Come see what a unique ecosystem ...
INTEGRATED CLINICAL CARE AND RESEARCH ARE AT THE HEART OF EVERYTHING WE DO, SUPPORTING OUR MISSION TO CREATE THE BEST POSSIBLE OUTCOMES FOR KIDS EVERYWHERE.

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Want More?

Visit our Digital Annual Report for online exclusives, such as in-depth features, videos and links to everything you need to know about Nationwide Children’s!

NATIONWIDECHILDRENS.ORG/2021-REPORT

NATIONWIDE CHILDREN’S HOSPITAL
2020–2021 ANNUAL REPORT
NATIONWIDECHILDRENS.ORG
NATIONWIDECHILDRENS.ORG/2021-REPORT
Nationwide Children’s Hospital has announced the most ambitious strategic plan in our 129-year history: A five-year $3.3 billion commitment to transform health outcomes for all children. What makes this plan unique is its distinctive approach to improving the health of the whole child through:

- World-Class Care & Cutting-Edge Research: Integrating talent, quality and technology to achieve best outcomes
- Health Equity & Population Health: Breaking down barriers to impact every child’s future potential
- Behavioral & Mental Health Care: Expanding and sharing an innovative model of care
- Genomics Research & Personalized Medicine: Revolutionizing the next frontier of pediatric health

“Empowered by tremendous community support, our successes in clinical care, behavioral health, population health and research innovations aligned with our focus on the whole child and our mission to provide care regardless of ability to pay, uniquely positions us to change the way pediatric health care is delivered as a national model. We are ready to do even more.”

— Tim Robinson, CEO

LEADING THE JOURNEY TO BEST OUTCOMES

FOR CHILDREN EVERYWHERE

HONORS AND ACHIEVEMENTS

America’s largest neonatal network and pediatric surgery provider

RANKED 6th among NIH-funded freestanding pediatric research facilities in the U.S.

Patient Safety*

- **500+ DAYS** without a Serious Safety Event
- **1+ YEAR** without a CLABSI in the CICU
- **700+ DAYS** between preventable codes outside the ICU

Exceptionally Low Mortality**

- **<2%** Cardiac surgery mortality
- **<3.5%** Bronchopulmonary dysplasia mortality
- **<1%** Leukemia (ALL) mortality

*At time of printing

**2020 data

ONCE AGAIN NAMED TO THE HONOR ROLL OF BEST CHILDREN’S HOSPITALS AND RANKED IN ALL 10 SPECIALTIES BY U.S. NEWS & WORLD REPORT

- In 2020, patients from 49 states and 43 countries came to Nationwide Children’s for care
- More than 104,400 donors contributed more than $53 million to support the hospital’s mission
- Four-time American Nurses Credentialing Center Magnet® designation for nursing excellence
- Provide more than $264 million in charity care and community benefit services annually
- Fully accredited by the Association for the Accreditation of Human Research Protection Programs

* Based on Children’s Hospital Association Survey of Utilization and Financial Indicators of Children’s Hospitals

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NATIONWIDE CHILDREN’S HOSPITAL

2020-21 Annual Report

NationwideChildrens.org/2021-Report
Throughout Nationwide Children’s Hospital’s 129-year history, we have been on a journey to best outcomes for every child. But over the last two decades in particular, we have been redefining what “best outcomes” means.

Physical health will always be crucial. Nationwide Children’s draws patients and families from nearly every state and more than 43 different countries with the highest quality, most advanced care in the world. The deep talent and resources of our Abigail Wexner Research Institute guide that care, develop new treatments and make discoveries that will have an impact far into the future.

We have also dedicated ourselves to expanding our efforts to address the overall wellbeing of children, and that has led us to think beyond the kind of physical health outcomes that are usually achieved inside a hospital or provider’s office.

It’s why we have developed Nationwide Children’s unique model of care or “ecosystem”: a nationally recognized focus on children’s behavioral health; on population health; on the conditions of our neighborhoods; on precision medicine through genomics; on quality and safety in pediatric medicine; on issues of disparity and inequity. And we combine all of that with a clear commitment to integrated clinical care and research.

We are excited to bring these strengths to our new strategic plan Leading the Journey to Best Outcomes, and we are proud to introduce it in this annual report.

As you’ll see in these pages, it is the most ambitious plan in our history — a $3.3 billion shovel-ready investment to improve the wellbeing of children in our community and across the world. It doubles down on our commitment to clinical care and research. It reinvents our innovative Zero Hero program to further advance safety. It also enlarges and heightens our efforts in behavioral health, population health and health equity.

Our work has already begun. The COVID-19 pandemic continues to challenge all of us, but because of our ecosystem and culture, Nationwide Children’s adapted in the last year to meet the needs of even more children and families.

At the invitation of Dayton Children’s Hospital, our Partners For Kids® accountable care organization expanded to the west central region of Ohio and is now responsible for the health of more than 400,000 children covered by Medicaid Managed Care in 47 of Ohio’s 88 counties. Healthy Neighborhoods Healthy Families has brought its nationally prominent community improvement model to another opportunity-rich area of Columbus. Our On Our Sleeves® movement for children’s mental health has worked to put free resources in one million classrooms across the United States. Our Stand Against Racism, Stand For Health Equity initiative is building momentum to create a more equitable world for our staff and the families we serve.

Nationwide Children’s has audacious, aspirational goals. But the last two decades of redefining “best outcomes” has taught us that big goals make a big difference in children’s lives. And nearly two years of a global pandemic have taught us that our team of 14,000-strong can achieve just about anything.

“We have also dedicated ourselves to expanding our efforts to address the overall wellbeing of children, and that has led us to think beyond the kind of physical health outcomes that are usually achieved inside a hospital or provider’s office.”
With the launch of our next five-year strategic plan, Leading the Journey to Best Outcomes, the work begins to build on our strong, wide and stable foundation and once again elevate our life-changing care for the children and families who need it.

The institution we know today as Nationwide Children's didn't occur by accident. It arose from a deliberate goal set by the central Ohio community to ensure that no child needed to leave home to get the best care in the world. In the process, we have become a place to which talented and passionate health care professionals gather to practice and share the art and science of care and invent the next generation of healing breakthroughs.

Inseparable from our mission — our identity — is our commitment to improving the lives of all children. Not only does that apply to what happens inside our walls, it also applies to our groundbreaking work to turn the hospital inside out and serve the community around us, by making neighborhoods healthier, safer and better able to provide for successful living.

With the new strategic plan we will build on our signature efforts and create new ones, such as new fetal medicine and abdominal transplant programs, just to name two. We will also create new facilities for this and other work to take place, including a new inpatient tower and new research facilities. All of this is to continue to meet the needs of central Ohio’s children and any others who can benefit from what we know and can do.

In moving from being on the journey to now Leading the Journey to Best Outcomes, our responsibilities increase, and we are ready for that challenge because those who choose to put their passion to work at Nationwide Children’s are among the most talented in the world at what they do.

If you thought the journey to this point was fascinating, I predict the years to come will show it to be just the set-up. We set high goals because the children we serve deserve our best. We have repeatedly shown them, ourselves and our community that we can deliver for them.”
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[Photography in this report involves images from 2021 and prior, those not reflecting masks or social distancing were taken pre-COVID-19.]
Leading a Bold Journey to Best Outcomes for Children Everywhere

Nationwide Children’s Hospital’s New Strategic Plan Addresses Health of the Whole Child

Nationwide Children’s Hospital has announced the most ambitious strategic plan in its 129-year history: A five-year $3.3 billion commitment to transform health outcomes for all children.
INTINTEGRATED
CLINICAL CARE AND RESEARCH

Integrated care and research are at the heart of all we do to lead best outcomes for children everywhere...

With more than 1,000 faculty working in over 100 subspecialties and 14 research centers, Nationwide Children’s Hospital’s clinical innovations and research serve children here in Ohio and around the world.

Our new strategic plan lays the groundwork for extended care and research — venturing into new areas and building on our established programs in others — to provide the best possible outcomes for children and their families.

**FETAL MEDICINE**

has the potential to treat many life-threatening and debilitating conditions before the baby is born. With our partners in the Ohio Fetal Medicine Collaborative, we will create a full-service maternal fetal medicine program, adding limited delivery services and keeping mom and baby close to home for fetal services and, in some cases, delivery.

“Nationwide Children’s is an international leader in pediatric research. We know that the way to improve outcomes for children is through clinical research. From natural history studies that enable us to understand disease progression to clinical trials of the latest innovations in therapies, our comprehensive clinical research integration enables the next generation of discoveries to reach children here, and around the world.”

**THE KIDNEY AND URINARY TRACT CENTER**

will build on the established environment of collaboration, care and research from the Nephrology and Urology teams. The unique care model will streamline patient care, offering coordinated, evidence-based care and access to the latest in clinical research.

**CLINICAL RESEARCH**

is critical and integral to the mission of Nationwide Children’s. The Clinical Research Office will build on the past successes that have led to the translation of innovative new therapies for children to make Nationwide Children’s a destination for bringing ideas from the bench to the bedside of patients everywhere.

Katherine Deans, MD, Chief Clinical Research Officer at Nationwide Children’s and Professor of Surgery at The Ohio State University College of Medicine
Our ecosystem showcases our unique strengths and our commitment to care for the whole child, family and community.

“We are committed to creating health equity for children. We cannot say we have the best outcomes for children if we don’t have the best outcomes for all children.”

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

“Our nation’s children are experiencing a behavioral health crisis. Nationwide Children’s has put a tremendous investment of resources into behavioral health — from care to research to improved outcomes. This investment is unique and beyond that of any other institution in the United States.”

David Axelton, MD, Chief of Psychiatry and Medical Director of Behavioral Health

“Genomics has the ability to impact every area of care and treatment for children and their families. From understanding the underlying mechanisms of diseases, disorders and behavioral health conditions to finding personalized, targeted therapies, genomic medicine is making a difference in the lives of children here at Nationwide Children’s. Through our continued work, we look forward to building on our success to bring best outcomes to children everywhere.”

Richard Wilson, PhD, Executive Director of the Steve and Cindy Rasmussen Institute for Genomic Medicine

Our Firm Foundation Makes It All Possible

- Health Equity and Population Health
- Behavioral Health
- Genomics
- Quality and Safety
- Culture and Talent
- Partnerships
- Technology
- Operational Excellence

[Quotes from various leaders discussing their contributions to the ecosystem]
Nationwide Children’s invented the quality and safety programs that are now national models. Quality and safety will always be important to our success and apply to everyone — from frontline staff and faculty to operations colleagues behind the scenes. Leveraging our strong quality and safety foundation, the Center for Clinical Excellence and a new quality framework were established to help support achieving best outcomes.

“Quality and safety are foundational elements of the strategic plan. Our achievements in these areas are a source of pride for all employees and are key differentiators that help define our leadership among pediatric medical centers. Because of our quality and safety commitment, we can truly offer best outcomes for children.”

Rustin Morse, MD, Chief Medical Officer

“The new Center for Clinical Excellence is the next evolution of our strong quality and patient safety program. By creating the center, we are moving away from the traditional hospital quality department to a center that provides a comprehensive and broad approach to safety and quality as we lead the journey to best outcomes.”

Janet Berry, DNP, RN, Vice President, Center for Clinical Excellence

With SCOPE, we are both widening the lens and sharpening the focus on how we conceptualize quality and safety. While there is continued emphasis on safety and patient experience, there is sharpened focus to define, measure and improve clinical outcomes. In addition, we are greatly expanding the work of our quality program to also focus on the health and wellbeing of children across our community and state while also addressing issues around equity and health disparities. We believe premier children’s hospitals have to lead this body of work well beyond the walls of their hospitals.
Reimagining Zero Hero

The national pediatric patient safety movement started in earnest here in Columbus, Ohio, and our Zero Hero tools are now on hospital badge buddies across the country. Almost a decade since it started, the Zero Hero program is ready for refreshing and reimagining.

As part of this effort, we continue to grow efforts to predict and stop safety events before they happen. Using simulation, predictive analytics, appreciative inquiry, advances in technology, and a portfolio of innovative, proactive safety initiatives we are changing the way we think about safety and in doing so dramatically improving our outcomes.

“I am so proud of the work we have done to build our Zero Hero program and lead the country in taking patient safety to the next level. As we continue to grow and evolve our program, I am excited about what we will achieve.”

Lee Ann Wallace, MBA, BSN, RN, NEA-BC, Chief Nursing Officer

Focused Efforts to Lead the Journey to Best Outcomes Through Integrated Clinical Pathways, Care Processes and Quality Improvement Initiatives

Driving best outcomes in clinical care with:
- One Team focus, alignment and synergy (QI, pathways, diagnostic excellence, utilization management, disease management, antimicrobial stewardship)
- Care process models (guidelines, pathways, disease management)
- Decision support
- Integration into the Nationwide Children’s network (regional hospital affiliates, NICUs, pediatric hospital partners, etc.)

Doubling Down on Our Commitment to Culture

Nationwide Children’s has a strong organizational culture grounded in our mission, vision and values. By celebrating and deepening our One Team culture, we can create Best Outcomes and health equity for all children. As we have grown from a small, local hospital, to an international destination and nationally ranked pediatric institution, we are committed to never losing sight of the vibrant and collaborative culture that fuels our strategic plan.

Our One Team culture is the result of our shared values, which every employee lives out each day — regardless of their role. From front line staff to those behind the scenes, our commitment to our values makes for a culture that you can feel the moment you walk through campus.

OUR VALUES

As One Team where Everyone Matters we:

DO THE RIGHT THING
- We are committed to health equity for all children
- We always act with integrity, kindness and honesty
- We are inclusive and respectful, embracing the uniqueness and differences of each individual

PRIORITIZE QUALITY AND SAFETY
- We put patients and families at the center of every decision
- We create a safe day every day
- We communicate clearly and completely
- We routinely seek input from others and always support our colleagues

PROMOTE HEALTH AND WELLBEING
- We balance work and life demands
- We generate optimism and energy in one another
- We advance our health and the health of our community

ARE AGILE AND INNOVATIVE
- We embrace and lead positive change
- We fuel a streamlined environment and an entrepreneurial spirit
- We generate and share new knowledge and ideas

GET RESULTS
- We’re accountable (we do what we say we’ll do)
- We’re determined (we get the desired result)
- We’re committed to best outcomes and constant improvement
- We leverage our diverse strength and talents

Driving best outcomes in every patient, every time

Clinical excellence and innovation, transparency, and academic productivity

Evidence and best practices

Defined and measured outcomes

Implementation and care delivery

Clinical pathways care process models, and education

Across the continuum of care — every patient, every time

Integrated technology and clinical decision support

Clinical pathways, care process models, and education

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Tim:
Our culture is our greatest strength. It is what enables the terrific community of collaboration and innovation that makes these ambitious goals possible. Our clinicians work together collaboratively, without silos. Our researchers are inspired by our patients and supported by the institution. This together makes for a culture where we can, as One Team, achieve anything. Our plans stand on our strong foundation of quality and safety, culture and talent, and operational excellence and technology, which we will continue to strengthen.

Patty:
The integrated clinical care and research for the benefit of children everywhere are the core of our plan, but what’s really exciting is the special ecosystem that only Nationwide Children’s brings to the table. We have unique programs in health equity and population health, genomics and behavioral health, that no other children’s hospital has in the same way that we do. It’s really the “secret sauce” that makes our organization and our strategic plan so well equipped to achieve our goals.

John:
We are excited to significantly expand our integrated clinical care and innovative research programs by launching new initiatives such as fetal therapy, liver transplantation, kidney disease and behavioral health research, among others. These programs will impact the children in our community, offer hope to families who travel here from around the globe and accelerate our drive for discovery. There remain many frontiers in pediatric medicine. To advance our field, and develop new cures, we increasingly must tightly integrate care and research.

Patty:
Nationwide Children’s has a long history of successful strategic plans. Beginning in 1995 with “Right to Grow,” we have used the strategic plan to define goals and aspirations for the institution. Because each plan builds on the last, our latest plan is an evolution, not a revolution.

In developing the new strategic plan, we interviewed more than 110 Nationwide Children’s leaders and surveyed an additional 75. Our consultant reviewed more than 75 analyses, we contributed more than 1,300 hours to the planning process. In short, we did not take this process lightly.

Our process of “reflect, fortify, move to action,” enabled us to fully understand our strengths, opportunities and how our goals can best align with our primary vision: the best possible outcomes for children everywhere. As a result, we have developed an ambitious, aspirational strategy that will lead the journey to best outcomes.

How did Nationwide Children’s develop the new strategic plan?

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What Makes the 2021-2026 Strategic Plan Special?

Q&A With Executive Leadership:

What sets this strategic plan apart from others?

**Tim:**
What sets this plan apart is our commitment to the health of the whole child. Nationwide Children’s has committed to a $3.3 billion investment that expands and deepens our already vast scope, and it represents our commitment to making an impact on children’s health locally, nationally and internationally.

Nationwide Children’s has the distinction of being a pediatric trailblazer in the areas of health equity and population health, behavioral health and genomics. Our new plan capitalizes on and broadens those efforts. All of this stands on our very strong foundation of quality and safety, culture and talent, partnerships, operational excellence and technology, which we will continue to strengthen.

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Q&A

Knowing that an organization is as strong as its people, how is Nationwide Children’s prepared to build the team needed to achieve the strategic plan goals?

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In the year since Nationwide Children's Hospital established Stand Against Racism, Stand For Health Equity, a program to strengthen and invigorate our diversity, equity and inclusion (DEI) initiatives, teams from across the organization have worked together to move DEI from concept to action.

“Our team members are worthy of investment. This is why we are dedicating a tremendous amount of resources to education, learning together, professional and personal growth, and ultimately holding each other accountable to do the work needed for true manifestation of diversity, inclusion and health equity for our employees, our patients and our communities.”

Lourdes Negron-McDaniel, Director of Diversity & Inclusion

Action Starts With Education

After the Stand Against Racism, Stand For Health Equity was launched, DEI leaders moved to address the question: What should the “work” look like in action? After conducting surveys of more than 1,700 employees and assessing the DEI landscape in place, the first step was clear: education.

“We have a variety of comfort levels and experiences with diversity and inclusion work across the organization,” says Negron-McDaniel. “So, to start, we want to give everyone an opportunity for DEI education and create a common language for us to use as we learn together.”

4 EDUCATIONAL MODULES FOR ALL EMPLOYEES:
Covering topics including unconscious bias, microaggressions and cultural competence

INCLUSIVE LEADER EDUCATION TRACK:
>700 leaders will complete an inclusive behaviors inventory and receive recommendations for development

DEI TOOLKIT FOR MANAGERS:
Regularly updated tools and content

DEI in Action: Project SEARCH Program Launched in 2021

Project SEARCH is an intensive nine-month internship program providing training and education for students with disabilities. This program is specifically designed for central Ohio students in their last year of high school who have autism spectrum disorder. In this unique Project SEARCH program, all student interns, skills trainers and departments will have access to an additional layer of support through Nationwide Children's Hospital Center for Autism Spectrum Disorders.

DEI In Action: Creating a Physician Workforce that Reflects the Patients and Families We Serve

While individuals who identify as Black/African American, Latinx/Hispanic, Native American and Pacific Islander comprise roughly 30% of the U.S. population, they are less than 15% of physicians, making them underrepresented in medicine — or URM. In fact, as the U.S. population grows more diverse, the racial and ethnic demographic gap between patients and physicians, including pediatricians, is worsening.

"We aspired to develop more effective strategies for recruitment of URM students into our residency program. We hypothesized that disparities in our training programs might be perpetuated by the premise that, "You can't be what you can't see," as stated by children's rights activist Marian Wright Edelman,” says Monica Hoff, MD, resident chief at Nationwide Children’s. "In short, we believed that URM recruitment would increase if applicants were exposed to physicians with whom they could identify, illustrating a culture of inclusive excellence.”

A recent publication in Pediatrics describes the work of the team to increase the percentage of URM residents who matched into Pediatric, Child Neurology and Medical Genetics residency programs from 5% baseline to 21% in 2021. During the 2019-2020 recruitment year, the URM Resident Recruitment Task Force transitioned to a more robust resident-led minority house staff organization (MHO), named the Resident Diversity Inclusion Coalition, and was expanded to include Lesbian, Gay, Bisexual, Transgender, Queer (LGBTQ) faculty and trainees.

NEW FACULTY IN DIVERSITY, EQUITY AND INCLUSION

Valencia Walker, MD, MPH, Named Associate Chief Diversity and Health Equity Officer

Dr. Valencia P. Walker recently joined Nationwide Children's Hospital as the associate chief diversity and health equity officer. Prior to her new role, she served as an assistant dean of equity and diversity inclusion for the David Geffen School of Medicine at the University of California Los Angeles (UCLA). A physician leader, Dr. Walker chaired the California Medical Association’s Council on Legislation and provided guidance on the organization’s advocacy efforts. As a practicing neonatologist, she champions the elimination of maternal-infant health inequities.

O.N. Ray Bignall II, MD, FAAP, Named Assistant Chief Equity and Diversity Officer

Dr. O.N. Ray Bignall is a pediatric nephrologist and advocate for child health equity. In this role, Dr. Bignall will work with Valencia Walker, MD, MPH, and Olivia Thomas, MD, chief health equity officer, to enhance Nationwide Children's position as a leader in diversity, equity and inclusion. He will also lead initiatives to increase diversity, equity and inclusion within the Division of Nephrology and Hypertension and the Kidney and Urinary Tract Center.
“Creating just, equitable, diverse and inclusive spaces for our patients, families and staff is foundational to our vision of excellence in compassion, healing, discovery and innovation at Nationwide Children’s. It doesn’t matter if our patients are from Linden, Lima or Los Angeles; from the West Side, West Virginia or West Africa. Championing workforce diversity and health equity is how we prove that every child, every family, and everyone matters here,” adds O.N. Ray Bignall, MD, pediatric nephrologist and assistant chief diversity and health equity officer at Nationwide Children’s.

“We aspired to develop more effective strategies for recruitment of URM students into our residency program. We hypothesized that disparities in our training programs might be perpetuated by the premise that, you can’t be what you can’t see. In short, we believed that URM recruitment would increase if applicants were exposed to physicians with whom they could identify, illustrating a culture of inclusive excellence.”

Monica Hoff, MD, Resident Chief at Nationwide Children’s

GROWING COLLABORATION, SERVICES AND PARTNERSHIPS

Nationwide Children’s will acquire Mercy Health — Children’s Hospital, effective January 1, 2022. Since early 2020, Nationwide Children’s has partnered with Mercy Health — Children’s Hospital to advance subspecialty pediatric physician recruitment, enhance continuing medical education and improve care coordination.

Partners For Kids Expands to the Dayton Region

Dayton Children’s Hospital invited Partners For Kids, a transformational accountable care organization, to enhance Dayton Children’s mission of the relentless pursuit of optimal health for every child within its reach, particularly those most likely to be at-risk for poor health outcomes. In this new collaboration, Partners For Kids will help coordinate the delivery of health services for 94,000 children enrolled in Medicaid managed care and covered by CareSource in Auglaize, Champaign, Clark, Darke, Greene, Mercer, Miami, Montgomery, Preble and Shelby counties.

Partners For Kids, established by Nationwide Children’s more than 25 years ago, has improved the health of millions of children in south central and southeastern Ohio by serving as a crucial link between health care providers, families, and Ohio’s Medicaid managed care plans. Partners For Kids now manages the health care of more than 425,000 children across more than half of Ohio’s counties.
AS PART OF THE $3.3 BILLION STRATEGIC PLAN, EXPANDED FACILITIES AND PROGRAMS REQUIRE ADDITIONAL FACILITIES TO SUPPORT OUR MORE THAN 1.3 MILLION PATIENT VISITS EACH YEAR.

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

Blue Zone: Ambulatory Outpatient
Orange Zone: Research
Tan Zone: Inpatient
Purple Zone: Acute Outpatient

1. Livingston Orthopedics & Surgery Center
2. Research Building IV
3. Research Building V
4. Inpatient Tower
P Parking Garage
C Conference Center

NEW HOSPITAL TOWER
The new hospital tower will mirror the existing 12-story inpatient facility, slated for planning and breaking ground within the five-year strategic plan.

RESEARCH BUILDING
Research Building 4, currently under construction, will open in 2023 with expanded wet bench and dry lab space.

LIVINGSTON ORTHOPEDIC & SURGERY CENTER
New Livingston Orthopedic & Surgery Center to open in 2024 with 270,000 square feet dedicated to high quality, multidisciplinary care in orthopedics and sports medicine.

ANDELYN BIOSCIENCES™
Beyond Nationwide Children’s campus, Andelyn Biosciences has broken ground on a commercial-scale gene therapy manufacturing facility in the Columbus Innovation District, on The Ohio State University’s west campus.
After more than 20 years of distinguished service at Nationwide Children’s Hospital and the Abigail Wexner Research Institute, John Barnard, MD, has announced that he will be retiring in March 2022.

Dr. Barnard’s scope of responsibilities impacts nearly every aspect of our mission. He currently serves Nationwide Children’s as president of the Abigail Wexner Research Institute, chief of Pediatrics, and physician-in-chief. He holds the distinguished Ann I. Wolfe Endowed Chair in Pediatric Research. Dr. Barnard also serves as chair of the Department of Pediatrics for The Ohio State University’s College of Medicine.

During the last two decades, Dr. Barnard’s impact on Nationwide Children’s and the field of pediatrics has been transformational. His leadership of the Abigail Wexner Research Institute has solidly placed Nationwide Children’s among the pre-eminent pediatric research centers in the country. During his tenure, our National Institutes of Health (NIH) funding has quadrupled and we have more than tripled the dedicated child health research space on our campus.

With his vision for growing multidisciplinary research programs, we established multiple research Centers of Emphasis, launched the Steve and Cindy Rasmussen Institute for Genomic Medicine in AWRI, built our first Good Manufacturing Practices facility and established our highly successful Office of Technology Commercialization.

Dr. Barnard has been a magnet for attracting the best and brightest talent to both our clinical and research faculty, recruiting 29 of the current research institute center directors and division chiefs to the Department of Pediatrics. Beyond these vital leaders, Dr. Barnard’s recruiting talents have added more than 150 research intensive scientists and more than 250 pediatricians and pediatric subspecialists to our faculty. His passion for teaching and training are evident in our residency and fellowship programs where he has championed diversity and education efforts to help shape the next generation of pediatric physicians and scientists. The impact of his recruiting efforts will be felt for decades to come.

A distinguished, NIH-funded physician-scientist, Dr. Barnard is a nationally recognized pediatric gastroenterologist who has authored multiple peer-reviewed publications and more than 100 pediatric science editorials as an invited columnist for The Columbus Dispatch. He has served as president of the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition and was recognized with their prestigious Shwachman Award, the highest national recognition for pediatric gastroenterologists.
Jaimie D. Nathan, MD, has been named chief of pediatric abdominal transplant and hepatopancreatoabdominal surgery. He comes to Nationwide Children’s from the University of Cincinnati College of Medicine, where he was surgical director of the Kidney and Intestinal Transplant Programs and surgical director of the Pancreas Care Center. Dr. Nathan brings expertise in numerous areas, including an advanced procedure — total pancreactectomy with islet autotransplantation (TPIAT) — which helps children with debilitating pancreatectomy with islet autotransplantation (TPIAT) — which helps children with debilitating pain and impaired quality of life from acute recurrent and chronic pancreatitis. "I am thrilled to have the opportunity to build upon the established pediatric liver and kidney transplantation programs, and launch the new TPIAT capability at Nationwide Children's. I look forward to the numerous opportunities for collaboration across the many disciplines, and, along with Dr. Appakalai, to the ability to provide the highest likelihood for children undergoing TPIAT to achieve insulin independence after total pancreatectomy." Dr. Nathan, who is also the recipient of the Nationwide Foundation Endowed Chair in Abdominal Surgery, conducts research focusing on the surgical management of pancreatic diseases in children, including collaboration with INSPIRE (International Study Group of Pediatric Pancreatitis: In Search for a Cure). He also serves as a co-investigator on the National Institutes of Health R01-funded multicenter prospective observational cohort study of TPIAT (POST Study). The study’s goal is to address research gaps and develop future intervention studies regarding the surgical approach to TPIAT. He has partnered with numerous investigators to advance the field of pediatric pancreatology, including the development of the patient-derived microfluidic pancreas-on-a-chip to study cell-cell interactions and further the understanding of pancreatic function. "I am thrilled to have the opportunity to build upon the established pediatric liver and kidney transplantation programs and launch the new TPIAT capability at Nationwide Children's," says Dr. Nathan. "I look forward to the numerous opportunities for collaboration across the many disciplines, and, along with Dr. Appakalai, to the ability to provide the highest likelihood for children undergoing TPIAT to achieve insulin independence after total pancreatectomy."

Balamurugan N. Appakalai, PhD, an international leader in islet cell processing and transplantation, has been appointed as principal investigator in the Abigail Wexner Research Institute (AWRI) and will lead the pancreatic islet cell isolation laboratories at Nationwide Children’s. Dr. Appakalai will lead the new islet cell isolation program, an essential component of the new TPIAT service. Dr. Appakalai is among the world’s most experienced in processing human pancreas for clinical islet autotransplantation and allotransplantation. He has processed more than 1,500 pancreases that have been utilized for clinical auto- and allotransplantation and for islet biology research initiatives. His research has been dedicated to methods to preserve and improve blood circulation to isolated islets after transplantation. He has published more than 200 research articles including book chapters and serves on the editorial review boards of several journals. New surgical capabilities also include living donor liver transplantation and the ability to perform liver transplants in babies 12 months or younger with substantial expertise in split liver transplantation. The kidney transplant program will also expand and allow for kidney transplantation in younger children.
Faculty Updates

Marc Michalsky, MD, Named Vice Chair of Strategic Operations, Department of Pediatric Surgery

Marc Michalsky, MD, MBA, has been named vice chair of Strategic Operations in the Department of Pediatric Surgery at Nationwide Children’s. In alignment with institutional priorities, the position focuses on the development and oversite of several key operational areas including patient and professional outreach, subspecialty marketing and optimization of organizational efficiency within the ambulatory surgical space. Dr. Michalsky is also the surgical director for the Center for Healthy Weight & Nutrition, director the of the Metabolic and Bariatric Surgery Program and director of the Center for Robotic Surgery. Dr. Michalsky has been at Nationwide Children’s since 2004 and has helped Nationwide Children’s become a nationally recognized model for the surgical care of pediatric patients suffering from severe obesity.

Nicholas Yeager, MD, Named Director of Oncology in the Division of Hematology, Oncology, and Blood & Marrow Transplantation

Nicholas Yeager, MD, was named director of Oncology in the Division of Hematology, Oncology & Blood and Marrow Transplantation. Dr. Yeager received his bachelor’s degree from Youngstown State University and his medical degree from Northeastern Ohio Medical University. He has been a member of the Nationwide Children’s Hospital faculty since 2003 and serves as the medical director of the sarcoma program, director of the 4th year sarcoma fellowship, director of the Adolescent and Young Adult Oncology program and associate director of the overall fellowship training program. Dr. Yeager joins other service line physician directors within the division.
Lauren Bakaletz, PhD, director of the Center for Microbial Pathogenesis in the Abigail Wexner Research Institute (AWRI) at Nationwide Children’s Hospital, was named the 2021 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. Bakaletz has been an exemplary investigator and leader since her arrival to Nationwide Children’s Hospital in 1998,” says Dennis Durbin, MD, MSCE, chief scientific officer at AWRI. “Her research has been continuously funded by the NIH for over 25 years, and she has established herself as an international thought leader in mechanisms of microbial pathogenesis.”

She and her team study the molecular mechanisms that underlie polymicrobial infections of the respiratory tract, including otitis media, or middle ear infections. Otitis media affects more than 90% of children by age 3 years. Dr. Bakaletz’s research has also led to 43 patents and two biotechnology startups.

While working to create a novel vaccine candidate for otitis media (which is still in clinical trials), she and her team made a discovery that would change how we understand and approach biofilms — the extracellular fortresses that shield and protect bacteria from the immune system and antibiotics. This discovery led to a platform technology that has been shown to be effective against biofilms of all kinds in preclinical studies. A clinical trial is anticipated in the next year.

“As a basic scientist, being able to discover something fundamental about a microorganism and to use that new knowledge to develop a platform technology and shepherd it all the way to human trials is a tremendously gratifying and educational experience,” says Dr. Bakaletz.

“Dr. Bakaletz’s research on bacterial biofilms, in collaboration with other AWRI investigators, clearly demonstrates her commitment to translate fundamental discoveries into novel paradigm-shifting therapeutics,” says Dr. Durbin. “We are proud to recognize her many accomplishments here as an Allen Distinguished Scholar.”

Dr. Bakaletz is also the Tillie E. Coleman Endowed Chair in Pediatric Research and vice president for Basic Sciences Research at Nationwide Children’s, as well as a professor of Pediatrics and Otolaryngology at The Ohio State University. She is a scientific founder of Scioto Biosciences and Scientific Advisory Board co-chair for Clarametyx Biosciences. She was named an Ohio State University College of Medicine Distinguished Professor in 2013, a lifelong honorific distinction. In 2020, she was named a fellow of the American Academy of Microbiology.
Grants and Honors

Carlo Di Lorenzo, MD, Receives Aldo Torsoli Research Award From the Rome Foundation
Carlo Di Lorenzo, MD, chief of the Division of Pediatric Gastroenterology, Hepatology and Nutrition at Nationwide Children’s Hospital, was awarded the Aldo Torsoli Research Award for 2021. The Rome Foundation award is selected by a joint Scientific Selection Committee composed of six members. The award is given to doctors and researchers with an academic record of research, education and patient care in the area of disorders of gut brain interaction.

John Mahan, MD, Named 2021 Henry L. Barnett Award Recipient
John Mahan, MD, is a pediatric nephrologist, director of Nationwide Children’s Hospital’s Center for Faculty Development and program director of the Pediatric Nephrology Fellowship Program. He is the 2021 recipient of the American Academy of Pediatrics Section on Nephrology lifetime achievement award in the field of pediatric nephrology. He is an esteemed teacher of nephrology, with more than 100 presentations at scientific meetings, education courses, grand rounds and invited lectures. Dr. Mahan has also made significant contributions to the field of pediatric nephrology, including the establishment of the American Society of Pediatric Nephrology Leadership Development Program, among other accomplishments.

Patty McClimon, MHA, Named to the Modern Healthcare Women to Watch List
Patty McClimon, MHA, senior vice president and chief strategy officer at Nationwide Children’s Hospital was recognized by Modern Healthcare as one of 2021’s Women to Watch in Health Care. Patty is responsible for the development and tracking of Nationwide Children’s long range strategic plan and its related master facilities plan. Patty oversees Nationwide Children’s main campus and ambulatory expansion strategies, budget projection planning and business development initiatives. Included in her scope of responsibilities are capital construction, project coordination and oversight of the Engineering, Planning, Growth Initiatives, Community Wellness Initiatives and Data Resources departments.

Carlo Di Lorenzo, MD
John Mahan, MD
Patty McClimon, MHA

Jerry Mendell, MD, Receives First Jerry Mendell Award for Translational Science from the American Society for Gene and Cell Therapy (ASGCT)
Jerry Mendell, MD, child neurologist and principal investigator in the Center for Gene Therapy in the Abigail Wexner Research Institute at Nationwide Children’s Hospital, received an award created in his honor. The Jerry Mendell Award for Translational Science recognizes the extensive work required to bring gene and cell therapies to clinical trial. Dr. Mendell was the first person to study viral mediated gene therapy for muscular dystrophy in humans. He was also the principal investigator in the study of the gene transfer clinical trial for spinal muscular atrophy type 1, which led to the Food and Drug Administration approval of onasemnogene abeparvovec-xioi (Zolgensma®) in the United States in 2019.

