying and Reflecting on Interprofessional Collaboration in Clinical Practice."

Dan Coury, MD, and Anita Narayanan, MD, are the principal investigator and co-investigator, respectively, on a Patient-Centered Outcomes Research Institute (PCORI) grant for the AWARE Study.

Leadership and Collaboration to Help Kids Everywhere

Faculty in our division are deeply committed to advancing our field. Our experts are involved in professional organizations and in collaborations across the nation. Highlighted leadership roles and collaborations include:

- Dr. Coury is chair of the Past Presidents Committee, chair of the Awards Committee, and is on the Program Committee of the Society for Developmental & Behavioral Pediatrics (SDBP). He also serves on the FLEAT (Fellowship, Leadership, Education, Accreditation and Training) Academy of the Academic Pediatric Association. He also holds multiple national administrative and research roles, including medical directorship of the Autism Care Network.
- Dr. Steingass is co-chair of the Early Childhood special interest group for SDBP.
- Dr. Coury continues his work with the Autism Care Network (ACNet), which now has 20 sites across North America.
- Dr. Barnhardt leads the Williams Syndrome Clinic Program, which is part of the collaborative clinic consortium through the Williams Syndrome Association, engaged in developing joint research endeavors through the Collaborative Registry for Williams Syndrome (CRWS).
- Dr. Barnhardt leads a multisite educational research project with the University of Chicago and Cincinnati Children's LEND programs entitled "Case-Based Interprofessional Simulation Exercises to Develop Interprofessional Competence in LEND Trainees."
- Dr. Steingass collaborates with the Spina Bifida Association and three other sites to pilot mental health screening in spina bifida clinics.

Selected Publications

Abbas K, Barnhardt EW, Nash PL, Strengh M, Coury DL. A review of amphetamine extended release once-daily options for the management of attention-deficit hyperactivity disorder. *Expert Rev Neurother.* 2024 Apr;24(4):421-432.

Barnhardt E, Coury DL. Family-systems interventions for families of people with an intellectual disability or who are autistic show potential, but further research is needed. *Evid Based Nurs.* 2024 Feb 6:ebnurs-2023-103869.

Barnhardt EW, Gonzalez A, Rabidoux P, Allain DC. Assessment of interprofessional competence of leadership education in neurodevelopmental and related disabilities trainees through a virtual standardized patient encounter. *Matern Child Health J.* 2024 Jan;28(1):44-51.

Barnhardt EW, Martens M, Andridge R, Walton J. Caregiver-reported barriers to care for children and adults with Williams Syndrome. *J Community Genet.* 2024 May 22. Epub ahead of print.

Narayanan A, Solamen L, Torres C. Service and emotional support animals in pediatrics. *Curr Probl Pediatr Adolesc Health Care.* 2023 Dec;53(12):101503.

Department of Pediatrics EMERGENCY MEDICINE

The Department of Emergency Medicine at Nationwide Children's Hospital is one of the nation's highest ranked and busiest pediatric emergency departments (based on Children's Hospital Association benchmarking data and Parents magazine). Emergency Medicine features a Level I Pediatric Trauma Center and an Emergency Department staffed by board-certified/eligible pediatric emergency medicine subspecialists 24 hours a day.

Faculty



Rachel M. Stanley, MD, MHSA
Division Chief



Delia Gold, MD
Section Chief



Julie C. Leonard, MD, MPH
Associate Division Chief
for Research

Adjoa Andoh, MD
Srikanth Aravapalli, MD
Berkeley Bennett, MD
Alan Bleiberg, MD
Bridget Bonaventura, MD
Mary Bowman, MD
Beth Bubolz, MD
Jonathon Chang, MD
Michael Chua, MD

Cullen Clark, MD
Beth Claxton, MD
Daniel Cohen, MD
Courtney Coyle, MD
Carrie DeHoff, MD
Michael Dunn, MD
Meika Eby, MD

Emile El-Shammaa, MD
Aarti Gaglani, MD
Christopher Gaw, MD
Yaffa Gewirtz, MD
Michelle Greene, DO
Angela Harris, MD
Todd Holman, MD

Maya Iyer, MD
Yamini Jadcherla, MD
Hazel Jeong, MD
Chris Jones, DO
Chelsea Kadish, MD
Julia Lloyd, MD
Rosalia Mahr, MD

Jennifer Melvin, MD
Leah Middelberg, MD
Samir Mishra, MD
Jennifer Mitzman, MD
Jennifer Mrozek, MD
Michael Patrick, MD
Maegan Reynolds, MD

Anne Runkle, MD
Laura Rust, MD
Daniel Scherzer, MD
Betsy Schmerler, MD
Emily Sentman, MD
Bashar Shihabuddin, MD
Gregory Stewart, MD
Kristin Stukus, MD

Scott Sutton, MD
Tracey Wagner, MD
Jordee Wells, MD
Taylor White, DO
Jessica Wilson, MD
Morgan Wurtz, MD
Anita Yalamanchi, DO

2023 – 2024 Fellows
Sarah Allen, MD
Abha Athale, DO
Sarah Chen, MD
Karely Correa Calderas, MD
Cecelia Favede, MD
Luke Hartman, MD
David Kling, DO

Celia Ligorski, DO
Charles McCombs, MD
Zachary Panzer, DO
Rachel Thompson, MD
Robert Trevino, MD
Sara Touzinsky, MD
Blen Weldekidan, MD
Christopher Wright, MD



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024
\$6,059,217

>>> Fast Facts: July 2023 – June 2024

Developmental Behavioral Pediatrics Clinic Visits:	4,509	Newark Developmental Behavioral Pediatrics Clinic Visits:	54
Developmental Disabilities Clinic Visits:	106	Northern Lights Developmental Behavioral Pediatrics Clinic Visits:	117
Myelomeningocele Clinic Visits:	627	Westerville Developmental Behavioral Pediatrics Clinic Visits:	2,128

Highlights From the Past Year

The Department of Emergency Medicine provides expertise in pediatric advanced life support and resuscitation, as well as evaluation and treatment in every area for acute medical and surgical conditions. Emergency services are provided at our main campus and Lewis Center Emergency Departments.

The Emergency Department is a hub for medical education in the acute care of children, adolescents, and selected adults. Medical students and more than 300 residents from Emergency Medicine, Family Practice, Internal Medicine/Pediatrics and Pediatrics programs are educated in all aspects of pediatric emergencies. In addition, Nationwide Children's has a large, vibrant Pediatric Emergency Medicine Fellowship program. Members of the Section of Emergency Medicine are active leaders and participants in the residency program at Nationwide Children's and at The Ohio State University College of Medicine.

In addition to providing clinical, operational and educational excellence, Emergency Medicine has a strong history of clinical research. We lead the federally funded Great Lakes node of the Pediatric Emergency Care Applied Research Network (PECARN), a large 18-hospital research network. We have developed research collaborations with the Columbus Division of Fire and other emergency medical service agencies regionally and nationally. The section is committed to the ongoing improvement of health care delivery in the Emergency Department and clinical outcomes. Our team published 76 peer-reviewed publications in the 2023-2024 academic year.

National Leaders in Emergency Medicine

Our clinicians are actively engaged in local and national organizations designed to drive our field forward, including Pediatric Emergency Research Network (PERN), Pediatric Pandemic Networks, FEMA Region V Center of Excellence, Pediatric Emergency Care Applied Research Network, and IMPACTS (a national simulation network). Highlighted leadership activities include:

- Rachel Stanley, MD, is chair of the Pediatric Emergency Medicine North America Chiefs.
- Maya Iyer, MD, serves as assistant dean of clinical track faculty at The Ohio State University College of Medicine (OSUCOM) and director of Women in Medicine and Science at OSUCOM.
- Julie Leonard, MD, is the program director for the State of Ohio Emergency Medical Services for Children State Partnership Grant. She also directs Ohio's Essentials for Childhood: Preventing Adverse Childhood Experiences, a Center for Disease Control and Prevention program.
- Dan Cohen, MD, is the chair for Student Review and Associate Academic Program Director (Part 3) for the LSI (Lead. Serve.Inspire) curriculum. He's also the community assistant dean for Education at OSUCOM.

Selected Publications

Cruz Vidal D, Lee S, Ardoin SP, Dalmacy D, Chaparro J, Blaney C, Rodriguez V, Sankar A, Akoghlanian S, Lisciandro R, Washam M, Abraham RS, Leber A, Eby M, **Bennett B**, Erdem G. Multisystem inflammatory syndrome in children and cardiac involvement: A quaternary center experience. *Pediatr Infect Dis J*. 2024 May 1;43(5):e160-e163.

Gaw CE, Metzger KB, Pfeiffer MR, Yerys BE, Boyd RC, Corwin DJ, Curry AE. Driver's licensure and driving outcomes among youths with mood disorders. *JAMA Netw Open*. 2024 Apr 1;7(4):e245543.

Iyer MS, Bradford C, Gottlieb AS, **Kling DB** Jr, Jagasi R, Mangurian C, Marks L, Meltzer CC, Overholser B, Silver JK, Way DP, Spector ND. Gender differences in the path to medical school deanship. *JAMA Netw Open*. 2024 Jul 1;7(7):e2420570.

Iyer MS, Nagler J, Mink RB, Gonzalez Del Rey J. Child health needs and the pediatric emergency medicine workforce: 2020-2040. *Pediatrics*. 2024 Feb 1;153(Suppl 2):e20230636781.

Leonard JC, Harding M, Cook LJ, Leonard JR, Adalgais KM, Ahmad FA, Browne LR, Burger RK, Chaudhari PP, Corwin DJ, Glomb NW, Lee LK, Owusu-Ansah S, Riney LC, Rogers AJ, Rubalcava DM, Sapien RE, Szadkowski MA, Tzimenatos L, Ward CE, Yen K, Kuppermann N. PECARN prediction rule for cervical spine imaging of children presenting to the emergency department with blunt trauma: a multicentre prospective observational study. *Lancet Child Adolesc Health*. 2024 Jul;8(7):482-490.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$5,432,661

>>> Fast Facts: July 2023 – June 2024

Main Campus ED Visits:	72,996	Total ED Visits:	95,196
Lewis Center ED Visits:	22,200		

Insulin pumps and CGM used together may provide much better control over type 1 diabetes.

Kajal K. Gandhi, DO, MPH (left), and Manmohan K. Kamboj, MD



ENDOCRINOLOGY

How Are Insulin Pumps Being Utilized for Patients with Type 1 Diabetes?

A multicenter observational study of 22,000 children and adults shows improving quality of life for patients with type 1 diabetes.

Type 1 diabetes diagnoses are increasing among children, particularly those in racial/ethnic minority groups. Insulin pumps and continuous glucose monitoring (CGM) systems may improve quality of life and long-term outcomes. However, little research has investigated how effective both technologies are when used together in pediatric type 1 diabetes patients.

Kajal K. Gandhi, DO, MPH, an endocrinologist in the Division of Endocrinology at Nationwide Children's, recently led an observational study, published in *Clinical Diabetes*, that examined trends in insulin pump use compared with multiple daily injection (MDI) insulin regimens and continuous glucose monitoring (CGM) trends.

"We wanted to verify that quality of life is improved with the use of an insulin pump, either with CGM or without it. We also wanted to identify how many patients were using them, as well as disparities associated with accessing and using the technology," says Manmohan K. Kamboj, MD, division and section chief of the Division of Endocrinology at Nationwide Children's, and a senior author of the publication.

The study showed that insulin pump utilization has increased from 59% to 66% since 2017. Users were more likely to be female and have private insurance. Insulin pump use was also significantly higher among non-Hispanic White, as compared with non-Hispanic Black patients.

Used together, the use of insulin pumps and CGM may provide much better control over type 1 diabetes, according to the study results.

"This new study shows that diabetes technology delivers more accurate, automated and safer care when compared to injection therapy. However, there are significant barriers to access," Dr. Gandhi explains. "Future work should focus on strategies that advocate for increased diabetes technology use."

At Nationwide Children's, ongoing quality improvement initiatives focus on increasing utilization rates of diabetes technology by educating medical providers and families about the benefits of using insulin pumps, providing a diabetes nurse team and coordinator dedicated to helping patients through the implementation process, reducing the required paperwork and insurance approvals, and providing additional support for minority populations that cause barriers to access.

REFERENCE:

Gandhi K, Ebekozien O, Noor N, McDonough RJ, Hsieh S, Miyazaki B, Dei-Tutu S, Golden L, Desimone M, Hardison H, Rompicherla S, Akturk HK, Kamboj MK; T1D Exchange Quality Improvement Collaborative. Insulin pump utilization in 2017-2021 for more than 22,000 children and adults with type 1 diabetes: A multicenter observational study. *Clin Diabetes*. 2024 Winter;42(1):56-64. Epub 2023 Oct 12.

Department of Pediatrics
ENDOCRINOLOGY

The Section of Endocrinology at Nationwide Children’s Hospital provides comprehensive primary and consultative services for the diagnosis and treatment of endocrine/hormone disorders and diabetes mellitus in children and adolescents. We offer multidisciplinary care for complex chronic medical conditions that impact the endocrine system. The section has a strong national presence in quality improvement for diabetes.

Faculty



Manmohan K. Kamboj, MD
Chief



Leena Nahata, MD
Associate Division Chief
for Research

Amjad Ali, MD
Sasigarn A. Bowden, MD
Elizabeth O. Buschur, MD
Cecilia Damilano, MD
Victoria A. Elliott, MD
Kajal Gandhi, DO
Rohan K. Henry, MD, MS
Robert P. Hoffman, MD
Justin A. Indyk, MD, PhD
Jennifer Ladd, MD

Amit Lahoti, MD
Leena Mamilly, MD
Kathryn Obrynba, MD
LeAnne M. Sancrainte, DO
2023 – 2024 Fellows
Ala’a Alsmadi, MD
Shadi Bakjaji, MD
Esther Bell, MD
Foram Patel, MD

Highlights From the Past Year

Growth and Accomplishment

The past year has been one of growth and accomplishment for the department. We had 17,000 patient visits in 2023, representing 15% growth over 2022.

This year, we opened a new clinic for patients with Turner syndrome. This clinic supports streamlined care for patients with Turner syndrome and provides access to experts in subspecialties including endocrinology, gynecology, genetics, nephrology, psychology, audiology, social work and others.

We were recognized by the American Diabetes Association Education Recognition Program. The program provides a framework for effective delivery of quality diabetes self-management education and support (DSME) through the national standards of DSME.

Commitment to Research and Innovation

This year we were honored to receive two National Institutes of Health grants, five industry-sponsored grants, two intramural grants and one foundation grant. The studies funded by these awards range from investigations into web-based family-centered decision tools to clinical trials of new therapeutics.

Our team understands that research and clinical collaborations are essential for improving care for children everywhere. We are proud to be associated with the following:

- REPRO-Hope National Oncofertility Registry
- Multicenter study for discovery of risk factors for adolescent type 2 diabetes
- Multicenter study for cortisol production in children and adolescents with Prader-Willi Syndrome

- InsignTS Registry for Turner Syndrome
- Multicenter collaboration evaluating trends for diabetes in youth (TRENDY)
- Participating site for dental effects of hypophosphatasia and burosumab on dental mineralization
- Cystic Fibrosis Foundation
- T1D Exchange
- NIH PCOS Registry Multicenter Consortium

Selected National Leadership Roles

Our faculty participate in nationally significant endocrinology organizations and collaborations, with several taking leadership roles.

- Manmohan Kamboj, MD, is an invited committee co-chair for The Education Council of the Pediatric Endocrine Society.
- Leena Nahata, MD, is the co-chair of the Research Affairs Committee of the Pediatric Endocrine Society.
- Victoria Elliot, MD, is the co-chair of the Pediatric Endocrine Society Turner Syndrome special interest group.
- Sasigarn Bowden, MD, is the co-chair of the Pediatric Endocrine Society Bone & Mineral special interest group and member of the board of directors for the Human Growth Foundation.

Selected Publications

Al-Rayess H, **Lahoti A**, Simpson LL, Palzer E, Thornton P, Heksch R, **Kamboj M**, Stanley T, Regelman MO, Gupta A, Raman V, Mehta S, Geffner ME, Sarafoglou K; Pediatric Endocrine Society Drug & Therapeutics Committee. Practice variation among pediatric endocrinologists in the dosing of glucocorticoids in young children with congenital adrenal hyperplasia. *Children (Basel)*. 2023 Nov 29(10);10:1871.

Banks L, Kelly NA, Onwuka A, Alhubaiti A, **Damilano C**, **Hoffman RP**, Aldrink JH, Jatana KR, Walz P. Does preoperative calcium and 1, 25 OH vitamin D supplementation impact postoperative hypocalcemia and length of stay following pediatric thyroidectomy? *Int J Pediatr Otorhinolaryngol*. 2024 Mar;178:111895.

Gandhi K, Ebekeozien O, Noor N, McDonough RJ, Hsieh S, Miyazaki B, Dei-Tutu S, Golden L, Desimone M, Hardison H, Rompicherla S, Akturk HK, **Kamboj MK**. Insulin pump utilization in 2017-2021 for more than 22,000 children and adults with type 1 diabetes: A multicenter observational study. *Clin Diabetes*. 2024 Oct 12;42(1):56-64.

Henry RK, **Mamilly L**, Chaudhari M, Klammer BG, Nikahd M, Pyle-Eilola AL. Beyond the bias! Sex distribution in paediatric growth hormone deficiency reexamined. *Clin Endocrinol (Oxf)*. 2024 May;100(5):441-446.

Stanek CJ, Creary SE, Liles SM, Colton ZA, Stanek JR, Quinn GP, Barnard-Kirk T, Abrams MA, **Nahata L**. FUTURES: efficacy and acceptability of a novel reproductive health education program for adolescent males with sickle cell disease. *Blood Adv*. 2023 Nov 14(21);7:6648-6651.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$1,254,205

>>> Fast Facts: July 2023 – June 2024

Inpatient Discharges:	378	Dublin Endocrinology Clinic Visits:	2,027
Observation and Outpatient-in-a-Bed Discharges:	236	East Broad Endocrinology Clinic Visits:	599
Total Discharges:	614	Lima Endocrinology Clinic Visits:	67
Average Length of Stay*:	2.08	Main Campus Endocrinology Clinic Visits:	2,180
Average Daily Census*:	2.15	Westerville Endocrinology Clinic Visits:	1,869
Patient Days*:	786	Prader-Willi Clinic Visits:	133
Inpatient Consults:	717	Total Clinic Visits:	18,434
Canal Winchester Endocrinology Clinic Visits:	310	<i>*Excludes observation and outpatient-in-a-bed patients</i>	

“94% of families said they would do the same treatment again.”
– Peter Lu, MD



GASTROENTEROLOGY, HEPATOLOGY AND NUTRITION

Sacral Nerve Stimulation Improves Symptoms and Quality of Life in Children With Defecation Disorders

A new study narrows down the patients who may benefit the most from the treatment.

In a large prospective study, researchers from Nationwide Children’s Hospital found that sacral nerve stimulation (SNS) can lead to significant and long-lasting improvements in fecal continence and quality of life in children with refractory defecation disorders.

SNS involves low-amplitude stimulation of the sacral nerve through an implanted electrode. It has been effectively used to treat urinary and fecal incontinence in adults and, more recently, urinary issues in children. However, the efficacy of SNS in children with defecation disorders is less clear, especially since fecal incontinence in children and adults often has different underlying causes.

“Based on our research and work done at a few other centers, we knew that there is probably some potential for using SNS for kids with defecation-related symptoms,” says Peter Lu, MD, a pediatric gastroenterologist at Nationwide Children’s and senior author of the new study.

To investigate, Dr. Lu and colleagues performed a prospective study of children with functional and organic defecation disorders who started SNS treatment at Nationwide Children’s between 2012 and 2018. The researchers evaluated clinical response, quality of life and complications over the first five years of SNS treatment.

The findings showed that SNS led to a steady and sustained improvement in fecal incontinence regardless of the underlying etiology, but children with functional disorders were more likely to respond than those with organic disorders. Other measures associated with constipation, such as bowel movement frequency, did not significantly change with treatment.

Approximately one-third of patients experienced complications within the follow-up time frame, resulting in a total of 24 additional surgeries and four device removals.

“Despite this, when we asked families about whether they would still choose to do this, looking back at the benefit and the potential complications that they had, 94% said they would do the same treatment again,” says Dr. Lu. “I think that indicates that even though the complication rate is very concerning for us as physicians, the benefits of the treatment seem to outweigh the potential risks for most of these kids and their families.”

Dr. Lu hopes this study will help clinicians make decisions about which patients might be best suited for SNS treatment, considering the risks.

REFERENCE:

Park CK, Wang L, Koppen LJK, Alpert SA, Diefenbach KA, Wood RJ, Bali N, Vaz K, Yacob D, Di Lorenzo C, Lu PL. Sacral nerve stimulation leads to long-term improvement in fecal incontinence and quality of life for children with functional and organic defecation disorders. *Neurogastroenterol Motil.* 2024 Jul 15:e14865. 14865. Epub ahead of print.



Department of Pediatrics

GASTROENTEROLOGY, HEPATOLOGY AND NUTRITION

Consistently ranked as a top digestive disorders program by U.S. News & World Report, the Division of Gastroenterology, Hepatology and Nutrition at Nationwide Children’s Hospital provides comprehensive care for a broad range of gastrointestinal, liver, pancreatic and nutritional problems in addition to providing advanced endoscopic techniques. The division strives for excellence in research, teaching and clinical care, and maintains a team of physicians committed to creating new knowledge in the discipline. Our team, including pediatric advanced nurse practitioners, registered dietician nutritionists, and social workers, collaborates with other disciplines including behavioral and developmental psychologists, radiologists and surgeons to provide comprehensive, coordinated care for each child.

Faculty



Carlo Di Lorenzo, MD
Division Chief



Brendan M. Boyle, MD, MPH
Section Chief



Cheryl E. Gariepy, MD
Associate Division Chief
for Research

- | | | | |
|--------------------------|---------------------------|------------------------|----------------------------|
| Brandon Arnold, DO | A. Jay Freeman, MD | Ross Maltz, MD | Ala K. Shaikhkhalil, MD |
| Rosara Bass, MD | Jonathan M. Gisser, MD | Ethan Mezoff, MD | Karla K. Vaz, MD |
| Steve L. Ciciora, MD | Praveen Goday, MD | Hilary Michel, MD | Rajitha Venkatesh, MD, MPH |
| Molly C. Dienhart, MD | Muhammad Khan, MD, MPH | Carol J. Potter, MD | Alex Weymann, MD |
| Tracy R. Ediger, MD, PhD | Jennifer Lee, MD | Neetu B. Puri, MD, MPH | Kent C. Williams, MD |
| Steven H. Erdman, MD | Peter Lu, MD | John M. Russo, MD | Frederick W. Woodley, PhD |
| Colleen Flahive, MD | Dieudonne Nonga Makon, MD | Raul Sanchez, MD | Desale Yacob, MD |

2023 – 2024 Pediatric Gastroenterology Fellows

- Eduardo Castillo Leon, MD
- Nicole Davidson, MD
- John (Matthew) Grisham, MD
- Laura Hamant, MD
- Janice Khoo, MD

- Alyshah Lakhani, MD
- Judy-April Murayi, MD
- Samantha Paglinco, DO
- Colin Winkie, MD

2023-2024 Pediatric Neurogastroenterology and Motility Fellow

- Sujithra Velayuthan, MD

Highlights From the Past Year

This year, we opened three new clinics to meet the needs of our patients. These clinics highlight the diverse health care concerns our team addresses and our commitment to collaborative care. The clinics are: Inflammatory Bowel Disease (IBD) Surgery Clinic, GI Fontan Clinic and the Multidisciplinary Pulmonary-GI Clinic.

Expanding Care Through Interventional Endoscopy

The division opened a state-of-the-art interventional endoscopy suite fully equipped with three different endoscopy systems, a 3D C-arm, and multimedia capabilities to locally broadcast and store data.

We have performed more than 100 ERCP and 100 EUS procedures annually. We have a fully staffed Interventional and Complex Endoscopy (ICE) Team on-call 24/7 to help manage emergent endoscopic procedures. The ICE team has developed a robust endoscopic G-tube placement program, performing more than 100 of these annually. The TNE (transnasal endoscopy) service is performing more than 50 unsedated endoscopies annually. Our comprehensive polyposis program also maintains more than 200 patients with polyposis disorders.

Nationwide Children’s is one of very few centers offering POEM procedures for children, and the only center providing G-POEM for gastroparesis in children. We are also the first center in the United States to livestream a POEM procedure at a conference.

Improving Best Outcomes for Children Everywhere Through Research and Collaboration

Our faculty published 71 articles in peer-reviewed journals in the past year. Highlighted publications are as follows.

Among children who suffer from acute recurrent pancreatitis (ARP) or chronic pancreatitis (CP), acute pancreatitis (AP) episodes are painful, often require hospitalization, and contribute to disease complications and progression. Despite this recognition, there are currently no interventions to prevent AP episodes. In a retrospective analysis published in April 2024 in *The American Journal of Gastroenterology*, led by A. Jay Freeman, MD, use of pancreatic enzyme supplementation was associated with a reduction in the incidence rate of AP among children with pancreatic-sufficient ARP or CP. If supported by further prospective research, this could lead to the first treatment to prevent disease progression in those with ARP and CP.

Carlo Di Lorenzo, MD, led a study that resulted in the approval of a new drug, linaclotide, for treating constipation in children. This study was published in March 2024 in *Lancet Gastroenterology and Hepatology*.

Peter Lu, MD, and a Gastroenterology fellow, Kate Hawa, MD, led a Nationwide Children’s team (including Drs. Sanchez, Kroon Van Diest, Bali-Puri, Vaz, Yacob and Di Lorenzo) to complete the first controlled trial of gastric electrical stimulation in children, showing that improvement with stimulation was significantly greater than with sham treatment (presented at Digestive Disease Week 2024, manuscript in preparation).

Dr. Ciciora demonstrated in a study he led that disorders of gut-brain interaction significantly lowered the quality of life of individuals with Down syndrome, particularly those with irritable bowel syndrome. The study was published in December 2023 in *American Journal of Medical Genetics Part C Seminars in Medical Genetics*.

The team is actively engaged in collaborations with other children’s hospitals and academic institutions, as well as advocacy groups, disease specific foundations and research collaboratives.

Professional Leadership and Recognition

- Rosara Bass, MD, received the Cystic Fibrosis Foundation’s Harry Shwachman Clinical Investigator Award (2022-2025) and was selected for membership in DIGEST, a program dedicated to developing a network of gastroenterologists across North America with expertise in the care of people with cystic fibrosis.
- Rajitha Venkatesh, MD, is the chair of the Special Interest Group for Eosinophilic Disorders of the North American Society of Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN).
- Dr. Lu is the chair of the Technology Committee of NASPGHAN. He is also member of the American Neurogastroenterology and Motility Society (ANMS) Nominating Committee.

- Dr. Lu and Jennifer Lee, MD, are co-creators and hosts of Bowel Sounds: The Pediatric GI Podcast, the official podcast of NASPGHAN. They recently won the NASPGHAN Foundation Teri Li Young Educator Award for their work with the podcast.
- Ethan Mezzoff, MD, is the associate editor for JPGN and the secretary for NASPGHAN Intestinal Rehabilitation Special Interest Group.
- Steven Ciciora, MD, is an Editorial Board member for *Pediatrics in Review* and a committee member for NASPGHAN Professional Education Committee.
- The Division of Gastroenterology, Hepatology and Nutrition is a National Pancreas Foundation Center of Excellence. This designation recognizes our team as a premier health care organization focusing on the wholistic, multidisciplinary care of patients with pancreas disease.

Selected Publications

Di Lorenzo C, Khlevner J, Rodriguez-Araujo G, Xie W, Huh SY, Ando M, Hyams JS, Nurko S, Benninga MA, Simon M, Hewson ME, Saps M. Efficacy and safety of linaclotide in treating functional constipation in paediatric patients: a randomised, double-blind, placebo-controlled, multicentre, phase 3 trial. *Lancet Gastroenterol Hepatol*. 2024 Mar;9(3):238-250.

Freeman AJ, Ng K, Wang F, Abu-Ei-Haija MA, Chugh A, Cress GA, Fishman DS, **Garipey CE**, Giefer MJ, **Goday P**, Gonska TY, Grover AS, Lindblad D, Liu QY, Maqbool A, Mark JA, McFerron BA, Mehta MS, Morinville VD, Noel RA, Ooi CY, Perito ER, Schwarzenberg SJ, Sellers ZM, Wilschanski M, Zheng Y, Yuan Y, Andersen DK, Lowe ME, Uc A; Consortium for the Study of Chronic Pancreatitis, Diabetes, and Pancreatic Cancer (CPDPC). Pancreatic enzyme use reduces pancreatitis frequency in children with acute recurrent or chronic pancreatitis: A report from INSPPIRE. *Am J Gastroenterol*. 2024 Apr 18.

McNicol M, Abdel-Rasoul M, McClinchie MG, Morris GA, **Boyle B**, Dotson JL, **Michel HK**, **Maltz RM**. Clinical outcomes and cost savings of a nonmedical switch to a biosimilar in children/young adults with inflammatory bowel disease. *J Pediatr Gastroenterol Nutr*. 2024 Mar;78(3):644-652.

Mezzoff EA, Gil LA, **Lee JA**, Gumer L, Namjoshi SS, Hoffman JM, Wendel D. Digital phenotype generation and time to encounter closure. *JAMA Pediatr*. 2023 Dec 1;177(12):1358-1360.

Yang DM, Sabella J, Kroon Van Diest A, **Bali N**, **Vaz K**, **Yacob D**, **Di Lorenzo C**, **Lu PL**. Early childhood-onset rumination syndrome is clinically distinct from adolescent-onset rumination syndrome. *J Pediatr Gastroenterol Nutr*. 2024 Mar;78(3):565-572.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$517,479

>>> Fast Facts: July 2023 – June 2024

Inpatient Discharges:	808	Gastroenterology Clinic Visits (Main Campus):	17,666
Observation and Outpatient-in-a-Bed Discharges:	401	Chillicothe Gastroenterology Clinic Visits:	340
Total Discharges:	1,209	Dublin Gastroenterology Clinic Visits:	1,747
Average Length of Stay*:	6.53	Lima Gastroenterology Clinic Visits:	432
Average Daily Census*:	14.46	Mansfield Gastroenterology Clinic Visits:	629
Patient Days*:	5,277	Westerville Gastroenterology Clinic Visits:	1,530
Total Surgical Procedures:	4,489	GI Allergy Clinic Visits:	61
*Excludes observation and outpatient-in-a-bed patients		Total GI Clinic Visits:	22,405



Department of Pediatrics

GENETIC AND GENOMIC MEDICINE

The mission of the Division of Genetic and Genomic Medicine at Nationwide Children’s Hospital is to deliver compassionate, family-centered care via genetic/genomic diagnostic and therapeutic services while providing counseling, education, research and advocacy to improve the lives of individuals with genetic conditions. We treat inborn errors of metabolism and genetic conditions across all ages, from preconception and prenatal through childhood and well into adulthood. Clinical services are supported partly by the Ohio Department of Health as a Regional Genetics Center of the state of Ohio, Region IV. Research partners include the Steve and Cindy Rasmussen Institute for Genomic Medicine, and the Center for Gene Therapy and the Center for Cardiovascular Research in the Abigail Wexner Research Institute at Nationwide Children’s Hospital.

Faculty



Beth Kozel, MD, PhD
Division Chief



Kandamurugu (Murugu) Manickam, MD, MPH
Section Chief

Dennis W. Bartholomew, MD

William B. Burns, MD

Bimal Chaudhari, MD, MPH

Scott Hickey, MD

Stephen G. Kaler, MD

April Lehman, MD

Mari Mori, MD

Britton D. Rink, MD

Brandon Stone, MD

Kristen Truxal, MD

Bianca Zapanata, DO

2023 – 2024 Fellows & Residents

Medical Genetics Residents

Jacqueline Yurkoski, MD (PGY4)

Hannah Hughes, MD (PGY3)

Cameron Snapp, MD (PGY1)

Highlights From the Past Year

This last year, our division was recognized for excellence in the care of individuals and families with genetic disorders. We expanded our services through Nationwide Children’s Hospital - Toledo and restarted our Lima outreach clinic. Our department received recognition as a National Organization of Rare Diseases Center of Excellence, NF1 Center of Excellence, Marfan Syndrome Center of Excellence and joined the 10 Institution Williams Syndrome Clinical Consortium, directed by Beth Kozel, MD, PhD.

We continue to see the most patients in the state of Ohio for genetic services with over 4,500 patients served in the past year and are proud to maintain a 100% first-time pass rate for the genetics boards among our trainees. Additionally, faculty published 36 peer-review articles in the past year.

We were able to significantly expand our clinical faculty, including adding our new division chief, Beth Kozel, MD, PhD, and three clinical genetics staff, all of whom are former trainees of our program. We also filled the 2024-2025 Metabolic Biochemical Fellowship with a trainee from Vanderbilt University.

Additional highlights include:

- Clinical expansion of our rapid genome sequencing program. This program started as a research project in 2022 and has moved to clinical testing in 2024.
- We continued our collaboration with The Ohio State University and the Clinical and Translational Science Institute.
- Continued work on CAVaLRi: An Algorithm for Rapid Identification of Diagnostic Germline Variation.
- Our team is part of a PCORI grant to improve resources for Black and Hispanic families who have a child with Down syndrome.
- Emily Messick, a fellow in the Chaudri Lab, received one of four prestigious Marshall Perinatal Klaus Awards for Clinical Research from the AAP for her work on the clinical utility of genetic testing in patients admitted to the hospital as neonates.

- Kandamurugu (Murugu) Manickam, MD, MPH, received the ClinGen Significant Contributor Award.
- Dr. Kozel received the NHBLI Director’s Award for Partnership/Collaboration – “for work as part of the Vascular Diagnostics Center” from the National Heart, Lung, and Blood Institute, NIH as well as the NIH Director’s Award as a member of the Vascular Diagnostics Center Team “for establishing the first Vascular Diagnostics Center of its kind at the NIH” from National Institutes of Health.

Professional Involvement and Funding

Our work is supported by grants, including four newly funded research grants in the past year. Faculty in Genetic and Genomic Medicine are involved in various professional organizations, including:

- SMFM Board of Directors
- Perinatal Quality Foundation Board of Directors
- The Foundation for Reproductive Genetics Education (FoRGE) Board of Directors
- SMFM Publications Committee
- Chair, Genomics Focus Group of the Children’s Hospital’s Neonatal Consortium (US-Canada Multicenter Consortium)
- Chair, ACMG Systematic Evidence Review, rapid genome sequencing

Selected Publications

Antoniou AA, McGinley R, Metzler M, **Chaudhari BP**. NeoGx: Machine-recommended rapid genome sequencing for neonates. *medRxiv [Preprint]*. 2024 Jun 25:2024.06.24.24309403.

de Sainte Agathe JM, Pode-Shakked B, Naudion S, Michaud V, Arveiler B, Fergelot P, Delmas J, Keren B, Poirsier C, Alkuraya FS, Tabarki B, Bend E, Davis K, Bebin M, Thompson ML, Bryant EM, Wagner M, Hannibal I, Lenberg J, Krenn M, Wigby KM, Friedman JR, Iacone M, Cereda A, Miao T, LeGuern E, Argilli E, Sherr E, Caluseriu O, Tidwell T, Bayrak-Toydemir P, Hagedorn C, Brugger M, Vill K, Morneau-Jacob FD, Chung W, Weaver KN, Owens JW, Husami A, **Chaudhari BP**, **Stone BS**, Burns K, Li R, de Lange IM, Biehler M, Ginglinger E, Gérard B, Stottmann RW, Trimouille A. ARF1-related disorder: phenotypic and molecular spectrum. *J Med Genet*. 2023 Oct;60(10):999-1005.

McGrath SP, **Kozel BA**, Gracefo S, Sutherland N, Danford CJ, Walton N. A comparative evaluation of ChatGPT 3.5 and ChatGPT 4 in responses to selected genetics questions. *J Am Med Inform Assoc*. 2024 Jun 14:ocae128. Epub ahead of print.

Owlett LD, **Zapanta B**, Sandkuhler SE, Ames EG, **Hickey SE**, Mackenzie SJ, Meisner JK. Multicenter appraisal of comorbid TANGO2 deficiency disorder in patients with 22q11.2 deletion syndrome. *Am J Med Genet A*. 2024 Jun 3:e63778. Epub ahead of print.

Wojcik MH, Callahan KP, Antoniou A, Del Rosario MC, Brunelli L, ElHassan NO, Gogcu S, Murthy K, Rumpel JA, Wambach JA, Suhrie K, Fishler K, **Chaudhari BP**. Provision and availability of genomic medicine services in Level IV neonatal intensive care units. *Genet Med*. 2023 Oct;25(10):100926.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$2,197,389

>>> Fast Facts: July 2023 – June 2024

Inpatient Discharges:	43	Outpatient Visits	
Observation and Outpatient-in-a-Bed Discharges:	27	Cardiogenetics Clinic Visits:	310
Total Nationwide Children’s Discharges:	70	Canal Winchester Genetics Clinic Visits:	108
Average Length of Stay*:	8.19	Dublin Genetics Clinic Visits:	166
Average Daily Census*:	0.96	Lima Genetics Clinic Visits:	5
Patient Days*:	352	Main Campus Genetics Clinic Visits:	2,409
Inpatient Consults:	371	Marietta Genetics Clinic Visits:	12
*Excludes observation and outpatient-in-a-bed patients		Westerville Genetics Clinic Visits:	319
		Zanesville Genetics Clinic Visits:	101

“While resection surgeries have greatly improved in recent years, systemic therapies haven’t seen much progress over the past 40 years.”

– Ryan Roberts, MD, PhD



HEMATOLOGY, ONCOLOGY & BLOOD AND MARROW TRANSPLANT

Interactions Between Invading Tumor and Lung Cells Permit Metastatic Lung Colonization of Osteosarcoma

Survival signals elicited by lung tissue interactions promote osteosarcoma metastasis and represent a promising target for clinical trials in both human and canine patients.

Osteosarcoma, the most common primary tumor of bone, occurs predominantly in children, teens and young adults. Patient survival largely depends upon the presence or absence of metastasis. Within five years of diagnosis, approximately 30% of patients with localized disease die, while over 80% of patients who develop metastasis die.

“Osteosarcoma has an unusual propensity for a single location of metastasis — to the lung. When lung metastasis occurs, it makes everything much more difficult; the tumors tend to not respond to systemic therapies and become harder to resect,” explained Ryan Roberts, MD, PhD, a principal investigator for the Center for Childhood Cancer Research at the Abigail Wexner Research Institute and physician for the Division of Hematology and Oncology at Nationwide Children’s Hospital. “While resection surgeries have greatly improved in recent years, systemic therapies haven’t seen much progress over the past 40 years.”

Dr. Roberts and colleagues have now identified mechanisms that help those few surviving cancer cells to persist within lung tissues after dissemination. The findings were published in *Cellular Oncology* and offer insights into therapeutic strategies that could prevent and treat metastasis.

The collaborative effort was spearheaded by then-graduate student Camille McAloney of The Ohio State University College of Veterinary Medicine. Using single-cell RNA-sequencing (scRNAseq), the team evaluated gene expression changes in murine primary osteosarcoma tumor cells and metastasis-bearing lung cells at different points during metastatic colonization.

The researchers used NicheNet, a software that can identify the mediators of cell-cell interactions in scRNAseq data, to predict active ligand-target links between interacting cells. They found that several of the stromal cells express growth factors that signal through the MAPK/ERK pathway to increase the expression of MCL1, a pro-survival protein, within tumor cells. They also found that both early and established metastases are vulnerable to MCL1 inhibition — combining MCL1 inhibition with chemotherapy both prevented colonization and eliminated established metastases in vivo.

“We were able to cure mice that had established lung metastases. I don’t think I’ve ever seen that before,” said Dr. Roberts. “We’re now working to translate these findings into the clinic.”

REFERENCE:

McAloney CA, Makkawi R, Budhathoki Y, Cannon MV, Franz EM, Gross AC, Cam M, Vetter TA, Duhon R, Davies AE, Roberts RD. Host-derived growth factors drive ERK phosphorylation and MCL1 expression to promote osteosarcoma cell survival during metastatic lung colonization. *Cell Oncol (Dordr)*. 2023 Sep 7. Epub ahead of print.

Department of Pediatrics

HEMATOLOGY, ONCOLOGY & BLOOD AND MARROW TRANSPLANT

The Division of Hematology, Oncology & Blood and Marrow Transplant at Nationwide Children’s Hospital treats patients with any one of a full array of blood diseases, cancers, immunodeficiency disorders, bone marrow failure syndromes and inherited metabolic storage diseases. Our clinical team oversees the comprehensive evaluation, multidisciplinary diagnosis, treatment and long-term management of children, adolescents and young adults with blood diseases and cancer, as well as other diseases treated by cellular therapies or apheresis.

In addition to clinical care, through our integrated programs within the Abigail Wexner Research Institute’s Center for Childhood Cancer Research, the Steve and Cindy Rasmussen Institute for Genomic Medicine, the Blood Diseases Research Affinity Group, the Center for Translational Research, the Center for Health Equity and Outcomes Research, and the Biopathology Center, we seek to transform the way patients with cancer and blood diseases are cared for by fully integrating research, cutting-edge therapies and multidisciplinary teams.

Faculty



Timothy P. Cripe, MD, PhD, FAAP
Division Chief



Nicholas D. Yeager, MD
Section Chief



Sarah H. O'Brien, MD, MS
Associate Division Chief for Research

Rolla F. Abu-Arja, MD
Anthony N. Audino, MD
Jeffery J. Auletta, MD
Rajinder P. Bajwa, MD, MBBS
Danielle Chambers, PhD
Susan I. Colace, MD
Susan E. Creary, MD
Amy L. Dunn, MD

Maryam Fouladi, MD, MSc, FRCP
Molly Gardner, PhD
Cynthia A. Gerhardt, PhD
Terri L. Guinipero, MD
Jennifer Hansen-Moore, PhD
Jay Hudgins, DO
Amanda Jacobson-Kelly, MD

Bryce A. Kerlin, MD
Sara Khan, MD
Margot Lazow, MD
Dean Lee, MD, PhD
Kathleen L. Lemanek, PhD
Randal S. Olshefski, MD
Jeffrey Papiernik, MD

Samara Potter, MD
Mark A. Ranalli, MD
Hemalatha G. Rangarajan, MD
Suzanne M. Reed, MD
Ryan D. Roberts, MD, PhD
Melissa J. Rose, DO
Amanda Sankar, MD

Megan Schaefer, PhD
Bhuvana A. Setty, MD
Nilay D. Shah, MD
Keri A. Streby, MD
Kathryn Vannatta, PhD
Lynda Villagomez, MD
Anthony D. Villella, MD

Andrea Wojtowicz, PhD
Tammi K. Young-Saleme, PhD
2023 – 2024 Fellows
FIRST YEAR
Sara Bowman, MD
Kelly Gutpell, MBChB

Lisa Hall, DO
Darcy Morris, MD
SECOND YEAR
Ann Kebede, MD
Charles Treinen, MD
Mariah Wright, MD

THIRD YEAR
Amanda Campbell, MD
Megan Scruggs, MD
FOURTH YEAR
NEURO-ONCOLOGY
James Reinecke, MD, PhD
Yasin Yilmaz, MD

FOURTH YEAR (SARCOMA)
Alejandra Rosales, MD

Highlights From the Past Year

This past year has been an exciting one for the Division of Hematology, Oncology and Blood and Marrow Transplantation. We opened our Hemophilia Gene Therapy Clinic and performed our first commercial gene therapy infusion of Hemgenix in March 2024. We were thrilled to see this new therapy in clinical use.

Our collaborations and partnerships continue to provide important access to children with cancer. The Proton Therapy Center at The James – The Ohio State University Comprehensive Cancer Center, reached patient volume milestone of more than 1,000 patients in 2024. We are also partnering with The Ohio State Blood & Marrow Transplant program to support patients <25 who have leukemia/lymphoma or aplastic anemia and need a transplant. Finally, we’ve expanded our existing partnership with Dayton Children’s to support their Blood and Marrow Transplant Program. In 2024, we began seeing patients in the Dayton Children’s outpatient BMT Clinic weekly.

Other notable accomplishments for our division include:

- We achieved Foundation for the Accreditation of Cellular Therapy (FACT) re-accreditation in 2024.
- Our team celebrated the successful completion of Children’s Oncology Group (COG) 2024 audit.
- We were designated an International Hemophilia Training Center and will host Martha Bruckman, RN, from Tanzania.
- We were a first-time recipient of the American Society of Hemophilia Visitor Training Program and will host Sharon McLean, MD, of Jamaica.

Training the Next Generation

Our fellowship program expanded as we added a fourth fellow position to our American College of Graduate Medical Education (ACGME) Pediatric Hematology/Oncology fellowship program. Former Nationwide Children’s Hematology/Oncology fellow Surbhi Saini, MD, was designated the director of the Hemophilia Treatment Center at Washington University and former fellow Gary Woods, MD, was designated as the director of clinical hematology at Children’s Healthcare of Atlanta.

Achieving Best Outcomes Through Research and Innovation

With more than 240 open clinical trials, our team is deeply invested in bringing the next generation of therapies for cancer and blood disease to the clinic. Notable trials and research findings include:

- This year we launched the TarGet umbrella trial, the first-of-its-kind multi-arm study for pediatric brain tumors.
- Our zebrafish work continues to innovate, with a new method that enables the evaluation of novel, rare fusion oncogenes.
- A recent publication from our team described new mechanisms for lung tissue interactions to prevent and treat metastasis.
- We now have six cell and gene therapy treatments available for conditions including acute lymphoblastic leukemia (ALL), thalassemia, hemophilia A and B and sickle cell disease (SCD).

Additionally, our team has published 156 articles in peer-reviewed journals in the past year.

Celebrating Excellence: Awards and Notable Leadership Positions in Professional Organizations

Our faculty are committed to improving patient care everywhere through numerous collaborations and service in professional organizations. The list below highlights some notable service positions our faculty held this year.

- Anthony Audino, MD, is the vice principal investigator for the Therapeutic Advances for Childhood Leukemia (TACL) consortium.
- Tim Cripe, MD, is the editor-in-chief of *Molecular Therapy Oncology*. He is also a member of the Internal Scientific Advisory Board for the Pelotonia Institute for Immuno-Oncology at The Ohio State University. Dr. Cripe is co-founder and board member of Vironexis Biotherapeutics, Inc.

- Amy Dunn, MD, is the chair of the Medical and Scientific Advisory Council of the National Bleeding Disorder Foundation, on the Hemostasis and Thrombosis Research Society Mentored Research/Dream Award Review Committee World Federation of Hemophilia-USA Board. She is also on the National Bleeding Disorder Foundation Board of Directors.
- Maryam Fouladi, MD, is the Central Nervous System (CNS) Committee Chair for the Children’s Oncology Group, chair of the Collaborative Network of Neuro-Oncology Clinical Trials (CONNECT) and associate editor of Neuro-oncology.
- Bryce Kerlin, MD, was elected Research and Awards Officer of the Executive Committee for the Hemostasis and Thrombosis Research Society, and also serves as a Study Section member for the organization’s Mentored Research Awards.
- Sara Khan, MD, is the co-lead of the CONNECT Embryonal Brain Tumor Working Group.
- Margot Lazow, MD, is the co-chair of the CONNECT High-grade Glioma Working Group and a scholar in the Society for Neuro-Oncology Editorial Scholars Program.
- Dean Lee, MD, is the chair of the CONNECT Consortium, Immunotherapy Working Group and Sunshine Consortium, Immunotherapy Task Force. He is the associate editor for *Molecular Therapy – Oncolytics* and on the editorial board of Blood Advances.
- Sarah O’Brien, MD, is the councilor of the Executive Committee for the American Society of Hematology and president of the Board of Directors for the Foundation for Women and Girls with Blood Disorders.
- Suzanne Reed, MD, chairs for the Assessment Task Force for the Association for Pediatric Program Directors (APPD).
- Ryan Roberts, MD, serves as chair of the COG Osteosarcoma Biology subcommittee.
- Melissa Rose, MD, is an Executive Committee member and Education chair for the North American Immuno-Hematology Clinical Education & Research (NICER). She is also a past chair of the American Society of Pediatric Hematology/Oncology (ASHPO) Clinical Immunology Special Interest Group.
- Bhuvana Setty, MD, is the chair of the Ewing Sarcoma Pillar Think Tank for the Sunshine Project.
- Anthony Villella, MD is the co-chair of Pediatric Committee for the National Alliance of Sickle Cell Centers.
- Nicholas Yeager, MD, is the chair of the ASPHO Adolescent and Young Adult Special Interest Group.

Selected Publications

Ciurea SO, Kongtim P, Srouf S, Chen J, Soebbing D, Shpall E, Rezvani K, Nakkula R, Thakkar A, Troy EC, Cash AA, Behbehani G, Cao K, Schafer J, Champlin RE, **Lee DA**. Results of a phase I trial with Haploidentical mblL-21 ex vivo expanded NK cells for patients with multiply relapsed and refractory AML. *Am J Hematol*. 2024 May;99(5):890-899.

Lulla RR, Buxton A, Krailo MD, **Lazow MA**, Boue DR, Leach JL, Lin T, Geller JI, Kumar SS, Nikiforova MN, Chandran U, Jugal SS, Nelson MD Jr, Onar-Thomas A, Haas-Kogan DA, Cohen KJ, Kieran MW, Gajjar A, Drissi R, Pollack IF, **Fouladi M**. Vorinostat, temozolomide or bevacizumab with irradiation and maintenance BEV/TMZ in pediatric high-grade glioma: A Children’s Oncology Group Study. *Neurooncol Adv*. 2024 Mar 14;6(1):vdae035.

Mehyar LS, Hartog L, Kahwash SB, **Abu-Arja R, Ranalli M, Rangarajan HG**. Long term survivor of MOZ-p300 therapy-related acute myeloid leukemia after matched unrelated donor bone marrow transplantation. *Leuk Lymphoma*. 2023 Jul-Aug;64(7):1344-1347.

O’Brien SH, Rodriguez V, Lew G, Newburger JW, Schultz CL, Orgel E, Derr K, **Ranalli MA**, Esbenshade AJ, Hochberg J, Kang HJ, Dinikina Y, Mills D, Donovan M, Dyme JL, Favatella NA, Mitchell LG; PREVAPIX-ALL investigators. Apixaban versus no anticoagulation for the prevention of venous thromboembolism in children with newly diagnosed acute lymphoblastic leukaemia or lymphoma (PREVAPIX-ALL): a phase 3, open-label, randomised, controlled trial. *Lancet Haematol*. 2024 Jan;11(1):e27-e37.

