EMPOWERING

THE FUTURE OF CHILD HEALTH
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THE FUTURE OF CHILD HEALTH
2018-2019 Annual Report
NationwideChildrens.org/2019-Report
Empowering

- HEALTH CARE LEADERS to quantify and achieve zero preventable harms
- SCIENTISTS AND CLINICIANS to harness the power of the human genome to redefine disease and how we treat it
- PATIENTS AND FAMILIES to access essential behavioral health services
- COMMUNITIES to improve well-being and access to care for every child

Qualifying, Safety and Service
leading achievements in quality and safety outcomes

Genomics and Translational Medicine
Redefining diseases and how we treat them

Wellness/Population Health
Advancing America's largest pediatric accountable care organization

Behavioral Health
Addressing challenges that impact patients, mental and behavioral health

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I have been fortunate to spend the last 25 years of my career at Nationwide Children’s Hospital, alongside thousands of talented staff working to improve the health of children in our region and throughout the world.

This is the first time, however, that I have the honor of introducing our annual report as this institution’s chief executive officer. As you will see, Nationwide Children’s commitment to the patients and families we serve is stronger than ever, and we continue to shape the future of pediatric medicine through our innovative approach to population health, clinical care and discovery.

This year, a landmark gene therapy, based on decades of research at our hospital, was given federal approval and is already changing children’s lives around the country. We welcomed one of the nation’s most preeminent pediatric surgeons, an early pioneer in fetal surgery, as our surgeon-in-chief. Our nursing staff, the front line of our family-centered care, has become the first in our state to earn the prestigious Magnet Recognition from the American Nurses Credentialing Center four times.

In the midst of these and other signature accomplishments, Nationwide Children’s has continued our transformational investments in four areas that will accelerate our journey to best outcomes for children:

- **Population Health.** Our pediatric accountable care organization, Partners For Kids, has modeled ways that pharmacists can improve care for the 330,000 children in our coverage region and help lower overall spending on medications.
- **Behavioral Health.** Our Center for Suicide Prevention and Research has shown that suicide screening in an Emergency Department is important for children as young as 10, and how an increased suicide rate was associated with a popular Netflix show.
- **Genomics.** The Steve and Cindy Rasmussen Institute for Genomic Medicine at Nationwide Children’s has created a new method to identify “gene fusion events” that can cause pediatric cancer.
- **Quality, Safety and Service.** A quality improvement project shared by a number of clinicians and researchers has led to a nearly 29% reduction in asthma-related emergency department utilization in our county.

The achievements you’ll read about in this report are possible because of the Nationwide Children’s team, and their mission to give children their best chance at healthy, happy lives. I am incredibly proud to have the opportunity to further empower this team as CEO, and to present its extraordinary work from the last year.

Best,

Tim Robinson
Chief Executive Officer
Nationwide Children’s Hospital
DEAR FRIENDS:

“The end of the beginning.” That’s how I described where Nationwide Children’s Hospital is on its journey when, this past winter, we named Tim Robinson as the new chief executive officer.

Tim exemplifies everything we were seeking in a successor for our outstanding retiring CEO, Dr. Steve Allen. He has galvanized my belief in the tremendous strength of this organization and our ability to lead the way as a destination academic medical center, research and technology commercialization engine, and a steadfast community partner.

In his role as the hospital’s chief financial officer for nearly 25 years, Tim has been at the center of every major decision during our time of significant growth, and his thoughtful, inclusive approach earned him the admiration of people throughout the enterprise along the way. His innovative thinking helped make possible one-of-a-kind efforts like Partners For Kids®, our program for caring for Ohio’s neediest children, and Healthy Neighborhoods Healthy Families, which has won national acclaim for reimagining population health efforts and what it means to be a children’s hospital. We are fortunate to have him guiding our 14,000 employees as we take the hospital to the next level.

Among the investments of the past decade whose returns began to exceed everyone’s expectations this year are those in research. There are too many to list, but I will point to one that is the first of its kind in the world: Zolgensma. With the Food and Drug Administration’s approval of this revolutionary, single-infusion gene therapy for spinal muscular atrophy, the world changed for children and families facing a disease once considered a death sentence.

Just as visionary is our work in behavioral health. The opening of the Big Lots Behavioral Health Pavilion in March 2020 will bring desperately needed new resources to young people and families living with mental illness. In the process, we will break the stigmas that hold back progress in this area and demonstrate how an integrated, community-wide system can change lives.

These successes are only possible thanks to the talented, passionate men and women who come to work at Nationwide Children’s every day and the generous donors who believe that children everywhere deserve transformational health care and research. This year we honored two of our most distinguished philanthropic leaders by dedicating the Abigail Wexner Research Institute and the Steve and Cindy Rasmussen Institute for Genomic Medicine at Nationwide Children’s. These dedications honor transformational individuals, and I am humbled by your dedication and grateful for the gift of being inspired by you.

What lies ahead in 2020 will leave people saying, “Just when I thought I’d seen them do everything…” We want the world talking about us because it helps attract the talent and resources that makes possible world-class care and discoveries. The words we all most want to hear from our work, however, are simply, “I feel better. Can I go out and play?”

Like the butterflies in our logo and on our buildings, every child is meant to fly. Helping them do it is our mission. Together we make it possible.

ALEX R. FISCHER
Chair
Nationwide Children’s Hospital Inc.
Nationwide Children’s Hospital Board of Directors
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A NATIONAL DESTINATION FOR COLLABORATION

Completion of the new Conference Center on the west campus of Nationwide Children’s dramatically expands space necessary for national and international conferences. Construction on the 90,000-square-foot, multistory facility began in late 2018 and required just over a year to complete. The first events are scheduled to take place in the spring of 2020.

The $55 million facility comprises two levels for conference activities, including the Dr. Steven J. Allen Auditorium – named for the Nationwide Children’s CEO who served for nearly 13 years before retiring in 2019. The auditorium is capable of seating more than 460 theatre seats and can be divided for multiple group sizes. Conference space also includes approximately 5,000 square feet of pre-function space and individual training rooms. The facility also features an attached parking garage. The lower level houses the Nationwide Children’s Simulation Program, which provides hands-on experiential learning for faculty and community providers.

A NEW ERA FOR BEHAVIORAL HEALTH

March 2020 marks an unprecedented milestone in the integration of physical well-being and behavior health with the official opening of the Big Lots Behavioral Health Pavilion, America’s largest behavioral health treatment and research center on a pediatric campus just for children and adolescents.

The new pavilion is a $158 million investment and part of an acceleration to the Nationwide Children’s Hospital strategic plan to address a disparity in mental health treatment services that has become a national crisis for children.

The pavilion was designed for the unique needs of behavioral health patients, following the latest evidence-based treatment philosophies. In addition to treatment spaces, the pavilion houses behavioral health research and fosters collaboration between community partner agencies. The complete facility includes:

- Nine Stories, 400,000 sq. ft.
- 48 Inpatient Beds for Three Units:
  - Adolescent Inpatient
  - Child Inpatient
  - Intellectual & Developmental Disability
- Outpatient Programs
- Outpatient Crisis Clinic
- 16-bed Youth Crisis Stabilization Unit
- 10-bed Psychiatric Crisis Center
- Family Resource Center
QUALITY, SAFETY AND SERVICE

Reducing Asthma-Related Emergency Department Visits Through Quality Improvement

Numerous studies have demonstrated that quality improvement (QI) methodologies improve asthma outcomes. However, moving that success from individual patients to a large population is challenging. In a recent study published in *Academic Pediatrics*, clinicians and researchers from Nationwide Children’s Hospital and Partners For KidsSM, one of the country’s oldest and largest pediatric accountable care organizations (ACO), worked together to use QI-methodology to reduce asthma-related emergency department (ED) utilization across a large urban network.

“Asthma affects more than 1 in 12 children, and it is one of the most common reasons for pediatric emergency room visits and hospitalizations. We know that good preventive care and early treatment of flares can protect our patients from severe episodes of difficulty breathing that lead them to seek help in the emergency department,” says Elizabeth Allen, MD, pulmonologist and lead physician for the Nationwide Children’s Keep Me Well Asthma Quality Improvement Initiative. She is also associate professor of Clinical Pediatrics at The Ohio State University College of Medicine. “Recognizing this, in 2010, Nationwide Children’s made improving the health of children with asthma one of its top quality improvement priorities.”

The team used multiple evidence-based interventions to address various levels of general pediatric asthma care and high health care utilizers. They analyzed the annual asthma ED and inpatient utilization rates of 2- to 18-year-old members of the ACO living in the surrounding county and compared them to national rates from 2006 to 2014.

“Providing consistent, evidence-based care for all patients with asthma, including more intensive interventions for families and patients who struggle with their asthma management, can have a measurable positive impact on their health,” says Richard J. Brilli, MD, chief medical officer at Nationwide Children’s and professor of Pediatrics at Ohio State. “Achieving this in the ‘real world’ – including busy primary care offices – requires teamwork across specialties and professions.”

Through serial interventions and teamwork, the quality improvement initiative was able to reduce asthma-related ED utilization rates by an average of 3.9% per year from 2008 to 2016. The ACO’s asthma ED utilization rates fell from 18.1 visits per 1,000 children to 12.9 visits per 1,000 children at a time when national rates were rising.

The team continues to optimize patient care by leveraging electronic medical record support, providing family education, expanding the school-based asthma program and investing in innovative approaches such as predictive analytics to help identify (and help) the most at-risk children.