Jennifer Walton, MD, MPH, Named National Leader in Minority Health
Jennifer Walton, MD, MPH, attending physician in Developmental Behavioral Pediatrics, director of the Developmental Behavioral Pediatrics Resident Rotation and co-director of the Williams Syndrome Clinic at Nationwide Children’s Hospital, was named a National Minority Quality Forum (NMQF) 2021 40 Under 40 Leader in Minority Health. Dr. Walton is also director of Clinical Services at The Ohio State University’s Nisonger Center, one of the nation’s University Centers for Excellence in Developmental Disabilities. She is also an associate director of the Ohio State Leadership Education in Neurodevelopmental Disabilities (LEND) Program, one of 52 LEND programs funded by the Maternal Child Health Bureau.

Henry Xiang, MD, MPH, PhD, Elected President of SAVIR Board of Directors
Henry Xiang, MD, MPH, PhD, director of the Center for Pediatric Trauma Research and principal investigator and director for International Programs in the Center for Injury Research and Policy at Nationwide Children’s Hospital, has been elected to serve a three-year term on the Board of Directors of the Society for Advancement of Violence and Injury Research (SAVIR), a professional organization for those conducting research on and developing improved policies and programs for violence and injury prevention and control. Dr. Xiang, who earned the Outstanding Board of Directors Service Award in 2009 for his commitment to SAVIR leadership, was nominated by his colleagues to serve on the SAVIR Board of Directors. During his term, Dr. Xiang will hold three leadership roles for one year each. Dr. Xiang’s tenure as president elect began April 1, 2021, and he will serve as president beginning in 2022 and immediate past president beginning in 2023.

Jennifer Walton, MD, MPH
Henry Xiang, MD, MPH, PhD

Jerry Mendell, MD
Jingzhen (Ginger) Yang, PhD, MPH, Receives Two National Institutes of Health R01 Grants for More Than $3M Each

**Longitudinal Assessment of Driving After Mild TBI in Teens**

While mild traumatic brain injury (mTBI) can lead to significant cognitive difficulties, little is known about how it may affect driving, especially among teen drivers who are at an increased risk of both mTBI and motor vehicle collisions compared to other age groups.

This multiple-principal investigator, multiple-site study includes principal investigator Jingzhen (Ginger) Yang, PhD, MPH, at Nationwide Children’s Hospital; principal investigator Despina Stavrinos, PhD, at University of Alabama – Birmingham; and site principal investigator Thomas Kerwin, PhD, at The Ohio State University, and uses state-of-the-art driving simulators to longitudinally evaluate driving performance of teen drivers with mTBI as compared to matched health controls from acutely post-injury until symptom resolution.

**Adoption and Implementation of an Evidence-Based Safe Driving Program for High-Risk Teen Drivers**

Teen drivers who have committed a traffic violation are at a higher risk of motor vehicle collision-related injuries and deaths compared to their counterparts without a traffic violation. Although parent engagement interventions are an effective strategy to improve driving safety among teens of all risk profiles, these interventions have not been translated and tested among high-risk teen drivers such as those with a traffic violation.

The study is conducted by a strong, multidisciplinary team including principal investigator Jingzhen (Ginger) Yang, PhD, MPH, at Nationwide Children’s Hospital; and co-investigators Corinne Peek-Asa, PhD, and Cara Hamann, PhD, both at University of Iowa; Cynthia Siek, PhD, MPH, and Eric Sehrt, PhD, both at The Ohio State University; and Ying Zhang, PhD, at University of Nebraska. Through a unique partnership with rural and urban traffic courts, this study tests, in a hybrid randomized controlled trial, the implementation, effectiveness and cost-effectiveness of the translated intervention, Steering Teens Safe+, which integrates in-vehicle driving feedback technology with parent communication training.

Cynthia Gerhardt, PhD, Awarded National Institutes of Health R01 Grant to Study Psychosocial Risk in Pediatric Cancer

Cynthia Gerhardt, PhD, director of the Center for Biobehavioral Health in the Abigail Wexner Research Institute at Nationwide Children’s Hospital, was recently awarded funding from the National Institutes of Health to conduct the first multi-site study, in collaboration with St. Jude Children’s Research Hospital and Children’s Hospital of Philadelphia, to assess friendships, peer interactions and school and family factors among young pediatric cancer survivors who were treated early in life to better understand the psychosocial challenges they experience. This research aims to inform interventions to reduce morbidity and improve the wellbeing of children with cancer through an improved understanding of these psychosocial challenges, as well as the risk and protective factors that predict long-term adaptation.

Eric Nelson, PhD, Receives National Institutes of Health R01 Grant to Study the Impact of Pubertal Suppression in Adolescents

Eric Nelson, PhD, principal investigator in the Center for Biobehavioral Health in the Abigail Wexner Research Institute at Nationwide Children’s Hospital, has received an R01 grant that will support the project “The Impact of Pubertal Suppression on Adolescent Neural and Mental Health Trajectories.” Dr. Nelson and his colleagues will examine the effects of puberty suppression on brain and emotional development in adolescents with gender dysphoria. The project will span three centers: Nationwide Childrens, Childrens National Medical Center and Lurie Children’s Hospital.
Department, Section and Research Institute Reports
A LETTER FROM THE DEAN OF THE OHIO STATE UNIVERSITY COLLEGE OF MEDICINE

Dear Friends,

Each fall, I am filled with anticipation and excitement as our learners return to campus. I look forward to meeting our incoming health science students and to participating in rigorous didactic and bedside instruction for both our new and more-seasoned learners. Quite simply, I can’t wait to teach!

What I love about teaching is witnessing our learners’ uncontainable excitement and striking passion. Their overwhelming desire to learn everything they possibly can about anatomy, biomedical science and patient care inspires me. Their curiosity and thoughtful questions remind me how important it is for me — for all of our faculty at The Ohio State University College of Medicine — to always be at the top of our game, to regularly engage with the most current biomedical literature, to be true lifelong learners.

It is also important to offer a wide variety of specialized, clinical training to our future physicians. That’s why I am delighted that among our more than 2,700 faculty members, more than 600 are Nationwide Children’s Hospital Pediatric faculty. Our partnership and rich collaboration with Nationwide Children’s, one of the top pediatric hospitals in the world, enable Ohio State to be among the best places anywhere to become a physician.

Did you know that Nationwide Children’s is one of OSUCM’s largest medical training environments? Here are some impressive highlights from the past academic year:

- 223 third-year medical students completed core rotations in Pediatrics
- 162 fourth-year medical students completed rotations (both required and elective)
- 20 first-year medical students completed a summer research experience at Nationwide Children’s sites, where 32 Pediatrics faculty members serve as longitudinal practice preceptors
- 16 of our graduating medical students (8%) went into Pediatrics, one went into Child Neurology and 12 selected Medicine/Pediatrics as their specialty

I am very grateful for the symbiotic relationship we enjoy with Nationwide Children’s and know that — together — we will transform the health of our communities through inclusive and innovative education, discovery and care.

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 & 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 to bear on optimal child health and provide evidence-based, efficient and compassionate medical care to our patients and their families.

The department comprises 27 clinical divisions, the Steve and Cindy Rasmussen Institute for Genomic Medicine and 13 research centers of emphasis in the Abigail Wexner Research Institute. 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 500 faculty. An important mission of our department and hospital is the discovery and dissemination of new knowledge related to child health and health care delivery. This discovery mission is supported by more than $105 million in research funding and we are ranked sixth among free-standing children’s hospitals in NIH funding.
Dear Colleagues:

Thank you for engaging with our 2020-2021 Annual Report. Herein, you will have the opportunity to appreciate the depth and breadth of our impact as national leaders in child health care. The Department of Pediatrics at Nationwide Children’s Hospital and The Ohio State University provides state-of-the-art clinical care for children in Ohio and worldwide. Our vibrant training programs provide preeminent educational and research experiences. Our outstanding research programs are changing futures for children across the world. And we relentlessly advocate for the cause of children and families at every opportunity. Clinical care, education, research and advocacy are central to our work in the collegial and collaborative environment that makes our culture so very special here at Nationwide Children’s.

If we were asked to describe our work in one word – that word would be *comprehensive*. We have embarked on creative population health initiatives in at-risk neighborhoods here in Columbus with a goal of abrogating ZIP code as a determinant of health. On the other end of the health care spectrum, our gene therapy programs have created hope where there has been none in children with rare, single gene disorders. Our subspecialty pediatrics and surgeons are among the nation’s most innovative in their care of patients and families who came from 49 U.S. states and 43 foreign countries in 2020. Our scientists achieved a milestone in external grant funding, surpassing $120M in awards, including nearly $50M in NIH support.

We are not content in our achievements and successes. We must do more for children and families who deserve optimal health. This annual report describes our ambitious new strategic plan, one that promises new breakthroughs, innovation, and better health for the world over. I invite you to explore these pages to learn more. And I take this opportunity to thank our more than 600 physicians and scientists, the more than 250 extraordinary trainees, and all my colleagues and friends at Nationwide Children’s Hospital who work so hard every day to enable our noble cause.

Sincerely,

[Signature]

John A. Barnard, MD
Ann L. Wolf Chair in Pediatric Research President,
Abigail Wexner Research Institute at Nationwide Children’s Hospital Professor and Chair, Department of Pediatrics, The Ohio State University College of Medicine

DEPARTMENT OF PEDIATRICS VICE CHAIRS

Rebecca Wallihan, MD
Vice Chair, Education

Valencia P. Walker, MD, MPH
Vice Chair, Health Equity and Inclusion

Catherine D. Krowsczenki, MD
Senior Vice Chair, Department of Pediatrics

Linda Cripe, MD
Vice Chair, Promotion and Tenure

Dennis Durbin, MD
Vice Chair, Research
The Section of Adolescent Medicine at Nationwide Children’s Hospital provides general and specialty care for adolescents and young adults. 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 youth experiencing homelessness or incarceration, and adolescents with complex health problems.

Highlights From the Past Year

- The Adolescent Medicine clinics are located in the Livingston Ambulatory Center on our Columbus campus. Primary care is offered, as are consultative clinics for adolescents with reproductive health needs and those who need treatment for addiction.
- The Medical Clinic at the Franklin County Juvenile Intervention Center provides health care for detained youth.
- The Eating Disorders Program is a multidisciplinary team involving Adolescent Medicine physicians, a psychiatrist, behavioral health therapists, nurses and dietitians. Three levels of care are available: partial hospitalization, intensive outpatient therapy and coordinated outpatient visits.
- The Medication Assisted Treatment for Addiction Program has been providing medication treatment of addiction to adolescents and young adults since 2010.
- The Young Women’s Contraceptive Services Program, also known as BC4Teens, increases accessibility to long-acting reversible contraception.
- The THRIVE program provides comprehensive care to transgender and gender-nonconforming youth, and our clinic at Star House provides acute and preventive health care to youth experiencing homelessness.
- Physicians in the Section of Adolescent Medicine provide ongoing and consultative care for adolescents admitted to Nationwide Children’s with diverse medical problems, such as gynecological conditions and complications from eating disorders. An Accreditation Council for Graduate Medical Education Fellowship in Adolescent Medicine has been in place since 2010.
- Our faculty members actively participate in research and national leadership.
  - Elise D. Berlan, MD, MPH, was awarded two large Merck investigator-initiated grants, “Coordination of outpatient mental healthcare and adolescent family planning services via telehealth” and “Implementation and examination of contraception care for hospitalized adolescents with mental health disorders.”
  - Erin R. McKnight, MD, MPH, and Andrea E. Bonny, MD, are co-investigators on a National Institutes of Health grant, developing new statistical approaches for estimating county-level rates of opioid misuse to target areas of highest priority.
  - Ashley M. Ebersole, MD, MS, fellow in Adolescent Medicine, was awarded a Society for Adolescent Health and Medicine/National Institute on Drug Abuse Mentored Training Award in Substance Use Disorders.
  - Cynthia M. Holland-Hall, MD, MPH, serves on the Executive Committee of the American Academy of Pediatrics Section of Adolescent Health.
  - Fareeda W. Haamid, DO, was elected to the board of directors for the North American Society for Pediatric and Adolescent Gynecology.

Faculty

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<th>Name</th>
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<tbody>
<tr>
<td>Ashley M. Ebersole, MD, MS</td>
<td>2020 – 2021 Fellows</td>
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<td>Hunter Wernick, DO, MS</td>
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<td>Laureen Matera, DO</td>
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<td>Andrea E. Bonny, MD</td>
<td>Chief</td>
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<td>Elise D. Berlan, MD, MPH</td>
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<td>Maria D. Brown, MD, MA</td>
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<td>Gayathri Chevakumar, MD, MPH</td>
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<td>Casey B. Cottrill, MD, MPH</td>
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<td>Fareeda W. Haamid, DO</td>
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<td>Cynthia M. Holland-Hall, MD, MPH</td>
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<td>Steven C. Matson, MD</td>
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<td>Erin R. McKnight, MD, MPH</td>
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Selected Publications


Fast Facts: July 2020 – June 2021

- Adolescent Medicine Clinic Visits: 5,658
- Adolescent Medicine Eating Disorders Visits: 3,200
- Dublin Adolescent Medicine Clinic Visits: 245
- East Broad Adolescent Medicine Clinic Visits: 492
- Total Adolescent Medicine Clinic Visits: 9,595
- Inpatient Consults: 55

Grants Awarded

- JULY 1, 2020 – JUNE 30, 2021
- $1,182,597

Strategic Plan

“We are leading the Journey to Best Outcomes for adolescents and young adults everywhere by expanding and evolving our groundbreaking clinical programs and clinical research activities to better care for marginalized and underserved youth.”

– Andrea E. Bonny, MD, Chief, Adolescent Medicine
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.

Highlights From the Past Year

The Division of Allergy and Immunology has been busy working to provide the best outcomes for children with allergic and immunologic disorders:

- The Food Allergy Treatment Center in Lewis Center opened. This one-of-a-kind center in central Ohio provides comprehensive evaluation, diagnosis and management of food allergies, including high-risk oral food challenges.
- We are one of only six World Allergy Organization Centers of Excellence in North America.
- We are committed to the care of children with immune system defects, and along with the Nationwide Children’s Hospital Diagnostic Immunology Laboratory, continue to be a Jeffrey Modell Foundation for Primary Immunodeficiencies Diagnostic and Research Center of Excellence.
- Our faculty are on the American Academy of Allergy, Asthma & Immunology COVID-19 Task Force, providing advice and education to allergists throughout the United States, and we worked with Nationwide Children’s Hospital Employee Health to evaluate and risk stratify employees for COVID-19 vaccines.
- Our providers manage all allergic conditions, including asthma, allergic and nonallergic rhinitis, chronic sinusitis, hives, eczema, angioedema, drug and food allergies, latex allergy and stinging insect allergy. We provide allergy skin testing, allergen immunotherapy, asthma education, pulmonary function testing, comprehensive food allergy management (including oral food challenges) and drug allergy testing/oral drug challenges. We evaluate children with recurrent or unusual infections, and provide complete evaluation and management for primary immunodeficiencies. Faculty participate in the Complex Asthma and 22q11 clinics and in multidisciplinary clinics with Hematology/Oncology, Otolaryngology (ENT) and Gastroenterology. We provide inpatient consultation and immediate assistance for health care providers through the physician consult transfer center.
- Our faculty perform a wide array of basic and clinical research, as well as quality improvement initiatives, exploring mechanisms driving development of asthma and allergies, clinical studies of eosinophilic esophagitis, food allergy, use of technology to improve patient outcomes, transition of care, primary immunodeficiency, asthma, and allergic and nonallergic rhinitis.
- Allergy and Immunology faculty provide clinical and didactic instruction for the Nationwide Children’s Hospital Allergy and Immunology Fellowship Program and Pediatric Residency Program along with students from The Ohio State University College of Medicine. Faculty and fellows have leadership positions in national and international conferences.

Strategic Plan

“The Division of Allergy and Immunology is leading the Journey to Best Outcomes for children everywhere through our unique and groundbreaking clinical programs, like our new Food Allergy Treatment Center (in Lewis Center), which is helping children from central Ohio and across the United States learn to overcome and defeat food allergies.”

– Mitchell H. Grayson, MD, Division Chief, Allergy and Immunology

Faculty

Mitchell H. Grayson, MD
Division Chief

Rebecca Scherzer, MD
Section Chief

Selected Publications


Yonkof JR, Mikhail IJ, Prince BT, Stukus D. Delayed and severe reactions to baked egg and baked milk challenges. The Journal of Allergy and Clinical Immunology in Practice. 2021 Jan;9(1):283-289.e2.

Fast Facts: July 2020 - June 2021

Main Campus Allergy Clinic Visits: 5,140
Immunology Clinic Visits: 532
Complex Asthma-Allergy Clinic Visits: 93
Hilliard Allergy Clinic Visits: 632
Westerville Allergy Clinic Visits: 465
Early Peanut Introduction Clinic Visits: 53
Total Clinic Visits: 6,651
Inpatient Consults: 86

Inpatient Consults: 86
The Heart Center

Stent Implantations Are an Option for Small Patients

Studies have demonstrated stent implantation is more effective and safer than balloon angioplasty for the treatment of coarctation of the aorta in adult and older pediatric patients. In patients weighing 20 kg or less, balloon angioplasty is performed more often due to challenges in smaller patients, such as smaller vessel sizes, limitations of technology and materials, and patient growth.

The Heart Center at Nationwide Children's Hospital's approach to coarctation of the aorta is determined by a multidisciplinary group by case. Since 2004, clinicians at Nationwide Children's have sometimes opted for implantation of stents that can later dilate to adult size.

In a new study published in *Circulation: Cardiovascular Interventions*, researchers evaluated outcomes for the treatment of coarctation of the aorta in 39 patients over 12 years who underwent stent implantation at The Heart Center. They found that stent implantation is a safe and effective option for patients, with a 97% success rate.

“We were able to double the size of the stenotic lesion and decrease the pressure gradient to a median of 0mm mercury, essentially eliminating the pressure gradient,” says Brian Boe, MD, a congenital interventional cardiologist at Nationwide Children's and one of the study’s authors.

The procedure does have risks. Seven patients (18%) experienced adverse events, vascular injury being most common.

“One of the risks of this procedure in small children is injuring the femoral artery,” says Aimee Armstrong, MD, director of Cardiac Catheterization and Interventional Therapies at Nationwide Children’s and another of the study’s authors. “In this study, 14% of patients had a vascular injury long-term.”

Most patients return to the catheterization laboratory about four years after their first procedure to enlarge their stent.

Over a five-year follow-up period, about 70% of patients were without significant complications of aortic coarctation, meaning no hypertension and no pressure difference measured by blood pressure cuffs in clinic.

The team is working to reduce the number of patients who experience vascular injury—through innovative stent development and clinical changes, such as using ultrasound guidance for vascular access.

“We have shown that these interventions decreased the rate of access-related complications and as new technologies are developed, this treatment will become even safer for more and smaller patients.”

– Brian Boe, MD

REFERENCE:

The Heart Center at Nationwide Children’s Hospital combines all clinical and research disciplines under one umbrella in order 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.

Highlights From the Past Year

**NATIONAL AND INTERNATIONAL REPUTATION**

- Continued outstanding surgical outcomes, significantly better than the national mean, with overall surgical mortality 2% or less for the last three years (2018-2020) and below 2% to date in calendar year 2021
- Remained leaders in postoperative outcomes reported to the national PC4 collaborative, with one of the shortest lengths of ICU stay and shortest need for postoperative mechanical ventilation in the entire collaborative
- Sustained extremely low rate of blood stream infections associated with central intravenous lines in cardiac inpatients (ICU and acute care), with just a single infection in 2020
- Over 50% growth in transplant referrals with eight heart transplants performed and six ventricular assist devices implanted in 2020
- Following pandemic-related closures, returned to full outpatient clinical volume in May 2020, maintaining infection control practices, with a record number of referrals the remainder of 2020
- Sustained timely clinic access for new outpatient referrals with over 85% of patients being seen within 30 days of referral
- Multiple device trials led by the interventional team, including pivotal trials for the two self-expanding transcatheter pulmonary valves and the Piccolo patent ductus arteriosus (PDA) device in premature neonates
- Implantation of the first leadless dual chamber pacemaker in a child in the United States by our electrophysiology team
- Expansion of Project Adam with virtual teaching and remote drills to certify more schools in a larger radius in the placement and use of automatic external defibrillators (AEDs)
- Continued growth of Adult Congenital Heart Disease (ACHD) program with 4,500 outpatient visits (largest in country) and surgical and interventional outcomes significantly better than national benchmarks
- Opening of the new multidisciplinary Nationwide Children’s Fetal Center in 2020 and expansion of fetal cardiology services to Mount Carmel St. Ann’s Hospital
- Maintenance of a robust fetal cardiac intervention program through the Congenital Heart Collaborative with three fetal intervention patients over the past year
- Establishment of an AutoStrain program for detailed echocardiographic evaluation of ventricular function
- Creation of a clinical 4D flow program using ferumoxytol blood pool contrast agent to facilitate quick MRI acquisition for same-day imaging clinical visits in ACHD patients
- Establishment of a biomechanical flow lab in the Pediatric Advanced Imaging Resource (PAIR) as a joint venture with the Department of Bioengineering at Georgia Tech, focusing on patient-specific 3D printing and biomechanical flow modeling

**STRATEGIC FOCUS**

- Ongoing support of the large animal cardiac imaging program
- Active work in multiple quality improvement projects including those focused on improving long-term neurodevelopmental outcomes, increasing human milk feeds in critically ill neonates, reducing postoperative length of stay, and reduction in hospital acquired conditions
- Development of a multidisciplinary proactive risk mitigation Safety II program called PROMISE (PRO-active Mitigation to decrease Serious adverse Events) to improve outcomes in high-risk surgical patients
- Funded nine intramural projects and obtained $2 million in extramural grant funding from the National Institutes of Health (NIH), the American Heart Association and the Additional Ventures Foundation
- New multi-year funding totaling nearly $2.5 million from the NIH’s National Heart, Lung, and Blood Institute and Additional Ventures to investigate the use of induced pluripotent stem cells to study single ventricle heart disease
- Ongoing collaboration with the Center for Regenerative Medicine on the tissue-engineered vascular graft clinical trial in patients with single ventricle heart disease
- Collaboration with the Center for Cardiovascular Research in the genomics of congenital heart disease, modeling of single ventricle heart disease using induced pluripotent stem cells, and the discovery of maternal biomarkers for single ventricle heart disease

Center for Cardiovascular Research: See page 201 for information about this center in the Abigail Wexner Research Institute at Nationwide Children’s.

**Faculty**

- Catherine D. Krawczeski, MD
  Heart Center Co-Director
  Cardiology Chief
- Mark E. Galantowicz, MD
  Heart Center Co-Director
  Cardiothoracic Surgery Chief
- Vidu Garg, MD
  Heart Center Director of Translational Research
  Director, Center for Cardiovascular Research
Grants Awarded
JULY 1, 2020 – JUNE 30, 2021
$1,724,890

Fast Facts: July 2020 - June 2021

Heart Center Clinics
Main Campus and Close to Home™ Center Visits: 17,578
Regional Clinics Visits: 2,320

Heart Center Diagnostics
Echocardiograms: 16,212
Electrocardiograms (EKGs): 17,599
Cardiac Monitoring: 3,474
Exercise Stress Tests: 833
Cardiac MRIs: 749
Cardiac CTs: 213

Heart Center Procedures
Cardiac Surgeries: 432
Cardiac Catheterizations: 549
Electrophysiology Procedures: 160
Heart Transplants: 9

Selected Publications


Tran AH, Kimball TR, Khoury PR, Dolan LM, Urbina EM. Obese and type 2 diabetic youth have increased forward and backward wave reflections. Arteriosclerosis, Thrombosis, and Vascular Biology. 2020 Dec 10;ATVBAHA120315317.

Cardiology is a section of the Department of Pediatrics and an integral part of The Heart Center at Nationwide Children’s Hospital. See page 49 for complete details.

**Faculty**

Catherine D. Krawczeski, MD  
Division Chief

Robert J. Gajarski, MD, MHSA  
Section Chief

- Catherine D. Krawczeski, MD
- Robert J. Gajarski, MD, MHSA
- Aimee K. Armstrong, MD
- Carl H. Backes, MD
- Darren Berman, MD
- Anne Bigelow, MD
- Brian A. Boe, MD
- Jessica L. Bowman, MD
- Steven C. Cassiday, MD
- Tara Cosgrove, MD, MBOE
- Linda H. Cripe, MD
- Clifford L. Cua, MD
- Curt J. Daniels, MD
- Richard P. Fernandez, MD
- Jill A. Flitch, MD
- Vidu Garg, MD
- Jennifer Gauntt, MD
- Stephen A. Hart, MD
- Kan N. Hor, MD
- Anna N. Kamp, MD, MPH
- John Kelly, MD
- Naomi J. Kertesz, MD
- Omar M. Khalid, MD
- John P. Kovalchin, MD
- Rohan Kumthekar, MD
- Lauren Lastinger, MD
- Anthony Y. Lee, MD
- Marc Lee, MD
- Simon Lee, MD
- Kaitlin E. L’Italien, MD
- Eric A. Lloyd, MD
- May L. Mah, MD
- Dejanjan Nandi, MD, MSc
- Kathryn D. Nardelli, MD
- Christina M. Phelps, MD
- Saurabh Rajpal, MD
- Kerry L. Rosen, MD
- Daniel G. Rowland, MD
- Janet M. Simsic, MD
- Corey A. Silver, MD
- Karen M. Texter, MD
- Andrew Tran, MD
- Lydia Wright, MD, MSc
- Andrew R. Yates, MD

**2020 – 2021 Fellows**

**Adult Congenital Heart Disease**
- Anudeep Dodeja, MD
- Isla McClelland, MD

**Advanced Noninvasive Cardiac Imaging**
- Jason Williams, MD

**Advanced Interventional Cardiology**
- Rachel Taylor, MD

**Pediatric Cardiology**
- Julie Aldrich, MD
- Jeffrey Bennett, MD
- William Fogerty, DO
- Rachel Harris, DO
- Emily Hayes, MD
- Britthayl Hills, MD

- Hannah Jacobs, DO
- Erin Nealon, 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.

Highlights From the Past Year

- The Section of Child and Family Advocacy provides comprehensive evaluation and management of child maltreatment, offering inpatient and outpatient services. Key services include the Child Assessment Center, Fostering Connections Program, Non-Accidental Traumatic Brain Injury Clinic and inpatient consultations.
- The Child Assessment Center offers a coordinated response to family violence for families through partnerships with law enforcement, children services and a range of community resources. Through a collaborative effort with the Emergency Department, we also provide suspected child abuse assessments after clinic hours by utilizing on-call forensic interviewers and pediatric sexual assault nurse examiners in the emergency department setting.
- As a clinical partnership with Franklin County Children Services, the Fostering Connections Program is offered at three different locations and serves as a medical home for children in out-of-home placement.
- In October 2021, we opened the Child Assessment Team (CAT) Clinic, which is focused on follow-up for children with suspected physical abuse. This is a multidisciplinary clinic with Child Abuse Pediatrics, Trauma Surgery, Psychology and Social Work.
- The section remains committed to providing quality educational experiences for trainees, including medical student and pediatric resident electives. Under the direction of Megan M. Letson, MD, MEd, the Child Abuse Pediatrics Fellowship is an Accreditation Council for Graduate Medical Education-accredited program and continues to attract excellent trainees. Additionally, in collaboration with Pediatric Emergency Medicine, we are one of only a few programs nationally to offer a combined four-year Child Abuse Pediatrics and Pediatric Emergency Medicine Fellowship.
- Members of the section continue to be recognized nationally, including representation on the American Board of Pediatrics Sub-board on Child Abuse Pediatrics and on multiple Ray Helfer Society committees. Additionally, faculty continue a tradition of national speaking engagements, including the Huntsville International Symposium on Child Abuse, and are involved in child maltreatment-related research. In 2020, we were selected as one of nine initial sites for the launch of CAPNET, a child abuse research network.

Faculty

2020 – 2021 Fellows
Child Abuse Pediatrics
Nicole Barrett, MD
Shilpa Hart, MD

Combined Child Abuse
Pediatric and Pediatric
Emergucry Medicine
Fellow
Michelle Greene, DO

Selected Publications


Faculty

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

Megan M. Letson, MD, MEd
Chief

Selected Publications


Fast Facts: July 2020 - June 2021

Clinic Visits: 1,394
Foster Care Clinic Visits: 1,380
Sharon Woods Foster Care Clinic Visits: 243
Eastland Foster Care Clinic Visits: 205
Non-Accidental TBI Clinic Visits: 76
Child Assessment Team Clinic Visits: 131
Total Clinic Visits: 3,429
Inpatient Consults (Child Abuse Team): 546

Grants Awarded

JULY 1, 2020 – JUNE 30, 2021
$1,928,322

Strategic Plan

“We are leading the Journey to Best Outcomes for children everywhere by launching and evolving innovative clinical programs, like the new multidisciplinary Child Assessment Team Clinic and by becoming an initial site for CAPNET, which will conduct rigorous, multicenter research to make the care of potentially abused children and their families more effective, safe and fair.”

– Megan M. Letson, MD, MEd, Chief, Child and Family Advocacy
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.

Highlights From the Past Year

The faculty and fellows in the Division of Clinical Informatics work to enhance the effectiveness of our clinical information systems and to provide expert consultation to operational leaders, clinicians and investigators across the institution. We collaborate with other divisions and disciplines to improve tools for clinical documentation, patient management, population health, quality improvement and research. This past year has seen a number of important contributions from the division in the areas of patient safety, quality improvement, clinical communication and provider efficiency.

- In collaboration with our Information Services Department and data scientists from the Abigail Wexner Research Institute, Laura Rust, MD, MPH, and Kathryn E. Nuss, MD, deployed a new predictive model in several pilot inpatient units that provides bedside staff with advance warning of potential clinical deterioration among their patients. Our early experience suggests that this tool, when deployed across all our non-ICU inpatient units, has the potential to significantly reduce the number of out-of-ICU cardiopulmonary arrests, emergency transfers to the ICU and possibly even patient deaths.

- On a separate front, Dr. Nuss worked to optimize digital tools used by our neonatology colleagues to communicate with and transition patients back to primary care providers in the community. Similarly, Juan D. Chaparro, MD, MS; Samuel Yang, MD; and Manjot Gill, MD, transitioned our deceased patient documentation from paper into the electronic health record (EHR), not only streamlining the workflow, but also significantly improving the rate at which primary care providers are promptly notified of this unfortunate circumstance.

- In 2021, the Centers for Medicare and Medicaid Services (CMS) modified their billing-related documentation requirements in an effort to reduce burdens on frontline providers. To take full advantage of these changes, a multidisciplinary group co-led by Aarti R. Chandawarkar, MD, developed new institutional guidelines and overhauled many of our ambulatory note templates. These new templates drastically reduced the size and complexity of many clinic visit notes, making them much easier to complete and much easier to read.

- In addition to these and other major improvements, our faculty and fellows collectively implemented over 140 individual EHR enhancements, as well as assisting 18 colleagues across 14 different specialties to implement other EHR enhancements for the benefit of their own divisions.

- Academically, the division published 20 peer-reviewed manuscripts and, despite the ongoing pandemic, gave 12 national and international presentations on a variety of informatics topics.

Strategic Plan

“By developing innovative and groundbreaking digital tools, like our pediatric sepsis early warning system, which has now been adopted by dozens of hospitals across the country, we are making a difference for children everywhere.”

— Jeffrey M. Hoffman, MD, Chief, Division of Clinical Informatics

Faculty

Aarti R. Chandawarkar, MD
Juan D. Chaparro, MD, MS
Jennifer A. Lee, MD
Simon Lin, MD, MS, MBA
Kathryn E. Nuss, MD
Laura Rust, MD, MPH

2020 – 2021 Fellows

Manjot Gill, MD
Shravani Vundavalli, MD
Samuel Yang, MD

Jeffrey M. Hoffman, MD
Chief

Selected Publications


Faculty

Robert W. Snyder, MD, FAAP
Chief

Maha B. Al Absa, MD
Nikita T. Al-Ain, MD
Iona A. Albrecht, DO
Benjamin P. Almasanou, DO
Lacey J. Althausen, MD
Nardha S. Alatman, MD
Jennifer E. Bachman, MD
Taylor A. Ballenger, MD
Richard A. Baltsberger, MD
Lauren C. Bar-Lev, MD
Terri P. Barber, MD
Carrie J. Barnes-Mullett, MD
Brent M. Baron, DO
Ryan M. Baron, MD
Courtney R. Bartisch, MD
Heather A. Battles, MD
Sarah A. Behrens, MD
Anne M. Seward, MD
Cynthia J. Black, MD
Kathleen D. Blake, MD
Kimberly K. Blazer, MD
Eileen C. Bolton, MD
Sandra L. Boyle, MD
Richard J. Breen, MD

Steve Randall Brown, MD
Michelle S. Buendia, MD
Kyle Burchgraft, MD
Jennifer L. Burkam, MD
Shari L. Burns, MD
James A. Bryant, MD
Bethany J. Caldwell, MD
Jennifer H. Campbell, MD
Mitchell R. Camp, MD
Patricia A. Cannon, MD
Stephen M. Canowitz, MD
Ali M. Carine, DO
Jennifer B. Carlos, MD
Aila L. Co, MD
Benjamin W. Cole, MD
Kathleen A. Costlow, MD
Sidney L. Couling, MD
Elizabeth A. Crickard, DO
Ann M. Cruff, MD
Camilla Curren, MD
Omolara Y. Dairo, MD
Virginia K. DeVertue, MD
Amy E. Delbel, MD
Traci A. Devoe, MD

Praveena V. Dhawale, MD
Michael T. DiBartolo, MD
Kevin M. Dickerson, MD
Bradley E. Dickson, MD
Dawn C. Dillinger, DO
Kent W. Doherty, DO
Praevna V. Dhawale, MD
Michael T. DiBartolo, MD
Kevin M. Dickerson, MD
Bradley E. Dickson, MD
Dawn C. Dillinger, DO
Kent W. Doherty, DO
Lorna F. Donovan, MD
Dennis M. Doudy, MD
James R. Dorado, MD
Julie M. Duries, DO
Meika K. Eby, MD
Kimberly A. Elfring, DO
Patricia A. Francis, MD

Monica C. Gilbert, MD
Kathryn L. Ginocchi, MD
Jamuna C. Giragos, MD
Charles M. Goddard, MD
Erlin L. Goist, MD
Michelle C. Golla, MD
Anna C. Gray, MD
Emily K. Gray, MD
Jacob H. Gregerson, MD
Judith A. Groner, MD
Patrick J. Gross, DO
Dawn S. Hackshaw, MD
Darla L. Hamilton, DO
Malika Haque, MD
Daniel J. Heinmiller, MD
John S. Heintz, MD
Megan E. Heitzman, MD
David E. Henderson, MD
Christoerph B. Houts, MD
Elizabeth M. Jacob, MD
Ranee M. Jespostelle, MD
Enaas K. Kasheer, MD
Stephen L. Keble, MD
Lisa A. Keich, MD
Andrew M. Keller, MD
Sara A. Kelli, MD
Andrew J. Kent, MD
Arja Kiel, MD
Cheryl K. Kirkby, MD
Adam M. Kirkland, MD
William E.C. Knobeloch, MD
Jennifer J. Mastruero, MD
Jennifer J. Mastruero, MD

Robert W. Snyder, MD, FAAP, Section Chief, Community Pediatrics, Vice-President of the
Medical Staff, Associate Administrative Medical Director

Fast Facts: July 2020 - June 2021

Inpatient Discharges: 124
Observation and Outpatient-in-a-Bed Discharges: 689
Total Discharges: 813
Average Length of Stay*: 5.4
Average Daily Census*: 1.8
Patient Days*: 671

*Excludes observation and outpatient-in-a-bed patients
Department of Pediatrics

COMPLEX CARE

The Division of Complex Care at Nationwide Children’s Hospital provides comprehensive, coordinated and holistic 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 expertise in neurodevelopmental care alongside their other specialists. Our other division services include the comprehensive Cerebral Palsy Program and the comprehensive Feeding and Swallowing Program. Faculty participate in the Interdisciplinary Spinal Muscular Atrophy Clinic, the Adult Down Syndrome Clinic at the Nisonger Center, the Leukodystrophy Clinic, and provide medical care to the residents of the Heizerling Community. In addition to our outpatient programs, Complex Care has an inpatient service to provide medical care to our patients who require hospitalization.