Zhao Z, Patel PA, Slatnick L, Sitthi-Amorn A, Bielamowicz KJ, Nunez FA, Walsh AM, Hess J, Rossoff J, Elgarten C, Myers R, Saab R, Basbous M, McCormick M, Aftandilian C, Richards R, Nessel CN, Tribble AC, Sheth Bhutada JK, Coven SL, Runco D, Wilkes J, Gurunathan A, **Guinipero T**, Belsky JA, Lee K, Wong V, Malhotra M, Armstrong A, Jerkins LP, Cross SJ, Fisher L, Stein MT, Wu NL, Yi T, Orgel E, Haeusler GM, Wolf J, Demedis JM, Miller TP, Esbenshade AJ. Prospective external validation of the Esbenshade Vanderbilt models accurately predicts bloodstream infection risk in febrile non-neutropenic children with cancer. *J Clin Oncol*. 2024 Mar 1;42(7):832-841.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$15,802,117

>>> Fast Facts: July 2023 – June 2024

Inpatient Discharges:	1,615	Anticoagulation Clinic Visits:	190
Observation and Outpatient-in-a-Bed Discharges:	359	BMT Clinic Visits:	4,992
Total Discharges:	1,974	Chillicothe Hematology/Oncology Clinic Visits:	21
Patient Days*:	10,356	Dayton Hematology/Oncology Clinic Visits:	5
Average Length of Stay*:	6.41	Dublin Hematology Clinic Visits:	141
Average Daily Census*:	28.37	East Broad Sickle Cell Clinic Visits:	171
Inpatient Consults:	717	Main Campus Hematology/Oncology Clinic Visits:	10,043
Total Surgical Procedures:	835	Mansfield Hematology/Oncology Clinic Visits:	13
BMT Transplants:	80	Neuro Oncology Clinic Visits:	373
Apheresis and Photopheresis Procedures:	869	Portsmouth Hematology/Oncology Clinic Visits:	7
		Surgical Oncology Clinic Visits:	97
		Zanesville Hematology/Oncology Clinic Visits:	27

*Excludes observation and outpatient-in-a-bed patients

Department of Pediatrics

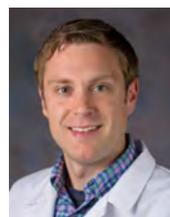
HOSPITAL PEDIATRICS AND ADULT HOSPITAL MEDICINE

The Section of Hospital Pediatrics at Nationwide Children’s Hospital, which also includes newborn and adult hospital medicine, is home to a talented group of physicians who specialize in the care of hospitalized newborns, children, adolescents and adults. The section supports Nationwide Children’s commitment to providing the highest-quality care to all children and their families regardless of ability to pay, and specifically aims to set the standard in the provision of high-value, quality inpatient care, the intentional and thoughtful education of future generations of doctors, and the production of useful and influential clinical, educational and quality-improvement research.

Faculty



Amy N. Tyler, MD, MScS
Division Chief



Michael Perry, MD
Section Chief



Sharon S. Clark, MD
Adult Section Chief



Nancy Liao, MD
Associate Division Chief
for Education



Melissa Skaug, MD
Associate Division Chief
for Operations

- | | | | | |
|-------------------------|------------------------|-------------------------|---------------------------|-----------------------|
| Karen Allen, MD | Megan Coe, MD | Matthew Emery, MD | Rena Kasick, MD | Daniel McFarlane, MD |
| Sean Ankrom, MD | Sofia Davila, MD | Emily Graham, MD | Jillian Kunar, DO | Gerd McGwire, MD, PhD |
| Joshua Black, MD | Anyelika Delerme, MD | Kelly Grannan, MD, MPH | Kristen Lewis, MD | Lucas McKnight, MD |
| Jessica Bockenstedt, MD | Michael Dienstbach, MD | Rakhi Gupta-Basuray, MD | Nancy Liao, MD | Christy Mulligan, MD |
| Ryan S. Bode, MD | Vignesh Doraiswamy, MD | Allison Heacock, MD | Beth Liston, MD, PhD, MPH | Mohammed Najjar, MD |
| Carrie Cacioppo, MD | Samuel Dudley, MD | Kelsey Jackson, MD | Jamie Macklin, MD, MPH | Alana Painter, MD |
| Sharon Clark, MD | Christian Earl, MD | Shawn Jacquemin, MD | Sarah Marzec, MD, MA | Michael Perry, MD |

- | | | |
|--------------------------|---------------------------|----------------------|
| Laura Plachta, MD | Claire Sevov, MD | Matthew Suer, MD |
| Charles Redman, MD | Melissa Skaug, MD | Cara Texler, MD, MPH |
| Allison Rossetti, MD | Ashleigh Slemmer, DO, MBA | Melissa Tullock, DO |
| Christine Schmerge, MD | Anuja Sriparameswaran, MD | Kathryn Westphal, MD |
| Shauna Schord, MD | | Maria Widmann, MD |
| Eric Schumacher, DO, MBA | Mary Stone, MD, MPH | |

2023 – 2024 Fellows

- Kathryn Connor, MD
- Meghan Fennell, MD
- Monica Hoff, MD
- Emily Kramer, DO

Highlights From the Past Year

In 2023, Hospital Pediatrics had historic volumes with nearly 8,000 discharges. As part of one of America’s largest pediatric hospitals, we’re proud to care for a large number of patients from diverse backgrounds, each with unique needs.

Expanded Fellowship Opportunity

We are excited to announce the addition of an optional third year to our Pediatric Hospital Medicine Fellowship program. This innovative option is designed to provide fellows with an immersive research experience, allowing them to delve deeper into pediatric hospital medicine and contribute to advancing the field. Our fellows will have the opportunity to work closely with leading researchers, access state-of-the-art facilities, and participate in groundbreaking projects. This additional year is tailored for those who aspire to integrate research with clinical practice, ultimately enhancing patient care and outcomes. We believe this new option will cultivate the next generation of physician-scientists and leaders in pediatric hospital medicine.

Improving Patient Outcomes Through Research and Collaboration

Our faculty are involved in many research projects across the organization. In the past year, our faculty have also received grant funding for studies central to hospital pediatrics and published 38 peer-reviewed articles.

Our team led or participated in several multi-site research studies and quality improvement projects. We led ROUTT-B (Reducing overutilized tests and treatments in bronchiolitis), a multi-institutional, multi-year, Agency for Healthcare Research and Quality (AHRQ)-funded de-implementation study. We participated in the American Academy of Pediatric Acute & Critical Care Quality Network’s Learning and Implementing Guidelines for Hyperbilirubinemia Treatment (LIGHT) project to implement newly published hyperbilirubinemia guidelines and the Eliminating Monitoring Overuse study- a multi-institution de-implementation study.

Notable new grants awarded to our faculty this year are as follows:

- Sharon Clark, MD, Poorvi Hardman, DO, and Tasha Posid, PhD, were awarded a Nationwide Children’s Hospital & Research Institute and The Ohio State University College of Medicine Office of Research Cross-Campus-Collaborative Pilot Program Award for “Development of a Global Health Scholars Program: Improving Global Health Education and Experiences.”
- Cara Texler, MD, MPH, received a grant from the Nationwide Children’s Hospital Intramural Funding Program for “Comparing post-discharge outcomes for patients whose families use a language other than English (LOE) for care to those who use English.”
- Shauna Schord, MD, and Claire Sevov, MD, received funding from Nationwide Children’s Hospital Intramural Funding Program for “Structured Subspecialty Education for Residents on Hospital Medicine: Implementing a Case-based Rheumatology Curriculum.”

Encouraging Excellence Through Professional Achievement

- Amy Tyler, MD, MScS, serves on the Executive Committee for the Council on Quality Improvement and Patient Safety at the American Academy of Pediatrics and was awarded the 2024 Council Award for Education. She also chairs the implementation subcommittee of the Council on Quality Improvement and Patient Safety at the AAP.
- Rakhi Gupta Basuray, MD, co-chairs the AAP Society of Hospital Medicine Neonatal Hospitalist Subcommittee and was awarded the 2024 Pediatric Hospital Medicine Collaborative Impact Award.
- Megan Coe, MD, co-chairs the American Academy of Pediatrics Society of Hospital Medicine Educator’s Subcommittee Fellow’s Group.
- Allison Rossetti, MD, co-chairs of the National Med-Peds Program Director Association Recruitment Committee.

- Dr. Schord co-chairs the American Academy of Pediatrics Society of Hospital Medicine Educator’s Subcommittee Interprofessional Education Group.
- Dr. Clark won Best Innovations Poster, Society of Hospital Medicine Converge Conference 2024 and was selected for Best Innovations Poster for “Advancing Interdisciplinary Rounding Practices Through Enhanced Data Transparency” from 1,373 submissions and 34 finalists at the Research Innovations Vignettes (RIV) Competition, Society of Hospital Medicine (SHM) Converge national conference.

Selected Publications

Delerme AA, Kasick R, Manning K, Rossetti A. Microaggressions: Be An Active Bystander. *Acad Pediatr.* 2024 Jun 13:S1876-2859(24)00216-X. Epub ahead of print.

Gupta Basuray R, Cacioppo C, Inuzuka V, Cooper K, Hardy C, **Perry MF.** Increasing exclusive nursery care of late preterm and low birth weight infants. *Hosp Pediatr.* 2023 Nov 1;13(11):992-1000.

Jackson K, Marek R, Yildiz V, Fromme HB. A survey study of motivators for pediatric hospitalists to work in the community. *Hosp Pediatr.* 2024 Apr 1;14(4):217-224.

Stemmer A, Klamer B, **Schmerge C,** Lauden S, **Texler C, Fennell M,** Lowing D, Leyenaar JK, **Bode RS.** Comparing outcomes between direct and ED admissions for neonatal hyperbilirubinemia. *Hosp Pediatr.* 2024 Jun 1;14(6):421-429.

Westphal K, Adib H, **Doraiswamy V,** Basiago K, Lee J, Banker SL, Morrison J, McCartor S, Berger S, Schmit EO, Van Meurs A, Mitchell M, Lee C, Wood JK, Tapp LG, Kunkel D, Halvorson EE, Potisek NM; Hypothermic Young Infant Research Collaborative. Performance of febrile infant decision tools on hypothermic infants evaluated for infection. *Hosp Pediatr.* 2024 Mar 1;14(3):163-171.

>>> Fast Facts: July 2023 – June 2024

Inpatient Discharges:	5,552	Average Daily Census*:	43.09
Observation Discharges:	2,446	Patient Days*:	15,728
Total Discharges:	7,998	<i>*Excludes observation and outpatient-in-a-bed patients</i>	
Average Length of Stay*:	2.83		



Characterizing cases of measles vaccine shedding in recently vaccinated children presenting with respiratory viral symptoms.

Matthew Washam, MD, MPH (left) and Huanyu Wang, PhD, D(ABMM)



INFECTIOUS DISEASES

Differentiating True Measles Cases from Vaccine Shedding

Shedding of measles vaccine RNA can occur for up to four weeks post vaccination.

Measles, mumps and rubella (MMR) vaccination is a critical component of measles outbreak responses. But since this vaccine contains live, weakened viruses, viral genetic material (RNA) can be “shed” into the body, making case classification difficult.

“The frequency at which detection after MMR occurs in this patient population really highlights, in a measles outbreak setting, the need to distinguish wild type versus the vaccine strain in terms of your PCR,” says Matthew Washam, MD, MPH, Chief of Epidemiology and Infection Prevention at Nationwide Children’s and coauthor of the study.

The Clinical Microbiology Laboratory at Nationwide Children’s Hospital developed an in-house Pan-measles PCR test to aid the rapid diagnosis of patients with suspected measles. The assay detects measles RNA from nasopharyngeal samples and can detect both vaccine and wild-type measles strains.

For the new study, Dr. Washam and colleagues identified children who were tested with a respiratory panel within 30 days after receiving the MMR vaccine during the recent measles outbreak.

“We found a surprisingly high percentage of these kids, approximately one-third of them, had detectable measles vaccine RNA after vaccination,” says Huanyu Wang, PhD, D(ABMM) Director of Molecular Microbiology Laboratory at Nationwide Children’s, associate professor of Pathology at The Ohio State University College of Medicine, and senior author of the study.

The results suggest that most measles RNA detection will occur within two weeks after vaccination, but detection out to 29 days can occur. The findings also point to a measure that can differentiate vaccine RNA and wild-type infection.

Dr. Washam emphasizes that this does not mean that the MMR vaccine gives children measles. “It’s a highly safe and effective vaccine,” he says.

Clinicians and public health officials should be aware of the possibility of measles vaccine detection in recently vaccinated individuals. While awaiting genotyping testing, the Pan-measles PCR Ct value may help with time-sensitive public health decisions.

REFERENCE:

Washam MC, Leber AL, Oyeniran SJ, Everhart K, Wang H. Shedding of measles vaccine RNA in children after receiving measles, mumps and rubella vaccination. *J Clin Virol.* 2024 Aug;173:105696. Epub 2024 May 24.



Department of Pediatrics
INFECTIOUS DISEASES

The specialists in the Division of Infectious Diseases at Nationwide Children’s Hospital provide expertise in the diagnosis and management of immune-competent and immune-compromised children with all types of acute and chronic infections. Our physicians provide direct care for patients admitted to the Nationwide Children’s Infectious Diseases Unit and clinical consultation for patients with complicated infectious diseases throughout the hospital, in close partnership with their primary care teams and other subspecialists. We have developed close clinical and research collaborations with physicians in Hematology, Oncology & Blood and Bone Marrow Transplant, Cardiology, Lung, Heart and Liver Transplantation, Pediatric Critical Care, Neonatology, Nephrology, and the hospital’s other medical and surgical departments with the goal of optimizing the infectious diseases-related care of patients. Patients are also evaluated in the ambulatory setting following referral to the Infectious Diseases, Tuberculosis, Neonatal Infectious Diseases, Host Defense, Travel Medicine, Hepatitis C, Family AIDS Clinic Education Services (FACES) and Kawasaki Disease clinics located on the Nationwide Children’s main campus. Additionally, our division offers consultation to both external and internal providers through the Nationwide Children’s Physician Consult and Transfer Center. Bench, translational and clinical research is conducted by members of the division and in collaboration with our colleagues from the Clinical Microbiology Laboratory, the Center for Microbial Pathogenesis, the Center for Vaccines and Immunity and other centers in the Abigail Wexner Research Institute at Nationwide Children’s, as well as national and international collaborators.

Faculty



Jason G. Newland, MD, MEd
Division Chief



William J. Barson, MD, MS
Section Chief



Masako Shimamura, MD
Associate Division Chief for Research

Monica Ardura, DO, MSCS
Jeffrey Auletta, MD
Kevin Cassady, MD
Juan Chaparro, MD
Guliz Erdem, MD
Charitha Gowda, MD, MPH
Jonathan R. Honegger, MD
Rachel Martin-Blais, MD, DTM&H

Christopher Ouellette, MD
Pablo J. Sánchez, MD
Eunkyung Song, MD
Jeanette Taveras, DO
Sanya Thomas, MD
Cristina Tomatis, MD
Rebecca Wallihan, MD
Matthew Washam, MD, MPH
Joshua Watson, MD

Clinical Microbiology
Amy Leber, PhD
Director
Sophonie Jean, PhD
Assistant Director
Huanyu Wang, PhD
Assistant Director

2023 – 2024 Infectious Diseases Fellows
Radwa Abozeid, MBBS
Francis M. Banda, MBBS
Randal De Souza, MD
Raquel Giacomelli Cao, MD, PhD
Justin R. Hofmann, MD
Patrik Sarmiento-Wilches, MD
Guillermo Yepes Junquera, MD

2023 – 2024 Infectious Diseases Host Defense Fellow
Varvara Probst, MD

Highlights From the Past Year

Industry Leaders

Our division has continued to be a national leader in infectious disease research. The research program led by Kevin Cassady, MD, continues to make advancements in using viruses to treat cancer, specifically brain tumors. Our division faculty published 48 articles this year in national peer-reviewed journals. In April 2024, William J. Barson, MD, MS, and Maria Vegh, ID nursing program manager, organized another successful Dwight A. Powell Pediatric Infectious Diseases and Pediatric Infectious Diseases Nursing Conference at Nationwide Children’s. 2023 was the 40th and 38th annual conference, respectively, and had the largest attendance to date.

In addition to continuing to train the next generation of pediatric infectious diseases physicians worldwide, our team has amplified the impact of our work. Selected highlights include:

- The travel clinic led by Rachel Martin-Blais, MD, DTM&H, has become one of the only family-centered centers that provides complete services to children. Dr. Martin-Blais has also successfully started a Pediatric Infectious Diseases fellowship in Botswana.
- The Host Defense Program, led by Monica Ardura, DO, MSCS, and team, continues to lead the country in the optimal care of children with immunocompromising conditions. This program is the national leader in the delivery of vaccines in a safe and effective way to vulnerable children and adolescents.
- As of November 2023, the Centers for Disease Control and Prevention now recommend all neonates born to a mother with hepatitis C to be screened between 2 and 6 months of age. This recommendation was a direct result of work published in 2021 by Jonathan R. Honegger, MD. Dr. Honegger has now established a unique family hepatitis C clinic to ensure exposed infants receive the appropriate follow-up and therapy.
- Pablo J. Sánchez, MD, continues to be an international leader in the appropriate use of antimicrobials in the Neonatal Intensive Care Unit.

Program Growth

The Infectious Diseases Clinic continues to see growth. In 2023, clinic visits exceeded 1,700 and the Infectious Diseases Travel Clinic provided services to families traveling to more than 30 countries. The Infectious Diseases inpatient consult service continues to grow, with more than 173 new general consults and 1,291 consult encounters for Host Defense Program patients. Host Defense Program outpatient services were expanded with an increase in outpatient ambulatory visits of more than 40%.

Our department also welcomed Jason G. Newland, MD, MEd, to Nationwide Children’s as the new division chief of Infectious Diseases in July 2024.

Professional Memberships

Infectious Diseases works as a close collaborator with many other centers and organizations, but our team also holds positions in several professional organizations. Selected highlights include:

- Monica Ardura, DO, MSCS, and Guliz Erdem, MD, are elected board members of the Pediatric Infectious Diseases Society and Pediatric Infectious Diseases Foundation.
- Monica Ardura, DO, MSCS, is an elected member of the American Academy of Pediatrics Committee on Infectious Diseases. This committee leads the publications of the important AAP textbook, *Red Book*.
- Juan Chaparro, MD, is on the Executive Committee of the AAP Council on Clinical Information Technology.
- Jason G. Newland, MD, MEd, is the vice-chair of the Presidential Advisory Committee on Combating Antibiotic Resistant Bacteria.
- Masako Shimamura, MD, is the Chair of the Pediatric Infectious Diseases Society Fellowship Awards Committee and lead author for the HHS/CDC/NIH Pediatric HIV Opportunistic Infections CMV guideline.
- Pablo J. Sánchez, MD, is a member of the CDC Advisory Committee on Immunization Practices.
- Rebecca Wallihan, MD, is a program instructor for the Advancing Pediatric Education eXcellence (APEX) Teaching Program for the American Academy of Pediatrics.

Selected Publications

Cruz Vidal D, Lee S, Ardoin SP, Dalmacy D, **Chaparro J**, Blaney C, Rodriguez V, Sankar A, Akoghlanian S, Lisciandro R, **Washam M**, Abraham RS, **Leber A**, Eby M, Bennett B, **Erdem G**. Multisystem inflammatory syndrome in children and cardiac involvement: A quaternary center experience. *Pediatr Infect Dis J*. 2024 May 1;43(5):e160-e163.

Pai VB, Tansmore J, **Song E**. Pharmacokinetic analysis driven letermovir dosing in pediatric hematopoietic cell transplantation patients with resistant CMV disease. *Pediatr Transplant*. 2024 Feb;28(1):e14580.

Probst V, Thomas SJ, Ouellette CP. Adopting a new approach to treat refractory or resistant viral infections in solid organ transplant recipients. *Transpl Infect Dis*. 2023 Dec;25(6):e14161.

Tomatis-Souverbielle C, Lyman E, Thomas T, May A, **Erdem G**. Ventilator-associated respiratory infections in children on home invasive mechanical ventilation. *Pediatr Pulmonol*. 2024 Aug;59(8):2141-2144.

Quintero AM, Cruz Vidal DA, Klamer BG, **Ardura MI**, Oyeniran SJ. Emerging Resistance trends in viridans group streptococci bloodstream infections among immunocompromised children receiving levofloxacin prophylaxis. *J Pediatric Infect Dis Soc*. 2023 Jul 31;12(7):381-391.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$2,410,503

>>> Fast Facts: July 2023 – June 2024

Inpatient Discharges:	2,032	Inpatient Consults:	1,020
Observation and Outpatient-in-a-Bed Discharges:	597	FACES Clinic Visits:	2,104
Total Discharges:	2,629	Infectious Disease Clinic Visits:	1,777
Average Length of Stay*:	2.79	Tuberculosis Clinic Visits:	578
Average Daily Census*:	15.54	Total Clinic Visits:	4,459
Patient Days*:	5,672	<i>*Excludes observation and outpatient-in-a-bed patients</i>	



“The use of thickeners and thickened feeds comes with short-term and long-term side effects.”

– Sudarshan Jadcherla,
MD



Sudarshan Jadcherla, MD
Associate Chief
Division of Neonatology



NEONATOLOGY

How Does Thickened Formula Affect Reflux in Infants?

More clinical trials should be conducted to determine how to decrease acid in neonatal infants while still alleviating other GERD symptoms.

Infants in the neonatal intensive care unit with suspected gastroesophageal reflux disease (GERD) are often fed formula with added rice cereal or other thickeners, despite limited evidence of its efficacy or long-term consequences.

“The use of thickeners and thickened feeds comes with short-term and long-term side effects,” says Sudarshan Jadcherla, MD, a principal investigator at the Center for Perinatal Research at Nationwide Children’s Hospital and the medical director of the Neonatal and Infant Feeding Disorders Program.

Dr. Jadcherla and colleagues recently conducted a crossover cohort study in 40 infants with suspected GERD at Nationwide Children’s. The study is published in the *Journal of Parenteral and Enteral Nutrition*. The team used 24-hour pH-impedance testing to compare the direct effects of rice-thickened formula versus routine feeds on GERD symptom characteristics.

Overall, the researchers say their results suggest there are pros and cons of using thickened feeds: Although thickened feeds may help decrease weakly acidic reflux, they may not alleviate other troublesome GERD symptoms. Plus, all thickeners have associated risks and some negative side effects that necessitate further research.

Dr. Jadcherla says that clinical trials are needed to clarify objective indications and therapeutic use of thickened formula in this population, along with study of their side effects. He and his team have recently been funded by the National Institutes of Health to conduct a clinical trial to test the effects of natural maturation versus acid suppressive medications versus rice-thickened formula on infants with suspected GERD.

“This will be a randomized trial that will, hopefully, be able to answer all of the questions we have about when to use thickened formula,” says Dr. Jadcherla, who is also a professor of pediatrics at The Ohio State University College of Medicine. “With this clinical trial, we will determine the short- and long-term side effects, as well as the short- and long-term benefits, of thickened formula for infants with GERD.”

REFERENCE:

Njeh M, Sultana Z, Plumb T, Alshaiikh E, **Jadcherla SR**. Comparison of direct effects of rice-thickened formula vs routine feeds on symptoms and gastroesophageal reflux indices: A crossover cohort study. *Journal of Parenteral and Enteral Nutrition*. 2024 Jan;48(1):64-73.

Department of Pediatrics

NEONATOLOGY

Nationwide Children’s Hospital is home to one of the largest networks of clinical neonatal care in the United States. The Section of Neonatology at Nationwide Children’s is an integral component of the neonatal program, which includes a full range of family-centered newborn care and innovative clinical and translational research programs, conducted through the Division of Neonatology and in collaboration with the Center for Perinatal Research in the Abigail Wexner Research Institute at Nationwide Children’s.

Faculty



Leif D. Nelin, MD
Division Chief



Edward G. Shepherd, MD
Section Chief



Amy Schlegel, MD
Associate Division Chief



Sudarshan Jadcherla, MD
Associate Division Chief for Academics



Elizabeth Bonachea, MD
Associate Division Chief for Health Equity and Inclusion



Carl H. Backes, MD
Associate Division Chief for Clinical Research

- Molly K. Ball, MD
- Roopali V. Bapat, MD
- Jenny Bellodas-Sanchez, MD
- Kristen L. Benninger, MDpe
- Bimal Chaudhari, MD
- Bernadette Chen, MD
- George El-Ferzli, MD
- Jana Erner, MD
- Zachary Farmer, MD
- Omid Fathi, MD
- Patrick Gallagher, MD

- Jennifer Haase, MD
- Cecilie Halling, MD
- Jason Jackson, DO
- Maria Jebbia, MD
- Matthew Kielt, MD
- Susan Lopata, MD
- Jason Kovalcik, MD
- Audrey Miller, MD
- Craig A. Nankervis, MD
- Stephanie Napolitano, MD
- Namrita Odackal, MD

- Ahmed Osman, MD
- Shama Patel, MD
- Leeann Pavlek, MD
- Pablo J. Sánchez, MD
- Ruth B. Seabrook, MD
- Jonathan L. Slaughter, MD, MPH
- Michael R. Stenger, MD
- Christopher J. Timan, MD
- Jennifer K. Trittman, MD, MPH
- Sheria D. Wilson, MD

Community-Based Faculty

- Neil Alviedo, MD
- Sunny Arikat, MD
- Felix Banadera, MD
- Lindsey Beer, MD
- Gary Bixler, MD
- Ene Fairchild, MD
- Angela Firestine, MD
- Joshua H. Goldberg, MD
- Nancy B. Hansen, MD
- Juli Kern, MD

- Jeffrey S. Keyes, MD
- Safdar Khan, MD
- Michelle Lash, MD
- Corin Cozzi Linsey, MD
- Wendy A. Luce, MD
- Maclain Magee, MD
- Benjamin A. McDonald, MD

- Maria Mercado, MD
- Avante Milton, MD
- Richard Moraille, MD
- Mitali Pakvasa, MD
- Danielle Parham, MD
- Christopher Regan, DO
- Teresa L. Seto, MD

- Michael Shoemaker, MD
- Christina N. Stine, MD
- Anupama Sundaram, MD
- Anthony R. Theile, DO
- Youness Tolaymat, MD
- Peri Ulema, DO
- Allison Vasileff, MD

- Heather Weydig, MD
- Natalie O. White, DO
- Jonathan R. Wispe, MD
- William Zaia, MD

2023 – 2024 Fellows

- Nicole Asdell, MD
- Megan Barcroft, DO
- Mary Crume, MD
- Gurpreet Kaur, MD
- Kala Levine, MD
- Allison Lure, MD
- Abigail Melemed, MD

- Emily Messick, DO
- Kaitlyn Miller, MD
- Robert Nadler, MD
- Michael Ratti, MD
- Rebecca Saliga, MD
- Ashley Wethall, MD

Highlights From the Past Year

Our team’s expertise spans from fetal diagnosis and therapies across the spectrum of newborn conditions and essential long-term follow-up. We are proud to be a leader in neonatology with multiple world-renowned programs, including our Small Baby, Infant Feeding Disorders and Bronchopulmonary Dysplasia programs. Each year we care for more than 3,000 babies in our more than 260 beds. The size and strength of our program are supported by our commitment to academic excellence, research and innovation.

Advanced Fellowships Support Best Outcomes for Vulnerable Patients

The Neonatal and Infant Feeding Disorders Program has re-established an advanced fellowship program, in which Dr. Gurpreet Kaur completed and graduated from the program. This initiative is supported by the Division of Neonatology leadership and Graduate Medical Education. Our division is also recruiting for an advanced Bronchopulmonary Dysplasia fellowship.

Collaboration for Research and Innovation in Neonatology

The Division of Neonatology works with multiple centers of emphasis across the Abigail Wexner Research Institute, including the Center for Perinatal Research, Institute for Genomic Medicine and Center for Cardiovascular Research.

Outside of our organization, we are key contributors to the Children’s Hospitals Neonatal Consortium, the BPD Collaborative, the National Institute of Child Health and Development (NICHD) Neonatal Research Network, the Neonatal Kidney Collaborative, the Tiny Baby Collaborative, the Extracorporeal Membrane Support Organization and the Vermont Oxford Network.

Through these networks, we are able to share and establish best practices, conduct research vital to improving patient care and develop networks of professional support and development to grow the next generation of neonatologists.

Notable Grants

Grant-funded research is a core component of the academic work of our division. In the past academic year, three notable National Institutes of Health (NIH) grants have been awarded to our faculty.

- R01 to Sudarshan Jadcherla, MD, for “Pathophysiological Evidence Driven Management of GERD in Neonatal ICU Infants: Randomized Controlled Trial.”
- U-award to Jonathan Slaughter, MD, Sarah Keim, PhD (Nationwide Children’s Center for Biobehavioral Health), Courtney Denning-Johnson Lynch, PhD, MPH (The Ohio State University), and Kartick Kailas Venkatesh, MD, PhD, (The Ohio State University) for “Environmental Influences on Child Health Outcomes (ECHO) and Pregnancy in Ohio.”
- T32 award to Carl Backes, MD, and Vidu Garg, MD, (Center for Cardiovascular Research) for an integrative research training program in pediatrics cardiopulmonary disease.

Patent applications: Provisional application for patents was filed November 29, 2022, and was assigned the number 63/428,532 (converted). Patent Cooperation Treaty PCT patent application was filed November 29, 2023, and was assigned the number PCT/US23/81696. Full details of approvals are pending. The intellectual property includes the development of products to activate, measure motility responses, interpret data and train the infant and parent/providers. Some of these are in the form of process patent and includes the PIONEER program initiative.

Leading Through Service in Professional Organizations

Another way we are working across the organization and the globe to improve outcomes for vulnerable infants is through service in professional organizations and committees. Highlighted leadership positions are as follows:

- Carl Backes, MD, is President of the Midwest Society for Pediatric Research.
- Elizabeth Bonachea, MD, serves as chair for Research in the National Neonatology Curriculum Executive Committee, Organization of Neonatal-Perinatal Medicine Training Program Directors.
- Amy Schlegel, MD, is the president of the Perinatal Palliative Care Forum, American Association of Hospice and Palliative Care Medicine.
- Edward Shepherd, MD, is the chair of the Membership Committee for the BPD Collaborative.
- Matthew Kielt, MD, is the co-chair of the Mentoring Committee for the BPD Collaborative.
- Audrey Miller, MD, is the chair of the Advocacy Committee for the BPD Collaborative.
- Leif Nelin, MD, is the chair of the Executive Board of the BPD Collaborative.
- Molly Ball, MD, is the co-chair of the Cardiac Focus Group for the Children’s Hospitals Neonatal Consortium (CHNC).
- Leeann Pavlek, MD, is the co-chair of the Extremely Preterm Infant Focus Group of the CHNC.
- Omid Fathi, MD, is the co-chair of the Extremely Preterm Infant Focus Group for the CHNC.
- Bimal Chadhari, MD, is the co-chair of the Genomics Focus Group for the CHNC.
- Kristen Benninger, MD, is the co-Chair, Substance Exposed Newborns Focus Group, CHNC.
- George El-Ferzli, MD, is the chair of the Innovation Committee at NeoMind-AI.

Selected Publications

Ball MK, Seabrook RB, Bonachea EM, Chen B, Fathi O, Nankervis CA, Osman A, Schlegel AB, Magers J, Kulpa T, Sharpin P, Snyder ML, Gajarski RJ, Nandi D, **Backes CH Jr.** Evidence-based guidelines for acute stabilization and management of neonates with persistent pulmonary hypertension of the newborn. *Am J Perinatol.* 2023 Oct;40(14):1495-1508.

Bapat R, Duran M, Piazza A, Pallotto EK, Joe P, Chuo J, Mingrone T, Hawes J, Powell M, Falciglia GH, Grover TR, Rintoul N, MacPherson MJ, Rose A, Brozanski B. A multicenter collaborative to improve postoperative pain management in the NICU. *Pediatrics.* 2023 Aug 1;152(2):e2022059860.

Miller AN, Shepherd EG, Manning A, Shamim H, Chiang T, **El-Ferzli G, Nelin LD.** Tracheostomy in severe bronchopulmonary dysplasia-How to decide in the absence of evidence. *Biomedicines.* 2023 Sep 19;11(9):2572.

Njeh M, Helmick R, Alshaiikh E, Marcano K, Alexander A, Osborn E, **Jadcherla SR.** The irritable infant in the neonatal intensive care unit: Risk factors and biomarkers of gastroesophageal reflux disease. *J Pediatr.* 2024 Jan;264:113760.

Slaughter JL, Klebanoff MA, Hade EM. Estimating the effect of diuretics and inhaled corticosteroids for evolving bronchopulmonary dysplasia in preterm infants. *Paediatr Perinat Epidemiol.* 2024 Jan 8;10.1111/ppe.13038. Epub ahead of print.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$7,294,379

>>> Fast Facts: July 2023 – June 2024

Main Campus	Newborn Intensive Care Unit at Grant Medical Center	Newborn Intensive Care Unit at St. Ann’s Hospital
Inpatient Discharges: 1,150	Inpatient Discharges: 213	Inpatient Discharges: 244
Observation and Outpatient-in-a-Bed Discharges: 4	Observation and Outpatient-in-a-Bed Discharges: 5	Observation and Outpatient-in-a-Bed Discharges: 5
Total Discharges: 1,154	Total Discharges: 218	Total Discharges: 249
Average Length of Stay*: 37.2	Average Length of Stay*: 23.5	Average Length of Stay*: 19.2
Average Daily Census*: 117.1	Average Daily Census*: 13.7	Average Daily Census*: 12.8
Patient Days*: 42,724	Patient Days*: 5,012	Patient Days*: 4,678
Fetal Medicine Collaborative Clinic Visits: 1,867	Newborn Intensive Care Unit at Doctor’s Hospital West	Newborn Intensive Care Unit at The Ohio State University Wexner Medical Center
Neonatology Clinic Visits: 3,175	Total Discharges: 131	Inpatient Discharges: 620
Neonatology BPD Clinic Visits: 1,132	Average Length of Stay*: 13.0	Observation and Outpatient-in-a-Bed Discharges: 66
Newborn Intensive Care Unit at Riverside Methodist Hospital	Average Daily Census*: 4.7	Total Discharges: 686
Inpatient Discharges: 638	Patient Days*: 1,703	Average Length of Stay*: 18.8
Observation and Outpatient-in-a-Bed Discharges: 4	Newborn Special Care Nursery at Dublin Methodist Hospital	Average Daily Census*: 31.9
Total Discharges: 642	Inpatient Discharges: 173	Patient Days*: 11,661
Average Length of Stay*: 23.2	Observation and Outpatient-in-a-Bed Discharges: 4	<i>*Excludes observation and outpatient-in-a-bed patients</i>
Average Daily Census*: 40.5	Total Discharges: 177	
Patient Days*: 14,799	Average Length of Stay*: 9.0	
	Average Daily Census*: 4.3	
	Patient Days*: 1,556	

“The findings in this study conclude that not all oxidative stress is bad.”

– Diana Zepeda-Orozco, MD



NEPHROLOGY AND HYPERTENSION

Disrupting Mitochondrial Pyruvate Uptake in Kidney Tubular Cells Bolsters Antioxidant Responses and Protects From Acute Kidney Injury

Blocking mitochondrial pyruvate uptake in the kidney was found to upregulate oxidant defense systems, ultimately mitigating the effects of an acute kidney injury (AKI).

In a proof-of-concept study published in *Molecular Metabolism*, Diana Zepeda-Orozco, MD, co-director of the Acute Kidney Injury program at Nationwide Children’s Hospital and assistant professor of pediatrics at The Ohio State University College of Medicine, and colleagues sought to investigate the injury-induced metabolic changes in the kidney. They generated a kidney mouse model with a tubular epithelial cell-specific mitochondrial pyruvate carrier 1 (Mpc1) knockout (MPC TubKO) to conduct in vivo glucose tracing and enzyme activity tests under normal and induced AKI scenarios.

The MPC TubKO mice had normal body weight and renal function through 8 weeks of age but had Mpc1 mRNA levels more than 90% reduced in kidney tissue relative to wild type mice ($P < .01$).

Although renal function was maintained in the experimental mice, blocking tubular mitochondrial pyruvate transport in tubular cells caused glucose to be diverted to the pentose pathway, resulting in low-level oxidative stress in the kidneys. As an effect of the glucose diversion, and likely in response to the low oxidative stress, MPC TubKO mice had significant increases in nicotinamide adenine dinucleotide phosphate (NADPH) production by the pentose phosphate pathway ($P \leq .05$), which is an important component of antioxidant response.

After an induced AKI using a rhabdomyolysis model, the experimental mice had an upregulation of oxidative defense systems relative to wild type mice ($P < .05$).

“When we caused an acute kidney injury to these mice, we were sure that the mice were going to have a defective injury response, that they were going to have injury more easily because of their altered metabolism and their low levels of oxidative stress. It was very surprising that it was the opposite. It seemed that these mice were protected from a very severe injury,” says Dr. Zepeda-Orozco.

In addition to more efficiently reacting to the oxidative stress caused by injury, the MPC TubKO mice had increased overall survival 48 hours after injury compared with controls (100% vs 63.6%; $P = .05$), respectively.

Dr. Zepeda-Orozco says, “The findings in this study conclude that not all oxidative stress is bad. If we’re able to find and leverage this mechanism of adaptation at a time of injury, hopefully, we’ll be able to let the tubular cells survive better.”

REFERENCE:

Rauckhorst AJ, Martinze GV, Andrade GM, Wen H, Kim JY, Simoni A, Robles-Planells C, Mapuskar KA, Rastogi P, Steinbach EJ, McCormick ML, Allen BG, Pabla NS, Jackson AR, Coleman MC, Spitz DR, Taylor EB, Zepeda-Orozco D. Tubular mitochondrial pyruvate carrier disruption elicits redox adaptations that protect from acute kidney injury. *Mol Metab*. 2024;79:101849.



Department of Pediatrics
NEPHROLOGY AND HYPERTENSION

The Division of Nephrology and Hypertension at Nationwide Children’s Hospital provides specialized primary and consultative care for children with kidney and urinary tract problems through age 21. Disorders treated include acute kidney injury, chronic kidney disease, congenital anomalies of the kidneys and urinary tract, glomerular disorders, tubular disorders, urinary tract infection, kidney stones, electrolyte disorders, hypertension and metabolic bone disease.

A full range of renal replacement therapy services are available, including hemodialysis, peritoneal dialysis, continuous renal replacement therapy, aquapheresis and kidney transplantation.

Faculty



John David Spencer, MD
Division Chief



Hiren P. Patel, MD
Section Chief



Diana Zepeda-Orozco, MD
Associate Division Chief for Research

Brian Becknell, MD, PhD
 Ray Bignall III, MD
 Gabriel Cara-Fuentes, MD, PhD
 Mahmoud Kallash, MD
 Kirsten Kusumi MD
 John D. Mahan, MD
 Tahagod Mohamed, MD
 Stephanie Peters, APN

William E. Smoyer, MD
 Emily Stonebrook, MD
 Beth A. Vogt, MD
 Amy Wright, APN

Research Faculty

Ashley Jackson, PhD
 Juan de dios Ruiz Rosado, PhD
 Laura Schwartz, PhD

2023 – 2024 Fellows

Morgan Beebe, MD
 Denise Kimbrough, MD, PhD
 Claudia Mosquera-Vasquez
 Mayra Alejandra Oseguera, MD

Melonie Phillips, MD
 Benjamin Russell, MD
 Laura Walawender, MD

Highlights From the Past Year

The Division of Nephrology and Hypertension is staffed by pediatric experts who provide patients and their families with unparalleled and innovative care. In the past year, we opened a new clinic site in Mansfield, Ohio to continue our mission. Our team delivers individualized care to patients and is available to answer all questions and listen to concerns.

Commitment to Discovery

Our work with the Kidney and Urinary Tract Center is a collaborative, integrated process designed to combine patient care, advocacy, research and training to develop the next generation of nephrology and urology treatment for children. Our faculty published 47 peer-reviewed articles in the past year.

Research is supported through various grants. In the past year, Diana Zepeda-Orozco, MD, was awarded a \$3,094,449 R01 grant from the National Institute of Diabetes and Digestive and Kidney Diseases for her research to examine novel diagnostic and therapeutic approaches to promote renal repair in cisplatin-induced kidney toxicity. Dr. Zepeda-Orozco also received another \$2,930,403 R01 grant from the National Cancer Institute to maximize alpha-emitter radioligand therapy (α -RLT), a potent anti-tumor treatment for neuroendocrine tumors and neuroblastoma, using nephroprotective approaches.

Growth and Recognition

We are thrilled to welcome our newest recruits, who bring a wealth of knowledge and expertise to our team. Their diverse backgrounds and innovative approaches will undoubtedly contribute to our ongoing success and growth. New recruits include:

- Kristen Kusumi, MD, who will participate in the Metabolic Bone Clinic and the Kidney Stone Clinic.
- Gabriel Cara-Fuentes, MD, PhD, whose primary appointment is in the Kidney and Urinary Tract Center and will direct the Glomerular Clinic.

Additionally, we are proud to celebrate the outstanding achievements of our faculty and staff, who have been recognized with prestigious awards for their exceptional contributions to their fields. Selected highlights include:

- Ray Bignall, MD: Chair, American Society of Nephrology Justice Committee
- John Mahan, MD: Treasurer, International Pediatric Nephrology Association and Director, American Society of Pediatric Nephrology Leadership Development Program
- Kirsten Kusumi, MD: Co-Chair ASPN Stone and Bone interest group
- Beth A. Vogt, MD, was awarded Nationwide Children’s Physician of the Year from the Nationwide Children’s Medical Staff Office

Selected Publications

Bhayana S, Dougherty JA, Kamigaki Y, Agrawal S, Wijeratne S, Fitch J, Waller AP, Wolfgang KJ, White P, Kerlin BA, **Smoyer WE**. Glucocorticoid- and pioglitazone-induced proteinuria reduction in experimental NS both correlate with glomerular ECM modulation. *iScience*. 2023 Dec 2;27(1):108631.

Li M, Robles-Planells C, Liu D, Graves SA, Vasquez-Martinez G, Mayoral-Andrade G, Lee D, Rastogi P, Marks BM, Sagastume EA, Weiss RM, Linn-Peirano SC, Johnson FL, Schultz MK, **Zepeda-Orozco D**. Pre-clinical evaluation of biomarkers for the early detection of nephrotoxicity following alpha-particle radioligand therapy. *Eur J Nucl Med Mol Imaging*. 2024 Apr;51(5):1395-1408.

Schwartz L, Salamon K, Simoni A, Eichler T, **Jackson AR**, Murtha M, **Becknell B**, Kauffman A, Linn-Peirano S, Holdsworth N, Tyagi V, Tang H, Rust S, Cortado H, Zabbarova I, Kanai A, Spencer JD. Insulin receptor signaling engages bladder urothelial defenses that limit urinary tract infection. *Cell Rep*. 2024 Apr 23;43(4):114007.

Walawender L, Santhanam N, Davies B, Fei YF, McLeod D, **Becknell B**. Müllerian anomalies in girls with congenital solitary kidney. *Pediatr Nephrol*. 2024 Jun;39(6):1783-1789.

Wright ML, Klamer BG, Bonachea E, **Spencer JD**, Slaughter JL, **Mohamed TH**. Positive fluid balance and diuretic therapy are associated with mechanical ventilation and mortality in preterm neonates in the first fourteen postnatal days. *Pediatr Nephrol*. 2023 Jul;38(7):2243-2253.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024
\$1,763,725

>>> Fast Facts: July 2023 – June 2024

Inpatient Discharges:	202	Patient Days*:	1,025
Observation and Outpatient-in-a-Bed Discharges:	121	Kidney Transplants:	14
Total Discharges:	323	Dublin Nephrology Clinic Visits:	222
Average Length of Stay*:	5.07	Heinzerling Nephrology Clinic Visits:	29
Average Daily Census*:	2.81	Main Campus Nephrology Clinic Visits:	5,308

**Excludes observation and outpatient-in-a-bed patients*

“With the advent of novel treatments, patients are living longer and need differing levels of neurorehabilitation support.”

– Emily de los Reyes,
MD



Emily de los Reyes, MD
Pediatric Neurology



NEUROLOGY

Neurorehabilitation for Children With Batten Disease

Therapy should be tailored to each child's needs.

Batten disease comprises a rare group of related genetic disorders characterized by progressive neurodegeneration. The disease primarily presents in childhood as seizures, vision loss, and developmental regression. Neurorehabilitation services, including physical therapy (PT), occupational therapy (OT), and speech-language pathology therapy (SLP), can delay loss of function and impairment and improve quality of life. However, given the rarity of Batten disease, standardized clinical recommendations and outcome assessments for neurorehabilitation have not yet been established.

“Historically, children with Batten disease would have a shortened lifespan. However, with the advent of novel treatments, patients are living longer and need differing levels of neurorehabilitation support,” says Emily de los Reyes, MD, attending pediatric neurologist and director of the Nationwide Children’s Hospital Batten Disease Center of Excellence.

In a study published in *Pediatric Neurology*, Dr. de los Reyes and colleagues describe the developmental profiles and outcome assessments used at Nationwide Children’s for children diagnosed with Batten disease.

The team investigated the occurrence of clinical features that may impact neurorehabilitation that were present in this population. Overall, the most common clinical features were vision impairments (61%) and seizures (68%). Most children experienced delays in fine motor (65%), gross motor (80%), cognitive (63%) and language skills (83%).

Children typically received neurorehabilitation services through early education/school, outpatient clinic, or a combination of these settings. However, to the surprise of the researchers, 20% of children did not receive any PT or OT services, and 25% of children did not receive SLP services.

The study underscores the need for continued development and validation of new outcome measures for children with Batten disease.

“We have needed outcome assessment tools developed specifically for this population to capture changes in their developmental trajectory, to guide clinical recommendations and for use in clinical trials,” adds first author of the study Rachel Bican, PT, DPT, PhD, assistant professor and principal investigator of the Pediatric FUNctional Mobility (FUN) Lab at Ohio University. “The findings from this study have served as a basis for developing those tools within the Batten Clinic at Nationwide Children’s.”

REFERENCE:

Bican R, Goddard V, Abreu N, Peifer D, Basinger A, Sveda M, Tanner K, de Los Reyes EC. Developmental skills and neurorehabilitation for children with Batten disease: A retrospective chart review of a comprehensive Batten clinic *Pediatr Neurol*. 2024 Mar;152:107-114. Epub 2023.

Department of Pediatrics

NEUROLOGY

Providers in the Division of Neurology at Nationwide Children’s Hospital deliver comprehensive care for children with a wide variety of disorders. These children include those with simple and complex epilepsy, primary and secondary headache and migraine, tics and movement disorders, neuroinflammatory conditions, muscular dystrophy, spinal muscular atrophy and neuropathy (acquired and genetic). To correctly identify and safely treat these children, state-of-the-art neurophysiological diagnostic testing and intraoperative monitoring is used. Our mission is to achieve the best outcomes for all children and adolescents with neurological illness.

Faculty



Anne M. Connolly, MD
Division Chief



Jaime-Dawn Twanow, MD
Section Chief



Adam P. Ostendorf, MD
Associate Division Chief
for Research

Stephanie Ahrens, MD
Dara Albert, DO
William D. Arnold, MD
Kristen Arredondo, MD
Sylvia Awadalla, MD
Shawn Aylward, MD
Christopher Beatty, MD
Melissa Chung, MD

Emily De Los Reyes, MD
John L. Eickholt III, MD
Kevin Flanigan, MD
Mariam L. Freimer, MD
Darrah Haffner, MD
Melissa Hutchinson, MD
Monica P. Islam, MD

Latif Khuhro, MD
Neil Kulkarni, MD
Warren D. Lo, MD
Setty Magaña, MD, PhD
Jennifer McKinney, MD
Jerry Mendell, MD
John Mytinger, MD

Stefan Nicolou, MD
Ann Pakalnis, MD
Anup Patel, MD
Toni S. Pearson, MD
Kelsey Poisson, MD
Margie Ream, MD, PhD
Sean Rose, MD

Zarife Sahenk, MD, PhD
Laurel Slaughter, MD
Chang-Yong Tsao, MD
Jorge Vidaurre, MD
Megan Waldrop, MD
Amanda Weber, DO
Pedro Weisleder, MD, PhD

2023 – 2024 Residency and Fellowship Programs

Child Neurology Residents

Ahmed Awad, MD
Brianna Brun, MD
April Consevage, MD
Sean DeBoyace, MD

Maxim Dragoun, MD
Shaymaa Elhadidy, MD
Rae Gumayan, MD
Muhammed Talha Gunduz, MD
Monica Kim, MD
Laura (Kate) Lamberta, DO
Quinton Mandle, MD

Corinne McCabe, MD
Megan McConathy, MD
Alyssa-Claire Mendoza, MD
Richard Miller, MD
Stephanie Rinne, DO
Alexandra Sankovic, MD
Alex Sunshine, MD, PhD

Neurophysiology Fellow

Megan Fredwall, MD

Headache Fellow

Lisa Moore, MD

Neuro/Critical Care Fellow

Carol Park, MD

Highlights From the Past Year

In 2023, we expanded our care for children with complex epilepsy by adding a Complex Epilepsy Clinic at Nationwide Children’s - Toledo. The clinic is led by Amanda Weber, DO.

We also expanded our fellowship programming by offering a Pediatric Neurocritical Care Fellowship. This opportunity offers comprehensive training experience with clinical service, structured research experience and a thorough academic curriculum. The one-year fellowship is divided into 11 clinical months and one research month.

Excellence in Care and Research

The Neurology team at Nationwide Children’s is a recognized leader in pediatric neurological disorders. This is evidenced by the number of externally awarded accreditations and Center of Excellence designations, including:

- ABRET LAB Long-Term Monitoring (LTM) Accreditation
- Batten Disease Center of Excellence
- International Rett Syndrome Foundation Rett Syndrome Center of Excellence
- Leukodystrophy Care Network Certified Center
- Tourette Association of America Center of Excellence

Our team’s research is supported by a variety of National Institutes of Health, industry and other external funding sources. Notable NIH and industry grants received last year include:

- Focal Cerebral Arteriopathy Steroids (FOCAS) Trial, which is part of the NIH Stroke Net. This trial aims to test the hypothesis that among children with suspected focal cerebral arteriopathy, early corticosteroid treatment to prevent progression leads to overall better outcomes than selective, delayed treatment in only the subset that progresses.
- SRP-6004, which is Sarepta’s investigational gene therapy being developed for the treatment of LGMD2B/R2. Sarepta’s investigational LGMD gene therapy, SRP-6004, is designed to express the full-length protein dysferlin that is missing in individuals with LGMD2B/R2.
- EDG-5506-210, which is Edgewise Therapeutic’s 2-part 2 study of safety, pharmacokinetics and biomarkers in children with Duchenne muscular dystrophy including a randomized, double-blind, placebo-controlled part A, followed by an open-label part B.
- Clinical Trial Readiness for Children 0-5 years with Congenital Muscular Dystrophy Secondary to LAMA2 Mutations, led by Anne Connolly, MD, and funded by the NIH.
- SRK-015-004, which is Scholar Rock’s open-label, multicenter, extension trial to evaluate the long-term safety and efficacy of apitegromab in patients with type 2 and type 3 spinal muscular atrophy who completed previous investigational trials of apitegromab.
- Quality Improvement in time to Treatment of Status Epilepticus (QuITT-SE), led by Adam Ostendorf, MD, and funded by the NIH.
- SRP-9001-305, which is Sarepta’s phase 3, multinational, long-term follow-up study to evaluate safety and efficacy in subjects who have previously received SRP-9001 in a clinical study with protocol number.