CITATION:

Elizabeth D. Allen, MD
Dedman Professor of Pulmonary Medicine
Chief, Pulmonary Medicine
Nationwide Children’s Hospital

Gloria Ayres, BS
Respiratory Care Program Coordinator

Richard J. Brilli, MD
Chief Medical Officer

Jennifer Cooper, PhD
Director, Perinatal Research

Sean P. Gleeson, MD
President, Partners For Kids

Judith Groner, MD
Pediatrician

Richard J. Brilli, MD
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Elizabeth D. Allen, MD
Pulmonary Medicine

Gerd McGwire, MD
Hospital Pediatrics

Courtney Rane, CPNP-AC
Community Practice Program Manager

David Stukus, MD
Allergy/Immunology

Jennifer Cooper, PhD
Center for Innovation in Pediatric Practice

Christopher Timan, MD
Neonatology

Dane Snyder, MD
Chief, Primary Care Pediatrics

Gloria Ayres, BS
Respiratory Care Program Coordinator
“The pharmacy role has evolved over time...from predominantly being focused on pharmacy expenditures in the PFK population to more network- and practice-level interventions.”

– Charitha Gowda, MD, MPH, MSCE, an associate medical director of PFK. “It went from predominately being focused on pharmacy expenditures in the PFK population to more network- and practice-level interventions, working with quality improvement specialists on disease-specific management processes.”

Pharmacists now co-lead many of the organization’s quality improvement projects in asthma, reproductive health, ADHD, depression and other diseases that depend greatly on appropriate medication management. For example, the program’s pharmacists have used patient adherence to asthma medications (via data on prescription pick-up) as a marker of disease control. By bringing prescription-related data to the prescribers, patients with risk factors — such as filling too many rescue inhaler prescriptions — can get the extra attention they need before they end up with even bigger health problems.

“Pharmacists have extensive education and training in drug and disease nuances as well as patient-specific scenarios that impact the affordability and practical adherence issues for a medication,” says Brigid Groves, RPh, PharmD, MS, a clinical pharmacist at Nationwide Children’s Hospital and one of two PFK pharmacists. She co-authored an invited review paper about the involvement of pharmacists in PFK work, published in Children in July. “Pharmacists have the data and the background to really help physicians and other care providers by working with them to identify the most appropriate, efficacious, cost-beneficial and patient-friendly medications to use.”

Other PFK pharmacist-led endeavors include in-office chart review, prescription management education for participating providers, evaluation of provider-based prescribing habits and prescription guideline development for common diseases. PFK pharmacists are now establishing partnerships with community pharmacists who can build long-term relationships with local providers to share data on their patients’ prescription behaviors, reinforce appropriate medication use and adherence when patients fill a prescription, and even relieve some physician burden by providing immunizations and other injection therapies.

It is an endeavor that PFK leaders hope will result in demonstrable improvements in health outcomes, cost and quality in numerous disease categories.

BEHAVIORAL HEALTH

Finding the Reasons Why: Looking for Answers in Trends of Child and Youth Suicides

Suicide is the second-leading cause of death among 10- to 24-year-olds. And even as awareness grows, suicide rates continue to climb. For decades, researchers have scoured the data to look for patterns that could help them understand why so many youth continue to be affected.

At the Center for Suicide Prevention and Research in the Abigail Wexner Research Institute at Nationwide Children’s Hospital, this search has revealed unique patterns in suicide for specific populations of children and young adults, including differences based on age, sex and race. Now, they are using the findings as a first step toward developing prevention strategies.

“If we can identify a pattern, if the epidemiology of suicide has changed over time and rates are increasing...the results from these studies allow us to start asking what are some of the factors that might have changed that are driving the increase,” says Jeff Bridge, PhD, director of the Center for Suicide Prevention and Research.

One notable study was published in May 2019 in the journal of the American Academy of Child and Adolescent Psychiatry. The team at Nationwide Children’s was among several to investigate, and the first to publish their results, on whether or not the Netflix series “13 Reasons Why” could be linked to increased suicides.

What they found was compelling: The suicide rate among youth aged 10-17 years increased by almost 30% in the months following the release of the first season.

Following the “13 Reasons Why” study, Netflix removed the graphic suicide scene aired during the first season, saying it was “mindful about the ongoing debate around the show” and that it was doing so based on advice from medical experts.

“We hope the actions taken based on the evidence our study provided are proof of concept for how acting to reverse trends where a clear association has been established can save lives,” says Arielle Sheftall, PhD, principal investigator in the Center for Suicide Prevention and Research and co-author of the study.

“Based on our research findings, we have an opportunity to significantly reduce the number of deaths by suicide among young people.”

CITATION:


“Based on our research findings, we have an opportunity to significantly reduce the number of deaths by suicide among young people.”

– Arielle H. Sheftall, PhD, Principal Investigator, Center for Suicide Prevention and Research
GENOMICS

Identifying Genetic Drivers of Pediatric Cancer

“I think that one of the most important things we can do to help a cancer patient is to gain a more complete understanding of the intricacies underlying their specific cancer, and to use a personalized medicine approach to help guide treatment,” says Stephanie LaHaye, PhD, a postdoctoral scientist in the Steve and Cindy Rasmussen Institute for Genomic Medicine at Nationwide Children’s Hospital. “Here, we are taking a case by case approach to refine diagnosis, better understand prognosis, and identify potential targeted treatment options for these patients.”

Dr. LaHaye and her colleagues are part of a larger team of Nationwide Children’s scientists focusing on the development of the fusion detection platform. Using a multifaceted, automated, high-throughput approach to detect driver gene fusion events – chromosomal rearrangements, insertions or deletions – in patient RNA-sequencing data, researchers in the Steve and Cindy Rasmussen Institute for Genomic Medicine have identified 20 clinically meaningful fusions in 73 pediatric cancer cases so far.

“This study is expanding our ability to identify fusion genes in pediatric cancers,” says Elaine R. Mardis, PhD, co-executive director of the Institute. “This approach enables us not only to identify the fusion genes we understand already but also to discover new ones that may indicate what is driving the cancer development. In certain cases, this discovery also may indicate existing drugs that could shut down the disruptive function driving the cancer.”

“Our automated approach takes seven fusion calling algorithms and overlaps those data, allowing us to remove false positives and only focus on what we predict to be the true positives,” says Dr. LaHaye, who was awarded the Women in Cancer Research: 2019 Research Scholar Award at the 2019 American Association for Cancer Research Annual Meeting for her work on this project. “We require at least two of the seven algorithms to call the fusion for it to be output, which we then hierarchically sort based on evidence. When we identify a potentially clinically relevant fusion, we work with our colleagues in the clinical laboratory to confirm the findings.”

This information can then be used to inform the diagnosis and/or treatment of individual patients.

CITATION:

“This study is expanding our ability to identify fusion genes in pediatric cancers.”

— Elaine R. Mardis, PhD, Co-executive Director of the Steve and Cindy Rasmussen Institute for Genomic Medicine
MILESTONES
A Trusted New Leader on the Journey to Best Outcomes

Tim Robinson takes the reigns as CEO.

As chief financial officer for more than 20 years, Tim Robinson helped guide Nationwide Children’s Hospital through a period of unprecedented growth – from an important regional children’s health system to an internationally preeminent academic medical center.

When CEO Steve Allen, MD, announced his retirement in 2018, a national search began for the person who could continue to build on Nationwide Children’s institutional momentum. That search led right back to Robinson, who began as CEO on July 1, 2019.

“It should not be surprising that the nation's leader for pediatric health care is also the top institution in the country for growing amazing talent,” said Alex Fischer, board chair of Nationwide Children’s, in announcing Robinson’s appointment. “Following a comprehensive national search, which attracted broad-based interest and conversations with the highest caliber physician and non-physician leaders in health care today, Tim was our unanimous and enthusiastic choice.”

Robinson joined Nationwide Children’s staff in 1995 as assistant treasurer. In 1997, he became senior vice president and CFO, and in 2008 was named executive vice president and chief financial and administrative officer. He is credited with building the hospital’s investment portfolio from $100 million to almost $3 billion, and leading the hospital to earn an Aa2 bond rating consistently since 2001.

But his achievements have gone far beyond the traditional definition of a CFO. Robinson led groundbreaking efforts in population health, such as Partners For Kids (PFK). Now one of the country’s oldest and largest pediatric accountable care organizations, PFK grew from responsibility for 13,000 children to approximately 330,000 under Robinson’s watch. He was also a driving force behind the Healthy Neighborhoods Healthy Families initiative, which has become a national model for health systems to improve housing, educational opportunities and public safety in their communities.

More recently, Robinson has championed research and related technology commercialization efforts, and 13 companies have now been created based on Nationwide Children’s medical and scientific discoveries. The hospital’s scientists had 10 patents issued in 2015; in 2018, there were more than 40.

Q&A:

Q: How has Nationwide Children’s mission affected the hospital’s extraordinary growth of recent years?

A: Our mission has made it possible. We keep asking ourselves: “What can we do to improve the lives of children?” and each element of our strategic plan is part of the answer. We understand that addressing a community’s social determinants of health is critical for keeping families healthy, so with neighborhood partners we created Healthy Neighborhoods Healthy Families, which helped build or renovate nearly 400 homes. We know first-hand that children’s behavioral health needs are not being met, so we’ve greatly expanded our behavioral health offerings and are nearing completion of the largest center of its kind in the United States.

Our Institute for Genomic Medicine, our nationally prominent Zero Hero program to eliminate preventable patient harm, our accelerating efforts to give children access to therapies invented here — all are manifestations of our mission.

Q: What attracted you to Nationwide Children’s Hospital 25 years ago?

A: What attracted me is what continues to attract so many of the team members: our mission, vision and values. I had a non-traditional path to pediatric health care — I had been treasurer for a national shoe retailer. But when I came here, I immediately fell in love with the people and with the way everyone pulls together for the patients we serve.

Many organizations talk about mission and values, but we put ours in the foreground. We are on a Journey to Best Outcomes for all children. The best way for us to succeed is to work as One Team. Those are not just words for us. I felt those guiding principles in my first week as an employee 25 years ago, and I am honored for the opportunity to support them as CEO.

Q: What does the future hold for Nationwide Children’s?

A: Ten years ago no one would have imagined where we are today. But there is even greater opportunity ahead and some of it has already been planned. We have announced the construction of a new research building and a new simulation center for staff training. We continue our investments in population health and precision medicine. The Big Lots Behavioral Health Pavilion will be a hub of research and treatment.