Highlights From the Past Year

- Through our Complex Health Care Program we are leading an institution-wide initiative to improve the care of children with feeding tubes with an aim to improve families’ ability to care for the tubes at home. We have started a Feeding Tube Transition clinic to ensure that patients going home with new feeding tubes have the knowledge, supplies, training and support to succeed.
- The comprehensive Cerebral Palsy Program at Nationwide Children’s is the lead site for the Cerebral Palsy Research Network. By linking more than 30 centers in the United States and Canada, we are working to improve treatments and outcomes for people with cerebral palsy through high-quality clinical research and quality initiatives. In partnership with the nationally recognized Early Development Clinic, where early diagnosis of cerebral palsy is a priority, we have improved the clinical transition for patients with cerebral palsy from infancy through childhood. We also run one of the few cerebral palsy clinics for adults in the United States.
- The comprehensive Pediatric Feeding and Swallowing Program at Nationwide Children’s provides evaluation and treatment of complex feeding disorders and is one of only a handful in the country to offer an intensive feeding program. One of the major outcomes is reduction in the need for enteral tube feeding. Other outcomes focus on increased enjoyment in eating, family stress reduction and nutritional optimization. A substantial expansion of services and space is in process.
- Our faculty continue to be a sought-after resource for mentoring and education, with invited lectures locally, nationally and internationally. Our non-physician staff are leaders in training their colleagues in psychology, nursing, nutrition, pharmacy, social work and allied therapies in the provision of family-centered care for children and adults with disabilities.
- Members of our faculty have leadership positions at leading national organizations, including the American Academy of Pediatrics, the Society for Developmental and Behavioral Pediatrics, the Cerebral Palsy Foundation, and the American Academy for Cerebral Palsy and Developmental Medicine.

Faculty

Garey Noritz, MD
Division Chief

Laurie Glader, MD
Section Chief

Selected Publications


Fast Facts: July 2020 - June 2021

Inpatient Discharges: 324
Observation and Outpatient-in-a-Bed Discharges: 40
Average Length of Stay*: 7.24
Average Daily Census*: 6.43
Patient Days*: 2,347
Inpatient Consults: 89
Complex Health Care Clinic Visits: 6,802

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

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“Our integrated care for patients with cerebral palsy, other neurodevelopmental disabilities and feeding disorders are exemplary models of care delivery for children and adults with medical complexity and their families. We partner with extraordinary families to provide extraordinary care.”

-- Garey Noritz, MD, Division Chief, Complex Care

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Joy Walton, MD
Katherine Steingass, MD
Elizabeth Lucas, MD
Derek Fletcher, MD
Joy Walton, MD
Department of Pediatrics
CRITICAL CARE MEDICINE

The Section 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. This service cares for approximately 3,000 patients per year, covering up to 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 Pediatric Analgesia and Sedation Service.

Highlights From the Past Year

The section remains a leader in pediatric critical care research, with robust ongoing leadership and participation in single- and multi-center studies. In 2020, Nationwide Children’s Hospital continued its participation as one of only eight sites in the country in the National Institutes of Health-funded Collaborative Pediatric Critical Care Research Network. Division Chief Mark W. Hall, MD, is a national leader in the field of immunobiology research, including multicenter clinical trials of immunostimulation in pediatric critical illness and injury. Examples of other areas of research focus for the pediatric critical care medicine faculty include Staphylococcus aureus microbiology (Christopher P. Montgomery, MD), cerebral malaria and global health (Nicole F. O’Brien, MD), transfusion science (Jennifer A. Muszynski, MD, MPH, FCCM), respiratory infections (Todd J. Karsies, MD, MPH), bereavement (Markita L. Suttle, MD), anesthesiology (Joseph D. Tobias, MD), simulation (Tensing Maa, MD, FAAP), transport (Samantha W. Gee, MD, FAAP), resuscitation (Andrew R. Yates, MD), quality and safety (Richard J. Brilli, MD, FAAP, MCCM) and others. With this broad scientific portfolio, an in-situ research laboratory within the PICU, and four divisional research coordinators, the section remains at the forefront of innovation in the field. Our Accreditation Council for Graduate Medical Education-approved Pediatric Critical Care Medicine Fellowship provides rigorous clinical and academic training for the next generation of ICU faculty, accepting four fellows per class in our three-year program. The Critical Care Medicine faculty participate in instruction for the pediatric and surgical residency programs, as well as multiple other fellowship programs. A PICU elective is also provided for fourth-year medical students.

Faculty

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

Nadeem Khan, MD, FAAP

Onys S. Ayid, MD, FAAP
Amee M. Bigelow, MD
Katherine E. Eline, MD
Richard J. Brilli, MD, FAAP
Margaret A. Chaise, 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
Todd J. Karsies, MD, MPH
Catherine D. Kawczynski, MD
Anthony Y. Lee, MD, FAAP

Selected Publications


Grants Awarded

JULY 1, 2020 – JUNE 30, 2021

$1,198,448

Fast Facts: July 2020 – June 2021

PICU Admissions: 2,562
Average Length of Stay*: 4
Average Daily Census*: 25
Total Patient Days*: 9,297
Inpatient Discharges: 2,615
Number of Beds: 54

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

Strategic Plan

“We are combining cutting-edge science with the highest-quality clinical care to save and improve the lives of critically ill children in our region and beyond.”

– Mark W. Hall, MD, FAAP, FCCM, Chief, Division of Critical Care Medicine
Department of Pediatrics
DERMATOLOGY

The Section of Dermatology at Nationwide Children’s Hospital sees outpatients from birth through age 21 for both common and rare disorders of the hair, skin and nails.

Highlights From the Past Year
- Reopened all clinical services to pre-COVID volumes implementing appropriate safety guidelines
- Maintained and fine-tuned telemedicine services for specific problem types
- Successfully launched new excimer laser treatment program for inflammatory skin conditions
- Trained our first international Pediatric Dermatology fellow, Bayan Matarneh, MD

Faculty

Esteban Fernández Faith, MD
Katya Harfmann, MD
Joy Lynn Mosser-Goldfarb, MD

2020 – 2021 Fellow
Bayan Matarneh, MD

Patricia M. Witman, MD
Chief

Selected Publications

Fast Facts: July 2020 - June 2021
Canal Winchester Dermatology Clinic Visits: 494
Dermatology Clinic Visits: 7,604
Dublin Dermatology Clinic Visits: 2,641
Westerville Dermatology Clinic Visits: 644
Total Clinic Visits: 11,383
Inpatient Consults: 154
*Excludes observation and outpatient-in-a-bed patients

Strategic Plan
“We are leading the Journey to Best Outcomes for children everywhere by launching innovative clinical services, including our newly acquired excimer laser program, which allows us to safely and effectively treat vitiligo and psoriasis in a pediatric-friendly manner.”

– Patricia M. Witman, MD, Chief, Dermatology
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 evidence-based, family-centered, interprofessional practice. Outpatient services include comprehensive care delivered by developmental and behavioral pediatricians and advanced nurse practitioners in partnership with pediatric psychology and other health care professionals. Areas of expertise include the evaluation and management of complex ADHD, autism spectrum disorders 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 Hospital’s Behavioral Health Services.

Faculty

Amy Newmeyer, MD
Division Chief

Jennifer Walton, MD, MPH
Associate Chief

Lindsay Bartram, DO

Daniel L. Coury, MD

Anita R. Narayanan, MD

Patricia L. Nash, MD

Katherine Steingass, MD

Narayanan, MD, leads the division’s quality improvement efforts to reduce environmental stressors faced by developmental and behavioral pediatric patients.

Daniel L. Coury, MD, holds multiple national administrative and research roles, including medical directorship of the Autism Care Network.

Anita R. Narayanan, MD, is a member of the Society for Developmental Behavioral Pediatrics’ Board of Directors, and was named a National Minority Quality Forum (NMQF) 2021 40 Under 40 Leader in Minority Health.

Patricia L. Nash, MD, serves as medical director of the Nationwide Children’s Down Syndrome Program.

Katherine Steingass, MD, serves as medical director of the Nationwide Children’s Myelomeningocele Clinic and as a PI on the National Spina Bifida Patient Registry.

Jennifer Walton, MD, MPH, is co-director of the Nationwide Children’s Williams Syndrome Clinic and is a member of the Williams Syndrome Professional Advisory Board. She is completing her term this year as chair of the Pediatrics Section of the National Medical Association, is a member of the Society for Developmental Behavioral Pediatrics’ Board of Directors, and was named a National Minority Quality Forum (NMQF) 2021 40 Under 40 Leader in Minority Health.

In April 2021, the division launched an outreach clinic in conjunction with Licking Memorial Hospital in Newark, Ohio, to bring high-quality, accessible care for children with emotional, behavioral and developmental disorders to the patients in Licking County.

The division continues to support a robust fellowship program led by Dr. Steingass. The fellowship is integrated with The Ohio State University’s Leadership Education in Neurodevelopmental Disabilities (LEND) program at the Nisonger Center, with Dr. Walton serving as the LEND program's co-associate director.

Selected Publications


The Emergency Department 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.

**Highlights From the Past Year**

The Emergency Department 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. Urgent care services are provided at Nationwide Children’s Close To Home℠ Centers in Canal Winchester, Dublin, East Columbus, Hilliard, Marysville, Westerville and also at the main campus Urgent Care. 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.

The Department of Emergency Medicine was able to provide excellent care while maintaining appropriate safety measures to protect our patients, families and staff against COVID-19. The Emergency Medicine faculty and staff put the needs of the patients and community first in the face of the ongoing pandemic. 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 in clinical outcomes.

**Faculty**

- **Rachel M. Stanley, MD, MSHA**
  - Division Chief

  - Michael Stoner, MD
    - Section Chief

  - Alanal Albano, MD
  - Barbara Amakye, MD
  - Adjoa Andoh, MD
  - Srikarth Annapallavi, MD
  - Brett Ballard, MD
  - Terry Barber, MD
  - Robert Baum, MD
  - Berkeley Bennett, MD
  - Luciana Berg, MD
  - Deborah Blackwell, MD
  - Alan Bleiberg, MD
  - Bema Bonsu, MD
  - Traci Bouchard, MD
  - Brian Bowden, MD
  - Mary Bowman, MD
  - Seth Bubolz, MD
  - Michael Chua, MD
  - Cullen Clark, MD

- Beth Claxton, MD
- Daniel Cohen, MD
- Melanie Copenhaver, DO
- Carrie DeHoff, MD
- Lori Deschene, MD
- Meghan Dishong, MD
- Michael Dunn, MD
- Meika Eby, MD
- Emile Elshammas, MD
- Joelle Farlow, MD
- Rachel Feldkamp, MD
- Aarti Gagnani, MD
- Adam Garlock, MD
- Yaffa Gevirtz, MD
- Delia Gold, MD
- Angela Harris, MD
- Karla Hagensperger, MD
- Todd Helman, MD
- Daniela Humphrey, MD
- Maya Iyer, MD
- Iram Jafri, MD
- Chris Jones, DO
- Simmi Dogra Kulkarni, MD
- Catherine Lambert, MD
- Marc Leder, MD
- Julie Leonardi, MD
- Rachel Levine, MD
- Celia Ligorski, DO

- Seth Lainakis, MD
- Julia Lloyd, MD
- Manuel Lugo, MD
- Timothy McClung, MD
- Ellen McManus, MD
- Jennifer Melvin, MD
- Leah Middelberg, MD
- Leslie Mihalov, MD
- Jennifer Mitzman, MD
- Rustin Morse, MD
- Jennifer Mrzek, MD
- Kathy Nuss, MD
- Nkeiruka Orajaka, MD
- Jimisha Patel, MD
- Michael Patrick, MD
- Jan Perry, MD
- Jonathan Price, MD
- Sheila Rao, MD
- Maegan Reynolds, MD
- Laura Rust, MD
- Mary Ryan, MD
- Daniel Scherzer, MD
- Betsy Schmerler, MD
- Emily Sentman, MD

- Bashar Shihabuddin, MD
- John Sotos, MD
- Sandra Spencer, MD
- Gregory Stewart, MD
- Kristin Stokus, MD
- Jerry Stultz, MD
- Kathleen Sugre, MD
- Bethany Uhrl, MD
- Ruhi Verma, MD
- Tracey Wagner, MD
- Jordev Wells, MD
- Jessica Wilson, MD
- Morgan Wurtz, MD
- Jennifer Wyse, MD
- Anita Yalamanchi, DO

**Strategic Plan**

“The Department of Emergency Medicine is leading the Journey to Best Outcomes by being a national leader in pediatric emergency medicine research through the PECARN network, and through providing the highest-quality acute care for the pediatric population of Ohio.”

-- Rachel M. Stanley, MD, MSHA, Division Chief, Emergency Medicine
2020 – 2021 Fellows
Bridget Bonaventura, MD
Michelle Greene, DO
Jennifer Nystrom, MD
Crista Cerrone, MD
Nita Gupta, MD
Alan Potts, MD
Courtney Coyle, MD
Yamini Jadherna, MD
Jason Toews, MD
Kristol Das, MD
Chelsea Kadish, MD
Kellya Ubokudom, DO
Nathaniel Forman, MD
Taylor White, MD

Selected Publications


Fast Facts: July 2020 - June 2021
ED Visits (Includes All Visits Regardless of Disposition)
Main Campus ED: 52,198
Lewis Center ED: 10,351

Urgent Care Visits
Main Campus Urgent Care: 25,951
Canal Winchester Urgent Care: 8,890
Dublin Urgent Care: 5,942
East Broad Urgent Care: 11,929
Hilliard Urgent Care: 9,654
Marysville Urgent Care: 5,999
Westerville Urgent Care: 15,745
Urgent Care Telehealth: 570
Total Urgent Care Visits: 84,620

Grants Awarded
JULY 1, 2020 – JUNE 30, 2021
$4,208,791
“HbA1c is important, but it’s not everything when it comes to understanding how well a person’s diabetes is controlled,” says Dr. Mannmohan Kamboj, MD, chief of Endocrinology at Nationwide Children’s and senior author on the publication detailing the team’s quality improvement (QI) initiative to create the score.

“We can make anyone’s HbA1c lower but that leads to greater hypoglycemia risks and parents lying awake at night worrying about their child developing a scary low blood sugar,” adds Justin Indyk, MD, PhD, pediatric endocrinologist at Nationwide Children’s and lead author on the publication. “We wanted to find a better way to capture how a patient is doing in a global sense.”

Dr. Indyk and the QI team compiled key diabetes surveillance measures recommended by the American Diabetes Association and the International Society for Pediatric and Adolescent Diabetes, including blood pressure, urine screening and lipid profiles and added other known outcomes-related factors, such as wellness visit attendance, hypoglycemia and hospitalization episodes, use of continuous glucose monitoring (CGM) devices and more. The new process- and outcomes-driven composite measure includes nine components and has a scoring system of 0 to 18, with higher numbers representing better diabetes management.

They worked with hospital information science experts to build a diabetes registry for the clinic in 2017. This patient registry, which now includes more than 1,900 patients, was then used to develop the framework and clinician “dashboard” showing patient- and population-level T1DCS data. The team tested the scoring tool in 2018 and continued applying it clinic-wide using periodic assessments of 2019 data. Since implementing the T1DCS as a tool in the electronic medical record system, the clinic has tracked steady improvements in population-level scores driven, they believe, by visibility of these metrics as well as a push for increased CGM use and patient-specific education.

While the broad use of the composite score depends on fairly high-tech integration with a clinic’s electronic records system, Dr. Indyk is hopeful that future iterations of standard EMR programs could be built with this module included. He also believes elements can also be adopted on a smaller, less computer-driven scale.

REFERENCE:
**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 systems. The section has a strong national presence in the realm of quality improvement for diabetes.

The Section of Endocrinology currently has 11 active pediatric endocrinologists, five advanced practitioners and five pediatric endocrinology fellows. The section presently conducts 15,000 outpatient appointments per year. In 2020, there were over 330 patients diagnosed with new-onset diabetes, and there are over 2,600 patients with diabetes mellitus being followed at Nationwide Children’s on a regular basis. Dyer 2010-2021, we successfully transitioned to telemedicine to maintain continuity in providing the best care to our patients and families.

The section collaborates closely with other disciplines to offer endocrine expertise in the multidisciplinary clinic format to facilitate patient care. At present, these include: type 1 and type 2 diabetes mellitus, cystic fibrosis-related diabetes, Prader-Willi Syndrome Clinic, Bone Marrow Transplant Long-Term Follow-Up Clinic, metabolic bone disease, Muscular Dystrophy Clinic, thyroid nodule/cancer, Reproductive Health and Fertility Program, Sickie Cell Clinic, Young Adult Diabetes Transition Clinic, the THRIVE program (differences of sexual development), PCOS Program, and the Neuro-Oncology Program. The section maintains a robust quality improvement portfolio that includes over 15 active projects designed to achieve best safety and quality outcomes.


**Fast Facts: July 2020 - June 2021**

- Canal Winchester Endocrinology Clinic Visits: 276
- Lima Endocrinology Clinic Visits: 73
- Dublin Endocrinology Clinic Visits: 849
- Dublin Endocrinology Clinic Visits: 1,335
- East Broad Endocrinology Clinic Visits: 503
- Endocrinology Clinic Visits: 9,390
- Westerville Endocrinology Clinic Visits: 2,129
- Lima Endocrinology Clinic Visits: 73
- Prader-Will Clinic Visits: 94
- Prader-Will Clinic Visits: 94
- *Excludes observation and outpatient-in-a-bed patients

**Selected Publications**


Morgan TL, Young NP, Lipik KG, Lehmann E, Kinsky J, Quinn GP, Semhardt CA, Nahata L. “We can always adopt”: perspectives of adolescent and young adult males with cancer and their families on alternatives to biological parenthood. Journal of Adolescent and Young Adult Oncology. 2020 Oct;9(5):572-578.

Gastroenterology, Hepatology and Nutrition

Lubiprostone Found to be Safe, as Effective as Placebo in Children With Constipation

Pediatric functional constipation remains challenging to treat. Lubiprostone, a medication approved by the U.S. Food and Drug Administration (FDA), treats constipation and irritable bowel syndrome with constipation in adults.

A new FDA mandated study, published in *Clinical Gastroenterology and Hepatology*, evaluated the efficacy and safety of lubiprostone in children with constipation.

The researchers conducted a double-blind, randomized, placebo-controlled study and a long-term, open-label extension study in over 600 children 6-17 years of age with pediatric functional constipation. The results showed that while well tolerated and safe, the efficacy was the same as a placebo.

“Similarly to other double-blind studies on pediatric constipation, we found lubiprostone was as effective as placebo in treating children with chronic constipation,” says Carlo Di Lorenzo, MD, chief of the Division of Pediatric Gastroenterology, Hepatology and Nutrition at Nationwide Children’s and senior author of the study. Dr. Di Lorenzo says he was not surprised that the medication did not show the same efficacy in children as in adults. “Pediatric constipation is usually a behavioral issue, a completely different condition from constipation in adults,” he says.

Dr. Di Lorenzo points to a few factors affecting their results. The first part of the study was 12 weeks long, often not enough time for children who withhold their stool because they are afraid it will hurt to overcome their fear. In addition, one of the outcome measures mandated by the FDA — frequency of bowel movements — may not be as relevant in children. While this measure is appropriate for adults with constipation, Dr. Di Lorenzo says that children with constipation complain more about hard stool or fecal incontinence than infrequent bowel movements.

According to Dr. Di Lorenzo, the fact that lubiprostone was as effective as placebo does not mean it was ineffective.

“In the right patients, this medication worked well,” says Dr. Di Lorenzo. “It was probably not beneficial in patients that withhold their stool. If a child is going to withhold their stool, there is no medication that will help until they overcome their fear.”

Dr. Di Lorenzo suggests that lubiprostone might be more appropriate for adolescent patients experiencing constipation with no behavioral issues.

Based on these results, the FDA-approved labeling for lubiprostone has been updated to state that its safety and effectiveness have not been established in pediatric patients under 6 years of age, and that effectiveness has not been established in pediatric patients 6 years and older.

REFERENCE:
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. The division strives for excellence in research, teaching and clinical care, and maintains a team of physician-scientists committed to the creation of new knowledge in the discipline. Our physicians work with pediatric nurse practitioners to diagnose and treat gastrointestinal, pancreatic and liver disorders while collaborating with other specialists, such as dietitians, behavioral and developmental psychologists, and surgeons to provide comprehensive, coordinated care for each child.

Highlights From the Past Year

The Division of Gastroenterology, Hepatology and Nutrition at Nationwide Children’s Hospital:

• Consistently ranked among the top programs in the country by U.S. News & World Report

• Nationally recognized for its expertise in several pediatric gastrointestinal disorders including:
  – The Motility Center – a national leader in caring for children with neuro-gastrointestinal and functional disorders. Team members include Carlo Di Lorenzo, MD, division chief of Gastroenterology; Desale Yacob, MD, medical director; and Karla Vaz, MD, Neetu Bali, MD, Peter Lu, MD, and Ashley Kroon Van Diest, PhD
  – The Center for Colorectal and Pelvic Reconstruction – works in partnership with the Motility Center to provide advanced comprehensive medical and surgical services for children with complex motility disorders
  – The Inflammatory Bowel Disease Center – a national leader in providing state-of-the-art care for children with Crohn’s disease and ulcerative colitis. Co-directors of the inflammatory bowel disease (IBD) service are Brendan Boyle, MD, and Jennifer Dolson, MD, working together with Ross Mattz, MD, and Hilary Michel, MD. The IBD Center has one of the highest steroid-free remission rates in the country and works closely with the pediatric surgeons to provide comprehensive care for children with severe IBD
  – The Intestinal Rehabilitation Service – under the leadership of Molly Dienhart, MD, and Ethan Mezoff, MD, the team follows a large cohort of children with intestinal failure and has some of the best outcomes in the country for care of children with short bowel syndrome
  – The Celiac Disease Center – under the leadership of Tracy Ediger, MD, PhD, medical director, and Ivor Hill, MD, MB, ChB, section chief, the center is nationally recognized for promotion of more standardized care for children with celiac disease to improve long-term outcomes
  – Intestinal Polyposis Service – led by Steven Erdman, MD, a world expert in polyposis syndromes, the service works closely with geneticists to provide comprehensive care and counseling for children and families with polyposis syndromes
  – The Eosinophilic Esophagitis Clinic – team members include John Russo, MD, Rajitha Venkatesh, MD, and Elizabeth Erwin, MD. The service provides both gastrointestinal and allergy expertise in the long-term management of children with eosinophilic esophagitis
  – The Liver Disease Center and Transplant Hepatology Center – led by Alex Weymann, MD, together with team members Monique Goldschmidt, MD, Carol Potter, MD, and Cheryl Gariepy, MD, the centers provide comprehensive care for children with all forms of liver disease, and members work with the transplant surgeons to care for children requiring liver transplantation
  – The Pancreas Center – under the leadership of Cheryl Gariepy, MD, the center is accredited by the National Pancreatic Foundation and provides state-of-the-art care for children of all ages who have disorders of the pancreas

• The NICU cholestasis service – under the leadership of Carol Potter, MD, this unique service provides specialized, individualized, long-term care to hospitalized infants with liver disease

• Multidisciplinary clinics – members of the GI Division work closely with other medical and surgical subspecialists to provide comprehensive care in dedicated clinics for children with complex medical problems including aerodigestive disorders (Karla Vaz, MD, cystic fibrosis, congenital heart disease and bone disease (Ai Shaikhkhalil, MD, who has specialized expertise in both GI and nutrition), muscular dystrophy (Kent Williams, MD), feeding disorders and the complex care clinic (Neetu Bali, MD, MPH)

• Outreach clinics – in addition to seeing children with GI disorders at Nationwide Children’s, our faculty see patients at satellite clinics locally (in Dublin and Westerville) and at regional outreach sites in Mansfield (Jonathan Gisser, MD, and Brandon-Arnold, DO), Lima (Steve Cicoria, MD, and Tracy Ediger, MD, PhD) and Chillicothe (Carlo Di Lorenzo, MD, Desale Yacob, MD, Peter Lu, MD, and Alex Weymann, MD)

– The Gastrointestinal Autism Clinic – led by Kent Williams, MD, a nationally renowned expert on children with autism and gastrointestinal problems, this clinic provides comprehensive care for diagnosis and management of GI disorders in this specialized group of children

– The NICU cholestasis service – under the leadership of Carol Potter, MD, this unique service provides specialized, individualized, long-term care to hospitalized infants with liver disease

– Multidisciplinary clinics – members of the GI Division work closely with other medical and surgical subspecialists to provide comprehensive care in dedicated clinics for children with complex medical problems including aerodigestive disorders (Karla Vaz, MD, cystic fibrosis, congenital heart disease and bone disease (Ai Shaikhkhalil, MD, who has specialized expertise in both GI and nutrition), muscular dystrophy (Kent Williams, MD), feeding disorders and the complex care clinic (Neetu Bali, MD, MPH)

– Outreach clinics – in addition to seeing children with GI disorders at Nationwide Children’s, our faculty see patients at satellite clinics locally (in Dublin and Westerville) and at regional outreach sites in Mansfield (Jonathan Gisser, MD, and Brandon-Arnold, DO), Lima (Steve Cicoria, MD, and Tracy Ediger, MD, PhD) and Chillicothe (Carlo Di Lorenzo, MD, Desale Yacob, MD, Peter Lu, MD, and Alex Weymann, MD)

Faculty

Carlo Di Lorenzo, MD  Division Chief
Ivor D. Hill, MD  Section Chief
Hillary Michel, MD
Kent C. Williams, MD
Brandon Arnold, DO
Neetu Bali, MD, MPH
John A. Barnard, MD
Brendan M. Boyle, MD, MPH
Steve L. Ciciora, MD
Molly C. Dienhart, MD
Jennifer L. Dolson, MD, MPH
Tracy R. Ediger, MD, PhD
Hilary Michel, MD
Carol J. Potter, MD
John M. Russo, MD
Ala K. Shaikhkhalil, MD
Karla K. Vaz, MD
Rajitha Venkatesh, MD
Alex Weymann, MD

2020 – 2021 Fellows

Pediatric Gastroenterology

Madelynn Cohen, DO
M. Peter Farmer, MD
Colleen Flahive, MD
Shivani Gupta, DO
Kathryn Hawa, DO

Grant Morris, MD
Patrick Rowland, MD
Raul Sanchez, MD
Garrett Sprague, MD
GI Motility

Zeyad Abdulkader, MD

Strategic Plan

“We are leading the Journey to Best Outcomes for children everywhere by launching and evolving groundbreaking clinical programs, like the new multidisciplinary pancreato-biliary clinic, which will open within the next 12 months and will attract referrals from across the United States.”

– Carlo Di Lorenzo, MD, Division Chief, Gastroenterology, Hepatology and Nutrition
Selected Publications


Grants Awarded

July 1, 2020 – June 30, 2021

$200,021

Fast Facts: July 2020 - June 2021

Inpatient Discharges: 535
Total Discharges: 873
Average Length of Stay*: 6.5
Average Daily Census*: 9.6
Total Surgical Procedures: 2,905
Dublin Gastroenterology Clinic Visits: 1,416
GI Allergy Clinic Visits: 92
Gastroenterology Clinic Visits: 15,167
Mansfield Gastroenterology Clinic Visits: 445
Westerville Gastroenterology Clinic Visits: 1,504
Lima Gastroenterology Clinic Visits: 396
Total GI Clinic Visits: 19,263

*Excludes observation and outpatient-in-a-bed patients
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 the 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 Center for Cardiovascular Research in the Abigail Wexner Research Institute at Nationwide Children’s Hospital.

Faculty

Kim L. McBride, MD, MS
Division Chief

Dennis W. Bartholomew, MD
Section Chief

Bimal Chaudhari, MD, MPH
Scott E. Hickey, MD
Stephen G. Kaler, MD
Kandamurugu (Murugu) Manickam, MD, MPH
Mari Mori, MD
Britton D. Rink, MD
Kristin Truxal, MD

2020 – 2021 Fellows

Medical Genetics

Daniel Nolan, MD, PhD PGY3
Brandon Stone, MD PGY2
Jacqueline Yurkoski, MD PGY1
Blanca Zapanata, DO PGY3

Genetics and Metabolism


Outpatient Visits

Athenos Genetics Clinic Visits: 4
Cardiogenetics Clinic Visits: 242
Genetics (Main Campus) Clinic Visits: 2,508
Lim Genetics Clinic Visits: 68
Marietta Genetics Clinic Visits: 12
Westerville Genetics Clinic Visits: 182
Zanesville Genetics Clinic Visits: 13

Grants Awarded

JULY 1, 2020 – JUNE 30, 2021

$162,293

Hematology, Oncology & Blood and Marrow Transplant

Targeting DIPG With Collaboration and Innovation

Diffuse intrinsic pontine glioma (DIPG) is rare, with only 200-300 cases diagnosed in children each year in the United States. Its location in the brain’s pons makes it hard to access for biopsy or drug delivery. The diffuse nature of the tumor also makes it essentially unresectable; tumor cells cannot be removed without taking vital healthy tissue with them.

Maryam Fouladi, MD, pediatric neuro-oncologist and the new co-executive director of the Pediatric Neuro-Oncology Program at Nationwide Children’s, founded the CONNECT Consortium in 2012 to help build a network of patients and clinicians focused on the rare and deadly tumor. The international collaborative of pediatric cancer research and clinical care centers exists to improve outcomes for children with high-risk brain tumors such as DIPG and other high-grade gliomas and is now based out of Nationwide Children’s.

“DIPG is a wily tumor,” says Dr. Fouladi, who is currently leading a trial to test efficacy and safety of combining a BMI-1 inhibitor with radiation therapy in children with DIPG and other high-grade gliomas (CONNECT1702); the study is based on findings from basic science collaborations with Rachid Drissi, PhD, principal investigator in the Center for Childhood Cancer and Blood Diseases at Nationwide Children’s, and others, described in a 2020 publication in Molecular Cancer Research. “It develops resistance and survives through multiple different pathways, so we will need a multi-pronged approach to trying to cure it.”

“We want to build on what we know works right now — radiation — not just throw every method at these children and adversely affect their quality of life,” says Dr. Fouladi. “We want to judiciously, carefully conduct clinical trials looking at both toxicity and efficacy, combining radiation with chemotherapy, immunotherapy or targeted therapy. Progress will be incremental, but in the end, all of these are likely to become part of an effective armamentarium against DIPG in some way.”

The DIPG Registry — also founded and chaired by Dr. Fouladi to advance DIPG research via the collection and sharing of tissue samples — includes more than 1200 patients at about 115 sites in 15 countries, pooling clinical imaging, pathology findings and tissue samples to enable large-scale studies of DIPG biology. The registry has enabled 140 disease models and more than 30 collaborative studies, with numerous publications to share valuable data with the broader scientific community. The registry’s genomics efforts will now be based out of the Steve and Cindy Rasmussen Institute for Genomic Medicine at Nationwide Children’s Hospital.

REFERENCES:

“DIPG is a wily tumor. It develops resistance and survives through multiple different pathways, so we will need a multi-pronged approach to trying to cure it.”
— Maryam Fouladi, MD
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 and Blood Diseases, the Steve and Cindy Rasmussen Institute for Genomic Medicine, 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.

Highlights From the Past Year

Through research, patient care and psychosocial support, the Division of Hematology, Oncology & Blood and Marrow Transplant provides the best possible outcomes for our patients, families and care teams. For eight straight years, we’ve been ranked in the top 10 by U.S. News & World Report. Our discoveries, clinical trials and new treatments offer new solutions for patients and families, not only at Nationwide Children’s Hospital, but around the world.

COVID-19 certainly presented operational challenges, but it also pushed us to be agile and innovative to maintain the best outcome possible for every patient. To kick off 2020, we identified non-traditional care delivery models and technology innovation as divisional priorities over the next five years. Because of COVID-19, our telehealth initiative was fast-tracked, which was one positive outcome of working through the global pandemic.

The Division of Hematology, Oncology & Blood and Marrow Transplant continues to prioritize quality improvements to achieve best outcomes for all patients. The division achieved six months of zero Preventable Harm Index (PHI) in 2020 and a 42% decrease in PHI during 2020 compared with 2019. We credit our frontline staff for keeping Zero Hero top of mind amid a global pandemic.

Mid-2020, we welcomed Maryam Fouladi, MD, as co-executive director of our Pediatric Neuro-Oncology Program. Dr. Fouladi will continue her extensive work on brain stem gliomas alongside co-director Jeffrey Leonard, MD. Dr. Fouladi is the founding director of CONNECT, an international consortium that works to develop and test novel therapies in early phase clinical trials. Dr. Fouladi is also the founding chair of the International Diffuse Intrinsic Pontine Glioma (DIPG) and Diffuse Midline Glioma (DFMG) registries and has served as chair of the Collaborative Network for Neuro-Oncology Clinical Trials and the CNS Committee of the Children’s Oncology Group. Dr. Fouladi recruited Ralph Salloum, MD, who joined Nationwide Children’s Hospital in November 2020. The Neuro-Oncology team is sure to further expand our early phase research portfolio and thus attract patients from across the globe.

Other division-wide accomplishments:

- Successful faculty recruitment:
  - Maryam Fouladi, MD – co-executive director of Pediatric Neuro-Oncology program
  - Margaret Lamb, MD – BMT, Cellular Therapy
  - Margot Lazow, MD – Neuro-Oncology
  - Vilmaire Rodriguez, MD – Hemostasis and Thrombosis
  - Ralph Salloum, MD – Neuro-Oncology

- Dayton Children’s Partnership:
  - BMT team increased Dayton clinic presence to twice per month
  - Developed Dayton BMT Quality Index
  - Dayton BMT coordinator participates in weekly Nationwide Children’s BMT meetings for patient updates
  - Developed a provider-to-provider communication plan

- Hemalatha G. Rangarajan, MD, presented at Dayton’s Pediatric Grand Rounds
- Collaborated with Dayton Children’s Hospital for research patient surveillance
- Additional gene therapy infusions given to hemophilia A patients
- Opened regional Hem/Onc/BMT Infusion Clinic in Lewis Center, Ohio
- Expanded Neuro-Oncology comprehensive clinic to include providers from Endocrinology and Neurology, along with existing providers from Psychology, Neurosurgery, and Physical Medicine and Rehabilitation
- Achieved new membership in PBTC & CONNECT Consortia and transitioned CONNECT to Nationwide Children’s Hospital
- Opened NEXT Consortium international sites in New Zealand and Canada
- Utilized blood conservation strategies for red cell exchanges to accommodate COVID-19-induced national blood shortages
- Expanded research portfolio in hemophilia, immune thrombocytopenia, rare bleeding disorders, von Willebrand disease, iron deficiency and sickle cell disease

Through our clinical and research work, driven by the best and brightest physicians and staff, we vow to remain on the cutting edge of solutions for our patients worldwide.

Center for Childhood Cancer and Blood Diseases: See page 205 for information about the Center for Childhood Cancer in the Abigail Wexner Research Institute at Nationwide Children’s Hospital.