Selected Publications

Beatty C, Ahrens SM, Arredondo K, Bagic AI, Bai S, Chapman KE, Ciliberto MA, Clarke DF, Eisner M, Fountain NB, Gavvala JR, Perry MS, Rossi KC, Wong-Kisiel LC, Herman ST, Ostendorf AP. Associations between testing and treatment pathways in lesional temporal or extratemporal epilepsy: A census survey of NAEC center directors. *Epilepsia*. 2023 Apr;64(4):821-30.

Beauchamp MH, Degeilh F, **Rose SC.** Improving outcome after pediatric concussion: challenges and possibilities. *Lancet Child Adolesc Health*. 2023 Oct;7(10):728-40.

Boutzoukas AE, Freedman DA, Koterba C, Hunt GW, Mack K, Cass J, Yildiz VO, **De Los Reyes E, Twanow J, Chung M,** et al. La Crosse virus neuroinvasive disease in children: A contemporary analysis of clinical/neurobehavioral outcomes and predictors of disease severity. *Clin Infect Dis*. 2023 Feb;76(3):E1114-22.

Kulkarni N, Albert DVF, Klamer B, Drees M, **Twanow JD.** The spike-wave index of the first 100 seconds of sleep can be a reliable scoring method for electrographic status epilepticus in sleep. *J Clin Neurophysiol*. 2023 Sept;40(6):547-52.

Rao S, Burch M, **Fredwall MM,** Enciso L, Trott K, **Patel AD, Albert DVF.** Multidisciplinary care for pediatric patients with psychogenic nonepileptic seizures may be associated with decreased health care utilization. *Neurol Clin Pract*. 2023 Dec;13(6):e200195.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$9,205,670

>>> Fast Facts: July 2023 – June 2024

Neurology Inpatient

Inpatient Discharges:	279
Observation and Outpatient-in-a-Bed Discharges:	576
Total Epilepsy Monitoring Unit Discharges:	855
Average Length of Stay*:	1.46
Average Daily Census*:	3.42
Patient Days*:	1,250
Average Daily Census of 8 bed Epilepsy Monitoring Unit:	7
Inpatient Neurology Consults:	6,000
Epilepsy Presurgical Evaluations:	137

*Includes Inpatient, observation and outpatient-in-a-bed patients

Neurology Outpatient

Dublin Neurology Clinic Visits:	3,729
East Broad Neurology Clinic Visits:	910
Findlay Neurology Clinic Visits:	51
Heinzerling Neurology Clinic Visits:	56
Main Campus Complex Concussion Clinic Visits:	470
Main Campus Neurology Clinic Visits:	11,013
Mansfield Neurology Clinic Visits:	84
New Albany Complex Concussion Clinic Visits:	153
Stroke Clinic Visits:	232
Westerville Neurology Clinic Visits:	1,789
Total Neurology Clinic Visits:	18,487

Neuromuscular Disorders Outpatient

MDA Clinic Visits:	654
Neuromuscular Disorders Clinic Visits:	847
Spinal Muscular Atrophy Clinic Visits:	191
Total Neuromuscular Clinic Visits:	1,692



Department of Pediatrics

PEDIATRIC PSYCHOLOGY AND NEUROPSYCHOLOGY

The Section of Pediatric Psychology and Neuropsychology in the Department of Pediatrics at Nationwide Children’s Hospital concentrates clinical services in four primary areas: Pediatric Psychology provides specialized assessment and intervention services that focus on the relationship between cognitive, social and emotional functioning and physical health, typically for children with cooccurring medical conditions (e.g., cancer, diabetes, sickle cell disease). Pediatric Neuropsychology performs specialized evaluations for children and adolescents with a range of medical and neurological disorders that impact thinking or behavior (e.g., brain tumors, epilepsy, seizure disorders, traumatic brain injury). Pediatric Psychiatric Acute Care Psychology provides services to support the acute care continuum in the Big Lots Behavioral Health Pavilion. In addition, Intellectual and Developmental Disability/Autism Spectrum Disorder Psychology provides specialized assessment and intervention services for children and adolescents impacted by various genetic and neurodevelopmental disabilities, including autism spectrum disorders. See page 149 for details and for information about all Behavioral Health services.

Faculty



Eric M. Butter, PhD
Chief



Catherine Butz, PhD
Senior Associate Division Chief, Pediatric Psychology and Clinical Programs



Jennifer E. Cass, PhD
Associate Division Chief, Neuropsychology and Quality



Kelly McNally, PhD
Associate Division Chief for Research



Caroline Murphy, PhD
Associate Division Chief, Neurodevelopmental Psychology and Clinical Informatics

Charles Albright, PhD
Jacqueline Aldrich, PhD
Hannah Barton, PhD
Amy E. Baughcum, PhD
Kari Benson, PhD
Doug Bodin, PhD
Shalonda Brooks, PhD
Abbey Caserta, PhD
Danielle Chambers, PhD

Eileen Chaves, PhD
Sindhia Colburn, PhD
Andrea Coppens, PhD
Alison Hatley Cotter, PhD
Canice Crerand, PhD
Jennifer David, PhD
Anne Dawson, PhD
Ashley Debeljak, PhD
Nicole Dempster, PhD

Robert M. Dempster, PhD
Christine Eichelberger, PhD
Anya Froelich, PsyD
Lauren Garbacz, PhD
Molly Gardner, PhD
Frances Beth Garrity-Rokous, PhD
Ellen Geib, PsyD
Cynthia A. Gerhardt, PhD
Shannon Gillespie, PhD

Alana Goldstein-Leever, PhD
Dawn Greathouse, PhD
Amy Hahn, PhD
Jane Hamel-Lambert, PhD

Jennifer Hansen, PhD
Rebecca Hellenthal, PhD
Greta Hilbrands, PhD
Caroline Hodgson, PhD

Jessica Hoehn, PhD
Ariana Hoet, PhD
Kristen E. Hoskinson, PhD
Cody Hostutler, PhD

Jennifer Hughes, PhD
Cara Inglis, PsyD
Jamie Jackson, PhD
Osigwe Ijeoma, PhD

Katie Johanning-Gray, PhD
Oula Khoury, PhD
Rebecca Kirchner, PhD
Chrissie Koterba, PhD
Ashley Kroon Van Diest, PhD
Elizabeth Kryszak, PhD
Kathleen L. Lemanek, PhD
Ann Levine, PhD

Della Lofin, PhD
Barbara Mackinaw-Koons, PhD
Laura M. Mackner, PhD
Marilee Martens, PhD
Babetta Mathai, PhD
Wayne Mason, PhD
Ian McKay, PhD
Hannah McKillop, PhD

Erin McTiernan, PhD
Margaret Mehling, PhD
David Michalec, PhD
Kara Monnin, PhD
Elisabeth Moore, PhD
Katie Mosher, PhD
James A. Mulick, PhD
Megan Norris, PhD

Jessica Palilla, PhD
Ari Rabkin, PhD
Natalie Raff, PhD
Whitney Raglin-Bignall, PhD
Heather Richard, PsyD
Courtney Rice, PsyD
Emily Ronkin, PhD
Margaret Rosencrans, PhD

Nicholas Russell, PhD
Megan Schaefer, PhD
Jessica Scherr, PhD
Rose Schroedl, PhD
Kelsey Shively, PhD
Ashley Showalter, PhD
Adina Seidenfeld, PhD
Micheline Silva, PhD
Destiny Singleton, PhD

Tyanna Snider, PsyD
Janet Souder, PsyD
Kevin Stephenson, PhD
Jack H. Stevens, PhD
Ruhee Sutar, PhD
Moneika Sutton, PhD
Karen Tabern, PhD
H. Gerry Taylor, PhD
Leah Taylor, PhD

Sean Tams, PhD
Kristen Trott, PhD
Natalie Truba, PhD
Kathryn A. Vannatta, PhD
Lindsey Vater, PhD
Sarah N. VerLee, PhD
Bethany Walker, PhD
Jacqueline Warner, PhD
Jonathan Wilkins, PhD

Camille Wilson, PhD
Mary Wojnaroski, PhD
Andrea Wojtowicz, PhD
Noelle Wolf, PhD
Morgan Wright, PhD
Jacqueline Wynn, PhD
Heather L. Yardley, PhD
Tammi K. Young-Saleme, PhD

Selected Publications

Dawson AE, Ray Bignall ON 2nd, Spencer JD, McLeod DJ. A Call to Comprehensively Understand Our Patients to Provide Equitable Pediatric Urological Care. *Urology*. 2023 Sep;179:126-135.

Dotson JL, Bricker J, Chisolm DJ, **Mackner LM**. Patient, Parent, and Provider Perceptions of Barriers to Pediatric Inflammatory Bowel Disease Care *JPGN Rep*. 2023 Nov 8;4(4):e386.

Hails KA, Wellen BC, Simoni M, Gaultney WM, Petts RA, **Hostutler CA**, Riley AR. Parents’ Preferences for Primary Care-Based Behavioral Services and the COVID-19 Pandemic: A Mixed Method Study. *J Pediatr Psychol*. 2023 Nov 16;48(11):879-892.

Olsavsky AL, Ralph J, Benhayoun A, Hill KN, Guttoo P, Akard TF, **Gerhardt C**, Skeens MA. COVID-19 impact, resilience, and child quality of life: A dyadic analysis. *J Fam Psychol*. 2024 Jun;38(4):523-535.

Stephenson KG, Fenning RM, Macklin EA, Lu F, **Norris M**, Steinberg-Epstein R, **Butter EM**. Child Behavior Problems and Parenting Stress in Underserved Families of Children with ASD: Investigation of Family Resources and Parenting Self-efficacy. *J Autism Dev Disord*. 2023 Oct;53(10):3787-3798.

Yang DM, Sabella J, **Kroon Van Diest A**, Bali N, Vaz K, Yacob D, Di Lorenzo C, Lu PL. Early childhood-onset rumination syndrome is clinically distinct from adolescent-onset rumination syndrome. *J Pediatr Gastroenterol Nutr*. 2024 Mar;78(3):565-572.



Grants Awarded
JULY 1, 2023 – JUNE 30, 2024
\$5,191,186

>>> Fast Facts: July 2023 – June 2024

Inpatient Consultations:	6,658	Psychology Medical Clinic Visits/Outpatient	
Psychology Clinic Visits:	16,760	Consultation Visits:	24,165

Department of Pediatrics
PRIMARY CARE PEDIATRICS

Pediatricians in the Division of Primary Care Pediatrics at Nationwide Children’s Hospital staff the 14 Nationwide Children’s Primary Care Centers located throughout the Columbus area. A multidisciplinary staff provides comprehensive primary care services for a diverse and underserved population of patients.

Faculty



Alex R. Kemper, MD, MPH, MS
 Division Chief



Dane A. Snyder, MD
 Section Chief

- | | |
|-----------------------------------|--------------------------|
| Mary Ann Abrams, MD | Aarti Chandawarkar, MD |
| Akua A. Amponsah, MD | Linda E. Chun, MD |
| Kristen Beck, MD | Katharine Coffman, MD |
| Stefanie R. Bester, MD | Duane R. Copenheaver, MD |
| Sara Bode, MD | Emily A. Decker, MD |
| Courtney Brown, MD | Tanya Dedyo, MD |
| Megan Brundrett, MD | Sarah Denny, MD |
| Milagro P. Castaneda-Vidaurre, MD | Meghan Dishong, MD |

- | | | | |
|--------------------------------|------------------------|---------------------|------------------------|
| Ahmani Doodoo, DO | Sean P. Gleeson, MD | Lisa Humphrey, MD | Ranee Jostpille, MD |
| Allyson Driggers Gallagher, MD | Gabriella Gonzales, MD | Evan Ingram, MD | Skyler Kalady, MD |
| Maretta Fan, DO | Judith A. Groner, MD | Sinimol James, MD | Tatyana Karakay, MD |
| Nadia Ferder, MD | Malika Haque, MD | Angela V. Jones, MD | Amrik Singh Khalsa, MD |
| Ashley Fernandes, MD | Laura Hart, MD | Rajneesh Jain, MD | Jack A. Kopechek, MD |
| Jessica Gefvert, MD | Stephen J. Hersey, MD | Shelby Jordan, MD | Alicia Kuper, DO |

- | | | | |
|------------------------|---------------------------|----------------------|------------------------------|
| Mary Kay Kuzma, MD | Shengyi Mao, MD | Belinda M. Mills, MD | Stephanie Quach, MD |
| Deanna LaBianca, DO | Laura Martin, MD | Alana Milton, MD | Alexander T. Rakowsky, MD |
| Lauren Lange Smith, MD | Rose Martoma, MD | Asma Mobin-Uddin, MD | Jessica Retzke, MD |
| Benjamin Levinson, MD | Lucas McKnight, MD | Mary A. Nelin, MD | Jennifer Ricciardo, MD |
| Caroline Lieser, MD | Douglas J. McLaughlin, MD | Barbara Oettgen, MD | Nathan Richards, MD |
| Gilbert Liu, MD | Melissa A. Meyer, MD | Michele Oortey, MD | Richard E. Rodenberg Jr., MD |
| Jonathan T. Lucas, MD | Christopher Miller, MD | Aubrey Pizza, MD | Allison Rossetti, MD |

- | | | | |
|---------------------|-----------------------|--------------------------|------------------------|
| Andrea Sattler, MD | Kimberly Stettler, MD | Gina R. Thompson, DO | Mark Wells, MD |
| Sara Schroder, MD | Lisa Stone, DO | Jagadisharaje K. Urs, MD | Aisha White, MD |
| Na’il Scoggins, MD | Angelica Storms, MD | Jose Vargas, MD | Dominique Williams, MD |
| Andrew Searcy, MD | Kathleen Sugrue, MD | Suzanne Voorhees, MD | Mark Winerman, MD |
| Amina Smajlovic, MD | Melissa Swanson, MD | Shravani Vundavalli, MD | |
| Brandi Spitler, DO | Janice Taylor, MD | Caroline Weingart, MD | |

Highlights From the Past Year

The Primary Care Centers provide comprehensive care primarily for children from birth to 21 years of age. Available services include preventive care, chronic disease management and acute care, with both scheduled and same-day, walk-in access.

With the expansion of the Olentangy Primary Care Center, our team completed more the 239,000 patient visits in 2023. We also developed a new clinic for patients that are new to the United States and have not yet established a medical home.

Professional Involvement and Recognition

Nationwide Children’s Primary Care Network has received NCQA Patient-Centered Medical Home (PCMH) recognition for using evidence-based, patient-centered processes that focus on highly coordinated care and long-term, participative relationships. Additional selected highlights include:

- The Primary Care Network received the 2023 Center for Clinical Excellence Quality award.
- Alex Kemper, MD, MPH, MS, serves as deputy editor for the journal *Pediatrics*.
- Sarah Denny, MD, is president-elect of the Ohio chapter of the American Academy of Pediatrics.

Research and Collaboration

Research in the division continues to focus on strategies to improve the delivery of preventive health care services, with a special focus on early child health and behavioral health care services. Research also continues strategies to promote the appropriate use of antibiotics. Our faculty contributed to 36 peer-reviewed articles in the last year.

Alex Kemper, MD, MPH, MS, serves as the Chair of the Evidence Review Group for the U.S. Secretary of Health and Human Services Advisory Committee on Heritable Disorders in Newborns and Children. Research collaborations continue projects funded by the Patient-Centered Outcomes Research Institute with Seattle Children’s Hospital to improve the delivery of preventive care services and with the Children’s Hospital of Philadelphia to improve antibiotic stewardship. The Division of Primary Care Pediatrics has strong multidisciplinary clinical partnerships across Nationwide Children’s to improve outcomes for asthma, autism, depression, suicide risk, antibiotic allergies and a wide variety of other health conditions.

Selected Publications

Hart LC, Viswanathan M, Nicholson WK, Silverstein M, Stevermer J, Harris S, Ali R, Chou R, Doran E, Hudson K, Rains C, Sathe N, Zolotor AJ. Evidence from the USPSTF and new approaches to evaluate interventions to prevent child maltreatment. *JAMA Netw Open*. 2024 Jul 1;7(7):e2420591.

Hersey SJ, Retzke J, Allen ED, **Snyder D**, Hardy C, **Groner J**. A primary care-based quality improvement project to reduce asthma emergency department visits. *Pediatrics*. 2023 Dec 1;152(6):e2023061355.

Hostutler C, Wolf N, Snider T, Butz C, **Kemper AR**, Butter E. Increasing access to and utilization of behavioral health care through integrated primary care. *Pediatrics*. 2023 Dec 1;152(6):e2023062514.

Ream MA, Lam WKK, Grosse SD, Ojodu J, Jones E, Prosser LA, Rose AM, Comeau AM, Tanksley S, Powell CM, **Kemper AR**. Evidence and recommendation for guanidinoacetate methyltransferase deficiency newborn screening. *Pediatrics*. 2023 Aug 1;152(2):e2023062100.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024
\$4,538,0971

>>> Fast Facts: July 2023 – June 2024

Primary Care Network Visits: **237,467**
 Unique Patients Treated in Entire Primary Care Network: **111,990**

Department of Pediatrics

HEALTHY WEIGHT AND NUTRITION

The Center for Healthy Weight and Nutrition at Nationwide Children’s Hospital offers a comprehensive approach to weight management with medical and bariatric surgery programs for the prevention and treatment of children and young adults, ages 2 to 21 years, with obesity. The center’s mission is to empower children and families to establish a foundation for healthy lifestyles through clinical care, education, research, community engagement and advocacy.

Faculty



Gina R. Thompson, DO
Interim Director



Marc P. Michalsky, MD, MBA,
FACS, FAAP
Surgical Director

Angelica A. Storms Avina, MD
Eileen Chaves, PhD
Hiba Salhah, MD
Keeley Pratt, PhD
Affiliate Faculty, OSU

Highlights From the Past Year

Promoting Healthy Kids Everywhere

The Center for Healthy Weight and Nutrition is dedicated to improving care for children across central Ohio and throughout the country. The center anchors the obesity metric in the hospital’s signature population health initiative, Pediatric Vital Signs, which involves numerous community partnerships and aims to enhance clinician training opportunities for those caring for children with obesity.

The center leads the ECHO (Extension for Community Care Outcomes) Obesity framework which trained and supported more than 300 health care professionals in 2023.

Additionally, the center convenes a multisector coalition, Healthy Kids of Central Ohio, to address, develop and influence policy recommendations and community-level practices that affect the overall health and well-being of children living in Central Ohio, ages 0-18 years. Healthy Kids Coalition aims to achieve the following vision: Central Ohio is a community in which all children have daily opportunities to be physically active and have access to nutritious foods, so they are ready to live, learn and play at their best.

Commitment to Quality, Innovation and Excellence

The center’s adolescent bariatric surgery program has been accredited by the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) since 2015 and was successful re-accredited in 2022.

The center faculty provides leadership for several leading national organizations in the field including the American Society for Metabolic and Bariatric Surgery (ASMBS) and the American Academy of Pediatrics.

Experts in the center are also involved in research efforts. A newly funded grant enables center faculty to explore the therapeutic alliance in pediatric weight management, including primary care perspectives on metabolic and bariatric surgery in youth.

Selected Publications

Michalsky MP, Pratt J. Addressing Disparities and underutilization of adolescent metabolic and bariatric surgery. *Pediatrics.* 2024 Mar 1;153(3):e2023064375.

Perez ME, **Pratt KJ, Chaves E.** Associations between adolescent preoperative mental health, psychosocial factors, and body mass index. *Obes Surg.* 2024 Jul;34(7):2744-2750.

Pratt KJ, Boles RE, **Michalsky MP,** Inge TH, Jenkins TM. Associations between marital status and weight loss trajectories entering into early adulthood: a Teen-LABS study. *Surg Obes Relat Dis.* 2024 Apr;20(4):376-382.

Roberts KJ, **Chaves E,** Ariza AJ, Thaker WV, Cho CC, Binns HJ. Exploring genetic testing for rare disorders of obesity: experience and perspectives of pediatric weight management providers. *Child Obes.* 2024 Jan 8. Epub ahead of print.

Griffin K, Svetanoff WJ, Diefenbach K, Aldrink JH, Mansfield SA, Schwart D, McManaway C., and **Michalsky MP.** ERAS Protocol for Pediatric Metabolic and Bariatric Surgery: A Single Institutional Perspective and Lessons Learned. *J Ped Surg Open.* 2024 April;6:100131.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$360,470

>>> Fast Facts: July 2023 – June 2024

Bariatric Clinic Visits:	768	Westerville Healthy Weight Clinic Visits:	869
Healthy Weight and Nutrition Clinic Visits:	2,826	Total Clinic Visits:	5,274
Hilliard Healthy Weight Clinic Visits:	811		

“We wanted to know if anything specifically related to the perinatal period could lead to issues such as recurrent wheezing.”

– Brooke R. Gustafson, MD



PULMONARY, SLEEP MEDICINE AND CYSTIC FIBROSIS

What Are the Risk Factors for Recurrent Wheezing in Late Preterm Infants?

A recent collaboration between researchers identifies four risk factors associated with recurrent wheezing in these patients.

Mitchell H. Grayson, MD, chief of the Division of Allergy and Immunology at Nationwide Children’s Hospital, and Brooke R. Gustafson, MD, member of the Section of pediatric Pulmonary Medicine at Nationwide Children’s and an assistant professor of pediatrics at The Ohio State University College of Medicine, collaborated to see if understanding the risks of recurrent wheezing in late preterm infants would help avoid chronic respiratory issues like asthma or allergies later in life.

“There is a lot of research done on progressive lung disease in infants born before 32 weeks. We also know that premature infants who are born closer to term and don’t have extreme lung issues can develop recurrent wheezing as well. We wanted to know if anything specifically related to the perinatal period could lead to issues such as recurrent wheezing,” Dr. Gustafson says.

The study, recently published in *Pediatric Pulmonology*, identified recurrent wheezing by a diagnosis of reactive airway disease, wheezing-associated respiratory infection, wheezing, or asthma at least twice during the first three years of life.

The risk factors examined included various factors related to these infants’ birth, neonatal care, and early life experiences. Dr. Gustafson found that recurrent wheezing was associated with positive family history of asthma, receiving antibiotics during the neonatal period, requiring continuous positive airway pressure (CPAP) for less than 24 hours, receiving supplemental oxygen during the newborn period, and requiring any degree of respiratory support.

Overall, the study found that exposure to any type of respiratory support, including invasive mechanical ventilation, noninvasive ventilation like CPAP, or oxygen, was a significant factor associated with developing recurrent wheezing, regardless of duration those supports were needed.

Identifying these risk factors at birth may assist physicians in providing more effective treatment and knowing what issues to look for. According to Dr. Gustafson, more studies are needed to determine whether these factors can predict recurrent wheezing in this patient population.

REFERENCE:

Gustafson B, Britt RD Jr, Eisner M, Narayanan D, Grayson MH. Predictors of recurrent wheezing in late preterm infants. *Pediatr Pulmonol.* 2024 Jan;59(1):181-188.



Department of Pediatrics

PULMONARY, SLEEP MEDICINE AND CYSTIC FIBROSIS

The Division of Pulmonary, Sleep Medicine and Cystic Fibrosis at Nationwide Children’s Hospital provides the highest quality clinical care for children and adults with congenital respiratory disorders including asthma, cystic fibrosis, primary ciliary dyskinesia, interstitial lung diseases, disorders of breathing control, sleep-related breathing disorders, hemoglobinopathies and neuromuscular diseases. Additionally, our providers care for those approaching and following lung and heart-lung transplant, advanced lung disease management, and for management of those requiring long-term mechanical ventilation. Given the many challenges these children and their families face, it is important that the care we deliver is multidisciplinary and often multi-specialty in nature. Another extremely important part of our mission is to provide medical education to prepare the next generation of clinicians, scientists, and educators.

Multispecialty Collaborators: Endocrinology, Hematology/Oncology, Pediatric and Adult Gastroenterology, Hepatology and Nutrition; Cardiology/Cardiac Failure, Neurology/Neuromuscular, Otolaryngology, Psychiatry, Psychology

Multidisciplinary Staff: respiratory therapists, registered dietitians, pharmacists, social workers (LISW and LISW-S), research coordinators, genetic counselors, clinical nursing (RN, APN), clinic staff (RN, LPN, MA); Pulmonary Research Core, Child life and dedicated administrative staff.

Faculty



Karen S. McCoy, MD
Division Chief
Associate Division Chief for



Richard D. Shell, MD
Section Chief

Debra Boyer, MD

Courtney Gushue, DO

Brooke Gustafson, MD

John Heintz, MD

Melissa Holtzlander, MD

Sehyr Imran, MD

Maninder Kalra, MD

Stephen Kirkby, MD

Kavitha Kotha, MD

Robert Kowatch, MD

Katelyn Krivchenia, MD

Anne May, MD

Eric Mull, DO

Sabrina Palacios, MD

Alpa Patel, MD

Grace Paul, MD

Shahid Sheikh, MD

Lisa Ulrich, MD

2023 – 2024 Fellows

Sarah Cohen, MD

Michelle Gillespie, MD

Swati Jayaram, DO

Rachel Ronau, DO

Kyndall Smith, MD

Terace Thomas, MD

Lusine Unanyan, MD

Highlights From the Past Year

In 2023, the first gene therapy of its kind for Duchenne muscular dystrophy was approved by the Food and Drug Administration under accelerated approval. This year, we saw expanded approval. We are proud to have been part of the research team conducting clinical trials supporting innovations in care for patients with muscular dystrophy. Our long history of collaboration with the Center for Gene Therapy and the Neuromuscular Disorders program here at Nationwide Children’s was also integral to the approval of the first systemically delivered gene therapy (Zolgensma for Spinal Muscular Atrophy) in 2019.

This past year our Pulmonary Clinics saw 18% growth. We also expanded our expertise and offerings by adding advanced bronchoscopy procedures, such as lung biopsies, balloon dilation of the bronchi, and endobronchial valve placement for the treatment of bronchopulmonary fistulas.

Accreditations

This year, we are proud to be one of eight centers to be renewed as Cystic Fibrosis Foundation Research Development Programs (RDPs). As part of this network of research centers, we are working with other elite scientists across different disciplines all working toward overcoming challenges associated with cystic fibrosis.

We also renewed accreditations in the following areas:

- CF Pediatric Center
- CF Adult Center
- Interstitial Lung Disease
- Primary Ciliary Disease
- Lung Transplant
- Sleep Center
- Muscular Dystrophy Association
- Parent Project Muscular Dystrophy Neuromuscular Center

Educating the Next Generation of Experts

Our accredited Pediatric Pulmonary Fellowship program makes the training and education of future specialists our top priority. Our large program has consistently filled fellowship positions in a national environment of insufficient numbers of applicants. We have a thriving combined pediatric and adult pulmonary pathway. Our fellows have graduated and taken positions all over the United States with nearly all our graduates staying in academic medicine. We take pride in the success our fellows have consistently achieved in their research, national presentations, external grants and other scholarly activities.

Research and Academic Excellence

Our researchers received more than \$1 million in grants from the Cystic Fibrosis Foundation last year, covering six projects, including two fellowships. Our faculty published 29 peer-reviewed articles and continues to collaborate with other academic centers to benefit children with cystic fibrosis and other pulmonary conditions. Our collaborations support innovative new discoveries and approaches to care for children with pulmonary disorders through trials of novel therapeutics, registry work and more. Collaborators include Atrium Health, Boston Children’s Hospital, Saint Louis University, Children’s Hospital of Philadelphia, University of Alabama at Birmingham, University of North Carolina at Chapel Hill, Vanderbilt University Medical Center, The Ohio State University and the Ohio Valley Consortium.

Driving the Field Forward

Our faculty are part of numerous professional and advocacy groups, often taking leadership roles. These activities help advance care and research for patients across the globe. Highlighted participation in these activities follows:

- Steve Kirkby, MD, is the president of the Pediatric Pulmonary Training Directors Association, which is associated with the American Thoracic Society. He is also the vice chair for the Pediatric Network Steering Committee of the American College of Chest Physicians.
- Katelyn Krivchenia, MD, is the chair of the Medical Advisory Council for A Kid Again, National Chapter. She’s also an Advisory Board Member for the childhood Interstitial and diffuse Lung Disease (chILD) Foundation National Board of Directors.
- Lisa Ulrich, MD, serves as a committee member on the CHEST Physician Editorial Board and CHEST Pediatric Chest Medicine Section.
- Alpa Patel, MD, is on the CF Foundation Therapeutics Development Network Public Relations Committee.
- Debra Boyer, MD, is the International Conference Committee Chair for the American Thoracic Society. She is also an American College of Graduate Medical Education Appeal Panel member for Pediatric Pulmonology. Dr. Boyer also received the residential Commendation from the American Thoracic Society.

- Karen McCoy, MD, is a member of the CF Foundation Center Accreditation Committee.
- Grace Paul, MD, is a member of the CF Foundation’s Global Health Advisory Committee.
- Richard Shell, MD, is the chair of the Adjudication Committee for Ionis Pharmaceuticals, a member of the DMD Care Considerations Committee Pulmonary Working Group and a member of the Certification Committee for Parent Project Muscular Dystrophy.
- Shahid Sheikh, MD, is the vice chair of the Airway Network Steering Committee for the American College of Chest Physicians. He is the chair of the Ethics and Grievance Committee of the Association of Physicians of Pakistani Descent of North America (APPNA). Locally, he chairs the APPNA Ohio Chapter’s Social Welfare and Disaster Relief Committee. Dr. Sheikh received the Distinguished CHEST Educator Award from the American College of Chest Physicians.

Selected Publications

Gushue C, Eisner M, Bai S, Johnson T, **Holtzlander M**, **McCoy K**, **Sheikh S**. Impact of Elexacaftor-Tezacaftor-Ivacaftor on lung disease in cystic fibrosis. *Pediatr Pulmonol*. 2023 Aug;58(8):2308-2316.

Sheikh S, Ho ML, Eisner M, **Gushue C**, **Paul G**, **Holtzlander M**, Johnson T, **McCoy KS**, Lind M. Elexacaftor-tezacaftor-ivacaftor therapy for chronic sinus disease in cystic fibrosis. *JAMA Otolaryngol Head Neck Surg*. 2023 Dec 1;149(12):1075-1082.

Shell RD, McGrattan KE, Hurst-Davis R, Young SD, Baranello G, Lavrov A, O’Brien E, Wallach S, LaMarca N, Reyna SP, Darras BT. Onasemnogene abeparvovec preserves bulbar function in infants with presymptomatic spinal muscular atrophy: a post-hoc analysis of the SPR1NT trial. *Neuromuscul Disord*. 2023 Aug;33(8):670-676.

Ulrich LM, **Palacios S**, Boyer D, **Kirkby S**. Novel and engaging teaching method for pulmonary physiology. *J Med Educ Curric Dev*. 2023 Dec 27;10:23821205231221722.

Ulrich L, Yell J, **Holtzlander M**. Asthma medication use and health care utilization evolution during pandemic times. *Pediatr Pulmonol*. 2023 Oct;58(10):2757-2760.



Grants Awarded
JULY 1, 2023 – JUNE 30, 2024
\$1,909,619

>>> Fast Facts: July 2023 – June 2024

Inpatient Discharges:	725	Pulmonary Diagnostics Clinic Visits	
Observation and Outpatient-in-a-Bed Discharges*:	2,320	Pulmonary Rehab Clinic Visits:	614
Total Discharges:	3,045	Dublin Pulmonary Diagnostics Clinic Visits:	15
Average Length of Stay†:	8.19	Main Campus Pulmonary Diagnostics Clinic Visits:	336
Average Daily Census†:	16.27	Westerville Pulmonary Diagnostics Clinic Visits:	86
Patient Day†:	5,940	Total Pulmonary Diagnostics Clinic Visits:	1,051
Inpatient Consults:	642	Sleep Disorders Center	
Cystic Fibrosis Total Unique Patients:	562	Main Campus Sleep Clinic Visits:	693
*Excludes sleep studies		Dublin Sleep Clinic Visits:	1,745
†Excludes observation and outpatient-in-a-bed patients		Hilliard Sleep Clinic Visits:	34
Pulmonary Clinic Visits		New Albany Sleep Clinic Visits:	263
Dublin Pulmonary Clinic Visits:	829	Westerville Sleep Clinic Visits:	800
Lima Pulmonary Clinic Visits:	212	Total Sleep Clinic Visits:	3,535
Lung Transplant Clinic Visits:	65		
Main Campus Pulmonary Clinic Visits:	7,336		
Westerville Pulmonary Clinic Visits:	2,850		
Total Pulmonary Clinic Visits:	11,292		

SLEEP DISORDERS CENTER

Faculty



Maninder S. Kalra, MD, PhD
Medical Director, Sleep
Medicine

Margaret Chase, MD

Sehyr Imran, MD

A. Latif Khuhro, MD

Robert Kowatch, MD, PhD

Paola Malerba, PhD

Anne May, MD

Brandon Morgan, MSW, LISW

Alpa Patel, MD

Grace Paul, MD

Nicholas Russell, PhD

Jack Stevens, PhD

Fellows

Swati Jayaram, MD

Sarah Knapp, MD

Kimberly Vandongen, MD

Highlights From the Past Year

Accredited by the American Academy of Sleep Medicine, the Sleep Disorders Center at Nationwide Children’s Hospital provides outpatient and inpatient consultations for children with a wide variety of sleep disorders. General Sleep Disorders clinics are now held at Dublin, Hilliard, Main Campus, New Albany and Westerville. The Sleep Clinic volume increased by 20% in the past year, with over 3,000 patient visits. The Sleep Lab volume also increased by 10% in the past year, with over 2,750 sleep studies completed.

Dedicated multidisciplinary clinics are conducted for the following disorders:

- Behavioral insomnia
- Hypersomnia
- Complex obstructive sleep apnea
- Prader-Willi syndrome
- Positive airway pressure dependent
- Polycystic ovarian syndrome

Diagnostic testing is provided in sleep laboratories at Nationwide Children’s Lew Center and Main Campus with a combined testing capacity of 14 patients nightly. Home sleep testing is also provided for a select group of patient ages 18 years and older.

Commitment to Training and Research

As part of the Sleep Medicine Fellowship Program at The Ohio State University College of Medicine, the center provides two months of clinical training to sleep medicine fellows each year. This training includes didactic lectures, supervised clinical experience and interpretation of polysomnographic studies.

The Sleep Disorders Center also participates in the training of medical students and residents at The Ohio State University and Nationwide Children’s. Over the past 15 years, 58 sleep medicine and pediatric subspecialty fellows have completed required rotations in pediatric sleep medicine at the center.

Sleep Center faculty continues to collaborate with the Malerba Lab in the Center for Biobehavioral Health on two ongoing research projects investigating sleep brain oscillations and their role in cognition and health. Sleep disorders research from the center was presented at the following national meetings:

- Sleep 2024
- Society of Pediatric Psychology Annual Conference 2024

Awards and Recognition

Each of our faculty brings unique talents and expertise to the team. Selected professional involvement highlights include:

- Maninder Kalra, MD, PhD, is co-chair of Pediatric Sleep ISR committee of AASM and is a member of AASM Artificial Intelligence Committee and CHEST Pediatric Pulmonary Committee.
- Alpa Patel, MD, is a member of the CHEST Sleep Disorders Committee.
- Anne May, MD, is a member of the AIBM Sleep Board Exam Committee.

Selected Publications

Adrian M, McCauley E, Gallop R, **Stevens J**, Jobes DA, Crumlish J, Stanley B, Brown GK, Green KL, Hughes JL, Bridge JA. Advancing Suicide Intervention Strategies for Teens (ASSIST): study protocol for a multisite randomised controlled trial. *BMJ Open*. 2023 Dec 12;13(12):e074116.

Alipour M, Seok S, Mednick SC, **Malerba P**. A classification-based generative approach to selective targeting of global slow oscillations during sleep. *Front Hum Neurosci*. 2024 Feb 13;18:1342975.

Phelan KJ, Dill-McFarland KA, Kothari A, Segnitz RM, Burkle J, Grashel B, Jenkins S, Spagna D, Martin LJ, Haslam DB, Biagini JM, **Kalra M**, McCoy KS, Ross KR, Jackson DJ, Mersha TB, Altman MC, Khurana Hershey GK. Airway transcriptome networks identify susceptibility to frequent asthma exacerbations in children. *J Allergy Clin Immunol*. 2023 Jul;152(1):73-83.

Ramsey ML, Li SS, Lara LF, Gokun Y, Akshintala VS, Conwell DL, Heintz J, Kirkby SE, McCoy KS, Papachristou GI, **Patel A**, Singh VK, Hart PA. Cystic fibrosis transmembrane conductance regulator modulators and the exocrine pancreas: A scoping review. *J Cyst Fibros*. 2023 Mar;22(2):193-200.

Tomatis-Souverbille C, Lyman E, Thomas T, **May A**, Erdem G. Ventilator-associated respiratory infections in children on home invasive mechanical ventilation. *Pediatr Pulmonol*. 2024 Aug;59(8):2141-2144.

Department of Pediatrics

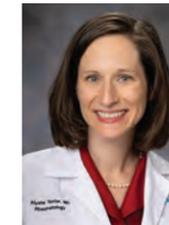
RHEUMATOLOGY

Our mission is to improve the lives of children with rheumatic disease through high-quality and innovative care, education and research. The Division of Rheumatology at Nationwide Children's Hospital provides comprehensive, compassionate, evidence-based clinical care to children with musculoskeletal and rheumatic diseases, conducts research on these diseases, and educates students, residents, fellows and pediatricians. The division is involved in several quality improvement projects to improve outcomes for children with rheumatic disease, and partners with patients and families in these efforts.

Faculty



Stacy Payne Ardoin, MD, MS
Chief



Alysha J. Taxter, MD, MSCE
Associate Division Chief
for Research

Shoghik Akoghlanian, MD
Melissa Argraves, MD, MEd
Kyla Driest, MD, MEd
Ysabella Esteban, MD, MS
Gloria C. Higgins, PhD, MD
Edward Oberle, MD
Laura R. Pratt, MD
Vidya Sivaraman, MD

2023 – 2024 Fellows
Samantha Coss, MD, PhD
Lauren Harper, MD
Kendra Lauer, DO
Ivana Stojkic, MD

Highlights From the Past Year

This year has been exciting for the Division of Rheumatology. Our outpatient volumes increased by 15% from 2022 to 2023. During 2023-2024 we experienced continued growth in the following specialty clinics: Lupus and Vasculitis Clinic, Hypermobility Clinic and Neuroimmunology Clinic. Our Rheumatology Clinic and administrative offices relocated to the Livingston Orthopedic and Surgery Center in May 2024. The new state-of-the-art building supports our goals to offer comprehensive one-stop care for patients and their families.

We have established a Pediatric Rheumatology Joint Injection clinic in conjunction with the Surgery Center. We have dedicated space and time to safely, comfortably, and timely complete sedated procedures, including the ability to complete ultrasound guided joint injections. We continue to expand our Musculoskeletal Ultrasound, Joint Injection and Hypermobility Clinic providers and resources to improve patient experience and outcomes. We also now utilize point-of-care ultrasound utilization in routine care and have a dedicated ultrasound clinic completed by our pediatric rheumatology ultrasound experts.

Expanded Approach and Recognized Excellence in Hypermobility Care

Laura R. Pratt, MD, joined the rheumatology faculty in 2023 as an attending physician. She's also an assistant professor of Pediatrics at The Ohio State University. She brings expertise in musculoskeletal ultrasound to the team. She is passionate about medical education and has clinical and research interests in encouraging physical activity for children with juvenile idiopathic arthritis and hypermobility.

The Hypermobility Clinic has expanded to include Dr. Pratt as a provider and William Black, PhD, from the Center for Biobehavioral Health as a clinical and research psychologist with expertise in chronic pain related to hypermobility. Additionally, our Hypermobility Program was recognized as a Research Center of Excellence by the Ehlers-Danlos Society.

Whole Child Focus Supports Best Outcomes

We are one of the only pediatric rheumatology clinics in the country to screen for mental health conditions, including anxiety, depression and suicide. All patients with lupus and lupus-related conditions complete mental health screening at every visit. Additionally, we have expanded these screenings to all patients who meet with our dedicated pediatric rheumatology psychologist.

Collaboration and Advocacy for Children With Rheumatoid Disease

The Division of Rheumatology at Nationwide Children’s is engaged in local and national advocacy, participating in and leading events sponsored by the Ohio Association of Rheumatology, Arthritis Foundation, Lupus Foundation of America, Cure Juvenile Myositis, Vasculitis Foundation and Scleroderma Foundation.

Selected Research and Clinical Achievements

Our team is involved in research projects across the organization and with collaborators across the nation. This year we had 22 peer-reviewed articles published by our faculty. Our research is supported by National Institutes of Health grants. Some notable grants we received this year include:

- Center for Lupus Research, supported by Cornell University Joan and Sanford I. Weill College of Medicine and the NIH. This project seeks to evaluate pathogenesis of systemic lupus erythematosus in children and adolescents with lupus.
- Autoantibodies, T cells and Complement in Juvenile Dermatomyositis, supported by Cure JM Foundation. This project seeks to evaluate impact of autoantibody, T cell and complement dysfunction in juvenile dermatomyositis.
- Efficacy and Safety of Pharmacokinetically-Driven Dosing of Mycophenolate Mofetil for the Treatment of Pediatric Proliferative Lupus Nephritis - A Double-Blind Placebo Controlled Trial (PLUMM), supported by the NIH/National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS). This project aims to determine optimal dosing of mycophenolate mofetil for children and adolescents with lupus nephritis.
- Phase 3, Randomized, Double-blind, Parallel-group, Placebo-Controlled Study to Evaluate the Pharmacokinetics, Pharmacodynamics, Efficacy, and Safety of IV Anifrolumab in Pediatric Participants with Active Systemic Lupus Erythematosus Investigation of Genetic and Molecular Determinants of Cardio-Vascular Risk in a Global Cohort of Young People with Juvenile Systemic Lupus Erythematosus (JSLE), funded by AstraZeneca. The purpose of this study is to characterize the pharmacokinetics, pharmacodynamics, efficacy and safety of anifrolumab administered intravenously every 4 weeks in pediatric participants 5 to < 18 years of age with moderate to severe active systemic lupus erythematosus while on background standard of care therapy.

Our faculty are also regularly recognized for their contributions to research, medical education and clinical care.

- Samantha Coss, MD, PhD, was awarded the Pediatric Scientist Development Program Career Development Award to support the early career development for pediatric physician scientists. Her research focuses on understanding the immunopathology of myositis conditions.
- Edward Oberle, MD, Laura Pratt, MD, and Ysabella Esteban, MD, MS, are collaborating with investigators across the country to develop scoring systems to standardize scoring systems for ultrasounds to enhance their use in clinical care and research.
- Dr. Oberle received the Golden Stethoscope Award from Nationwide Children’s Hospital. Dr. Vidya Sivaraman was elected to Alpha Omega Alpha honor society.
- Dr. Alysha Taxter received the Women in Medicine Shining Star award from the Ohio State University Medical Center.

We continue to be one of the top enrolling centers for the Childhood Arthritis and Rheumatology Research Alliance (CARRA) Registry and biorepository and for the juvenile idiopathic arthritis quality improvement network, Pediatric Rheumatology- Clinical Outcomes Care and Improvement Network (PR-COIN). Investigators from our center are members of the Pediatric Rheumatology Collaborative Study Group.

Growing the Rheumatology Pipeline Through Professional Organizations

We believe in active participation in professional organizations to support excellence in our field and benefits for children everywhere. Our faculty are active leaders and members in numerous organizations.

- Stacy Ardoin, MD, MS, serves as vice president of the Childhood Arthritis and Rheumatology Research Alliance (CARRA), member of the Rheumatology Research Foundation’s Leadership Development Council and as member of board of directors of the Ohio Association of Rheumatology.
- Dr. Oberle is a member of the Ultrasound School of North American Rheumatologists (USSONAR) faculty. He also served as medical co-chair for the Arthritis Foundation’s national Juvenile Idiopathic Arthritis Family Summit for the second year.
- Alysha Taxter, MD, MSCE, was elected to serve on the CARRA Finance Committee and was nominated to serve on the American College of Rheumatology (ACR) Committee on Registries and Health Information Technology.
- Kyla Driest, MD, MEd, was elected to serve on the CARRA Membership Committee.
- Shoghik Akoghlanian, MD, was elected to serve on the CARRA Ethics Committee.

Selected Publications

Esteban Y, Rodriguez-Smith J, Tominna M, Cassidy A, Meyers AB, Henrickson M, Ting TV, Vega-Fernandez P. Dissemination of a pediatric musculoskeletal POCUS scoring system via virtual education: A proof-of-concept study. *POCUS J.* 2023 Nov 27;8(2):146-152.

Goldstein-Leever A, Bearer C, Sivaraman V, Akoghlanian S, Gallup J, Ardoin S. Increasing access to psychological services within pediatric rheumatology care. *Pediatr Rheumatol Online J.* 2023 Jun 2;21(1):51.

Kendel NE, Stanek JR, **Thomas BB, Ardoin SP, O’Brien SH.** Assessing bleeding symptoms in pediatric patients with generalized joint hypermobility. *Arthritis Care Res (Hoboken).* 2023 Aug;75(8):1788-1794.

Nowicki KD, Balboni IM, Cidon MJ, Dhanrajani AD, **Driest KD, Fair DC, Imundo LF, Mehta JJ, Tarvin SE, Walters HM, Woolnough LC, Edgar LC, Curran ML.** Assessing pediatric rheumatology fellow competence in the milestone era: Past, present, and future. *Arthritis Care Res (Hoboken).* 2024 May;76(5):600-607.

Peng J, Dönnies P, **Ardoin SP, Schanberg LE, Lewandowski L;** APPLE trial investigators and Childhood Rheumatology Research Alliance (CARRA); Robinson G, Jury EC, Ciurtin C. Atherosclerosis progression in the APPLE trial can be predicted in young people with juvenile-onset systemic lupus erythematosus using a novel lipid metabolomic signature. *Arthritis Rheumatol.* 2024 Mar;76(3):455-468.

Vega-Fernandez P, **Oberle EJ, Henrickson M, Huggins J, Prahalad S, Cassidy A, Roth J, Ting TV;** Childhood Arthritis and Rheumatology Research Alliance Investigators. Musculoskeletal ultrasound and the assessment of disease activity in juvenile idiopathic arthritis. *Arthritis Care Res (Hoboken).* 2023 Aug;75(8):1815-1820.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$74,881

>>> Fast Facts: July 2023 – June 2024

Inpatient Discharges:	20	Inpatient Consults:	210
Observation and Outpatient-in-a-Bed Discharges:	14	Dublin Rheumatology Clinic Visits:	687
Total Discharges:	34	Main Campus Rheumatology Clinic Visits:	5,683
Average Length of Stay*:	4.60	Total Clinic Visits:	6,370
Average Daily Census*:	0.25	*Excludes observation and outpatient-in-a-bed patients	
Patient Days*:	92		

Department of Pediatrics
SPORTS MEDICINE

The Division of Sports Medicine at Nationwide Children’s Hospital includes a team of experts who specialize in the treatment and prevention of sports-related injuries in the pediatric and adolescent athlete. The focus of the department is prevention, diagnosis and treatment of youth and adolescent sports injuries, including concussions and other specialties.

Faculty



Thomas L. Pommering, DO
Division Chief



James P. MacDonald, MD, MPH
Associate Division Chief
for Research

Steven C. Cuff, MD

Drew H. Duerson, MD

Anastasia N. Fischer, MD,
FAAFP, FACSM

Megan E. Liberty, DO

Jonathan T. Napolitano, MD

Reno Ravindran, MD

Richard E. Rodenberg, MD

Amy E. Valasek, MD, MS

2023 – 2024 Fellow

Justin Leasure, MD

Highlights From the Past Year

Nationwide Children’s Sports Medicine experienced more than 6% growth in volumes of clinic visits in 2023. Additionally, our volumes continue to grow in functional rehabilitation and Play Strong (9,609 visits) and sports nutrition visits (528 visits), which all together totaled 27,647 visits in Sports Medicine in 2023. Sports Medicine was the eighth highest volume outpatient specialty department at Nationwide Children’s in 2023.

New Clinic for Dance Medicine

To better meet the unique needs of dancers in our community, we have invested in establishing a Dance Medicine program. Megan Liberty, DO, was recruited to further develop the program. Dr. Liberty was a professional ballet dancer before studying Biology and Dance at the renowned Indiana University Jacobs School of Music. As a member of our multispecialty Dance Medicine Team, she combines her sports medicine and professional dance skillsets to provide state of the art treatment for dancers of all disciplines and skill levels in central Ohio.

Improving Care Through Academic Excellence and Research

In addition to meeting the needs of high volumes of patients, our faculty are dedicated to advancing the field through academic and research activities. In 2023, our team completed:

- 49 presentations at state and national conferences
- 32 publications and book chapters
- 22 peer-reviewed articles
- 12 editorials, case studies, PediaCast (podcast) episodes

Our team is engaged in research and clinical collaborations with Nationwide Children’s departments and research centers, including the Center for Injury Research and Policy, Orthopedics, Rheumatology and Radiology. We also work with organizations such as Colorado Children’s Hospital, Boston Children’s Hospital, The Ohio State University and others for multicenter studies.

Looking ahead to next year, through a competitive process, Nationwide Children’s (Sports Medicine and Orthopedics) was chosen to host the Annual Scientific Meeting for the Pediatric Research in Sports Medicine (PRISM) Conference.

Our faculty also serve as leaders in numerous professional organizations to support the growth and development of future generations of Sports Medicine experts. Highlighted positions include:

- Steven Cuff, MD, serves as chair of the Physician Advisory Council, Commission on Accreditation of Athletic Training Education (CAATE) and on the CAATE board. He is a member of the Executive Committee, American Academy of Pediatrics (AAP) Council on Sports Medicine and Fitness.
- Amy Valasek, MD, is the chair of the Pediatric Sports Medicine Interest Group for the American Medical Society for Sports Medicine (AMSSM) and on the PREP board of AAP.
- James MacDonald, MD, is on the board of directors for the American College of Sports Medicine (ACSM) and the Pediatric Research in Sports Medicine (PRISM). He also serves as deputy editor of the *Clinical Journal of Sport Medicine*.
- Jonathan Napolitano, MD, is on the board of directors for Adaptive Sports Connection. He is also co-chair of the PRISM Scientific Program Committee.
- Reno Ravindran, MD, is the editor for the AMSSM online case study teaching tool.
- Thomas Pommering, DO, is an invited member of Team Up For Sports Safety (TUFSS) Advisory Committee for High School Sports Best-Practice Policies supported by the National Football League (NFL), The Korey Stringer Institute and The National and Ohio Athletic Trainers’ Associations (NATA and OATA).