Otherwise, we continue our Journey to Best Outcomes, and keep asking how we can best serve children. I am blessed to work with a forward-looking community, a talented leadership team and a visionary Board of Directors. I am excited to build on this foundation, and I know we have unmatched potential as a leader in research and pediatric medicine.
MILESTONES

FDA Approves First-of-Its-Kind Gene Therapy

On May 24, 2019, Zolgensma became the first gene therapy approved by the U.S. Food and Drug Administration (FDA) for spinal muscular atrophy. It is the second gene therapy approved in the United States.

SMA, the number one genetic killer of babies under two years of age, is a progressive, childhood, neuromuscular disease caused by a mutation in a single gene. Children with SMA type 1 fail to meet motor milestones and typically die or require permanent mechanical ventilation by 2 years of age.

Jerry Mendell, MD, principal investigator in the Center for Gene Therapy at the Abigail Wexner Research Institute led the Phase 1 clinical trial to study gene therapy for SMA1. In the trial, an intravenous injection of Zolgensma delivered a functional copy of the gene to the participants’ cells. Most children in the study who received the FDA-approved dose gained the ability to sit and roll, and a few could crawl or walk. Additionally, after two years, 7 of 10 participants who were free of pulmonary support at the time of dosing remained support-free.

“Treatment of SMA1 with gene therapy has the potential to transform the disease course, in addition to improving patient and caregiver quality of life. Reduced used of ventilation and nutritional support, as well as decreased hospitalization, could significantly decrease the overall health care utilization of these patients,” says Richard Shell, MD, section chief of Pulmonary Medicine at Nationwide Children’s and senior author of the publication describing long-term health outcomes of the therapy.

The preclinical work leading to the FDA approval of Zolgensma was conducted by researchers from Nationwide Children’s and The Ohio State University College of Medicine. The therapy was licensed to AveXis to help advance its use into the clinical setting.

“Our Center for Gene Therapy is a national leader in gene therapy with a robust pipeline of more than 20 genetic targets in various stages of research,” says Kevin Flanigan, MD, director of the Center for Gene Therapy. “The Abigail Wexner Research Institute invested in a clinical trial infrastructure, a Good Manufacturing Practice facility, regulatory experts and an Office of Technology Commercialization with the goal of taking discoveries from the laboratory bench to the clinic.”

CITATIONS


MILESTONES
New Leadership, New Horizons: Surgeon-in-Chief Shares Vision for the Future

In August 2019, Nationwide Children’s Hospital welcomed Oluyinka Olutoye, MD, PhD, as Surgeon-in-Chief. In a Q&A, the internationally renowned pediatric and fetal surgeon shares his thoughts about the challenges and opportunities facing pediatric surgeons today.

Q: What brought you to Nationwide Children’s Hospital?
I was initially attracted to the strength of the existing surgery services at Nationwide Children’s and was further intrigued by the organization’s desire to expand in breadth, depth, service access and reputation. I was impressed by the hospital’s collaborative culture and its universal commitment to exceptional patient care, as well as its outcomes-driven model of high quality and safe care delivery. These elements, coupled with the organization’s focus on discovery and innovation in pediatric research and educational excellence led me to join this team.

Q: What are the biggest challenges or opportunities facing pediatric surgeons now?
With continued advances in children’s surgery, we know more and we can diagnose more. But we also have to think about conditions and ailments that we have not yet considered. We have to approach our surgical practice through a holistic perspective of care, for example, by considering the impact of social determinants of health not only on treatment strategies but also on overall patient outcomes.

Our challenge now is to improve patient access, develop multidisciplinary programs to meet their medical and psychosocial needs in one setting, approach clinical diagnosis and care delivery with quality and safety at the forefront, and emphasize a values-driven care model that puts the patient and family squarely in the center. Equally important, we must be prepared to both model and cultivate for our learners, the standards of professionalism, intellectual curiosity and versatility that will be required for effective clinical practice in the future.

Q: What inspired you to specialize in fetal surgery?
My interest in fetal surgery began in high school, when I read a biography of Christian Barnard -- the first surgeon to perform a human-to-human heart transplant. I was especially intrigued by his earlier research where he and his colleagues sought to find out why some babies were born with intestinal anomalies (atresias). They performed surgery on fetal animals to recreate those anomalies. That was when I was first exposed to the idea that one could perform surgery on a fetus.

While I was always interested in medicine, one aspect that especially captured my interest was embryology – how the embryo develops and all the anomalies that can happen during development. This interest led me toward surgery and pediatric surgery. As a pediatric surgeon, I focused on the question “what if we didn’t have to wait until the fetus is born to do something about their anomaly?” The mother’s womb is the best intensive care unit there is, and by conducting corrective surgeries in the fetus while in the womb, we can help to change the trajectory of the baby’s outcome in life.

Q: What excites you most about the future of fetal surgery?
Initially, fetal surgery was reserved for conditions where the fetus was either expected to die or predicted to have severe morbidity at birth but the outcomes could potentially be improved with intervention. Fetal surgery was only offered in those rare and severe cases where the potential fetal benefit outweighed the risk to the mother.

Over time, advances in the field have lowered the risk to the mother. These advances include miniaturization of instruments, better imaging technology and minimal uterine access. As the risks are reduced, it opens many opportunities to address other anomalies before birth. Furthermore, advances in genomics, gene and cell-based therapy offer other opportunities for non-surgical approaches to fetal maladies.

Things that would have been totally unreasonable to consider 10 to 15 years ago are now on the table. As the opportunity to help increases, so too does the responsibility to help. The fetal care landscape is broadening, and that’s exciting.

Q: What do you hope to bring to your new role as surgeon-in-chief at Nationwide Children’s?
I look forward to building on the exceptional work that has already been done at Nationwide Children’s Hospital. There are strong clinical programs in place, with tremendous achievements in patient care, safety, quality and health outcomes. I hope to bring a collaborative leadership style, a spirit of excellence, a tireless dedication to best outcomes, and to share a vision for transformative and sustainable growth as we move from excellence to pre-eminence.

Oluyinka O. Olutoye, MD, PhD, Surgeon-in-Chief
MILESTONES
Technology Commercialization at Nationwide Children’s Hospital

Scientific discovery is the basis for new technologies and products that improve the lives of children everywhere. Nationwide Children’s Hospital has a remarkable track record of moving discoveries into the marketplace. The hospital’s Office of Technology Commercialization facilitates the transfer of new technologies, research innovations to outside partners to benefit patients, the local community and the general public.

“There is a real pipeline here,” says Matthew McFarland, RPh, PhD, vice president, Commercialization and Industry Relations at Nationwide Children’s. “We’re not only innovating clinical tools to help provide safer and better health care, we’re also developing therapeutic, diagnostic biomarkers, software that improves data analysis and models that help study disease.

“People might not intuitively think of a nonprofit hospital like Nationwide Children’s as a hub for technology commercialization,” he says. “They should. Just like universities, we make substantial investments in commercialization of new discoveries and create job-producing startup companies.”

To date, the Office of Technology Commercialization has supported the transfer of a wide variety of technology licenses, including virtual reality programs, surgical and clinical devices, and gene therapy products. Furthermore, they helped investigators file more than 300 patents in the last five years. In that same time, more than 40 patents were issued.

STARTUP COMPANIES BASED ON NATIONWIDE CHILDREN’S DISCOVERIES INCLUDE:

STARTUP COMPANIES BASED ON NATIONWIDE CHILDREN’S DISCOVERIES INCLUDE:

FACULTY HONORS AND GRANTS

Lessnick Awarded $6.2 Million Childhood Cancer Moonshot Grant
Stephen Lessnick, MD, PhD, director of the Center for Childhood Cancer and Blood Diseases at the Abigail Wexner Research Institute, has received a federal five-year, $6.2 million grant to help uncover how proteins produced by a mutated gene transform healthy cells into tumor cells.

The National Cancer Institute grant is part the 21st Century Cures Act of 2016 authorizing a total of $1.8 billion to fund the "Cancer Moonshot" over a seven-year period with the goal of accelerating cancer research. Dr. Lessnick, who is also a professor of Pediatrics at The Ohio State University College of Medicine, is part of a national consortium of researchers investigating fusion oncoproteins, a class of proteins that drive cancer in children. Focusing on a particular fusion oncoprotein, EWS/FLI, Dr. Lessnick hopes to describe the process of how fusion proteins turn healthy cells into tumor cells in the detail needed for investigators to develop a new therapy. He will work with Richard Wilson, PhD, and Elaine Mardis, PhD, leaders of the Steve and Cindy Rasmussen Institute for Genomic Medicine at Nationwide Children’s, to define the specific DNA EWS/FLI attaches to and where it is located in the genome.

Emergency Medicine Receives $2.8 Million PECARN Grant
The Emergency Medicine Department at Nationwide Children’s received a four-year, $2.8 million grant to continue leading one of the six U.S. Research Node Centers for the Pediatric Emergency Care Applied Research Network (PECARN), the first federally-funded pediatric emergency medicine research network. Rachel Stanley, MD, MHSA, chief of Emergency Medicine, leads the Great Lakes node center as the principal investigator. The grant is awarded by the Emergency Medical Services for Children (EMSC) Program administered by the Health Resources and Services Administration’s Maternal and Child Health Bureau.

PECARN, founded in 2001, is the nation’s first federally funded pediatric research network dedicated to research about prevention and management of acute illnesses and injuries in children across the continuum of emergency medicine care. It comprises 18 hospital emergency departments that care for more than 1 million injured and ill children every year.