Faculty

- Timothy P. Cripe, MD, PhD, FAAP, Division Chief
- Randal S. Olshefski, MD, Section Chief
- Mohamed Abdellahi, MD
- Rolla F. Abu-Arja, MD
- Anthony N. Audino, MD
- Jeffery J. Auletta, MD
- Rajinder P Bajwa, MD, MBBS
- Nabamita Bhunia, MD
- Susan I. Colace, MD
- Susan E. Creamy, MD
- Amy L. Dunn, MD
- Jonathan L. Finlay, MD, ChB
- Molly Gardner, PhD
- Cynthia A. Gerhardt, PhD
- Terri L. Guinipero, MD
- Jennifer Hansen-Moore, PhD
- Amanda Jacobson-Kelly, MD
- Bryce A. Kerlin, MD

Strategic Plan

“Treating cancer and blood diseases in children requires continued groundbreaking strategies — regardless of the subspecialty. Whether it’s building destination programs for patients around the world like our Neuro-Oncology Program, or developing individualized therapies through immunotherapy and genomics, the journey to provide best outcomes for all requires a team. This is why our division is consistently ranked as one of the best pediatric hospitals by U.S. News and World Report in outcomes, and why you’ll continue to see innovative solutions for patients everywhere come from our Hematology, Oncology & Blood and Marrow Transplant team at Nationwide Children’s.”

— Timothy P. Cripe, MD, PhD, FAAP, Chief, Hematology/Oncology/BMT
The Section of Hospital Pediatrics at Nationwide Children’s Hospital, which also includes newborn and adult hospital medicine, is home to a diverse 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.

The section is involved in a multitude of patient safety, quality improvement and research initiatives with demonstrated outcomes that include:

- Patient Centered Outcomes Research Institute (PCORI) funded grant investigating the safety and efficiency of hospital direct admissions versus emergency department admissions
- Diversity, equity and inclusion focused projects including contraceptive counseling and intervention to at-risk hospitalized adolescents and ensuring hospital orientation in families’ primary language
- Clinical pathway development using evidence-based practice leading to improved patient outcomes
- Identifying and eliminating diagnostic errors
- Enhanced patient safety, including 24/7 in-house attending coverage and the innovative Safety Officer and Watchstander Program, which led to a decrease in unrecognized clinical deterioration on the floor, ICU transfers and patient mortality.

We are dedicated and committed to the education of future pediatricians with an emphasis on excellence in clinical teaching for both medical students and family practice and pediatric residents. Faculty serve as important mentors for these learners in their educational, clinical, research and professional development. Our faculty continue to be recognized on an annual basis with prestigious teaching awards, including being ranked as the number-one inpatient rotation this past academic year by the pediatric residents.

The section provides inpatient care for common pediatric illnesses such as bronchiolitis, asthma and failure to thrive, as well as undifferentiated and/or multisystem diseases, coordinating and facilitating care, and ensuring a safe transition back to primary care providers. In addition, in conjunction with the Section of Child Psychiatry, hospitalists work collaboratively in the Big Lots Behavioral Health Pavilion to provide medical care for children and adolescents facing acute mental health crises. Internal medicine-trained adult hospitalists serve as consultants for adult patients with congenital and childhood-onset chronic illnesses admitted to Nationwide Children’s.

Like the rest of the world, this past academic year was particularly challenging given the COVID-19 pandemic. This has included navigating the initial and still ongoing many unknowns related to the virus, as well as establishing safe admission, testing, treatment and isolation protocols. As a result of universal masking and social isolation, our inpatient volumes decreased by approximately 30% in 2020. Despite the extraordinary challenges that the pandemic brought, our team continued to thrive in our educational, safety, quality improvement (QI) and research programs. We continued to provide top-quality education, largely augmented by virtual teaching sessions. Our Pediatric Hospital Medicine Fellowship Program graduated our second fellow in June, and in July we expanded to two fellows per year and successfully matched our top highly talented candidates. Our important QI and research work looked different but continued and excelled. We continued to recruit new and talented faculty. Publications again increased compared to the prior year.
Selected Publications


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**Fast Facts: July 2020 - June 2021**

- Inpatient Discharges: 1,793
- Observation Discharges: 2,448
- Total Discharges: 4,241
- Average Length of Stay*: 4
- Average Daily Census*: 18
- Patient Days*: 6,485
- Complex Healthcare Clinic Visits: 3,434

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

**Grants Awarded**

**JULY 1, 2020 – JUNE 30, 2021**

$550,455
Understanding Immune Responses to Build a Better Vaccine

In 2015, a team of six researchers received a $6.75 million program project grant from the National Institutes of Health to study immune responses to RSV with the ultimate goal of developing a vaccine candidate. The team spans multiple areas of expertise and three research institutions: Nationwide Children’s Hospital, The Ohio State University and the University of South Florida. Its principal investigators include Octavio Ramilo, MD, Asuncion Mejias, MD, PhD, Mark Peeples, PhD, Jianrong Li, DVM, PhD, Stefan Niewiesk, DVM, PhD, and Michael Teng, PhD.

The team has published more than 46 peer-reviewed articles based on grant-funded research. And even more importantly, they’ve achieved their initial goal of developing a vaccine candidate for RSV.

Research by the team, including their 2020 publication in Science Translational Medicine, profiled immune responses in children with mild and severe RSV and led to an insight in clinical outcomes and a recommendation that for children with severe RSV, steroids should be avoided.

“By defining what a protective immune profile looks like, we can design the vaccine candidates that should stimulate that response,” says Dr. Mejias. “For example, we know based on in vivo and in vitro studies that higher levels of IL-6 indicate a more severe illness. But higher levels of IP-10 are protective. Understanding a ‘good’ immune response is critical to our success in developing an effective vaccine.”

The team’s novel vaccine candidate, described in their 2020 publication in Journal of Virology, uses recombinant RSV carrying mutations in two viral proteins, one in the RSV G protein that attaches the virus to the ciliated cells lining the airways, and one in the RSV polymerase protein that replicates the virus genome.

“We learned several years ago that the G protein is cut when RSV is produced in cultured cells, making the virus less able to infect the cells lining the nose. We located the site of the cut and mutated it to prevent this cleavage. As a result, we increased the amount of vaccine produced by 5 times,” says Dr. Peeples.

The vaccine candidate was evaluated in the cotton rat model for in vivo immunogenicity and protection. Intranasal delivery of a small dose of the RSV vaccine candidate provided complete protection of both the upper and lower respiratory tracts.

REFERENCES:


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 children with all types of acute and chronic infections in both immune-competent and immune-compromised children. 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. We have developed close clinical and research collaborations with physicians in Hematology, Oncology & Blood and Marrow Transplant; Pediatric Critical Care; Cardiology, Lung, Heart and Liver Transplantation; Neonatology and the various surgical departments in order to optimize the infectious diseases-related care of patients. Patients are also evaluated in the ambulatory setting following referral to the Infectious Diseases, Tuberculosis, Neonatal Infectious Disease, Host Defense, Kawasaki Disease, and the Family AIDS Clinic Education Services (FACES) Program clinics located on the Nationwide Children’s main campus. Additionally, our division offers consultation to external providers and their patients through the Nationwide Children’s Hospital Physician Consult and Transfer Center. Research is conducted through 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 Hospital, as well as national and international collaborators.

Highlights From the Past Year

The Division of Infectious Diseases continues to offer clinical expertise to patients with complex infections in different settings across the hospital, including the specialized Infectious Diseases inpatient unit, the Infectious Diseases consult service, and in a number of specialized outpatient clinics (General ID, Host Defense, HIV, Neonatal Infectious Disease, Tuberculosis and Kawasaki Disease). The COVID-19 pandemic brought challenges to our program in early 2020. However, these challenges presented opportunities to improve patient care. Our five-bed Special Pathogens Unit was activated and cared for patients admitted to Nationwide Children’s with confirmed SARS-CoV-2 infection. This unit offered an environment that afforded the best possible care for these patients in the safest manner possible for their hospital caregivers. Seriously ill patients requiring ventilatory assistance were cared for in this protected environment by our Pediatric Intensive Care Unit (PICU) staff. We also developed outpatient COVID-19 and MIS-C Clinics so that these patients could be followed in an outpatient setting that facilitated their follow-up care and participation in research. This effort has proven to be a very successful model that will help continue to grow our infectious diseases clinical research operation. We maintain our strong research collaborations with colleagues in the Center for Microbial Pathogenesis and the Center for Vaccines and Immunity in the Abigail Wexner Research Institute at Nationwide Children’s Hospital.

Faculty

Octavio Ramilo, MD
Division Chief

William J. Barson, MD, MS
Section Chief

Clinical Microbiology

Amy Leber, PhD
Director

Sophonie Jean, PhD
Assistant Director

Huanyu Wang, PhD
Assistant Director

Massimo Shimamuro, MD
Eunkyung Song, MD

Sanya Thomas, MD
Cristina Tornatis, MD

Matthew Wasilham, MD
Joshua Watson, MD

Monica Ardura, DO, MSCS
Jeffrey Auletta, MD
Megan Brundrett, MD

Kevin Cassidy, MD
Juan Chaparro, MD

Guliz Erdem, M.D
Charitha Gowda, MD, MPH
Katia Halabi, MD

Strategic Plan

“We are leading the Journey to Best Outcomes for children with immunocompromising conditions by enhancing the services offered by our Host Defense Program (HDP). With the addition of a new faculty member, Dr. Sanya Thomas, and a nurse practitioner, we are closer to our plan of offering a dedicated HDP consult service. Our plans to open a Vaccine Clinic specifically designed for these patients, which were placed on hold because of the COVID-19 pandemic, will be moving forward.

“The COVID-19 pandemic placed an enormous strain on our Department of Epidemiology/Infection Prevention and its director, Dr. Matt Wasilham. In response to this, we have added an additional faculty member earlier to this team than was expected, Dr. Katia Halabi, who will function as Dr. Wasilham’s associate director.”

– Octavio Ramilo, MD, Division Chief, Infectious Diseases

2020 – 2021 Fellows

Kai Broussard, MD
Diego Cruz, MD
Ana Quintero, MD
Jeanette Taveras, DO

Rouba Sayegh, MD
Stephanie Smith, MD
Selected Publications


Fast Facts: July 2020 - June 2021

Inpatient Discharges: 1,636
Observation and Outpatient-in-a-Bed Discharges: 584
Total Discharges: 2,220
Average Length of Stay*: 3
Average Daily Census*: 13
Patient Days*: 4,626
Inpatient Consults: 666
Immunodeficient Clinic Visits: 2,035
Infectious Disease Clinic Visits: 1,440
Tuberculosis Clinic Visits: 417
*Excludes observation and outpatient-in-a-bed patients

Grants Awarded to All Infectious Diseases Clinical and Research Faculty

JULY 1, 2020 – JUNE 30, 2021

$3,479,692
Neonatology
Prevention and Treatment of Early-Onset Sepsis in Newborns

Early-onset sepsis remains a potentially fatal condition among newborns, particularly preterm infants. According to a study published in *JAMA Pediatrics*, ongoing surveillance is required to optimize prevention and treatment strategies.

The study included data from 18 centers of the Eunice Kennedy Shriver National Institute of Child Health and Human Development Neonatal Research Network from April 2015 through March 2017. The researchers identified cases of early-onset sepsis – defined as a positive blood or cerebrospinal fluid culture within the first 72 hours of life – from a cohort of more than 200,000 infants, including infants in the Nationwide Children’s Hospital Neonatal Intensive Care Unit (NICU) at The Ohio State University Wexner Medical Center.

The researchers found 235 cases of early-onset sepsis in their cohort, for a rate of 1.08 cases per 1,000 live births. The most frequent pathogens were *Escherichia coli* (37%) and group *B* Streptococcus (30%), with *E. coli* disease primarily occurring among preterm infants and group B streptococcal infection occurring primarily among term neonates. Importantly, 53% of group B streptococcal infections occurred in newborns whose mothers had negative group B streptococcal screening test results.

Neonatal empirical antibiotic treatment most frequently included ampicillin and gentamicin. While the study found that these antimicrobial agents remained effective in most cases, the researchers say that ongoing surveillance should monitor antibiotic susceptibilities of early-onset sepsis pathogens.

“There has not been any resistance of group *B* Streptococcus to penicillin or ampicillin, which is reassuring,” says Pablo Sánchez, MD, a pediatric infectious diseases specialist and neonatologist who serves as the director of Clinical and Translational Research in Neonatology at Nationwide Children’s Hospital and an author of the study. “However, of 77 *E. coli* isolates tested for susceptibility to ampicillin and gentamicin, six were found to be resistant to both antibiotics.”

Overall, Dr. Sánchez says continued surveillance is necessary to identify changes in pathogen distribution and antibiotic susceptibilities in this population. To prevent more cases of early-onset sepsis, additional innovative prevention strategies are needed.

“I think this study highlights the fact that we’ve made a lot of progress against group B streptococcal infections, although they remain a problem,” says Dr. Sánchez. “And we still have a lot of work to do to prevent *E. coli* infections.”

REFERENCE:
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 in collaboration with the Center for Perinatal Research in the Abigail Wexner Research Institute at Nationwide Children’s.

Centered newborn care and innovative clinical and translational research programs, conducted through the Division 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 in collaboration with the Center for Perinatal Research in the Abigail Wexner Research Institute at Nationwide Children’s.

Highlights From the Past Year

The Section of Neonatology is dedicated to providing integrated perinatal care and research throughout the patient life cycle to reduce infant mortality and morbidity so that children are able to reach their full potential. To achieve this, the section not only provides outstanding Level III and IV neonatal care, but has also implemented a variety of innovative, unique programs that bring together multidisciplinary groups to provide advanced clinical care and research targeting the most common and most debilitating causes of mortality and morbidity in these babies.

- Comprehensive Center for Bronchopulmonary Dysplasia
  - The only dedicated inpatient unit for the care of infants with bronchopulmonary dysplasia (BPD)
  - Published our outcomes for those patients referred after 36 weeks PMA and found that despite presenting relatively late with a high degree of illness severity, nearly all patients survived with improvements in comorbidities by the time of discharge

- Small Baby Program
  - Dedicated unit for the care of infants born at <27 weeks gestation
  - Disseminated our approach to the small baby, including publication of the development of the small baby unit demonstrating that the small baby unit has improved survival, decreased short-term morbidities and improved neurodevelopmental outcomes

- Infant Feeding Disorders Program
  - Unique program providing physiology-based advanced care and treatment to optimize outcomes for infants with feeding disorders
  - In an attempt to objectively define gastroesophageal reflux and related symptoms, esophageal sensitivity phenotypes related to acid reflux and/or bolus reflux were identified and found to have distinct symptom profiles, which provides important insight into why acid suppressive therapy alone may not help neonates with gastroesophageal reflux disease

- Congenital Infections Program
  - Unique multidisciplinary inpatient/outpatient program to identify, treat and follow infants born with congenital viral infections
  - A study of infants admitted to a Level IV NICU found that targeted cytomegalovirus (CMV) testing for failed hearing screen in the NICU is problematic, supporting the need for CMV screening at NICU admission

- Fetal Center
  - Neonatologists with expertise in fetal medicine and complex neonatal care provide counseling to families facing a spectrum of fetal diagnoses and collaborate with maternal fetal medicine and pediatric specialists to ensure best outcomes
  - Growth of Nationwide Children’s fetus-related medical program with creation of the Fetal Center and the foundational role that neonatologists play within this unique care setting is leading to increased patient visits, improved collaborative care and expanded care options

- Innovative Advanced Fellowships
  - Unique advanced fellowships in infant feeding disorders and in BPD medicine
  - Curriculum includes advanced diagnostics and management of focused problems related to infant feeding disorders and BPD

Faculty

Leif D. Nelin, MD
Division Chief

Sudarshan Jadcherla, MD
Associate Division Chief for Academics

Amy Schlegel, MD
Associate Division Chief

Edward G. Shepherd, MD
Section Chief

Valencia P. Walker, MD, MPH
Associate Division Chief for Health Equity and Inclusion

Full-Time Nationwide Children’s Faculty

Carl H. Backes, MD
Molly K. Ball, MD
Roopali V. Bapat, MD
Thomas Bartman, MD, PhD
Kristen L. Benninger, MD
Elizabeth M. Bonachea, MD
Erica Brawell, MD

Bimal Chaudhuri, MD
Bernadette Chen, MD
George El-Ferzli, MD
Jana Erner, MD
Drum Fathy, MD
Jennifer Haase, MD
Cecile Halling, MD
Maria Jeebiya, MD
Jason Jackson, DO

Matthew Kielt, MD
Jason Kovalick, MD
J. Wells Logan, MD
Daniel Malleske, MD
Craig A. Nankervis, MD
Mary L. Neel, MD
Ahmed Osman, MD
Leeann Pavlek, MD
Pablo J. Sánchez, MD

Furthermore, Neonatology is dedicated to ensuring that the outstanding clinical care provided is equitable for all patients admitted to the Nationwide Children’s Neonatal Network NICUs. To support health equity in neonatal care, Neonatology has done the following in 2020-21:

- Increased focus on diversity, equity and inclusion efforts within the division
  - Creating the new role, Associate Division Chief for Health Equity and Inclusion (HEI)
  - Recruiting Valencia P. Walker, MD, MPH, into the role of Associate Division Chief for HEI
  - Planning the establishment of an office for Neonatal HEI

- Current diversity, equity and inclusion and health equity initiatives
  - Creating a strategic plan for the division’s five-year HEI goals
  - Procuring and analyzing baseline racial/ethnic disparity data trends for staff and patients
  - Launching several major clinical initiatives, including tobacco exposure mitigation, improving breastfeeding/human milk feeding, and increasing family engagement
  - Developing programs to improve effectiveness in recruiting and retaining a diverse and inclusive cadre of trainees, staff, and faculty

Perinatal Research: See page 215 for information about the Center for Perinatal Research in the Abigail Wexner Research Institute at Nationwide Children’s.
Christopher J. Timan, MD
Michael R. Stenger, MD, MPH
Jonathan L. Slaughter, MD, Vanessa L. Shanks, MD
Ruth B. Seabrook, MD
Amy L. Schlegel, MD

The hearing screening in the neonatal intensive care unit: implications for targeted screening for congenital cytomegalovirus infection.

Transfusion thresholds for preterm infants. CM, Carmen MF, Devaskar U, Chawla S, Higgins RD, Das A; Eunice Kennedy Shriver NICHD Neonatal Research Network. Higher or lower hemoglobin.


Kidney and Urinary Tract Protein Demonstrates Antimicrobial Activity

Nationwide Children’s Hospital researchers demonstrated that an understudied protein in the human kidney and bladder kills the bacteria that causes urinary tract infections (UTI). The findings were published in the *American Journal of Physiology-Renal Physiology*.

“The bacteria causing UTIs become resistant to antibiotics, driving the need to discover novel therapeutic approaches,” says co-first author Kristin Bender, a research associate in the Nephrology and Urology Research Affinity Group (NURAG) at Nationwide Children’s.

“UTI doesn’t receive a lot of attention in the press, but it has a high prevalence and places a substantial burden on both patients and the health care system,” adds co-first author Laura Schwartz, PhD, who is also a research scientist in NURAG.

Humans produce many ribonuclease (RNase) A proteins, which have antimicrobial activity. The team evaluated the antimicrobial function and tissue expression pattern of the least studied of this family, RNase 4.

*In vitro* experiments showed that RNase 4 has powerful antibacterial activity against uropathogenic *Escherichia coli* (UPEC) and multidrug-resistant UPEC, suggesting it may be a promising candidate to develop as a novel therapeutic.

While further study is needed, senior study author John David Spencer, MD, chief of the Division of Nephrology and Hypertension at Nationwide Children’s explains, “This antimicrobial protein has a series of positively charged amino acids that attract the negatively charged bacterium proteins, basically punching holes in the bacterial membrane, leading to cell death.”

Using human samples, the team found that RNase 4 is expressed within the kidney cells that are targeted by the UTI-causing pathogens within the bladder, and urinary RNase 4 concentrations were lower in females with UTI history compared with those with no history of UTI, suggesting that RNase 4 could potentially be developed as a biomarker to identify individuals most at risk for the establishment or recurrence of UTI.

“This was the first time that urinary levels of RNase 4 in humans were found to contribute to the immune defenses against UTI, highlighting the multifaceted nature of the immune system,” says Bender.

Prospective studies need to determine if the relationship between RNase 4 levels and UTI risk is causal.

“We are now studying RNase 4 levels in populations with higher risk of UTI, such as individuals with diabetes, patients requiring catheterization, and pregnant women,” says Dr. Schwartz.

**REFERENCE:**
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.

Highlights From the Past Year

In the 2020-2021 academic year, the division was renamed the Division of Nephrology and Hypertension. This was done to reflect our commitment to provide care to children with hypertension. In addition to expanding our hypertension services, we established a Neonatal Nephrology Program that is directed by Tahagod Mohamed, MD. As part of this program and the Kidney Supportive Services Program (directed by Beth A. Vogt, MD), we collaborated with the Neonatology team to establish an aquapheresis program. This therapy will allow us to deliver dialysis-based therapies to babies. Finally, despite the challenges of COVID-19, clinic volumes in our general nephrology clinic and urology-nephrology clinic continue to increase.

The Division of Nephrology and Hypertension maintains an active and highly funded research program in the Abigail Wexner Research Institute at Nationwide Children’s Hospital. Three of our physician-scientists maintain actively funded National Institutes of Health (NIH) research programs, including Brian Becknell, MD, PhD; William E. Smoyer, MD; and John David Spencer, MD. This past spring, our research affiliate faculty, including Ashley Jackson, PhD, and Juan de Dios Ruiz Rosado, PhD, were awarded career development grants from the NIH. Additionally, our division participates in over 50 Institutional Review Board-approved clinical and translational studies. These studies investigate mechanisms and outcomes of urinary tract infection, obstructive uropathy, chronic kidney disease, bacterial peritonitis, renal transplantation, glomerular diseases, metabolic bone disorders and medical education. Research done by the clinical and research faculty was presented at several national academic meetings, including the American Society of Nephrology Kidney Week, the Pediatric Academic Societies meeting and multiple specialized international research symposia. Nephrology faculty had over 40 unique, peer-reviewed publications, some of which are highlighted here.

Research: See page 207 for information about the Center for Clinical and Translational Research in the Abigail Wexner Research Institute at Nationwide Children’s.

Selected Publications


Faculty

- John David Spencer, MD
  Division Chief
- Hiren P. Patel, MD
  Section Chief
- Brian Becknell, MD, PhD
- Ray Bignall II, MD
- Mahmoud Kallah, MD
- John D. Mahan, MD
- Tahagod Mohamed, MD
- William E. Smoyer, MD
- Beth A. Vogt, MD
- Amy Wright, NP
- Diana Zepeda-Orozco, MD, MS

Grants Awarded

JULY 1, 2020 – JUNE 30, 2021
$3,609,294

Fast Facts: July 2020 - June 2021

- Inpatient Discharges: 162
- Observation and Outpatient-in-a-Bed Discharges: 127
- Total Discharges: 289
- Average Length of Stay*: 4.8
- Average Daily Census*: 2.1
- Patient Days*: 781
- Nephrology Clinic Visits: 4,211
- Dublin Nephrology Clinic Visits: 230
- Kidney Transplants: 4

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

Strategic Plan

“We are leading the Journey to Best Outcomes for children everywhere by launching and evolving clinical and research programs, like the new Kidney and Urinary Tract Center, which is helping children from across the United States with kidney disease stemming from urinary tract disorders.”

– John David Spencer, MD, Chief, Division Chief, Nephrology and Hypertension

2020 – 2021 Fellows

- Jessamyln Carter, MD (Medicine/Pediatrics)
- Shaza Hassan, MD (Pediatrics)
- Emily Stonebrook, MD (Pediatrics)
- Ahmed Zied, MD (Pediatrics)
Neurology
An Expanded, Multicenter Look at Gene Therapy for Spinal Muscular Atrophy

In May 2019, the U.S. Food and Drug Administration (FDA) approved onasemnogene abeparvovec-xioi, a gene replacement therapy for the inherited, progressive neuromuscular disease 5q-linked spinal muscular atrophy (SMA). Approval included all children with SMA under the age of 2 years; however, the gene therapy had only been studied in children aged up to 8 months.

A study published in *Pediatrics* discusses safety and early outcomes in a large cohort of SMA patients under the age of two years who were treated with gene therapy.

Jerry Mendell, MD, a neurologist with the Center for Gene Therapy, was involved in the preclinical work and human trial that demonstrated safety and efficacy of onasemnogene abeparvovec-xioi. The treatment was approved by the FDA for children diagnosed with any type of SMA under 2 years of age without end-stage disease. The 15 patients treated by Dr. Mendell and his colleagues were all children with type 1 SMA under 8 months of age.

In the study, Dr. Mendell and colleagues from Nationwide Children’s and three other Ohio children’s hospitals report safety and early outcome data from 21 children (age 1-23 months) treated with onasemnogene abeparvovec-xioi in Ohio.

Megan Waldrop, MD, a pediatric neurologist at Nationwide Children’s and the study’s first author, says their data show the treatment is safe and effective through age 2 years with genotypes predicted to be SMA1, 2 and 3, if proper screening and monitoring is conducted.

“If the children are older and heavier, there is a potential for more liver injury, and those patients require closer monitoring and may require longer corticosteroid treatment,” says Dr. Waldrop. “But if they are monitored appropriately, they tolerate the treatment well.”

According to the study, all symptomatic patients experienced subjective and objective functional improvements in motor function, while the five children treated prior to symptom onset developed none of the signs of weakness characteristic of SMA.

“Gene therapy is a remarkable treatment paradigm for certain diseases,” Dr. Waldrop continues. “At the moment, we are able to design gene therapies for some conditions that are recessive, loss-of-function, and involve small genes. I suspect that as the field continues to move forward, we will make progress and find ways to broaden the conditions we can treat using gene therapy.”

REFERENCE:
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, neurolaminflammatory conditions, muscular dystrophy, spinal muscular atrophy and neuropathy (acquired and genetic). In order 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.

Highlights From the Past Year

In the last year, we welcomed two new faculty members. Christopher Beatty, MD, joined in October 2020 and brings additional expertise in treatment of children who require surgical approaches for treatment of epilepsy. Setty Magaña completed MD, PhD and fellowship training in neuroimmunology and joined in January 2021, bringing deep expertise in the role of extracellular vesicles in neuroimmunology.

Active gene transfer for children with spinal muscular atrophy (SMA) continues, and in 2020, 11 children were safely treated. Basic and translational research to develop gene therapy for children with Batten disease, muscular dystrophy ( Duchenne and limb girdle) and Charcot-Marie-Tooth (CMT) continues. We continue to expand quality improvement initiatives, leading to improvement in care of children with epilepsy and further understanding of children with infantile spasms, status epilepticus and complex epilepsy.

The Division of Neurology includes 34 physicians and 12 advanced health care providers who oversee comprehensive programs for children with epilepsy, headache, movement disorders, neurodegenerative disorders and neuromuscular diseases. Children with complex disorders benefit from our multidisciplinary clinical approach. Additional ongoing multidisciplinary programs include centers of clinical excellence for children with Batten disease, leukodystrophy and muscular dystrophy. Eleven additional neurology multidisciplinary clinics include those for children with brain tumors, CMT, concussion, epilepsy, need for epilepsy transition, intracranial hypertension (pseudotumor cerebri), spinal muscular atrophy, neuroinmunologic disorders, stroke, tics, Tourette disorder and tibrous sclerosis.

The section offers outstanding residency and fellowship programs. The Child Neurology Residency program (certified by Accreditation Council for Graduate Medical Education) includes five residents per year with options for clinical- or research-focused educational tracks. Neurology also offers pediatric fellowship training in clinical neurophysiology, epilepsy surgery, gene therapy, headache, neuromuscular disease, neuromuscular pathology and stroke. Faculty members conduct quality improvement, basic and clinical research and published numerous journal articles and book chapters in 2020.

Research: See page 269 for information about the Center for Gene Therapy in the Abigail Wexner Research Institute at Nationwide Children’s.

Neurosurgery: See page 161 to learn about the Department of Neurosurgery at Nationwide Children’s.

Faculty

Anne M. Connolly, MD
Division Chief

Jaime-Dawn Tewanow, MD
Section Chief

Dara Albert, DO
William D. Arnold, MD
Kristen Arredondo, MD
Sylvia Awadalla, MD
Shawn Ayward, MD
Christopher Beatty, MD
Melissa Chung, MD
Emily De Los Reyes, MD
John L. Eckhardt III, MD
Kevin Flanigan, MD
Marilyn L. Freimer, MD
Danah Hatffer, MD
Melissa Hutchinson, MD
Monica P. Islam
Latif Khuhro, MD
Neil Kulkarni, MD
Warren D. Lo, MD
Setty Magaña, MD, PhD

Jennifer McKinney, MD
Jerry Mendell, MD
John Mytinger, MD
Adam Ostendorf, MD
Ann Pakalnis, MD
Anup Patel, 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
Pedro Weisleder, MD, PhD
Rae Gumayan, MD
Matthew Martin, MD
Thomas Murray, DO
Lisa Pabst, MD
Ezgi Saylam, MD
Whitney Woodruff, MD

EPILEPSY SURGERY
FELLOW
Stephanie Ahrens, DO

HEADACHE FELLOWS
Tanner Fenderer, MD
Meghan Hubert, DO

2020 – 2021 Residency and Fellowship Programs

CHILD NEUROLOGY RESIDENTS
Ahmed Awad, MD
Brianna Brun, MD
Daniel Clark, MD, PhD
Megan Fredwall, MD

NICOLAS ABREU, MD

NEUROMUSCULAR GENETIC THERAPEUTICS FELLOW
Nicolas Abreu, MD

NEUROMUSCULAR PATHOLOGY FELLOWS
Momen Almomen, MD
Samuel MacKenzie, MD

FELLOWS

NATIONWIDE CHILDREN’S HOSPITAL
2020-21 Annual Report
NationwideChildrens.org/2021-Report

Stephanie Ahrens, DO

FELLOWS

EPILEPSY SURGERY

NATIONWIDE CHILDREN’S HOSPITAL
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EPILEPSY SURGERY

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EPILEPSY SURGERY

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EPILEPSY SURGERY

NATIONWIDE CHILDREN’S HOSPITAL
2020-21 Annual Report
NationwideChildrens.org/2021-Report

Stephanie Ahrens, DO

FELLOWS

EPI
Selected Publications


Fast Facts: July 2020 – June 2021

Neurology
Inpatient Discharges: 253
Observation and Outpatient-in-a-Bed Discharges: 548
Total Discharges: 801
Average Length of Stay*: 2.8
Average Daily Census*: 2.0
Patient Days*: 719
Inpatient Consults: 1,262
Main Campus Neurology Clinic Visits: 11,238
Dublin Neurology Clinic Visits: 2,736
East Broad Neurology Clinic Visits: 827
Findlay Neurology Clinic Visits: 56
Heinzerling Neurology Clinic Visits: 49
Mansfield Neurology Clinic Visits: 103
Westerville Neurology Clinic Visits: 1,251
Complex Concussion Clinic Visits: 266
Stroke Clinic Visits: 238
Total Neurology Clinic Visits: 16,764
Neuromuscular Disorders
MDA Clinic Visits: 562
Neuromuscular Disorders Clinic Visits: 1,016
Westerville Neuromuscular Clinic Visits: 13
Spinal Muscular Atrophy Clinic Visits: 219
Total Neuromuscular Clinic Visits: 1,830

Grants Awarded to Center of Gene Therapy and Neurology Clinical and Research Faculty

JULY 1, 2020 – JUNE 30, 2021

$20,340,132
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 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, 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 143 for details and for information about all Behavioral Health services.

Selected Publications


Fast Facts: July 2020 - June 2021

Inpatient Consultations: 4,143
Psychology Clinic Visits: 15,423
Psychology Medical Clinic Visits/Outpatient Consultation Visits: 18,337

Grants Awarded

JULY 1, 2020 – JUNE 30, 2021
$456,646

Over the past year, our psychologists have been leading the Journey to Best Outcomes for children everywhere by publishing 66 peer-reviewed research studies and delivering nearly 100 research presentations at national and international conferences.”

– Eric M. Butter, PhD, Chief, Pediatric Psychology and Neuropsychology
Department of Pediatrics

PRIMARY CARE PEDIATRICS

Pediatricians in the Division of Primary Care Pediatrics at Nationwide Children’s Hospital staff the 13 Nationwide Children's Hospital Primary Care Centers located throughout the Columbus area. A multidisciplinary staff provides comprehensive primary care services for a diverse and underserved population of patients.

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. In addition to pediatricians and pediatric nurse practitioners, the clinics include a wide array of other individuals to support the needs of patients and their families, including health coaches, pharmacists, psychologists and social workers. Combined adult and pediatric adult health services are available at one clinic site. The division also houses the Center for Healthy Weight and Nutrition, a national model for multidisciplinary comprehensive care for children and adolescents with obesity.

The division’s quality improvement initiatives continue to focus on improving care for patients with a broad array of conditions, including anemia, asthma, attention deficit-hyperactivity disorder, depression and obesity. The division also focuses on ensuring all children and adolescents receive timely preventive services, including well-child visits and immunizations. A central goal of our work is to assure the delivery of high-quality preventive care to minimize secondary effects of the COVID-19 pandemic.

The Division of Primary Care Pediatrics provides training and education for The Ohio State University College of Medicine students, as well as residents in Pediatrics, Family Medicine and combined Internal Medicine-Pediatrics. Research focuses on a broad range of preventive services, smoking cessation, obesity prevention and treatment, health literacy, and transition from pediatric to adult health care services.

Faculty

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

Dane A. Snyder, MD
Section Chief

Mary Ann Abrams, MD
Oghenevwiroro Akpovva, MD
Razan Alkhoury, MD
Zeennath Ameen, MD
Akua A. Amponsah, MD
Kristen Beck, MD
Stefanie R. Bester, MD
Sara Bode, MD

Courtney Brown, MD
Megan Brundrett, MD
Milagro P. Castaneda-Vidaurre, MD
Aarti Chandawarkar, MD
Esha Chabuk, MD
Katharine Coffman, MD
Duane R. Copenheaver, DO

Emily A. Decker, MD
Tanya Dedov, MD
Sarah Denny, MD
Meghan Dishongh, MD
Inhuma U. Eneli, MD
Ashley Fernandes, MD

Susan Friedman, MD
Patricia Gabbe, MD
Jessica Gefvert, MD
Sean P. Glessen, MD
Judith A. Groner, MD
Uma Gupta, MD

Maika Haque, MD
Laura Hart, MD
Stephen J. Hersey, MD
Lisa Humphrey, MD
Aurella J. Jackson, MD
Sinimol James, MD

Angela V. Jones, MD
Tabitha Jones-McKnight, DO
Shelby Jordan, MD
Tatyana Karakay, MD
Amrik Singh Khalsa, MD
Lindsay Kneen, MD

Amina Smajlović, MD
Kimberly Stetler, MD
Lisa Stone, DO
Melissa Swanson, MD
Olivia W. Thomas, MD

Gina R. Thompson, DO
Jagadisharaje K. Urs, MD
Jose Vargas, MD
Shravani Vundavalli, MD
Caroline Weingart, MD

Strategic Plan

“We are leading the Journey to Best Outcomes by expanding the Primary Care Network, which will soon include 14 primary care clinics throughout Columbus. These clinics are designed to partner with the local community and to be a comprehensive resource to address physical and behavioral health as well as serving as a connection to other social and educational support services, all with the goal of promoting our patients’ long-term health and development.”

– Alex R. Kemper, MD, MPH, MS, Division Chief, Primary Care Pediatrics

Selected Publications


Selected Publications

Fast Facts: July 2020 – June 2021

PRIMARY CARE NETWORK

Primary Care Network Visits: 183,134
Unique Patients Treated in Entire Primary Care Network: 93,584

Grants Awarded

JULY 1, 2020 – JUNE 30, 2021
$3,384,526
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.