Celebrating Excellence

Our faculty have been acknowledged for their excellence through many awards and recognitions, including:

- Dr. Cuff: Ohio Athletic Trainers Association Team Physician of the Year
- Dr. MacDonald: guest editor for AMSSM Special Issue of British Journal of Sports Medicine
- Dr. Valasek: guest editor, British Journal of Sports Medicine
- Drs. Valasek and Pommering: Castle Connolly Top Doctor Recognition, 2024

Selected Publications

MacDonald JP, Kerr H. American physician in the land of smiles: Dr Robert Monaco in Thailand. *Br J Sports Med*. 2024 Feb 7;58(3):172-173.

Plumage EF, Bista S, Recker R, **Cuff S**, **Fischer A**, Tiso M, Yang J. Changes in physician recommendations for early physical activity after pediatric concussion: A retrospective study. *Clin J Sport Med*. 2024 Jan 1;34(1):17-24.

Sullivan L, Xu M, Yeates KO, Alshaikh E, Taylor HG, **Pommering T**, Yang J. Trajectories of daily postconcussion symptoms in children. *J Head Trauma Rehabil*. 2024 Mar-Apr 01;39(2):E41-E47.

Williams DR, **Fischer AN**. Pivot from Pain to Productive: Conversations about weight management in youth with obesity. *Curr Sports Med Rep*. 2023 Aug 1;22(8):290-296.

Yang J, Alshaikh E, Asa N, VonDeylen O, Desai N, Taylor HG, **Pommering T**, **MacDonald JP**, Cohen DM, Yeates KO; ReAct Clinical Study Group. Exploring the association between cognitive activity and symptom resolution following concussion in adolescents aged 11-17 years. *Br J Sports Med*. 2024 Mar 13;58(6):328-333.

>>> Fast Facts: July 2023 – June 2024

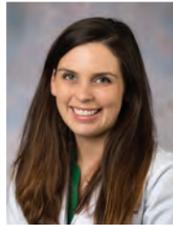
Canal Winchester Sports Medicine Clinic Visits:	1,536	Marysville Sports Medicine Clinic Visits:	639
Dublin Sports Medicine Clinic Visits:	4,352	New Albany Sports Medicine Clinic Visits:	1,997
East Broad Sports Medicine Clinic Visits:	862	Reynoldsburg School-Based Sports Medicine Clinic Visits:	78
Hilliard Sports Medicine Clinic Visits:	1,478	Westerville Sports Medicine Clinic Visits:	4,799
Main Campus Sports Medicine Clinic Visits:	1,543	Total Sports Medicine Clinic Visits:	17,284

Department of Pediatrics

TOXICOLOGY

The Section of Toxicology at Nationwide Children’s Hospital provides teaching, patient care and research to improve outcomes for poisoned patients. We provide medical support for the Central Ohio Poison Center (COPC) and the toxicology consult service in the treatment of poisoned patients and management of adverse drug reactions. Our research investigates drug and toxicant effects, poison prevention and population-based poison control. We provide important consultation resources to hospital-based and community physicians across Ohio, supporting them as they treat poisoned patients in their own communities.

Faculty



Hannah Hays, MD, FACEP, FAAC, FACMT
Chief
Associate Division Chief
for Research

- Cynthia Aaron, MD, FACMT, FACEP
- Alek Adkins, MD
- Marcel Casavant, MD, FACEP, FACMT, FAAC
- Prashant Joshi, MD
- Brian Patrick Murray, DO, FACEP, FAEM, FASAM
- Natalie I. Rine, PharmD, BCPS, BCCCP
- Jason Russell, DO

Highlights From the Past Year

In 2023, the Section of Toxicology at Nationwide Children’s added five additional toxicologists who collectively bring increased diversity, a geographic breath of practice experience important to toxicology, and experience in various practice settings, including poison center, inpatient consultation and military medicine. In 2023-2024, the toxicology consult service volume grew 395% as a result of the new, more robust staffing model. As a result, there is a medical toxicologist on site at Nationwide Children’s each day, making Nationwide Children’s the only pediatric hospital in the state with daily, on-site medical toxicology expertise.

Commitment to Collaboration Support Best Outcomes for Children

Drs. Hays and Casavant are affiliate faculty members in the Center for Injury Research and Policy. Members of the Section of Toxicology work closely with the center on research pursuits and mentoring medical students. We also work with the Section of Child Abuse Pediatrics, the Section of Adolescent Medicine, and the Clinical Laboratory to develop research and educational offerings.

Beyond Nationwide Children’s, the section works closely to develop systems-level solutions to mitigate the incidence and impact of pediatric poisonings by collaborating with the Franklin County Child Fatality Review Committee, Franklin County Public Health Overdose Review Committee, Ohio American Academy of Pediatrics Lead-Free Ohio Advisory Committee, and America’s Poison Centers.

Toxicology and the Central Ohio Poison Center (COPC) work closely with the Columbus Zoo. In 2023, the section developed new protocols for the management of accidental envenomation by each venomous reptile at the Columbus Zoo, distributed these protocols to all stakeholders, and tested them with a full-scale disaster exercise involving the Columbus Zoo, Nationwide Children’s Hospital, Central Ohio Poison Center, and Liberty Township EMS and Fire Department.

Advocacy To Reduce Cannabis Poisoning in Children

By working with Government Affairs and Media Relations, our team acts as advocates for child safety and educates the public about the dangers of poisoning. For example, Toxicology, Media Relations and Government Affairs have worked together throughout the past academic year to prevent pediatric exposure to cannabis edibles.

Cannabis edible exposures have increased 20-fold since medical marijuana sales began in 2019. For the toxicology consult service at Nationwide Children’s Hospital, caring for children poisoned by cannabis edibles has become an everyday event.

Members of the section have testified to both the Ohio State Senate and House of Representatives on severe cannabis poisoning in toddlers and the need for packaging restrictions to prevent pediatric exposures. Our team has provided counsel on the pediatric implications of recreational cannabis to Senator Sherrod Brown and worked with more than a dozen members of both chambers to describe specific evidence and experience-based packaging strategies, offering comment on House Bill 86, House Bill 354, Senate Bill 278 and Senate Bill 9.

Highlighted Awards and Leadership Roles

Our team’s excellence is evident beyond our hospital walls. Faculty in our section have been recognized with leadership positions in professional and advocacy organizations including the American College of Medical Toxicology, North American Congress of Clinical Toxicology, American College of Emergency Medicine, *Journal of Investigative Medicine* and American Academy of Clinical Toxicology, among others.

Additionally, Hannah Hays, MD, received a Columbus Business First 40 Under 40 Award, the Emerging Leader award from Northeast Ohio Medical University, and a Voluntary Service Recognition for Exceptional Service to the American College of Medical Toxicology. Marcel Casavant, MD, received The Ohio State University Department of Emergency Medicine Richard N. Nelson Distinguished Alumni Award and was inducted into the Alpha Omega Alpha Honor Medical Society.

Selected Publications

DeCoster MM, Spiller HA, Badeti J, **Casavant MJ, Rine NI**, Michaels NL, Zhu M, Smith GA. Pediatric ADHD medication errors reported to United States poison centers, 2000 to 2021. *Pediatrics*. 2023 Oct 1;152(4):e2023061942.

Gaw CE, **Hays HL**, Kemp CA, Kistamgari S, Spiller HA, **Rine NI**, Rhodes AL, Zhu M, Smith GA. Glucagon-like peptide-1 receptor agonist cases reported to United States poison centers, 2017-2022. *J Med Toxicol*. 2024 Apr;20(2):193-204.

Hays HL, Spiller HA, DeRienz RT, **Rine NI**, Guo HT, Seidenfeld M, Michaels NL, Smith GA. Evaluation of the relationship of xylazine and fentanyl blood concentrations among fentanyl-associated fatalities. *Clin Toxicol (Phila)*. 2024 Jan;62(1):26-31.

Illg Z, Carpenter J, Moran TP, Kiernan E, **Murray BP**. Hydrofluoric acid ingestions: Retrospective evaluations from cases reported to the National Poison Data System 2007-2017. *J Am Coll Emerg Physicians Open*. 2023 Oct 25;4(5):e13059.

Murray BP, Kiernan EA. Physiologic effects of substance use. *Emerg Med Clin North Am*. 2024 Feb;42(1):69-91.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$655,299

>>> Fast Facts: July 2023 – June 2024

Peer Consults:	1,340	Toxicology Poison Center Consults:	4,239
Inpatient Consults:	246	Poison Center Exposures Cases:	46,270

Department of Pediatrics

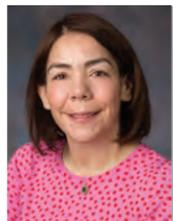
URGENT CARE

The Division of Urgent Care at Nationwide Children’s Hospital operates seven conveniently located urgent care centers throughout the central Ohio area. The urgent cares are staffed with physicians, advanced practice providers, nurses and technologists who specialize in the treatment of pediatric urgent care needs. Our centers have more than 160,000 visits annually and offer a full complement of urgent care services including radiology, laboratory, suturing and splinting. The division continues its mission of providing high quality, efficient, compassionate acute care when and where it is needed most, in a family-centered environment for the children of central Ohio.

Faculty



Cynthia S. Zimm, MD, MBA
Division Chief



Luciana E. Berg, MD
Associate Division Chief and
Medical Director of East Broad



Aaron J. Maki, MD, PhD
Associate Division Chief for
Research

Medical Site Directors

- Barry Belcher, DO
- Brian K. Bowden, MD
- Karla R. Hauersperger, MD
- Daniela A. Humphrey, DO
- Marc S. Leder, MD
- Jonathan J. Price, MD
- Jerry M. Stultz, MD

Providers

- | | | | |
|--------------------------|----------------------------|--------------------------|-----------------------|
| Elham M. Alqudah, MD | Traci A. Bouchard, MD, MPH | Iram Jafri, MD | Joshua J. Prudent, MD |
| Hayat Al Tabosh, MD | Brian K. Bowden, MD | Simmi Dogra Kulkarni, MD | Sheela R. Rao, MD |
| Robert R. Baun, MD | Michael S. Chua, MD | Catherine A. Lambert, MD | Farhan Rashid, MD |
| Barry Belcher, DO | Claire Christian, MD | Timothy S. McClung, MD | John P. Sotos, MD |
| Deborah L. Blackwell, DO | Lori R. Deschene, MD | Kathryn E. Nuss, MD | Jennifer L. Wyse, MD |
| | Jessica Easdale, DO | Jan E. Perry, MD | |

Highlights From the Past Year

In 2024, we’re proud to have our first Academic Pediatric Acute Care Fellow joining the team. This one-year fellowship will support participants in expanding and refining clinical pediatric acute care skills while developing academic, business and leadership expertise to become leaders in the field.

The division also welcomed Barry Belcher, DO, Jessica Easdale, DO, and Claire Christian, MD. Drs. Belcher and Easdale have taken over as co-directors of the Urgent Care Quality Improvement Group. Dr. Barry Belcher and Dr. Brian Bowden have taken over the roles of Co-director of the Main Campus Urgent Care.

Research and Quality Improvement for Best Outcomes

Aaron Maki, MD, PhD, has been promoted to associate division chief for research, effective September 2024. In this role, Dr. Maki will serve as a connection between the division and the Abigail Wexner Research Institute, helping other faculty in the division in their research pursuits. The role also serves to support the integration of clinical care and research, the cornerstone of the hospital’s strategic plan.

Traci Bouchard, MD, MPH, is the site lead for a multisite quality improvement project with the Society for Pediatric Urgent Care (SPUC) called REDUCE, reducing differences in urgent care encounters. The study aims to decrease differences in antibiotic prescribing between races and socioeconomic status for common respiratory infections in the urgent care setting.

Advancing the Field Through Professional Engagement

Our team recognizes the value of participating in professional organizations both for our benefit and to share our experience and expertise with others. Selected memberships and leadership roles are as follows:

- Cynthia Zimm, MD, and Luci Berg, MD, serve on the Pediatric Acute Care Fellowship Leaders Committee as well as the Pediatric Acute Care Fellowship Accreditation Committee of the APA.
- Dr. Zimm sits on the SPUC National Webinar Committee.
- Dr. Bouchard is on the executive committee for Global One Health Initiative at The Ohio State University and is the newsletter editor and social media editor for SPUC.
- Jonathan Price, MD, is the co-chair of the Ohio Chapter of the American Academy Pediatric Care Council and of the Ohio AAP Chapter Practice of Pediatrics Pillar.

Selected Publication

Galbraith AA, **Price J**, Abraham C, Giardino AP; COMMITTEE ON CHILD HEALTH FINANCING. Principles of child health care financing. *Pediatrics*. 2023 Sep 1;152(3):e2023063283.

>>> Fast Facts: July 2023 – June 2024

Main Campus Urgent Care Visits:	48,209	Hilliard Urgent Care Visits:	20,652
Canal Winchester Urgent Care Visits:	18,180	Marysville Urgent Care Visits:	11,801
Dublin Urgent Care Visits:	11,907	Westerville Urgent Care Visits:	29,941
East Broad (Columbus) Urgent Care Visits:	22,187	Total Visits:	162,877

Department Reports

ANESTHESIOLOGY AND PAIN MEDICINE

The Department of Anesthesiology and Pain Medicine at Nationwide Children's Hospital consists of fellowship-trained, board-certified pediatric anesthesiologists. The department provides anesthesiology and pain-management services for pediatric patients of all ages, from neonates through adolescents, requiring all types of surgical procedures, procedural sedation outside the operating room, acute and chronic pain management, and palliative care.

Faculty



Joseph D. Tobias, MD
Chief

Mauricio Arce Villalobos, MD
Graciela Argote-Romero, MD
Rita Banoub, MD
Ralph Beltran, MD
Candice Burrier, MD
Gregory Cambier, MD
Kristin Chenault, MD
Kate Cicozi, MD

Marco Corridore, MD
Olamide Dairo, MD
Ajay D'Mello, MD
Nicole Elsey, MD
Seth Hayes, MD
Renee Heng, MD
Grant Heydinger, MD
Jay Holladay, DO

Lisa M. Humphrey, MD
Ryan Jenkins, MD
Sarah Khan, MD
Senthil G. Krishna, MD
Katherine Manupipatpong, MD
David Martin, MD
Leslie Matthews, MD
Gregory Maves, MD

Christopher McKee, DO
Alok Moharir, MD
Aymen Naguib, MD
Vanessa Ng, MD
Amrish Patel, MD
Priyal Patel, DO
Laura Puertas-Ocio, MD

Alyzah Quereshey, DMD
Leila Reduque, MD
Saif Rehman, MD
Lance Relland, MD, PhD
Devin Sanders, MD
Erica Sivak, MD
Ashley Smith, MD

Steven Smith, MD
Timothy Smith, MD
Kevin Spellman, MD
Ahsan Syed, MD
Joshua Uffman, MD
Giorgio Veneziano, MD
Scott Wallace, MD

Tariq Wani, MD
Brittany Willer, MD
Peter Winch, MD, MBA

2023 – 2024 Fellows

Nahida Ahkter, MD
Madeleine Börjesson, MD
Loren Farley, MD
Camille Hawkins, DO

Marwan Hillis, MD
Shinya Ito, MD
Stephania Paredes Padilla, MD
George Terre, MD

Highlights From the Past Year

Program Growth

This year our department provided care for more than 45,000 patients. Anesthesia services for specialty surgical programs have continued to grow, including our support for fetal surgery, abdominal transplant and cardiac surgery programs. We have also expanded our Comprehensive Pain Program with continued development of the acute pain service, palliative care program and chronic pain programs including the inpatient chronic pain rehabilitation program.

This year we celebrated the opening of the Livingston Surgery Center on East Campus. The new building contains eight new operating rooms and two new magnetic resonance (MR) scanners.

Committed to the Future of Anesthesia Medicine

We are proud to share that we have received ACGME accreditation of the pediatric cardiac anesthesia fellowship.

Our dedication to research and innovation are exemplified by three notable awards received by our faculty.

- Technology Development Grant: Biofeedback-Based Virtual Reality for Pain Management
- Intramural Grant: Prospective Analysis of the Impact of Home-Based Palliative Care and Hospice Compared to Inpatient and Clinic-Based Palliative Care
- Intramural Grant: The Influence of Perioperative Sleep Quality on Postoperative Pain Outcomes in Pediatric Patients Undergoing Knee Surgery

National Leadership

- Joseph Tobias, MD, is the associate editor of *Pediatric Anesthesia* and section editor of two Pediatric Critical Care textbooks.
- Ashley Smith, MD, is an oral board examiner for the American Board of Anesthesiology.
- Giorgio Veneziano, MD, is the pediatric section editor for *Journal of Pain Research*.
- Lisa Humphrey, MD, is a member of the American Academy of Pediatrics Section on Hospice and Palliative Medicine.
- Brittany Willer, MD, is a member of the American Academy of Pediatrics Section on Anesthesiology.

Selected Publications

Elhamrawy A, **Veneziano G, Tobias JD**. Regional anesthesia and sickle cell crisis in pediatric patients: An educational-focused review. *Paediatr Anaesth*. 2024 March;34(3):195-203.

Uffman JC, Willer BL, Mody C, Nafiu OO, Tobias JD. Characteristics of transgender and gender-diverse youth presenting for surgery in the United States. *Anesth Analg*. 2023 Oct;137(4):882-886.

Willer BL, Mody C, Nafiu O, Tobias JD. Racial disparities in pediatric mortality following transfusion within 72 hours of operation. *J Pediatr Surg*. 2023 Dec;58(12):2429-2434.

Willer BL, Mody C, Nafiu OO. Racial inequity in pediatric anesthesia. *Curr Anesthesiol Rep*. 2023 May;13(2):108-116.

Wani TM, Sundaram M, Tobias JD. Evolution of the concepts of pediatric airway and endotracheal intubation. *Journal of Pediatric Critical Care*. 2023 Dec;10:265-268.

Department Reports

PATHOLOGY AND LABORATORY MEDICINE

The Department of Pathology and Laboratory Medicine at Nationwide Children’s Hospital provides a wide range of pediatric diagnostic services for hospitalized and ambulatory infants, children and adolescent patients. Laboratory services are provided through the main campus anatomic and clinical pathology laboratories, as well as multiple outpatient/reference laboratory testing facilities, Nationwide Children’s *Close To Home*SM and Urgent Care centers, and our freestanding Emergency Department.

Faculty



Shamlal Mangray, MB, BS
Chief



Kathleen K. Nicol, MD
Section Chief,
Clinical Pathology



Nicoleta Arva, MD, PhD
Section Chief,
Anatomic Pathology

Roshini Abraham, PhD, D(ABMLI)
Peter B. Baker III, MD
Laura Biederman, MD
Daniel R. Boue, MD, PhD
Kristina Brannock, MD
Dustin Bunch, PhD, DABCC
Srinivasa Chekuri, MBBS

Sonja Chen, MBBS
Catherine Chung, MD
Miriam R. Conces, MD
Jay Hudgins, DO, MS
Sophonie Jean Oyeniran, PhD
Samir Kahwash, MD
Benjamin Kaumeyer, MD, PhD

Amy L. Leber, PhD
Huifei Liu, MD, PhD
Jeffrey Papiernik, MD
Christopher R. Pierson, MD, PhD
Vinay Prasad, MD
Amy L. Pyle-Eilola, PhD
Nilsa Del Carmen Ramirez-Milan, MD

Hollie Reeves, DO
Ashlie Rubrecht, MD
Archana Shenoy, MD
Diana Thomas, MD, PhD
Huanyu Wang, PhD
Jingcai Wang, PhD

Steve and Cindy Rasmussen Institute for Genomic Medicine Clinical Laboratory
Yasmine Akkari, PhD, FACMG
Melanie Babcock, PhD, FACMG

Catherine Cottrell, PhD, FACMG
Claire Hou, PhD, FACMG
Jesse Hunter, PhD, FACMG
Marco Leung, PhD, FACMG
Reynold Ly, PhD

Mariam Mathew, PhD, FACMG
Hui Mei, PhD
Shalini Reshmi, PhD, FACMG
Kathleen Schieffer, PhD, FACMG
Karen Tsuchiya, MD

Neuromuscular Pathology
Zarife Sahenk, MD, PhD
2023 – 2024 Fellows
Lame´ Balikani, MD
Olufunmilayo Abobarin-Aofolaju, MD

Highlights From the Past Year

Pathology and Laboratory Medicine at Nationwide Children’s is one of the country’s leading full-service pediatric reference laboratories. In the past year, we have expanded to the main campus C-building laboratory, which continues renovations from a 10-year master facility planning project. Anatomic Pathology was under renovation as well, completing four of the five planned phases to include square footage expansion of the Histology Laboratory and new state of the art grossing room amenities. Additionally, the Point of Care Testing team implemented testing availability at five Nationwide Children’s school-based health locations.

Program Growth

The Digital Pathology Program for primary diagnosis of surgical and autopsy cases using whole slide imaging (WSI) has been on track with the goal of end of 2024 for implementation. The FDA approved Phillips WSI scanner was installed, and the validation process was completed under the supervision of Diana Thomas, MD, and Andrew Muller, BS, Digital Pathology Laboratory Supervisor. Neuropathology cases were successfully piloted for primary diagnosis followed by GI cases in the second quarter of 2024. We have also initiated discussion on exploring artificial intelligence algorithms in digital pathology.

Additional program highlights include:

- Overall testing grew by 8.8% to reach over 3.6 million tests performed in 2023 and the department launched a new, more user-friendly online Laboratory Test Directory.
- The Diagnostic Immunology Lab, led by Roshini Abraham, PhD, more than doubled their expected volume in 2023 due to a number of new flow cytometry quantitative assays. This included panels for T-cell Naïve and Memory, Autoimmune and Lymphoproliferative Diseases/Syndromes, and Comprehensive B-cell Naïve and Memory that aid in the diagnosis of primary immunodeficiency and immune dysregulation disorders.
- We completed over 230 projects related to new or improved clinical assays, which includes implementation of upgraded capital equipment.
- We have had zero serious safety events since 2020 and the SAFE Program Near Miss rate decreased from 2.0% in 2022 to 1.2% in 2023.
- Department faculty published 41 peer-reviewed articles in the past year.

We have also welcomed four new recruits in the past year:

- Hollie Reeves, DO, Co-director of Transfusion Medicine Services
- Ashlie Rubrecht, MD, Anatomic Pathologist
- Jay Hudgins, DO, MS, Director of Hemostasis and Thrombosis
- Reynold Ly, PhD, IGM Clinical Laboratory Director

Recognition

Several of our faculty were recognized for their outstanding work in the past year, as well as some operational and academic promotions. Selected highlights include:

- Nilsa Del Carmen Ramirez-Milan, MD, was awarded the inaugural Nationwide Children’s Endowed Chair in Pediatric Pathology.
- Vinay Prasad, MD, was appointed to the Nationwide Children’s Medical Staff Executive Committee.
- Kathleen Nicol, MD, received the Nationwide Children’s Hospital Career Contribution Award.
- Kristina Brannock, MD, was promoted to director of Hematopathology.
- Benjamin Kaumeyer, MD, PhD, was promoted to director of Hematology Flow Cytometry.
- Catherine Cottrell, PhD, was promoted to Section Chief of the IGM Clinical Laboratory, and promoted to professor within the departments of Pathology and Pediatrics at The Ohio State University College of Medicine.
- Sonja Chen, MBBS, Diana Thomas, MD, and Huanyu Wang, PhD, were promoted to associate professor status at The Ohio State University College of Medicine.

Selected Publications

- Bunch D, Pyle-Eilola AL.** Lead poisoning: Clinical and laboratory considerations. *Adv Clin Chem.* 2023;117:209-222.
- Chen S,** Gallant S, Cunningham MJ, Robson CD, Church AJ, Perez-Atayde AR, Al-Ibraheemi A. CTNNB1 and APC mutations in sinonasal myxoma : Expanding the spectrum of tumors driven by WNT/β-catenin pathway. *Am J Surg Pathol.* 2023 Nov 1;47(11):1291-1300.
- Goodhue Meyer EK, Uffman J, Townsend S, Rice-Weimer J, Tobias J, **Nicol K.** Establishing pediatric reference ranges for rotational thromboelastometry. *Am J Clin Pathol.* 2023 Jul 5;160(1):72-77.
- Oyeniran SJ, Wang H,** Everhart K, Mack K, Harvey K, **Leber AL.** Performance comparison of three commercial tests for the detection of SARS-CoV-2 antibodies in a common set of pediatric samples. *J Immunol Methods.* 2023 Sep;520:113536.
- Schieffer KM,** Moccia A, Bucknor BA, Stonerock E, Jayaraman V, Jenkins H, McKinney A, Koo SC, **Mathew MT,** Mardis ER, Lee K, **Reshmi SC, Cottrell CE.** Expanding the clinical utility of targeted RNA sequencing panels beyond gene fusions to complex, intragenic structural rearrangements. *Cancers (Basel).* 2023 Sep 2;15(17):4394.

Grants Awarded
JULY 1, 2023 – JUNE 30, 2024
\$17,236,694

Department Reports

PHYSICAL MEDICINE AND REHABILITATION

The Section of Physical Medicine and Rehabilitation at Nationwide Children’s Hospital specializes in the diagnosis and management of children with physically disabling conditions. Our physicians are board-certified specialists in Physical Medicine and Rehabilitation with additional certification in pediatric rehabilitation medicine and are members of the departments of Pediatrics, and Physical Medicine and Rehabilitation at The Ohio State University College of Medicine. In addition, Carl D. Gelfius, MD, is board certified in electrodiagnostic medicine. Dr. Gelfius, as well as Karl Klamar, MD, and Reginald D. Talley, MD, are board certified in brain injury medicine.

Faculty



Michelle A. Miller, MD
Chief

Carl D. Gelfius, MD
Amy D. Hiller, DO
Karl W. Klamar, MD
Dana Miller, MD
Wilawan Nopkhun, MD
Jessica A. Prokup, MD
Nathan S. Rosenberg, MD
Reginald D. Talley, MD

2023 – 2024 Fellows

Jennifer Kalbus, MD
Greg White, DO

Highlights From the Past Year

This year has been one of growth for the Department of Physical Medicine and Rehabilitation. We met strategic planning milestones on the inpatient rehabilitation unit to increase accessibility to cover 8 beds and working to open 4 more beds in the near future. Our Electrodiagnostic Lab was also reaccredited by American Association of Neuromuscular and Electrodiagnostic Medicine (AANEM).

With the opening of the Livingston Orthopedic & Surgery Center, we celebrated the opening of a new Assistive Technology Center, including the expansion of the Seating Clinic. This expansion doubled the available appointments for the Seating Clinic to address the growing needs of children for durable medical equipment and collaborated with therapy services to improve the assessment, training and distribution for durable medical equipment.

We are now providing enhanced consultative services to the Newborn Intensive Care Unit (NICU) for infants at risk for developmental delays. We also added physical medicine coverage for the Early Cerebral Palsy Clinic. As part of our initiative to meet the needs of more infants and young children at risk of or with developmental delays and physical impairments, we’ve recruited Dana Miller, MD, to the team.

Our team has also started the Disorders of Consciousness Program on the Inpatient Rehabilitation Unit addressing our strategic plan to enhance services to children with brain injury.

Growing the Next Generation of Experts Through Fellowship

We continue to recruit excellent candidates for our Pediatric Rehabilitation Fellowship. Our fellows have presented their research at national meetings regarding accessible exam tables in the outpatient setting at Nationwide Children’s and at The Ohio State University. Our fellows have a 100% pass rate for the Accreditation Council for Graduate Medical Education (ACGME) Pediatric Rehabilitation boards.

Advancing the Field Through Professional Leadership

Our faculty believe in the power of collaboration through professional organizations and have been recognized with leadership positions in those organizations. Highlighted membership and leadership contributions are as follows:

- Karl Klamar, MD, is the chair of the Pediatric Rehabilitation Fellowship Directors Member Community for the American Academy of Physical Medicine and Rehabilitation.
- Carl Gelfius, MD, is a member of the Complex Care Committee of the American Academy of Cerebral Palsy and Developmental Medicine, the Health Policy and Legislation Committee of the American Academy of Cerebral Palsy and Developmental Medicine, and the Medical Advisory Committee of the Down Syndrome Association of Central Ohio.
- Michelle Miller, MD, is the co-leader of the Pressure Injury Reduction Hospital-acquired Condition group through Solutions for Patient Safety and chair of the Council for the Association of Academic Physiatrists.
- Nathan Rosenberg, MD, is the chair of the International Committee for the American Academy of Cerebral Palsy and Developmental Medicine and chair of the Rehabilitation Special Interest Group for the Pediatric Trauma Society.
- Reginald Talley, MD, is a member of the Educational Content Advisory Committee through the American Academy of Physical Medicine and Rehabilitation.

Selected Publication

Leib S, Monnin K, Pagnotta C, Krouse R, **Talley R**. Peer education following pediatric brain injury. *Brain Injury Professional*. 2024 April;21(1):14-18.

>>> Fast Facts: July 2023 – June 2024

Inpatient Discharges:	86	Physical Medicine Clinic Visits:	6,182
Average Length of Stay*:	20.66	Myelomeningocele (Spina Bifida) Clinic Visits:	627
Average Daily Census*:	4.87	School-Based Seating Clinic Visits:	10
Patient Days*:	1,777	Total Clinic Visits:	6,819
Inpatient Consults:	527	<i>*Excludes observation and outpatient-in-a-bed patients</i>	
Number of Beds:	12		

“Integrating four psychologists in primary care clinics had a more significant impact on access and utilization than those 60 new behavioral health providers.”

– Cody A. Hostutler, PhD



BEHAVIORAL HEALTH

Ensuring All Children Have Access to Behavioral Health Care

New study reports the results of integrating psychologists into primary care clinics.

Cody A. Hostutler, PhD, a psychologist in the Department of Pediatric Psychology and Neuropsychology at Nationwide Children’s, and colleagues launched a study, recently published in *Pediatrics*, to answer three questions.

- Would integrating psychologists into primary care centers increase the number and timeliness of patients receiving treatment to care compared to clinics without integrated clinicians?
- Would this integration also increase equity of care?
- Would integration reduce the number of patients receiving behavioral health treatment outside of their primary care office?

“There is a mental health crisis for kids happening right now. The CDC recently reported that more than 50% of adolescent females say they feel hopeless and sad. Many parents take their kids to a primary care pediatrician instead of a therapist or psychologist. Yet, most pediatricians don’t have the training or time to treat mental health issues,” Dr. Hostutler says.

For the study, four of 12 primary care clinics within the Nationwide Children’s Hospital health system integrated psychologists into their services. The study compared changes in access and utilization from the year before integration with the two years after integration.

The study found that in clinics with integrated psychologists, 93% of initial behavioral health visits happened on the same day. The median wait time for patients not seen on the same day was 11.4 days compared with 48.3 days for nonintegrated clinics.

As a whole, the integration of psychologists resulted in more patients getting the care they needed with less stress on the overburdened behavioral health system. The control clinics did not see any increase in utilization even when the hospital hired more than 60 clinicians to work in their behavioral health facilities.

“Integrating four psychologists in primary care clinics had a more significant impact on access and utilization than those 60 new behavioral health providers,” Dr. Hostutler concludes.

The results were so conclusive that Nationwide Children’s expanded the program before the study concluded. Psychologists are now integrated into 10 primary care clinics. Mental health therapists were also added to clinic staff.

Dr. Hostutler’s team uses the learnings from the study to assist primary care clinics outside the Nationwide Children’s health system in integrating behavioral health providers within their practice.

REFERENCE:

Hostutler C, Wolf N, Snider T, Butz C, Kemper AR, Butter E. Increasing access to and utilization of behavioral health care through integrated primary care. *Pediatrics*. 2023 Dec 1;152(6):e2023062514.



Department Reports

BIG LOTS BEHAVIORAL HEALTH SERVICES

Faculty



David A. Axelson, MD

Medical Director, Big Lots Behavioral Health Services
 Chief, Psychiatry and Community Behavioral Health

Highlights From the Past Year

Big Lots Behavioral Health Services at Nationwide Children’s Hospital is a comprehensive service line dedicated to children and adolescents affected by mental illness and problems of emotion, behavior, development, thought and adaptation to life challenges, including those associated with physical illness and trauma. We are committed to partnering with patients, families and referring primary care clinicians and specialists to deliver services of public health relevance and to achieve the best possible clinical outcomes. Because no single discipline or professional can adequately address the needs of every child, our approach is deliberately multidisciplinary and collaborative.

In addition to being one of the largest outpatient service lines at Nationwide Children’s, we are also the largest pediatric behavioral health network of any children’s hospital in the country, with nearly 300,000 outpatient visits completed in the past year.

In 2024, we expanded our child psychiatry fellowship to 12 fellows and our advanced practice nurse fellowship in pediatric psychiatry to three fellows. In addition, medical students, residents in psychiatry, pediatric and family practice, and nursing students all have training experiences and rotations within the service line.

Also in the past year, we opened the Institute for Mental and Behavioral Health Research in the Big Lots Behavioral Health Pavilion in collaboration with the Abigail Wexner Research Institute. Led by Eric Youngstrom, PhD, the institute will stimulate innovative research that will lead to advancements in the diagnosis and treatment of pediatric mental health conditions. By integrating clinical, educational, research and advocacy efforts, we strive to improve the lives of children and families in central Ohio and beyond.

Psychiatry and Community Behavioral Health: This department is the largest and most clinically diverse section of Behavioral Health Services, providing care for pediatric mental disorders from prevention services to inpatient psychiatric units. Services currently available include the Psychiatric Crisis Department, an 11-bed Extended Observation Suite, a 16-bed Youth Crisis Stabilization Unit, three inpatient psychiatric units, consultation-liaison services for youth who are hospitalized on Nationwide Children’s medical and surgical units, a Partial Hospital Program, outpatient services for eating disorders provided in collaboration with Adolescent Medicine, intensive outpatient services within the Mood and Anxiety Program, intermediate levels of behavioral health care in the community, including in the courts and schools, specialized services for early child mental health, outpatient treatment clinics and novel programs to support mental health service delivery in primary care settings.

In the past year, we expanded the Mobile Response and Stabilization Services program, which sends behavioral health clinicians to homes or schools in Franklin County to respond to youth in crisis. We increased the capacity of the Adolescent Partial Hospital Program to 16 patients. See page 139 for a list of faculty, selected publications and grants awarded.

Child Development Center: The center offers a range of services to address the developmental and behavioral needs of children, adolescents and families of those with autism spectrum disorders and other developmental disabilities. Integrated care, which includes interdisciplinary assessment and treatment, family interventions, advocacy support and care coordination takes place in more than a dozen pediatric subspecialty clinics. Our psychologists are also involved in several other national research networks including the Simons Foundation SPARK Autism Network, the largest genetic research registry for individuals with autism spectrum disorder as well as multiple other federally funded multi-site research studies.

Center for Autism Spectrum Disorders: The center provides comprehensive, multidisciplinary care focusing on evidence-based treatment, education, research and advocacy for children diagnosed with autism spectrum disorder. Services include intensive behavioral intervention and consultation, school support and educational consultation, Asperger syndrome counseling, social skills groups, parent teaching, advocacy and community education. Services are delivered in clinic, homes and schools and cover the full age range from early childhood through transition to adulthood.

Pediatric Psychology and Neuropsychology: Pediatric Psychology provides specialized assessment and intervention services that focus on the relationship between cognitive, social and emotional functioning and physical health, typically for children with co-occurring medical conditions (e.g., cancer, diabetes, sickle cell disease); Pediatric Neuropsychology performs specialized evaluations for children and adolescents with a range of medical and neurological disorders that impact thinking or behavior (e.g., brain tumors, epilepsy, seizure disorders, concussion, traumatic brain injury). The section provides care throughout the hospital, including inpatient medical units, medical specialty outpatient clinics and the Psychology Clinic at Nationwide Children’s.

Pediatric Psychology also provides leadership in The Kids Mental Health Foundation. Previously known as The On Our Sleeves Movement for Children’s Mental Health, the initiative relaunched in April 2024 with a new name and expanded mission. The national leader in promoting mental health for children in the United States, The Kids Mental Health Foundation harnesses the power of more than 1,000 mental health professionals and researchers at Nationwide Children’s, in partnership with other trusted experts, to develop free educational videos, guides and curriculum. To date, more than 18 million people have engaged with the foundation’s materials.

Behavioral Health Research

Center for Biobehavioral Health: see page 197.
 Center for Suicide Prevention and Research: see page 223.
 Institute for Mental and Behavioral Health Research: see page 221.

>>> Fast Facts: July 2023 – June 2024

Outpatient Visits/Consults	297,822	Child Development Center Outpatient and Medical Clinic Visits	15,701
Inpatient Consults	7,566	Center for Autism Spectrum Disorders Visits	42,071
Inpatient Discharges	1,208		
Inpatient Days	13,660		

Department Reports

PSYCHIATRY AND COMMUNITY BEHAVIORAL HEALTH

Psychiatry and Community Behavioral Health at Nationwide Children’s Hospital is the largest and most clinically diverse section of the Big Lots Behavioral Health Service Line. This integrated program of care for pediatric mental health conditions spans a comprehensive spectrum of care from prevention services to inpatient psychiatric units. The Division of Child and Family in The Ohio State University Department of Psychiatry and Behavioral Health has faculty at Nationwide Children’s. See page 137 for details and for information about all Behavioral Health services.

Faculty



David A. Axelson, MD
Chief

- | | | |
|------------------------|--------------------------------|--------------------------|
| John Ackerman, PhD | Eric Butter, PhD | Benjamin Fields, PhD |
| Kento Akasaka, DO | Catherine Butz, PhD | Michael Flores, PhD |
| Benjamin Albrecht, DO | Meredith Chapman, MD | Cynthia Fontanella, PhD |
| Jaclyn Aldrich, PhD | Joyce Chen, MD | Mary Fristad, PhD |
| Sarah Amato, PsyD | Courtney Clemenshaw-Mahan, PhD | Bela M. Gandhi, MD |
| Samanta Boddapati, PhD | Allison Collier, MD | Mounika Ganguly, MD |
| Jeffrey A. Bridge, PhD | Nancy Cunningham, PsyD | Richard H. Gilchrist, MD |

- | | | | |
|-------------------------------|----------------------------|--------------------------------|----------------------|
| Charles J. Glawe, MD | Amy Hoisington-Stabile, MD | Robert A. Kowatch, MD, PhD | Molly Meers, PhD |
| Adam Goldberg, MD | Jennifer Hughes, PhD | Scott Leibowitz, MD | Christine Oh, MD |
| Jocelyn Hart, MD | Geeta Sai Illipillia, MD | Elizabeth (Lisa) Linstedt, PhD | Ijeoma Osigwe, PhD |
| Karah Harvey-Nuckles, MD, MPH | Natalie Jacobowski, MD | Della Loflin, PhD | Jessica Palilla, PhD |
| Taylor Hendricks-Johnson, MD | David Jensen, DO | Ghada Lteif, MD | Raisa Ray, PhD |
| Caroline Hodgson, PhD | Kristina R. Jiner, MD | Gina McDowell, LPCC-S | Sidney Risley, PhD |
| Ariana Hoet, PhD | Anna Kerlek, MD | Ian McKay, PhD | Jennifer Reese, PsyD |

- | | | | |
|---|-----------------------------|---------------------------------|----------------------|
| Margaret Rosencrans, PhD | Stephen Scott, DO | Lea Taylor, PhD | Nicole White, MD |
| Donna Ruch, PhD | Allison Siroky, PhD | Glenn Thomas, PhD | Lynda Wolfe, PhD |
| Eileen Ryan, DO | Alexandra (Lexi) Smith, PhD | Raymond Troy, MD | Heather Yardley, PhD |
| Brittany Schaffner, MEd, IMFT-S, LPCC-S | Lisa Sperle, PhD | Elizabeth Vickery, PhD | Musa Yilanli, MD |
| Kimberly Schubert, PhD | Maria Stamatakos, MD | Kelly Wesolowski, PsyD | Eric Youngstrom, PhD |
| Nadine Schwartz, MD | J’Nelle Stephenson, PhD | Kristopher West, PhD | Donald Zeolla, MD |
| Danielle Steelesmith, PhD | Moneika Sutton, PhD | Melinda Westlund-Schreiner, PhD | |

Selected Publications

- Hammond CJ, Hyer JM, Boustead AE, **Fristad MA, Steelesmith DL**, Brock GN, Hasin DS, **Fontanella CA**. Association Between Marijuana Laws and Suicide Among 12- to 25-Year-Olds in the United States From 2000 to 2019. *J Am Acad Child Adolesc Psychiatry*. 2024 Mar;63(3):345-354.
- Hodgson C**, Krishna R, **Akasaka K**. Milieu management and therapeutic groups in inpatient child and adolescent psychiatry units. *Child and Adolescent Psychiatry Clinics of North America*. 2024. ISSN 1056-4993,
- Ilipilla G**, Arnold LE. The role of adrenergic neurotransmitter reuptake inhibitors in the ADHD armamentarium. *Expert Opin Pharmacother*. 2024 Jun;25(8):945-956.
- Ruch DA**, Horowitz LM, **Hughes JL**, Sarkisian K, Luby JL, **Fontanella CA, Bridge JA**. Suicide in US Preteens Aged 8 to 12 Years, 2001 to 2022. *JAMA Netw Open*. 2024 Jul 1;7(7):e2424664.
- Thomas GV**, Camacho E, Masood FA, Huang Y, Valleru J, **Bridge JA, Ackerman J**. Development and Implementation of Post-discharge Text Messages to Adolescents With Suicidal Thoughts and Behaviors Through Caring Contacts: Implementation Study. *JMIR Pediatr Parent*. 2024 Aug 13;7:e51570.

 **Grants Awarded**
JULY 1, 2023 – JUNE 30, 2024
\$3,026,297

>>> **Fast Facts: July 2023 – June 2024**

Community-Based Therapy Visits:	39,670	Psychiatry Clinic Visits:	35,730
Office-Based Therapy Visits:	102,825	Psychiatry Inpatient Consultations:	908
Partial Hospital/Intensive Outpatient Program Visits:	6,312	Psychiatry Inpatient Unit Discharges:	916
Psychiatric Crisis Department Visits:	7,294	Youth Crisis Stabilization Unit Discharges:	1,208

Department Reports

RADIOLOGY

The Department of Pediatric Radiology at Nationwide Children’s Hospital is one of the nation’s premier imaging programs for children, with subspecialty expertise in abdominal, cardiac, chest, fetal/neonatal, interventional, musculoskeletal, neuroimaging and nuclear imaging. We provide expert care in image-guided diagnosis and therapy.

Our mission is to improve children’s lives through innovative imaging. The major philosophical consideration that drives our mission is that children are not small adults. Technology must be adapted to meet the needs of pediatric patients to create imaging biomarkers specific for pediatric disease. We approach imaging with the following goals in mind:

- Develop and validate imaging biomarkers specific to pediatric disease
- Determine quality, safety and cost-effectiveness of validated imaging biomarkers for discrete patient care pathways
- Integrate imaging biomarkers across the research and clinical spectrums
- Utilize Pediatric Advanced Imaging Resource (PAIR) analysts to provide advanced analysis of images

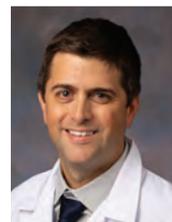
Faculty



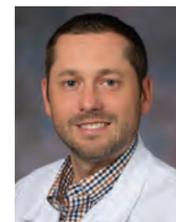
Ellen Chung, MD
Chief, Pediatric Radiology



Jeremy Jones, MD
Vice Chief, Pediatric Radiology and Section Chief, Neuro-Radiology



Mitchell Rees, MD
Section Chief, Body Imaging



Adam Bobbey, MD
Section Chief, Nuclear Medicine and Molecular Imaging



Leah Braswell, MD
Section Chief, Interventional Imaging

- | | | | |
|--------------------------|----------------------|---------------------|-----------------------|
| Lamya Atweh, MD | Aaron McAllister, MD | Diana Rodriguez, MD | Benjamin Thompson, DO |
| Sadaf Bhutta, MD | Kathryn Milks, MD | Lynne Ruess, MD | Patrick Warren, MD |
| Nathan Fagan, MD | James Murakami, MD | Jerome Rusin, MD | Cody Young, DO |
| Mark Hogan, MD | Becky Murray, MD | Rida Salman, MD | Nicholas Zumberge, MD |
| Rajesh Krishnamurthy, MD | Julie O’Donovan, MD | Summit Shah, MD | |
| Lisa Martin, MD | Andrew Rabe, DO | Sally Smith, DO | |

- 2023 – 2024 Pediatric Diagnostic Fellow**
Sarah Khoncarly, MD
- 2023 – 2024 Body Imaging Fellow**
Jasmeet Singh, MBBS

Highlights From the Past Year

This year in the Department of Radiology, we began utilizing new state-of-the-art endovascular equipment for acute and chronic deep venous thrombosis and pulmonary embolism. This approach allows us to expand our range of options for minimally invasive care of patients with thrombosis and pulmonary embolism.

Training the Next Generation of Radiologists

At Nationwide Children’s, our Radiology Fellowship program includes diagnostic pediatric radiology, as well as second year subspecialty fellowships. Subspecialty fellowships in Pediatric Cardiovascular Imaging, Pediatric Neuroradiology, Interventional Radiology and Pediatric Radiology Body Imaging are available. We’re proud to share that our first body imaging fellow completed training in September 2024 and will start a position at Arkansas Children’s Hospital.

Welcoming New Members to the Team

We are looking forward to growing our team in the latter part of 2024. Adarsh Ghosh, MD, finished his second year of fellowship at Cincinnati Children’s Hospital Medical Center and joined the team in August. He will focus on body, musculoskeletal and fetal imaging. Seth Crapp, MD, joined our team as a remote Emergency (night) Radiologist in October.

Paul Clark, DO, and Aaron Betts, MD, both retired from the U.S. Army and joined Nationwide Children’s in September. Dr. Clark is a remote radiologist specializing in body and musculoskeletal imaging. Dr. Betts is a remote neuroradiologist.

Selected Publications

Expert Panels on Cardiac Imaging and Pediatric Imaging; **Krishnamurthy R**, Suman G, Chan SS, Kirsch J, Iyer RS, Bolen MA, Brown RKJ, El-Sherief AH, Galizia MS, Hanneman K, Hsu JY, de Rosen VL, Rajiah PS, Renapurkar RD, Russell RR, Samyn M, Shen J, Villines TC, Wall JJ, Rigsby CK, Abbara S. ACR Appropriateness Criteria® congenital or acquired heart disease. *J Am Coll Radiol*. 2023 Nov;20(11S):S351-S381.

Kazerooni AF, Khalili N, Liu X, Haldar D, Jiang Z, Anwar SM, Albrecht J, Adewole M, Anazodo U, Anderson H, Bagheri S, Baid U, Bergquist T, Borja AJ, Calabrese E, Chung V, Conte GM, Dako F, Eddy J, Ezhov I, Familiar A, Farahani K, Haldar S, Iglesias JE, Janas A, Johansen E, Jones BV, Kofler F, LaBella D, Lai HA, Van Leemput K, Li HB, Maleki N, **McAllister AS**, Meier Z, Menze B, Moawad AW, Nandolia KK, Pavaine J, Piraud M, Poussaint T, Prabhu SP, Reitman Z, Rodriguez A, Rudie JD, Shaikh IS, Shah LM, Sheth N, Shinohara RT, Tu W, Viswanathan K, Wang C, Ware JB, Wiestler B, Wiggins W, Zapaishchykova A, Aboian M, Bornhorst M, de Blank P, Deutsch M, Fouladi M, Hoffman L, Kann B, Lazow M, Mikael L, Nabavizadeh A, Packer R, Resnick A, Rood B, Vossough A, Bakas S, Linguraru MG. The Brain Tumor Segmentation (BraTS) Challenge 2023: Focus on pediatrics (CBTN-CONNECT-DIPGR-ASNR-MICCAI BraTS-PEDs). *ArXiv [Preprint]*. 2024 May 23;arXiv:2305.17033v7.

Milks KS, Singh J, Benedict JA, Rees MA. Fluid-attenuated inversion-recovery sequence with fat suppression as an alternative to contrast-enhanced MRI in pediatric synovitis. *Pediatr Radiol*. 2024 Jan;54(1):96-104.

Turner ME, Blum KM, Watanabe T, Schwarz EL, Nabavinia M, Leland JT, Villarreal DJ, Schwartzman WE, Chou TH, Baker PB, Matsumura G, **Krishnamurthy R**, Yates AR, Hor KN, Humphrey JD, Marsden AL, Stacy MR, Shinoka T, Breuer CK. Tissue engineered vascular grafts are resistant to the formation of dystrophic calcification. *Nat Commun*. 2024 Mar 11;15(1):2187.

Yao T, St Clair N, Miller GF, Dorfman AL, Fogel MA, Ghelani S, **Krishnamurthy R**, Lam CZ, Quail M, Robinson JD, Schidlow D, Slesnick TC, Weigand J, Steeden JA, Rathod RH, Muthurangu V. A deep learning pipeline for assessing ventricular volumes from a cardiac MRI registry of patients with single ventricle physiology. *Radiol Artif Intell*. 2024 Jan;6(1):e230132.



Oluyinka O. Olutoye, MD, PhD
Surgeon-in-Chief

SURGICAL SERVICES

Nationwide Children’s Hospital’s surgical departments have come together with a single, clear focus — to provide optimal outcomes for every child — inside and outside the walls of the operating room. This work is predicated on three core pillars — providing advanced clinical care, performing ground-breaking research and offering industry-leading training programs — that combine to provide the best care for every child.

Our faculty are helping to improve the care provided to children around the world by training the next generation of surgeons. Our departments offer the most surgical residency and fellowship programs of any free-standing pediatric hospital in the United States. Training programs are also offered to other surgeons, providing opportunities for them to advance their skills in more advanced techniques such as minimally invasive surgery, robotic assisted surgery and complex colorectal surgery.