Cystic Fibrosis R&D Program Awarded $2 Million CF Foundation Grant
A team of researchers at Nationwide Children’s Hospital and The Ohio State University (OSU) was awarded a $2 million grant over four years to continue development of the Cure CF: Columbus Research and Development Program (C3 RDP). The program aims to study the relationship between immune system function and cystic fibrosis to develop treatments that will improve clinical outcomes for children and adults with CF. Nationwide Children’s and OSU teamed up in 2007 to establish a multidisciplinary translational research team of microbiologists, biochemists, immunologists, cell biologists, pathologists and CF pulmonary clinicians. Since then, the team of 29 clinical and basic science investigators have been building a body of research geared toward changing outcomes for patients in the clinic. Research projects include understanding aspects of the adaptive and innate immune systems and how immune dysfunctions related to CF lead to infection with microorganisms.

Karen McCoy, MD, chief of the Division of Pulmonary Medicine at Nationwide Children’s is co-director of C3 RDP, along with Daniel Wozniak, PhD, professor of Microbiology and Microbial Infection and Immunology at The Ohio State University College of Medicine.
Barnard Honored for Lifelong Contributions to Pediatric Gastroenterology

John A. Barnard, MD, was honored by the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN) with the 2018 Harry Shwachman Award for making major, lifelong scientific and educational contributions to the field of pediatric gastroenterology, hepatology and nutrition. NASPGHAN is the preeminent professional society for pediatric gastroenterologists in North America. Dr. Barnard is chief of Pediatrics at Nationwide Children’s Hospital, president of the Abigail Wexner Research Institute, and holds the Ann J. Wolfe Endowed Chair in Pediatric Research Leadership. He is also chair of Pediatrics at The Ohio State University College of Medicine. He has served as president of NASPGHAN, and also as president of the NASPGHAN Foundation.

Mendell Named Allen Distinguished Scholar in Pediatric Research

Jerry R. Mendell, MD, became the inaugural recipient of the Allen Distinguished Scholar in Pediatric Research in May 2019, an award recognizing a preeminent senior researcher who exemplifies the innovation happening at Nationwide Children’s and the Abigail Wexner Research Institute. Dr. Mendell has made fundamental contributions in clinical research and in the molecular genetics of neuromuscular disease throughout his career. He was among the first to test muscle cell transplantation for Duchenne muscular dystrophy in the early 1990s, and the first person to study viral-mediated gene therapy for muscular dystrophy in humans. The Allen Distinguished Scholar is named for Steve Allen, MD, who served as Nationwide Children's CEO for nearly 13 years before retiring in 2019. During Dr. Allen's tenure, he helped build Nationwide Children's into a renowned pediatric research institution, including overseeing an increase from $41.7 million to $105.9 million in external research awards. Nationwide Children's is currently ranked fifth in the country for National Institutes of Health funding among freestanding children's hospitals.

Gerhardt Receives Endowed Chair in Pediatric Behavioral Health

Cynthia A. Gerhardt, PhD, received the Janet Orrtrung-Morrow, MD, and Grant Morrow, III, MD, Endowed Chair in Pediatric Behavioral Health in May 2019. Endowed chairs are among the highest honors that can be bestowed upon a researcher, academic, or clinician. Dr. Gerhardt is the director of the Center for Biobehavioral Health in the Abigail Wexner Research Institute. She is also a psychologist in the Pediatric Psychology and Neuropsychology Program at Nationwide Children's and a professor of Pediatrics and Psychology at The Ohio State University College of Medicine. Dr. Gerhardt is an internationally known expert in risk and resilience factors associated with family adjustment to stress, particularly life-threatening illnesses such as childhood cancer.

Bonny Named Chief of Adolescent Medicine

Anne M. Connolly, MD, has joined Nationwide Children’s Hospital as division chief of Neurology and a member of the Center for Gene Therapy. An internationally recognized expert in pediatric neuromuscular disease and neuroimmunology, Dr. Connolly’s early research involved examining the relationship between auto-antibodies and development of childhood neurological disorders. She has helped develop outcome measures for infants and boys with Duchenne muscular dystrophy, and has led or been a collaborator in numerous pivotal clinical trials in children with neuromuscular disorders. Dr. Connolly, who is also a professor of Pediatrics at The Ohio State University College of Medicine, has published 90 peer-reviewed articles, 18 invited reviews and chapters and given more than 40 invited lectures the world over. She is associate editor for the Journal of Child Neurology and has served as a national thought leader for multiple foundation and government agency efforts to improve outcomes in children with neuromuscular disorders.

Krawczeski Named Division Chief of Cardiology

Catherine Krawczeski, MD, joined Nationwide Children's as division chief of Cardiology in The Heart Center, George H. Dunlap Endowed Chair in Cardiology, and professor of Pediatrics at The Ohio State University College of Medicine. Prior to joining Nationwide Children’s, Dr. Krawczeski was medical director of the CVICU and director of the pediatric cardiology fellowship at Lucile Packard Children's Hospital. She has authored more than 100 peer-reviewed publications, book chapters and invited papers, and has lectured extensively nationally and internationally. She is a fellow of the American Academy of Pediatrics, the American College of Cardiology and the American Heart Association. An accomplished physician-scientist, Dr. Krawczeski's research focuses on acute kidney injury following cardiac surgery and interventions for congenital heart disease. She has served as a principal investigator or co-investigator on more than 10 funded grants since 2004, with seven supported by the National Institutes of Health.

Chisolm Named Director of Center for Innovation in Pediatric Practice and VP Health Services Research

Deena Chisolm, PhD, has been named the director of the Center for Innovation in Pediatric Practice and vice president of Health Services Research at the Abigail Wexner Research Institute (AWRI). Dr. Chisolm is professor of Pediatrics at The Ohio State University College of Medicine and professor of Health Services Management and Policy at OSU’s College of Public Health. Dr. Chisolm joined the AWRI in 2003 as a postdoctoral researcher, becoming a principal investigator in 2004. In 2012, she became co-director of the Patient-Centered Pediatric Research Fellowship program and in 2015 was named director of Population Health and Equity Research within the Center for Innovation in Pediatric Practice. Her current research explores how health literacy, health policy and social factors influence the health of at-risk adolescents transitioning to adulthood and is funded by agencies including the National Institute on Minority Health and Health Disparities, and the National Institute on Drug Abuse.

Deena Chisolm, PhD

Catherine Krawczeski, MD

Bonny Named Chief of Adolescent Medicine

Andrea E. Bonny, MD, has been named chief of Adolescent Medicine at Nationwide Children’s Hospital. Dr. Bonny, a principal investigator in the Center for Clinical and Translation Research at the Abigail Wexner Research Institute and associate professor of Pediatrics at The Ohio State University College of Medicine, joined Nationwide Children's in 2011. She also serves as the director of research for Adolescent Medicine. Dr. Bonny's research focuses on reproductive health care for adolescents and adolescent substance abuse. She has served as a principal investigator on multiple externally funded grants including awards from the National Institutes of Health. She has authored more than 55 peer-reviewed publications and invited papers and has lectured nationally and internationally.

Mendell Named Allen Distinguished Scholar in Pediatric Research

Jerry R. Mendell, MD

Cynthia A. Gerhardt, PhD

Deena Chisolm, PhD

Andrea E. Bonny, MD

Anne M. Connolly, MD

Catherine Krawczeski, MD


NEW APPOINTMENTS

Nationwide Children’s Named CMTA Center of Excellence

The Charcot-Marie-Tooth Association named Nationwide Children’s a CMT Center of Excellence, in recognition of the comprehensive care and expertise provided to children with the most common form of Charcot-Marie-Tooth disease, CMT1A. Zanife Sahenk, MD, PhD, an attending neurologist, is director of the CMT Center which comprises a multidisciplinary team of specialists in neuromuscular disorders, genetics counseling and orthopedics, as well as physical and occupational therapy. All clinical care is coordinated within a single location, within a single visit. Dr. Sahenk serves as director of Clinical and Experimental Neuromuscular Pathology in the Abigail Wexner Research Institute and is a principal investigator in the Center for Gene Therapy. She is also leading the upcoming National Institutes of Health-funded clinical trial of a gene therapy designed to protect and restore peripheral nerve function in children and adults with CMT1A.
Rebecca G. Wallihan, MD

Wallihan Named Residency Director

Rebecca G. Wallihan, MD, was named program director of the Nationwide Children’s Pediatric Residency Program in 2019. An attending physician in Infectious Diseases at Nationwide Children’s, Dr. Wallihan has served as associate director for the Pediatric Residency Program since 2012 and vice chair for Education in the Department of Pediatrics since 2015. On the national scene, she has served a number of important roles in the Association of Pediatric Program Directors (APPD). These include serving as a member of the Vision 2020: Research and Scholarship Strategic Plan Working Group, the Research and Scholarship Task Force, and as a content expert for the Pediatric Milestones Assessment Collaborative – a joint initiative between APPD and the National Board of Medical Examiners. Dr. Wallihan is also associate professor of Pediatrics at The Ohio State University College of Medicine.

Oluyinka O. Olutoye, MD, PhD

Oluyinka O. Olutoye, MD, PhD, has been appointed surgeon-in-chief at Nationwide Children’s as well as professor and the E. Thomas Boles chair of Pediatric Surgery at The Ohio State University College of Medicine. In this role, Dr. Olutoye leads the 11 surgical departments within Nationwide Children’s. Dr. Olutoye previously served as co-director of the Fetal Center at Texas Children’s Hospital. As a pediatric and fetal surgeon, he brings specialized clinical expertise in fetal and neonatal surgery. In addition to his clinical expertise, Dr. Olutoye also leads an established research program focused on the role of the inflammatory response in scarless fetal wound healing, in utero correction of severe congenital malformations, and the early detection of necrotizing enterocolitis in preterm infants. Dr. Olutoye received his medical degree from Obafemi Awolowo University in Nigeria, and earned his PhD in anatomy from Virginia Commonwealth University. He completed his General Surgery residency at the Medical College of Virginia Hospitals, Virginia Commonwealth University, and his fellowships in Pediatric and Fetal Surgery at the Children’s Hospital of Philadelphia.