The Center for Healthy Weight and Nutrition offers assessment clinics for evaluation of children and young adults with obesity, and a variety of interdisciplinary programs for intensive weight management. The center’s adolescent bariatric surgery program is accredited by the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program. The center leads the Primary Care Obesity Network (PCON), a program that supports primary care practices with training and resources. In 2021, CareSource, a nationally recognized nonprofit health plan, funded a partnership with the center to expand the center’s PCON program and introduce the Project ECHO (Extension for Community Care Outcomes) framework.

The center remains committed to providing educational opportunities with a fourth-year medical student elective, a residency elective rotation, a childhood obesity and adolescent bariatric surgery fellowship, in addition to serving as an expert to obesity programs around the United States and internationally. In addition to other grants, the center participates in three National Institutes of Health (NIH) multicenter studies on the long-term outcomes of adolescent bariatric surgery, modeling obesity program attrition and the use of family behavioral therapy to address childhood obesity in the primary care setting. The center faculty provides leadership for several leading national organizations in the field including the Obesity Medicine Association (OMA), American Society for Metabolic and Bariatric Surgery (ASMBBS), American Academy of Pediatrics Institute for Healthy Childhood Weight (AAPIHCW) and the National Academy of Medicine (NAM) Roundtable on Obesity Solutions.

In 2021, the center received the Academic Pediatric Association (APA) Health Care Delivery Award. The award recognizes innovative, effective programs that support health care in a teaching setting.

Highlights From the Past Year

The Center for Healthy Weight and Nutrition offers assessment clinics for evaluation of children and young adults with obesity, and a variety of interdisciplinary programs for intensive weight management. The center’s adolescent bariatric surgery program is accredited by the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program. The center leads the Primary Care Obesity Network (PCON), a program that supports primary care practices with training and resources. In 2021, CareSource, a nationally recognized nonprofit health plan, funded a partnership with the center to expand the center’s PCON program and introduce the Project ECHO (Extension for Community Care Outcomes) framework.

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In 2021, the center received the Academic Pediatric Association (APA) Health Care Delivery Award. The award recognizes innovative, effective programs that support health care in a teaching setting.

Strategic Plan

“The COVID-19 pandemic has adversely affected healthy lifestyles across the country. In response, we are leading the Journey to Best Outcomes for children everywhere by building partnerships to improve population health indicators for obesity in our community and supporting health care providers with training and resources to provide optimal care for children and families that struggle with obesity.”

-- Ihuoma U. Eneli, MD, MS, FAAP, Director, Center for Healthy Weight and Nutrition

Faculty

Dominique Williams, MD, MPH,
FAAP, Dipl ABOM
Eileen Chaves, PhD
Jane Hamel-Lambert, PhD
Jenyu Xu MD, MPH, PhD
Research Scientist
Nicole Greenwood, MD
Childhood Obesity Fellow

Faculty

Ihuoma U. Eneli, MD, MS, FAAP
Director
Marc P. Michalsky, MD, MBA, FACS, FAAP
Surgical Director

Selected Publications


Fast Facts: July 2020 - June 2021

- Bariatric Clinic Visits: 787
- Healthy Weight and Nutrition Clinic Visits: 2,457
- Hilliard Healthy Weight Clinic Visits: 585
- Westerville Healthy Weight Clinic Visits: 1,011

Grants Awarded

- JULY 1, 2020 – JUNE 30, 2021
  - $383,779

Grants Awarded

- JULY 1, 2020 – JUNE 30, 2021
  - $383,779

Grants Awarded

- JULY 1, 2020 – JUNE 30, 2021
  - $383,779
Pulmonary Medicine

Improved Respiratory Outcomes With New Spinal Muscular Atrophy Treatments

The last five years have brought major advances in the treatment of spinal muscular atrophy (SMA), including three FDA-approved therapies: intrathecal nusinersen (approved by the FDA in December 2016), intravenous onasemnogene abeparvovec-xioi (FDA-approved in May 2019), and enteral risdiplam (FDA-approved in August 2020).

In an article published in a special issue of Pediatric Pulmonology, clinician-scientists at Nationwide Children’s discuss the impact of these novel therapies on respiratory outcomes and highlight the need for long-term data and continued monitoring of SMA patients.

Most studies have demonstrated favorable responses in overall muscle strength with these treatments, but respiratory outcomes vary. The degree of improvement depends upon SMA genotype, severity of baseline impairment, the medication used, and the timing of the first dose.

With onasemnogene abeparvovec-xioi, a gene replacement therapy that was developed at Nationwide Children’s, a single intravenous dose of the medicine has led to improvements in muscle strength and less dependence on noninvasive ventilation.

“These kids would not have survived without any kind of respiratory support,” says Richard Shell, MD, section chief of Pulmonary Medicine at Nationwide Children’s and senior author of the paper. “Now, three of them are walking and more of them are eating orally and do not require ventilation support.”

Dr. Shell says there have also been significant benefits following the other two treatments, although dependent on factors such as SMA subtype and age at treatment. Because of the rarity of SMA and the expense of treatments, current data on therapeutic outcomes are from small numbers of patients from multiple medical centers across the world. He and his co-authors advocate for more multicenter trials to substantiate the impact and effectiveness of these new therapies.

“Even though we are seeing great results with these drugs, we are still cautious about continuing our surveillance of these patients with pulmonary function tests and sleep studies,” says Grace Paul, MD, a pediatric pulmonologist at Nationwide Children’s and first author of the publication. “These kids may get weaker when they are sick; we do not know if one child is going to respond to a medication the same as another child.”

Moving forward, the authors expect to manage SMA patients with a spectrum of disease severity. Close monitoring of respiratory outcomes, including pulmonary function, sleep-disordered breathing and nutritional wellbeing, will be essential for the design of future studies, the use of combination therapies, and the evaluation of long-term outcomes.

REFERENCE:
Department of Pediatrics  
PULMONARY MEDICINE

The mission of the Division of Pulmonary Medicine at Nationwide Children’s Hospital is to provide outstanding clinical care for children and adults with congenital respiratory disorders, including asthma, cystic fibrosis (CF), sleep-related breathing disorders, lung transplant, advanced lung disease care and management of chronic mechanical ventilation. The care model is multidisciplinary. Our mission also includes education of medical and allied health professional trainees and involvement in cutting-edge clinical, basic and translational research.

Highlights From the Past Year

Pulmonary Medicine clinicians provide care at the Nationwide Children’s main campus in Columbus and at regional Ohio locations in Westerville, Dublin and Lima Close To Home Centers. Our 18 physicians collaborate to complete more than 10,000 outpatient visits at these four locations. Ranked in the top seven by U.S. News & World Report, the program excels in patient care, training programs and research.

The cornerstone of the Division of Pulmonary Medicine is our nationally recognized Cystic Fibrosis Care Center, which is a designated Therapeutic Development Center site. The center collaborates with our colleagues in Endocrinology, Gastroenterology, Hepatology, Otolaryngology, Psychology and Psychiatry to provide the best clinical outcomes for our pediatric and adult CF patients. A strong collaboration, Care CF Columbus (C3), has also formed with clinicians and researchers at The Ohio State University and is funded as a Research and Development Program through the Cystic Fibrosis Foundation. This work is focused on immune dysfunction and infection in CF. Huge advances have been made with our most unstable patients with asthma. In our Complex Asthma Clinic, we collaborate with our school-based asthma therapy (SBAT) program to provide quality medical care and consistent treatment therapies. A reduction in urgent care and emergency department visits by these medically fragile patients is a noticeable benefit of these two programs.

Our nationally accredited Cardiopulmonary Rehabilitation Program is led by our team of physicians; dietitians; respiratory, massage and exercise therapists; social workers and nurses to provide our patients with the tools necessary to resume normal living after a serious cardiopulmonary event or if they become deconditioned. As evidence of our center having helped hundreds of patients regain their independence, we received reaccreditation in 2016 by the American Association of Cardiovascular and Pulmonary Rehabilitation. The division also has a robust quality improvement portfolio, conducts clinical and translational research with a broad group of basic-science collaborators and exhibits steadily climbing research productivity with numerous faculty publications.

Selected Publications


Strategic Plan

“Our Journey to Best Outcomes includes working with researchers around the world to provide the newest and most effective treatments that have transformed the care of patients with cystic fibrosis. We have focused on other rare pediatric lung disease including interstitial lung disease and primary ciliary dyskinesia to name a few.”

— Karen S. McCoy, MD, Division Chief, Pulmonary Medicine

“With more than $2 million in external funding our center continues to conduct and translate the most advanced research to allow children to breathe easier everywhere.”

— Richard D. Shell, MD, Section Chief, Pulmonary Medicine

Faculty

Karen S. McCoy, MD  
Division Chief

Richard D. Shell, MD  
Section Chief

Selected Publications


Selected Publications


Fast Facts: July 2020 - June 2021

Inpatient Discharges: 652
Observation and Outpatient-in-a-Bed Discharges*: 2,032
Total Discharges: 2,684
Average Length of Stay*: 6.6
Average Daily Census*: 11.9
Patient Days*: 4,332
Inpatient Consults: 327
Cystic Fibrosis Patients: 554
Pulmonary Clinic Visits
Dublin Pulmonary Clinic Visits: 410
Lima Pulmonary Clinic Visits: 154

SLEEP DISORDERS CENTER

Highlights From the Past Year

Accredited by the American Association of Sleep Medicine, the Sleep Disorders Center at Nationwide Children’s Hospital provides inpatient and outpatient consultations and treatment for children with a wide variety of sleep-related problems. Most referrals are for evaluation of abnormal breathing during sleep. Other symptoms may include insomnia, unusual movements at night and excessive daytime sleepiness. 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, which includes didactic lectures, supervised clinical experience and interpretation of infant and child polysomnographic studies.

The Sleep Disorders Center participates in the training of medical students, residents in Pediatrics, Neurology, Otolaryngology, Physical Medicine and Rehabilitation, and Radiology, as well as pediatricians, psychiatrists and graduate students at The Ohio State University. Over the past 13 years, 46 sleep medicine and pediatric subspecialty fellows have completed required rotations in pediatric sleep medicine at the center. Center physicians lecture widely throughout The Ohio State University on a variety of topics, including sleep and performance. At Nationwide Children’s, pediatric subspecialists in pulmonology, neurology and psychiatry, who are also board certified in sleep medicine, review all polysomnographic studies to determine both diagnosis and potential therapies that would benefit each child. Further evaluation and treatment is available through the outpatient Sleep Disorders Clinic.

Grants Awarded

JULY 1, 2020 – JUNE 30, 2021
$3,271,199

Staff of the Sleep Disorders Center collaborated on research projects with Nationwide Children’s investigators from Anesthesiology, Critical Care, Gastroenterology, Endocrinology, Neonatology, Neurology, Otolaryngology, Pediatric Surgery, Psychiatry, Psychology, Pulmonary, Plastic Surgery, the Center for Injury Research and Policy at Nationwide Children’s, and the Department of Mathematics at The Ohio State University.

Faculty

Rohan Thompson, MD
Sleep Lab Medical Director

Anne May, MD
Sleep Clinic Medical Director

Selected Publications


Fast Facts: July 2020 - June 2021

Main Campus Sleep Clinic Visits: 490
Dublin Sleep Clinic Visits: 565
Westerville Sleep Clinic Visits: 455
Total Sleep Clinic Visits: 1,510
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.

Highlights From the Past Year

The Rheumatology Clinic at Nationwide Children’s Hospital serves children with diseases including juvenile idiopathic arthritis, systemic lupus erythematosus, juvenile dermatomyositis, spondyloarthropathy, vasculitis, scleroderma, autoinflammatory conditions and painful musculoskeletal problems. The clinic conducts more than 5,000 outpatient visits annually at locations on main campus and in Dublin, Ohio. Our fellowship includes three categorical pediatric fellows and one internal medicine-pediatrics fellow. To meet the needs of patients and families with complex immunologic disease, we offer several multidisciplinary clinics.

- The Lupus, Vasculitis and Glomerulonephritis Clinic incorporates expertise from rheumatologists, nephrologists, pulmonologists, psychologists, pharmacists and social workers to provide evidence-based, personalized treatment plans for children and adolescents with lupus and vasculitis.
- The Neuro-Immunology Clinic includes representatives from rheumatology, psychiatry, psychology and neuropsychology and focuses on care of children with autoimmune encephalitis and other neuro-immunologic disorders.
- Our Hypermobility Clinic engages providers from rheumatology, physical therapy, occupational therapy, psychology and social work, and provides comprehensive support to children with symptomatic hypermobility.
- Edward Oberle, MD, directs our Musculoskeletal Ultrasound Clinic.
- Kyla Driest, MD, MEd, participates in a collaborative clinic with Hematology, Immunology and Genetics focused on care of patients with persistent cytopenias and combined immunologic and hematologic dysfunction.

Our close association with adult rheumatology at The Ohio State University and with multiple pediatric subspecialists at Nationwide Children’s Hospital promotes collaborative educational opportunities, clinical care and research. Rheumatology is engaged in clinical and basic science research projects and participates in several national and international collaborative studies of childhood rheumatic diseases. Basic scientist Chack-Yung Yu, DPhil, has an appointment in Rheumatology focusing on the relationship between complement and disease. Our team participates in the Childhood Arthritis and Rheumatology Research Alliance and Pediatric Rheumatology Collaborative Study Group clinical research networks. We also participate in the quality improvement initiative Pediatric Rheumatology Care and Outcomes Improvement Network.

Faculty

Shoghik Akoghlanian, MD
Laura Ballenger, MD
Fatima Barbary-Smiley, MD
Kyla Driest, MD, MEd
Gloria C. Higgins, PhD, MD
Edward Oberle, MD
Vidy Sivarayman, MD

Selected Publications


Strategic Plan

“We are leading the Journey to Best Outcomes for children everywhere by launching and evolving groundbreaking clinical programs, like the multidisciplinary Lupus, Vasculitis and Glomerulonephritis Clinic and the Neuro-Immunology Clinic, which are now helping children from across the United States.”

– Stacy Payne Ardoin, MD, MS, Chief, Rheumatology

Fast Facts: July 2020 - June 2021

- Inpatient Consults: 173
- Main Campus Rheumatology Clinic Visits: 4,681
- Dublin Rheumatology Clinic Visits: 986
- Total Clinic Visits: 5,667

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

Patient Days*: 202

Average Daily Census*: 3.7

Total Discharges: 105

Average Length of Stay*: 5,667

Observation and Outpatient-in-a-Bed Discharges: 51

Inpatient Discharges: 54

Main Campus Rheumatology Clinic Visits: 4,681

Total Clinic Visits: 5,667

Excludes observation and outpatient-in-a-bed patients

Dublin Rheumatology Clinic Visits: 986

Fast Facts: July 2020 - June 2021

- Inpatient Consults: 173
- Main Campus Rheumatology Clinic Visits: 4,681
- Dublin Rheumatology Clinic Visits: 986
- Total Clinic Visits: 5,667

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

Dublin Rheumatology Clinic Visits: 986

Fast Facts: July 2020 - June 2021

- Inpatient Consults: 173
- Main Campus Rheumatology Clinic Visits: 4,681
- Dublin Rheumatology Clinic Visits: 986
- Total Clinic Visits: 5,667

*Excludes observation and outpatient-in-a-bed patients
Highlights From the Past Year

We provide team-centered sports medicine care. Our clinical staff works with the athlete’s team, which includes the patient, family, athletic trainer, school nurse, coach and primary care physician, to assist in the recovery of the injury, development of a treatment plan and recommendations for successful participation in future sports activities. Our department also helps patients navigate their care through our partners in other departments within Nationwide Children’s, including Radiology, Orthopaedics, Physical Therapy, Cardiology, Healthy Weight and Nutrition, Pulmonary Medicine, Neuropsychology/Psychology, Emergency Medicine, Primary Care, Sports Nutrition, Education and all other necessary outside services.

Highlights:
- Implemented telehealth services to augment patient care during a pandemic
- Collaborated with local school districts, the Ohio High School Athletic Association and other Nationwide Children’s departments on COVID-19 safety protocols, return to sport and related medical care
- Developed an Adaptive Sports Medicine Program for athletes with special physical needs
- Served as team physicians for Ohio Dominican University and several central Ohio high schools and middle schools
- Faculty named over 50 times in publications, abstracts and national podium and poster presentations

Services available at Nationwide Children's Sports Medicine include:
- Diagnosis and treatment of all sports-related injuries
- Sports Concussion Clinic
- Adaptive Sports Medicine Clinic
- Limb Deformity Clinic in collaboration with the Department of Orthopaedics
- Point-of-service musculoskeletal ultrasound for diagnostic and therapeutic treatment
- Injury rehabilitation
- Specialized rehabilitation and injury prevention programs for swimmers, throwers, dancers, runners and athletes in other sports
- Sports Nutrition Counseling
- Sports Performance Training
- Play Strong (supervised exercise program for children with medical conditions)
- Sports Medicine Fellowship Training Program
- Central Ohio EMS Community Outreach and Education for Care of Athletes Injured on the Field of Play
- Partnerships with youth and club sport organizations and schools Coordination of care with patient’s primary care physician and other Nationwide Children’s services; educational resources and training to physicians, athletic trainers, school nurses, patients/families and coaches.

Fast Facts: July 2020 - June 2021

- Top 10 Principal Final Diagnoses at the Sports Medicine Clinics:
  - Knee Pain/Injury: 1,520
  - Concussion: 1,260
  - Ankle Sprain: 836
  - Low Back: 718
  - Foot Pain: 359
  - Patellofemoral Pain: 345
  - Tendinitis: 318
  - Strain: 308
  - Shoulder Pain/Injury: 301
  - Apophysitis: 297
  - Spondylothesis: 275
  - Salter Harris Fracture: 255
  - Dislocation/Subluxation: 249

Strategic Plan

“We are leading the Journey to Best Outcomes for children by launching and evolving niche clinical programs (such as Adaptive Sports Medicine, Golf Medicine, Point of Care Musculoskeletal Ultrasound), and expanding our existing Play Strong Program, designed to address the exercise needs of patients who are cancer survivors, living with other medical illnesses or just kids needing to start a safe and healthy exercise-based lifestyle. We’re achieving this by developing school and community partnerships that will allow us to treat kids where they live.”

– Thomas L. Pommering, DO, Chief, Sports Medicine

Faculty

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steven C. Cuff, MD</td>
<td>Chief, Sports Medicine</td>
</tr>
<tr>
<td>Drew Dunson, MD</td>
<td>Sports Medicine</td>
</tr>
<tr>
<td>Anastasia N. Fischer, MD</td>
<td>Sports Medicine</td>
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<tr>
<td>James P. MacDonald, MD</td>
<td>Sports Medicine</td>
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<tr>
<td>Jonathan Napolitano, MD</td>
<td>Sports Medicine</td>
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<tr>
<td>René Ravindran, MD</td>
<td>Sports Medicine</td>
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<tr>
<td>Richard E. Rodenberg, MD</td>
<td>Sports Medicine</td>
</tr>
<tr>
<td>Amy E. Valasek, MD</td>
<td>Sports Medicine</td>
</tr>
</tbody>
</table>

2020 – 2021 Fellows

- Daniel Chen, MD
- Francis Comer, DO

Selected Publications


Grants Awarded

JULY 1, 2020 – JUNE 30, 2021

- $145,951

Department of Pediatrics
TOXICOLOGY

The Section of Toxicology at Nationwide Children’s Hospital provides teaching, patient care and research to improve the outcome for poisoned patients. We provide medical supervision 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, as well as poison prevention and population-based poison control. We provide important consultation resources to hospital-based and community physicians across Ohio, supporting them as they continue to treat poisoned patients in their own communities.

Highlights From the Past Year

Medical and pharmacy students, and physicians from emergency medicine, pediatrics, internal medicine, pediatric emergency medicine and child abuse training programs, benefit from rotations — now all remote in the era of COVID-19 — with the Section of Toxicology and the COPC. We teach the public through frequent media interviews and programs. We also help local, county and state governments and agencies prepare to respond effectively to mass-casualty events and to terrorism involving biological, chemical and radiological hazards, and have been a critical partner to the public health response to COVID-19. The section is an important resource for Ohio’s childhood lead poisoning prevention program. The COPC serves the citizens of 64 Ohio counties. The 22 specially trained, nationally certified nurses and pharmacists handle poison exposure cases from the public, health care professionals, health departments and emergency medical services. Certified by the American Association of Poison Control Centers, the COPC has been improving the care of poisoned patients for 63 years.

With our nationally recognized Be Poison Smart® public education program, the COPC works to reduce the incidence of childhood poisonings throughout Ohio. Our Be Poison WiseSM program helps older adults prevent poison exposures and medication mistakes. The COPC plays an important role in toxic surveillance, communications and emergency professional education in preparation for and during a community disaster. Research to describe important poisoning hazards and to reduce the incidence of poisoning is conducted with the Center for Injury Research and Policy in the Abigail Wexner Research Institute at Nationwide Children’s Hospital.

Strategic Plan

“We are leading the Journey to Best Outcomes for children everywhere by accurately describing the burdens of poisoning across the United States, supplying solid epidemiological evidence to support changes in patient care and government policy.”

– Marcel J. Casavant, MD, FACEP, FACMT, FAACT, Chief, Toxicology

Medical and pharmacy students, and physicians from emergency medicine, pediatrics, internal medicine, pediatric emergency medicine and child abuse training programs, benefit from rotations — now all remote in the era of COVID-19 — with the Section of Toxicology and the COPC. We teach the public through frequent media interviews and programs. We also help local, county and state governments and agencies prepare to respond effectively to mass-casualty events and to terrorism involving biological, chemical and radiological hazards, and have been a critical partner to the public health response to COVID-19. The section is an important resource for Ohio’s childhood lead poisoning prevention program. The COPC serves the citizens of 64 Ohio counties. The 22 specially trained, nationally certified nurses and pharmacists handle poison exposure cases from the public, health care professionals, health departments and emergency medical services. Certified by the American Association of Poison Control Centers, the COPC has been improving the care of poisoned patients for 63 years.

With our nationally recognized Be Poison SmartSM public education program, the COPC works to reduce the incidence of childhood poisonings throughout Ohio. Our Be Poison WiseSM program helps older adults prevent poison exposures and medication mistakes. The COPC plays an important role in toxic surveillance, communications and emergency professional education in preparation for and during a community disaster. Research to describe important poisoning hazards and to reduce the incidence of poisoning is conducted with the Center for Injury Research and Policy in the Abigail Wexner Research Institute at Nationwide Children’s Hospital.

Faculty

Alexandra R. Funk, PharmD, DABAT
Hannah L. Hays, MD, FACEP
Michael T. Kelley, MD, MPH, FACMT
Jason Russell, DO
Henry Spiller, MS, DABAT

Marcel J. Casavant, MD, FACEP, FACMT, FAACT
Chief

Selected Publications


Fast Facts: July 2020 - June 2021

Inpatient Toxicology Consults: 269
Peer Consults: 2,665
Toxicology Poison Center Consults: 4,591
Poison Control Exposure Cases: 35,976

Grants Awarded

JULY 1, 2020 – JUNE 30, 2021
$597,198
The Department of Anesthesiology and Pain Medicine at Nationwide Children's Hospital 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.

### Highlights From the Past Year

- **The Department of Anesthesiology and Pain Medicine** provides care at 43 different sites each day and includes the following professionals:
  - Pediatric anesthesiologists (42)
  - Palliative care physicians (5)
  - Certified registered nurse anesthetists (55)
- In 2020, the department provided anesthetic care and sedation services for approximately 32,000 procedures.
- Members of the faculty are fellowship-trained in pediatric anesthesiology and board certified in anesthesia and pain medicine by the American Board of Anesthesiology, and additional board certification is held in:
  - Pediatric critical care medicine (2)
  - Pain medicine (8)
  - General pediatrics (4)
- An attending pediatric anesthesiologist is present in the hospital at all times for emergency cases.
- We have a division of cardiac anesthesia that includes six pediatric anesthesiologists dedicated to the care of patients with acquired and congenital heart disease.
- We also have an active acute pain service that provides pain management services, including patient-controlled analgesia and regional anesthesia.
- The department also provides palliative care and hospice services with five full-time palliative care physicians.
- The fellowship program provides subspecialty training in pediatric anesthesiology for fellows in both an ACGME-accredited program and international fellows from around the world.
- Advanced subspecialty training is offered in:
  - Pediatric cardiac anesthesia
  - Pediatric regional anesthesia
  - Quality improvement and safety
  - Acute pain management
  - Chronic pain management
  - Palliative care
- Departmental research initiatives are led by a vice-chair for Academic Affairs and supported by:
  - Postdoctoral research scientists (2)
- Full-time clinical research nurses (2)
- Research associates (4)
- The department participates in an active clinical research program with numerous ongoing prospective investigations in various areas of pediatric anesthesiology and acute care medicine.
- Clinical research involves novel approaches to:
  - Airway management
  - Innovations in regional anesthesia and pain medicine
  - Perioperative implications of comorbid conditions, including obstructive sleep apnea and COVID-19
  - Use of novel pharmacologic agents in the pediatric population
  - Outcomes research and the impact of ethnicity and socioeconomic factors on perioperative care
  - Several quality improvement initiatives
- Despite the COVID-19 disruptions, the department published more than 50 manuscripts in peer-reviewed journals and presented more than 40 abstracts at national meetings in 2020.
- In response to the ongoing COVID-19 crisis, the perioperative team has continued with measures to safely and effectively maintain all operating room, procedural sedation, pain management, and palliative care services.
- Additional operating room sites and MRI coverage will be added in fall 2021 to allow for expansion of our surgical volumes and to meet the needs of newly hired surgical colleagues.
- We anticipate increases in the solid organ transplantation program and the development of a fetal surgery program.
- There will be continual growth of chronic pain initiatives, including expansion of:
  - Palliative care services
  - Inpatient rehabilitation program for patients with complex pain issues
  - Chronic pain clinic.

### Strategic Plan

“W’e are leading the Journey to Best Outcomes for children with the launch and development of a fetal surgery program. Additionally, we anticipate expansion of our abdominal transplant program. Our clinical research will continue to identify the impact of socioeconomic status and ethnicity on perioperative outcomes. These initiatives will allow us to provide novel and innovative care for children throughout the region and beyond.”

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**Faculty**

- **Director**: Joseph D. Tobias, MD
- **Chief**
  - Emmanuel Alaide, MD
  - Graciela Argote-Romero, MD
  - Rita Banoub, MD
  - Ralph Beltran, MD
  - Jason Bryant, MD
  - Candice Burrier, MD
  - Gregory Cambier, MD
  - David Martin, MD
  - Leslie Matthews, MD
  - Gregory Maves, MD
  - Christopher McKee, DO
  - Renata Miketic, MD
  - Alak Moharic, MD
  - Oluibukola Nafiu, MD
  - Aymen Naguib, MD
  - Vanessa Ng, MD
  - Ekuwa Owusu-Bediako, MD
  - Priyal Patel, DO
  - Vidya Raman, MD
  - Leila Redque, MD
  - Lance Reiland, MD
  - Devin Sanders, MD
  - Brian Schloss, MD
  - Erica Sirak, MD
  - Ashley Smith, MD
  - Steven Smith, MD
  - Timothy Smith, MD
  - Ahnaf Syed, MD

**2020 – 2021 Fellows**

- **Alok Moharic, DO**
- **Ambrish Patel, MD**
- **David Martin, MD**
- **Jason Bryant, MD**
- **Leslie Matthews, MD**
- **Gregory Maves, MD**
- **Christopher McKee, DO**
- **Renata Miketic, MD**
- **Alak Moharic, MD**
- **Oluibukola Nafiu, MD**

**Grants Awarded**

**2020 – 2021 Annual Report**

**Audit Results**

- **Department Reports**
  - ANESTHESIOLOGY AND PAIN MEDICINE
  - Highlights From the Past Year
  - Strategic Plan
  - Faculty
  - 2020 – 2021 Fellows
  - Grants Awarded

**Selected Publications**

- Bryant J, Tobias JB. Enclosure with augmented airflow to decrease risk of exposure to aerosolized pathogens including coronovirus during endotracheal intubation. Can the reduction in aerosolized particles be quantified? Pediatric Anesthesia. 2020;30:900-904.

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**Research**

- **Clinical research**
  - Innovative approaches to:
    - Airway management
    - Innovations in regional anesthesia and pain medicine
    - Perioperative implications of comorbid conditions, including obstructive sleep apnea and COVID-19
    - Use of novel pharmacologic agents in the pediatric population
    - Outcomes research and the impact of ethnicity and socioeconomic factors on perioperative care
    - Several quality improvement initiatives

**Fellowship**

- **2020-21 Annual Report**
  - Summary of training
  - Scholarship opportunities
  - Research awards
  - Clinical research
  - Faculty
  - 2020 – 2021 Fellows
  - Grants Awarded

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**Grants Awarded**

**2020 – 2021 Annual Report**

**Audit Results**

- **Department Reports**
  - ANESTHESIOLOGY AND PAIN MEDICINE
  - Highlights From the Past Year
  - Strategic Plan
  - Faculty
  - 2020 – 2021 Fellows
  - Grants Awarded

**Selected Publications**

- Bryant J, Tobias JB. Enclosure with augmented airflow to decrease risk of exposure to aerosolized pathogens including coronovirus during endotracheal intubation. Can the reduction in aerosolized particles be quantified? Pediatric Anesthesia. 2020;30:900-904.
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® and Urgent Care centers, and our freestanding Emergency Department.

Faculty

Shamil Mangray, MB, BS
Chief, Pathology and Laboratory Medicine
Section Chief, Anatomic Pathology

Kathleen K. Nicol, MD
Medical Director
Genomic Medicine Clinical Laboratory

Roshini Abraham, PhD
Peter B. Baker III, MD
Laura Biederman, MD
Daniel R. Bogue, MD, PhD
Dustin Bunch, PhD
Catherine Chung, MD
Miriam R. Conces, MD
Bonita R. Fung, MD
Sophie Jean, PhD

Affiliated Faculty

Biochemical Genetics

Dennis W. Bartholomew, MD
Kim L. McBride, MD, MS

Steve and Cindy Rasmussen Institute for Genomic Medicine Clinical Laboratory

Catherine Cotterell, PhD

Selected Publications


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. Geffius, MD, is board certified in electrodiagnostic medicine. Carl D. Geffius, MD, Karl Klamar, MD, and Reginald D. Talley, MD, are board certified in brain injury medicine.

Highlights From the Past Year

Physical Medicine and Rehabilitation was actively involved in the teaching of medical students, medical residents and fellows over the past year. We offer a pediatric rehabilitation rotation to the Physical Medicine and Rehabilitation residents from Larkin Community Hospital and the Palm Spring Branch of Larkin. Presentations on pediatric rehabilitation, concussion, neuromuscular disorders, musculoskeletal disorders, spasticity management and pediatric traumatic brain injury were made at local, regional, national and international levels.

Clinically, we provide services to the multidisciplinary brachial plexus team, the wheelchair seating and equipment clinic, and the EMG laboratory. We also continue services to our CARF (Commission on Accreditation of Rehabilitation Facilities)-accredited inpatient rehabilitation unit, the inpatient consult service and the following outpatient clinics: general rehabilitation, myelomeningocele, botulinum toxin, concussion, gait lab, neuro-oncology and non-accidental traumatic brain injury.

Faculty

Michelle A. Miller, MD
Chief

Carl D. Geffius, MD
Amy D. Hiller, DO
Karl W. Klamar, MD
Wilawan Nopkhun, MD
Jonathan S. Pedrick, MD
Nathan S. Rosenberg, MD
Reginald D. Talley, MD

2020 – 2021 Fellow
Noel Pristas, MD

Fast Facts: July 2020 - June 2021

- Inpatient Discharges: 92
- Observation and Outpatient-in-a-Bed Discharges: 1
- Total Discharges: 93
- Average Length of Stay*: 28.2
- Average Daily Census*: 7.1

- Patient Days*: 2,595
- Inpatient Consults: 446
- Number of Beds: 12
- Physical Medicine Clinic Visits: 5,798
- Myelomeningocele (Spina Bifida) Clinic Visits: 692

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

Improving Suicide Prevention by Examining Characteristics and Precipitating Circumstances Among Children Aged 5 to 11 Years

Suicide is the eighth leading cause of death among youth aged 5 to 11 in the United States, and suicide rates in this age group increased nearly 15% annually between 2012 and 2017, according to the Centers for Disease Control and Prevention. However, research on suicide deaths among this age range has been limited.

To address this gap, a team of researchers led by Donna Ruch, PhD, a research scientist in the Center for Suicide Prevention and Research at Nationwide Children’s Hospital, and Jeff Bridge, PhD, director of the center, examined common characteristics and precipitating circumstances of youth suicide deaths using the National Violent Death Reporting System (NVDRS). Their study is published in JAMA Network Open.

Results showed that suicide in children is most often associated with mental health concerns, prior suicidal behavior, trauma — including abuse or neglect, exposure to domestic violence, suicide or the death of a family member — or peer, school or family-related problems. Suicide deaths were commonly preceded by a negative or “triggering” event on the day of death such as an argument between the child and a family member or a disciplinary action.

Researchers found children in the study were disciplined on the day of suicide in 32% of cases. Disciplinary actions often followed a school-related issue or an argument between children and their parent or guardian and involved sending children to their bedrooms in half of cases or taking away a technological device in 29% of cases.

“We found these major themes were often co-occurring,” says Dr. Ruch. “Children with mental health concerns or a history of suicidal behavior often had traumatic histories related to adverse family situations. School problems frequently resulted in parent-child conflicts and were more likely to occur in children with mental health concerns.”

The study also found common patterns in how the suicide deaths occurred. While most suicides in this age group occurred by hanging/suffocation in the child’s bedroom, 19% occurred by firearm. In all cases where detailed information on these deaths was available, children had obtained unsecured guns from within their homes, where they were stored loaded, unlocked, with ammunition or otherwise unsafely.

“These findings underscore the importance of early suicide prevention efforts that include improvements in suicide risk assessment, family relations and lethal means safety, particularly safe firearms storage,” says Dr. Bridge.

REFERENCE:
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.

Care is typically delivered by a team composed of a combination of child and adolescent psychiatrists, developmental and behavioral pediatricians, psychologists and neuropsychologists, nurses, social workers, family therapists and counselors. By working together, we aim to deliver team-based care that transcends the work of individual professionals, incorporating evidence-based practices into active clinical settings and establishing high standards of quality, safety and customer satisfaction.

Faculty from the Department of Pediatrics and the Child and Adolescent Division of the Department of Psychiatry and Behavioral Health provide clinical care for the service line. In March 2020, Nationwide Children’s opened the Big Lots Behavioral Health Pavilion, a new facility fully dedicated to children and adolescents with mental and behavioral health conditions. As the most comprehensive pediatric facility of its kind nationally, the Pavilion houses integrated behavioral health services, including inpatient psychiatric beds, a psychiatric crisis evaluation center with observation beds, a crisis stabilization unit, a partial hospital (which opened in July 2020), and intensive outpatient and outpatient programs. The Pavilion serves as a place to conduct trainings for the wide range of disciplines in pediatric mental and behavioral health, as well as foster collaboration with Nationwide Children’s research teams and community partner agencies. The service line has hosted representatives from several pediatric hospitals and behavioral health organizations that have asked to visit and learn about the design and service delivery at the Big Lots Behavioral Health Pavilion.