SURGICAL SUBSPECIALTIES

- Abdominal Transplant and Hepatopancreatobiliary Surgery
- Cardiothoracic Surgery
- Colorectal and Pelvic Reconstruction
- Dentistry
- Fetal Medicine
- Neurosurgery
- Ophthalmology
- Orthopedics
- Otolaryngology
- Pediatric and Adolescent Gynecology
- Pediatric Surgery
- Plastic and Reconstructive Surgery
- Trauma
- Urology

Surgical Services

ABDOMINAL TRANSPLANT AND HEPATOPANCREATOBILIARY SURGERY

The Department of Abdominal Transplant and Hepatopancreatobiliary Surgery at Nationwide Children’s is leading the way in providing liver and kidney transplantation as well as surgical treatment of children with pancreatic and hepatobiliary conditions. A national and international destination, the department serves as the principal surgical component for several advanced multidisciplinary programs, including the Pancreas and Liver Care Center and Kidney Transplant. Surgical capabilities include many advanced procedures available at only a handful of children’s hospitals in the United States. Program highlights include:

- Total pancreatectomy with islet autotransplantation (TPIAT) for children with debilitating pain and impaired quality of life from acute recurrent or chronic pancreatitis.
- One of the only pediatric hospitals in the United States with a dedicated on-site GMP islet isolation facility.
- Advanced liver surgery options and all technical variant transplant grafts, including reduced-size grafts, split liver grafts and living donor transplantation.
- Liver transplants in very young patients (<6 months).
- Highly specialized hepatobiliary surgery team with extensive experience in hepatoportoenterostomy (Kasai) for biliary atresia, choledochal cyst resection and complex resections of tumors and masses.
- Expertise in portal hypertension operations, including meso-Rex shunts for extrahepatic portal vein thrombosis, distal splenorenal shunts and mesocaval shunts.
- Autologous intestinal reconstruction surgery, including the Bianchi procedure and the serial transverse enteroplasty procedure (STEP), for children with short bowel syndrome.

Faculty



Jaimie D. Nathan, MD, FACS
Chief, Abdominal Transplant and Hepatopancreatobiliary Surgery

KIDNEY TRANSPLANT Pediatric Surgery and Kidney Transplant

- Jaimie D. Nathan, MD, FACS
- Amer Rajab, MD, PhD
- Sara Rasmussen, MD, PhD

Nephrology

- Brian Becknell, MD, PhD
- O. N. Ray Bignall II, MD

- Gabriel M. Cara Fuentes, MD
- Mahmoud Kallash, MD
- Kirsten A. Kusumi, MD
- John D. Mahan, MD
- Tahagod Mohamed, MD
- Hiren P. Patel, MD
Medical Director, Kidney Transplant
- William E. Smoyer, MD
- John David Spencer, MD

- Emily J. Stonebrook, MD
- Beth A. Vogt, MD
- Diana Zepeda-Orozco, MD

Urology

- Christina B. Ching, MD
- Daniel G. DaJusta, MD
- V. Rama Jayanthi, MD
- Daryl J. McLeod, MD

PANCREAS AND LIVER CARE CENTER Hepatopancreatobiliary Surgery and Liver Transplant

- Jaimie D. Nathan, MD, FACS
- Ashley Limkemann, MD
- Sara Rasmussen, MD, PhD

Gastroenterology, Hepatology and Nutrition

- Rosara Bass, MD, MS
- A. Jay Freeman, MD, MSc
Medical Director, Pancreas Care
- Cheryl E. Garipey, MD
- John Matthew Grisham, MD
- Muhammad A. Khan, MD, MPH
Director, Interventional and Diagnostic Endoscopy

- Dieudonne Nonga Makon, MD
- Carol J. Potter, MD
- Alexander Weymann, MD
Medical Director, Liver Care
- Anesthesiology and Pain Medicine**
- Graciela Argote-Romero, MD
- Candice Burrier, MD
- Ajay D’Mello, MD

- Leslie J. Matthews, MD
- Greg Maves, MD
- Ambrish Patel, MD
- Timothy Smith, MD
- Ahsan S. Syed, MD
- Brittany Willer, MD

Endocrinology

Kajal K. Gandhi, DO, MPH
Robert Hoffman, MD
Justin A. Indyk, MD, PhD
Jennifer Ladd, MD, MSc

Hematology/Oncology

Mark A. Ranalli, MD

Infectious Disease

Monica I. Ardura, DO, MSCS
Christopher P. Ouellette, MD
Eunkyung Song, MD
Sanya J. Thomas, MD

Islet Cell Transplantation and Beta Cell Biology

Balamurugan N. Appakalai, PhD
Director
Ahad Ahmed Kodipad, PhD
Research Scientist
Chandrashekar Bangalore Revanna, PhD
Research Scientist
Krishna Kumar Samaga, MS
Chief Research Associate

Pediatric Psychology

Hannah N. McKillop, PhD

Radiology

Nathan Fagan, MD
Mitchell A. Rees, MD
Patrick Warren, MD

He is a member of the following national committees:

- Member, Membership Committee of the Society of University Surgeons (SUS)
- Primary Representative, United Network for Organ Sharing (UNOS) National Liver Review Board Pediatrics
- American Academy of Pediatrics (AAP) Section on Surgery Program Committee

Sara K. Rasmussen, MD, PhD, serves on the following national boards and committees:

- UNOS Board of Directors At-Large Representative
- UNOS Board of Directors Nominating Committee
- American Academy of Pediatrics Special Representative to the Organ Procurement & Transplantation Network (OPTN)
- AAP Section on Surgery Liaisons Committee Member

Highlights From the Past Year

Since hiring two full-time board-certified pediatric transplant surgeons, the program has performed:

- 20 TPIATs (2022-present)
- 37 Kidney Transplants (2021-present)
- 14 Liver Transplants (2021-present)
- 4 Distal Splenorenal Shunts (2021-present)
- 2 Meso-Portal Shunts (2021-present)
- 7 Meso-Rex Shunts (2021-present)
- 4 Other Shunt-Related Operations (2021-present)

This year we were privileged to add two new recruits to our team. Rosara Bass, MD, MS, joined the Division of Gastroenterology, Hepatology, and Nutrition as a gastroenterologist and physician nutrition specialist following the completion of her fellowship in pediatric gastroenterology at the Children’s Hospital of Philadelphia. She cares for children with disorders spanning all aspects of general gastroenterology, with a focus on pancreatic and nutrition disorders. John Matthew Grisham, MD, is joining the Division of Gastroenterology Hepatology and Nutrition following the completion of a Pediatric Gastroenterology Fellowship at Nationwide Children’s. He is currently a Clinical Informatics Fellow at The Ohio State University/Nationwide Children’s. Dr. Grisham will be an integral part of the Pancreas and Liver Care Center, helping to care for children with disorders spanning all aspects of general gastroenterology and pancreatology.

Collaborating to Advance Care for Children Everywhere

In the past year, our center became the second site for the Mixed Meal Tolerance Test in collaboration with Cincinnati Children’s Hospital. This test shows how much insulin the patient’s body is producing after consuming a liquid meal containing a mix of nutrients including fats, protein and carbohydrates.

We supported and championed Children’s Hospital of Los Angeles to begin performing total pancreatectomy with islet autotransplantation (TPIAT) procedures in 2024 improving access to care for children in the western United States.

Sara Rasmussen, MD, PhD, collaborated with the Surgeon’s Working Group of the Starzl Network for Excellence in Pediatric Transplantation (SNEPT) and served as lead author on a position paper about training in pediatric liver transplantation.

We partnered with the National Pancreas Foundation and Rebecca’s Wish to provide medical staffing services for Camp Hope, a summer camp for children and adolescents affected by pancreatitis or who have undergone TPIAT.

Leading in Professional Excellence

Jaimie D. Nathan, MD, FACS, was honored as a Castle Connolly Top Doctor and accepted as a member of the Society of University Surgeons. He serves as vice chair of the American Society of Transplant Surgeons Pediatric Advisory Committee.

Selected Publications

Akshintala VS, Moore M, Cruz-Monserrate Z, **Nathan JD**, Searle BC, Abu-El-Hajja M. Urine proteomics profiling identifies novel acute pancreatitis diagnostic biomarkers in a pediatric population. *Gastroenterology*. 2024 May 24:S0016-5085(24)04937-0. Epub ahead of print.

Alharbi H, Daniel EJP, Thies J, Chang I, Goldner DL, Ng BG, Witters P, Aqul A, Velez-Bartolomei F, Enns GM, Hsu E, Kichula E, Lee E, Lourenco C, Poskanzer SA, **Rasmussen S**, Saarela K, Wang YM, Raymond KM, Schultz MJ, Freeze HH, Lam C, Edmondson AC, He M. Fractionated plasma N-glycan profiling of novel cohort of ATP6AP1-CDG subjects identifies phenotypic association. *J Inherit Metab Dis*. 2023 Mar;46(2):300-312.

Downs EM, Eaton A, Witkowski P, Wijkstrom M, Walsh M, Trikudanathan G, Singh VK, Schwarzenberg SJ, Pruett TL, Posselt A, Naziruddin B, **Nathan JD**, Mokshagundam SP, Morgan K, Lara LF, Gardner TB, Freeman ML, Ellery K, Chinnakotla S, Beilman GJ, Adams D, Ahmad S, Abu-El-Hajja M, Bellin MD. Nutritional risks in patients undergoing total pancreatectomy islet autotransplantation in the POST consortium. *J Gastrointest Surg*. 2023 Sep;27(9):1893-1902.

Heinzman C, Hornung L, Lin TK, Lowe CMO, Vitale DS, Abu-El-Hajja M, **Nathan JD**. Total pancreatectomy with islet autotransplantation reduces opioid use and improves nutritional support in children with debilitating pancreatitis. *PLoS One*. 2023 Aug 4;18(8):e0289620.

Rasmussen SK, Lemoine CP, Superina R, Sayed B, Goldaracena N, Soltys KA, Griesemer A, Dick A, Angelis M, Chin LT, Florman S, Ganoza A, Lyer K, Kang SM, Magliocca J, Squires J, Eisenberg E, Bray D, Tunno J, Reyes JD, Mazariegos GV. State of pediatric liver transplantation in the United States and achieving zero wait list mortality with ideal outcomes: A statement from the Starzl Network for Excellence in Pediatric Transplant Surgeon’s Working Group. *Pediatr Transplant*. 2023 Feb;27 Suppl 1:e14283.

Soltys K, Lemoine C, Zhang X, Bhat R, Bucuvalas J, **Rasmussen S**, Romero R, Batsis I, Sayed B, Tunno J, Confair C, Vargas S, Superina R, Mazariegos G. Factors associated with thrombotic and hemorrhagic complications in pediatric liver transplant: A multi-center analysis from the Starzl Network for Excellence in Pediatric Transplantation. *Pediatr Transplant*. 2023 Jun;27(4):e14521.a



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$300,001

>>> Fast Facts: July 2023 – June 2024

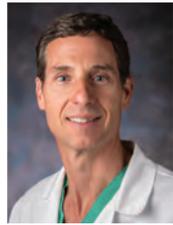
Abdominal Transplant Inpatient Discharges:	179	Total Surgical Procedures:	156
Abdominal Transplant Observation and Outpatient-in-a-Bed Discharges:	109	Kidney Clinic Visits:	25
Kidney Transplants:	14	Liver Clinic Visits:	50
Liver Transplants:	3	TPIAT Clinic Visits:	95
TPIAT Procedures:	8	All Other Related Clinic Visits:	170
Other Procedures	132	Total Abdominal Transplant and Hepatopancreatobiliary Surgery Clinic Visits:	340

Surgical Services

THE HEART CENTER/CARDIOTHORACIC SURGERY

The Cardiothoracic Surgery Program at Nationwide Children's Hospital is dedicated to the treatment of all patients, from fetus to adulthood, with congenital heart defects ranging from the most straightforward to the extremely complex. As part of The Heart Center, we offer a comprehensive approach to heart care that is based on a multidisciplinary team model, which enables our team to constantly monitor quality of care and patient safety pre and post-surgery to assure the best possible outcomes. See page 41 for details about The Heart Center.

Faculty



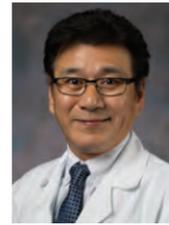
Mark E. Galantowicz, MD
Chief, Cardiothoracic Surgery
Co-director, The Heart Center



Sergio A. Carrillo Melendez, MD
Surgical Director, Adult
Congenital Heart Disease



Patrick I. McConnell, MD
Director, Cardiopulmonary
Mechanical Assist Program



Toshiharu Shinoka, MD, PhD
Director, Cardiovascular Tissue
Engineering Program

Selected Publications

Argo MB, Barron DJ, Eghtesady P, Yerebakan C, DeCampi WM, Alsoufi B, Honjo O, Jacobs JP, Paramanathan T, Rahman M, Lambert LM, Jegatheeswaran A, Carrillo SA, Husain SA, Ramakrishnan K, Caldarone CA, Karamlou T, Nelson J, Mannie C, Romano JC, Turek JW, Blackstone EH, **Galantowicz ME**, Kirklin JK, Mitchell ME, McCrindle BW; Congenital Heart Surgeons Society Critical Left Heart Obstruction Work Group. Outcomes after hybrid palliation for infants with critical left heart obstruction. *J Am Coll Cardiol*. 2023 Oct 3;82:1427-1441.

Marshall V WH, **McConnell P**. Surgical considerations in adult congenital heart disease heart failure. *Heart Fail Clin*. 2024 Apr;20:199-208.

Nash KM, Boe BA, **Carrillo SA**, Harrison A, Iwaki R, Kelly J, Kirkton RD, Krishnamurthy R, Lawson JH, Matsuzaki Y, Prichard HL, Shah K, **Shinoka T**, Breuer CK. Evaluation of tissue-engineered human acellular vessels as a Blalock-Taussig-Thomas shunt in a juvenile primate model. *JTCVS Open*. 2023 Aug 9;15:433-445.

Wang Z, Mithieux SM, Vindin H, Wang Y, Zhang M, Liu L, Zbinden J, Blum KM, Yi T, Matsuzaki Y, Oveissi F, Akdemir R, Lockley KM, Zhang L, Ma K, Guan J, Waterhouse A, Pham NTH, Hawkett BS, **Shinoka T**, Breuer CK, Weiss AS. Rapid regeneration of a neoartery with elastic lamellae. *Adv Mater*. 2024 Jan;36:e2312063.

Surgical Services

COLORECTAL AND PELVIC RECONSTRUCTION

The Center for Colorectal and Pelvic Reconstruction (CCPR) at Nationwide Children's Hospital is leading the way in providing high-quality care for children diagnosed with colorectal and pelvic conditions. There is a direct correlation between the number of patients a clinical program sees and the high-quality outcomes they can deliver to their patients. CCPR is the busiest program of its kind anywhere in the world, having performed more than 550 operations last year. Every child diagnosed with a colorectal or pelvic condition is handled with an individualized treatment plan. Because of the complexity of many conditions, most children require care throughout their life. Our team is committed to providing optimal outcomes and quality of life for patients ranging from the newborn stage, through toilet training, puberty and adulthood, including bowel, urinary, sexual function and childbearing.

Faculty



Richard J. Wood, MD
Chief

Colorectal and Pelvic Reconstructive Surgery

Karen A. Diefenbach, MD
Alessandra Gasior, DO
Transitional Care Director
Ihab Halaweish, MD

Gastroenterology, Hepatology and Nutrition

Carlo Di Lorenzo, MD
Peter Lu, MD
Neetu B. Puri, MD, MPH
Karla Vaz, MD
Kent C. Williams, MD
Desale Yacob, MD
Motility Director, Colorectal and
Pelvic Reconstruction

Diagnostic Radiology

Brent H. Adler, MD
Benjamin P. Thompson, DO

Neurosurgery

Jeffrey R. Leonard, MD

Orthopedics

Christopher A. Iobst, MD

Pediatric and Adolescent Gynecology

Geri D. Hewitt, MD
Gynecology Director, Colorectal
and Pelvic Reconstruction
Chelsea A. Kebodeaux, MD
Katherine A. McCracken, MD

Urology

Daniel G. DaJusta, MD
Urology Director, Colorectal and
Pelvic Reconstruction
Molly Fuchs, MD
V. Rama Jayanthi, MD

2023 – 2024 Fellows Pediatric Colorectal Research

Shruthi Srinivas, MD

Pediatric Colorectal Surgery

Wendy Jo Svetanoff, MD

International Pelvic Reconstruction

Syed Faizullah Hussaini, MD

Highlights From the Past Year

This year, the Center for Colorectal and Pelvic Reconstruction along with colleagues in Urology and Gastroenterology opened a multidisciplinary clinic at Nationwide Children's - Toledo, bringing expert, specialty care to the northwest Ohio region.

Research and Outcomes Sharing to Drive the Field Forward

Our team is actively involved in research and publishing outcomes data to show the effectiveness of our innovative approaches to care. Notably, we published outcomes on para-U modification to the posterior sagittal anorectoplasty (PSARP) or more complicated anorectal vaginal urethroplasty (PSARVUP) for anorectal malformations.

More broadly, our outcomes are the best-reported results in the literature for anorectal malformations and cloaca. We've demonstrated bladder and renal preservation after a new approach to cloaca reconstruction started in 2017. Additionally, we led a multicenter study demonstrating colorectal outcomes for cloacal exstrophy, and we won the colorectal prize at the British Association of Pediatric Surgeons meeting.

Our team’s collaborations include multicenter research with Seattle Children’s and Royal Children’s in Melbourne. We are the founding site for the Pediatric Colorectal and Pelvic Learning Consortium (PCPLC), which was founded in 2016 as an international consortium of surgeons, scientists and other experts.

Supporting Professional Excellence

Our faculty are involved in professional organizations, giving expertise and leadership to advance the field and servicing as mentors and role models for young professionals. Some highlighted memberships and leadership roles are as follows:

- Richard Wood, MD, is on the executive committee of PCPLC, and serves on several working groups including those for ARM, cloaca and quality. Dr. Wood has also been recognized with membership to the Society of University Surgeons (SUS).
- Alessandra Gasior, DO, is a member of the PCPLC ARM working group.
- Ihab Halaweish, MD, is a member of the PCPLC Hirschsprung Disease Working Group.

Selected Publications

Fuchs ME, Srinivas S, Quintanilla Amoros R, Jayanthi VR, Wood RJ, Dajusta DG. The effect of surgical reconstruction on bladder function in cloacal malformation: A study of urodynamics. *J Pediatr Urol.* 2024 Jul 10:S1477-5131(24)00356-5. Epub ahead of print.

Knaus ME, Westgarth-Taylor C, **Gasior AC, Halaweish I,** Thomas JL, **Srinivas S,** Levitt MA, **Wood RJ.** A Modification of the Anoplasty Technique during a Posterior Sagittal Anorectoplasty and Anorectal Vaginal Urethroplasty Closure: The Para-U-Stitch to Prevent Wound Dehiscence. *Eur J Pediatr Surg.* 2024 Jun;34(3):222-227.

Morin JP, **Srinivas S, Wood RJ, Dajusta DG, Fuchs ME.** Bladder Management and Continence in Girls With Cloacal Malformation After 3 Years of Age. *J Pediatr Surg.* 2024 Aug;59(8):1647-1651. Epub 2024 Apr 20.

Srinivas S, Knaus ME, Avansino JR, Badillo A, Calkins CM, Dickie BH, Durham MM, Fuller MK, Ralls MW, Reeder RW, Rentea RM, Rollins MD, van Leeuwen K, **Wood RJ;** Pediatric Colorectal and Pelvic Learning Consortium. Outcomes From Colonic Pull-Through for Cloacal Exstrophy Differ by Colon Length: A Multi-Institutional Study. *J Pediatr Surg.* 2024 Feb;59(2):225-229.

>>> Fast Facts: July 2023 – June 2024

Inpatient Discharges:	307	Colorectal and Pelvic Reconstruction Clinic Visits:	2,387
Observation and Outpatient-in-a-Bed Discharges:	33	Multidisciplinary Clinic Visits (CCPR/Urology/GYN/Psychology):	431
Total Discharges:	340	Total Clinic Visits:	2,818
Average Length of Stay*:	6.13		
Patient Days*:	1,881		
Total Surgical Procedures:	606		

*Excludes observation and outpatient-in-a-bed patients

Surgical Services

DENTISTRY

The Department of Dentistry at Nationwide Children’s Hospital is comprised of dedicated professionals in the fields of pediatric dentistry, orthodontics, oral surgery, endodontics, periodontics, general dentistry, dental hygiene and dental assisting who provide comprehensive preventive, therapeutic, urgent and emergency oral health care services for infants, children and adolescents, including those with special health care needs. Our mission is to optimize oral health for the children who need us most through a balanced program dedicated to providing quality clinical care and specialty services while advancing knowledge through research, advocacy and community partnerships within a premier educational environment. Scientific discoveries focus on caries prevention, behavior management, oral microbiome and dental trauma outcomes.

Faculty



Daniel B. Claman, DDS
Chief

Homa Amini, DDS, MS, MPH
Ehsan Azadani, DDS, MS
Paul S. Casamassimo, DDS, MS
Daniel B. Claman, DDS
Associate Program Director
David Danesh, DMD, MS, MPH

Kimberly Hammersmith, DDS, MPH, MS
Program Director
Ashok Kumar, DDS, MS
Director of Clinical Operations and General Anesthesia
Kyulim Lee, DMD, PhD, MS
Kristina Petrich, DDS

OSU-Affiliate Faculty

Hany A. Emam, DDS, MS
Section Chief, Oral and Maxillofacial Surgery
Henry W. Fields, DDS, MS, MSD
Section Chief, Orthodontics
Ann L. Griffen, DDS, MS
Erin L. Gross, DDS, PhD, MS

Courtney A. Jatana, DDS, MS, FACS
Kelly S. Kennedy, DDS, MS, FACS
Dennis J. McTigue, DDS, MS
Beau Meyer, DDS, MPH
Diego A. Solis, DDS

Orthodontists (Primary Appointment in Plastics)
Kaitrin Kramer, DDS, MS, PhD
Ana M. Mercado, DMD, MS, PhD
Kara Morris, DDS, MS

Community-Based Dentists
Ashley E. Anderson, DDS
Amy Augustine, DDS
Richa Banthia, DDS
Carolyn A. Barber, DDS
Kyle Beulke, DDS

Janet J. Brown, DDS
Jennifer Bryk-Hechko, DDS, MS
Emily R. Burns, DDS, MS
George Chen, DDS, MS
Darya Dabiri, DMD, MS
Joseph DePalo, DMD, MS
Johnathan W. Draney, DDS, MS

Kylene H. Fernandez, DDS, MS
Timothy J. Frey, DDS
Lucia C. Gerstmann, DDS, MS
Kimberly M. Gill, DDS, MS
Jillian N. Gray, DDS
Michael Hawk, DMD
Marcus Heffner, DDS

Courtney D. Herman, DDS
Mitzi L. Hines, DDS
Nicole Johnson, DDS
Gary M. Judis, DDS
Patrick M. Kennedy, DDS
Nicholas M. Kerns, DDS, MS
Benjamin Kwok, DDS, MS

Joshua M. Leavitt, DMD, MS
Eileen M. Martinez, DDS
Monte E. Masonbrink, DDS, MS
Yoon-Mi L. Matracia, DMD, MS
Jeffrey T. Milton, DDS, MS
Cecilia A. Moy, DDS, MS
Andrea M. Myers, DDS

Gregory M. Ness, DDS
Scott W. Nieman, DDS
Sean T. O’Day, DMD
Colleen C. Orellana, DDS, MS
Andree-Anne Page, DMD
Sachin S. Parulkar, DDS
Chintan I. Patel, DDS

Monica R. Patel, DMD, MS	Shaun A. Rotenberg, DMD, MS	David A. Smeltzer, DDS	Kevin T. Weitzel, DMD, MS
Nira S. Patel, DDS	Avneet K. Sandhu, DDS	Eric Soller, DDS	Stephen Wilson, DMD, PhD
Emily E. Pearson, DMD	Katherine M Seymour, DDS	Kumar Subramanian, DDS, MS	Chloe Wong, DDS, MS
Matthew L. Pingel, DMD	Marlina M. Shah, DDS, MS	CaAdrian N. Taylor, DDS	Valentina Zahran, DDS, MD
Mindy A. Price, DDS, MS	Chelsea C. Shellhart, DDS	Claire E. Towner, DDS	
Sidney D. Price, DDS, MS	Kristine N. Fu Shue, DMD	Eric C. Van Gilder, DDS	
Joel J. Richards, DDS	David S. Silverglade, DDS, MS	Andrew Vo, DDS, MS	

2023 – 2024 Residents

Joe Benson, DDS	Brandi Hall, DMD	Matt Shafron, DDS
Anna Bollag, DMD	Julia Jagannath, DMD	Ryan Sonnabend, DDS
Amber Courtney, DMD, MS	Mikaela Lujan, DDS	Amanda Swanson, DDS
Briawna Dildy, DDS	Rachel Maydew, DDS	Ryan Sympson, DDS
Lexi Dunnells, DDS	Maria Park, DDS	Travis Wagner, DDS
Ryan Gallegos, DDS	Taylor Rowe, DDS	Calli Welker (Herron), DDS
	Rachael Sells, DMD	

Highlights From the Past Year

In the past year, the department has continued our long tradition of care for children with an emphasis on children with special health care needs and patients with barriers accessing care. We opened new facilities, including the Livingston Orthopedic & Surgery Center. This is an innovative pediatric center providing convenient, comprehensive surgical services including four operating rooms dedicated to dental surgery.

Research Growth

Department faculty published 26 peer-reviewed articles in the past year and our research efforts continue to grow with the support of new research grants such as:

- Kimberly Hammersmith, DDS, MPH, MS: Postdoctoral Training in General, Pediatric and Public Health Dentistry and Dental Hygiene: \$2,304,490
- Ehsan Azadani, DDS, MS: Validation of ICD Codes for Traumatic Dental Injuries at a Major Childrens Hospital, Delta Dental Foundation: \$7,981
- Kylum Lee, DMD, PhD, MS: Clinical Research Loan Repayment Program Award, National Institute of Dental and Craniofacial Research: \$50,000 per year

We've continued collaborating with experts across Nationwide Children's. Kylum Lee was appointed as an assistant professor on tenure track at The Ohio State University College of Dentistry and is partnering with the Bone Marrow Transplant Clinic at Nationwide Children's to make red light therapy available during chemotherapy to prevent or decrease mucositis in patients.

Professional Engagements and Recognition

Our staff is involved in various professional organizations, and some have been recognized for their work. Selected highlights include:

- Erin Gross, DDS, PhD, MS, is chair of the American Dental Education Association Council of Faculties Administrative Board.
- Homa Amini, DDS, MPH, is chair of the Qualifying Exam Committee and the American Board of Pediatric Dentistry.
- Beau Meyer, DDS, MPH, MS, is chair of the Council on Pre-doctoral Education for the American Academy of Pediatric Dentistry.
- Janice Townsend, DDS, MS, received the American Academy of Pediatric Dentistry Suzi Seale Coll Award for Evidence Based Dentistry.

Selected Publications

Azadani EN, Evans J, Peng J, McTigue D, Townsend J. Risk of concomitant traumatic brain injuries in children with traumatic dental injuries in a pediatric emergency department: A case-control study. *J Am Dent Assoc.* 2023 Sep;154(9):805-813.e1.

Bussard N, Casamassimo P, Amini H, Peng J, Wapner A, Meyer BD. Age of first dental visits: A benefit of the pediatric medical home. *J Public Health Dent.* 2024 Apr 29. Epub ahead of print.

Kopczynski K, Casamassimo P, Amini H, Peng J, Gorham T, Meyer BD. Evaluating the type of pediatric dental care use in the context of neighborhood opportunity. *J Am Dent Assoc.* 2024 Apr;155(4):294-303.e4.

Kumar A, Casamassimo P, Kovalchin J, Claman D, Peng J, McDaniel J, Hunt WG, Wong CA. The changing profile of infective endocarditis: A multi-year retrospective study for dentists. *Int J Paediatr Dent.* 2024 Sep;34(5):673-679. Epub 2024 Jan 31.

Yinger S, Claman D, Luca J, Hammersmith K, Gross E, Meyer B. Triazolam for pediatric dental sedation: A retrospective evaluation of safety and changes in visit behavior. *Pediatr Dent.* 2024 Jan 15;46(1):63-67.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$527,337

>>> Fast Facts: July 2023 – June 2024

Observation and Outpatient-in-a-Bed Discharges:	29	Dental Clinic and Sedation Visits:	307
Total Surgical Procedures:	5,948	Community Dental Clinic Visits:	2,003
Dental Clinic Visits:	35,642	Total Clinic Visits:	37,952

Surgical Services

FETAL MEDICINE

The Fetal Center at Nationwide Children’s Hospital provides comprehensive care to families from across the United States and around the world who are facing potentially complex birth defects. The multidisciplinary Fetal Team works closely with families and their perinatologists to utilize state-of-the-art diagnostic and treatment protocols from a full range of specialties to improve neonatal outcomes. Families receive care beginning with prenatal counseling and continuing through the birth of their child and beyond.

The Fetal Center is a member of the North American Fetal Therapy Network (NAFTNet), a voluntary association of 36 medical centers in the United States, Canada and Mexico that performs advanced in-utero fetal therapeutic procedures. The center is also a member of the Ohio Fetal Medicine Collaborative (OFMC), a multi-system effort to provide high-risk expectant mothers and their babies with suspected fetal diagnoses the highest quality care.

Faculty



Adolfo Etchegaray, MD
Chief

Anesthesiology

Seth B. Hayes, MD
Jay D. Holladay, DO
Katherine Manupipatpong, MD
Leslie J. Matthews, MD
Laura Puertas Ocio, MD

Cardiology

Aimee K. Armstrong, MD
Clifford L. Cua, MD
Erin A. Hehr, MD
Omar M. Khalid, MD
John P. Kovalchin, MD
Kathryn D. Nardell, MD
Corey A. Stiver, MD

Karen M. Texter, MD
Stephanie Y. Tseng, MD

Cardiovascular Surgery

Mark E. Galantowicz, MD
Patrick I. McConnell, MD
Sergio Carrillo Melendez, MD
Toshiharu Shinoka, MD, PhD

Craniofacial and Plastic Surgery

Kim A. Bjorklund, MD
Richard E. Kirschner, MD, FAAP, FACS
Gregory D. Pearson, MD, FAAP, FACS

Fetal Imaging/Radiology

Brent H. Adler, MD
Jeremy Y. Jones, MD
Lisa C. Martin, MD
Aaron S. McAllister, MD
Kathryn S. Milks, MD
Julie C. O’Donovan, MD

Mitchell A. Rees, MD
Jerome A. Rusin, MD
Cody M. Young, DO
Nicholas A. Zumberge, MD

Fetal Medicine/Fetal Intervention

Adolfo Etchegaray, MD
Oluseyi K. Ogunleye, MD

Genetic and Genomic Medicine

Bimal P. Chaudhari, MD, MPH
Scott E. Hickey, MD
Kandamurugu Manickam, MD

Hematology

Amy L. Dunn, MD
Amanda E. Jacobson-Kelly, MD
Melissa J. Rose, DO

Susan M. Lopata, MD

Namrita Odackal, DO
Shama Y. Patel, MD, MPH
Ruth B. Seabrook, MD
Sheria D. Wilson, MD

Nephrology

Michael Brian Becknell, MD, PhD
Hiren P. Patel, MD

Neurology

Darrah N. Haffner, MD
Margie A. Ream, MD, PhD
Jaime Dawn E. Twanow, MD

Neonatology

Molly K. Ball, MD
Cecilie Halling, MD
Jason R. Jackson, DO

Neonatology/Infectious Disease

Pablo J. Sánchez, MD

Neurosurgery

Albert M. Isaacs, MD
Jeffrey R. Leonard, MD
Eric A. Sribnick, MD, PhD

Otolaryngology

Charles A. Elmaraghy, MD, FACS, FAAP
Jonathan M. Grischkan, MD, FACS, FAAP
Meredith N. Lind, MD, FACS, FAAP

Palliative Care

Kate Cicozi, MD
Zachary J. Farmer, MD
Lisa M. Humphrey, MD
Natalie L. Jacobowski, MD
Amy B. Schlegel, MD
Steven M. Smith, MD

Pediatric Surgery

Karen A. Diefenbach, MD
Ihab F. Halaweish, MD
Oluyinka O. Olutoye, MD, PhD
Dana M. Schwartz, MD

Psychology

Amy E. Baughcum, PhD
Catherine L. Butz, PhD
Nicole R. Dempster, PhD

Pulmonary Medicine

Karen S. McCoy, MD
Spina Bifida
Katherine J. Steingass, MD

Urology

Seth A. Alpert, MD
Linda A. Baker, MD
Christina B. Ching, MD

Daniel G. DaJusta, MD
Molly E. Fuchs, MD
V. Rama Jayanthi, MD
Daryl J. McLeod, MD

2023-2024 Perinatal Surgery Fellow

Stephanie Cruz, MD

Highlights From the Past Year

Growing Research to Improve Fetal Care

Nationwide Children’s has committed to developing a state-of-the-art fetal therapy program. This undertaking includes not only offering fetal surgeries for life-limiting congenital anomalies but also severe medical conditions not yet amenable to treatment. Within those conditions are several genetic and metabolic syndromes in which organic damage starts well before birth, putting the infant at risk of death or irreversible handicap for life. Current advances in early non-invasive genetic diagnosis, coupled with new developments in enzyme replacement therapies (ERT), gene editing and stem cell research, have made these once inaccessible diseases a renewed target for innovative therapies starting in utero, aiming to improve not only the perinatal but also the long-term outcome. To advance these options through research, the Fetal Center has joined forces with experts across the organization to form the Fetal Research Affinity Group (FRAG).

In their first year, FRAG members presented on a number of topics, including:

- Fetal Therapy: Present and Future
- NURAG and FRAG Joint Meeting: Fetal Therapy update for Lower Urinary Tract Obstruction
- Exploring Perspectives on Prenatal Therapeutic Interventions in Spinal Muscular Atrophy
- Prenatal Therapies for Lysosomal Storage Diseases
- What is New in Mucopolysaccharidosis

Leading Through National Conferences and Organizational Leadership

Nationwide Children’s hosted the first annual Fetal/Neonatal conference with national experts coming to our campus to engage in learning and collaboration. Additionally, our experts participated in invited talks and leadership positions across the world.

- Bimal Chaudhari, MD, was appointed to NAFTNet Ethics Committee.
- Adolfo Etchegaray, MD, was appointed to NAFTNet Publications Committee. He was also invited to present at the Prune Belly Network Conference and International Congress of the Argentinean Fetal Medicine Network. He additionally completed the Harvard Gene Therapy and Genetic Sequencing Technologies course.
- Mickey Johnson, RN, serves as Chair of Governance Committee for the Fetal Therapy Nurse Network (FTNN).

Our team has also been recognized with local and national awards. Dr. Etchegaray received the Marcelino Herrera Vargas Childhood Surgery Award from the National Academy of Medicine of Buenos Aires, Argentina. Stephanie Cruz, MD, received the International Fetal Medicine and Surgery Society Fellow Award. In 2024, the FTNN awarded Becky Corbitt, RN, MSN, CNL, fetal center nurse coordinator, the inaugural FTNN Outstanding Nurse Award. This award recognizes nurses who make an outstanding impact on the health of expectant families facing a fetal diagnosis.

Selected Publications

Calcara S, Paeltz A, Richards B, Sisk T, Stiver C, Ogunleye O, Texter K, Mah ML, Cua CL. The utility of screening fetal echocardiograms following normal level II ultrasounds in fetuses with maternal congenital heart disease. *Cardiol Ther.* 2024 Mar;13(1):163-171.

Callahan KP, Clayton EW, Lemke AA, **Chaudhari BP**, Wenger TL, Lyle ANJ, Brothers KB. Ethical and legal issues surrounding genetic testing in the NICU. *Neoreviews.* 2024 Mar 1;25(3):e127-e138.

Ogunleye O, Griffin K, Xia J, **Jackson J, Etchegaray A, Olutoye O, Diefenbach KA.** Duodenal atresia: prenatal diagnosis and postnatal management. *Neoreviews.* 2024 Mar 1;25(3):e180-e186.

Ogunleye O, Xia J, **Cruz S**, Saulsbery A, **Nicoll R, Schlegel A, Etchegaray A, Sribnick E, Olutoye O.** Health disparities and route of repair of fetal myelomeningocele-prenatal versus postnatal repair. *Advances in Surgical Sciences.* 2024 June 14;12(1):27-35.



Surgical Services
NEUROSURGERY

Ranked sixth in the country by U.S. News & World Report, the Department of Neurosurgery at Nationwide Children’s Hospital provides evaluation and treatment for problems of the central nervous system in patients from birth through 21 years of age and in selected adults with congenital neurological disorders. The staff works closely with members of the departments of Anesthesia, Hematology, Oncology & Blood and Marrow Transplant, Neurology, Physical Medicine & Rehabilitation, Pediatric Surgery, Plastic and Reconstructive Surgery, Colorectal and Pelvic Reconstruction, Fetal Medicine and many other pediatric disciplines as well as the adult neurosurgical program.

Faculty



Jeffrey R. Leonard, MD
Chief

Albert Isaacs, MD, PhD

Jonathan A. Pindrik, MD

Ammar Shaikhouni, MD, PhD

Eric A. Sribnick, MD, PhD

Michelle Wedemeyer, MD, PhD

OSU-Affiliate Faculty

Andrew J. Grossbach, MD

John M. McGregor, MD

Shahid Nimjee, MD

Ciaran J. Powers, MD, PhD

Daniel Prevedello, MD

Patrick Youssef, MD

Highlights From the Past Year

Program Growth

The Department of Neurosurgery continued with significant growth with 850 surgical cases and more than 6,500 clinic visits performed each year. Our out-of-state and international referrals have grown significantly, as demonstrated by increases in new patient clinic visits, inpatient hospital days and case volume.

The Selective Dorsal Rhizotomy (SDR) Program continues to provide comprehensive care for patients with spastic cerebral palsy, including care provided by colleagues in Physical Medicine and Rehabilitation, and Clinical Therapy Services. Jeffrey Leonard, MD, chief of Neurosurgery and director of the program, is renowned for his expertise in SDR, and Nationwide Children’s is one of only a few in the country that performs this procedure with great success.

The Neuro-Oncology Program is an international destination for pediatric, adolescent and young adult patients with malignant brain and spinal cord tumors. Dr. Leonard is co-director of the program along with Maryam Fouladi, MD, a leading pediatric neuro-oncologist, and provides cutting-edge surgical expertise for treatment of highly complex brain tumors in young patients.

The Epilepsy Surgery Program is steadily expanding and is on track to perform more than 70 epilepsy cases per year. In 2023, the program was awarded the Germain Family Accelerator Award to hasten clinical impact through advancement of translational and clinical research discoveries.

During the past year, leadership roles were announced for the Pediatric Neurosurgery Fellowship Program. Jonathan A. Pindrik, MD, was named program director and Albert Isaacs, MD, PhD, was named the associate program director.

The program includes a one-year fellowship with an optional second year, beginning in July of each year. The first-year fellowship is accredited by the Accreditation Council for Pediatric Neurosurgery Fellowships (ACPNF) and is ideal for candidates looking for diverse, well-rounded training, and want to pursue a career in pediatric neurosurgery. The second year of training allows fellows additional clinical and research experience. Our fellows lead a team of residents and nurse practitioners while learning innovative neurosurgical interventions as well as gaining comprehensive research experience.

Professional Involvement and Collaboration

Our entire team is dedicated to collaborating with neurosurgeons globally. All of our neurosurgeons are members of the American Association of Neurological Surgeons (AANS) and Congress of Neurological Surgeons (CNS). Additionally, we have partnered with other centers and organizations to further the impact our of work. Selected highlights include:

- Advancing Treatment for Pediatric Craniopharyngioma Consortium
- Cerebral Palsy Research Network
- Pediatric Brain Tumor Consortium
- Pediatric Emergency Care Applied Research Networks
- Children’s Oncology Group

Selected Publications

Bergus KC, Patterson KN, Asti L, Bricker J, Beyene TJ, Schulz LN, Schwartz DM, Thakkar RK, **Sribnick EA**. Association of initial assessment variables and mortality in severe pediatric traumatic brain injury. *World J Pediatr Surg*. 2024 May 28;7(2):e000718.

Damante MA, Rosenberg N, **Shaikhouni A**, Johnson HK, **Leonard JW**, Ostendorf AP, **Pindrik JA**. Impact of etiology on seizure and quantitative functional outcomes in children with cerebral palsy and medically intractable epilepsy undergoing hemispherotomy/hemispherectomy. *World Neurosurg*. 2023 Jul;175:e769-e774.

Hedberg J, Studebaker A, Smith L, Chen CY, Westfall JJ, Cam M, Gross A, Hernandez-Aguirre I, Martin A, Kim D, Dhital R, Kim Y, Roberts RD, Cripe TP, Mardis ER, Cassady KA, **Leonard J**, Miller KE. Oncolytic virus-driven immune remodeling revealed in mouse medulloblastomas at single cell resolution. *Mol Ther Oncolytics*. 2023 Jul 19;30:39-55.

Leonard JC, Harding M, Cook LJ, **Leonard JR**, Adelgais KM, Ahmad FA, Browne LR, Burger RK, Chaudhari PP, Corwin DJ, Glomb NW, Lee LK, Owusu-Ansah S, Riney LC, Rogers AJ, Rubalcava DM, Sapien RE, Szadkowski MA, Tzimenatos L, Ward CE, Yen K, Kuppermann N. PECARN prediction rule for cervical spine imaging of children presenting to the emergency department with blunt trauma: a multicentre prospective observational study. *Lancet Child Adolesc Health*. 2024 Jul;8(7):482-490.

Sribnick EA, Warner T, Hall MW. Granulocyte- macrophage colony-stimulating factor reverses immunosuppression acutely following a traumatic brain injury and hemorrhage polytrauma in a juvenile male rat model. *J Neurotrauma*. 2024 Jul;41(13-14):e1708-e1718.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$833,877

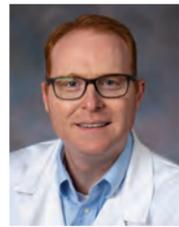
>>> Fast Facts: July 2023 – June 2024

Inpatient Discharges:	542	Patient Days*:	2,998
Observation and Outpatient-in-a-Bed Discharges:	159	Total Surgical Procedures:	705
Total Discharges:	701	Neurosurgery Main Campus Clinic Visits:	6,583
Average Length of Stay*:	5.53	<i>*Excludes observation and outpatient-in-a-bed patients</i>	
Average Daily Census*:	8.21		

Surgical Services
OPHTHALMOLOGY

The Department of Ophthalmology at Nationwide Children’s Hospital is dedicated to providing ongoing comprehensive eye care for children and adults. The Department of Ophthalmology includes the Eye Clinic and the Electrophysiology Testing Laboratory. Our department provides comprehensive eye care in both the hospital inpatient setting as well as to families in the community. Our clinics also provide special testing on pediatric patients referred by community-based providers. The clinic staff includes pediatric ophthalmologists, optometrists, a pediatric ophthalmology fellow, and ophthalmology residents from The Ohio State University College of Medicine, as well as low-vision and rehabilitation specialists. We are pleased to have an approved and accredited Orthoptic Fellowship Program by the American Orthoptic Council. In addition, the Eye Clinic offers subspecialty clinics staffed by ophthalmologists for patients with issues related to glaucoma, retina, oculoplastics, cornea and external disease, intracranial hypertension and low vision.

Faculty



David L. Rogers, MD
Chief

Don L. Bremer, MD
Cybil B. Cassady, MD
Richard P. Golden, MD
Hilliary E. Inger, MD
Catherine Olson Jordan, MD
Julie M. Lange, MD
Mary Lou McGregor, MD

Gary L. Rogers, MD
Hersh Varma, MD
Amanda L. Way, MD
OSU-Affiliate Faculty
Sayoko Moroi, MD, PhD
Chair, Ophthalmology and Visual Sciences, The Ohio State University

N. Douglas Baker, MD
Dominic M. Buzzacco, MD
Kenneth V. Cahill, MD
Colleen M. Cebulla, MD, PhD
Megan M. Chambers, MD
Raymond I. Cho, MD
Frederick H. Davidorf, MD

Jill A Foster, MD
Allen Gu, MD
Andrew J. Hendershot, MD
Charles J. Hickey, MD
Steven E. Katz, MD
Curtin G. Kelley, MD

Johnstone M. Kim, MD
Rebecca A. Kuennen, MD
Carrie A. Lembach, DO
Christina Martinez, MD
Thomas A. Mendel, MD, PhD
Zachary J. Mikolaj, MD

Cameron B. Nabavi, MD
Matthew P. Ohr, MD
Tyler Oostra, MD
Daniel G. Straka, MD
Ana M. Suelves Cogollos, MD, PhD
Michael B. Wells, MD

2023 – 2024 Fellow
Mairghread Casey, MD

Highlights From the Past Year

The Department of Ophthalmology supports research and teaching programs that ensure delivery of the highest quality pediatric care for our patients, now and in the future. In the past year, we opened school-based eye clinics at Reynoldsburg High School Livingston Campus and Fort Hayes Academic Center. Our faculty published 12 articles in peer-reviewed journals during the past academic year, and we also participated in multiple Professional Eye Disease Investigators Group (PEDIG) studies.

We welcomed two fellows in the 2024-2025 academic year, Megan Fanelli, DO, and Michaeline Isawumi, MBBCh. Dr. Isawumi, a professor and community ophthalmologist in Nigeria, is part of the Greif International Fellowship, a program that brings international physicians to Nationwide Children’s for one year of subspecialty clinical training.

In the fall of 2024, we welcomed a new ophthalmologist to the team: Shreya Prabhu, MD. Dr. Prabhu joined us from the Ross Eye Institute of The University of Buffalo Jacobs School of Medicine, where she was a community practitioner and clinical assistant professor.

Additionally selected highlights include:

- Jessica Crawford, MD, has joined as a full-time faculty member at The Ohio State University Wexner Medical Center Havener Eye Institute.
- Reese Bergstrom, MD, will establish a uveitis clinic at Nationwide Children’s in 2025.
- Mary Lou McGregor, MD, received the 2024 AAPOS Outstanding Mentor/Educator award.
- Catherine Jordan, MD, has been appointed Associate Program Director for the Pediatric Ophthalmology Fellowship.

All our faculty are members of the Pediatric Eye Disease Investigators Group (PEDIG), the American Association of Pediatric Ophthalmology and Strabismus (AAPOS) and the American Association of Ophthalmology (AAO). In addition, several of our faculty have been appointed to various professional committees. Selected highlights include:

- David Rogers, MD: AAPOS Adult Strabismus Committee, AAPOS Fellowship Directors Group, AAPOS Subday Program Committee
- Catherine Jordan, MD: AAPOS Director-at-Large, AAPOS Vice-Chair Public Information Committee, AAPOS Uveitis Committee
- Hilliary Inger, MD: AAPOS Public Information Committee
- Hersh Varma, MD: North American Neuro-Ophthalmology Society member
- Richard Golden, MD: American Academy of Pediatrics member, Ohio Ophthalmology Society member

Selected Publications

Bliss A, Craft A, Haber J, **Inger H**, Mousset M, Chiang T, Elmaraghy C. Visual outcomes following orbital decompression for orbital infections. *Int J Pediatr Otorhinolaryngol.* 2024 Jan;176:111824.

Cabal Herrera AM, Mandle Q, **Varma H**, Magaña S. Nausea and vomiting as initial manifestations of pediatric NMOSD. *Pediatrics.* 2024 Apr 1;153(4):e2023062269.

Rogers DL, De Los Reyes E, **Mendel TA**, Caprul B, Podlasiak S, **Jordan CO**. Peripheral retinal finding on fluorescein angiography in neuronal ceroid lipofuscinosis type 2 (CLN2). *J AAPOS.* 2024 Apr;28(2):103830.

Rogers JD, **Jordan CO**, **Inger HE**, Aylward SC. Secondary intracranial hypertension in pediatric lyme meningitis. *J Child Neurol.* 2023 Oct;38(10-12):611-616.

Silverstein M, **Jordan CO**, Aylward SC, **Inger H**. Yearly Occurrence and Seasonality of Neuro-ophthalmic Manifestations of Pediatric Lyme Disease. *J Pediatr Ophthalmol Strabismus.* 2024 May-Jun;61(3):179-182.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$1,014,257

>>> Fast Facts: July 2023 – June 2024

Total Surgical Procedures:	1,878	Eye Clinic and Low Vision Eye Clinic Visits:	12,333
Inpatient Consults:	1,491		

“We are finding that these patients adapt well to their prosthetics and seem to have less discomfort than we’ve seen previous.”

– Thomas, Scharschmidt, MD



Thomas J. Scharschmidt, M.D.
Director
Pediatric Orthopaedic Oncology



ORTHOPEDICS

Targeted Muscle Reinnervation Prevents Neuroma and Phantom Limb Pain in Children After Amputation

In certain cases, such as limb traumas and sarcomas, amputation may be chosen to optimize patients’ physical function.

Targeted muscle reinnervation, a procedure originally developed to improve myoelectric prosthetic control, has been shown to improve function and decrease phantom limb pain in adult patients who have undergone limb amputation. However, reports about targeted muscle reinnervation in pediatric patients are limited.

“Targeted muscle reinnervation aims to transfer transected nerves to small motor nerves of a nearby muscle. This allows the severed nerve from the amputation to regenerate in the target muscle in an organized fashion,” explained Thomas Scharschmidt, MD, director of the Pediatric Orthopedic Oncology Program at Nationwide Children’s Hospital.

In an article recently published in *Plastic and Reconstructive Surgery Global Open*, Dr. Scharschmidt and colleagues at Nationwide Children’s have demonstrated decreased phantom limb and residual limb pain, as well as early prosthetic adoption, in pediatric patients following limb amputation with targeted muscle reinnervation.

The retrospective study included a series of 9 children and young adults who underwent major limb amputation with targeted muscle reinnervation at Nationwide Children’s. The study showed average t-scores for measures of pain behavior, interference, affective quality (e.g., felt unpleasant, annoying, unending), and sensory quality (e.g., burning, throbbing, tingly) for both phantom limb pain and residual limb pain were approximately one standard deviation lower than those in the U.S. general pediatric population.

“In general, we are finding that these patients adapt well to their prosthetics, and although early in evaluation, seem to have less discomfort than we’ve seen previous to this procedure,” shared Dr. Scharschmidt, who is also a professor in Orthopaedics at The Ohio State University Medical Center and James Cancer Hospital.

Only one patient developed a symptomatic neuroma in a nerve that was not included in the initial surgery; after undergoing revision targeted muscle reinnervation, the patient’s pain was resolved.

“Targeted muscle reinnervation at the time of amputation is feasible and safe in the pediatric population,” said Dr. Scharschmidt, “We believe the procedure should be considered to optimize patients’ physical function and to prevent neuroma and phantom limb pain in all children undergoing major limb amputation.”