RESEARCH INSTITUTE DEDICATED TO ABIGAIL WEXNER

Nationwide Children’s Hospital dedicated the hospital’s Research Institute as the Abigail Wexner Research Institute at Nationwide Children’s in May 2019. As a lawyer and community volunteer, Abigail S. Wexner is involved in philanthropic work nationally and locally, with a particular focus on children’s issues. She began serving on the Nationwide Children’s board in 1993 and acted as board chair for seven years from 2005 to 2012. During her tenure as chair, Mrs. Wexner led the hospital through the largest expansion in its 127-year history, including completion of a 12-story hospital building and a third research building with more than $1.2 billion in regional economic impact. The Wexners’ cumulative personal giving and philanthropic impact at Nationwide Children’s now exceeds more than $80 million. This transformational funding has enabled the hospital to expand its clinical and research programs as one of America’s premier pediatric leaders.
Dear Colleagues:

The Ohio State University College of Medicine is among the best places anywhere to train to be a physician. Last year, nearly 7,800 students applied for just 209 positions at an institution with a reputation for teaching students to deliver the highest level of health care, in a compassionate and caring way. One of the keys to the success of our medical education program is the strong symbiotic relationship we enjoy with Nationwide Children’s Hospital. Allow me to share some highlights with you.

Nationwide Children’s is one of Ohio State’s largest medical training environments. At Nationwide Children’s, in fiscal year 2019:

- 194 third-year medical students completed core rotations in Pediatrics
- 171 fourth-year medical students completed rotations
  - 154 were Ohio State students
  - 101 medical students completed required rotations
  - 70 medical students chose elective rotations
  - 37 were visiting students
- More than 30 first-year medical students completed a summer research experience at Nationwide Children’s

Additionally, 41 first- and second-year medical students are completing their longitudinal clinical placements (Longitudinal Practice) at Nationwide Children’s sites, where 32 Pediatrics faculty members serve as Longitudinal Practice preceptors.

Finally, 14 of our graduating medical students (8%) went into Pediatrics, one went into Child Neurology and seven selected Medicine/Pediatrics as their specialty.

In addition to our education partnership, The Ohio State University College of Medicine is creating stronger research collaborations with Nationwide Children’s. There are currently many successful collaborative programs with more under development.

On behalf of The Ohio State University College of Medicine, I congratulate Tim Robinson, John Barnard, MD, and all of the faculty and staff of the Department of Pediatrics and Nationwide Children’s for another outstanding year. Through our partnership with Nationwide Children’s, we are leading the way in educating the next generation of doctors, advancing research and enhancing care delivery throughout central Ohio and beyond.

Sincerely

K. CRAIG KENT, MD
Dean, College of Medicine
The Ohio State University
Leslie H. and Abigail S. Wexner Dean’s Chair in Medicine
Vice President of Health Sciences
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. We promote optimum 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 joint appointments with 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 $120 million in research funding.

Dear Colleagues:

Each year in this report we have the privilege of presenting just a few of the myriad highlights of the clinical care, teaching and research conducted by our outstanding Department of Pediatrics faculty. The following division reports convey our efforts to promote optimal child health by providing comprehensive, state-of-the-art programs for children in Ohio and across the globe. Our vibrant training programs provide among the most diverse and preeminent educational experiences in pediatrics available in the United States.

Many of our discoveries over the past year have resulted in high-impact publications, seminal breakthroughs and landmark commercialization opportunities. With more than $120 million in research support, we are ranked 6th among free-standing children’s hospitals in National Institutes of Health funding.

I invite you to explore the following pages and appreciate the depth and breadth of our pursuit to achieve best outcomes for children everywhere.

Sincerely,

John A. Barnard, MD
Ann I. Wolfe 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
2018–2019 Nationwide Children’s Residency Program
Nationwide Children’s Hospital | The Ohio State University College of Medicine

**Pediatrics Residency Program Director**
Rebecca G. Wallihan, MD

**Internal Medicine/Pediatrics Residency Program Director**
Margaret Chase, MD

**Associate Program Directors**
- Pediatrics
  - Mary Kay Kuma, MD
  - Alexander T. Rakowsky, MD
  - Mary Kay Kuzma, MD
  - Suzanne M. Reed, MD
  - Claire A. Stewart, MD

- Internal Medicine/Pediatrics
  - Lucas McGilvry, MD
  - Allison Rossetti, MD

**Pediatrics Chief Residents**
- Dr. Taylor Ballenger
- Dr. Sara Dong
- Dr. Kylene Draeger
- Dr. Jill O’Hara
- Dr. Laura Walawender
- Dr. Sheri Poskanzer
- Dr. Matthew Allen
- Dr. Sarah Ashland
- Dr. Elizabeth Barnhardt
- Dr. Ben Cole
- Dr. Frances Comer
- Dr. Zeenath Ameen
- Dr. Brett Ballard
- Dr. Angelique Boutzoukas
- Dr. Kyle Burghgraaf
- Dr. Lauren Carlson
- Dr. Danny Clark
- Dr. Ada Co
- Dr. Kari Cunningham
- Dr. Laura Deluzina
- Dr. Madisons Fassett
- Dr. Nancy Forman
- Dr. Sarah Grubin
- Dr. Jackie Guzylkone
- Dr. Lauren Guntherman
- Dr. Erika Jones
- Dr. Shelby Jordan
- Dr. Aaye Kori
- Dr. Jareed Kauma
- Dr. Kasey Lowell
- Dr. Rachel Levine
- Dr. Cola Ligorski
- Dr. Nenad Malik
- Dr. Kristin Maloney
- Dr. Lauren Marcus
- Dr. Ashwarya Narasipura
- Dr. Haley Nobel
- Dr. Michael Petruza
- Dr. Stephanie Ptoch
- Dr. James Ramirez
- Dr. Jessica Ramzy
- Dr. Aoife Sheer
- Dr. Louis Sesh
- Dr. Tais Shenoy
- Dr. Liv Singh
- Dr. Sam Strong
- Dr. Denny Wilson

**Internal Medicine-Pediatrics**
- PL-1
  - Dr. Collin Abbott
  - Dr. Ruth Abraham
  - Dr. Kooshte Akhtarzadeh
  - Dr. Abha Akhtar
  - Dr. Erik Anul
  - Dr. Bratina Bhandari
  - Dr. Amanda Campbell
  - Dr. Sarah Chen
  - Dr. Christian Coloma
  - Dr. Zac Daniels
  - Dr. Jonathan Degty
  - Dr. Dave Dong
  - Dr. Megan Freake
  - Dr. Chao Gable
  - Dr. Noga Gal
  - Dr. Matt Glaub
  - Dr. Bas Gomaray
  - Dr. Francesca Hodge
  - Dr. Monica Hoff
  - Dr. Aung Lowell
  - Dr. Kelly Lewis
  - Dr. Megan King
  - Dr. Antonio Kopp
  - Dr. Megan MacGregor
  - Dr. Abby McGinnis
  - Dr. Rachel Nash
  - Dr. Jackie Nicodemo
  - Dr. Kortney Pifher
  - Dr. Aubrey Pizza
  - Dr. Bucky Ribbeck
  - Dr. Melanie Ribbeck
  - Dr. Alex Saucedo
  - Dr. Ashleigh Slemmer
  - Dr. Cristina Tomatis Souverba
  - Dr. Carly Stilphen
  - Dr. Mosquera Vasquez
  - Dr. Mark Walker
  - Dr. Juan Zapienza

- PL-2
  - Dr. Karon Allen
  - Dr. Zoranna Arment
  - Dr. Brent Ballard
  - Dr. Angelique Boutronat
  - Dr. Kyle Burghgraaf
  - Dr. Lauren Carlson
  - Dr. Danny Clark
  - Dr. Ada Co
  - Dr. Kari Cunningham
  - Dr. Laura Deluzina
  - Dr. Madisons Fassett
  - Dr. Nancy Forman
  - Dr. Sarah Grubin
  - Dr. Jackie Guzylkone
  - Dr. Lauren Guntherman
  - Dr. Erika Jones
  - Dr. Shelby Jordan
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  - Dr. Jareed Kauma
  - Dr. Kasey Lowell
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  - Dr. Cola Ligorski
  - Dr. Nenad Malik
  - Dr. Kristin Maloney
  - Dr. Lauren Marcus
  - Dr. Ashwarya Narasipura
  - Dr. Haley Nobel
  - Dr. Michael Petruza
  - Dr. Stephanie Ptoch
  - Dr. James Ramirez
  - Dr. Jessica Ramzy
  - Dr. Aoife Sheer
  - Dr. Louis Sesh
  - Dr. Tais Shenoy
  - Dr. Liv Singh
  - Dr. Sam Strong
  - Dr. Denny Wilson

- PL-3
  - Dr. Matthew Allen
  - Dr. Sarah Ashland
  - Dr. Elizabeth Barnhardt
  - Dr. Ben Cole
  - Dr. Frances Comer
  - Dr. Zeenath Ameen
  - Dr. Brett Ballard
  - Dr. Angelique Boutzoukas
  - Dr. Kyle Burghgraaf
  - Dr. Lauren Carlozzi
  - Dr. Danny Clark
  - Dr. Aila Co
  - Dr. Kaci Cunningham
  - Dr. Laura DiScenna
  - Dr. Maureen Faust
  - Dr. Nate Forman
  - Dr. Sarah Gaubatz
  - Dr. Jackie Giafaglione
  - Dr. Lauren Gunderman
  - Dr. Eric Jones
  - Dr. Shelby Jordan
  - Dr. Ajay Koti
  - Dr. Jared Kusma
  - Dr. Kelsey Lecerf
  - Dr. Rachael Levine
  - Dr. Celia Ligorski
  - Dr. Nina Ma
  - Dr. Kristin Maletsky
  - Dr. Lauren Matera
  - Dr. Aishwarya Navalpakam
  - Dr. Haley Pearlstein
  - Dr. Michael Perisa
  - Dr. Stephanie Quach
  - Dr. James Reineke
  - Dr. Jessica Rutsky
  - Dr. Jennifer Scheer
  - Dr. Louisa Sethi
  - Dr. Tara Shenoy
  - Dr. Liv Singh
  - Dr. Sam Stough
  - Dr. Destiny Wilson