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 about 250,000 outpatient visits completed in the last year, clinical services within behavioral health serve as a setting for training a wide range of disciplines. Associated training programs include pre-professional internships in psychology, social work and clinical counseling; fellowships in child and adolescent psychiatry and in developmental behavioral pediatrics; postdoctoral psychology fellowships in pediatric psychology, neuropsychology, child clinical, intellectual and developmental disabilities and autism treatment; a postgraduate fellowship program in child and adolescent mental health for advanced practice nurses; and externships for psychiatric and mental health advanced practice nurses, clinical counselors, social workers, family therapists and psychologists. In addition, medical students, residents in psychiatry, pediatric and family practice, and nursing students all have training experiences and rotations within the service line. The service line supports a diverse portfolio of clinical research studies, many of which are led by investigators from the Center for Biobehavioral Health, the Center for Suicide Research and Prevention, and the Child Development Center Research Program, as well as collaborations with the Steve and Cindy Rasmussen Institute for Genomic Medicine. By integrating clinical, educational, research and advocacy efforts, we strive to improve the lives of children and families in central Ohio and beyond. The programs within Behavioral Health Services are described below.

The Child Development Center and Center for Autism Spectrum Disorders provide services to individuals with intellectual and developmental disabilities, including those with autism spectrum disorders. The Child Development Center offers a wide 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.

These services include interdisciplinary assessment and treatment; psychological evaluation and treatment, family interventions, advocacy support and care coordination with medical, speech and additional services. The Child Development Center provides integrated care in more than a dozen pediatric subspecialties. It also serves as a site for Autism Speaks’ Autism Care Network, which has more than 30 sites across the United States and Canada. CDC psychologists are also involved in several other national research networks including the Simmons Foundation SPARK Autism Network, the largest genetic research registry for individuals with autism spectrum disorder.

The Center for Autism Spectrum Disorders 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’s counseling, social skills groups, parent teaching, advocacy and community education.

Pediatric Psychology and Neuropsychology provides clinical services in two 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 attention disorders, learning disabilities, autism spectrum disorders, academic challenges, anxiety or depression. Pediatric Neuropsychology provides 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). The service provides care throughout the hospital, including inpatient medical units, medical specialty outpatient clinics and the Psychology Clinics. Psychologists act as liaisons to divisions within the departments of Pediatrics and Psychiatry to provide expertise in clinical care and to assist in development of research and quality initiatives around the psychosocial care for patients and families. In 2020, Pediatric Psychology continued to provide inpatient consultation and liaison, and outpatient services. One area of continued expansion has been integrating pediatric psychologists into our Primary Care Centers with new integration sites added in 2020. Also, Pediatric Psychology expanded integrated care within Complex Care, Pediatric Rehabilitation, Adolescent Medicine and Orthopedics. Psychologists further developed psychiatric acute care services on a larger scale in the Big Lots Behavioral Health Pavilion. Additionally, there is a history of psychologists providing leadership in several programs within the Department of Pediatrics at Nationwide Children’s, with roles as director of Psychosocial Services for the Division of Hematology, Oncology & Blood and Marrow Transplant, psychosocial leadership in areas of gastrointestinal care and the Newborn Intensive Care Unit, program leadership in the interdisciplinary feeding program for children with feeding problems, and the comprehensive interdisciplinary pain program. Pediatric Psychology continued to provide leadership for the Nationwide Children’s Intensive Pain Rehabilitation and Education Program in its first year of operation and started to provide clinical leadership in the On Our Sleeves initiative.

See page 119 for a list of faculty, selected publications and grants awarded.

Psychiatry and Community Behavioral Health is the largest and most clinically diverse section of Behavioral Health Services. This integrated program of care for pediatric mental disorders spans a comprehensive spectrum, from prevention services to inpatient psychiatric units. Services
currently available include pediatric crisis assessment and treatment within an expanded Youth Crisis Stabilization Unit, consultation-liaison services for youth who are hospitalized at Nationwide Children’s, psychiatric inpatient beds at Nationwide Children’s, Partial Hospital Program, multiple levels of care for eating disorders 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 a novel program to integrate mental health service delivery in primary care settings. Over the past year, the focus has been on refining and expanding services at the new Big Lots Behavioral Health Pavilion. See page 143 for a list of faculty, selected publications and grants awarded.

Center for Biobehavioral Health: See page 199 for information about the Center for Biobehavioral Health in the Abigail Wexner Research Institute at Nationwide Children’s Hospital.

**Fast Facts: July 2020 - June 2021**

- Child Development Center Visits: 11,002
- Child Development Center Medical Clinic/Outpatient Consultation Visits: 1,665
- Center for Autism Spectrum Disorders Visits: 40,105
- Total Outpatient Visits/Consults: 263,829
- Total Inpatient Consults: 5,293
- Total Inpatient Discharges: 2,196
- Total Inpatient Days: 13,466

**Grants Awarded to Clinical and Research Faculty**

**JULY 1, 2020 – JUNE 30, 2021**

$6,596,627
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 Child and Family Division in The Ohio State University Department of Psychiatry and Behavioral Health has faculty at Nationwide Children’s. See page 143 for details and for information about all Behavioral Health services.

Faculty

David A. Axelson, MD
Chief

Robert A. Kowatch, MD, PhD
Rajeev Krishna, MD, PhD, MBA
Scott Leibowitz, MD
Alana Moses, PhD
Petronella Mbu, MD
Gina McDowell, LPC-S

Joyce Chen, MD
Nancy Cunningham, PsyD
Benjamin Fields, PhD
Mary Fristad, PhD
Michael Flores, PhD
Bela M. Gandhi, MD
Richard H. Gilchrist, MD
Charles J. Glawe, MD
Jocelyn Hart, MD
Karah Harvey, MD, MPH
Amy Hoisington-Stable, MD
Geeta Ilipilla, MD
Natalie Jacobowski, MD
Kristina R. Jiner, MD
Anna Kerlek, MD
Oula Khoury, PhD

Mentor Ackerman, PhD
Benjamin Albrecht, DO
Kento Akasaka, DO
Samantha Boddapati, PhD
Jeffrey A. Bridge, PhD
Eric Butter, PhD
Catherine Butz, PhD
Meredith Chapman, MD

John Ackerman, PhD
Benjamin Albrecht, DO
Kento Akasaka, DO
Samantha Boddapati, PhD
Jeffrey A. Bridge, PhD
Eric Butter, PhD
Catherine Butz, PhD
Meredith Chapman, MD

Joyce Chen, MD
Nancy Cunningham, PsyD
Benjamin Fields, PhD
Mary Fristad, PhD
Michael Flores, PhD
Bela M. Gandhi, MD
Richard H. Gilchrist, MD
Charles J. Glawe, MD
Jocelyn Hart, MD
Karah Harvey, MD, MPH
Amy Hoisington-Stable, MD
Geeta Ilipilla, MD
Natalie Jacobowski, MD
Kristina R. Jiner, MD
Anna Kerlek, MD
Oula Khoury, PhD

Selected Publications


Strategic Plan

“We are leading the Journey to Best Outcomes for children everywhere by developing one of the most comprehensive systems of pediatric behavioral health services in the nation. It will serve as a model for other hospitals to emulate.”

David A. Axelson, MD, Chief, Psychiatry and Community Behavioral Health

Grants Awarded

JULY 1, 2020 – JUNE 30, 2021
$1,387,760

Community-Based Therapy Visits: 37,967
Office-Based Therapy Visits: 99,830
Partial Hospital/Intensive Outpatient Program Visits: 4,342
Psychiatric Crisis Department: 7,178
Psychiatry Clinic Visits: 27,960
Psychiatry Inpatient Consultations: 1,150
Psychiatry Inpatient Unit Discharges: 913
Youth Crisis Stabilization Unit Discharges: 1,285

Fast Facts: July 2020 - June 2021
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/renatinal, 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

Highlights From the Past Year

Radiology has had several clinical advancements over the past year. Most notably, we have grown subspecialized programs to include:

- Cardiac imaging: establishing a clinical 4D flow program using blood pool contrast agent to reduce imaging scan time for adult congenital heart disease
- Body imaging: introduction of a new ultrasound contrast program for liver lesions in collaboration with Hepatology
- Oncologic imaging: utilizing tumor metrics to quantify tumor mass and measure impact of novel targeted antibody treatment
- Neuroimaging: utilizing tumor metrics program to support multi-institutional collaborations
- Vascular anomalies: creating new lymphatic channel imaging and intervention programs, and the formalization and expansion of the multidisciplinary hemangioma and vascular malformations clinic

Finally, we have several advancements in research. Our Interventional Radiology team is administering targeted gene delivery to support gene therapy research. We have been a key imaging partner for the tissue engineering group. A biomechanical flow lab was established with a focus on patient-specific 3D printing and biomechanical flow modeling to enhance understanding of the cause of poor outcomes in pediatric cardiovascular disease and promote patient specific treatment options.

Our imaging faculty lead and promote multi-institutional data sharing through large patient registries, including the Imaging Registry for Orphan and Rare Disease (IRORI) at the American College of Radiology and its association with PEDSnet, the Fontan Outcome Registry Using Cardiovascular Magnetic Resonance Imaging Examinations (FORCE), and the Society of Cardiovascular Magnetic Resonance imaging registry.

Strategic Plan

“Radiology is leading the Journey to Best Outcomes for children everywhere by working with colleagues across the institution to expand the Hemangioma and Vascular Malformations Clinic, bringing together a highly skilled interdisciplinary team of pediatric specialists to provide coordinated and comprehensive care for patients with vascular anomalies. Cutting-edge research and development of advanced diagnostic imaging techniques, in addition to comprehensive genetic evaluation through collaboration with the Steve and Cindy Rasmussen Institute for Genomic Medicine, allows the team to provide comprehensive evaluation, diagnosis and management of vascular tumors and complex vascular anomalies.”

—Anna Lillis, MD, PhD, Co-director, Hemangioma and Vascular Malformations Program

“Radiology is leading the Journey to Best Outcomes for children everywhere by offering minimally invasive image guided procedures to treat benign bone tumors such as aneurysmal bone cysts… treating benign diseases with benign treatments to cure patients and achieve rapid full recovery.”

—James Murakami, MD, Interventional Radiology

2020 – 2021 Fellow

PEDIATRIC CARDIOVASCULAR IMAGING

Eric Morgan, MD, PhD

Selected Publications


Kirsch CE, Ho ML. Advanced magnetic resonance imaging of the skull base. Seminars in Ultrasound, CT and MR. 2021 Jun;42(3):229-252.


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

- Cardiothoracic Surgery
- Colorectal and Pelvic Reconstruction
- Dentistry
- Neurosurgery
- Ophthalmology
- Orthopaedics
- Otolaryngology
- Pediatric and Adolescent Gynecology
- Pediatric Surgery
- Plastic and Reconstructive Surgery
- Transplant
- Trauma
- Urology

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 49 for details about The Heart Center.

Faculty

- Mark E. Galantowicz, MD
  - Chief, Cardiothoracic Surgery
  - Co-Director, The Heart Center
- Sergio A. Carrillo, MD
  - Pediatric Cardiothoracic Surgeon
- Patrick I. McConnell, MD
  - Director, Cardiopulmonary Mechanical Assist Program
- Toshiharu Shimoka, MD, PhD
  - Director, Cardiovascular Tissue Engineering Program

Selected Publications


Grants Awarded to The Heart Center and Cardiovascular Faculty

JULY 1, 2020 – JUNE 30, 2021

$1,724,890
Surgical Services

COLORECTAL AND PELVIC RECONSTRUCTION

The Center for Colorectal and Pelvic Reconstruction 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. Colorectal and Pelvic Reconstruction is the busiest program of its kind anywhere in the world, having performed more than 764 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 lifetime. Our team is committed to providing optimal outcomes and quality of life for patients ranging from newborns, through toilet training, puberty, and adulthood, including bowel, urinary, sexual function and childbirth.

Highlights From the Past Year

The Center for Colorectal and Pelvic Reconstruction complex reconstruction program, working closely with urologists, gynecologists and gastroenterologists, continues to help children from around the world, providing guidance and surgery for children from all 50 states and 73 countries. The use of minimally invasive surgery has expanded as well, offering both robot-assisted and pure laparoscopic surgical treatment of complex conditions, including bladder neck reconstruction, and appendicovesicostomy and/or Malone procedures for severe incontinence, both urinary and fecal, and offering unique opportunities to share tissues such as a shared appendix used for both procedures. The Colorectal and Pelvic Reconstruction team travels to provide surgical education across the globe. Surgeons train fellow surgeons and nurses train fellow nurses. The Center for Colorectal and Pelvic Reconstruction has a growing transition of care program for children as they become young adults and move into adulthood. With the expertise of Alessandra Gasior, DO, the first surgeon in the world trained in both pediatric and adult colorectal surgery, this unique program will collaborate with The Ohio State University Wexner Medical Center. The center has changed the lives of many adult patients through our collaborative approach to care.

Clinical Leaders

Kristina Booth, MSN, CFNP
Natalie Rose, BSN, RN

Advance Practice Nurse Coordinator
Donalisa Nash, MS, CFNP-PC

Business Office Coordinator
Kelly Gibson, MHA

2020 – 2021 Fellows

Pediatric Colorectal Research
Hira Ahmad, MD

Pediatric Colorectal Surgery
Robert Michael Dorman, MD

International Pelvic Reconstruction
Dr. Batang Nimako
(Anokeye Teaching Hospital, Kumasi, Ghana)
Dr. Naem Liapat
(Medicare Hospital, Rawalpindi, Pakistan)

Selected Publications


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.

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. The department has maintained excellence in joint specialty care with our Periodontics Clinic and Trauma Clinic. Dental care was disrupted due to COVID-19 for many families, so we have been treating children with more complex dental needs. To reduce barriers to accessing dental care, the department has launched a school-based dentistry program in the Columbus area in collaboration with School Based Health and Care Connection. To continue to improve clinical access to care, Chelsea Shellhart, DDS, has been recruited.

National and local faculty and resident recognitions:

- Homa Amir, DDS, DS, MPH, received funding for Ohio Medicaid, Medicaid Equity Simulation Project, “What about me? Simulating health care experiences of low-income, minority youth and increasing access to HPV vaccine information.
- Ehsan Azadani, DDS, MS, was awarded the Dean’s Award for Research Excellence for the social and behavioral sciences and public health research paper of the year.
- Ashok Kumar, DDS, MS, completed the Nationwide Children’s Hospital Medical Leadership Program.
- Janice Townsend, DDS, MS, was awarded the Dr. Ronald A. Bell Mentor of the Year Award from the College of Diplomates of the American Board of Pediatric Dentistry.

Research (funded) highlights:

- Improved Access to Care with Homa Amir, DDS, MPH, MS
- Oral Microbiome Studies with Ann Griffen, DDS, MS, and research team, The Ohio State University College of Dentistry
- Postdoctoral Training Grant with Kimberly Hammersmith, DDS, MPH, MS

Faculty

Janice A. Townsend, DDS, MS Chief

Peter E. Larsen, DDS Section Chief, Oral and Maxillofacial Surgery
Dennis J. McGrath, DDS, MS
Anita M. Mercado, DMD, MS, PhD
Beau Meyer, DDS, MPH

Gregory M. Ness, DDS
Diego A. Solis, DDS

Community-Based Dentists

Ashley E. Anderson, DDS
Carolyn A. Barber, DDS

Kimberly M. Gill, DDS, MS
Jillian N. Gray, DDS
Marcus Heffner, DDS
Mitzi L. Hines, DDS
Nicole Johnson, DDS
Gary M. Jodid, DDS

Patrick M. Kennedy, DDS
Nicholas M. Korns, DDS, MS
Benjamin Kwok, DDS, MS
Joshua M. Leavitt, DMD, MS
Jeffrey S. Lee, DDS
Eileen M. Martinez, DDS

Monte E. Masonbrink, DDS, MS
Yoon-MI. L. Matracia, DMD, MS
Jeffrey T. Milton, DDS, MS
Kara M. Morris, DDS, MS
Cecilia A. Moy, DDS, MS
Andrea M. Myers, DDS

Matthew L. Pingle, DDS
Jessica Pitano, DMD
Mitchell Poole, DDS, MS
Mindy A. Price, DDS, MS
Sidney D. Price, DDS, MS
Joel J. Richards, DDS

Adam Richardson, DDS, MS
Shaun A. Rotenberg, DMD, MS
Annie L. Sandhu, DDS
Martha M. Shah, DDS, MS
Anuradha Sharan, DDS
David S. Silverglade, DDS, MS

Kimberly Hammersmith, DDS, MPH, MS
Ashok Kumar, DDS, MS

OSU-Affiliate Faculty

Hany A. Enam, BDS, MS
Henry W. Fields, DDS, MS, MSD
Ann Griffen, DDS, MS
Rosa Ortega, DDS, MS
Chelsea Shellhart, DDS

Janice A. Townsend, DDS, MS, Chief, Dentistry

“Are we leading the Journey to Best Outcomes by helping children where they are to provide health equity and improved population health by implementing our new collaboration with Care Connection and School Based Health.”

— Janice A. Townsend, DDS, MS, Chief, Dentistry
2020 – 2021 Residents

- Philip Barras, DMD
- Bradley Bennet, DMD
- Erin Bibber, DMD
- Natalie Bussard, DDS
- David Danesh, DMD
- Michael Davis, DDS
- Marlee Hansen, DDS
- Kayla Kopcynski, DDS
- Jennifer Lee, DMD
- Kyulim Lee, DMD
- Ina Mulo, DDS
- Lana Richardson, DDS
- Alison Riley, DDS
- Brittany Schweiger, DDS
- Warren Spencer, DDS
- Kristen Sweeney, DMD
- Casey White, DMD
- Sheaffer Yinger, DDS

Selected Publications


Grants Awarded to Clinical and Research Faculty

**JULY 1, 2020 – JUNE 30, 2021**

$469,569

**Fast Facts: July 2020 – June 2021**

- Inpatient Discharges: 3
- Observation and Outpatient-in-a-Bed Discharges: 20
- Total Discharges: 23
- Average Length of Stay*: 1.3
- Patient Days*: 4
- Dental Clinic Visits: 28,230
- Dental Clinic and Sedation: 422
- Total Surgical Procedures: 3,702

*Excludes observation and outpatient-in-a-bed patients
With over 850 surgical cases and more than 5,500 clinic visits performed annually, the Department of Pediatric Neurosurgery has continued with significant growth. Outreach efforts have been successful, as the team has provided care to patients from all around the world, including 36 states and nine countries. The pediatric epilepsy surgery program is steadily expanding and is on pace to perform over 50 epilepsy cases this year. The Selective Dorsal Rhizotomy Program continues to provide comprehensive care for patients with spastic cerebral palsy, including care provided by colleagues in Physical Medicine and Rehabilitation, as well as in Therapy Services. Our program is one of very few in the country that perform this procedure with great success. Our out-of-state referrals have grown significantly, as demonstrated by increases in new patient clinic visits, inpatient hospital days and case volume.

The scholarly output of the program has increased markedly with over 35 publications (journals, chapters and manuscripts) and 20 presentations in national and international meetings. We have enrolled over 650 patients in either clinical trials or registry projects, and as a member of the Hydrocephalus Clinical Research Network, we continue to participate in multi-institutional studies focusing on the treatment of hydrocephalus. In particular, Dr. Drapeau has several research and quality improvement projects focusing on optimizing care for craniostenosis patients. Our 2018-19 fellow, Ammar Shaikhouni, MD, PhD, is a faculty member working with both Nationwide Children’s and The Ohio State University Wexner Medical Center. He has a clinical and research focus on both adult and pediatric epilepsy, movement disorders and stereotactic surgery for gene and drug delivery. Jeffrey R. Leonard, MD, continues his focus on spasticity, cerebral palsy and improving treatment for childhood brain tumors. He is currently participating as the neurosurgical lead for a multi-institutional collaboration dedicated to treatment of cerebral palsy in the pediatric and adult populations. He also serves on the editorial boards and Scientific Peer Review Panel for SRA International, Journal of Pediatric Neurology, and Journal of Neurosurgery (Pediatrics), and is an associate editor of Neurology (Pediatrics).

**Highlights From the Past Year**

The role of immunology in traumatic brain injury and is the trauma liaison for the department. Both have submitted and presented multiple abstracts at national meetings over the last year. Annie I. Drapeau, MD, is co-director of the Craniosynostosis Program, a multidisciplinary program led jointly by Neurosurgery and the Center for Complex Craniofacial Disorders. She is the medical co-director of the neurosurgery/neurology inpatient floor and is the Department of Neurosurgery’s quality improvement lead. Dr. Drapeau has several research and quality improvement projects focusing on optimizing care for craniostenosis patients. Our 2018-19 fellow, Ammar Shaikhouni, MD, PhD, is a faculty member working with both Nationwide Children’s and The Ohio State University Wexner Medical Center. He has a clinical and research focus on both adult and pediatric epilepsy, movement disorders and stereotactic surgery for gene and drug delivery. Jeffrey R. Leonard, MD, continues his focus on spasticity, cerebral palsy and improving treatment for childhood brain tumors. He is currently participating as the neurosurgical lead for a multi-institutional collaboration dedicated to treatment of cerebral palsy in the pediatric and adult populations. He also serves on the editorial boards and Scientific Peer Review Panel for SRA International, Journal of Pediatric Neurology, and Journal of Neurosurgery (Pediatrics), and is an associate editor of Neurology (Pediatrics).
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. We also provide special testing on 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. In addition, the Eye Clinic offers subspecialty clinics staffed by ophthalmologists for patients with issues related to glaucoma, retina, ocuplastics, cornea and external disease, intracranial hypertension and low vision.

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. We are participating in multiple research projects including those involving amblyopia, cataract, myopia, and retinopathy of prematurity (ROP) studies sponsored by the Pediatric Eye Disease Investigator Group. We are actively engaged in studies focused on preserving vision in children with Batten disease. We continue to do research on projects concerning infantile cataracts, intracranial hypertension, secondary intraocular lens placement, pediatric drusen and children with cystic fibrosis. We are also one of only 15 sites currently participating in the multicenter Artisan Aphakia Lens study. The Artisan Aphakia Lens is unique because it is fixed to the iris and therefore allows for lens implantation in patients who do not have the support structure for a traditional implant. Without an implant lens, these children must wear extremely strong and cosmetically unappealing glasses or highly customized, and often poorly tolerated, hard contact lenses. These patients now have an option to enjoy life with a more normal visual function. These lenses are not FDA approved, and we expect this study will help gain future FDA approval.

The Visual Electrophysiology Clinic at Nationwide Children’s is led by Julie Racine, Ph.D. This clinic performs electroretinograms, multifocal electroretinograms, electro-oculograms and visual evoked potential on patients of all ages, including adults, to assess retinal and retino-cortical function. Our department also manages and acts as the physical location for the office of the Ohio Amblyope Registry program (funded by the Ohio Department of Health’s Save Our Sight Fund), the first and only statewide program in the United States designed to serve the needs of children with amblyopia. It is a voluntary registration program to increase knowledge about amblyopia, its causes, prevention and treatment options. It also provides free eye patches and other helpful services to help families with children with amblyopia.

The department is equipped with state-of-the-art technology for utilization in standard dilated eye exams and for specialty testing, including ultrasound (A/B scans), retinal photography, visual field, optical coherence tomography (OCT), intraocular and oral fluorescein angiography, autorefracraion, tonometry, color vision and contrast sensitivity testing. We are proud to serve patients from across the country and the world.

Our vision of providing comprehensive care for all children includes our plan during the upcoming year to expand our clinical space. This will allow us to develop a robust contact lens service and provide the physical space to grow our low vision clinic. We are committed to providing the necessary subspecialty eye care our patients need. We are committed to continue recruiting top candidates.

Faculty

Full-Time Nationwide Children’s Faculty

Don L. Bremer, MD
Cyttl B. Cassidy, MD
Richard P. Golden, MD
Hillary E. Inger, MD
Catherine Olson Jordan, MD

David L. Rogers, MD
Chief

Julie M. Lange, MD
Mary Lou McGregor, MD
Gary L. Rogers, MD
Amanda L. Way, MD

OSU-Affiliate Faculty

Sayoko Morii, MD, PhD
Chair, Ophthalmology and Visual Sciences

N. Douglas Baker, MD
Dominic M. Buzzacco, MD
Kenneth V. Cahill, MD
Colleen M. Cebulla, MD
Megan M. Chambers, MD
Raymond I. Cho, MD
Louis J. Chorich III, MD
Frederick H. Davidsor, MD

Selected Publications


Grants Awarded

JULY 1, 2020 – JUNE 30, 2021

Inpatient Discharges: 1
Inpatient Consults: 1,790

Fast Facts: July 2020 - June 2021

Inpatient Discharges: 1
Observation and Outpatient-in-a-Bed Discharges: 6
Total Discharges: 7
Total Surgical Procedures: 1,554

Inpatient Consults: 1,790

Eye Clinic and Low Vision Eye Clinic Visits: 9,239

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

Strategic Plan

“We are leading the Journey to Best Outcomes for children everywhere by launching and evolving groundbreaking clinical programs, like the new Cornea Clinic. We continue to grow and expand our specialty services to ensure we bring world class care to our region.”

David L. Rogers, MD, Chief, Ophthalmology

Jill A Foster, MD
Johnstone M. Kim, MD
Dino D. Klosovic, MD
Carrie A. Kueneman, MD
Curtin G. Kelley, MD
Christina Martinez, MD
Cameron B. Nibavi, MD
Matthew P. Ohr, MD
Tyler Ossory, MD
Daniel G. Straka, MD
Ana M. Suelves Cogollos, MD

JULY 1, 2020 – JUNE 30, 2021

$500,000

NATIONWIDE CHILDREN’S HOSPITAL | 2020-21 Annual Report | NationwideChildrens.org/2021-Report
**Orthopaedics**

**Surgical Management of Recurrent Patellar Instability in the Pediatric Population**

In a recent study published in *Journal of Pediatric Orthopedics*, researchers from Nationwide Children’s Hospital demonstrate the safety and efficacy of the quadriceps turndown technique for medial patellofemoral ligament reconstruction in pediatric and adolescent patients.

Patellar instability is a common knee condition in children and adolescents. Rates of recurrent instability following a lateral patellar dislocation approach 50%, and these patients often require surgical intervention.

Several surgical procedures have been described to help address recurrent patellar instability. Medial patellofemoral ligament (MPFL) reconstruction using the quadriceps turndown technique is one procedure, performed to restore medial stability of the knee. While this technique has been studied in adults, data are lacking in adolescents.

In the new study, researchers reviewed the results of MPFL reconstructions via the quadriceps turndown technique in pediatric patients seen at Nationwide Children’s between 2011 and 2018. They evaluated the functional outcomes and instances of recurrent patellar instability following 36 MPFL reconstructions using the technique.

“This operation works well and markedly reduces the risk of recurrent instability with resumption of daily living within two months of surgery and a reproducible return to pre-injury levels of sport anywhere from three to five months after surgery,” says Kevin Klingele, MD, chief of Orthopedic Surgery, surgical director of Sports Medicine at Nationwide Children’s and the study’s senior author.

In addition to the positive functional outcomes, patients who underwent the quadriceps MPFL reconstruction also reported high satisfaction and low pain scores.

Dr. Klingele says the results confirm what he and his colleagues suspected: The quadriceps turndown technique is a safe and effective surgical management option for young patients with recurrent patellar instability.

“This technique has become our go-to for patients that require a more formal MPFL reconstruction,” says Dr. Klingele.

“We have used this approach to take care of younger patients, and it has resulted in good outcomes in terms of recurrent instability while avoiding some of the risk factors and potential problems that can occur with other types of reconstruction.” – Kevin Klingele, MD

**REFERENCE:**

Surgical Services

ORTHOPAEDICS

The Department of Orthopaedics 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 of their pediatric orthopedic experience at Nationwide Children’s. The Accreditation Council for Graduate Medical Education-accredited fellowship program rounds out the extensive educational program.

Highlights From the Past Year

In 2020-2021, the Department of Orthopaedics maintained its stature as a top-10-ranked pediatric orthopedic provider, developed surgical innovative techniques and protocols, and maintained its role as one of the most academically productive surgical departments.

Surgical innovation within the Center for Hip Preservation focused on developing a novel method of ligamentum teres reconstruction for the management of developmental dysplasia of the hip. This technique showed early success in maintaining hip stability following open reduction without the need for prolonged, postoperative cast immobilization. In addition, collaborative efforts between Plastic Surgery, our Bone Tumor Clinic and our Limb Deficiency Clinic continued to highlight the benefit of a novel amputation technique called targeted muscle re-innervation (TMR). This type of surgical innovation has shown significantly improved functional outcome and diminished pain for pediatric amputees.

The Department of Pediatric Orthopaedics published a study in April 2021 (see Selected Publications) that is the first of its kind to document excellent outcomes of a novel surgical technique now performed routinely by our surgeons in the pediatric and adolescent athlete. Medial patellofemoral ligament (MPFL) reconstruction utilizing a quadriceps turndown technique shows excellent short- and long-term results in the management of patellar instability.

Selected Publications


Fast Facts: July 2020 - June 2021

Inpatient Discharges: 503
Observation and Outpatient-in-a-Bed Discharges: 652
Total Discharges: 1,155
Average Length of Stay*: 3.5
Average Daily Census*: 4.8
Patient Days*: 1,746
Total Surgical Cases: 3,006
Inpatient Consults: 244
Main Campus Orthopaedic Clinic Visits: 17,080

OSU-Affiliate Faculty
John Alexander, MD
Hisham M. Awad, MD
Joel L. Mayerson, MD
Thomas J. Scharbach, MD

Community-Based Faculty
Brent A. Bickel, MD
Craig N. Dimiris, MD
Jonathan B. Feibel, MD
Robert T. Gonsline, MD

Full-Time Nationwide Children's Faculty
Allan C. Beebe, MD
Matthew C. Beran, MD
Reid C. Chambers, DO
Christopher A. Iobst, MD
Jan E. Klamar, MD
Julie Balch Samora, MD, PhD, MPH
Walter P. Samora III, MD
Craig A. Smith, MD

Adam S. Martin, MD
James E. Popp, MD
Corey L. Van Hoff, MD
Raymond K. Warapa, MD

2020 – 2021 Fellow
Kevin E. Klingele, MD
Chief

Craig A. Smith, MD
Walter P. Samora III, MD
Julie Balch Samora, MD, PhD
Jan E. Klamar, MD
Christopher A. Iobst, MD

Reid C. Chambers, DO
Brent A. Bickel, MD
Craig N. Dimiris, MD
Jonathan B. Feibel, MD
Robert T. Gonsline, MD

Kevin E. Klingele, MD
Chief

“Strategic Plan
“The Department of Orthopaedics continues to lead the Journey to Best Outcomes for children everywhere by utilizing and developing novel surgical techniques. Innovation drives the surgical future of pediatric care, guaranteeing the best and safest treatment options.”

— Kevin E. Klingele, MD, Chief, Orthopaedics

Faculty
postoperative pain regimens. In addition, we have reduced less painful tonsillectomy technique and adopting novel tonsillectomy. This has been achieved by shifting to substantially reduced readmission rates for pediatric for pediatric ears, nose and throat patients. We have The department continues to pursue the best outcomes sleep apnea, skull base tumors, salivary gland problems and many other related diseases.

The Department of Pediatric Otolaryngology, Head and Neck Surgery at Nationwide Children's Hospital provides comprehensive diagnosis 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.

Highlights From the Past Year

The department continues to pursue the best outcomes for pediatric ears, nose and throat patients. We have substantially reduced readmission rates for pediatric tonsillectomy. This has been achieved by shifting to less painful tonsillectomy technique and adopting novel postoperative pain regimens. In addition, we have reduced the use of narcotics in this population by 95%, making Nationwide Children’s one of the safest places for pediatric otolaryngology surgery. We continue to provide outstanding care with more than 30,000 clinic visits and more than 6,000 surgeries performed.

Faculty

Full-Time Nationwide Children’s Faculty

- Spencer Lindsey, MD
- Prashant S. Malhotra, MD, FAAP, FACS
- Meredith Merz-Lind, MD, FAAP, FACS
- James M. Ruda, MD
- Patrick C. Walz, MD
- Gregory J. Wiet, MD, FAAP, FACS

OSU-Affiliate Faculty

- Amit Agrawal, MD
- Eugene Ge-Hink Cho, MD
- Brad W. deSilva, MD
- Edward E. Dodson, MD
- Garth F. Essig Jr., MD
- L. Arick Forrest, MD
- Brandon Kim, MD

Community-Based Faculty

- Alexander A. Farag, MD
- Alfred J. Fleming Jr., MD
- Akash Gupta, MD
- Joseph E. Hall, MD
- Jeffrey B. Hiltbrand, MD
- Steven M. Hirschl, MD
- Clifton R. Hood, DO
- Richard T. Irene, MD
- Scott T. Kramer, MD
- Michael J. Loochlan, MD
- James D. Lowery, MD
- Michael D. Martyr, MD
- Douglas D. Massick, MD
- Timothy J. Nash, DO

Otolaryngology

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.

Selected Publications


Fast Facts: July 2020 - June 2021

- Inpatient Discharges: 54
- Observation and Outpatient-in-a-Bed Discharges: 1,567
- Total Discharges: 1,621
- Average Length of Stay*: 4.0
- Average Daily Census*: 0.6
- Patient Days*: 217
- Total Surgical Cases: 5,750
- Inpatient Consults: 657
- ENT (Main Campus) Clinic Visits: 12,906
- Dublin ENT Clinic Visits: 6,340

Grants Awarded

- Lewis Center ENT Clinic Visits: 112
- Lima ENT Clinic Visits: 97
- Mansfield ENT Clinic Visits: 271
- Marysville ENT Clinic Visits: 355
- Springfield ENT Clinic Visits: 198
- Westerville ENT Clinic Visits: 6,761
- Pediatric Aerodigestive Clinics: 89
- Rhinology Clinic Visits: 29
- Total ENT Clinic Visits: 27,158

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

Strategic Plan

“With more than $3.7 million in external funding, the Chiang Lab in the Department of Pediatric Otolaryngology is conducting and translating advanced research in tissue engineering for tracheal defects. This research will benefit children around the world as our research team has made progress in a complex problem interfacing with multiple different specialties.”

— Tendy Chiang, MD, Otolaryngologist, Chiang Lab Director
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
- Endometriosis and Chronic Pain Program
- 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)

**Highlights From the Past Year**

Pediatric and Adolescent Gynecology at Nationwide Children’s continues to grow in all aspects of medical services provided: ambulatory and telehealth visits, inpatient consultations and surgical procedures performed. By adding additional ambulatory clinical sites and an additional advanced practice nurse, the geographic region we serve continues to expand as well. We sustained services to our patients during the pandemic by providing close to 960 telehealth visits between July 1, 2020, and June 30, 2021. Gynecology continues to work collaboratively within the Center for Colorectal and Pelvic Reconstruction (CCPR) to address the reproductive health needs of patients born with anorectal malformations throughout their lifespan. This work encompasses direct surgical and medical patient care, research projects, patient advocacy and educational initiatives. We also work collaboratively with the Anorectal Malformation (ARM) transitional program at The Ohio State University Wexner Medical Center.

The Endometriosis and Chronic Pelvic Pain program provides streamlined, comprehensive care for patients with chronic pelvic pain. The multidisciplinary collaboration includes providers from numerous disciplines across the medical center working together to enhance quality of life and reproductive outcomes for these patients. The Fertility and Reproductive Health Program provides clinical services and best practices for patients at risk of diminished fertility. Nationwide Children’s is part of the international Oncofertility Consortium, and we continue to offer ovarian tissue cryopreservation and cancer survivorship care. The Teen and Pregnant Program clinic continues to serve pregnant patients in central Ohio, offering multidisciplinary care in both traditional and centering obstetric care models.