REFERENCE:

Bjorklund KA, Alexander J, Tulchin-Francis K, Yanes NS, Singh S, Valerio I, Klingele K, Scharschmidt T. Targeted muscle reinnervation for limb amputation to avoid neuroma and phantom limb pain in patients treated at a pediatric hospital. *Plast Reconstr Surg Glob Open*. 2023 Apr 13;11(4):e4944.

Surgical Services ORTHOPEDICS

The Department of Orthopedics at Nationwide Children’s Hospital provides diagnosis, evaluation and treatment for all orthopedic conditions and disorders in infants, children and adolescents. Inpatient, outpatient and emergency services are provided to patients with a wide range of developmental, congenital, neuromuscular and posttraumatic problems of the musculoskeletal system, trauma and fractures, scoliosis, and other spinal abnormalities. Faculty members participate in the education of health care professionals at several levels. Residents, medical students and nurses from The Ohio State University Wexner Medical Center, OhioHealth and Mount Carmel Health System receive all their pediatric orthopedic experience at Nationwide Children’s. The Accreditation Council for Graduate Medical Education-accredited fellowship program rounds out the extensive educational program.

Faculty



Kevin E. Klingele, MD
Chief

Allan C. Beebe, MD
Matthew C. Beran, MD
Reid C. Chambers, DO
Christopher A. Iobst, MD, FAOA
Allen Kadado, MD
Walter P. Samora III, MD, FAOA
Thomas Scharschmidt, MD,
FAOA, FACS, MBOE
Craig A. Smith, MD
Sean A. Tabaie, MD, MBA,
FAAOS, FAOA

OSU-Affiliate Faculty

Hisham M. Awan, MD
Carl Quinion, MD

Community-Based Faculty

Brent A. Bickel, MD
Craig N. Dimitris, MD
James E. Popp, MD
Corey L. Van Hoff, MD
Raymond K. Wurapa, MD

2023 – 2024 Fellows

Phillip Stokey, MD
Thomas Utset-Ward, MD

Highlights From the Past Year

Growth and Expansion

Orthopedics has the largest clinic volume at Nationwide Children’s, with an average 3% increase in surgical cases per year and a total 44% increase in total case volume over the past 10 years. This continued growth with excellent outcomes highlights the expertise and dedication of our team.

This year we celebrated the opening of the Livingston Orthopedic & Surgery Center on East Campus. In this innovative pediatric center, the Orthopedics team provides convenient, comprehensive outpatient surgical services, on-site imaging, and sports and orthopedic physical therapy. The state-of-the-art building features an 11,000 square foot rehabilitation gymnasium.

This year we also established three new specialty programs:

- Spine Motion Lab, part of the Honda Center for Gait Analysis and Mobility Enhancement
- Center for Orthopedic Oncology, a collaborative effort with Oncology
- Long-term Halo Gravity Program

The Orthopedic Oncology Program brings together a team with expertise in the diagnosis and management of bone and soft tissue sarcoma, with an emphasis on novel and innovative treatment approaches. It was designated as a Germain Family Accelerator Program in 2024. Through the three-year accelerator program, team members will increase clinical and trial volumes, implement universal biology consent, launch rapid research autopsy, and boost surgical innovation via 3D printing and gait analysis.

Commitment to Innovation

Our Center for Orthopedic Intervention is thriving as an incubator and training program for growing new ideas. Currently, there are five patents pending from the center. We also established a Center for Innovation Fellowship, which will help train the next generation of orthopedic surgeons to think beyond the status quo.

As a result of our innovative culture, we’ve had numerous new grants funded this year, including:

- Technology Development Fund: 3D Biomechanical Model for Scoliosis
- Technology Development Fund: Long-term Halo Traction
- Pediatric Orthopedic Society of North American (POSNA): Dynamic Spinal Cord Monitoring
- Honda: Limb Lengthening Basic Research Model
- Honda: Gait Lab equipment
- Aalborg University: Collaborative preclinical studies

Selected Publications

Bafor A, **Iobst C**, Samchukov M, Cherkashin A, Singh S, Aguilar L, Glatt V. Reverse dynamization accelerates regenerate bone formation and remodeling in a goat distraction osteogenesis model. *J Bone Joint Surg Am.* 2023 Dec 20;105(24):1937-1946.

Bjorklund KA, Alexander J, Tulchin-Francis K, Yanes NS, Singh S, Valerio I, **Klingele K, Scharschmidt T.** Targeted muscle reinnervation for limb amputation to avoid neuroma and phantom limb pain in patients treated at a pediatric hospital. *Plast Reconstr Surg Glob Open.* 2023 Apr 13;11(4):e4944.

Chen S, Tulchin-Francis K, Gaines D, **Kadado A, Smith C, Klingele K.** Acetabular “fleck” sign: outcomes of surgical repair. *J Pediatr Orthop.* 2024 May-Jun 01;44(5):e433-e438.

Iobst C, Bafor A. A modified reverse planning method for correction of distal femoral valgus deformity: surgical technique and early results. *Techniques in Orthopedics.* 2023 Sept; 38:149-155.

Smith C, DiBartola AC, Fisher M, **Klingele KE.** Surgical hip dislocation in pediatric and adolescent patients. *J Am Acad Orthop Surg.* 2023 Mar 15;31(6):287-297.

>>> Fast Facts: July 2023 – June 2024

Inpatient Discharges:	437	Main Campus Orthopedic Clinic Visits:	18,815
Observation and Outpatient-in-a-Bed-Discharges:	564	Dublin Orthopedic Clinic Visits:	11,003
Total Discharges:	1,001	Hilliard Orthopedic Clinic Visits:	79
Average Length of Stay*:	2.5	Mansfield Orthopedic Clinic Visits:	58
Average Daily Census*:	3.0	New Albany Orthopedic Clinic Visits:	4,316
Patient Days*:	1,112	Westerville Orthopedic Clinic Visits:	7,689
Total Surgical Cases:	3,209	Orthopedic-Oncology Clinic Visits:	1,267
Inpatient Consults:	306	Total Orthopedic Clinic Visits:	42,231

*Excludes observation and outpatient-in-a-bed patients

Surgical Services
OTOLARYNGOLOGY

The Department of Pediatric Otolaryngology, Head and Neck Surgery at Nationwide Children’s Hospital provides comprehensive diagnosis and treatment for children who have diseases of the ears, nose and throat. These problems include congenital and acquired diseases of the head and neck, hearing loss, ear infections, tonsillitis, sinusitis, acute and chronic nasal problems, airway disorders, voice disorders, sleep apnea, skull base tumors, salivary gland problems and many other related diseases.

Faculty



Charles A. Elmaraghy, MD, FAAP, FACS
Chief

Tendy Chiang, MD
Jonathan M. Grischkan, MD, FAAP, FACS
Kris R. Jatana, MD, FAAP, FACS
Spencer Lindsey, MD
Prashant S. Malhotra, MD, FAAP
Amy Manning, MD
Meredith Merz-Lind, MD, FAAP, FACS

Prasanth Pattisapu, MD, FAAP
James M. Ruda, MD, FAAP, FACS
Patrick C. Walz, MD, FAAP, FACS
Gregory J. Wiet, MD, FAAP, FACS

OSU-Affiliate Faculty
Oliver F. Adunka, MD, FACS
Eugene Ge-Hink Chio, MD
Brad W. deSilva, MD
Edward E. Dodson, MD
Brandon Kim, MD
Leslie R. Kim, MD, MPH
Bradley A. Otto, MD
Minka L. Schofield, MD

Community-Based Faculty

Patrick L. Bockenstedt, MD
Jacob P. Burkhart, DO
Roberto J. Castellon, MD
Daniel W. Chase, MD
Timothy P. Drankwalter, DO
Alfred J. Fleming Jr., MD
Akash Gupta, MD
Joseph E. Hall, MD

Jeffrey B. Hiltbrand, MD
Steven M. Hirsch, MD
Scott T. Kramer, MD
Michael J. Loochtan, MD
James D. Lowery, MD
Michael D. Martyn, MD
Timothy J. Nash, DO
Stephen J. Nogan, MD
Blaize A. O’Brien, MD

David M. Powell, MD
Cherie Ryoo, MD
John M. Ryzenman, MD
Ashish Shah, MD
Thomas M. Shirck, DO
Adam C. Spiess, MD
Evan J. Tobin, MD
Andrew Tompkins, MD

2023 – 2024 Fellow
Monirah Albathi, MD

Highlights From the Past Year

The Department of Pediatric Otolaryngology accounts for 34% of the total surgical volume at Nationwide Children’s and continues to pursue the best outcomes for pediatric ear, nose and throat patients. Clinical visits and surgical procedures increased this year, and we received funding through the National Institutes of Health to research the use of AI in diagnosis of otitis media. New clinical programs this year included developing an in-office Ear Tube Clinic and a same-day Ear Tube Surgery Clinic. We continue to provide outstanding care with some of the best outcomes and lowest readmissions nationally.

Our faculty published more than 30 articles in peer-reviewed journals during the past academic year, and we have continued collaborating on research and clinical developments with organizations such as Vanderbilt University, The Ohio State University and Wake Forest University.

Meredith Merz-Lind, MD, FAAP, FACS, was recently named surgical officer and education coordinator for the American Academy of Otolaryngology-Head and Neck Surgery.

Our department also welcomed two new faculty this past year:

- Rishabh Sethia, MD, who recently completed his fellowship in Pediatric Otolaryngology—Head and Neck Surgery at Lurie Children’s Hospital of Chicago has joined our team of sinonasal disorders and general pediatric ENT. Dr. Sethia is also an assistant professor of Otolaryngology—Head and Neck Surgery at The Ohio State University College of Medicine.
- Ashley Miller, MD, will join our Aerodigestive Surgical Team. She recently completed her fellowship in Laryngology at the Medical University of South Carolina, having previously completed a fellowship in Pediatric Otolaryngology at Cincinnati Children’s.

Selected Publications

Banks L, Kelly NA, Onwuka A, Althubaiti A, Damilano C, Hoffman RP, Aldrink JH, **Jatana KR, Walz P.** Does preoperative calcium and 1, 25 OH vitamin D supplementation impact postoperative hypocalcemia and length of stay following pediatric thyroidectomy? *Int J Pediatr Otorhinolaryngol.* 2024 Mar;178:111895.

Bliss A, Craft A, Haber J, Inger H, Mousset M, **Chiang T, Elmaraghy C.** Visual outcomes following orbital decompression for orbital infections. *Int J Pediatr Otorhinolaryngol.* 2024 Jan;176:111824.

Miller AN, Shepherd EG, **Manning A, Shamim H, Chiang T, El-Ferzli G, Nelin LD.** Tracheostomy in severe bronchopulmonary dysplasia-how to decide in the absence of evidence. *Biomedicines.* 2023 Sep 19;11(9):2572.

Wentzel S, Craft A, Onwuka A, **Lind M.** Racial, ethnic and language disparities in healthcare utilization in pediatric patients following tonsillectomy. *Int J Pediatr Otorhinolaryngol.* 2024 Jan;176:111805.

 **Grants Awarded**
JULY 1, 2023 – JUNE 30, 2024
\$1,126,947

>>> Fast Facts: July 2023 – June 2024

Inpatient Discharges:	147	ENT (Main Campus) Clinic Visits:	19,110
Observation and Outpatient-in-a-Bed-Discharges:	2,066	Dublin ENT Clinic Visits:	8,771
Total Discharges:	2,213	Lewis Center ENT Clinic Visits:	1,552
Average Length of Stay*:	2.82	Lima ENT Clinic Visits:	87
Average Daily Census*:	1.13	Mansfield ENT Clinic Visits:	355
Patient Days*:	414	Marysville ENT Clinic Visits:	546
Total Surgical Cases:	11,127	Springfield ENT Clinic Visits:	230
Inpatient Consults:	1,038	Westerville ENT Clinic Visits:	7,789
<i>*Excludes observation and outpatient-in-a-bed patients</i>		Pediatric Aerodigestive Disorders Clinic Visits:	128
		Rhinology Clinic Visits:	57
		Total ENT Clinic Visits:	38,625

Surgical Services

PEDIATRIC AND ADOLESCENT GYNECOLOGY

The Department of Pediatric and Adolescent Gynecology at Nationwide Children’s Hospital provides comprehensive reproductive health services for patients and their families from birth through early adulthood. These services are provided within a wide array of clinical services including:

- Pediatric and Adolescent Gynecology
- Center for Colorectal and Pelvic Reconstruction
- Family AIDS Clinic and Education Services (FACES)
- Fertility and Reproductive Health Program
- Teen and Pregnant Program
- THRIVE Program (differences of sexual development and complex urological and gender concerns)
- Turner’s Syndrome Program

Faculty



Geri D. Hewitt, MD
Chief

Pediatric and Adolescent Gynecology

Y. Frances Fei, MD
Geri D. Hewitt, MD
Chelsea Kebodeaux, MD

OSU-Affiliate Faculty

Melissa Brown, MD
Melissa M. Goist, MD

Maggie Rosen, MD

Rebecca H. Rudesill, MD

Teen and Pregnant Program

Maggie Rosen, MD
Melissa Brown, MD

Family Aids Clinic and Education Services

Jacqueline Evans, DO

Pediatric and Adolescent Gynecology Fellow

Vidhya Krishnan, MD

Highlights From the Past Year

Training the Next Generation of Pediatric and Adolescent Gynecologists

Our newly established Pediatric and Adolescent Fellowship is a two-year program, and our first fellow, Vidhya Krishnan, MD, recently completed her first year. We are also pleased to share that we successfully matched a fellow for the upcoming year — Jackie Evans, DO. Our curriculum is comprehensive and multidisciplinary, including a new monthly educational lecture series.

Improving Outcomes for Patients Through Research and Collaboration

Y. Frances Fei, MD, and Chelsea Kebodeaux, MD, led important research projects this past year that were published. In total, our team published nine peer-reviewed articles. Dr. Kebodeaux’s study investigated reproductive health care in female cancer survivors. Dr. Fei developed a comprehensive, novel grading system and suggestions for patient-centered care for patients with female genital trauma.

We are active members of several national and international groups working together to conduct research and better understand best practices for the patients we serve, including:

- Pediatric Colorectal and Pelvic Learning Consortium (PCPLC) Gynecology Working Group
- The Midwest Pediatric and Adolescent Gynecology Consortium
- The North American Society for Pediatric and Adolescent Gynecology (NASPAG) Research Network
- The Turner Syndrome Global Alliance InshighTS (Inspiring New Science in Guiding Health Care in Turner Syndrome) Registry
- The Oncofertility Consortium.

Professional Service and Honors

Dr. Hewitt served on the Past President’s Committee and the Budget/Finance/Development Committee for NASPAG. She’s also a *Journal of Pediatric and Adolescent Gynecology* board member and co-chair of the American Board of Obstetrics and Gynecology (ABOG) MOC Pediatric and Adolescent Gynecology committee. Dr. Hewitt was an invited speaker and gave a keynote address at NASPAG describing her collaboration with pediatric surgery at Nationwide Children’s.

Dr. Fei is on the NASPAG Research and Website committees and serves as chair of NASPAG research network and chair of NASPAG mentoring families working group. She’s also the social media scholar for the *Journal of Minimally Invasive Gynecology* Social Media Committee.

Dr. Kebodeaux serves on the NASPAG Research Committee as chair of the Grant Working Group. She’s also on the NASPAG website committee, Oncofertility Consortium Pediatric and Adolescent Committee, and PCPLC Gynecology Section committee.

Selected Publications

Bergus K, Frooman A, Castellanos S, Thakkar R, McCracken K, **Kebodeaux C, Hewitt G**, Schwartz D, **Fei YF**. Characterization of pediatric female genital trauma using a novel grading system and recommendations for management. *J Pediatr Surg*. 2024 Jun 14:S0022-3468(24)00366-X.

Mason I, **Hewitt GD**, McCracken KA, Whiteside S, Nahata L, Kebodeaux CA. Sexual and reproductive health care after gonadotoxic treatment in females at a tertiary pediatric hospital. *J Pediatr Adolesc Gynecol*. 2024 Jun;37(3):360-364.

Minneci PC, Bergus KC, Lutz C, Aldrink J, Bence C, Breech L, Dillon PA, Downard C, Ehrlich PF, Fallat M, Fraser JD, Grabowski J, Helmrath M, Hertweck P, **Hewitt G**, Hirschl RB, Kabre R, Lal DR, Landman M, Leys C, Mak G, Markel T, Pressey J, Rajji M, Rymeski B, Saito J, Sato TT, St Peter SD, Cooper J, Deans K; Midwest Pediatric Surgery Consortium. Reducing unnecessary oophorectomies for benign ovarian neoplasms in pediatric patients. *JAMA*. 2023 Oct 3;330(13):1247-1254.

Walawender L, Santhanam N, Davies B, **Fei YF**, McLeod D, Becknell B. Müllerian anomalies in girls with congenital solitary kidney. *Pediatr Nephrol*. 2024 Jun;39(6):1783-1789.

Zablock K, **Fei YF**. Young men’s attitudes and understanding of menstruation. *J Adolesc Health*. 2024 Apr;74(4):782-786.

>>> Fast Facts: July 2023 – June 2024

Downtown Teen and Pregnant Clinic Visits:	1,700	Main Campus Clinic Visits:	3,344
Canal Winchester Clinic Visits:	351	Westerville Clinic Visits:	815
Dublin Clinic Visits:	1,094	Total Clinic Visits:	7,747
East Columbus Clinic Visits:	443	Total Surgical Procedures:	348

“Even after decades of research, little has changed in terms of prognosis for infants who develop NEC.”

– Gail Besner, MD



PEDIATRIC SURGERY

Probiotics Delivered in Biofilm State Protect the Intestines and Brain in NEC Model

*Biofilm formulation of *Limosilactobacillus reuteri* protects against necrotizing enterocolitis in piglet model.*

Necrotizing enterocolitis (NEC) is a debilitating and deadly condition affecting infants born preterm. In NEC cases, intestinal tissues become inflamed, and in severe cases, there is ischemia and death of the involved intestines. Treatment often involves surgery to remove the dying tissue.

“Even after decades of research, little has changed in terms of prognosis for infants who develop NEC,” says Gail Besner, MD, pediatric surgeon and principal investigator in the Center for Perinatal Research at Nationwide Children’s Hospital. “Anywhere from 30 to 50% of infants with NEC will die from it. And those who survive face lifelong challenges including short-gut syndrome and neurodevelopmental delays.”

Dr. Besner and her collaborators Michael Bailey, PhD, and Steven Goodman, PhD, both principal investigators in the Center for Microbial Pathogenesis at Nationwide Children’s, have been working on a solution to prevent NEC. They have developed a novel probiotic delivery system, licensed to Scioto Biosciences that harnesses the durability of biofilms to improve the administration of probiotics to patients.

Their latest study, published in *Nature Scientific Reports*, describes the use of a biofilm formulation of *Limosilactobacillus reuteri* (*Lr*) to prevent NEC in a piglet model.

Dr. Besner and her team adapted the very challenging piglet model of NEC into her laboratory for this study. Preterm piglets and preterm humans are very similar in terms of size and intestinal anatomy. Thus, the piglet model of NEC represents an excellent pre-clinical model of the human disease.

The data from the piglet model validated findings from previous rodent models. Findings demonstrate the superiority of *Lr* in its biofilm state compared to planktonic (free-living) *Lr* in preventing the morbidity and mortality associated with NEC. Importantly, *Lr* in its biofilm state protects both the intestines from acute NEC and the brain from the sequellae of NEC.

“The data from this study helps us understand the safety and efficacy profile of this novel formulation. This will be helpful as we work with the FDA to plan for future human studies,” says Joe Trebley, PhD, founder and chief executive officer of Scioto Biosciences.

This research was funded through a \$2.3M SBIR grant from the National Institute of General Medical Sciences at the National Institutes of Health. Drs. Besner, Bailey and Goodman are all scientific founders of Scioto Biosciences.

REFERENCE:

Wala SJ, Sanjankila N, Ragan MV, Duff AE, Wickham J, Volpe SG, Wang Y, Conces M, Dumbauld Z, Purayil N, Rajab A, Mihi B, Bailey MT, Goodman SD, Besner GE. Superior performance of biofilm vs planktonic *Limosilactobacillus reuteri* in protection of the intestines and brain in a piglet model of necrotizing enterocolitis. *Nature Scientific Reports*. 23 Oct 2023 [Epub ahead of print].

Surgical Services

PEDIATRIC SURGERY

The mission of the Department of Pediatric Surgery at Nationwide Children’s Hospital is to develop, promote, and provide equitable, innovative, evidence based, comprehensive pediatric surgical care. The members of the department are all full-time faculty members of the Department of Surgery at The Ohio State University College of Medicine and are committed to excellence in clinical care, surgical education, research and quality improvement.

Faculty



Gail E. Besner, MD
Chief

Jennifer H. Aldrink, MD	Ihab Halaweish, MD	Oluyinka O. Olutoye, MD, PhD <i>Surgeon-in-Chief</i>
Christopher K. Breuer, MD	Brian D. Kenney, MD, MPH	Sara Rasmussen, MD
David R. Brigstock, PhD	Sara Mansfield, MD	Dana Schwartz, MD
Cory Criss, MD	Marc P. Michalsky, MD, MBA	Rajan K. Thakkar, MD
Karen A. Diefenbach, MD	Peter C. Minneci, MD, MHSc	Kyle Van Arendonk, MD, PhD
Renata B. Fabia, MD, PhD	Jaimie D. Nathan, MD	Richard J. Wood, MD
Jonathan I. Groner, MD	Benedict C. Nwomeh, MD, MPH	

OSU-Affiliate Faculty

Nicole Bernal, MD	Bradley J. Needleman, MD
Steven Bruch, MD	Kristine Orion, MD
James Geiger, MD	Xin Peng, MD
Mounir J. Haurani, MD	Matthew Ralls, MD
Marcus Jarboe, MD	Xiaoyi Teng, MD
Kyongjune Lee, MD	Bryan Tillman, MD

2023 – 2024 Fellows

Pediatric Surgery
Liese Pruitt, MD
Steven Scoville, MD
Pediatric Minimally Invasive Surgery
Omar Nasher, MD

Surgical Critical Care

Derek Marlor, MD

Highlights From the Past Year

The Department of Pediatric Surgery is one of the largest and most diverse departments in the country. The department maintains active clinical programs focused on general pediatric surgery, trauma, burns, minimally invasive surgery, robotic surgery, surgical oncology and more.

Clinical and Research Enhancements

Pediatric Surgery continues to hold market dominance in our primary and secondary service areas, with stable overall case volumes. We are making significant advances in selected niche service areas such as scar revision surgery and robotic repair of median arcuate ligament syndrome (MALS). Additional selected highlights include:

- The department launched a comprehensive Chest Wall Clinic to enhance services for patients with congenital and acquired chest wall deformities.
- Gail Besner, MD, and her co-investigators, Steven Goodman, PhD, and Michael Bailey, PhD, are scientific co-founders of Scioto Biosciences, Inc. The company has completed a first-in-human Phase 1 Clinical Trial of SB-121 – for patients with autism spectrum disorders – with very promising clinical results.
- Christopher Breuer, MD, and David Brigstock, PhD, received grant funding from the American Heart Association and Additional Ventures to study the basic mechanisms of Fontan associated liver disease using animal models to determine how blood flow impacts the development and progression of the condition.

Accreditations and Recognition

Each faculty member brings individual strengths and talents to the department and is recognized for their expertise in clinical care, research and education. Our team has grown, and this year we welcomed Kyle Van Arendonk, MD, PhD, to join the faculty in Pediatric Surgery and to co-direct Nationwide Children’s Hospital’s Center for Surgical Outcomes. In addition to renewing accreditations in Pediatric Surgery and Surgical Critical Care, selected highlights include:

- Karen Diefenbach, MD, continues to be one of the few surgeons in the country to provide robotic repair of MALS. She also continues to advance simulation models for rare pediatric surgery cases and is actively working on a simulation model of in utero surgery for Twin-Twin-Transfusion Syndrome.
- Cory Criss, MD, received a \$6.95 million Midwest Pediatric Device Consortium Grant from the FDA. The Midwest Pediatric Device Consortium has been awarded an Innovation Fellowship funded by CobiCure, led by Cory Criss, MD.
- Gail Besner, MD, received the 2024 Daniel Drake Medal bestowed by the University of Cincinnati College of Medicine.

Selected Publications

Bergus KC, Patterson K, Castellanos S, Bourgeois T, MacDonald J, Mallampalli G, **Fabia R, Thakkar R, Schwartz D.** Characterizing delirium and associated risk factors using the Cornell Assessment of pediatric delirium score in pediatric burn patients. *J Burn Care Res.* 2024 Jan 5;45(1):8-16.

Scoville SD, Stanek JR, Rinehardt H, Sutthatarat P, Abdelhafeez AH, Talbot LJ, Malek M, Leraas HJ, Tracy ET, Chen SY, Kim ES, Lotakis DM, Ehrlich PF, Favela JG, Le HD, Davidson J, Wilson CA, Seemann NM, Osman Y, Piche N, Hoang V, Petroze RT, Polites SF, McKay KG, Correa H, Lovvorn HN 3rd, Lee YM, Balagani A, Dasgupta R, **Aldrink JH.** Comparison of outcomes between surveillance ultrasound and completion lymph node dissection in children and adolescents with sentinel lymph node-positive cutaneous melanoma. *Ann Surg.* 2024 Mar 1;279(3):536-541.

Srinivas S, Henderson K, Griffin KL, Thomas E, **Wood RJ,** Langer JC, **Halaweish I.** Rates of hirschsprung-associated enterocolitis decrease with increasing child opportunity index. *J Pediatr Surg.* 2024 Jul;59(7):1240-1244.

Turner ME, Blum KM, Watanabe T, Schwarz EL, Nabavinia M, Leland JT, Villarreal DJ, Schwartzman WE, Chou TH, Baker PB, Matsumura G, Krishnamurthy R, Yates AR, Hor KN, Humphrey JD, Marsden AL, Stacy MR, Shinoka T, **Breuer CK.** Tissue engineered vascular grafts are resistant to the formation of dystrophic calcification. *Nat Commun.* 2024 Mar 11;15(1):2187.

Wala SJ, Sajankila N, Ragan MV, Duff AF, Wickham J, Volpe SG, Wang Y, Conces M, Dumbauld Z, Purayil N, Narayanan S, Rajab A, Mihi B, Bailey MT, Goodman SD, **Besner GE.** Superior performance of biofilm versus planktonic *Limosilactobacillus reuteri* in protection of the intestines and brain in a piglet model of necrotizing enterocolitis. *Sci Rep.* 2023 Oct 23;13(1):17740.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$5,962,223

>>> Fast Facts: July 2023 – June 2024

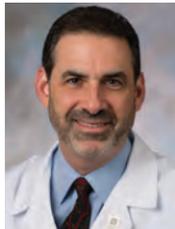
Inpatient Discharges:	998	Total Surgical Procedures:	3,787
Observation and Outpatient-in-a-Bed Discharges:	1,188	Inpatient Consults:	1,059
Total Discharges:	2,186	Colorectal Clinic Visits:	2,387
Average Length of Stay*:	4.83	Dublin Surgery Clinic Visits:	174
Average Daily Census*:	13.22	Surgery/Burn Clinic Visits:	6,002
Patient Days*:	4,824	Westerville Surgery Clinic Visits:	257
<i>*Excludes observation and outpatient-in-a-bed patients</i>		Total Surgery Clinic Visits:	8,820

Surgical Services

PLASTIC AND RECONSTRUCTIVE SURGERY

The Department of Plastic and Reconstructive Surgery at Nationwide Children's Hospital provides comprehensive, interdisciplinary management of cleft lip and palate, congenital and traumatic craniofacial anomalies, 22q deletion syndrome, velopharyngeal dysfunction, hemangiomas and vascular anomalies, pigmented birthmarks, burn injuries, microtia and other ear anomalies, breast abnormalities, congenital and traumatic hand and upper extremity anomalies, post-oncologic defects, and peripheral nerve disorders.

Faculty



**Richard E. Kirschner, MD,
FAAP, FACS**
Chief

Jenny C. Barker, MD, PhD

Adriane Baylis, PhD, CCC-SLP

Kim Bjorklund, MD

Albert H. Chao, MD

Kaitrin Kramer, DDS, MS, PhD

Ana Mercado, DMD, PhD

Amy M. Moore, DMD, PhD

Kara Morris, DDS, MS

Gregory D. Pearson, MD

2023 – 2024 Fellows

**Pediatric Plastic and
Craniofacial Surgery Fellow**

Nicholas Roney, MD

Craniofacial Speech Fellow

Kayla Bruns, MS

Highlights From the Past Year

The Department of Plastic and Reconstructive Surgery has had a tremendous year. We experienced 6% growth in clinic volumes and cared for patients from 31 states and 5 countries.

We also established a new multidisciplinary program, the Comprehensive Pediatric Wound Program, led by new recruit Jenny C. Barker, MD, PhD. Dr. Barker joined our team in 2023 as the director of the Plastic and Reconstructive Surgery Research Laboratory, director of the Comprehensive Pediatric Wound Program, and director of the Adolescent Breast Program.

The department also established a new Orthodontic Teledentistry Program, which is an extension of the Orthodontic Treatment Program. This program offers a compassionate approach to patients with facial differences from a team of experts who understand dental development of these children as they grow.

Our Nationally Recognized Programs

- Our Cleft Lip and Palate Center is an American Cleft Palate-Craniofacial Association approved team.
- Our Center for Complex Craniofacial Disorders is an American Cleft Palate-Craniofacial Association approved team.
- Our 22q Center is a nationally recognized Center of Excellence.

Commitment to Collaboration for Best Outcomes

Our team understands the importance of collaboration for research and innovation. Our faculty are part of multicenter studies and support registries for children with facial differences. Some notable collaborations are as follows:

- Adrienne Baylis, PhD, is part of a National Institutes of Health study with colleagues from Seattle Children's Hospital and Children's Hospital of Los Angeles. This multi-site study will test a novel, caregiver-focused, remotely delivered intervention to promote language and literacy for young children with oral clefts.

- Dr. Baylis and Richard Kirschner, MD, are part of a NIH-funded collaboration with Phoenix Children's Hospital and nine other clinical centers across the United States and Canada. This study aims to establish criteria for identifying children who can be effectively treated by palate re-repair or pharyngoplasty procedures and identify barriers and facilitators to implementing personalized VPI procedure selection.
- Dr. Baylis is participating in an NIH study with University of North Carolina – Chapel Hill and Nemours Children's Hospital to define the timeline of development of stop consonant production and evidence of velopharyngeal closure during speech after palate repair in children with cleft palate, as compared to normal controls and matched peers with otitis media.
- Drs. Baylis and Kirschner are participating in the NIH-funded "A comparative effectiveness study of speech and surgical treatments using a Cleft Palate Registry/Research Outcomes Network (CORNET)" study along with 16 other clinical sites across the United States. This prospective longitudinal project examines the impact of surgical approach for cleft palate repair (intra-velar veloplasty vs Furlow Z-plasty) on fistula rate and speech outcomes of children from 17 cleft palate centers in the United States at age 3 years.

The department also has ongoing research with research centers in the Abigail Wexner Research Institute and other divisions in the hospital, including:

- Jerry R. Mendell, MD, Center for Gene Therapy
- Center for Surgical Outcomes Research
- Clinical Center of Excellence – Clinical Outcomes Quality
- Steve and Cindy Rasmussen Institute for Genomic Medicine
- Center for Pediatric Trauma Research

Our faculty also work with The Ohio State University Departments of Biomedical Engineering and Chemical and Biomolecular Engineering, the The Ohio State University College of Dentistry and the National Institute of Dental and Craniofacial Research.

Professional Leadership

Beyond official research collaborations and interdepartmental projects, our faculty are devoted to advancing the field through participation in professional organizations. Selected memberships and leadership positions are as follows:

- Dr. Barker serves on the bylaws committee of the Plastic Surgery Research Council.
- Dr. Baylis is the president of the American Cleft Palate Craniofacial Association (ACPA).
- Kim Bjorklund, MD, is a Visiting Professor through Surgeons in Humanitarian Alliance for Reconstruction (SHARE) for education of surgeons internationally (Rwanda in February 2024) and chair of Resident Education Curriculum American Society of Plastic Surgeons (ASPS) Upper Extremity Committee.
- Dr. Kirschner is the president and board chair of the Magical Moments Foundation, on the Advisory Committee for the International 22q Foundation and on the Fellowship Committee of the American Society of Craniofacial Surgeons.
- Kaitrin Kramer, DDS, MS, PhD, is a trustee at large on the Board of Trustees for the American Association of Orthodontics.
- Ana Mercado, DMD, PhD, is a member of the ACPA Nominating committee, Advocacy committee, and Parameters of Care Taskforce.
- Kara Morris, DDS, is an opinion columnist for ODA Today, the monthly membership publication for the Ohio Dental Association, and a member of the Cleft without Caries Global Taskforce.
- Gregory D. Pearson, MD, is a board member of the ACPA and the American Society of Maxillofacial Surgeons.

Selected Publications

Baylis AL, Cummings CE, Lien KM, Sitzman TJ, **Kirschner RE**, Chapman KL; CORNet and VPI-OPS Consortiums and Americleft Speech Group. Standardization of videorecorded speech samples for children with cleft palate: Methods to facilitate high-quality speech outcomes data collection. *Cleft Palate Craniofac J.* 2023 Nov 28;10556656231217645. Epub ahead of print.

Gamarra V, **Pearson GD**, Drapeau A, Pindrik J, Crerand CE, Rabkin AN, Khansa I. Prospective evaluation of health-related quality-of-life in children with craniosynostosis. *Cleft Palate Craniofac J.* 2024 Feb 21;10556656241234562. Epub ahead of print.

Hardin-Jones M, Chapman KL, Heimbaugh L, Dahill AE, Cummings C, **Baylis A**, Hatch Pollard S; Cleft Outcomes Research NETwork (CORNET) Consortium. Stop consonant production in children with cleft palate after palatoplasty. *Cleft Palate Craniofac J.* 2024 Jul;61(7):1087-1095.

Khansa I, Pollard SH, Fogolin A, **Baylis A**, Sitzman TJ, Chapman KL, **Kirschner RE**. Factors associated with delayed palatoplasty before, during, and after the COVID-19 pandemic. *J Craniofac Surg.* 2024 Feb 27. Epub ahead of print.

Turner ME, Che J, Mirhaidari GJM, Kennedy CC, Blum KM, Rajesh S, Zbinden JC, Breuer CK, Best CA, **Barker JC**. The lysosomal trafficking regulator “LYST”: an 80-year traffic jam. *Front Immunol.* 2024 May 7;15:1404846.

 **Grants Awarded**
JULY 1, 2023 – JUNE 30, 2024
\$189,213

>>> Fast Facts: July 2023 – June 2024

Inpatient Discharges:	62	Total Surgical Procedures:	1,315
Observation and Outpatient-in-Bed Discharges:	287	Inpatient Consults:	35
Total Discharges:	349	Ortho Center Plastic Surgery Clinic Visits:	67
Average Length of Stay*:	3.23	Orthodontics Treatment Program Visits:	3,326
Average Daily Census*:	0.55	Cleft Lip/Craniofacial Clinic Visits:	2,622
Patient Days*:	200	Hilliard Plastic Surgery Clinic Visits:	426
		Plastic Surgery Clinic Visits:	4,155
		Westerville Plastic Surgery Clinic Visits:	432
		Total Plastic Surgery Clinic Visits:	11,028

*Excludes observation and outpatient-in-a-bed patients



Surgical Services

TRAUMA

Nationwide Children’s Hospital is one of the only freestanding pediatric hospitals in the nation with a Level 1 Pediatric Trauma Center verified by the American College of Surgeons (ACS), a Burn Center verified by the American Burn Association (ABA) and a rehabilitation center accredited by the Commission on Accreditation of Rehabilitation Facilities (CARF). These three accreditations allow us to provide the most comprehensive care for injured children all on the same campus. The Trauma and Burn Centers provide clinical care for injured children, a robust performance improvement program to ensure that the highest quality of care is provided, a passenger safety program and research to improve outcomes. The Trauma Center was successfully reverified and many strengths were identified throughout all aspects of the patient’s care from pre-hospital, emergency department, critical care, inpatient, operative management and rehabilitation, validating our multidisciplinary, collaborative approach that allows us to provide patients with exceptional care. The Trauma and Burn Centers serve our community and beyond in our commitment to best outcomes and health equity for injured children everywhere.

Faculty



Rajan Thakkar, MD
Medical Director, Trauma, and
Co-director, Burn Center



Dana Schwartz, MD
Associate Medical Director,
Trauma



Renata Fabia, MD, PhD
Co-director, Burn Center

Trauma Surgeons

- Jennifer H. Aldrink, MD
- Kyle J. Van Arendonk, MD, PhD
- Gail E. Besner, MD
- Cory Criss, MD
- Karen A. Diefenbach, MD
- Ihab Halaweish, MD
- Brian D. Kenney, MD, MPH
- Sara Mansfield, MD
- Marc P. Michalsky, MD

- Jaimie D. Nathan, MD
- Benedict C. Nwomeh, MD
- Oluyinka Olutoye, MD
- Sara K. Rasmussen, MD, PhD
- Richard Wood, MD

Physician Trauma/Burn Liasons

- Graciela Argote-Romero, MD (Anesthesia)
- Allan Beebe, MD (Orthopedics)
- Cullen Clark, MD (Emergency Medicine)
- Maria Estrada, DO (Critical Care)
- Michelle Greene, MD (Emergency Medicine)

- Jeff Lutmer, MD (Critical Care)
- Jennifer MacDonald, MD (Critical Care)
- Andrew Rabe, MD (Radiology)
- Summit Shah, MD (Radiology)
- Eric Sribnick, MD, PhD (Neurosurgery)
- Morgan Wurtz, MD (Emergency Medicine)

Center for Pediatric Trauma Research Faculty



Henry Xiang, MD, MPH, PhD, MBA
Director



Jonathan I. Groner, MD
Medical Director



Julie Leonard, MD, MPH
Associate Director

- Renata Fabia, MD, PhD
- Brian Kenney, MD, MPH
- Jeffrey Leonard, MD
- Julie Leonard, MD, MPH
- Eric Sribnick, MD, PhD
- Rachel Stanley, MD
- Gerry Taylor, PhD

- Rajan Thakkar, MD
- Ginger Yang, PhD, MPH
- Affiliate Faculty**
- Allan C. Beebe, MD
- Mark Hall, MD, FAAP, FCCM
- Bo Lu, PhD (The Ohio State University)

- Jennifer Lundine, PhD, CCCSLP, BC-ANCDS
- Ai Ni, PhD (The Ohio State University)
- Keith Yeates, PhD
- Ping Zhang, PhD, FAMIA (The Ohio State University)

- Clinical Research Coordinator Team Lead**
- Megan Armstrong, MPH

Highlights From the Past Year

The Trauma Program at Nationwide Children’s Hospital is one of the busiest pediatric ACS verified Level 1 trauma centers in the nation - committed to pursuing best outcomes for every patient we treat. Our nationally recognized trauma and burn programs provide care for all injured children, from infants to adolescents.

The Trauma department continues to grow, and we are excited to welcome our new recruits: Sarah Shpil, who will be joining us as the Burn Coordinator; Chris Newsome, stepping in as the EMS Coordinator; and Alexa Yuran, who will serve as the Passenger Safety Specialist. Their expertise and dedication will undoubtedly enhance our team’s capabilities and service quality.

Awards and Recognition

We are proud to announce that our team has received several prestigious awards in the past year. These accolades reflect our commitment to excellence and innovation in trauma care. Selected highlights include:

- Rajan Thakkar, MD, participated in the Summit of Health System and Hospital Executives on the Public Health Crisis of Gun Violence in Washington, D.C., contributing valuable insights.
- Lee Ann Wurster MS, RN, TCRN, CPNP-PC, was elected as president-elect for the Ohio Society of Trauma Nurse Leaders (OSTNL).
- Kelli Burkey BSN, CPEN, TCRN, achieved certification as a Trauma Certified Registered Nurse (TCRN).
- Renata Fabia, MD, PhD, received both the Golden Apple teaching award and The Ohio State University College of Medicine Dean’s Excellence Award.
- Eric Sribnick, MD, PhD, was honored with the Bronze Award at the Annual Surgical Research Day for his research on “GM-CSF Attenuates Polytrauma TBI Immune Suppression and Lung Infection in a Post-Injury Pneumonia Model.”
- Sheila Giles retired after 37 years of dedicated service to Nationwide Children’s, including 23 years as the Burn Center Coordinator.

Professional Involvement

Our team members continue to contribute significantly to professional organizations, ensuring that we remain at the forefront of advancements in trauma care and burn treatment. Their involvement includes:

- Rajan Thakkar, MD: American Burn Association’s Research Committee, Pediatric Trauma Society’s Guidelines Committee, American Pediatric Surgery Association’s Trauma Committee
- Lee Ann Wurster, MS, RN, TCRN, CPNP-PC: Trauma Center Association of America’s Pediatric Committee, Pediatric Trauma Society’s Program Committee
- Renata Fabia, MD, PhD: Organization and Delivery of Burn Care Committee
- Maria Penrose: President of the Ohio Association of Trauma Registrars

Center for Pediatric Trauma Research Achievements

Our team has made significant strides in research achievements this year. One notable accomplishment is the newly funded grant awarded to Henry Xiang, MD, MPH, PhD, MBA, by the Ohio Department of Public Safety/EMS. This grant supports the project titled “Artificial Intelligence Risk Prediction to Guide Patient-Centered Support Discussion Following Elderly TBI,” which aims to enhance patient care through advanced AI technologies.

Lee Ann Wurster led the Pediatric Firearm Prevention Collaborative, resulting in a significant publication: “Quality Improvement Practices and Resources Targeting Firearm Injuries: A Survey of U.S. Pediatric Trauma Centers,” published in the *Journal of Trauma Nursing*. This collaborative effort highlights the importance of quality improvement practices in addressing firearm injuries among pediatric patients.

Our team is actively engaged in the only pediatric burn quality improvement collaborative in the United States, working alongside centers such as Children’s Hospital of Michigan, Johns Hopkins Children’s Hospital, Children’s National Hospital, and Kansas City Mercy Children’s Hospital. Additionally, Renata Fabia, MD, serves as a Steering Committee Member of the “Pediatric Burn Think Tank,” co-organizing meetings of pediatric burn care leaders nationwide, including a recent gathering in Louisville, Kentucky.

We are also involved in collaborative efforts with 11 other pediatric trauma centers to evaluate outcomes after blunt renal injury, with the goal of standardizing post-injury care. Furthermore, our collaboration with these centers aims to identify risk factors for the development of deep venous thrombosis (DVT) after injury.

Our faculty members have been recognized for their outstanding contributions. Henry Xiang received the 2023 Senior Faculty Investigator Award from The Ohio State University Department of Pediatrics, and Megan Armstrong, MPH, was honored with the 2023 Outstanding Clinical Research Assistant/Associate/Coordinator Award from the Abigail Wexner Research Institute at Nationwide Children’s Hospital.

In addition to these individual accolades, our faculty has published over 17 peer-reviewed articles this year. The trauma center also implemented a new cervical spine clinical pathway to standardize imaging and the removal of cervical collars in pediatric trauma patients, further demonstrating our commitment to improving patient care through research and innovation.

Selected Publications

Armstrong M, Groner JI, Samora J, Olbrecht VA, Tram NK, Noffsinger D, Boyer EW, Xiang H. Impact of opioid law on prescriptions and satisfaction of pediatric burn and orthopedic patients: An epidemiologic study. *PLoS One*. 2023 Nov 16;18(11):e0294279.

Jain S, **Armstrong M**, Luna J, **Thakkar RK, Fabia R, Groner JI, Noffsinger D, Ni A**, Nelson E, **Xiang H.** Features of virtual reality impact effectiveness of VR pain alleviation therapeutics in pediatric burn patients: A randomized clinical trial. *PLOS Digit Health*. 2024 Jan 25;3(1):e0000440.

Yang J, Alshaikh E, Asa N, VonDeylen O, Desai N, Taylor HG, Pommering T, **MacDonald JP**, Cohen DM, **Yeates KO**; ReAct Clinical Study Group. Exploring the association between cognitive activity and symptom resolution following concussion in adolescents aged 11-17 years. *Br J Sports Med*. 2024 Mar 13;58(6):328-333.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$6,786,121

Trauma-related research funding spans multiple centers, which include Center for Clinical and Translational Research, Center for Injury Research and Policy, Emergency Medicine, and Pediatric Surgery.

>>> Fast Facts: July 2023 – June 2024

Admissions:	1,403	Neurosurgery Trauma Admissions:	133
Average Length of Stay*:	2.0	Orthopedic Trauma Admissions:	494
Asphyxial Injury Admissions:	19	Pediatric Surgery Trauma Admissions:	688
Blunt Injury Admissions:	1098	Penetrating Injury Admissions:	133
Burn Injury Admissions:	152	<i>*Excludes observation and outpatient-in-a-bed patients</i>	

“So long as I don’t
have the answer,
I’ll keep asking
questions.”

– Linda A. Baker, MD



UROLOGY

Unraveling the Genetic Mystery Behind a Rare Pediatric Disease

Linda Baker, MD, and her growing research team have made progress in uncovering the genetic causes of Prune Belly Syndrome, but there’s still a long way to go.

Prune belly syndrome (PBS), also known as Eagle-Barrett Syndrome, is a rare, congenital urologic disease, affecting an estimated 1 out of 50,000 births. Around 20% of babies with severe PBS don’t survive the first two weeks of life. Children with PBS face a lifetime of surgeries and treatment.

This rare disease is a research puzzle that Linda Baker, MD, pediatric urologist, principal investigator and co-director of the Kidney and Urinary Tract Center at Nationwide Children’s Hospital, has dedicated 15 years of her career to solving.

She directs the nation’s only multidisciplinary center dedicated to treating children with PBS and heads the only research lab in the United States studying the genetic cause of the disease. While most urologists will see fewer than three cases of PBS in their careers, Dr. Baker has treated more than 50 patients and met and counseled nearly 200 in the last 15 years.

No one gene causes PBS, so finding the combination of mutations is like unspooling a knot of threads with multiple ends and directions. To date, three key discoveries have brought Dr. Baker and her lab closer to understanding the genetic changes.

X-linked Filamin A Gene

Dr. Baker and her team’s first DNA mutation findings were in two half-brothers and two unrelated children with PBS. The mutations were in the gene for filamin A – a protein that regulates how cells detect stretching and contraction. This means there’s a mechanotransduction problem with the cells.

PIEZO1 Gene

Dr. Baker’s lab team found DNA mutations among PBS patients in another gene called PIEZO1, which codes for a protein that acts as a pressure sensor on a cell’s surface. PIEZO1 is found throughout the lower urinary tract and is responsible for making a channel that helps the body respond to mechanical forces.

Myocardin

The last finding involves myocardin – an on-and-off switch for cells to become smooth muscle cells, like in the fetal bladder and ureter. They found five novel myocardin mutations in PBS cases, highlighting the genetic transmission from asymptomatic carriers.

“It bothers me that I still don’t have the answer for what causes prune belly syndrome in the majority of kids, even though I’ve already spent 10 years of my life trying to answer that question,” she says. “So long as I don’t have the answer, I’ll keep asking questions.”

REFERENCE:

Amado NG, Nossyeva ED, Thompson D, Egeland TJ, Ogujirofor OW, Yang M, Fusco AN, Passoni N, Mathews J, Cantarel B, Baker LA, Syeda R. PIEZO1 loss-of-function compound heterozygous mutations in the rare congenital human disorder Prune Belly Syndrome. *Nature Communications*. 6 Jan 2024;15(1):339.

Iqbal NS, Jascur TA, Harrison SM, Edwards AB, Smith LT, Choi ES, Arevalo MK, Chen C, Zhang S, Kern AJ, Scheuerle AE, Sanchez EJ, Xing C, Baker LA. Prune belly syndrome in surviving males can be caused by Hemizygous missense mutations in the X-linked Filamin A gene. *BMC Medical Genetics*. 2020;21(1):38.

Fusco AN, Mathews JA, Coco CT, Egeland TJ, Cantarel BL, Amado NG, Baker LA. Myocardin loss of function variants down-regulate smooth muscle development in prune belly syndrome (PBS). *Journal of Urology*. 2021 Sep 12;206(3S):e898-899.



Surgical Services

UROLOGY

The Department of Urology at Nationwide Children’s Hospital provides comprehensive diagnostic and therapeutic services for a wide range of urological disorders in children of all ages, including teenagers and young adults. Advanced services include reconstructive surgery of the urinary tract, genitalia and urinary sphincter, as well as consultations for urinary tract abnormalities detected in utero. The department participates in several multispecialty clinics, including THRIVE (a program specializing in care for differences of sexual development, complex urological problems and gender concerns), the Center for Colorectal and Pelvic Reconstruction (CCPR), the Urology/Nephrology Combined Clinic, the Stone Clinic and the Myelomeningocele Program.

The mission of the department is to provide the highest quality pediatric urological care in the safest and most child friendly environment. The department includes members who are full-time pediatric urologists, hold faculty appointments in the Department of Urology at The Ohio State University College of Medicine and are committed to cutting-edge medical research and surgical education.

Faculty



V. Rama Jayanthi, MD
Chief

Seth A. Alpert, MD
Linda Baker, MD
Christopher T. Brown, MD
Christina B. Ching, MD
Daniel G. DaJusta, MD
Molly E. Fuchs, MD
Daryl J. McLeod, MD
Donald H. Nguyen, MD

Community-Based Faculty

Nima Baradaran, MD
Roy R. Brown Jr., MD
George T. Ho, MD
Adam C. Weiser, MD

2023 – 2024 Fellow

Jacqueline Morin, MD

Highlights From the Past Year

Expanding Urologic Care in the Region

The Urology team is proud to be part of the *Close To Home*SM Center expansion into Zanesville and Athens, Ohio. As these new centers open in 2024, our experts will provide expert urology care for children in southeastern Ohio.

We also opened an integrated, multidisciplinary Prune Belly Clinic, the first of its kind for children. The Prune Belly Clinic is led by Linda Baker, MD, who is an internationally renowned physician and researcher with a primary focus on Prune Belly Syndrome.

We are also proud to welcome Bryan Sack, MD, as chief of Urology at Nationwide Children’s - Toledo. His leadership will enable us to best support the care of children in the northwest Ohio region as services there continue to grow.

Collaborative Care Drives Collaborative Research

Members of the Division of Urology are actively engaged in collaborative approaches to care and research across the institution.

While many of our faculty collaborate with our colleagues in Nephrology to offer collaborative care and conduct novel research in the Kidney and Urinary Tract Center, others are engaged in collaborations with Center for Colorectal and Pelvic Reconstruction and the Center for Surgical Outcomes Research. Daryl McLeod, MD, is the co-director of the Center for Surgical Outcomes Research.