- PL-4
  - Dr. Shari Poskanzer
  - Dr. Matthew Allen
  - Dr. Sarah Ashland
  - Dr. Elizabeth Barnhardt
  - Dr. Ben Cole
  - Dr. Frances Comer
  - Dr. Zeenath Ameen
  - Dr. Brett Ballard
  - Dr. Angelique Boutzoukas
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  - Dr. Louis Sesh
  - Dr. Tais Shenoy
  - Dr. Liv Singh
  - Dr. Sam Strong
  - Dr. Denny Wilson

- PGY-1
  - Dr. Nabeeha Ahmad
  - Dr. Kristin Cooper
  - Dr. Rachel D’Amico
  - Dr. Michael Dienstbach
  - Dr. Mary Hanks
  - Dr. Rachael Mangaudis
  - Dr. Timothy Pian
  - Dr. Daniel Schmitz
  - Dr. Savannah Smith
  - Dr. Aisha White

- PGY-2
  - Dr. Philip Chang
  - Dr. Anyelika Delorme
  - Dr. Michelle Gielen
  - Dr. Rishi Guneman
  - Dr. Anahita Heidarian
  - Dr.直营 Hinton
  - Dr. Anuradha Menon
  - Dr. Ninh Le Tran
  - Dr. Mosquera Vasquez
  - Dr. Destiny Wilson

- PGY-3
  - Dr. Collin Abbott
  - Dr. Karon Allen
  - Dr. Zoranna Arment
  - Dr. Brent Ballard
  - Dr. Angelique Boutronat
  - Dr. Kyle Burghgraaf
  - Dr. Lauren Carlozzi
  - Dr. Danny Clark
  - Dr. Aila Co
  - Dr. Kaci Cunningham
  - Dr. Laura DiScenna
  - Dr. Maureen Faust
  - Dr. Nate Forman
  - Dr. Sarah Gaubatz
  - Dr. Jackie Giafaglione
  - Dr. Lauren Gunderman
  - Dr. Eric Jones
  - Dr. Shelby Jordan
  - Dr. Ajay Koti
  - Dr. Jared Kusma
  - Dr. Kelsey Lecerf
  - Dr. Rachael Levine
  - Dr. Celia Ligorski
  - Dr. Nina Ma
  - Dr. Kristin Maletsky
  - Dr. Lauren Matera
  - Dr. Aishwarya Navalpakam
  - Dr. Haley Pearlstein
  - Dr. Michael Perisa
  - Dr. Stephanie Quach
  - Dr. James Reineke
  - Dr. Jessica Rutsky
  - Dr. Jennifer Scheer
  - Dr. Louisa Sethi
  - Dr. Tara Shenoy
  - Dr. Liv Singh
  - Dr. Sam Stough
  - Dr. Destiny Wilson
The Section of Adolescent Medicine at Nationwide Children’s Hospital provides general and specialty care for adolescents. The staff is expert 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 for incarcerated youth, and adolescents with complex health problems.

**FACULTY**

Andrea E. Bonny, MD  
Elise D. Berlan, MD, MPH  
Gayathri Chelvakumar, MD, MPH  
Casey B. Cottrill, MD, MPH  
Fareeda W. Haamid, DO  
Cynthia M. Holland-Hall, MD, MPH  
Steven C. Marson, MD  
Erin R. McKnight, MD, MPH

The Adolescent Medicine Clinic is 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 addiction. The Medical Clinic at the Franklin County Juvenile Detention Facility provides health care for detained youth. The Eating Disorders Program is a comprehensive primary care, reproductive health care, eating disorders, LGBTQ youth, substance abuse, health for incarcerated youth, and adolescents with complex health problems.

The Medication-Assisted Treatment for Addiction (MATA) program has treated adolescents and young adults with opioid addiction since 2010. Our faculty members are active participants in research and education. Erin R. McKnight, MD, MPH, and Andrea E. Bonny, MD, were recipients of an NIH grant to develop new statistical approaches for estimating county-level rates of opioid misuse to target areas of highest priority. Gayathri Chelvakumar, MD, MPH, presented her research at the World Professional Association for Transgender Health in Buenos Aires, Argentina. Steven C. Marson, MD, and Andrea E. Bonny, MD, were invited keynote speakers at the 1st Annual Jerry Rauh Memorial Lectureship at Cincinnati Children’s Medical Center and spoke on integration of medication treatment of addiction into outpatient medical care.

**SELECTED PUBLICATIONS**


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, several multispecialty clinics, an urgent referral clinic and inpatient consultation services. The division is also actively involved in both basic science and clinical research.

FACULTY

Philip N. Rancitelli, MD
Grace V. Rya, MD

OSU-AFFILIATE FACULTY

Rebecca Scherzer, MD

OSU-ASSOCIATE FACULTY

Mitchell H. Grayson, MD

OSU-ASSOCIATE FACULTY

Rebecca Scherzer, MD

FULL-TIME NATIONAL CHILDREN’S FACULTY

Elizabeth A. Erwin, MD
Irene J. Mikhail, MD
Peter J. Mustillo, MD
Benjamin Prince, MD
Margaret Redmond, MD
Kasey Strothman, MD
David R. Stukus, MD

COMMUNITY-BASED FACULTY

Roger A. Friedman, MD
David W. Hauzsmith, MD

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, several multispecialty clinics, an urgent referral clinic and inpatient consultation services. The division is also actively involved in both basic science and clinical research.

FACULTY

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Benjamin Prince, MD
Margaret Redmond, MD
Kasey Strothman, MD
David R. Stukus, MD

COMMUNITY-BASED FACULTY

Roger A. Friedman, MD
David W. Hauzsmith, MD
Percutaneous occlusion for patent ductus arteriosus (PDA) in infants weighing less than 6 kg is associated with potential longer term improvements in respiratory health, research by investigators at Nationwide Children’s Hospital shows.

At the same time, the procedure is associated with risks of device-related complications and, particularly among infants weighing less than 3 kg, adverse cardiopulmonary outcomes, according to the study published in *The Journal of Pediatrics*.

“We’ve used catheter-based PDA closures on infants who have not spontaneously closed their PDA beyond the first 30 days of life and who continued to have evidence of potential complications related to an open ductus,” says Carl H. Backes, Jr., MD, attending neonatologist and attending cardiologist at Nationwide Children’s and co-author of the study. “But fundamental questions of the appropriate use of the procedure remain.”

The retrospective study analyzed the medical records of 92 infants who had a PDA closure device implanted while being treated in The Heart Center at Nationwide Children’s Hospital from 2003 to 2017.

Pulmonary outcomes were quantified using a composite pulmonary score based on weighted clinical therapies, including type (mechanical ventilation, continuous positive airway pressure or nasal cannula), need for supplemental oxygen and pulmonary medications (systemic steroids, diuretics). A lower score indicates respiratory improvement.

Scores were calculated weekly for 28 weeks. By then, the mean score for the cohort dropped more than 50% from the pre-procedural mean.

The procedure was successful in all but two infants. In those who underwent successful device closure, post-procedural echocardiograms indicated mild left pulmonary artery obstruction in 20 infants and mild descending aorta obstruction in seven immediately following device implantation. The numbers dropped to three and four infants respectively by discharge. Infant age and weight were not associated with the device-related complications. No patient required reintervention for these findings.

Among infants weighing less than 3 kg, the rate of oxygenation failure was 28% and rate of decreased left ventricular systolic function (LVSF) was 29%; among infants weighing 3 and 5.9 kilograms, the failure rate was 8% and LVSF 5%.

“The low but real device-related complications identified in this study underscore the need for continued device development,” says Darren Berman, MD, co-director of Cardiac Catheterization and Interventional Therapies in The Heart Center at Nationwide Children’s, and study co-author. “In fact, a newer device, just recently FDA approved, will help reduce the incidence of device-related complications significantly.”

He and the rest of the authors call for clinical trials comparing percutaneous occlusion to alternatives in order to definitively determine risks and best practices.

**CITATION:**
THE HEART CENTER

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 developing novel therapies for our patients, focusing on each as an individual and providing the state-of-the-art care that all patients deserve, regardless of age. We support the mission of Nationwide Children’s to provide our services in a safe environment focused on family-centered care.

FACULTY

Aimer K. Armstrong, MD
Carl H. Backes, MD
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Brian A. Boz, MD
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Elisa A. Bradley, MD
Sergio A. Carrillo Melendez, MD
Steven C. Cassidy, MD
John P. Cheatham, MD
Kristin M. Chenault, MD
Marco Cordone, MD
Linda H. Coipe, MD
Clifford L. Coo, MD
Curt J. Daniels, MD
Stephen M. Druhan, MD
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Richard P. Fernandez, MD
Jill A. Finch, MD
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Omar M. Khalid, MD
Sarah Khan, MD
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Rajesh Krishnamurthy, MD
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Eric A. Lloyd, MD

May L. Mah, MD
Patrick I. McConnell, MD
Christopher T. McKer, DO
Katherine T. Mihielle, DO
Aymen N. Noghabi, MD
Dejanjan Nandi, MD
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Christina M. Phelps, MD
Saurabh Rajpal, MD
Kerry L. Rosen, MD
Daniel G. Rowland, MD
Aarti Sabanayagam, MD
Toshiharu Shinoka, MD, PhD
Janet M. Simson, MD
Corey A. Sivier, MD
Karen M. Testor, MD
Peter D. Winch, MD, MBA
Andrew R. Yates, MD
Cody M. Young, DO

NATIONAL AND INTERNATIONAL REPUTATION

Highlights

• Recruitment of Catherine Krawczeski, MD, as new chief of Cardiology and co-director of The Heart Center
• Hosted 3DE3 Meeting, an annual international interventional cardiology meeting, highlighting 3D imaging techniques in catheterization
• Funded 11 intramural projects and obtained extramural National Institutes of Health grants totaling $2.5 million
• Successful joint quality improvement metrics between Dayton Children’s Hospital and Nationwide Children’s Heart Center OPCa Joint Venture
• Expanded regional outreach pediatric and adult congenital clinics with record volume in outpatient visits and diagnostic studies
• Significantly improved patient access to clinic visits with decrease in wait time by modifying scheduling process and adding flexible clinic sessions

The Heart Center continues to grow in both volume and capabilities. In 2018, the Heart Transplant program saw a nearly 50% increase in both referrals and completed transplants. We implanted ventricular assist devices (VAD) for refractory heart failure in four patients awaiting transplant and were the first pediatric center in Ohio to implant the new generation HeartMate III™ VAD. We developed a comprehensive outpatient VAD program and successfully discharged our first VAD patient. We anticipate continued VAD program growth, meeting the needs of an increasing population of older pediatric and young adult patients with congenital heart disease, as well as being a research site for novel pediatric VAD designs. We have also begun a cardio-oncology program to provide ongoing cardiac care to long-term survivors of childhood cancers at risk for cardiomyopathy.