**Selected Publications**


**Faculty**

- **Pediatric and Adolescent Gynecology**
  - Geri D. Hewitt, MD
  - Dana Lenobel, APN
  - Kate A. McCracken, MD
  - Nicolette Varanani, CNP

- **OSU-Affiliate Faculty**
  - Melissa M. Goist, MD
  - Emily Rosen, MD
  - Rebecca H. Rudess, MD
  - Anne Marie Sinay, MD
  - Andrea N. Snyder, MD

- **Teen and Pregnant Program**
  - Kara Malone, MD
  - Natasha Reno, WHNP
  - Megan Wacker, WHNP

- **Family AIDS Clinic and Education Services**
  - Maggie Rosen, MD

- **Highlights From the Past Year**
  - Linden Teen and Pregnant Clinic Visits: 1,484
  - Canal Winchester Pediatric and Adolescent Gynecology Clinic Visits: 207
  - Dublin Pediatric and Adolescent Gynecology Clinic Visits: 650
  - Total Pediatric and Adolescent Gynecology Clinic Visits: 5,717
  - Total Surgical Procedures: 301
Pediatric Surgery

Probiotic Treatment Promotes Neurodevelopment After Experimental Necrotizing Enterocolitis

Researchers at Nationwide Children’s Hospital have demonstrated that when given in a biofilm state, probiotic *Lactobacillus reuteri* prevents the neurodevelopmental sequelae of experimental necrotizing enterocolitis (NEC).

The findings, published in *Brain, Behavior, & Immunity – Health*, have significant implications for bench-to-bedside translation of this microsphere-based probiotic delivery system that promotes biofilm development and potentially reduces the harmful effects of clinical NEC in neonates.

“In the last seven decades, despite an incredible amount of progress in treating most pediatric diseases, relatively little progress has been made in the ability to prevent babies with NEC from dying or from developing severe consequences of the disease in those that survive,” says Gail Besner, MD, chief of Pediatric Surgery and a principal investigator in the Center for Perinatal Research at Nationwide Children’s.

The study has emerged from a collaboration among the laboratories of Dr. Besner, Steven Goodman, PhD, and Michael Bailey, PhD. The multidisciplinary team previously demonstrated that a single dose of *L. reuteri* delivered in its biofilm state protects the intestines from injury in an animal model of NEC, significantly reducing NEC incidence and severity.

“In all clinical trials of probiotics to protect babies from NEC to date, the probiotics have been administered in their free-living state. However, bacteria thrive and are much more effective in a biofilm state,” adds Dr. Besner.

Approximately 45% of infants who survive NEC will have neurodevelopmental deficits as they age. The study aimed to determine whether a single dose of the probiotic therapy could protect the brain after experimentally-induced NEC in a rodent model. The investigators first confirmed that rat pups exposed to NEC took significantly longer to reach developmental milestones, such as eye and ear opening, body coordination and forelimb grasp strength, and experienced negative effects on cognitive behaviors, such as those required for learning and memory, compared with control pups.

When NEC-exposed rat pups were administered the probiotic treatment, the negative effects on cognitive behavior were prevented, anxiety-like behaviors were reduced, and memory was improved.

The team found that the behavioral effects of NEC were associated with increased numbers of activated microglia, decreased levels of a protein component of myelin, and decreased neurotrophic gene expression, all of which were prevented by the probiotic treatment.

“It is very powerful that a single dose of this probiotic treatment can reduce the incidence of disease and protect the brains of animals after they have experienced NEC,” says Dr. Besner.

REFERENCES


The mission of the Department of Pediatric Surgery at Nationwide Children's Hospital is to provide collaborative, comprehensive, state-of-the-art, multidisciplinary care for infants, children and adolescents with surgical disorders. The members of the department are all full-time faculty 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.

Highlights From the Past Year

The Department of Pediatric Surgery is one of the largest and most diverse departments of its kind. The department maintains active clinical programs focused on general pediatric surgery, trauma, burns, minimally invasive surgery, robotic surgery, surgical oncology, surgical endocrinology, chest wall deformities, bariatric surgery, inflammatory bowel disease, hepatobiliary surgery, neuroendocrine and pediatric colorectal surgery. The Trauma Program has been verified by the American College of Surgeons as a Level 1 Trauma Program since 1991, and the Burn Program has been an American Burn Association verified Burn Center since 2003.

Each of the 16 faculty members in the department bring individual strengths and talents to the department, and are recognized for their expertise in clinical care, research and education. Faculty members received awards this year for their excellent clinical care and educational expertise including:

- Jennifer H. Aldrick, MD, received the Golden Apple Teaching Award.
- Ibah Halaweish, MD, received the Denis R. King Teacher of the Year Award.
- Benedict C. Nwomeh, MD, was inducted into The Ohio State University Mazzaferrl-Elson Society of Master Clinicians, increasing the number of faculty members who have received this prestigious award to two.
- He was also selected to serve a three-year term as a governor on the Board of the American Pediatric Surgical Association.
- Rajan K. Thakkar, MD, was listed in Castle Connolly 2020 Top Doctors, increasing the number of faculty members chosen to eight.
- Renata B. Fabia, MD, PhD, and Gail E. Benser, MD, were recognized as 2020 Castle Connolly Exceptional Women in Medicine.
- Katherine J. Deans, MD, MPH, was accepted into the highly competitive national Executive Leadership in Academic Medicine (ELAM) Program for Women. In addition, after a broad national search, Dr. Deans was appointed Chief Research Officer of Nationwide Children's Hospital.
- Karen A. Diefenbach, MD, was elected to the American College of Surgeons Academy of Master Surgery Educators.

One of the most important goals of our department is to train the next generation of pediatric surgeons through our highly desirable training programs in various aspects of pediatric surgery and pediatric surgical research. The research conducted in the department is broad and encompasses a range of basic, clinical, translational and outcomes research projects. The department continues as a leader in the nation in presentations at national academic meetings. For the 10th year in a row, our research trainees have received prestigious national awards for their high-quality research, bringing our total number of research awards to an unprecedented 42 in the past 10 years. Several of our pediatric surgery trainees won highly competitive awards this year:

- Maria Carmen Mora, MD (mentors: Dr. Diefenbach and Dr. Michalsky), received the International Pediatric Endosurgery Group Institute for Research into Cancer of the Digestive System (IPRGICAD) Award for her research titled “Robotic-assisted vertical sleeve gastrectomy in adolescents: do BMI limits apply?”
- Devin Halleran, MD (mentors: Dr. Minneci and Dr. Cooper), received the 2021 Outstanding Article of the Year Award for his publication “Association Between Age and Umbilical Hernia Repair Outcomes in Children: A Multistate Population-Based Cohort Study” published in the Journal of Pediatrics, awarded by the Agency for Healthcare Research and Quality (AHRQ) and Academy Health.
- Amen Al-Haddad, MD (mentor: Dr. Aldrick), received 2020 American Academy of Pediatrics Rohenkranz Clinical Research Award for his research titled “Pediatric Adapts Are Needed to Improve the Diagnostic Accuracy of Thyroid Ultrasound Using TR-AD.”
- Nitis Sajankila, MD (mentor: Dr. Beaulieu), received an National Institutes of Health T32 Advanced Training in Immunology for Surgical Trainees (ARTIST) grant for the research project, “Protective Effects of Trypotoxan Catabolites Produced by Lactobacillus Reuteri in the Neonatal Immune System and Intestine in Experimental Necrotizing Enterocolitis (NEC).”

Selected Publications

Faculty members in the department are highly prolific, publishing as many as 200 papers a year. Examples from the past year include:

Grants Awarded
JULY 1, 2020 – JUNE 30, 2021
$4,223,559

Fast Facts: July 2020 - June 2021

- Inpatient Discharges: 1,066
- Observation and Outpatient-In-a-Bed Discharges: 1,221
- Total Discharges: 2,287
- Average Length of Stay*: 6
- Average Daily Census*: 17
- Patient Days*: 6,216
- Total Surgical Procedures: 3,449
- Inpatient Consults: 693

Color ectal Clinic Visits: 2,143
Dublin Surgery Clinic Visits: 118
Surgery/Burn Clinic Visits: 5,719
Westerville Surgery Clinic Visits: 395
Total Surgery Clinic Visits: 8,375

*Excludes observation and outpatient-in-a-bed patients
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, and peripheral nerve disorders.

Highlights From the Past Year

• The Department of Plastic and Reconstructive Surgery continues to take the leading role in multiple interdisciplinary teams at Nationwide Children’s to provide comprehensive care for the restoration of both form and function. Faculty include nationally recognized experts in pediatric plastic and craniofacial surgery, speech-language pathology and craniofacial orthodontics. The department offers advanced fellowship training in both pediatric plastic/craniofacial surgery and craniofacial speech science.

• The Cleft Lip and Palate Center and the Center for Complex Craniofacial Disorders have received national recognition as leading American Cleft Palate-Craniofacial Association (ACPA)-approved programs. The team of experts in the Center for Complex Craniofacial Disorders cares for children from birth to young adulthood who require highly specialized care and access to the kind of technology that can only be found at a nationally recognized hospital like Nationwide Children’s. The Cleft Lip and Palate Center and Craniofacial Orthodontic Treatment Program are among the largest such programs in the nation and lead the way in achieving best outcomes for children across the United States by providing comprehensive, coordinated multidisciplinary team care. The Craniofacial Infant Feeding Program has provided comprehensive feeding services that ensure that infants born with orofacial clefts and other craniofacial differences get off to a healthy start. Members of the Nationwide Children’s team have historically served in national leadership roles. In keeping with this tradition, Adriane Baylis, PhD, CCC-SLP, director of the Velopharyngeal Dysfunction Program, was elected vice president-elect of the ACPA in 2020.

• The 22q Center at Nationwide Children’s Hospital provides children and families from across the United States and around the globe with access to the simplest to the most complicated. Our specialists provide coordinated and comprehensive state-of-the-art care for patients with vascular anomalies, from the simplest to the most complicated. Our specialists work in partnership with the primary care physician and collaborate in the evaluation and management of patients. Our team is actively involved in research efforts leading to the breakthrough of new therapeutic approaches to care for patients with vascular anomalies and hemangiomas.

• As a recognized leader in cleft lip and palate care, the Department of Plastic and Reconstructive Surgery plays a major role in national cleft outcomes research. The team recently launched enrollment for a new National Institutes of Health (NIH)-sponsored international multisite study, “Velopharyngeal insufficiency following cleft palate repair: a comparative effectiveness study of existing surgical procedures and identification of criteria to guide a personalized treatment approach.” The team continues to take a leading role in the NIH-sponsored multisite study “A comparative effectiveness study of speech and surgical treatments using a Cleft Palate Registry and Research Outcomes Network (CORNET),” the largest national cleft palate outcomes project undertaken to date.

Faculty

Richard E. Kirschner, MD, FAAP, FACS, Chief, Plastic and Reconstructive Surgery

Full-Time Nationwide Children’s Faculty

Adriane Baylis, PhD, CCC-SLP
Kim Bjorklund, MD
Ibrahim Khansa, MD
Lauren Madhoun, PhD
Kara Morris, DDS, MS
Gregory D. Pearson, MD

OSU-Affiliate Faculty

Albert Chao, MD
Matthew Chetta, MD
Jeffrey E. Janis, MD
Clarita N. Lee, MD
Amy Moore, MD
Stephen J. Potest, MD
Ryan Schmucker, MD
Steven Schultz, MD

Selected Publications


NATIONWIDE CHILDREN’S HOSPITAL

| 2020-21 Annual Report |

| NationwideChildrens.org/2021-Report |

| Fast Facts: July 2020 - June 2021 |

| Inpatient Discharges: 49 |
| Observation and Outpatient-in-Bed Discharges: 348 |
| Total Discharges: 397 |
| Average Length of Stay*: 4.3 |
| Average Daily Census*: 0.6 |
| Patient Days*: 209 |
| Total Surgical Procedures: 1,429 |

| Grants Awarded |

| JULY 1, 2020 – JUNE 30, 2021 |
| $488,807 |

| Strategic Plan |

“We are leading the Journey to Best Outcomes for children throughout Ohio and across the United States by building nationally recognized centers of excellence that provide comprehensive, coordinated, interdisciplinary team care to restore form and function and to allow the children that we serve to reach their full potential.”

— Richard E. Kirschner, MD, FAAP, FACS, Chief, Plastic and Reconstructive Surgery
The transplant programs at Nationwide Children’s Hospital provide comprehensive services to patients locally, nationally and internationally. Our programs are Abdominal Transplant (including Kidney and Liver Transplant), Blood and Marrow Transplant (BMT), Heart Transplant, and Lung and Heart-Lung Transplant.

Faculty

**ABDOMINAL TRANSPLANT**

- Jaimie D. Nathan, MD
  - Chief, Abdominal Transplant, Hepatopancreatobiliary Surgery
- Hiren P. Patel, MD
  - Medical Director, Kidney Transplant
- Amer Rajab, MD, PhD
  - Surgical Director, Kidney Transplant
- Alexander Weymann, MD
  - Medical Director, Liver Transplant

**BLOOD AND MARROW TRANSPLANT**

- Rolla F. Abu-Arja, MD
  - Clinical Director, Blood and Marrow Transplant
- Jeffery J. Auletta, MD
  - Medical Director, Blood and Marrow Transplant
- Patrick McConnell, MD
  - Surgical Director, Heart Transplant
- Delipanjan Kandi, MD, MSc
  - Medical Director, Heart Transplant

**HEART TRANSPLANT**

- Brian Tullius, MD, MA
  - Surgical Director, Heart Transplant

**LUNG AND HEART-LUNG TRANSPLANT**

- Stephen E. Kirkby, MD
  - Medical Director, Lung and Heart-Lung Transplant
- Mark E. Galantowicz, MD
  - Surgical Director, Lung and Heart-Lung Transplant

**2020 – 2021 Fellows**

**Pediatric Bone Marrow Transplant and Cell Therapy**

- Brian Tullius, MD, MA

**Pediatric Renal Transplant**

- Jessamy Carter, MD
- Shaza Hasan, MD
- Emily Stonebrook, MD
- Ahmed Zied, MD

**2020 – 2021 Fellows**

- Pediatric Bone Marrow Transplant and Cell Therapy
- Jessamy Carter, MD
- Shaza Hasan, MD
- Emily Stonebrook, MD
- Ahmed Zied, MD

**Pediatric Renal Transplant**

- Brian Tullius, MD, MA

**Pediatric Advanced Cardiac Therapies**

- Emily Hayes, MD (2021-22)

**ABDOMINAL TRANSPLANT**

The Abdominal Transplant Program at Nationwide Children’s Hospital offers specialized and comprehensive care to patients with end-stage liver disease due to congenital and acquired hepatic and biliary disorders, and end-stage renal disease due to kidney and urinary tract disorders. We perform both living- and deceased-donor kidney transplants and deceased-donor liver transplants for infants, children and adolescents. Both the Kidney and Liver Transplant Programs are certified by the United Network for Organ Sharing (UNOS). The Kidney Transplant Program is certified by the Centers for Medicare and Medicaid Services (CMS) and is a member of the Improving Renal Outcomes Collaborative (IROC). The Liver Transplant Program is accepted into the Ohio Solid Organ Transplant Consortium (OSOTC) and is an active member of the Society of Pediatric Liver Transplantation (SPLIT). In addition, the programs partner with The Ohio State University Abdominal Organ Transplant Program to provide the full continuum of care to patients as they age and transition to adult care. In 2021, Nationwide Children’s welcomed renowned pediatric transplant surgeon, Jaimie D. Nathan, MD, as chief of Abdominal Transplant and Hepatopancreatobiliary Surgery. Dr. Nathan brings expertise in a number of areas, including the advanced procedure, total pancreatectomy with islet autotransplantation (TPAT), Balamurugan N. Appakalai, PhD, an international pioneer in islet cell processing and transplantation, also joined Nationwide Children’s. Dr. Appakalai is among the world’s most experienced in processing human pancreases for clinical islet autotransplantation and allotransplantation.

**BLOOD AND MARROW TRANSPLANT**

The Blood and Marrow Transplant (BMT) Program uses a family-centered, holistic care model in utilizing hematopoietic cell transplantation (HCT) as the definitive cure for pediatric and adolescent/yound adult patients with malignant and nonmalignant disorders. Our team is dedicated to optimizing clinical applications of HCT by reducing transplant-associated morbidity and mortality through novel care and innovative therapies, including immune-directed cellular therapies. The BMT Program is supported by the Foundation for Accreditation of Cellular Therapy (FACT)-accredited Apheresis Program at Nationwide Children’s, which offers extracorporeal photopheresis for patients with graft-versus-host disease, and The James and W.W. Williams Company Cell Therapy Laboratory at The James Cancer Hospital and Solove Research Institute at The Ohio State University, which offers unique forms of hematopoietic cell graft manipulation and processing. Our Cellular Therapy and Cancer Immunotherapy Program (CTCP) provides logistic support for cell therapy manufacturing and protocol development for novel investigator-initiated cellular therapies. The BMT Program educates the next generation of HCT and cell therapy physicians through its fourth-year Pediatric BMT/Cell Therapy Fellowship Program.

The BMT Program is FACT-accredited and is affiliated with the National Marrow Donor Program (NMDP), the Center for International Blood and Marrow Transplant Research (CIBMTR), the Children’s Oncology Group (COG), the Pediatric Transplant and Cell Therapy Consortium (PTCTC), the Primary Immune Deficiency Treatment Consortium (PIDTC), the Blood and Marrow Transplant Clinical Trials Network (BMT CTN), the Sickle Cell Transplant Alliance for Research (STAR) Consortium, and the New Approaches to Neuroblastoma Therapy (NANT) Consortium. We actively collaborate in cutting-edge research and investigator-initiated clinical trials with The Ohio State University Comprehensive Cancer Center. Autologous and allogeneic hematopoietic cell transplants are performed using all types of stem cell sources (bone marrow, peripheral blood, and umbilical cord blood) from human leukocyte antigen (HLA) matched related, unrelated and haploidentical donors. In the last year, patients have been treated with a wide range of modified stem cell grafts and cellular therapies. The division’s research focuses on treatment methods to reduce transplant related toxicities. Eligible patients with leukemias were enrolled on the Institutional Hapleuk Trial which allowed patients access to transplant during COVID-19, when international unrelated donor specimens were not
accessible. Sickle cell disease patients with match sibling donors were enrolled on the SUN trial, which uses non-myeloablative approach leading to minimal post-transplant toxicities. Virus-specific T cells (VSTs) were isolated from healthy donors to treat life-threatening viral infections, and natural killer (NK) cells were manufactured and delivered to patients with high-risk acute myeloid leukemia (AML), brain tumors, relapsed/refractory neuroblastoma, and sarcomas.

**LUNG AND HEART-LUNG TRANSPLANT**

The Lung and Heart-Lung Transplant Program is part of an advanced lung disease center consisting of programs for cystic fibrosis, congenital heart disease, pulmonary vascular disorders, interstitial lung disease, and neonatal lung disease. Our transplant team also works in conjunction with The Heart Center, offering combined heart-lung transplantation to patients with advanced cardiopulmonary disease. We offer a full spectrum of lung assist devices and transplantation to patients with advanced lung disease, including acute respiratory decompensation, and have the capability of performing bridge to transplant in appropriate patients nonresponsive to pharmacologic heart failure therapies. The program is certified by UNOS, approved by the Ohio Department of Health and Human Services and remains a member in good standing within the Ohio Solid Organ Transplant Consortium. In the last year, the program experienced a 50% growth in transplant referrals and completed eight heart transplants in 2020. Our VAD program continues to grow as well, with six VADs in 2020 (four now at home) and more anticipated for the remainder of the year. The program remains an active member of a recently formed multicenter international quality research consortium, the Advanced Cardiac Therapies Improving Outcomes Network (ACTION), and Nationwide Children’s Transplant physicians remain in leadership roles within the VAD education, team communication and quality improvement modules. Finally, our faculty are the leaders of the newly created quality improvement arm of the Pediatric Heart Transplant Society, through which we continue to help advocate for patients everywhere.

**HEART TRANSPLANT**

The newly re-christened Pediatric and Adolescent Advanced Cardiac Therapies (PAACT) program continues to provide advanced cardiac support to any patient with end-stage heart failure refractory to conventional therapies. This includes advanced mechanical circulatory support with state-of-the-art ventricular assist devices (VAD) used as a bridge to transplant in appropriate patients nonresponsive to pharmacologic heart failure therapies. The program is certified by UNOS, approved by the Ohio Department of Health and Human Services and remains a member in good standing within the Ohio Solid Organ Transplant Consortium.

**Selected Publications**


**Fast Facts: July 2020 - June 2021**

- **Kidney Transplants:** 6
- **Liver Transplants:** 2
- **Heart Transplants:** 9
- **Blood and Marrow Transplants:** 59

<table>
<thead>
<tr>
<th>Organ Transplants:</th>
<th>Count</th>
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<tr>
<td>Kidney Transplants:</td>
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<tr>
<td>Liver Transplants:</td>
<td>2</td>
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<tr>
<td>Heart Transplants:</td>
<td>9</td>
</tr>
<tr>
<td>Blood and Marrow Transplants:</td>
<td>59</td>
</tr>
</tbody>
</table>
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). The trauma and burn programs provide clinical care for injured children, a robust performance improvement program to ensure that the highest quality of care is provided, and research to improve outcomes through the Abigail Wexner Research Institute at Nationwide Children’s Hospital. Pediatric trauma and burn experts are involved in all aspects of patient care for injured children from birth through adolescence, including pre-hospital, emergency department, critical care, inpatient, operative management and rehabilitation. Our multidisciplinary, collaborative approach allows us to provide patients with exceptional care. Our center serves as a resource for injury prevention and education for our primary service area and beyond.

Highlights From the Past Year

• Kathy Haley, MS, RN, retired after serving over 30 years as the Trauma program manager.
• Lee Ann Wurster, MS, RN, TCRN, CPNP, was hired as the new Trauma program manager in November 2020.
• Rajan Thakkar, MD, was appointed by the Ohio Department of Public Safety to serve on the Trauma Committee of the State Board of Emergency Medical, Fire and Transportation Services.

Faculty

Rajan Thakkar, MD
Medical Director, Trauma, and Co-director, Burn Center

Jonathan I. Groner, MD
Quality Medical Director, Trauma

Dana Schwartz, MD
Associate Medical Director, Trauma

Renata Fabia, MD
Co-director, Burn Center

Research Center Faculty

Henry Xiang, MD, MPH, PhD, Director

Jonathan I. Groner, MD

Julie Leonard, MD, MPH

 CENTER FOR PEDIATRIC TRAUMA RESEARCH

Center for Pediatric Trauma Research Achievements

• Henry Xiang, MD, MPH, PhD, was elected president-elect of the Society for Advancement of Violence and Injury Research (SAVIR).
• Renata Fabia, MD, PhD, was elected president of The North American Burn Society (NABS).
• Bo Lu, PhD, was elected fellow of the American Statistical Association.
• Ginger Yang, PhD, MPH, won the Tony A. Mobley International Distinguished Alumni Award from the School of Public Health, Indiana University Bloomington.
• Julie Leonard, MD, MPH, was awarded a National Institutes of Health (NIH) diversity supplement (NIH R01 HD091347-01S1) to support the project of Jordee Wells, MD, MPH, “Health Inequities in Pediatric Cervical Spine Injuries.”

Faculty

Jaimie D. Nathan, MD
Benedict C. Nwomeh, MD
Oluyinka Olotuyi, MD
Dana Schwartz, MD
Richard Wood, MD

Physician Trauma/Burn Liaisons

Graciela Argote-Romero, MD
(Anesthesiology)

Allan Beebe, MD (Orthopedics)
Greg Cambier, MD (Anesthesiology)
Maria Estrada, DO (Critical Care)
Jeff Lutmer, MD (Critical Care)
David Martin, MD (Anesthesiology)
Andrew Rabe, MD (Radiology)
Summit Shah, MD (Radiology)
Eric Sribnick, MD (Neurosurgery)
Mike Stoner, MD (Emergency Medicine)

Morgan Wurtz, MD (Emergency Medicine)

Trauma Program Manager
Lee Ann Wurster, MS, RN, TCRN, CPNP

Strategic Plan

“We are leading the Journey to Best Outcomes for injured children by conducting and translating cutting edge research, prioritizing new injury prevention strategies and delivering safe and effective trauma care for children within our region and beyond.”

— Rajan Thakkar, MD, Medical Director, Trauma
Selected Publications


Grants Awarded

JULY 1, 2020 – JUNE 30, 2021

$2,963,264

Jennifer Cooper, PhD
Renata Fabia, MD, PhD
Brian Kenney, MD, MPH
Jeffrey Leonard, MD
Eric Sribnick, MD, PhD
Rachel Stanley, MD
Gerry Taylor, PhD
Rajan Thakkar, MD
Ginger Yang, PhD, MPH

Affiliate Faculty
Allan C. DeBee, MD
Mark Hall, MD, FAAP, FCCM
Bo Lu, PhD (The Ohio State University)
Jennifer Lundine, PhD, CCC-SLP, BC-ANCDS
Keith Yeates, PhD

Nurse Researchers
Sheila Giles, BSN, RN
Dana Hoffinger, CPNP-AC
LeaAnn Wurster, MS, RN, TCRN, CPNP

Senior Research Associate
Megan Armstrong, MPH

Fast Facts: July 2020 - June 2021

Admissions: 1,613
Average Length of Stay*: 3.0
Blunt Injury Admissions: 1,177
Penetrating Injury Admissions: 173
Burn Injury Admissions: 217
Asphyxial Injury Admissions: 46
Orthopedic Trauma Admissions: 512
Neurosurgery Trauma Admissions: 197
Pediatric Surgery Trauma Admissions: 774
Other Service Trauma Admissions: 130

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

Trauma-related research funding spans multiple centers, which include Emergency Medicine, Center for Biobehavioral Health, Pediatric Psychology and Neuropsychology, Center for Injury Research and Policy, and Center for Innovation in Pediatric Practices.
“You have to absolutely lay it on the line with the families, tell them all the information you know, and then it has to be their choice...But that’s the point. Now there is a choice that they didn’t have before.”

– Rama Jayanthi, MD

Urology
A Surprising Approach to Classic Bladder Exstrophy

One of the best possible outcomes for children born with classic bladder exstrophy would be the ability to urinate normally. But two large studies in recent years, including one from Nationwide Children’s and its peers in the Pediatric Urology Midwest Alliance brought bad but not necessarily unexpected news: true continence with normal urination is unusual, and only then with many major surgeries.

The outcome that most patients can expect is “staying dry” through clean intermittent catheterization every few hours for the rest of their lives, the studies found. From a medical perspective, that may well be considered a success, but it negatively impacts quality of life, says Dr. Rama Jayanthi, MD, chief of Urology at Nationwide Children’s.

So Dr. Jayanthi has developed a new rectal diversion approach. He closes the bladder neck, augments the bladder so it becomes a low-pressure reservoir and connects it to the rectum via a new channel. Urine leaves the body through the rectum, and no catheterization is needed. The rectal sphincter maintains continence.

The approach is a reimagining of uterosigmoidostomy, a largely abandoned procedure involving connecting ureters to the sigmoid colon.

Uterosigmoidostomy carries significant infection and cancer risks. Dr. Jayanthi says that conceptually, his approach reduces the risks by eliminating feces reflux into the ureters (because the ureters remain connected to the bladder) and limiting the mixing of feces and urine.

The patients who have had this procedure at Nationwide Children’s have had very few infections. Dr. Jayanthi and other experts still advise caution, however, because there is little long-term data on safety. Most families may be best served by the procedures that result in regular catheterization.

But for families who are fully aware of the risks and benefits, Dr. Jayanthi’s approach can make for a better quality of life.

“You have to absolutely lay it on the line with the families, tell them all the information you know, and then it has to be their choice,” he says. “But that’s the point. Now there is a choice that they didn’t have before.”

REFERENCES:

**Faculty**

**Full-Time Nationwide Children’s Faculty**
- Seth A. Alpert, 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

**2020 – 2021 Fellows**
- Michael Ernst, MD
- Hamzeh Farraj, MD

**Highlights From the Past Year**

The Department of Urology has a long tradition of traveling to long-distance clinics to offer high-level specialty care close to our patients’ homes. Historically we have traveled to Lima, Mansfield and Portsmouth (Wheelersburg). Nationwide Children’s Hospital staff offer full-time pediatric urological services at Dayton Children’s Hospital to serve that region. This quest to expand high-quality regional care has led to Nationwide Children’s faculty being the primary pediatric urology caregivers in northwest Ohio, as part of our collaboration with Mercy Children’s Hospital in Toledo.

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, held 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.

**Selected Publications**


**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, genitilia 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, held 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.

**Fast Facts: July 2020 – June 2021**

- Inpatient Discharges: 138
- Observation and Outpatient-in-a-Bed Discharges: 173
- Total Discharges: 311
- Average Length of Stay*: 2.5
- Average Daily Census*: 0.9
- Patient Days*: 346
- Inpatient Consults: 132
- Total Surgical Procedures: 1,671
- Urodynamics: 962
- Canal Winchester Urology Clinic Visits: 277
- Dayton Children’s Clinic Visits: 706
- Dublin Urology Clinic Visits: 858
- East Broad Urology Clinic Visits: 342
- Hilliard Urology Clinic Visits: 522
- Lewis Center Urology Clinic Visits: 165
- Lima Urology Clinic Visits: 154
- Mansfield Urology Clinic Visits: 266
- Portsmouth Urology Clinic Visits: 119
- Urology (Main Campus) Clinic Visits: 6,197
- Urology/Nephrology (Main Campus) Clinic Visits: 307
- Westerville Urology Clinic Visits: 1,287
- Total Urology Clinic Visits: 11,200

**Grants Awarded**

JULY 1, 2020 – JUNE 30, 2021

$223,835
ABIGAIL WEXNER RESEARCH INSTITUTE AT NATIONWIDE CHILDREN’S HOSPITAL

As an international leader in pediatric research, science is thriving at Nationwide Children’s. The behavioral, basic and clinician scientists within the Abigail Wexner Research Institute (AWRI) at Nationwide Children’s 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 six 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 500,000 square feet of dedicated research space on the Nationwide Children’s campus. An additional facility, the new Research Building IV, is currently under construction. It is planned to open in 2023 with expanded wet bench and dry lab space.

INSTITUTES AND CENTERS OF EMPHASIS

- Battelle Center for Mathematical Medicine
- Biopathology Center
- Center for Biobehavioral Health
- Center for Cardiovascular Research
- Center for Child Health Equity and Outcomes Research
- Center for Childhood Cancer and Blood Diseases
- Center for Clinical and Translational Research
- Center for Gene Therapy
- Center for Injury Research and Policy
- Center for Microbial Pathogenesis

INSTITUTE LEADERSHIP

Lauren O. Bakaletz, PhD
Vice President, Basic Sciences Research

Dena J. Chisolm, PhD
Vice President, Health Services Research

Katherine Drans, MD
Chief Clinical Research Officer

Lauren O. Bakaletz, PhD
Vice President, Basic Sciences Research

Dena J. Chisolm, PhD
Vice President, Health Services Research

Katherine Drans, MD
Chief Clinical Research Officer

INSTITUTE LEADERSHIP

Lauren O. Bakaletz, PhD
Vice President, Basic Sciences Research

Dena J. Chisolm, PhD
Vice President, Health Services Research

Katherine Drans, MD
Chief Clinical Research Officer

Lauren O. Bakaletz, PhD
Vice President, Basic Sciences Research

Dena J. Chisolm, PhD
Vice President, Health Services Research

Katherine Drans, MD
Chief Clinical Research Officer

Lauren O. Bakaletz, PhD
Vice President, Basic Sciences Research

Dena J. Chisolm, PhD
Vice President, Health Services Research

Katherine Drans, MD
Chief Clinical Research Officer
Research Institute Reports

BATTLENE CENTER FOR MATHEMATICAL MEDICINE

Faculty from the Battelle Center for Mathematical Medicine in the Abigail Wexner Research Institute at Nationwide Children’s Hospital apply state-of-the-art, quantitative methods to basic and clinical research in order to better inform and ultimately improve clinical care in pediatrics. A primary goal of the center is to provide a unique environment in which specialists from a variety of mathematical, statistical and computational areas can share their professional home in order to facilitate creative, collaborative research within the group.

Highlights From the Past Year

Battelle Center for Mathematical Medicine faculty continued their tradition of active collaboration with one another, with investigators across the Nationwide Children’s organization and with colleagues at The Ohio State University and other institutions. This year, faculty published 22 peer-reviewed research papers and filed two patents, as well as presented 18 invited research talks at high-profile national and international venues. Center faculty were awarded three new research grants, bringing the total number of funded grants in which Battelle Center for Mathematical Medicine faculty participate to 19.

Faculty

Christopher W. Bartlett, PhD
Jayajit Das, PhD
David A. Greenberg, PhD
Andrzej Kloczkowski, PhD
Paola Malerba, PhD
William C. Ray, PhD

Veronica J. Vieland, PhD
Director

Selected Publications


Strategic Plan

“In this era of increasingly complex quantitative research, our center’s broad expertise in computational biology supports discoveries ranging from basic research in immunology to practical approaches to treating burn victims. We strive every day to show the many ways in which applying math to biomedical research can improve the lives of children.”

— Veronica J. Vieland, PhD, Director, Battelle Center for Mathematical Medicine

Grants Awarded

JULY 1, 2020 – JUNE 30, 2021

$1,641,214
Research Institute Reports

BIOPATHOLOGY CENTER

The Biopathology Center provides a full range of services related to biospecimen procurement, banking, processing, testing and distribution. The Biopathology Center is accredited by the College of American Pathologists Biorepository Accreditation Program (CAP BAP) and houses numerous National Cancer Institute (NCI)-funded biospecimen collection efforts, including the biorepositories of the Children’s Oncology Group (COG) and SWOG. Also part of the Biopathology Center are the NCI-funded Pediatric Division of the Cooperative Human Tissue Network and the NCI Biospecimen Core Resource of the Center for Cancer Genomics (CCG BCR), as well as numerous biospecimen collections from other sponsors (e.g., Nationwide Children’s-funded investigators, the SARC Foundation).

Highlights From the Past Year

We continuously pursue grant-supported, biorepository-based studies aimed to advance medical research. During the early stages of the COVID-19 pandemic, the Biopathology Center (BPC) worked with representatives from the National Cancer Institute’s Cancer Therapy and Evaluation Program (NCI CTEP) and the Experimental Therapeutics Clinical Trials Network (NCI ECTTN) to develop the biospecimen procurement, processing and storage infrastructure to support the NCI COVID-19 in Cancer Patients Study/NCCAPS. This first NCI-sponsored natural history study addressing the effects of COVID-19 in adult and pediatric cancer patients went from an idea to full launch in six weeks. Researchers will follow patients and collect medical and other information about them over time to learn more about how COVID-19 and its symptoms develop and change in this particular population. The knowledge gained through this study (which opened for enrollment on May 21, 2020, and we continue to support) will help manage future treatment for adults and children with cancer and COVID-19.

During the last year, the BPC received four supplemental awards totaling $2,105,868 from the NCI to complement the iMATCH trial will focus on providing prospective immunologic profiling to stratify patients; similar to adult MATCH and pediatric MATCH clinical trials, additional therapeutic trials will be developed to evaluate regimens in predefined molecular subgroups. These trials will be a cross-NCI National Clinical Trial Network effort, with SWOG leading the central protocol, and all NCTN groups developing subprotocols under the “central screening” platform.

Specimens, Rare and Under-Represented Cancer Tissue Banking, Tumor Specimens from Patients at Relapse, and Post-Mortem Tumor Tissue Collection at Autopsy) will continue to support cutting-edge research in childhood cancer. The BPC-based SWOG Biospecimen Bank also received an initial award of $3,760,000 to support the upcoming biobanking and the Experimental Therapeutics Clinical Trials Network (NCI ETCTN) to develop the biospecimen procurement, processing and storage infrastructure to support the NCI COVID-19 in Cancer Patients Study/NCCAPS.