Selected Publications

Amado NG, Nosyreva ED, Thompson D, Egeland TJ, Ogujiofor OW, Yang M, Fusco AN, Passoni N, Mathews J, Cantarel B, **Baker LA**, Syeda R. PIEZO1 loss-of-function compound heterozygous mutations in the rare congenital human disorder Prune Belly Syndrome. *Nat Commun.* 2024 Jan 6;15(1):339.

Morin JP, Srinivas S, Wood RJ, **Dajusta DG**, **Fuchs ME**. Bladder management and continence in girls with cloacal malformation after 3 years of age. *J Pediatr Surg.* 2024 Aug;59(8):1647-1651.

Ruiz-Rosado JD, Cortado H, Kerckmar M, Li B, Ballash G, Cotzomi-Ortega I, Sanchez-Zamora YI, Gupta S, **Ching C**, Boix E, Jackson AR, Spencer JD, Becknell B. Human ribonuclease 6 has a protective role during experimental urinary tract infection. *J Innate Immun.* 2023 Nov 18;15(1):865-875.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$531,060

>>> Fast Facts: July 2023 – June 2024

Inpatient Discharges:	130	Canal Winchester Urology Clinic Visits:	195
Observation and Outpatient–in-a-Bed Discharges:	181	Dayton Children’s Clinic Visits:	628
Total Discharges:	311	Dublin Urology Clinic Visits:	776
Average Length of Stay*:	2.66	East Broad Urology Clinic Visits:	321
Average Daily Census*:	0.95	Hilliard Urology Clinic Visits:	261
Patient Days*:	346	Lewis Center Urology Clinic Visits:	231
Inpatient Consults:	382	Lima Urology Clinic Visits:	325
		Mansfield Urology Clinic Visits:	239
		Portsmouth Urology Clinic Visits:	116
Total Surgical Procedures:	1,872	Urology (Main Campus) Clinic Visits:	6,861
Urodynamics:	667	Urology/Nephrology (Main Campus) Clinic Visits:	424
		Westerville Urology Clinic Visits:	983
		Total Urology Clinic Visits:	11,360

*Excludes observation and outpatient-in-a-bed patients



ABIGAIL WEXNER RESEARCH INSTITUTE LEADERSHIP



Dennis R. Durbin, MD, MSCE
President



Joanne Turner, PhD
Chief Scientific Officer



Cynthia A. Gerhardt, PhD
Chief Clinical Research Officer



Peter White, PhD
Chief Data Sciences Officer



Amy J. Roscoe
Vice President of Strategic Planning and Finance



Matthew McFarland, RPh, PhD
Vice President of Commercialization and Industry Relations

ABIGAIL WEXNER RESEARCH INSTITUTE AT NATIONWIDE CHILDREN'S HOSPITAL

With discoveries always on the horizon, science is thriving at Nationwide Children's. Our status as an international leader in pediatric research is supported by the behavioral-, basic- and clinician-scientists within the Abigail Wexner Research Institute (AWRI) at Nationwide Children's who are redefining pediatric health care with best outcomes for every child in mind.

One of the largest pediatric research centers in the United States, the AWRI is ranked in the top 10 for National Institutes of Health funding among free-standing children's hospitals. The centers of emphasis are structured to support multidisciplinary team science and discovery, enabled by outstanding shared resources. Each center is home to faculty members working in contiguous space and collaborating with talented staff, postdoctoral fellows, graduate students, residents and other students.

The AWRI occupies more than 750,000 square feet of dedicated research space on the Nationwide Children's campus. The new Research Building IV opened its doors in May 2023, featuring expanded wet bench and dry lab space.

INSTITUTES AND CENTERS OF EMPHASIS

- Biopathology Center
- Center for Biobehavioral Health
- Center for Cardiovascular Research
- Center for Child Health Equity and Outcomes Research
- Center for Childhood Cancer Research
- Center for Clinical and Translational Research
- Jerry R. Mendell, MD, Center for Gene Therapy
- Center for Injury Research and Policy
- Center for Microbial Pathogenesis
- Center for Perinatal Research
- Center for Regenerative Medicine
- Center for Suicide Prevention and Research
- Center for Vaccines and Immunity
- Kidney and Urinary Tract Center
- Institute for Mental and Behavioral Health Research
- Steve and Cindy Rasmussen Institute for Genomic Medicine

Research Institute Reports

BIOPATHOLOGY CENTER

The Biopathology Center (BPC) provides a full range of services related to biospecimen procurement, banking, processing, testing, and distribution. The BPC is accredited by the College of American Pathologists Biorepository Accreditation Program (CAP BAP) and the Laboratory Accreditation Program (CAP LAP) for histopathology and molecular processing procedures. The team of 200 staff members manage over six million biospecimens from numerous biospecimen collection efforts, including the National Cancer Institute (NCI)-funded biorepositories of the Children’s Oncology Group (COG), SWOG, and NRG Oncology-Columbus. The BPC also houses the NCI-funded Pediatric Division of the Cooperative Human Tissue Network (CHTN) and the Biospecimen Processing Center of the NCI’s Office for Cancer Genomics, as well as numerous biospecimen collections from other sponsors (e.g., Nationwide Children’s Hospital-funded investigators, the SARC Foundation, the Leukemia And Lymphoma Society).

Faculty



Nilsa Del Carmen Ramirez-Milan, MD, FCAP
Medical Director and Principal Investigator



Diana Thomas, MD, PhD, FCAP
Pathology Operations Director and Principal Investigator



Jay Bowen, MS
Principal Investigator



Kathleen Nicol, MD, FCAP
Principal Investigator

Highlights From the Past Year

The BPC continues to grow and expand its services. In October 2024, our center moved to a new state-of-the-art facility near Hilliard, Ohio, which was designed and developed by the team. Dr. Nilsa Ramirez-Milan was recognized in the past year as the first recipient of the Nationwide Endowed Chair in Pediatric Pathology.

Commitment to Discovery

The BPC was awarded a new grant cycle for the CHTN to fund the 2024-2029 period. Nilsa Ramirez-Milan, MD, FCAP, will continue to serve as the Principal investigator and Diana Thomas, MD, PhD, FCAP, will serve as the Co-I of the Pediatric Division of the CHTN. The first CHTN grant was awarded to the BPC in the late 1980’s, with Dr. Steve Qualman as PI until 2007, when Dr. Ramirez became PI. During this year existing grants continued to receive regular supplemental funding to support special projects.

Our work is additionally driven by collaborations with other institutional centers and departments, as well as external organizations. The NCI Childhood Cancer Data Initiative (CCDI) Molecular Characterization Initiative (MCI) project includes extensive institutional efforts from the BPC, the Department of Pathology and Laboratory Medicine (DPLM), and the Institute of Genomic Medicine (IGM). MCI is a project that aims to collect, analyze, and report clinical molecular data to support COG-affiliated clinicians in diagnosing and choosing the best treatment for each patient and collect data to support new research.

For MCI, the BPC utilizes the services of 18 board-certified pathologists from the DPLM at Nationwide Children’s to ensure diagnostic concordance between the samples submitted for testing and the diagnoses issued at the submitting

institutions. This year, biospecimens from over 3,442 MCI cases were received and processed in the BPC; 2,884 cases passed all required metrics and were sent to IGM for testing.

The Collaborative Network for NEuro-oncology Clinical Trials (CONNECT) focuses on clinical trials for high-risk pediatric brain tumors. The BPC, including Dr. Thomas, collaborated with the development of the Targeted Pediatrics high-grade glioma therapy (“TarGeT”) screening protocol, which will utilize some of the infrastructure and partnerships developed for the COG MCI protocol for patients diagnosed with high-grade gliomas. Similar to MCI, the DPLM pathologists will participate in the screening and central pathology review for the participants on this study.

Two new initiatives for the NCI Precision Medicine Cancer Treatment Program include immunoMATCH (iMATCH) and myeloMATCH. These clinical trials are led by the NCI, SWOG Cancer Research Network, and partners of the National Clinical Trial Network (NCTN). The BPC is an integral part of the sample processing, distribution, and banking for these trials.

The BPC and the DPLM have partnered to develop an Enterprise Digital Pathology team. A Phillips whole slide imager was purchased and installed in the DPLM and workflows are being implemented to scan all new diagnostic histology slides by the end of 2024. New image viewing and artificial intelligence solutions are being jointly evaluated for purchase in the coming year.

The BPC aims to excel in the long-term acquisition and storage of cancer-related biospecimens and associated data in support of cutting-edge research. We partner with multiple organizations to promote best outcomes. The NCI supported NCTN Biobanks receive, store and distribute biospecimens for the five NCTN Groups as well as the Canadian Cancer Trials Group. The BPC supports the COG, SWOG and NRG Oncology-Columbus Biospecimen Banks and, in this setting, BPC employees are members of the Group Banking Committee (GBC) Steering Committee and its four affiliated subcommittees: Access & Marketing, Best Practices & Operations, Informatics, and Regulatory.

Selected Publications

Chi SN, Yi JS, Williams PM, Roy-Chowdhuri S, Patton DR, Coffey BD, Reid JM, Piao J, Saguilig L, Alonzo TA, Berg SL, **Ramirez NC**, Jaju A, Mhlanga JC, Fox E, Hawkins DS, Mooney MM, Takebe N, Tricoli JV, Janeway KA, Seibel NL, Parsons DW. Tazemetostat for tumors harboring SMARCB1/SMARCA4 or EZH2 alterations: results from NCI-COG pediatric MATCH APEC1621C. *J Natl Cancer Inst.* 2023 Nov 8;115(11):1355-1363.

McCall SJ, Lubensky IA, Moskaluk CA, Parwani A, Radin K, **Ramirez NC**, Von Menchhofen Z, Washington MK, LiVolsi VA. The Cooperative Human Tissue Network of the National Cancer Institute: Supporting cancer research for 35 years. *Mol Cancer Ther.* 2023 Oct 2;22(10):1144-1153.

Miller KE, Rivaldi AC, Shinagawa N, Sran S, Navarro JB, Westfall JJ, Miller AR, Roberts RD, Akkari Y, Supinger R, Hester ME, Marhabaie M, Gade M, Lu J, Rodziyevska O, Bhattacharjee MB, Von Allmen GK, Yang E, Lidov HGW, Harini C, Shah MN, Leonard J, Pindrik J, Shaikhouni A, Goldman JE, Pierson CR, **Thomas DL**, Boué DR, Ostendorf AP, Mardis ER, Poduri A, Koboldt DC, Heinzen EL, Bedrosian TA. Post-zygotic rescue of meiotic errors causes brain mosaicism and focal epilepsy. *Nat Genet.* 2023 Nov;55(11):1920-1928.

Morton LM, Lee OW, Karyadi DM, Bogdanova TI, Stewart C, Hartley SW, Breeze CE, Schonfeld SJ, Cahoon EK, Drozdovitch V, Masiuk S, Chepurny M, Zurnadzhy LY, Dai J, Krznaric M, Yeager M, Hutchinson A, Hicks BD, Dagnall CL, Steinberg MK, Jones K, Jain K, Jordan B, Machiela MJ, Dawson ET, Vij V, Gastier-Foster JM, **Bowen J**, Mabuchi K, Hatch M, Berrington de Gonzalez A, Getz G, Tronko MD, Thomas GA, Chanock SJ. Genomic characterization of cervical lymph node metastases in papillary thyroid carcinoma following the Chernobyl accident. *Nat Commun.* 2024 Jun 13;15(1):5053.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$20,343,934

Research Institute Reports

CENTER FOR BIOBEHAVIORAL HEALTH

The mission of the Center for Biobehavioral Health in the Abigail Wexner Research Institute at Nationwide Children's Hospital is to improve the health and health care of children and their families. This is achieved through state-of-the-art research using a biopsychosocial approach. Our work considers the complex interactions of biological, psychological and social factors and the impact of these factors on health outcomes. This work includes the design and evaluation of new interventions, and dissemination and implementation of effective interventions into routine practice. We support trainees, ranging from undergraduate students to postdoctoral fellows, that will become the next generation of leaders in biobehavioral research. The Center for Biobehavioral Health also directs resources that support research across Nationwide Children's including the Behavioral Trials Office, Biobehavioral Outcomes Core, Neuroimaging Core and Neurodevelopmental Research Affinity Group.

Faculty



Ahna Pai, PhD
Director

Amy E. Baughcum, PhD

Elise Berlan, MD, MPH

William R. Black, PhD

Canice E. Crerand, PhD

Christine A. Fortney, PhD, RN

Kristen R. Fox, PhD

Cynthia A. Gerhardt, PhD

Jennifer Hansen-Moore, PhD

Kristen E. Hoskinson, PhD

Jamie L. Jackson, PhD

Sarah A. Keim, PhD

Kathy Lemanek, PhD

Paola Malerba, PhD

Kelly McNally, PhD

Emily Moscato, PhD

Leena Nahata, MD

Eric E. Nelson, PhD

Joseph R. Rausch, PhD

Emre Sezgin, PhD

Micah A. Skeens, PhD, APRN,
CPNP

Jack H. Stevens, PhD

H. Gerry Taylor, PhD

Kathryn Vannatta, PhD

- Sarah A. Keim, PhD, is collaborating with the Center for Perinatal Research on the Environmental Influences on Child Health Outcomes (ECHO) and Pregnancy in Ohio. She is also collaborating with the Center for Suicide Prevention and Research on a P50 grant as co-director of the Training in Prevention of Suicide (TiPS) Program.
- Kathryn Vannatta, PhD, and Jamie L. Jackson, PhD, are both principal investigators on R01s in collaboration with the Center for Cardiovascular Research and Cardiology.
- Leena Nahata, MD, serves as the Associate Division Chief of Research for Endocrinology.
- Kristen E. Hoskinson, PhD, and Micah A. Skeens, PhD, APRN, CPNP, are standing members of study sections at the National Institutes of Health and both collaborate with the Division of Hematology/Oncology/Bone Marrow Transplantation.

In the past year we welcomed Ahna Pai, PhD, as director of the Center for Biobehavioral Health. She will continue to build upon the amazing foundation of the center and support faculty examining interactions between biology and behavioral and interventions to optimize both.

Professional Involvement and Recognition

Our faculty published 139 articles in peer-reviewed journals in the past year and several faculty are involved in professional organizations and recognized for their work. Selected highlights include:

- Cynthia A. Gerhardt, PhD, is president of the Society of Pediatric Psychology, the Pediatric Program Director and Program Co-director of the Community and Stakeholder Engagement of the Clinical & Translational Science Institute and the chief diversity officer of the Midwest Pediatric Device Consortium.
- Canice E. Crerand, PhD, is vice president elect of the American Cleft Palate-Craniofacial Association.
- William R. Black, PhD, is the research network lead of the Ehlers-Danlos Society.
- Jamie Jackson, PhD, is an elected committee member of the Adult Congenital & Pediatric Cardiology Section Leadership Council through the American College of Cardiology.
- Dr. Nahata is chair of the Pediatric Initiative Network of the Oncofertility Consortium.
- Dr. Skeens is chair of Nursing Nominating Committee for the Children's Oncology Group.
- Emre Sezgin, PhD, received the Amazon Web Services Health Equity Initiative Award.

Postdoctoral Fellows

Amanda Ball, PhD

Emily Moscato, PhD

Anna Olsavsky, PhD

Lisa Robinette, PhD

Adriene Winning, PhD

Highlights From the Past Year

Our vision is to achieve the best possible outcomes for children and families by creating, disseminating and applying new knowledge related to the reciprocal influences of behavior and health.

Our commitment to discovery is showcased in part through our collaborations with other centers and organizations.

Selected highlights include:

- Eric E. Nelson, PhD, is collaborating with The Ohio State University on the SOAR Study. This is a \$20 million study funded by the State of Ohio and will examine families across generations to better understand factors associated with mental illness and addiction.

Selected Publications

Grannis C, Mattson WI, Leibowitz SF, **Nahata L**, Chen D, Strang JF, Thobe H, Indyk JA, **Nelson EE**. Expanding upon the relationship between gender-affirming hormone therapy, neural connectivity, mental health, and body image dissatisfaction. *Psychoneuroendocrinology*. 2023 Oct;156:106319.

Swenski TN, **Fox KR**, Udaipuria S, Korth CX, Daniels CJ, **Jackson JL**. Age moderates change in disease-related stress among congenital heart disease survivors: a 6-year follow-up. *Eur J Cardiovasc Nurs*. 2024 Jan 12;23(1):62-68.

Taylor HG, Quach J, Bricker J, Riggs A, Friedman J, Kozak M, **Vannatta K**, Backes C. School Readiness in preschool-age children with critical congenital heart disease. *Pediatr Cardiol*. 2024 Apr 1. Epub ahead of print.

Vrantsidis DM, Klebanoff MA, Yeates KO, Murnan A, Fried P, Boone KM, **Rausch J**, **Keim SA**. Associations of prenatal stress with 5-year-old children's executive function in a low socioeconomic status population. *Dev Psychopathol*. 2024 May 6:1-10. Epub ahead of print.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$6,119,379

Research Institute Reports

CENTER FOR CARDIOVASCULAR RESEARCH

The mission of the Center for Cardiovascular Research in the Abigail Wexner Research Institute at Nationwide Children's Hospital is to conduct innovative, mechanism-based research leading to improved therapies and outcomes for pediatric cardiovascular disease and to foster preventive strategies that promote cardiovascular health. Our cardiovascular studies span the spectrum from basic molecular research, which occurs in the Center for Cardiovascular Research, to translational and clinical research performed in collaboration with clinicians in The Heart Center at Nationwide Children's.

Faculty



Vidu Garg, MD
Director

Principal Investigators

Jihyun Jang, PhD

Deqiang Li, MD, PhD

Brenda Lilly, PhD

Patrick I. McConnell, MD

Aaron J. Trask, PhD

Mingtao Zhao, DVM, PhD

Associate Investigators

Carl H. Backes, Jr., MD

Amee M. Bigelow, MD

Christopher K. Breuer, MD

John M. Kelly, MD

Kan N. Hor, MD

Andrew H. Tran, MD

Andrew R. Yates, MD

Jessie Yester, MD, PhD

Postdoctoral Scientists 2023-2024

Matthew Alonzo, PhD

Jin Bu, MD, PhD

Aaron Argall, PhD

Xi Hu, MD, PhD

Anupama Rao, PhD

Yang Yu, PhD

General Surgery Resident

Ruth Ackah, MD

- Deqiang Li, MD, PhD, and team published in *Nature Communications* describing the epigenetic regulation of a noncardiomyocyte signaling pathway that is critical for heart development.
- Yang Yu, PhD, was awarded a postdoctoral fellowship grant from the American Heart Association.
- Vidu Garg, MD, was awarded a new four-year \$2.6 million grant from the National Institutes of Health National Heart, Lung and Blood Institute to investigate mechanisms and therapeutics for congenital aortic valve stenosis.
- Jihyun Jang, PhD, received the 2023 AHA-BCVS Early Career Travel Grant Award, as well as 2023 AHA Paul Dudley White International Scholar recognition.
- Aaron Trask, PhD, received the 2024 Distinguished Alumni Award, joining the Arcanum Alumni High School Hall of Fame.

Selected Publications

Jang J, Accornero F, Li D. Epigenetic determinants and non-myocardial signaling pathways contributing to heart growth and regeneration. *Pharmacol Ther.* 2024 May;257:108638.

Jang J, Bentsen M, Kim YJ, Kim E, Garg V, Cai CL, Looso M, Li D. Endocardial HDAC3 is required for myocardial trabeculation. *Nat Commun.* 2024 May 16;15(1):4166.

McCallinhart PE, Chade AR, Bender SB, **Trask AJ.** Expanding landscape of coronary microvascular disease in co-morbid conditions: Metabolic disease and beyond. *J Mol Cell Cardiol.* 2024 Jul;192:26-35.

Yasuhara J, Manivannan SN, Majumdar U, Gordon DM, Lawrence PJ, Aljuhani M, Myers K, Stiver C, **Bigelow AM,** Galantowicz M, Yamagishi H, McBride KL, White P, **Garg V.** Novel pathogenic GATA6 variant associated with congenital heart disease, diabetes mellitus and necrotizing enterocolitis. *Pediatr Res.* 2024 Jan;95(1):146-155.

Yu Y, Wang C, Ye S, Xu Z, Lin H, Texter K, Shukla V, Ghadiali S, Ma Q, Garg V, Zhao MT. Abnormal progenitor cell differentiation and cardiomyocyte proliferation in hypoplastic right heart syndrome. *Circulation.* 2024 Mar 12(11);149:888-891.

Highlights From the Past Year

The areas of focus for the Center for Cardiovascular Research include investigation into genetics of congenital heart disease, the molecular mechanisms underlying heart and blood vessel development, congenital and acquired heart valve disease, micro- and macro-vascular remodeling and aortic aneurysmal disease, and cardiac regeneration and stem cell biology.

Commitment to Education

Our department continues working to train the next generation of cardiovascular researchers through the support of the National Institutes of Health (NIH) and the National Heart, Lung and Blood Institute's (NHLBI) T32 and R25 training grants along with Summer Undergraduate Research Fellowships funded by the American Heart Association. Vidu Garg, MD, serves as principal investigator on each.

Awards and Recognition

Our department houses the largest induced pluripotent stem cell core (iPSC) repository from patients and families with congenital heart disease which has recruited 218 patients with congenital heart disease along with their family members and currently houses over 65 unique iPSC cell lines. The past year has been highly productive with research breakthroughs abounding, and continual involvement in various professional organizations. Selected highlights include:

- Mingtao Zhao, DVM, PhD, was an elected fellow of the American Heart Association.
- The Zhao lab team published an article in *Circulation* describing the use of induced pluripotent stem cell technology and single-cell genomics to elucidate abnormal cardiac cell development in hypoplastic right heart syndrome.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$2,775,024

Research Institute Reports

CENTER FOR CHILD HEALTH EQUITY AND OUTCOMES RESEARCH

The mission of the Center for Child Health Equity and Outcomes Research in the Abigail Wexner Research Institute at Nationwide Children's Hospital is to advance child health and well-being through research in and across clinical care, health services, health policy and community initiatives. We aspire to lead the nation in groundbreaking research that cultivates flourishing families and vibrant communities, reduces disparities and facilitates the best and most equitable outcomes for all children. Investigators in the center develop and test new health service delivery models, community interventions, and payment systems in partnership with pediatricians, payers, patients and families to improve quality and equity of care and to achieve best outcomes for all children.

Faculty



Deena J. Chisolm, PhD
Director

Principal Investigators

Mary Ann Abrams, MD, MPH
Laura J. Chavez, PhD, MPH
Susan E. Creary, MD, MSc
Mattina A. Davenport, PhD
Laura C. Hart, MD
Kelly J. Kelleher, MD, MPH

Alex R. Kemper, MD
Amrik S. Khalsa, MD
Jason Newland, MD
Sarah H. O'Brien, MD, MSc
Prasanth Pattisapu, MD, MPH
Amy N. Tyler, MD
Kyle Van Arendonk, MD
Jordee M. Wells, MD, MPH

Highlights From the Past Year

Growth and Collaboration

Newly awarded grants in the center expand our research in maternal and child health, health equity and clinical innovation. This year, our center expanded our focus on workforce development with the co-award of an AHRQ/PCORI P30 grant for the PEDSNet Scholars Program, a training award for junior faculty in Learning Health Systems Research across the country. We welcomed two new members in the past year: Jason Newland, MD, Division Chief of Infectious Diseases, and Kyle Van Arendonk, MD, PhD, co-director of the Center for Surgical Outcomes Research.

Our team continues to collaborate with centers and organizations to pursue the best outcomes for children everywhere. Selected collaborations include:

- Nationwide Children's departments such as Community Wellness, The Center for Family Safety and Healing and Research Informatics
- Nationwide Children's clinical divisions such as primary care, adolescent medicine and emergency medicine
- The Ohio State University Colleges of Education & Human Ecology and Public Health, along with University of Colorado, Emory University and George Mason University

Research Breakthroughs

Research in our center focuses on improving care. Among the 70 peer-reviewed articles published by faculty, significant findings in the past year include the following:

- Nationally, between 2006 and 2018, the proportion of outpatient visits that included a diagnosis of anxiety increased over time, accompanied by a decrease in the proportion of visits with therapy.

- Children in rural America are less likely than their urban counterparts to flourish but more likely to have social and emotional support.
- A comprehensive literature review found evidence of inaccuracies in risk assessment and racial and ethnic bias in the reporting of child maltreatment and in the evaluation of injuries concerning maltreatment, such as skull fractures.

Professional Engagement and Recognition

Our center aims to facilitate partnerships with pediatricians to succeed in our shared goals. Several of our staff hold positions in professional organizations. Selected highlights include:

- Deena Chisolm, PhD, is vice chair of the Columbus Board of Health and board chair for the Health Policy Institute of Ohio.
- Laura Hart, MD, is on the Research Committee of the Society of General Internal Medicine and the Executive Committee of the AAP Section on Med-Peds.
- Kelly Kelleher, MD, MPH, is a member of the NASEM Ad Hoc Committee on Improving the Health and Wellbeing of Children and Youth through Health Care System Transformation.
- Sarah O'Brien, MD, MSc, is a counselor for the American Society of Hematology, board president of the Foundation for Women and Girls with Blood Disorders and a standing study member of the NHLBI Clinical Trial Review Committee.
- Amy Tyler, MD, is an elected member of the Executive Committee of the AAP Council on Quality Improvement and Patient Safety.
- Kyle Van Arendonk, MD, PhD, is chief academic officer of the Midwest Pediatric Surgery Consortium; examination consultant for Pediatric Surgery In-Training Examination under the American Board of Surgery; member of the Access to Surgery for Kids Committee under the American Pediatric Surgical Association; and member of the Delivery of Surgery Care Committee under the American Academy of Pediatrics Section of Surgery.

Additionally, staff have been recognized for their work. Selected highlights include:

- Susan Creary, MD, received the 2023 PAA Outstanding Clinical-Translational Investigator Award.
- Mary Ann Abrams, MD, MPH, received The Ohio State University College of Medicine Courage to Teach Award for 2023.
- Jordee Wells, MD, MPH, was recognized in the 40 under 40 Leaders in Minority Health at the National Minority Quality Forum.

Selected Publications

Barnett KS, Reece J, Mosley BM, Baek M, Hyder A, **Kelleher K**, Sealy-Jefferson S, **Chisolm DJ**. A history of the impacts of discriminatory policies on housing and maternal and infant health in an Ohio neighborhood. *Health Aff (Millwood)*. 2024 Feb;43(2):181-189.

Chavez LJ, Gardner W, Tyson D, Pajer K, Rosic T, **Kemper AR**, **Kelleher K**. Trends in office-based anxiety treatment among US children, youth, and young adults: 2006-2018. *Pediatrics*. 2023 Jul 1;152(1):e2022059416.

Chisolm DJ, Dugan JA, Figueroa JF, Lane-Fall MB, Roby DH, Rodriguez HP, Ortega AN. Improving health equity through health care systems research. *Health Serv Res*. 2023 Dec;58 Suppl 3(Suppl 3):289-299.

Hardy RY, Boch SJ, **Davenport MA**, **Chavez LJ**, **Kelleher KJ**. Rural-urban differences in social and emotional protective factors and their association with child health and flourishing. *J Rural Health*. 2024 Mar;40(2):314-325.

O'Brien SH, Rodriguez V, Lew G, Newburger JW, Schultz CL, Orgel E, Derr K, Ranalli MA, Esbenshade AJ, Hochberg J, Kang HJ, Dinikina Y, Mills D, Donovan M, Dyme JL, Favatella NA, Mitchell LG; PREVAPIX-ALL investigators. Apixaban versus no anticoagulation for the prevention of venous thromboembolism in children with newly diagnosed acute lymphoblastic leukaemia or lymphoma (PREVAPIX-ALL): a phase 3, open-label, randomised, controlled trial. *Lancet Haematol*. 2024 Jan;11(1):e27-e37.



Grants Awarded

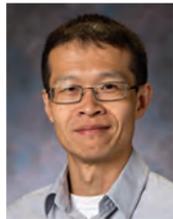
JULY 1, 2023 – JUNE 30, 2024
\$10,214,199

Research Institute Reports

CENTER FOR CHILDHOOD CANCER RESEARCH

The mission of the Center for Childhood Cancer Research in the Abigail Wexner Research Institute at Nationwide Children's Hospital is to transform the care of children, adolescents and young adults with cancer through fundamental biomedical research and clinical translation. Center investigators collaborate closely to study how cells grow, divide and function, how these basic processes are usurped to allow cancers to develop, how the body responds to developing cancers, and how this knowledge can be used to better diagnose and treat these diseases. Investigators work closely with physicians at Nationwide Children's, as well as with national and international colleagues, to translate these findings to the patient.

Faculty



Ruoning Wang, PhD
Interim Director

Principal Investigators

Kevin A. Cassady, MD
Dawn S. Chandler, PhD
Long-Sheng Chang, PhD
Timothy P. Cripe, MD, PhD
Rachid Drissi, PhD
Genevieve C. Kendall, PhD
Dean A. Lee, MD, PhD
Ryan D. Roberts, MD, PhD
Benjamin Z. Stanton, PhD
Emily R. Theisen, PhD

Emeritus Professor

Stephen L. Lessnick, MD, PhD

Associate and Affiliate Investigators

Meisam Naeimi Karaoudi, DVM, PhD
Jeffrey R. Leonard, MD

2023 – 2024 Fellows

Dermatology

Kirsten Johnson, MD, PhD

Hematology & Oncology

Kyle Beckwith, MD, PhD
Amanda Campbell, MD, PhD

Kelly Guppell, MD

Charles Treinen, MD

NeuroOncology

James Reinecke, MD

Highlights From the Past Year

Advancing the Science of Childhood Cancer

The past year has been a productive one for researchers in the center. In the following, we share highlighted accomplishments from lab teams.

The Kendall Lab was awarded the Best Paper of 2023 from *Developmental Biology*. As a result, first author Matthew Kent, PHD, was invited to give a talk on this paper at the Society for Developmental Biology Annual Meeting in July 2024.

The REMEDY novel gene editing technology from the Kararoudi Lab received an NIH Target Challenge award as “Revolutionizing Genome Editing Approach.”

The Roberts Lab published a series of three manuscripts describing the first detailed mechanisms of metastatic lung colonization in osteosarcoma, identifying several potential therapeutic opportunities now being developed into clinical trials.

The Stanton Lab developed in vivo epigenomics together with the Kendall Lab, for the first demonstration of genome-wide localization of the rhabdomyosarcoma fusion protein in an in vivo context.

Moving From Bench to Bedside

The Lee Lab initiated the first clinical trial investigational new drug (IND) application for CRISPR-modified CAR-NK cells and obtained final FDA and IRB approvals for NK cell therapy of brain tumors.

The Cassady Lab completed a phase I trial (C134 oncolytic viral therapy in brain tumor) identifying a C134 recommended phase II dose. Ongoing biological studies revealed unanticipated information about virotherapy and how it facilitates an ongoing immune response.

Growing the Next Generation of Scientists

This year, we graduated our first six trainees from the two-year National Institutes of Health-funded T32 Training Program in Basic and Translational Pediatric Oncology Research. We also held our first on-site external advisors meeting in which outgoing and incoming trainees presented their research and gained mentorship from nationally known scientists.

National Leadership and Participation

Our center's faculty are broadly involved in national organizations and societies devoted to advancing pediatric cancer research. Highlights of leadership roles and participation include:

- Long-Sheng Chang, PhD, served as a member of the Discussion Panel on Future Directions for NF2/Schwannomatosis Research at the NF2/Schwannomatosis State of the Art 2023 Meeting and a member of the Discussion Panel on meningioma models for therapeutic evaluation at the 2023 Neurofibromatosis Conference.
- In addition, Dr. Chang has served as an editorial board member for five peer-reviewed journals, including *International Journal of Clinical Medicine*, *Journal of Applied Medical Sciences*, *International Journal of Medicine*, *Austin Otolaryngology*, and *Journal of Otolaryngology Head & Neck Surgery*.
- Ryan Roberts, MD, accepted the 33rd Annual Nesbit Lectureship from the University of Minnesota.
- Dr. Roberts served as medical vice chair for CancerFree KIDS, among others.
- Dean Lee, MD, is chair of the Immunotherapy Focus Group for the NPCF. He is also a member of the executive council.
- Dr. Lee is also the Immunotherapy Working Group chair and member of the executive board for the CONNECT consortium.
- Dawn Chandler has been appointed Cancer Biology co-leader at The Ohio State University Comprehensive Cancer Center.

Selected Publications

Bayanjargal A, Taslim C, Showpnil IA, Selich-Anderson J, Crow JC, **Lessnick SL, Theisen ER**. DBD- α 4 helix of EWSR1::FLI1 is required for GGAA microsatellite binding that underlies genome regulation in Ewing sarcoma. *bioRxiv [Preprint]*. 2024 Jun 7:2024.01.31.578127.

Bhattacharyya S, Oblinger JL, Beauchamp RL, Kosa L, Robert F, Plotkin SR, **Chang LS**, Ramesh V. Preclinical evaluation of the third-generation, bi-steric mechanistic target of rapamycin complex 1-selective inhibitor RMC-6272 in NF2-deficient models. *Neurooncol Adv*. 2024 Feb 16;6(1):vdae024.

Ciurea SO, Kongtim P, Srouf S, Chen J, Soebbing D, Shpall E, Rezvani K, Nakkula R, Thakkar A, Troy EC, Cash AA, Behbehani G, Cao K, Schafer J, Champlin RE, **Lee DA**. Results of a phase I trial with Haploidentical mbIL-21 ex vivo expanded NK cells for patients with multiply relapsed and refractory AML. *Am J Hematol*. 2024 May;99(5):890-899.

Gnanaprakasam JNR, Kushwaha B, Liu L, Chen X, Kang S, Wang T, Cassel TA, Adams CM, Higashi RM, Scott DA, Xin G, Li Z, Yang J, Lane AN, Fan TW, Zhang J, **Wang R**. Asparagine restriction enhances CD8+ T cell metabolic fitness and antitumoral functionality through an NRF2-dependent stress response. *Nat Metab*. 2023 Aug;5(8):1423-1439.

Kent MR, Silvius K, Kucinski J, Calderon D, **Kendall GC**. Functional genomics of novel rhabdomyosarcoma fusion-oncogenes using zebrafish. *Methods Mol Biol*. 2024;2707:23-41.

McAloney CA, Makkawi R, Budhathoki Y, Cannon MV, Franz EM, Gross AC, Cam M, Vetter TA, Duhon R, Davies AE, **Roberts RD**. Host-derived growth factors drive ERK phosphorylation and MCL1 expression to promote osteosarcoma cell survival during metastatic lung colonization. *Cell Oncol (Dordr)*. 2024 Feb;47(1):259-282.

Paudel SN, Hutzen BJ, Miller KE, Garfinkle EAR, Chen CY, Wang PY, Glaspell AM, Currier MA, Ringwalt EM, Boon L, Mardis ER, Cairo MS, Ratner N, Dodd RD, **Cassady KA, Cripe TP**. Myelomodulatory treatments augment the therapeutic benefit of oncolytic viroimmunotherapy in murine models of malignant peripheral nerve sheath tumors. *Front Immunol*. 2024 Jun 25;15:1384623.

Sreenivas P, Wang L, Wang M, Challa A, Modi P, Hensch NR, Gryder B, Chou HC, Zhao XR, Sunkel B, Moreno-Campos R, Khan J, **Stanton BZ**, Ignatius MS. A SNAI2/CTCF interaction is required for NOTCH1 expression in rhabdomyosarcoma. *Mol Cell Biol*. 2023;43(11):547-565.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$10,541,061

Research Institute Reports

CENTER FOR CLINICAL AND TRANSLATIONAL RESEARCH

The Center for Clinical and Translational Research in the Abigail Wexner Research Institute at Nationwide Children's Hospital is committed to improving the diagnosis, treatment and outcomes of society's most important pediatric diseases by integrating high-caliber basic science research with innovative patient-based research.

Faculty



William E. Smoyer, MD, FASN
Director

Principal Investigators

Andrea E. Bonny, MD
David R. Brigstock, PhD
Mitchell H. Grayson, MD
Mark W. Hall, MD, FAAP, FCCM
Hunter Johnson, MD
Bryce A. Kerlin, MD

Setty M. Magaña, MD, PhD

Jennifer A. Muszynski, MD,
MPH, FCCM
Nicole O'Brien, MD
Eric A. Sribnick, MD, PhD
Rachel M. Stanley, MD, MHSA
Rajan K. Thakkar, MD

2023 – 2024 Fellows

Emily Hargrave, MD
Gabrielle Kostur, MD
(Thakkar Lab)
Jordan Lull, MD
Evan Meiman, MD
Christine Wang, MD

Highlights From the Past Year

The vision of the Center for Clinical and Translational Research is to integrate “evidence-based medicine” with “evidence-generating medicine” to ensure children benefit from the latest advances in both medical knowledge and innovative research to improve their health. We believe it is our responsibility to learn from every patient so that all subsequent children will be able to benefit from evidence-based improvements in care.

Our center has scientists investigating several diverse areas of research. The overarching theme of our research programs is to bring new knowledge both from bedside to bench and from bench to bedside to improve the lives of children.

Our faculty are from three departments and represents 10 different subspecialties: Adolescent Medicine, Allergy/Immunology, Anesthesia, Critical Care, Emergency Medicine, Hematology/Oncology, Nephrology, Neurology, Neurosurgery and Pediatric Surgery.

Our research programs are very diverse, and include immunoparalysis after sepsis or trauma, pathophysiology of stored red blood cell (RBC)-induced immune suppression, novel treatments for nephrotic syndrome, pathophysiology of thrombosis, burn injury, abdominal sepsis, hepatic fibrosis, cancer genetics, adolescent addiction, interventions for traumatic brain injury, spinal cord injuries, mechanisms behind viral infection and allergic disease, extracellular vesicles and noncoding RNAs in pediatric multiple sclerosis and perioperative respiratory complications.

Selected Publications

Bhayana S, Dougherty JA, Kamigaki Y, Agrawal S, Wijeratne S, Fitch J, Waller AP, Wolfgang KJ, White P, **Kerlin BA, Smoyer WE.** Glucocorticoid- and pioglitazone-induced proteinuria reduction in experimental NS both correlate with glomerular ECM modulation. *iScience.* 2023 Dec 2;27(1):108631.

Li X, Chen R, Kemper S, **Brigstock DR.** Production, exacerbating effect, and EV-mediated transcription of hepatic CCN2 in NASH: Implications for diagnosis and therapy of NASH fibrosis. *Int J Mol Sci.* 2023 Aug 15;24(16):12823.

Lintner Rivera M, Prager R, Gushu MB, June S, Phiri T, Salameh JP, **Johnson HC, Taylor T, O'Brien NF.** Point-of-care ultrasound to assess hemodynamic contributors to acute kidney injury in pediatric patients with cerebral malaria: A pilot study. *Pediatr Infect Dis J.* 2023 Oct 1;42(10):844-850.

Muszynski JA, Bembea MM, Gehred A, Lyman E, Cashen K, Cheifetz IM, Dalton HJ, Himebauch AS, Karam O, Moynihan KM, Nellis ME, Ozment C, Raman L, Rintoul NE, Said A, Saini A, Steiner ME, Thiagarajan RR, Watt K, Willems A, Zantek ND, Barbaro RP, Steffen K, Vogel AM, Alexander PMA; Pediatric Extracorporeal Membrane Oxygenation (ECMO) Anticoagulation Collaborative (PEACE), in collaboration with the Pediatric Acute Lung Injury and Sepsis Investigators (PALISI) Network, the Pediatric Critical Care Blood Research Network (BloodNet), and the Pediatric ECMO subgroup of PALISI and the Extracorporeal Life Support Organization (PediECMO). Priorities for clinical research in pediatric extracorporeal membrane oxygenation anticoagulation from the Pediatric Extracorporeal Membrane Oxygenation Anticoagulation Collaborative Consensus Conference. *Pediatr Crit Care Med.* 2024 Jul 1;25(7 Suppl 1):e78-e89.

Sribnick EA, Warner T, Hall MW. Granulocyte- macrophage colony-stimulating factor reverses immunosuppression acutely following a traumatic brain injury and hemorrhage polytrauma in a juvenile male rat model. *J Neurotrauma.* 2024 Jul;41(13-14):e1708-e1718.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024
\$4,723,717

Research Institute Reports

JERRY R. MENDELL, MD, CENTER FOR GENE THERAPY

The primary mission of the Jerry R. Mendell, MD, Center for Gene Therapy in the Abigail Wexner Research Institute at Nationwide Children's Hospital is to develop novel genetically based therapies for inherited diseases to ease the burden of these diseases on children and their families. This mission is pursued by a dedicated team of laboratory scientists whose work is directed toward clinical applications, and by the efforts of clinician-scientists who are tasked with bringing these therapies into clinical trials. To do this, the center works closely with the regulatory expert staff of Nationwide Children's Office of Research Regulatory Affairs and is affiliated for clinical manufacturing with Andelyn Biosciences and other biotech partners. This integrated approach allows us to accelerate the transfer of promising therapies from the bench to the bedside.

Faculty



Kevin M. Flanigan, MD
Director

Principal Investigators

Lindsay Alfano, PT, DPT, PCS
Allison Bradbury, PhD
Liubov Gushchina, MSc, PhD
Scott Harper, PhD
Linda Lowes, PT, PhD
Paul Martin, PhD

Jerry R. Mendell, MD

Stefan Nicolau, MD

Afrooz Rashnonejad, MSc, PhD

Nizar Saad, PhD

Zarife Sahenk, MD, PhD

Sriram Vaidyanathan, PhD

Tatyana Vetter, PhD

Megan Waldrop, MD

Nicolas Wein, PhD

Associate Faculty

Anne Connolly, MD

Kristen Truxal, MD

Christopher Walker, PhD

Highlights From the Past Year

Commitment to Discovery

The Jerry R. Mendell, MD, Center for Gene Therapy has once again had a highly productive and collaborative year, partnering with principal investigators within the Institute for Genomic Medicine. Our clinical research team within the center has supported the initiation of multiple sponsored gene therapy trials, including one for cardiac gene therapy in DMD patients directed by Deipanjan Nandi, MD, MSc, with the Cardiology team. The center has also catalyzed the organization of the new Nationwide Children's clinical Gene Therapy Center of Excellence as a home for commercial gene therapy delivery within Nationwide Children's. Additional research breakthroughs include:

- Work from the Jerry R. Mendell, MD, Center for Gene Therapy led to FDA approval of delandistrogene moxeparvovec, the first gene therapy for Duchenne muscular dystrophy.
- Paul Martin, PhD, and team showed that a single AAV vector carrying the *FKRP* gene and a gene for follistatin could show improvement and recovery of muscle function in a model of limb-girdle muscular dystrophy.

Continued Growth

The team within the Jerry R. Mendell, MD, Center for Gene Therapy continues to grow. In the past year, we welcomed Stefan Nicolau, MD, as principal investigator. Dr. Nicolau is a neuromuscular specialist and expert in neuromuscular pathology whose laboratory work is directed toward gene editing of the dystrophin gene.

Our center was also awarded a NIH Wellstone Muscular Dystrophy Specialized Research Center Award. This highly competitive award is only one of six awarded throughout the country.

Selected Publications

Gushchina LV, Bradley AJ, **Vetter TA**, Lay JW, Rohan NL, Frair EC, **Wein N**, **Flanigan KM**. Persistence of exon 2 skipping and dystrophin expression at 18 months after U7snRNA-mediated therapy in the Dup2 mouse model. *Mol Ther Methods Clin Dev*. 2023 Oct 26;31:101144.

Herstine JA, Chang PK, Chornyy S, Stevenson TJ, Sunshine AC, Nokhrina K, Rediger J, Wentz J, **Vetter TA**, Scholl E, Holaway C, Pyne NK, Bratasz A, Yeoh S, **Flanigan KM**, Bonkowsky JL, **Bradbury AM**. Evaluation of safety and early efficacy of AAV gene therapy in mouse models of vanishing white matter disease. *Mol Ther*. 2024 Jun 5;32(6):1701-1720.

Knox RN, Eidahl JO, Wallace LM, Choudury SG, , Daman K, Guggenbiller MJ, **Saad NY**, Hoover ME, Zhang L, Branson OE, Emerson CP Jr, Freitas MA, **Harper SQ**. Post-Translational Modifications of the DUX4 Protein Impact Toxic Function in FSHD Cell Models. *Ann Neurol*. 2023 Aug;94(2):398-413.

Mendell JR, **Sahenk Z**, **Lehman KJ**, **Lowes LP**, Reash NF, Iammarino MA, **Alfano LN**, Lewis S, Church K, Shell R, Potter RA, Griffin DA, Hogan M, Wang S, Mason S, Darton E, Rodino-Klapac LR. Long-term safety and functional outcomes of delandistrogene moxeparvovec gene therapy in patients with Duchenne muscular dystrophy: A phase 1/2a nonrandomized trial. *Muscle Nerve*. 2024 Jan;69(1):93-98.

Vaidyanathan S, Kerschner JL, Paranjapye A, Sinha V, Lin B, Bedrosian TA, Thrasher AJ, Turchiano G, Harris A, Porteus MH. Investigating adverse genomic and regulatory changes caused by replacement of the full-length CFTR cDNA using Cas9 and AAV. *Mol Ther Nucleic Acids*. 2024 Feb 2;35(1):102134.

Waldrop MA, Chagat S, Storey M, Meyer A, Iammarino M, Reash N, **Alfano L**, **Lowes L**, Noritz G, Prochoroff A, Rossman I, Ginsberg M, Mosher K, Broomall E, Bass N, Gushue C, Kotha K, Paul G, Shell R, Tsao CY, **Mendell JR**, **Connolly AM**. Continued safety and long-term effectiveness of onasemnogene abeparvovec in Ohio. *Neuromuscul Disord*. 2024 Jan;34:41-48.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$15,263,724

Research Institute Reports

CENTER FOR INJURY RESEARCH AND POLICY

The Center for Injury Research and Policy in the Abigail Wexner Research Institute at Nationwide Children's Hospital works globally to reduce injury-related pediatric death and disability. Established in 1999, the center serves as a pioneer by translating innovative injury research into education, advocacy and advances in clinical care. From design changes in consumer products to new public policy, the Center for Injury Research and Policy's influence is leading the way to a safer world.

Faculty



Gary A. Smith, MD, DrPH
Director

Principal Investigators

Julie C. Leonard, MD, MPH

Lara B. McKenzie, PhD, MA

Nichole L. Michaels, PhD, MPH

Henry Xiang, MD, MPH, PhD, MBA

Jingzhen (Ginger) Yang, PhD, MPH

Motao Zhu, MD, MS, PhD

Postdoctoral Scientists

Armita Kar, PhD

Biche Osong, PhD

Christopher R. M. Rundus, PhD

Research Scientists

Saroj Bista, PhD, MPH

Dominique Rose, PhD, MPH

Fangda Zhang, PhD

Highlights From the Past Year

The Center for Injury Research and Policy works from local to global levels to reduce death and disability due to injuries and violence through research, education, advocacy and advances in clinical care. The center aims to improve the scientific understanding of the epidemiology, prevention, acute treatment, rehabilitation and biomechanics of injuries. It provides leadership in the development, implementation and scientific evaluation of public policy regarding prevention of injuries and violence. The center was awarded Injury Control Research Center (ICRC) designation by the Centers for Disease Control and Prevention from 2008-2024, and was the only ICRC focused on pediatric injury research and prevention during that time.

In the past year, center faculty received eight new injury research grants. The multidisciplinary Center for Pediatric Trauma Research at Nationwide Children's, led by Henry Xiang, MD, MPH, PhD, MBA, conducts evidence-based trauma care and policy research to achieve the best outcomes for pediatric trauma patients. Focusing on pre-hospital emergency medical services, acute treatment and rehabilitation care, researchers associated with the Center for Pediatric Trauma Research help promote the mission of the Center for Injury Research and Policy. Dr. Xiang's team also published a study in the past year on an innovative approach to identifying key features of virtual reality in effective pain reduction during medical procedures.

Research Collaborations

The Center for Injury Research and Policy collaborates with many researchers within Nationwide Children's and other organizations. The Zhu Lab is collaborating with Brittany Shoots-Reinhard, PhD, in the department of psychology at The Ohio State University on research into teen driving safety and driver distraction. The McKenzie Lab continues their ongoing collaboration with the University of Virginia, CHOP and the Indiana University School of Medicine on safe infant sleep. The Xiang Lab is part of a multidisciplinary collaboration with the clinical chronic pain team and principal investigators in the Center for Biobehavioral Health to investigate digital health technologies for adolescent chronic pain management. The Michaels Lab is currently partnering with 45 community-based naloxone distribution sites and 32 courts in counties across Ohio to better understand whether fentanyl test strips can help prevent drug overdoses. The Yang Lab is collaborating with researchers from several universities and Dayton Children's Hospital and partnering with 10 juvenile traffic courts in central Ohio to study how in-vehicle technology and parent engagement can improve teen driving safety following a traffic citation.

Professional Involvement

The center's commitment to discovery is supported by involvement in various professional organizations. Selected highlights include:

- Motao Zhu, MD, MS, PhD, is a standing member of the Health Promotion in Communities study section of the National Institutes of Health Center for Scientific Review, a member of the Transportation Research Board of the National Academies of Sciences Occupant Protection Committee, a member of the policy committee of the Association for the Advancement of Automotive Medicine and a member of the editorial board for *Injury Epidemiology*.
- Jingzhen (Ginger) Yang, PhD, MPH, was appointed by the governor of Ohio to serve on the Ohio School Bus Safety Working Group and is also part of the expert consensus study committee for the National Academies of Sciences.
- Dr. Xiang is a member of the Council of Past Presidents of the Society for the Advancement of Violence and Injury Research (SAVIR) and senior associate editor of the *Journal of Medical Extended Reality*.
- Nichole L. Michaels, PhD, MPH, is on the board of directors for the Society for the Advancement of Violence and Injury Research and section councilor for the injury control and emergency health services section of the American Public Health Association.
- Gary A. Smith, MD, DrPH, is deputy editor of *Injury Epidemiology*.
- Lara B. McKenzie, PhD, MA, is a subject matter expert for the Nationwide Children's Hospital Pediatric Vital Signs All Child Mortality indicator.

Awards and Recognition

In the past year, several center faculty and staff have been recognized for their research achievements. Selected highlights include:

- Dr. Zhu: Excellence in Science Award from the American Public Health Association, Injury Control and Emergency Health Services Section and Bronze Digital Health Award from the Mobile Digital Health Resource
- Dr. Yang: Department of Pediatrics 2023 Mentor Award
- Dr. Xiang: 2023 Outstanding Senior Faculty Investigator Award of the Department of Pediatrics
- Megan Armstrong, MPH: 2023 Outstanding Clinical Research Assistant/Associate/Coordinator Award from the Abigail Wexner Research Institute at Nationwide Children's Hospital
- Dr. Smith: 2023 Champion Award from the Ohio Injury Prevention Partnership

Selected Publications

Bressler CJ, Malthaner L, Pondel N, Letson MM, Kline D, **Leonard JC**. Identifying children at risk for maltreatment using emergency medical services' data: An exploratory study. *Child Maltreat*. 2024 Feb;29(1):37-46.