Our interventional cardiologists participate in multiple pivotal device trials, leading to approval of a new ASD occluder device (Cardioform ASD Occluder) and the first PDA device for premature infants (Piccolo). They continue a successful fetal cardiac intervention program through the Congenital Heart Collaborative (with University Hospitals, Rainbow Babies and Children’s Hospital) and also perform pre-clinical research, implanting the first fully bioabsorbable tissue engineered pulmonary valve in an animal fetus via a percutaneous transartery approach. Through a collaboration among cardiologists, interventional radiology and hematology, they are performing new services for patients with lymphatic disorders, including diagnosis via advanced imaging as well as interventional treatment.

Our electrophysiologists developed a collaborative inherited arrhythmia clinic, combining the expertise of specialists in cardiology, psychology and genetic counseling. They are working to develop appropriate use criteria for implantable cardioverter defibrillators in patients with Duchenne’s muscular dystrophy. As part of Project Adam Ohio, which is housed at Nationwide Children’s, they have met with multiple school districts in an attempt to ensure schools have the appropriate placement of and training in the use of automatic external defibrillators. Additionally, faculty are involved in several international multicenter research projects to advance the care for children with arrhythmias and continue research in the identification of arrhythmias in adults with congenital heart disease.

The Adult Congenital Heart Disease (ACHD) Program has been active with several research projects involving the use of ambulatory pulmonary hemodynamic invasive monitors for ACHD patients to better control heart failure and hospital admissions and currently has the world’s largest experience with the use of these devices.
The ACHD program has expanded its clinical outreach in several cities around Ohio including additional clinics in Dayton, Portsmouth and Zanesville. The ACHD cardiologists and fellows have presented at several national and international meetings this past year covering areas of research and clinical care including atrial septal defects and pulmonary hypertension, ACHD program accreditation, future care of ACHD, neurodevelopment and CHD, and published in several areas including racial disparities in lost to CHD care, executive functioning and CHD, patient reported outcomes with ACHD and depression and anxiety with ACHD.

Cardiothoracic Intensive Care Unit (CTICU) physicians are principal or co-investigators on five externally funded grants, one industry sponsored study and one intramural grant that they authored 14 manuscripts published in peer-reviewed journals. Ten of the co-authored manuscripts were part of national multicenter studies, including National Emergency Airway Registry for Children (NEAR4KIDS), Therapeutic Hypothermia After Pediatric Cardiac Arrest (THAPCA) and Collaborative Pediatric Critical Care Research Network (CPCRN). Additionally, seven abstracts were presented at national and international scientific meetings.

The Non-Invasive Imaging team co-hosted the inaugural Ohio Fetal Medicine Conference in April 2019 with the Congenital Heart Collaborative. The team remains active in research with three funded investigators and a dedicated imaging research coordinator. Advanced Cardiac Imaging (MRI and CT) continue to grow, both programmatically and in volume. In Cardiac CT, new techniques were begun that allow non-sedated imaging of young children with much lower radiation exposure. New programs introduced in cardiac MRI included myocardial stress perfusion imaging, free-breathing real time cine for accelerated imaging without saturation, high-resolution coronary MRI angiography and comprehensive myocardial characterization. Large animal cardiac imaging was also successfully implemented on the dedicated research magnet to support the tissue engineered vascular graft development group.

The Heart Center is currently engaged in 15 active quality improvement projects including major projects to improve communication between the CTICU and the acute care floor at the time of transfer and improving 30-day clinic access for patients. Families have reported higher satisfaction during their stay on the acute care floor and changes in the process by which patients are scheduled for clinic has resulted in a dramatic decrease in appointment wait times. These projects reflect the ongoing commitment of The Heart Center to improving the overall care experience for patients and their families.

The Center for Cardiovascular Research continues to grow its participation in NIH and industry-funded clinical trials. An area of interest is the management of patent ducus arteriosus (PDA), a common cardiovascular complication of preterm birth. Our team has been among the leaders in catheter-based closure of PDA in lower weight infants and were investigators in the Amplatter Piccolo Occluder clinical trial that led to FDA approval of the device in 2019. In addition, we are participating in crucial NIH-funded interdisciplinary clinical research to determine whether and when a premature infant’s PDA will close on its own without intervention. Additionally, the center is participating as a site in several NIH and industry-funded clinical trials that total more than $900,000 and include studies for market approval of drugs to treat complications of cardiac surgery requiring cardiologympy or single ventricle congenital heart disease and transcatheter devices to non-invasively treat structural cardiac defects.

Center for Cardiovascular Research: see page 181 for information about this center in the Abigail Wexner Research Institute at Nationwide Children’s.

GRANTS AWARDED TO HEART CENTER AND CARDIOVASCULAR RESEARCH FACULTY JULY 1, 2018 – JUNE 30, 2019
$3,290,050

SELECTED PUBLICATIONS


Department of Pediatrics

CARDIOLOGY

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

FACULTY

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

Aimee K. Armstrong, MD
Carl H. Buckes, MD
Deren P. Berman, MD
Brian A. Boe, MD
Jessica L. Bowman, MD
Aimee K. Armstrong, MD
Carl H. Backes, MD
Darren P. Berman, MD
Brian A. Boe, MD
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May L. Mak, MD
Katherine M. Mizelle, MD
Deepanjan Nandi, MD
Kathryn D. Nandell, MD
Christina M. Phelps, MD
Suwabbi Rajpal, MD
Kerry L. Rosen, MD
Daniel G. Rowland, MD
Aurelii Saharnayam, MD
Janet M. Simsic, MD
Corey A. Stiver, MD
Karen M. Texter, MD
Andrew R. Yates, MD

GRANTS AWARDED TO HEART CENTER AND CARDIOVASCULAR RESEARCH FACULTY
JULY 1, 2018 – JUNE 30, 2019
$3,290,050

SELECTED HEART CENTER PUBLICATIONS


2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM

ADULT CONGENITAL HEART DISEASE
Anasudeep Dedijja, MD
Marc Lee, MD
ADVANCED NONINVASIVE CARDIAC IMAGING
Carmen Kiper, MD

PEDIATRIC CARDIOLOGY

Julie Aldrich, MD
Jeffrey Bennett, MD
Jason Cole, MD
Tyler W. Cunningham, MD
Christina M. Fink, MD
Emily Hayes, MD
Brittney Hills, MD
Erin Nealon, MD
Hannah Jacobs, DO
Andrew R. Yates, MD

2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM

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Carmen Kiper, MD

PEDIATRIC CARDIOLOGY

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Christina M. Fink, MD
Emily Hayes, MD
Brittney Hills, MD
Erin Nealon, MD
Hannah Jacobs, DO
Andrew R. Yates, MD
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 a multidisciplinary organization that provides coordinated and comprehensive services in the prevention, diagnosis and treatment of family violence. As a national leader in this important work, a team of more than 120 professionals representing medicine, behavioral health, social services, law enforcement, prosecution and children services are co-located at the center to address the complex issues of family violence.

FACULTY

Megan M. Letson, MD, MEd
Chief
Faud W. Brinkle, MD
Kristin G. Crichon, DO, MPH
Catherine M. Huber, MD
Jennifer J. Tscholl, MD

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 for suspected child maltreatment.

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 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.

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 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 Subboard on Child Abuse Pediatrics. Additionally, faculty continue a tradition of national speaking engagements. During the past year, faculty have presented at the San Diego International Conference on Child and Family Maltreatment, Huntsville International Symposium on Child Abuse, Pediatric Trauma Society Annual Meeting, and the American Burn Association.

GRANTS AWARDED

JULY 1, 2018 – JUNE 30, 2019

$1,437,429

SELECTED PUBLICATIONS


CLINICAL INFORMATICS

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

FACULTY

Jeffrey M. Hoffman, MD
Chief

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

The faculty and fellows in the Division of Clinical Informatics work to enhance the usability and effectiveness of our clinical information systems and to provide expert consultation to operational leaders, clinicians and clinical investigators across the organization. We collaborate closely with other divisions and disciplines to improve tools for clinical documentation, patient management, population health, information exchange with other providers and health systems, and data collection for quality improvement initiatives and research projects.

The division continues to participate in a multitude of quality and safety projects. A highlight of this work has been our recent implementation of an automated, electronic inpatient sepsis detection tool embedded within the EHR, which has increased the time between emergent ICU transfers for severe sepsis or septic shock to over 180 days. We are continuing to refine the detection algorithm and clinical workflows toward our overall goal of eliminating these events altogether.

Over the past year, we have further enhanced our clinical decision support for opioid prescribing. Additional prescriber alerting and documentation tools, combined with deeper integration of Ohio’s controlled substance reporting system (OARRS), has facilitated optimal patient care while remaining compliant with new legal requirements.