During the last year, the BPC received four supplemental awards totaling $2,105,868 from the NCI to complement the iMATCH trial will focus on providing prospective immunologic profiling to stratify patients; similar to adult MATCH and pediatric MATCH clinical trials, additional therapeutic trials will be developed to evaluate regimens in predefined molecular subgroups. These trials will be a cross-NCI National Clinical Trial Network effort, with SWOG leading the central protocol, and all NCTN groups developing subprotocols under the “central screening” platform.

Strategic Plan

“The Biopathology Center continues to be a leader in improving outcomes for children and adults with cancer by supporting cutting-edge research and serving as the caretaker for over 4 million biospecimens from children and adults enrolled in NCI-sponsored and other clinical trials at Nationwide Children’s Hospital, across the country and abroad.”

— Nilsa Del Carmen Ramirez-Milan, MD, FCAP, Director, Medical Director and Principal Investigator, Biopathology Center

Selected Publications


Facility

Nilsa Del Carmen Ramirez-Milan, MD, FCAP

Medical Director and Principal Investigator

Kathleen Nicol, MD, FCAP

Principal Investigator

Grants Awarded

JULY 1, 2020 – JUNE 30, 2021
$26,973,704

Faculty

Nilsa Del Carmen Ramirez-Milan, MD, FCAP

Medical Director and Principal Investigator

Jay Bowen, MS

Principal Investigator

Kathleen Nicol, MD, FCAP

Principal Investigator

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Research Institute Reports

CENTERS 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 families. This is achieved through state-of-the-art research using a biopsychosocial approach. A special focus is placed on identification of factors associated with developmental risk and resilience across the life span, design and evaluation of new interventions, and dissemination and implementation of effective interventions into routine practice.

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. We are also committed to training the next generation of leaders in biobehavioral research.

Developmental, behavioral and social risk factors contribute to significant morbidity and mortality among youth. Childhood health conditions affect not only the psychosocial well-being of youth but also that of families. Through our research, the center is transforming the health care and well-being of children and families in our community and worldwide.

The Center for Biobehavioral Health had a successful year for new National Institutes of Health (NIH) grant awards. Sarah A. Keim, PhD, received a five-year, $3.1 million R01 grant from the National Institute of Child Health and Human Development to examine the long-term impact of DHA supplementation in toddlers born preterm. Dr. Keim also received a $1.1 million R33 as co-PI to examine the impact of fatty acid supplements in children with autism spectrum disorder, as well as an R40 to examine the mental health of custodial grandparents and academic readiness of preschoolers.

Cynthia A. Gerhardt, PhD, was awarded a $3.5 million grant from the National Cancer Institute to identify neurocognitive and social cognitive late effects that influence the psychosocial well-being of children treated for cancer early in life. Collaborating sites include the Children’s Hospital of Philadelphia and St. Jude Children’s Research Hospital.

Micah Skeens, PhD, RN, CNP, received a five-year K99/R01 career development award from the National Institute of Nursing Research to develop and evaluate an app to improve medication adherence in children following hematopoietic stem cell transplant.

Two faculty members were also recognized for their leadership, research and teaching. Leena Nahata, MD, received the 2021 Bhagwan Satiani Award and the Robert Ruberg Award from the FAME Faculty Development Institute, as well as The Ohio State University College of Medicine 2021 Early Career Achievement Award. In addition, Jack H. Stevens, PhD, received a 2021 Curriculum Award for his teaching in The Ohio State University College of Medicine.

Behavioral Health: See page 143 for information about Behavioral Health services at Nationwide Children’s Hospital.

Faculty

Cynthia A. Gerhardt, PhD
Director

Full-Time Nationwide Children’s Faculty

Canice E. Cerrand, PhD
Kristen E. Hoskinson, PhD
Jamie L. Jackson, PhD
Sarah A. Keim, PhD
Laura Mackner, PhD
Leena Nahata, MD
Eric E. Nelson, PhD

Joseph R. Rausch, PhD
Jack H. Stevens, PhD
H. Gerry Taylor, PhD
Kathryn A. Vannatta, PhD

OSU-Affiliated Faculty

Amy Baughcum, PhD
Christine A. Fortney, PhD, RN
Tondi Harrison, PhD, RN
Kathy Lemamek, PhD
Kelly McNally, PhD
Paola Malerba, PhD

Selected Publications


Grants Awarded

JULY 1, 2020 – JUNE 30, 2021

$4,829,622
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 in adults.

Highlights From the Past Year

Our cardiovascular studies span the spectrum from basic research, which occurs in the Center for Cardiovascular Research, to translational and clinical research that is performed in collaboration with clinicians in The Heart Center at Nationwide Children’s. Areas of focus include investigation into the genes and gene-environment interactions that contribute to congenital heart defects, molecular and signaling pathways regulating normal heart and blood vessel development and how they are disrupted during disease development and progression. The center faculty receive funding from the National Institutes of Health (NIH), the American Heart Association (AHA) and Additional Ventures foundation to support their cutting-edge research. Since joining our center in 2019, Mingtao Zhao, DVM, PhD, has developed a program to use induced pluripotent stem cells (iPSCs) to investigate the errors in heart development that result in single ventricle heart defects. He was recently awarded new grants totaling nearly $2.5 million from NIH/ National Heart, Lung, and Blood Institute (NHLBI) and Additional Ventures to support this research, which includes the development of biorepository of patient-specific iPSCs for single ventricle heart disease. Aaron J. Trask, PhD, along with other leading cardiovascular scientists co-authored a consensus statement detailing the foundational guidelines to measure vascular function in isolated blood vessels, an important contribution to the field of vascular physiology. In addition, cardiovascular research education continues to be a priority within the center. Over the last year, our trainees have co-authored 11 manuscripts in leading journals and have been honored with five fellowship awards to support their research training.

The Heart Center: See page 49 for information about services within The Heart Center at Nationwide Children’s Hospital.

Faculty

Madhumita Basu, PhD
Brenda Lilly, PhD
Kim L. McBride, MD, MS
Patrick I. McConnell, MD
Aaron J. Trask, PhD
Mingtao Zhao, DVM, PhD

Vidu Garg, MD
Director

Selected Publications


Grants Awarded

JULY 1, 2020 – JUNE 30, 2021
$1,724,890

Strategic Plan

“External funding from NHLBI and Additional Ventures has allowed us to advance our congenital heart disease research programs by using patient-derived induced pluripotent stem cells to investigate disease mechanisms and discover potential therapies.”

– Vidu Garg, MD, Director, Center for Cardiovascular Research
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 produces reduced disparities, vibrant communities, flourishing families, and equitable and best outcomes for all children. Investigators at the center develop and test new health service delivery and payment systems in partnership with pediatricians, payers and Nationwide Children’s to improve quality and equity of care — especially for those patients most at risk.

Highlights From the Past Year

The Center for Innovation in Pediatric Practice has completed its name change to the Center for Child Health Equity and Outcomes Research. This center evolution retains our focus on innovative approaches to studying, funding and delivering health care and adds an explicit focus on health equity. New research projects are exploring the effectiveness of a wealth-building intervention to increase earned income tax credit uptake among Black women (Kelly J. Kelleher, MD, MPH), experiences of discrimination in prenatal care (Deena J. Chisolm, PhD), and the development of a mobile app for real-time measurement of menstrual cycle characteristics in adolescents (Sarah H. O’Brien, MD, MSc). Notable publications explored the effects of social determinates of health, examining housing instability, food insecurity, crime and screening approaches in primary care.

Affiliated centers advanced outcomes research in their specialized areas. Investigators in the Center for Surgical Outcomes Research faculty explored the use and disposal of opioids and studied outcomes and equity in conditions including pilonidal disease, tonsillectomy and appendectomy. Investigators in the Center for Suicide Prevention and Research advanced the discussion of suicide in Black youth and studied the implementation of suicide and depression screening in primary care.

Faculty member achievements included: Dr. Chisolm was recognized as a YWCA Woman of Achievement, Dr. Kelleher and the Healthy Neighborhoods Healthy Families program were awarded the Hearst Health Award for Outstanding Achievement in Population Health, and Jeffrey A. Bridge, PhD, Arielle H. Sheftall, PhD, and colleagues were awarded the Sigma Delta Chi award for Research.

Faculty

Deena J. Chisolm, PhD
Director

Selected Publications

Deena J. Chisolm, PhD
Jordee M. Wells, MD, MPH
Sarah H. O’Brien, MD, MSc
Jennifer N. Cooper, PhD
Laura C. Hart, MD
Arielle H. Sheftall, PhD
Jeffrey A. Bridge, PhD
Susan E. Creary, MD, MSc
Katherine J. Dears, MD, MHS
Kelly J. Kelleher, MD, MPhil
Daryl J. McLeod, MD
Alex R. Kemper, MD
Peter C. Mintz, MD, MHS
Anne S. Khalsa, MD
MHSic
Sarah H. O’Brien, MD, MSc
MHSic
Jordiee M. Wells, MD, MPH
Prasanth Pattisapu, MD, MPH

Grants Awarded

JULY 1, 2020 – JUNE 30, 2021
$9,133,348

Strategic Plan

“We are leading the Journey to Best Outcomes for children everywhere through our adoption of a new center strategic plan that includes targeted faculty recruitment, new partnerships, and an expanded public-facing communication plan for population health and health equity research”

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

Selected Publications

Deena J. Chisolm, PhD
Jordee M. Wells, MD, MPH
Sarah H. O’Brien, MD, MSc
Jennifer N. Cooper, PhD
Laura C. Hart, MD
Arielle H. Sheftall, PhD
Jeffrey A. Bridge, PhD
Susan E. Creary, MD, MSc
Katherine J. Dears, MD, MHS
Kelly J. Kelleher, MD, MPhil
Daryl J. McLeod, MD
Peter C. Mintz, MD, MHS
Prasanth Pattisapu, MD, MPH

Grants Awarded

JULY 1, 2020 – JUNE 30, 2021
$9,133,348
Research Institute Reports
CENTER FOR CHILDHOOD CANCER AND BLOOD DISEASES

The mission of the Center for Childhood Cancer and Blood Diseases in the Abigail Wexner Research Institute at Nationwide Children’s Hospital is to transform the care of children, adolescents and young adults with cancer and blood diseases through 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.

Highlights From the Past Year

The Center for Childhood Cancer and Blood Diseases exhibited strong growth and development in spite of the challenges presented by the COVID-19 pandemic. Early in the pandemic, many laboratories focused their efforts on computational and bioinformatic analysis of genomic and epigenetic data developed through close interactions with the Steve and Cindy Rasmussen Institute for Genomic Medicine. This pivot was made possible, in large part, through our long-term strategic plan to expand computational resources in the center, primarily through the recruitment of staff bioinformatic scientists, including Cenny Taslim, PhD, Meng Wang, PhD, and Matthew Cannon, PhD. As laboratories reopened, trainees and staff worked seamlessly to balance safety with productivity, and in doing so, minimized downtime and ramped laboratory activities back to pre-pandemic levels.

Rachid Drissi, PhD, was recruited to the center as a research associate professor to expand our focus on neuro-oncology. Dr. Drissi’s studies focus on translational neuro-oncology with a particular emphasis on the identification and validation of therapeutic targets that might serve as the basis for new treatments for children with brain tumors. Meisam Naeimi Karaoudi, PhD, was recruited as a research assistant professor to develop a new shared resource focused on gene editing using CRISPR technology. CRISPR allows researchers to modify the DNA of target cells, such as cancer cells, to test the roles of critical genes in the process of tumor development. This technology also allows for the genetic modification of immune cells, such as natural killer (NK) cells, to improve upon the ability of these cells to target cancers in children.

Hematology, Oncology, and Blood and Marrow Transplant: See page 87 for information about the Division of Hematology, Oncology & Blood and Marrow Transplant at Nationwide Children’s Hospital.

Faculty

Kevin A. Cassidy, MD
Dawn S. Chandler, PhD
Long-Sheng Chang, PhD
Timothy P. Cripe, MD, PhD
Rachid Drissi, PhD
Meisam Naeimi Karaoudi, PhD
Ryan D. Roberts, MD, PhD
Benjamin Z. Stanton, PhD
Emily R. Theisen, PhD
Running Wang, PhD
Dean A. Lee, MD, PhD
Jeffrey R. Leonard, MD

Selected Publications


Grants Awarded

JULY 1, 2020 – JUNE 30, 2021
$12,950,236

Strategic Plan

“We are using cutting-edge technologies and scientific innovation to understand how cancer develops and how the body responds to that process, and to use that knowledge to develop new treatments that will ensure that all children have the best possible outcomes.”

– Stephen L. Lessnick, MD, PhD, Director, Center for Childhood Cancer and Blood Diseases
Research Institute Reports
CENTER FOR CLINICAL AND TRANSLATIONAL RESEARCH

The Center for Clinical and Translational Research strives to create an environment in which patients, families, researchers and clinicians all collaborate to integrate “evidence-based medicine” with “evidence-generating medicine” to ensure children benefit from the latest advances in both medical knowledge and innovative treatments to improve their health.

Our vision is to use the delivery of care to each pediatric patient as an opportunity to learn how to improve future care. We believe it is our responsibility to learn from every patient so that 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 from both bedside to bench and from bench to bedside to improve the lives of children.

Our faculty are from three departments and represent nine different subspecialties: Nephrology, Hematology/Oncology, Adolescent Medicine, Critical Care, Urology, Pediatric Surgery, Anesthesia/Immunology and Emergency Medicine. Our research programs are very diverse and include innate immunity in urinary tract infections, immunoparalysis after sepsis or trauma, pathophysiology of stored RBC-induced immune suppression, novel treatments for nephrotic syndrome, pathophysiology of thrombosis, pathophysiology of bladder dysfunction in urinary tract obstruction, 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, perioperative respiratory complications, neonatal pain assessments and the role of pain control in immune function.

Highlights From the Past Year

Selected Publications

Shipla Agrawal, PhD  
Carlos E. Alvarez, PhD  
M. Brian Becknell, MD, PhD  
Andrea E. Bonny, MD  
David R. Brigstock, PhD  
Christina B. Ching, MD  
Mitchell H. Grayson, MD  
Mark W. Hall, MD, FAAP, FCCM  
Ashley R. Jackson, PhD


Faculty

William E. Smoyer, MD, FASN  
Director


Grants Awarded

JULY 1, 2020 – JUNE 30, 2021

$5,769,552
Research Institute Reports

CENTER FOR GENE THERAPY

The primary mission of the 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 in order 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.

Highlights From the Past Year

The Center for Gene Therapy again had a highly productive and collaborative year, facilitated by the NIH/NIMH P50-funded Center of Research Translation (CORT) in Muscular Dystrophy Therapeutic Development, which focuses on rapidly moving innovative therapies toward the clinic.

This year we saw the continued adoption by the neuromuscular community of the first adeno-associated viral (AAV) treatment for spinal muscular atrophy (SMA) — onasemnogene abeparvovec, which was developed at Nationwide Children’s — and the publication of the first data looking at outcomes from this therapy in clinical usage in the state of Ohio (Waldrop et al.). Highly promising data from the first-in-human trial of AAV-delivered microtubostasin in patients with Duchenne muscular dystrophy was published (Mendell et al.). The first clinical trial of viral-mediated exon skipping was conducted with Nationwide Children’s as the sole site, using an AAV-delivered UT small nuclear RNA (U7snRNA) in patients with exon duplications, and based upon preclinical studies in a unique mouse model of DMD (Simmons et al.).

Other gene therapy trials continued, including for two forms of limb girdle muscular dystrophy, for mucopoly saccharidosis types 3A and 3B, and for CLN3- and CLN6-related Batten disease. Additional preclinical data supports plans AAV-based therapies for Charcot-Marie-Tooth disease (Ozes et al.), Krabbe disease (Bradbury et al.), facioscapulohumeral muscular dystrophy (Rashnounejad et al.), and congenital muscular dystrophy (Packer et al.). The operationalization of new trials was facilitated by the maturation of the Gene Therapy Clinical Research Unit, made available to all investigators. Other highlights included the addition to the faculty of Lindsay Alfano, DPT, who specializes in outcome measure development and validation; development of a microscopic imaging laboratory, providing all investigators with highly complex and specialized approaches to immunofluorescent quantification of therapeutic or other protein expression in preclinical and clinical studies; and the publication of methods for reprogramming of patient fibroblasts into cells from central nervous system and muscle lineages, providing investigators tools for in vitro disease- or patient-specific therapies.

Neurology: See page 113 for related information about the Section of Neurology at Nationwide Children’s.

Faculty

Kevin M. Flanigan, MD
Director

Principal Investigators
Lindsay Alfano, DPT
Allison Bradbury, PhD
Scott Harper, PhD
Stephen Kaler, MD, MPH
Linda Lowes, PhD
Paul Martin, PhD

Jerry R. Mendell, MD
Kathrin Meyer, PhD
Zarife Sahenk, MD
Megan Waldrop, MD
Nicolas Wein, MD

Associate Faculty
Anne Connolly, MD
Kim McBride, PhD
Christopher Walker, PhD

2020 – 2021 FELLOWS
Nicolas Abreu, MD
(Gene Therapy Fellow)
Mamen Almomen, MD
(Neuro muscular Pathology Fellow)

Renatta Knox, MD, PhD
(Gene Therapy Fellow)
Samuel MacKenzie
(Neuro muscular Fellow)
Stefan Nicolaus, MD
(Gene Therapy Fellow)

Support Staff
Tabatha Simmons, PhD
Director, Gene Therapy Clinical Research Unit
Kathleen Church
Project Manager

Selected Publications


Grants Awarded

JULY 1, 2020 – JUNE 30, 2021
$20,340,132

“With our track record shows, our center is developing novel gene therapies, and rapidly translating them into clinical trials, with the goal of making a difference for children everywhere.”

– Kevin M. Flanigan, MD, Director, Center for Gene Therapy
The center has been awarded Injury Control Research Center (ICRC) designation by the Centers for Disease Control and Prevention since 2008. This designation was recently renewed through 2024. The center is one of only nine centers nationally with this designation, and it is the only ICRC focused on pediatric injury research and prevention. 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 Center for Injury Research and Policy’s mission.

The Make Safe Happen® app helps parents and caregivers overcome a perceived “overwhelming amount of advice” to make their homes safer for children. Developed by a team led by Lara B. McKenzie, PhD, MA, it addresses the difficulties parents and caregivers face when trying to keep their homes safe for their children. It provides parents and caregivers with room-by-room safety checklists and links to purchase recommended safety products. Recognizing that not all homes are the same, the app offers different solutions for different situations. Users can set reminders for activities, such as monthly smoke alarm testing or annual replacement of smoke alarm batteries. In 2016, a Home Fire Drill feature was added so families can choose a safe meeting place and practice getting out of the home in less than 2 minutes. The Nationwide Make Safe Happen campaign for Home Fire Drill Day was the winner of the 2017 Halo Award in the category of Best Message-Focused Campaign. The free app is available for iOS and Android systems and has been downloaded more than 67,000 times since early 2015.

Selected Publications


Research Institute Reports

CENTER FOR MICROBIAL PATHOGENESIS

The Center for Microbial Pathogenesis in the Abigail Wexner Research Institute at Nationwide Children’s Hospital has grown to 13 full-time basic and clinician scientist faculty members and is also home to the Oral and GI Microbiology Research Affinity Group. We are dedicated to developing 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 overall objective of identifying opportunities to interfere in the disease process and/or promote our ability to combat disease. We strive to rapidly translate our findings into the development of new and/or better ways to diagnose, treat, and ideally, prevent infectious diseases to improve the lives of children worldwide.

Highlights From the Past Year

Despite the unprecedented challenges to research activity presented by the global SARS-CoV-2 pandemic, faculty within the Center for Microbial Pathogenesis nonetheless continued to enact our long-term vision to combat infectious diseases, which remain a leading cause of morbidity and mortality globally. Our faculty study diseases of the respiratory tract (Lauren O. Bakaleitz, PhD, Samantha J. King, PhD, Benjamin T. Kopp, MD, Kevin M. Mason, PhD), the gastrointestinal tract (Michael T. Bailey, PhD, John S. Gunn, PhD, Ross M. Maitz, MD), the skin (Christopher P. Montgomery, MD), the oral cavity (Steven D. Goodman, PhD) and the genitourinary system (Jennifer L. Edwards, PhD, Sheryl S. Justice, PhD), as well as the humoral and cellular immune response to disease (Santiago Partida-Sanchez, PhD, Chack-Yung Yu, PhD). It was an exciting year as we continued to collaborate with colleagues locally, nationally and internationally to advance our multidisciplinary approaches in an effort to unravel the means by which bacteria and viruses cause infections, then use this understanding to invent novel ways to provide better clinical care to children battling these diseases. We also advanced our mission to teach the next generation of basic and clinician scientists. The importance of our work is evidenced by both high-impact publications and awards of greater than $7 million in external grants this academic year, which includes approximately $5 million from the National Institutes of Health (NIH). A listing of a few selected highlights is presented below:

- Center faculty published 57 primary peer-reviewed research papers.
- Multiple awards to Center faculty provided $2.25 million in new Year 1 direct costs.
- Benjamin T. Kopp, MD, was promoted to associate professor of Pediatrics, with tenure; inaugural director of Pulmonary Physician Research, Division of Pulmonary Medicine.
- Christopher P. Montgomery, MD, was voted Faculty Clinician of the Year by Critical Care Medicine fellows.
- Center trainees received numerous travel awards, recognition for exceptional performance within their graduate programs and funds to support outstanding research proposals.
- Steven D. Goodman, PhD, became a member of Executive Advisory Board, Center of Microbiome Science, The Ohio State University.
- Jennifer L. Edwards, PhD, became president-elect and chair of first Neisseria Gonorrhoeae Research Society Conference.
- Center faculty participated and served leadership roles in cross-campus ( Nationwide Children’s-Ohio State) academic initiatives (e.g., Biofilms in Human Medicine, Cure Cystic Fibrosis Columbus (C3), Infectious Diseases Institute).
- John S. Gunn, PhD, was the recipient of the Nationwide Children’s Technology Development Fund award to develop a non-antibiotic treatment for Salmonella infections.
- Start-up companies founded by Center for Microbial Pathogenesis faculty were in the news: Clarametyx Biosciences, a spinout from the Center, received up to $14.2 million from CARB-X, and Scioto Biosciences closed Series B funding with $26.5 million from Genome & Co. and was also awarded a $2.3 million phase II SBIR from the NIH.

Infectious Diseases: See page 97 for information about the Division of Infectious Diseases at Nationwide Children’s.

Faculty

- Michael T. Bailey, PhD
- Jennifer L. Edwards, PhD
- Steven D. Goodman, PhD
- John S. Gunn, PhD
- Sheryl S. Justice, PhD
- Samantha J. King, PhD
- Benjamin T. Kopp, MD
- Ross M. Maitz, MD

Director

Lauren O. Bakaleitz, PhD

Selected Publications


Novotny LA, Goodman SG, Bakaleitz LO. Targeting a bacterial DnaBII protein with a chimeric peptide immunogen or humanized monoclonal antibody to prevent or treat recalcitrant biofilm-mediated infections. ElibioMedicine. 2020 Sep;57:102967.


Grants Awarded

JULY 1, 2020 – JUNE 30, 2021

$7,153,957
Research Institute Reports

CENTER FOR PERINATAL RESEARCH

The Center for Perinatal Research in the Abigail Wexner Research Institute at Nationwide Children’s Hospital has a unique, integrative approach to prematurity research that extends from before birth to long after. In close collaboration with the Section of Neonatology, the mission of faculty in the Center for Perinatal Research is to conduct innovative basic, translational and clinical research focused on prevention of preterm birth and improvement of prematurity-related outcomes.

Highlights From the Past Year

Complications from preterm birth are the leading cause of infant mortality and morbidity. The investigators in the Center for Perinatal Research focus on prevention of prematurity and understanding and treating the complications that occur as a result of preterm birth. Our diverse team encompasses expertise in both basic science and clinical investigations. The basic science group explores the mechanisms involved in development of chronic lung disease such as bronchopulmonary dysplasia (Lynette K. Rogers, PhD), pulmonary hypertension (Leif D. Nelin, MD, Bernadette Chen, MD, Jennifer K. Tittmann, MD, MPH) and asthma (Rodney Brit, PhD), infection and inflammation (Yusen Liu, PhD), use of stem cell therapy in diagnosing and treating cystic fibrosis (Susan Reynolds, PhD) and GI disorders such as necrotizing enterocolitis (Gail E. Benninger, MD). Our diverse clinical research delves into prematurity prevention and maternal health (Mark A. Klebanoff, MD, MPH), infant feeding disorders (Sudarshan R. Jadcherla, MD), infectious diseases (Pablo Sánchez, MD), comparative effectiveness in pharmacoeconomics (Jonathan L. Slaughter, MD, MPH), cardiopulmonary deficiencies (Carl H. Backes, MD, Leeann R. Pavlek, MD, MPH), and development of novel treatments and approaches for improving outcomes in infants with neurological disorders or injuries (Mary Lauren Neel, MD, Kristen Benninger, MD). The center received more than $1.9 million in new prime National Institutes of Health (NIH) funding this year. Collectively, the Center for Perinatal Research brings in $3 million in NIH funding and $736,000 in foundation and industry grants for research. The center also is home to one of the sites of the Neonatal Research Network, a consortium of 17 institutions from across the United States funded by the NIH to conduct randomized, controlled trials of promising therapies and observational studies to advance care of the highest-risk newborns. In addition, our accomplished investigators have filed multiple patents for devices to improve infant outcomes.

Neonatology: See page 103 for information about Neonatology, home to one of the largest networks of clinical neonatal care in the United States funded by the NIH to conduct randomized, controlled trials that include infants born extremely premature: a systematic review.

Selected Publications


Grants Awarded

JULY 1, 2020 – JUNE 30, 2021

$5,222,863

Faculty

Carl H. Backes, MD
Kristen Benninger, MD
Gail E. Benninger, MD
Rodney Brit, PhD
Bernadette Chen, MD
Sudarshan R. Jadcherla, MD
Mark A. Klebanoff, MD, MPH
Yusen Liu, PhD
Mary Lauren Neel, MD

Leif D. Nelin, MD
Leeann R. Pavlek, MD, MPH
Susan Reynolds, PhD
Pablo Sánchez, MD
Jonathan L. Slaughter, MD, MPH
Jennifer K. Tittmann, MD, MPH

Interim Director

Lynette K. Rogers, PhD

Strategic Plan

“The resources in the Center for Perinatal Research are devoted to clinical and translational investigations that are focused on understanding mechanisms and identifying therapeutics to improve the quality of life for all children born prematurely.”

— Lynette K. Rogers, PhD, Interim Director, Center for Perinatal Research
Research Institute Reports

CENTERS 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.

Strategic Plan

“We are leading the Journey to Best Outcomes for children everywhere by developing the first vascular graft with growth capacity and performing the initial FDA-approved clinical trial evaluating their use in congenital heart surgery.”

– Christopher K. Breuer, MD, Director, Center for Regenerative Medicine

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 the unmet needs of these patients, the Abigail Wexner Research Institute at Nationwide Children’s established the Center for Regenerative Medicine in 2017.

Center for Regenerative Medicine clinicians and researchers, led by Christopher Breuer, MD, are creating biological vessels, intestines and tracheas; identifying tissue progenitor cells; and developing ways to enhance tissue repair and growth. To further diversify the center’s research strengths, we are actively recruiting principal investigators.

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, our center expanded our capabilities and pushed the envelope in the field of regenerative medicine. Not only have we made significant progress on our National Institutes of Health (NIH)-funded research, we have fostered new partnerships with sponsors and labs to help develop the next generation of biomaterials that regenerate tissue. In early 2021, we began the second phase of our human tissue-engineered vascular graft (TEVG) clinical trial for patients undergoing a Fontan repair. This NIH-funded project’s goal is to further our work on using the body’s innate repair mechanisms to assist patients with congenital heart defects.

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.

Highlights From the Past Year

Selected Publications


Schwarz EL, Kelly JM, Blum K, Hor KN, Tores AB, Zbinden JC, Viana A, Lindsey SE, Ramachandra AB, Szafron JM, Humphrey JD, Shinoka T, Marston AL, Breuer CK. Hemodynamics performance of tissue-engineered vascular grafts in Fontan patients. NPJ Regenerative Medicine. 2021 Jul 22;6(1):38.
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.

Highlights From the Past Year

Viral respiratory diseases are a significant research focus for our center. Over the past year several center investigators responded rapidly to the emerging COVID-19 pandemic. Studies to understand the course of severe coronavirus disease in children, including multi-system inflammatory syndrome, are led by Katherine Bline, MD; Asuncion Mejias, MD, PhD, MSCS; and Octavio Ramilo, MD, with early grant support from Nationwide Children’s. Center scientists and collaborators led by Rohini Abraham, PhD, of the Department of Pathology and Laboratory Medicine, and Masako Shimamura, MD, of our center, identified a genetic defect affecting immunity in a pediatric patient with severe SARS-CoV-2 infection. Finally, in collaboration with The Ohio State University investigators, center investigators Mark Peeples, PhD; Amit Kapoor, PhD; and Drs. Shimamura, Ramilo and Mejias contributed to a significant publication describing a new vaccine candidate to prevent SARS-CoV-2 virus infection in the prestigious Proceedings of the National Academy of Sciences. SARS-CoV-2 and other emerging respiratory viruses will remain a research priority for our center in the future.

Respiratory syncytial virus (RSV) is the leading cause of hospitalization of young children. Dr. Peeples, who leads a National Institutes of Health-funded multi-institutional consortium to develop RSV vaccines, is the senior author on a study in the influential PLoS Pathogens journal. The findings have broad implications for our understanding of how RSV infects the airway and how it might be blocked by vaccination.

Center scientists continue to lead in adaptation of genomic technologies to predict the severity of viral infections in children and to identify molecular pathways leading to disease. This technology has shown great promise in unraveling airway disease caused by RSV. Over the past year it was also applied to congenital cytomegalovirus (CMV) infections acquired at birth, which are often complicated by hearing loss and other serious side effects. Drs. Mejias and Shimamura and colleagues identified a unique genetic signature that may be predictive of hearing loss in congenital CMV infection. The study appeared in the journal Nature Communications, which publishes high-impact studies from multiple disciplines, including all areas of the biological, physical, chemical and Earth sciences.

Center researchers also study hepatitis virus infections, including the hepatitis C virus (HCV), which causes a persistent lifelong infection. HCV can be transmitted from infected mothers to children. Jonathan Honegger, MD, and colleagues demonstrated that modern diagnostic tests for the HCV genome have excellent sensitivity to detect transmitted infections in children during the first six months of life. Dr. Kapoor has pioneered an important animal model of HCV infection. In a PLoS Pathogens study, his laboratory documented the capacity of hepatitis C-like viruses to evade immunity generated by vaccination. Finally, studies by Chris Walker, PhD, and Zongdi Feng, PhD, published in the Journal of Hepatology have begun to define mechanisms of protective immunity against hepatitis E viruses that can persist in immune-compromised patients and cause death during late-stage pregnancy.

Infectious Diseases: See page 97 for information about the Division of Infectious Diseases at Nationwide Children’s.

Selected Publications


Grants Awarded

JULY 1, 2020 – JUNE 30, 2021

$7,400,376
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 is focused on improving outcomes for our patients using molecular diagnostics. Since its inception in 2016, the mission of the institute is to build a seamless continuum between research, clinical testing and patient care. The institute combines robust clinical diagnostics, leading-edge research and development, and high-performance computing to enable precision genomic medicine. Another area of emphasis is providing educational opportunities for care providers and all levels of trainees as a means by which genome-based results are made accessible and meaningful to the patients and families we serve.

Highlights From the Past Year

The Steve and Cindy Rasmussen Institute for Genomic Medicine is advancing the application of genomic medicine through cutting-edge translational research, launch of new genome-based clinical tests, development of computational tools and the application of big data technologies. By combining novel laboratory methods, state-of-the-art bioinformatics solutions and machine learning technologies, the institute is driven to create a future where no child with genetic disease goes undiagnosed and every child with cancer receives optimal treatment based on their genomic profile. Some highlights from the past year include:

- Launched a rapid-turnaround whole genome sequencing (rGS) analysis for neonatal intensive care patients. With 49 enrollments during the past year, rGS enables a new diagnostic pathway for critically ill newborns for whom no conclusive diagnosis has previously been achieved. The protocol enables all pertinent research results to be confirmed under CAP/CLIA standards and communicated to our NICU providers to inform patient management. At present the rGS assay used for this protocol is being clinically validated for broad scale offering to Nationwide Children’s patients.
- Introduced an RRB-approved protocol to study the genomes of patients and families with diagnoses of autism, bipolar disease and suicidality/depression who are being treated at the new Big Lots Behavioral Health Pavilion at Nationwide Children’s Hospital. Genome analysis will help us better understand the underlying causes and biological processes of these behavioral disorders, and eventually will lead to quicker, more precise diagnoses and improved treatments. In the eight months since enrollment began, 10 families have been enrolled and 46 subjects consented to evaluation.
- Expanded our comprehensive protocol that studies the genomes of children with cancer and hematologic diseases with a focus on rare, relapsed or treatment-refractory cancers. Through this protocol, we have been able to identify new treatment options leading to improved outcomes. To date, we have studied more than 290 pediatric cancer patients and have returned at least one medically meaningful result for over 90% of patients studied. The tumor-normal exome and diagnostic methylation assays used for this protocol were clinically validated in early 2021 and will inform the enrollment of pediatric patients onto clinical trials of the newest molecularly targeted therapies.
- Continued to discover the genomic events and processes driving treatment-refractory epilepsy through our translational protocol focused on these pediatric patients. DNA from affected brain tissue removed by surgery for curative intent is evaluated by highly sensitive exome sequencing, with the demonstrated ability to detect mosaic genetic variation associated with disease.
- Expanded our rare disease genomics study that employs integrated whole genome sequencing and transcriptome analysis of patients and families with complex medical genomics challenges. This protocol has elucidated a genetic diagnosis for greater than one-third of enrolled families, often for the first time after many years of testing and evaluations. These results provide critical answers for both patient and family as they can provide information relevant to reproductive decisions and new treatment directions.
- Implemented three new clinical workflows in our laboratory information management system, launched three new clinically validated bioinformatics pipelines, developed software to enhance the patient phenotyping process, implemented a pathogen detection workflow, developed tools to classify tumors in patients with tumors of the central nervous system, and advanced our capabilities in machine learning and data analytics.
- Significantly advanced our computational genomics infrastructure which provides a critical component of precision medicine. Our team has developed a state-of-the-art platform, built upon cloud-computing technology, that enables us to rapidly analyze human genomic data to identify rare genetic variants that lead to disease, and to perform comprehensive molecular profiling of a patient’s cancer. Over this past year we have implemented computational approaches that perform whole genome sequencing analysis in under 48 hours, using advanced matching of DNA sequence changes to descriptive terms about each patient’s disease characteristics.

Facility

Richard K. Wilson, PhD  Executive Director
Elaine R. Mardis, PhD  Co-Executive Director
Catherine E. Cottrell, PhD, FACMG  Senior Director
Richard J. Magrini, PhD  Senior Director
Peter White, PhD  Senior Director

Strategic Plan

“We are leading the Journey to Best Outcomes for children everywhere by developing and initiating novel translational programs that leverage modern genomics technology to integrate discovery research and clinical diagnostic testing. Key programs include cancer, newborn intensive care and behavioral health. Our program with the Nationwide Children’s Hospital neuro-oncology practice is a terrific example wherein personalized genome analysis has helped identify therapy for children with brain cancer from all over the world.”

—Richard K. Wilson, PhD, Executive Director, Steve and Cindy Rasmussen Institute for Genomic Medicine
Selected Publications


Cottrell CE. An overview of germline and somatic variant curations for the Scientific Workshops on Translational Molecular Diagnostics in Hematology. The American Society of Hematology 64th Annual Meeting; 2020 Dec 5-8; Washington, DC.


ACKNOWLEDGEMENTS

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