Moon RY, Mindell JA, Honaker S, Keim S, Roberts KJ, McAdams RJ, **McKenzie LB**. The tension between AAP safe sleep guidelines and infant sleep. *Pediatrics*. 2024 Apr 1;153(4):e2023064675.

Neuroth LM, Benedetti MH, Brooks-Russell A, Li L, **Zhu M**. Associations between adolescent marijuana use, driving after marijuana use and recreational retail sale in Colorado, USA. *Subst Use Misuse*. 2024;59(2):235-242.

Samuel D, O'Malley F, Brink FW, Crichton KG, Duffy B, Letson MM, **Michaels NL**. Characterizing child maltreatment fatalities among child victims with disabilities in the United States, 2010-2019. *Child Abuse Negl*. 2023 Oct;144:106354.

Schneider M, Woodworth A, Ericson M, Boerger L, Denne S, Dillon P, Duguid P, Ghanem E, Hunt J, Li JS, McCoy R, Prokofieva N, Rodriguez V, Sparks C, Zaleski J, **Xiang H**. Distinguishing between translational science and translational research in CTSA pilot studies: A collaborative project across 12 CTSA hubs. *J Clin Transl Sci*. 2023 Dec 18;8(1):e4.

Yang J, Peek-Asa C, Zhang Y, Hamann C, **Zhu M**, Wang Y, Kaur A, Recker R, **Rose D**, Roth L. ProjectDRIVE: study protocol for a randomized controlled trial to improve driving practices of high-risk teen drivers with a traffic violation. *Inj Epidemiol*. 2024 Mar 29;11(1):12.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$7,870,716

Research Institute Reports

CENTER FOR MICROBIAL PATHOGENESIS

The Center for Microbial Pathogenesis in the Abigail Wexner Research Institute at Nationwide Children's Hospital is home to 11 full-time basic and clinician scientist investigators. The Center for Microbial Pathogenesis also hosts the Oral and GI Microbe Research Affinity Group which brings together likeminded individuals actively involved in research in oral and gastrointestinal microbiology as it affects human disease. Collectively, we are dedicated to the development of a greater understanding of the molecular mechanisms by which microorganisms cause disease, as well as how we respond to these disease states. To do so, our faculty identify virulence mechanisms and define host immune response patterns by use of a variety of molecular, cellular and 'omics'-based approaches, with the overarching goal of identifying opportunities to interfere in the disease process and/or promote our ability to combat disease. We strive to then translate our findings rapidly into the development of new and/or better ways to diagnose, treat, and ideally, prevent infectious diseases to improve the lives of children worldwide.

Faculty



Lauren O. Bakaletz, PhD
Director

Principal Investigators

Juhi Bagaitkar, PhD

Michael T. Bailey, PhD

Jennifer L. Edwards, PhD

Steven D. Goodman, PhD

John S. Gunn, PhD

Samantha J. King, PhD

Kevin M. Mason, PhD

Christopher P. Montgomery, MD

Santiago Partida-Sanchez, PhD

Chack-Yung Yu, DPhil

Medical Fellows and Residents

Critical Care

Jordan Brauner, MD

Ian Francis, MD, PhD

Rheumatology

Samantha L. Coss, MD, PhD

Postdoctoral Fellows

Frank Robledo-Avila, PhD

Audrey Duff, PhD

Zahid Gani, PhD

Amber Hendricks, PhD

Carlos Rodriguez Hernandez, PhD

Kunal More, PhD

Savannah Morris, PhD

Highlights From the Past Year

This year our center has made substantial progress on continual research efforts to better understand the molecular mechanisms by which microorganisms cause infectious diseases. Collectively, our investigators study diseases of the respiratory tract, gastrointestinal tract, skin, oral cavity, genitourinary system, and the humoral and cellular immune response to disease. Selected highlights include:

- The Bagaitkar Lab identified a molecule produced by *P. gingivalis* that significantly attenuates host susceptibility to RSV by inactivating virions and is currently characterizing the mechanism of viral inactivation. Separately, the lab identified a heretofore never described virulence strategy employed by *P. gingivalis* that results in the entrapment and sequestration of live neutrophils within macrophages that actively contributes to persistence of the bacterium in the host.
- The Bailey Lab identified a bacterial-produced metabolite of tryptophan, opening the possibility of using targeted symbiotics to reduce brain inflammation.
- The Bakaletz Lab, in collaboration with the Goodman Lab, continued their efforts to develop a novel therapeutic approach for biofilm disruption and prevention which targets bacterial DNABII proteins, supporting the launch of a second human clinical trial in addition to an ongoing first-in-human clinical trial.

- The Goodman Lab, in collaboration with the Bakaletz Lab, made significant progress in their efforts to characterize a novel engineered 97 amino acid variant of the innate immune effector HMGB1 as a means to prevent pathological NETosis.
- The Gunn Lab progressed in their development of a new mouse model for typhoid fever chronic infection and antibiofilm compounds that target *Salmonella* and other biofilm-forming pathogens.
- The Edwards Lab continued studies on urethritis causes and effects, leading to the identification of a role for gonococcal phospholipase A in mediating cervical infection.
- The King Lab demonstrated that *Streptococcus mitis*, a common cause of infective endocarditis, binds platelets via two sialic acid-dependent adhesins. These adhesins contribute to infective endocarditis by binding platelets, but the King Lab were the first to reveal they also bind a wide range of extracellular matrix components, showing a broader contribution to diseases development than previously thought.
- The Mason Lab solved the structure of SapA periplasmic binding protein with coordinate heme-binding and defined antimicrobial peptide binding motifs. They also showed *in vivo* adaptation of *Haemophilus* hemoglobin-binding protein C.
- The Montgomery Lab discovered that T cell suppression occurring during acute *S. aureus* infection persists in many children and is associated with lower levels of toxin-neutralizing antibodies.
- The Partida-Sanchez Lab was awarded new MPI funding from the Cystic Fibrosis Foundation entitled "Cure CF Immune Dysfunction" and Dr. Partida-Sanchez is also serving as a subsite lead PI for a new program grant entitled "Role of the Non-canonical inflammasome in SARS-CoV-2-mediated Pathology and Coagulopathy" funded by NIH/NIAID.
- The Yu Lab demonstrated the engagements of variants in complement C4A in increasing genetic risk of aged macular degeneration.

We also continued national and international collaborations to advance our multidisciplinary approaches to unravel how bacteria and viruses cause infections. The importance of our work is evidenced by involvement in several professional organizations, multiple newly funded grants, 36 new peer-reviewed publications. Selected highlights include:

- Juhi Bagaitkar, PhD, received the OSU Women in Medicine & Science Buckeye Shining Star Award 2024.
- Lauren O. Bakaletz, PhD, is a fellow of the American Association for the Advancement of Science and the American Academy of Microbiology and served as Chair on the Special Emphasis Panel ZDC1 SRB-K(14) P for the NIH.
- Jennifer L. Edwards, PhD, served as an invited grant reviewer for La Marato de TV3; Sexual and Reproductive Health Agency for Health Quality and Assessment of Catalonia. She is also president-elect of the *Neisseria gonorrhoeae* Research Society and was an invited chair for the April 2024 NIH study section, Topics in Bacterial Virulence.
- Rheumatology Fellow Samantha L. Cross, MD, PhD, was awarded the AAP/APS Pediatric Scientist Development Program Pediatric Scientist Development Program Fellowship, a three-year award with Chack-Yung Yu, DPhil.
- Kevin M. Mason, PhD, serves as president-elect for the International Society for Otitis Media.

Selected Publications

Duff AF, Jurchisek JA, Kurbatfinski N, Chiang T, **Goodman SD, Bakaletz LO, Bailey MT**. Oral and middle ear delivery of otitis media standard of care antibiotics, but not biofilm-targeted antibodies, alter chinchilla nasopharyngeal and fecal microbiomes. *NPJ Biofilms Microbiomes*. 2024 Feb 3;10(1):10.

Hussan H, Clinton SK, Grainger EM, Webb M, Wang C, Webb A, Needleman B, Noria S, Zhu J, Choueiry F, Pietrzak M, **Bailey MT**. Distinctive patterns of sulfide- and butyrate-metabolizing bacteria after bariatric surgery: potential implications for colorectal cancer risk. *Gut Microbes*. 2023 Dec;15(2):2255345.

Kleinhenz M, Li Z, Chidella U, Picard W, Wolfe A, Popelka J, Alexander R, **Montgomery CP**. Toxin-neutralizing Abs are associated with improved T cell function following recovery from *Staphylococcus aureus* infection. *JCI Insight*. 2024 Jan 18;9(4):e173526.

Lamont RJ, Miller DP, **Bagaitkar J**. Illuminating the oral microbiome: cellular microbiology. *FEMS Microbiol Rev*. 2023 Jul 5;47(4):fuad045.

Zhang Y, Jen FE, Fox KL, **Edwards JL**, Jennings MP. The biosynthesis and role of phosphorylcholine in pathogenic and nonpathogenic bacteria. *Trends Microbiol*. 2023 Jul;31:692-706.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$5,110,901

Research Institute Reports

CENTER FOR PERINATAL RESEARCH

The Center for Perinatal Research performs basic, translational and clinical research focused on understanding aspects of prematurity, fetal and neonatal disorders, and neonatal outcomes. The ultimate goals of this research are to prevent prematurity and its complications, provide state-of-the-art treatment for neonates with disorders requiring medical care, and allow the best long-term outcome of children, mothers, and their families. The Center for Perinatal Research houses the Ohio Perinatal Research Network (OPRN), a platform for clinical research across a regional network of sites. Epidemiology studies focus on problems of prematurity and their influence on outcomes. Basic and translational research in the center focuses on diagnosis, treatment and prevention of genetic disorders, infectious diseases, pulmonary hypertension, aspects of lung development and disease, feeding and gastrointestinal disorders, blood disorders, and basic aspects of inflammation. Other areas of interest include health disparities, education, long-term outcomes of preterm and critically ill neonates, and quality improvement.

Faculty



Patrick G. Gallagher, MD
Director

Principal Investigators

Carl H. Backes, Jr., MD

Kristen Benninger, MD

Gail E. Besner, MD

Rodney Britt, PhD

Bernadette Chen, MD

Sara Conroy, PhD

Sudarshan R. Jadcherla, MD

Mark Klebanoff, PhD

Yusen Liu, PhD

Thomas Lynch, PhD

Leif D. Nelin, MD

Susan Reynolds, PhD

Pablo Sánchez, MD

Jonathan L. Slaughter, MD, MPH

Heather Tubbs Cooley, PhD, RN

Highlights From the Past Year

Advancing Care Through Clinical Research

The Environmental Influences on Child Health Outcomes (ECHO) program, supported by the National Institutes of Health (NIH) to study how risk factors during pregnancy affect children as they grow, began enrollment. Jon Slaughter, MD, is co-principal investigator of this large study that will follow a diverse group of pregnant people, their conceiving partners and children until the children reach adulthood.

World-class innovative clinical and research programs in infant feeding and aerodigestive disorders are led by center investigators. Sudarshan Jadcherla, MD, received an R01 supporting his work “Pathophysiological Evidence Driven Management of Gastroesophageal Reflux Disease (GERD) in Neonatal Intensive Care Unit (ICU) Infants: Randomized Controlled Trial.”

The center participates as a member site of the Congenital and Perinatal Infections Rare Diseases Clinical Research Consortium with Pablo Sanchez, MD, serving as site principal investigator.

The multicenter Percutaneous Intervention Versus Observational Trial of Arterial Ductus in Lower Gestational Age Infants (PIVOTAL) trial led by Carl Backes, MD, and Dr. Slaughter to determine if percutaneous catheter-based closure of patent ductus arteriosus (PDA) in infants with hemodynamically significant and clinically symptomatic PDA improves cardiopulmonary and neurodevelopmental outcomes continues to enroll patients.

Leaders in Collaboration

The BPD (bronchopulmonary dysplasia) Collaborative is an international group formed to fill knowledge gaps around the care of infants with BPD with the goal of improving care and outcomes by fostering interdisciplinary collaboration in patient diagnosis and treatment. Leif Nelin, MD, continues as founder and executive director of the collaborative.

The Cure CF Columbus Research and Development Program, a joint program of researchers from Nationwide Children’s Hospital and The Ohio State University, supports and promotes groundbreaking research and clinically related cystic fibrosis activities. Susan Reynolds, PhD, serves as director of the Epithelial Production Analysis and Innovation Core and co-director of the Pilot and Feasibility Program.

Commitment to Professional Excellence and Science Communication

Our faculty are proud to be leaders in academic medicine, as evidenced by our leadership in important journals in our areas of expertise and by awards to our faculty, including the following:

- Rodney Britt, PhD, was appointed associate editor, *AJP-Lung Cellular and Molecular Physiology*, a journal of the American Physiological Society publishing research covering the broad scope of molecular, cellular, and integrative aspects of normal and abnormal function of cells and components of the respiratory system.
- Patrick Gallagher, MD, continues as editor-in-chief of the *Journal of Perinatology*, the official journal of the American Academy of Pediatrics Section on Neonatal/Perinatal Medicine.
- The University of Cincinnati College of Medicine Daniel Drake Medal, the highest recognition the college bestows on the basis of outstanding scholarly achievements in biomedical science was awarded to Gail Besner, MD.

Selected Publications

Osborn EK, Alshaikh E, **Nelin LD, Jadcherla SR**. A decade of evidence: standardized feeding initiative targeting feeding milestones and predicting NICU stays in premature infants in an all-referral level IV NICU. *J Perinatol*. 2023 Sep;43(9):1105-1112.

Sheikh S, Eisner M, Walum J, Heyob K, Khan AQ, Lewis B, Grayson M, Kopp B, McCoy K, **Britt R Jr**. Innate immune responses are increased in children with acute asthma exacerbation. *Pediatr Allergy Immunol*. 2024 Jun;35(6):e14173.

Wala SJ, Sajankila N, Ragan MV, Duff AF, Wickham J, Volpe SG, Wang Y, Conces M, Dumbauld Z, Purayil N, Narayanan S, Rajab A, Mihi B, Bailey MT, Goodman SD, **Besner GE**. Superior performance of biofilm versus planktonic *Limosilactobacillus reuteri* in protection of the intestines and brain in a piglet model of necrotizing enterocolitis. *Sci Rep*. 2023 Oct 23;13(1):17740.

Wozniak PS, Cantey JB, Zeray F, Leos NK, Michelow IC, Sheffield JS, Wendel GD, **Sánchez PJ**. The mortality of congenital syphilis. *J Pediatr*. 2023 Dec;263:113650.

Zhang L, Kelly N, Shontz KM, Hill CL, Stack JT, Calyeca J, Matrka L, Miller A, **Reynolds SD**, Chiang T. Airway disease decreases the therapeutic potential of epithelial stem cells. *Respir Res*. 2024 Jan 12;25(1):28.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$8,548,689

Research Institute Reports

CENTER FOR REGENERATIVE MEDICINE

The Center for Regenerative Medicine in the Abigail Wexner Research Institute at Nationwide Children's Hospital applies the principles of engineering, computer modeling and life sciences to develop biological substitutes to restore or improve tissue function. Regenerative medicine is the process of creating living, functional tissues to repair or replace tissue or organ functions, lost primarily due to congenital defects or disease. The center currently focuses on producing blood vessels, valvular patches and heart valves, offering a positive impact on children with congenital heart disease. Other areas of regenerative medicine research in progress include intestinal and tracheal replacement.

Faculty



Christopher K. Breuer, MD
Director

Principal Investigators

Jenny Barker, MD, PhD
Sergio Carillo, MD
Tendy Chiang, MD, FACS
John M. Kelly, MD
Oluyinka O. Olutoye, MD, PhD
Daisuke Onohara, MD, PhD
Toshiharu Shinoka, MD, PhD
Mitchel R. Stacy, PhD

Postdoctoral Scientists

Syed Faizullah Hussaini, MD
Anjana Jayaraman, PhD
Junya Matsuda, PhD
Rehab Salah Mohamed, MD
Kosuke Nakamae, MD, PhD
James Reinhardt, PhD
Fahd Taha, MD
Anudari Ulziibayar, MD
Tatsuya Watanabe, MD, PhD
Satoshi Yuhara, MD

Research Scientists

Jazmin Calyeca, MS, PhD
Lumei Liu, PhD
Lourenco Sbragia Neto, MD, PhD
Tai Yi, MD

Surgery Research Fellows

Marissa Guo, MD
Sophia Hameedi, MD
Matt Wiet, MD
Jessica Wright, MD

Highlights From the Past Year

Medical advances have made it possible to save more patients from life-threatening injuries, diseases and congenital conditions. However, after the onset of these conditions, the damage is occasionally lifelong. Often, symptoms can be treated with success, but the underlying tissue or organ damage remains unhealed and can cause further complications over time. To develop new clinical applications that address unmet needs of these patients, the Center for Regenerative Medicine was established in 2017.

Commitment to Discovery

The Center for Regenerative Medicine clinicians and researchers, led by Christopher Breuer, MD, are using degradable scaffolds to bioengineer blood vessels, intestines and tracheas. Further, we are identifying progenitor cells that mediate neotissue formation in hopes to develop ways to enhance tissue repair and growth. And to diversify the center's research strengths, we are actively recruiting principal investigators. We have expanded our team in the past year, welcome two new principal investigators: Daisuke Onohara, MD, PhD, and Jenny Barker, MD, PhD.

Our vision is to pioneer new approaches in tissue regeneration and to develop next-generation reparative solutions. Further, we believe it is our responsibility to learn from every patient so our care for the next child will be improved.

This year, we moved into the newly constructed Research Building IV and have acquired new imaging technologies to enhance our data acquisition capabilities, in turn helping us push the discovery envelope in the field of regenerative medicine. Not only have we made significant progress on our Department of Defense and National Institutes of Health-

funded research, but we have also fostered new partnerships with sponsors and labs to help develop the next generation of biomaterials that have the ability to regenerate body tissues. Selected collaboration highlights include:

- Breuer Lab: Tissue Engineering Vascular Graft Fontan to Cleveland and Toledo Children's Hospitals
- Barker Lab: collaborations with the Jerry R. Mendell Center for Gene Therapy, the Center for Surgical Outcomes Research, the Institute for Genomic Medicine and others

In 2023, we continued the second phase of our human tissue-engineered vascular graft (TEVG) clinical trial for patients undergoing a Fontan repair which received FDA Breakthrough Designation. And excitingly, we have also recently established a large animal model of the Fontan circulation. As we study implantation of our biodegradable scaffolds, we also hope to unravel the many pathophysiological changes that occur in this patient population.

Ultimately, this comprehensive approach means that the Center for Regenerative Medicine has the ability to turn promising laboratory discoveries into proven treatments and make them available to patients.

Research Growth

Center faculty published 44 peer-reviewed articles in the past year and our research efforts continue to grow with the support of new research grants totaling more than \$3.5 million.

Selected Publications

Schwartzman WE, Che J, Naguib MA, Palillo J, Jimenez M, Turner ME, Yates AR, Arsuaga-Zorrilla C, **Breuer C**, Kelly J. Perioperative Evaluation of Arterial and Venous Whole Blood in the Lamb (*Ovis aries*) Fontan Model. *Comp Med*. 2024 Apr 1;74(2):70-80.

Tan ZH, Dharmadhikari S, Liu L, Yu J, Shontz KM, Stack JT, **Breuer CK**, Reynolds SD, **Chiang T**. Regeneration of tracheal neotissue in partially decellularized scaffolds. *NPJ Regen Med*. 2023 Jul 12;8(1):35.

Tram NK, Chou TH, Janse SA, Bobbey AJ, Audino AN, Onofrey JA, **Stacy MR**. Deep learning of image-derived measures of body composition in pediatric, adolescent, and young adult lymphoma: association with late treatment effects. *Eur Radiol*. 2023 Sep;33(9):6599-6607.

Turner ME, Blum KM, **Watanabe T**, Schwarz EL, Nabavinia M, Leland JT, Villarreal DJ, Schwartzman WE, Chou TH, Baker PB, Matsumura G, Krishnamurthy R, Yates AR, Hor KN, Humphrey JD, Marsden AL, **Stacy MR**, **Shinoka T**, **Breuer CK**. Tissue engineered vascular grafts are resistant to the formation of dystrophic calcification. *Nat Commun*. 2024 Mar 11;15(1):2187.

Turner ME, Che J, Mirhaidari GJM, Kennedy CC, Blum KM, Rajesh S, Zbinden JC, **Breuer CK**, Best CA, **Barker JC**. The lysosomal trafficking regulator "LYST": an 80-year traffic jam. *Front Immunol*. 2024 May 7;15:1404846.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$5,748,056

Research Institute Reports

CENTER FOR VACCINES AND IMMUNITY

The Center for Vaccines and Immunity in the Abigail Wexner Research Institute at Nationwide Children's Hospital has a single purpose: to improve the health of children through fundamental and applied research to better predict and understand the course of serious virus infections, and to translate this information into improved therapies and preventive vaccines.

Faculty



Christopher Walker, PhD
Director

Katherine Bline, MD
Zongdi Feng, PhD
Amit Kapoor, PhD
Mark Peeples, PhD
Masako Shimamura, MD
Nicole Skinner, MD, PhD

Highlights From the Past Year

Commitment to Discovery

In the past year, we've had several research breakthroughs that help advance our mission. Selected highlights include:

- Mark Peeples, PhD, and Jianrong Li, DVM, PhD, with The Ohio State University, generated a novel approach for vaccination against the Sars-CoV2 virus. Components of the MMR vaccine were altered to deliver the spike protein of three Sars-CoV2 variants. This vaccine, which can be administered nasally, provided protections for Sars-CoV2 challenge in pre-clinical studies. This approach builds upon an MMR vaccine that has a strong record of safety and efficacy in humans. Their work was highlighted in two high-profile papers published by Dr. Peeples and Dr. Li in the past year.
- Amit Kapoor, PhD, discovered new animal viruses that are closely related to the hepatitis C virus, which is a significant cause of chronic liver infection and disease in humans. Over the past year, Dr. Kapoor and colleagues at Emory University have demonstrated that prevention of chronic infection with HCV in animals depends upon co-operation between different arms of the immune system. These arms include B cells that produce antibodies to neutralize virus infectivity and T cells that kill infected cells to interrupt the production of new viruses. The work is important to the development of vaccines to prevent HCV infection, a significant unmet medical need.

Research within the center is also highly collaborative and depends on close ties to other centers and universities. Several principal investigators within our center collaborate with the Institute for Genomic Medicine, such as Katherine Miller, PhD, who leads the Genomics Services Laboratory. Additional collaboration highlights include:

- Drs. Peeples and Li, who work on next generation Sars-CoV2 vaccines.
- Dr. Kapoor and Arash Grakoui, from Emory University, who study immunity to hepatitis viruses necessary for vaccine development.
- Christopher Walker, PhD, and multiple collaborators at Stanford University, Purdue University and the University of Alberta, who are leading efforts to develop a vaccine for the hepatitis C virus.

Recognition and Funding

Our work is supported by grants, including nine newly funded research grants in the past year:

- Dr. Kapoor was awarded two NIH R01 grants, one to use animal models to study heterogeneous outcomes of HCV infection and pathogenesis and the other focuses on viral determinants of chronic hepatitis C infection.
- Masako Shimamura, MD, was awarded four grants from different organizations including CancerFree Kids, NIH, Arkansas Children's Hospital Research Institute and New York Medical College. Dr. Shimamura's research focuses on hematopoietic cell transplantation, cytomegalovirus infection, respiratory viral infections and other areas of vaccine science.
- Katherine Bline, MD, was awarded an NIH grant for the Pediatric Critical Care and Trauma Scientist Development Program K12 Scholar Award.
- Dr. Peeples was awarded two NIH grants to study the modulation of lung immune responses to viral infection and the role of the non-canonical inflammasome in SARS-CoV-2-mediated pathology and coagulopathy.
- Dr. Walker was awarded a grant from the Flanders Research Foundation and the University of Gent to research the development of new approaches to prevent and treat HEV infection.

We also recognize the achievements of our faculty for their contributions and discoveries. In the past year, Dr. Bline was the recipient of a prestigious NIH K12 Pediatric Critical Care and Trauma Scientist Development Program K12 Scholar Award. This career award provides support for Dr. Bline's research into the pathogenesis of severe respiratory virus infection in children.

Selected Publications

Bline KE, Wilt AL, Alexander RN, Andrews AN, Mertz SE, Ye F, Steele LM, Wolfe AL, Mejias A, Ramilo O. Myeloid-derived suppressor cells and T cell populations in children with Multisystem Inflammatory Syndrome. *Pediatr Res*. 2024 Apr;95(5):1288-1294.

Dravid P, Murthy S, Attia Z, Cassady C, Chandra R, Trivedi S, Vyas A, Gridley J, Holland B, Kumari A, Grakoui A, Cullen JM, **Walker CM**, Sharma H, **Kapoor A**. Phenotype and fate of liver-resident CD8 T cells during acute and chronic hepatitis C infection. *PLoS Pathog*. 2023 Oct 9;19(10):e1011697.

Gridley J, Holland B, Salinas E, Trivedi S, Dravid P, Elrod E, Jin F, Kumari A, Batista MN, Thapa M, Rice CM, Marcotrigiano J, **Kapoor A**, Grakoui A. Concerted synergy between viral-specific IgG and CD8 + T cells is critical for clearance of an HCV-related rodent hepatitis C virus. *Hepatology*. 2024 Oct 1;80(4):937-950. Epub 2024 Jan 12.

Ralfs P, Holland B, Salinas E, Bremer B, Wang M, Zhu J, Ambardekar C, Blasczyk H, **Walker CM**, **Feng Z**, Grakoui A. Soluble ORF2 protein enhances HEV replication and induces long-lasting antibody response and protective immunity in vivo. *Hepatology*. 2023 Dec 1;78(6):1867-1881.

Shoukry NH, Cox AL, **Walker CM**. Immunological monitoring in hepatitis C virus controlled human infection model. *Clin Infect Dis*. 2023 Aug 14;77(Suppl 3):S270-S275.

Xu J, Zhang Y, Qu P, Shamseldin MM, Yoo SJ, Misny J, Thongpan I, Kc M, Hall JM, Evans JP, Eltobgy M, Lu M, Ye C, Chamblee M, Liang X, Martinez-Sobrido L, Amer AO, Yount JS, Boyaka PN, **Peeples ME**, Liu SL, Dubey P, Li J. A next-generation intranasal trivalent MMS vaccine induces durable and broad protection against SARS-CoV-2 variants of concern. *Proc Natl Acad Sci U S A*. 2023 Oct 10;120(41):e2220403120.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$4,920,728

Research Institute Reports

KIDNEY AND URINARY TRACT CENTER

The Kidney and Urinary Tract Center offers patients access to expert surgical and medical treatment of urologic, genital and kidney conditions. The center is a collaborative, integrated process designed to combine patient care, advocacy, research and training to develop the next generation of nephrology and urology treatment for children. Nephrology and urology physicians, surgeons, scientists and care staff at Nationwide Children's Hospital are nationally recognized in patient care and research by peers for reputation and outcomes.

Faculty



Brian Becknell, MD, PhD
Research Director Nephrology
and Hypertension Faculty



Linda Baker, MD
Co-director
Urology Faculty



John David Spencer, MD
Co-director
Nephrology and Hypertension
Division Chief

Abdominal Transplant and Hepatopancreatobiliary Surgery

Jaimie D. Nathan, MD
Amer Rajab, MD, PhD
Sara K. Rasmussen, MD, PhD

Nephrology and Hypertension

O.N. Ray Bignall, II, MD
Gabriel Cara-Fuentes, MD, PhD
Ashley R. Jackson, PhD
Mahmoud Kallash, MD

Kirsten Kusumi, MD
John D. Mahan, MD
Tahagod H. Mohamed, MD
Hiren P. Patel, MD
Juan de Dios Ruiz-Rosado, PhD
William E. Smoyer, MD

Beth A. Vogt, MD
Diana Zepeda-Orozco, MD
Urology
Seth A. Alpert, MD
Christopher T. Brown, MD
Christina B. Ching, MD

Daniel G. DaJusta, MD
Molly E. Fuchs, MD
Rama Jayanthi, MD
Daryl J. McLeod, MD
Donald H. Nguyen, MD

2023-2024 Fellows:

Clinical Fellows:
Morgan Beebe, MD
Denise Kimbrough, MD, PhD
Jacqueline Morin, MD

Claudia Mosquera Vasquez, MD
Mayra Oseguera, MD
Postdoctoral Fellows:
Karunya Albert, PhD
Mohammad Alharakeh, PhD

Audrey Fetsko, PhD
Imtiaz Israel, PhD
Preeti John, PhD
Gabriel Mayoral Andrade, MD
Kaushik Muralidharan, PhD

Nixon Raj, PhD
Claudia Robles-Planells, PhD
Felipe Rodriguez, PhD
Yuriko Sanchez Zamora, PhD
Gabriela Vasquez Martinez, PhD

Highlights From the Past Year

Commitment to Discovery

A major goal of the Kidney and Urinary Tract Center is to enhance the health of children with kidney and urinary tract disorders by engaging in high-quality, innovative research. In March 2024, the KUTC convened its third symposium entitled "State-of-the-Art in Congenital Obstructive Uropathy" featuring an international panel of renowned, multidisciplinary speakers. In the past year, we've had several research breakthroughs that advance our mission. Selected highlights include:

- Diana Zepeda-Orozco, MD, received two NIH R01 awards investigating mechanisms of acute kidney injury following chemotherapy. Dr. Zepeda-Orozco's research group published novel, contextual roles for renal tubular mitochondrial pyruvate uptake in *Molecular Metabolism*.
- Gabriel Cara-Fuentes, MD, PhD, received an NIH K08 award for his research investigating roles for endothelial CD93 in the pathogenesis of childhood nephrotic syndrome.
- An investigatory team led by Linda Baker, MD, identified roles for mutations in PIEZO1 in prune belly syndrome. This work, published in *Nature Communications*, was supported by an NIH R01 award to Dr. Baker. Nathalia Amando, PhD, senior research scientist in Dr. Baker's lab, and 2022-2024 Research Scholar from the American Urological Association, served as the study's lead author.
- John David Spencer, MD, and Laura Schwartz, PhD, discovered novel roles for insulin receptor signaling in orchestrating kidney and bladder epithelial defenses that limit urinary tract infections. This work, supported by two NIH R01 awards with Dr. Spencer as principal investigator, was published in *Proceedings of the National Academy of Science* and *Cell Reports*.

Continued Growth

In June 2024, the KUTC welcomed 22 undergraduate and medical students to receive research training through the support of NIH R25 and T35 training grants under principal investigator Dr. Spencer. These students came from 12 different states ranging from California to Maryland to receive mentorship in labs at Nationwide Children's and The Ohio State University. Natalie Holdsworth, a T35 SUPER student co-mentored by Dr. Spencer and Dr. Schwartz, received the 2024 Trainee Award of the Year at the American Society of Pediatric Nephrology meeting. Natalie is the first medical student to ever receive this award, which is typically awarded to fellows.

We also welcomed Dr. Cara-Fuentes to our team as a principal investigator in the Center and Assistant Professor of Pediatrics at The Ohio State University College of Medicine. His research focuses on the roles of glomerular endothelium in pathogenesis of childhood nephrotic syndrome.

Selected Publications

Amado NG, Nosyreva ED, Thompson D, Egeland TJ, Ogujiofor OW, Yang M, Fusco AN, Passoni N, Mathews J, Cantarel B, **Baker LA**, Syeda R. PIEZO1 loss-of-function compound heterozygous mutations in the rare congenital human disorder Prune Belly Syndrome. *Nat Commun*. 2024 Jan 6;15(1):339.

Becknell B, El-Harakeh M, Rodriguez-Tirado F, Grounds KM, Li B, Kercksmar M, Wang X, **Jackson AR**. Keratin 5 basal cells are temporally regulated developmental and tissue repair progenitors in bladder urothelium. *Am J Physiol Renal Physiol*. 2024 Jun 1;326(6):F1078-F1090.

Cortado H, Kercksmar M, Li B, **Vasquez-Martinez G**, Gupta S, **Ching C**, Ballash G, Cotzomi-Ortega I, **Sanchez-Zamora YI**, Boix E, **Zepeda-Orozco D**, **Jackson AR**, **Spencer JD**, **Ruiz-Rosado JD**, **Becknell B**. Murine ribonuclease 6 Limits bacterial dissemination during experimental urinary tract infection. *J Innate Immun*. 2024;16(1):283-294.

Rauckhorst AJ, **Vasquez Martinez G**, **Mayoral Andrade G**, Wen H, Kim JY, Simoni A, **Robles-Planells C**, **Mapuskar KA**, Rastogi P, Steinbach EJ, McCormick ML, Allen BG, Pabla NS, **Jackson AR**, Coleman MC, Spitz DR, Taylor EB, **Zepeda-Orozco D**. Tubular mitochondrial pyruvate carrier disruption elicits redox adaptations that protect from acute kidney injury. *Mol Metab*. 2024 Jan;79:101849.

Schwartz L, Salamon K, Simoni A, Eichler T, **Jackson AR**, Murtha M, **Becknell B**, Kauffman A, Linn-Peirano S, Holdsworth N, Tyagi V, Tang H, Rust S, Cortado H, Zabbarova I, Kanai A, Spencer JD. Insulin receptor signaling engages bladder urothelial defenses that limit urinary tract infection. *Cell Rep*. 2024 Apr 23;43(4):114007.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024
\$2,011,631

Research Institute Reports

INSTITUTE FOR MENTAL AND BEHAVIORAL HEALTH RESEARCH

The Institute for Mental and Behavioral Health Research at Nationwide Children's Hospital conducts innovative translational, clinical and epidemiological research focused on etiology, prevention and treatment of mental, emotional and behavioral disorders. In addition to collaborative efforts across the Nationwide Children's Hospital campus, institute members work in collaboration with The Ohio State University Department of Psychiatry and Behavioral Health and the OSU Institute for Behavioral Medicine Research.

Faculty



Eric Youngstrom, PhD
Director

Jeff Bridge, PhD
Cynthia A. Fontanella, PhD
Donna A. Ruch, PhD

Highlights From the Past Year

The Institute for Mental and Behavioral Health Research was founded in October 2023 by Nationwide Children's Hospital to significantly expand research and understanding of mental and behavioral health in children and to develop better diagnostics, treatment and preventive strategies.

In February 2024, Eric Youngstrom, PhD, joined the institute as the inaugural director. Dr. Youngstrom is a nationally renowned psychologist who specializes in the relationship of mood and psychopathology, and the clinical assessment of children and families. In addition to leading the institute, Dr. Youngstrom is the first recipient of the DiMarco Family Endowed Chair in Mental and Behavioral Health Research at Nationwide Children's. He also serves as professor of Psychiatry in The Ohio State University College of Medicine.

Located in the state-of-the-art Big Lots Behavioral Health Pavilion, the institute includes 25,000 square feet of current research space with additional space in development.

During our first year we also announced the Research at IMBHR Summer Experience (RISE) program which will start in June 2025. RISE provides exceptional summer opportunities for undergraduate, postbaccalaureate and graduate students, particularly from backgrounds underrepresented in psychology and medicine. It will run for 10 weeks from June 2 to August 1, 2025. Our research mentorship faculty is comprised of several NIH-funded principal investigators. Participants will be situated within a dynamic ecosystem of pipeline programs spanning research internships through T32-funded post-doctoral programs.

The Center for Suicide Prevention and Research is an integral part of the Institute for Mental and Behavioral Health Research. The center was recently awarded a P50 grant from the National Institute of Mental Health.

Selected Publications

Carmin CN, Ownby RL, **Fontanella C**, Steelesmith D, Binkley PF. Impact of Mental Health Treatment on Outcomes in Patients With Heart Failure and Ischemic Heart Disease. *J Am Heart Assoc.* 2024 Apr 2;13(7):e031117.

Hammond CJ, Hyer JM, Boustead AE, Fristad MA, Steelesmith DL, Brock GN, Hasin DS, **Fontanella CA**. Association Between Marijuana Laws and Suicide Among 12- to 25-Year-Olds in the United States From 2000 to 2019. *J Am Acad Child Adolesc Psychiatry.* 2024 Mar;63(3):345-354.

Ruch DA, Bridge JA, Tissue J, Madden SP, Galfavy H, Gorlyn M, Sheftall AH, Szanto K, Keilp JG. Alterations in performance and discriminating power of the death/suicide implicit association test across the lifespan. *Psychiatry Res.* 2024 May;335:115840.

Stefana A, Fusar-Poli P, Vieta E, **Youngstrom EA**. Therapeutic relationship elements and therapy session outcomes: Protocol for a longitudinal study of the patient's perspective. *Open Res Eur.* 2024 Jun 4;3:133.

Thompson AJ, Henrich CC, Steelesmith DL, Hughes J, **Ruch D, Bridge JA**, Campo JV, Fontanella CA. Identifying Subgroups of Youth Suicide Decedents Based on Clinical Profiles of Psychiatric and Medical Diagnoses: A Latent Class Analysis. *J Adolesc Health.* 2024 Jun;74(6):1191-1197.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$298,010

Research Institute Reports

CENTER FOR SUICIDE PREVENTION AND RESEARCH

In response to the Nationwide Children's Hospital's behavioral health initiative, the Center for Suicide Prevention and Research was created in 2015 to address the growing problem of suicide among youth. The center is a joint partnership with Big Lots Behavioral Health Pavilion and the Abigail Wexner Research Institute. Our mission is to conduct research aimed at understanding the epidemiology of child and youth suicide and suicidal behavior by examining risk and protective factors, developing and testing evidence-based intervention strategies, implementing effective suicide prevention interventions and strategies in real world settings and foster the development and implementation of school-based programs to prevent youth suicide and attempted suicide in Ohio and promote methods for evaluating outcomes. This partnership between the Abigail Wexner Research Institute and the Big Lots Behavioral Health Services allows for the development and implementation of evidence-based prevention strategies.

Faculty



Jeff Bridge, PhD
Director



Meredith R. Chapman, MD
Medical Director

Cynthia A. Fontanella, PhD

Donna A. Ruch, PhD

John P. Ackerman, PhD

Affiliate Faculty

David A. Axelson, MD

Mary A. Fristad, PhD

Jennifer Hughes, PhD

Kelly J. Kelleher, MD

Jack Stevens, PhD

Glenn V. Thomas, PhD

Selected Publications

Carmin CN, Ownby RL, **Fontanella C**, Steelesmith D, Binkley PF. Impact of Mental Health Treatment on Outcomes in Patients With Heart Failure and Ischemic Heart Disease. *J Am Heart Assoc.* 2024 Apr 2;13(7):e031117.

Hammond CJ, Hyer JM, Boustead AE, Fristad MA, Steelesmith DL, Brock GN, Hasin DS, **Fontanella CA**. Association Between Marijuana Laws and Suicide Among 12- to 25-Year-Olds in the United States From 2000 to 2019. *J Am Acad Child Adolesc Psychiatry.* 2024 Mar;63(3):345-354.

Ruch DA, Bridge JA, Tissue J, Madden SP, Galfavy H, Gorlyn M, Sheftall AH, Szanto K, Keilp JG. Alterations in performance and discriminating power of the death/suicide implicit association test across the lifespan. *Psychiatry Res.* 2024 May;335:115840.

Thompson AJ, Henrich CC, Steelesmith DL, Hughes J, **Ruch D, Bridge JA**, Campo JV, Fontanella CA. Identifying Subgroups of Youth Suicide Decedents Based on Clinical Profiles of Psychiatric and Medical Diagnoses: A Latent Class Analysis. *J Adolesc Health.* 2024 Jun;74(6):1191-1197.



Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$5,385,626

Highlights From the Past Year

Researchers in the Center for Suicide Prevention and Research conduct epidemiological and intervention studies on child and youth suicide and suicidal behavior to inform policy, improve the delivery of services for suicidal youth, and ultimately prevent suicide and suicidal behavior. Principal investigators in the center research topics including health service use, special populations, racial and ethnic disparities, age trends, regional differences and the media and suicide.

The CSPR prevention team supports school, healthcare and youth-serving community organizations in Ohio implement effective and sustainable suicide prevention programs. The team also increases community awareness and reduces mental health stigma through presentations, trainings and actionable resources informed by the latest research on youth suicide prevention.

Our center is home to the Center for Accelerating Suicide Prevention in Real-World Settings (ASPIRES), which aims to accelerate the development and implementation of effective interventions to reduce suicide in children and adolescents. ASPIRES is supported by P50 Center grant funding from the National Institute of Mental Health of the National Institutes of Health. Jeff Bridge, PhD, and Cynthia Fontanella, PhD, lead ASPIRES and its investigators as co-directors.

Research Institute Reports

STEVE AND CINDY RASMUSSEN INSTITUTE FOR GENOMIC MEDICINE

The Steve and Cindy Rasmussen Institute for Genomic Medicine at Nationwide Children’s Hospital focuses on improving our patients’ outcomes using molecular diagnostic testing and advanced analysis in both research and clinical settings. Since its inception in 2016, the institute’s mission has been to build a seamless continuum between research, clinical testing and patient care by involving specialty-focused providers in translational genomics protocols that explore how best to apply different technologies in appropriate disease settings. The institute combines robust clinical diagnostics, leading-edge research and development, and computational genomics to enable precision genomic medicine. Another area of emphasis is providing educational opportunities for care providers and all levels of trainees to convey to colleagues how genomics can be applied to better understand disease and add precision to clinical diagnosis.

Our computational genomics group is composed of researchers and staff focused on applying state-of-the-art quantitative methods in basic and clinical research settings to better inform and improve clinical care in pediatrics. This team works collaboratively with internal and external scientists, utilizing their expertise in mathematics, statistics and quantitative methods to advance the organization’s mission.

Faculty



Richard K. Wilson, PhD
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Highlights From the Past Year

Continued Growth

Over the past year, the Institute for Genomic Medicine has expanded their facilities footprint to include a full floor in Research Building 4. This expansion creates a seamless full floor of Institute space spanning two adjoined buildings that encompass over 60,000 square feet of state-of-the-art laboratory and office space. The arrangement enables the clinical laboratory, research laboratories and informatics teams to work alongside each other, creating a highly collaborative interdisciplinary setting. We also welcomed Beth Kozel, MD, PhD, to the team as chief of medical genetics and an IGM principal investigator.

Research Breakthroughs

In 2022, the team signed a five-year contract with the National Cancer Institute to perform a multi-assay clinical characterization of pediatric solid tumor samples from patients enrolling in the Children’s Oncology Group (COG) Project Every Child registry, providing clinical results within a 14-day turnaround time as part of the Molecular Characterization Initiative (MCI). Thus far, we have clinically characterized samples from over 3,500 pediatric brain, soft-tissue sarcoma, rare cancers and neuroblastoma samples for patients from 48 states in the U.S., as well as from COG sites in Australia, Canada and New Zealand. All de-identified data from these patients are deposited into the NCI-administered Childhood Cancer Database, to enable future data mining and discoveries about pediatric cancers.

One major accomplishment related to the MCI testing centers around the use of DNA methylation in precision diagnosis of brain cancers, which became part of the WHO standard of diagnosis in 2021. In this test, IGM-based expertise in machine learning was used to devise a new classification approach to analyze DNA methylation data from these patient samples, which contributes information to determining their care. This approach has compared successfully to a previous classifier, enabling clinical validation and use in the MCI project.

In late 2023, we launched a Cardiology Translational Protocol — COURAGE for Kids — in collaboration with our Cardiology and Genetics providers at Nationwide Children’s Hospital. This protocol is designed to aid diagnosis of patients seeking care in the cardiac intensive care unit at Nationwide Children’s Hospital for congenital heart disease, unexplained cardiac arrest, severe ventricular dysfunction, or pulmonary hypertension. We study these patients’ genomes, often in comparison to their parent’s genomes to identify underlying genetic causes of the indicated disease, and evaluate disease-affected tissue and blood to fully characterize each patient in light of pediatric cardiovascular conditions and critical care outcomes. To date, we have sequenced and analyzed 76 patients and are actively in planning to transition this protocol to utilize the clinically validated GS/rGS assays discussed below.

Utilizing genome sequencing of epilepsy-affected patient brain tissue, IGM investigators discovered that somatic variants in the gene SLC35A2 cause as many as 20% of drug-resistant neocortical focal epilepsies (Bedrosian et al., *Epilepsia*, 2022). This important finding raised new opportunities to understand disease mechanisms and to develop treatments. Subsequently, the Bedrosian laboratory developed a novel mouse model of SLC35A2 epilepsy (invention disclosure filed 2022) that mimics the same seizure phenotype and brain pathology observed in patients. In a recent publication, they discovered how SLC35A2 deficiency perturbs brain development leading to epilepsy (Elziny et al., *Neuroscience Letters*, 2024). In follow-on studies, they are performing preclinical tests of a precision treatment approach that they hope will eventually benefit patients with SLC35A2-related drug-resistant epilepsy.

In early 2024, the team launched clinically valid assays for Genome Sequencing and Rapid Genome Sequencing. These assays evaluate the constitutional DNA from patients and biological parents with suspected genetic underpinnings for their disease presentation, in an effort to pinpoint the underlying altered gene(s). To date, the Institute for Genomic Medicine has analyzed data for 141 acutely ill children by rapid genome sequencing with a diagnostic rate of 23%. In addition, Genome Sequencing has been initiated in 207 patients, with 1 out of every 5 individuals receiving a diagnostic finding from this testing.

Collaborations and Support

Our Computational Genomics Group continues to support the development and analysis needs of the IGM Clinical Laboratory. In 2024, the group helped the IGM Clinical Laboratory validate and deploy an updated workflow manager, “Phoenix,” which has dramatically improved the speed and comprehensiveness of managing the lab’s growing volume. Alongside our colleagues in the IGM Clinical Laboratory, we developed an in-house DNA methylation classifier, named MACDADI, improving the speed, quality, and accuracy of results, and in 2024 validated and deployed MACDADI for clinical use in central nervous system tumor testing. A sarcoma version of the classifier is currently under development. Multiple development and validation efforts around new instrumentation, laboratory processing enhancements and updated analytical software components are underway.

The Computational Genomics Group also supports our organizational research efforts, including IGM’s Genomic Services Lab, and Technology Development Lab, as well as IGM’s Research PIs and their collaborators. The Computational Genomics Group is currently involved in several external collaborative research projects, including studying metastatic breast cancer as part of a multi-institutional working group, and profiling acute myeloid leukemia in minoritized populations with colleagues at Ohio State.

In 2023, an NCI R01 proposal was funded that links investigators from IGM (Elaine Mardis, Katie Miller), Ohio State University/The James Cancer Center (Ann-Kathrin Einfeld) and the University of Cincinnati (Lee Grimes). The focus of this research is to unravel the genomics of acute myeloid leukemia (AML) in Black AML patients, and to connect specific mutational profiles to outcomes in the disease. Preliminary data from these investigators demonstrated that AML in Blacks is different than in Whites in terms of the frequency of known driver gene mutations and how well those mutations predict disease outcomes. Several new genes were found frequently mutated that were not described in large-scale genomics studies that predominately profiled the genomes of White AML patients, and these mutations are now being studied in mouse models to determine their potential for driving AML development. The new funding will increase the numbers of Black AML patients studied, will profile African AML patient genomes, and will build evidence for new genes and their ancestry-specific association with the disease. Hopefully, improved outcomes for Black AML patients will result based on the findings from this research.

In collaboration with the Germain Family Accelerator Programs, the Epilepsy Surgery Accelerator Program was created and is engaged in the pursuit of curing epilepsy for children with unrelenting seizures. This program is a multi-site protocol expansion that builds on the success of our Epilepsy Translational Protocol, which identified genomic alterations in the brain that lead to treatment-refractory epilepsy. We will be receiving brain tissue specimens from patients who have undergone epilepsy surgery at three collaborating sites: Cook Children’s Health Care System, University of Michigan and University of Iowa. Sites are in the final stage of regulatory approval, and we anticipate receiving the first study samples by the end of 2024. This will allow us to build new external collaborations and will enable discoveries that will contribute to the best outcomes for patients and families.

Professional Engagements and Recognition

In addition to the work done inside Nationwide Children’s, faculty from the Institute for Genomic Medicine hold positions in professional organizations. Selected highlights include:

- Elaine Mardis, PhD, is Chair of the American Association for Cancer Research’s Nominating Committee; on the governing board for the Make-a-Wish Foundation for the Ohio, Kentucky and Indiana chapters; Co-Chair of the Scientific Advisory Board at the James P. Allison Institute at the MD Anderson Cancer Center; and Chair of the DKTK Scientific Advisory Board of the DKFZ in Heidelberg, Germany.

- Rolf Stottmann, PhD, is secretary for the Society for Craniofacial Genetics and Developmental Biology and organizing committee chair for the NIH Structural Birth Defects Working Group.
- Beth Kozel, MD, is a fellow of the American College of Medical Genetics and chair of the American Williams Syndrome Clinic Consortium, with leadership standing in the Collaborative Registry for Williams Syndrome.
- Marco Leung, PhD, FACMG, is Chair on the American College Medical Genetics and Genomics Advocacy and Government Affair Committee, as well as Chair on the Association for Molecular Pathology Diversity Equity and Inclusion Working Group.
- Karen D. Tsuchiya, MD, FCAP, FACMG, is co-leader of the FISH Technical Standards Workgroup for the American College of Medical Genetics.
- Tracy Bedrosian, PhD, is an editorial board member for Scientific Reports.
- Albert M. Issacs, MD, PhD, FRCSC, FAANS, is a board member on the Society for Research for Hydrocephalus and Spina Bifida.
- Catherine Cottrell, PhD, FACMG, is chair of the Laboratory Science Committee for the Children’s Oncology Group.
- Alex Wagner, PhD, is team leader on the Global Alliance for Genomics and Health Variation Representation Team, director of the Variant Interpretation for Cancer Consortium and co-lead of the Standards Work Group for the NIH Bridge to Artificial Intelligence Consortium.
- Yasmine Akkari, PhD, FACMG, is chair of the finance committee for the American College of Medical Genetics and vice chair of the International Outreach and Engagement Committee under the Association for Molecular Pathology.

We had an incredible year, with 142 articles published by faculty in peer-reviewed journals. Additional recognition highlights include:

- Elaine Mardis, PhD, was recognized as one of the Reuters Top 20 Trailblazing Women in Healthcare.
- Beth Kozel, MD, was recognized as a Lasker Clinical Research Scholar.
- Rolf Stottmann, PhD, was awarded Development Paper of the Year by the Company of Biologists.

Selected Publications

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Grants Awarded

JULY 1, 2023 – JUNE 30, 2024

\$9,182,777

ACKNOWLEDGEMENTS

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