Our work on EHR alert reduction is continuing, with new capabilities to elicit real-time end-user feedback on intrusive alerts. As a likely contributor to patient safety risks and potential staff burnout, alert fatigue is an ongoing challenge our division is actively combating. In early 2019, our efforts and leadership in this area led to the formation of a national Pediatric Decision Support Collaborative, linking clinical informatics experts from several major children’s hospitals to work together on tackling this important issue.

GRANTS AWARDED

JULY 1, 2018 – JUNE 30, 2019

$343,200

SELECTED PUBLICATIONS


Stukus D, Patrick M, Nuss KE. Social Media for Medical Professionals – Strategies for Successfully Engaging in an Online World. (Cham, Switzerland: Springer International Publishing AG, 2019), 221.
COMPLEX CARE

The Complex Health Care Program at Nationwide Children’s Hospital provides comprehensive, coordinated and holistic care to children and adults with neurodevelopmental disabilities. For some patients with complex issues, we are their primary care doctor and “medical home.” For others, we partner with their medical home and specialists to provide expert neurodevelopmental care. In collaboration with other services, we participate in the Comprehensive Cerebral Palsy Program, the Interdisciplinary Feeding Program, the Interdisciplinary Spinal Muscular Atrophy Clinic, the Early Developmental Clinic, the Adult Down Syndrome Clinic at the Nisonger Center, and provide medical care to the residents of the Heinzerling Foundation.

FACULTY

Garey Noritz, MD
Chief
Rukshana Ahmed, MD
Wendy Burdo-Hartman, MD
Derek Fletcher, MD
Elizabeth Lucas, MD
Katherine Steingass, MD
Joy Walton, MD

The Comprehensive Pediatric Feeding Program at Nationwide Children’s treats children with feeding disorders as outpatients and several patients at a time in the intensive program, which is extremely successful in reducing the need for tube feeding.

Our faculty continue to be a sought-after resource for education, with invited lectures at the local, national and international levels. Our non-physician staff members are leaders in training their colleagues in nursing, nutrition, pharmacy, social work and therapy 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 Pediatric Feeding Consortium, and the American Academy for Cerebral Palsy and Developmental Medicine.

SELECTED PUBLICATIONS


FAST FACTS

July 2018 through June 2019

| Inpatient Discharges | 364 |
| Observation and Outpatient-in-a-Bed Discharges | 24 |
| Average Length of Stay | 6.60 |
| Average Daily Census | 6.58 |

*Excludes observation and outpatient-in-a-bed patients.
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 rates of hospital-acquired infection and preventable harm 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.

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Maria H. Estrada, DO, FAAP
Jill A. Finch, MD
W. Joshua Fraetart, MD
Jennifer M. Gauntt, MD
Samantha W. Gee, MD, FAAP
Todd J. Karres, MD, MPH
Anthony Y. Lee, MD, FAAP
Ada T. Lin, MD, FAAP
Eric A. Lloyd, MD
Marlina E. Lovett, MD
Jeffrey E. Lutman MD
Tensing Maa, MD, FAAP
Christopher P. Montgomery, MD
Jennifer A. Muaynyuki, MD, MPH
Nicole F. O'Brien, MD
Danna W. Quinibi, MD
Claire A. Stewart, MD, MEd
Markita L. Suttle, MD
Nicole F. O'Brien, MD
Jennifer A. Muszynski, MD, MPH
Samantha W. Gee, MD, FAAP
Jennifer M. Gauntt, MD

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.

SELECTED PUBLICATIONS


Talent in situ research laboratory within the PICU, and four divisional research coordinators, the section remains at the forefront of innovation in the field. The Division of Critical Care Medicine continued its trajectory of growth in 2018 with the addition of four talented new junior faculty members: Danna W. Quinibi, MD, and Megan C. Daniel, MD, (general pediatric critical care); Marlina E. Lovett, MD, (neurocritical care); and Jennifer M. Gauntt, MD, (cardiac critical care).

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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.

**FACULTY**

Patricia M. Witman, MD  
Chief  
Esteban Fernández Faith, MD  
Karya Harfmann, MD  
Joy Lynn Mosser-Goldfarb, MD

In addition, our division is now offering expanded diagnostic patch testing for contact allergies. After careful review of those allergies most likely to occur in children as opposed to the general population, our Dermatology team has created a customized pediatric panel of contact allergens for which we offer testing. Additionally, our testing protocols are specifically designed with the pediatric patient in mind.

**SELECTED PUBLICATIONS**


**FAST FACTS**

- **July 2018 through June 2019**
  - Canal Winchester Dermatology Clinic Visits: 975
  - Dermatology Clinic Visits: 5,930
  - Dublin Dermatology Clinic Visits: 2,058
  - Westerville Dermatology Clinic Visits: 1,586
  - Total Clinic Visits: 11,349
  - Inpatient Consults: 1,586

**DEVELOPMENTAL AND BEHAVIORAL PEDIATRICS**

The mission of the Division of Developmental and Behavioral Pediatrics at Nationwide Children’s Hospital is to achieve best outcomes for children with developmental and behavioral needs through 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. See page 131 for details about Behavioral Health services.

**FACULTY**

Rebecca A. Baum, MD  
Chief  
Lindsay Bartram, DO  
Daniel L. Coury, MD  
Anita N. Narayanan, MD  
Patricia L. Nash, MD  
Gary H. Noritz, MD  
Katharine Steingass, MD  
Jennifer Walton, MD, MPH

The Division of Developmental and Behavioral Pediatrics at Nationwide Children’s is led by Rebecca Baum, MD. An associate professor of pediatrics at The Ohio State University College of Medicine, Dr. Baum holds leadership positions in several national organizations, including the Society for Developmental Behavioral Pediatrics’ board of directors, the American Board of Pediatric’s Developmental Behavioral Pediatrics Sub-board, and the American Academy of Pediatrics’ Committee on Psychosocial Aspects of Child and Family Health.

Faculty in the division contribute at the local and national levels to improve clinical outcomes and reduce avoidable harm. Daniel L. Coury, MD, holds multiple national administrative and research roles, including medical directorship of the Autism Treatment Network. Anita N. Narayanan, MD, and Lindsay Bartram, DO, lead the division’s quality improvement efforts to reduce environmental stressors faced by Developmental and Behavioral Pediatrics patients, reduce missed appointments and improve transition to adult care. Jennifer Walton, MD, MPH, is co-director of the Nationwide Children’s Williams Syndrome Clinic and chair-elect of the pediatrics section of the National Medical Association. Katherine Steingass, MD, serves as medical director of the Nationwide Children’s Myelomeningocele Clinic and co-chair of the Early Childhood Special Interest Group for the Society for Developmental and Behavioral Pediatrics. Patricia L. Nash, MD, serves as medical director of the Nationwide Children’s Down Syndrome Program.

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

**GRANTS AWARDED**

**JULY 1, 2018 – JUNE 30, 2019**

$252,216
SELECTED PUBLICATIONS


FAST FACTS

July 2018 through June 2019

Child Development Center Visits: 3,275

Developmental Disabilities Clinic Visits: 110

Myelomeningocele Clinic Visits: 687

Developmental Behavioral Pediatrics Clinic Visits: 4,920

2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM

DEVELOPMENTAL BEHAVIORAL PEDIATRICS

Lizanne F. Lindle, MD

Jean Lozano, MD

Rachel M. Stanley, MD, MHSA

Division Chief

Michael Stoner, MD

Section Chief

Barbara Amakye, MD

Srikant Aravapalli, MD

Terry Barber, MD

Berkeley Bennett, MD

Luciana Berg, MD

Deborah Blackwell, MD

Alan Bleiberg, MD

Jessica Beckemstedt, MD

Bema Bonu, MD

Brian Bowden, MD

Mary Bowman, MD

Beth Bobolz, MD

Michael Chua, MD

EMERGENCY MEDICINE

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 ED staffed by board-certified/eligible pediatric emergency medicine subspecialists 24 hours a day.

FACULTY

Beth Claxton, MD

Daniel Cohen, MD

Melanie Copenhaver, DO

Kristol Das, MD

Carrie DelHoff, MD

Lori Drsche, MD

Meghan Dishong, MD

Michael Dunn, MD

Meika Eby, MD

Emile Elshammar, MD

Joelle Fadlon, MD

Rachel Feldkamp, MD

Aarti Gaglani, MD

Adam Garlock, MD

Yaffa Gewirtz, MD

Della Gold, MD

Angela Harris, MD

Kara Hauesperger, MD

Todd Holman, MD

Daniela Humphrey, MD

Maya Iyer, MD

Iram Jafri, MD

Shelesea Johnson, MD

Muhammad Khan, MD

Simmi Dogra Kulkarni, MD

Catherine Lambert, MD

Marc Leifer, MD

Julie Leonard, MD

Seth Linakis, MD

Manuel Lugo, MD

Timothy McClung, MD

Ellen McManus, MD

Jennifer Melvin, MD

Leah Middelberg, MD

Leah Middelberg, MD

Michael Stoner, MD

Section Chief

Barbara Amakye, MD

Srikant Aravapalli, MD

Terry Barber, MD

Berkeley Bennett, MD

Luciana Berg, MD

Deborah Blackwell, MD

Alan Bleiberg, MD

Jessica Beckemstedt, MD

Bema Bonu, MD

Brian Bowden, MD

Mary Bowman, MD

Beth Bobolz, MD

Michael Chua, MD

Leah Middelberg, MD
The Emergency Department provides expertise in the ongoing improvement of health care delivery in the Emergency Department and in clinical outcomes. Grants Awarded July 1, 2018 – June 30, 2019 $1,425,489

SELECTED PUBLICATIONS


Study demonstrates the utility of a high risk assessment screening tool in differentiating between patients with versus patients without any acute health care utilization.

The multidisciplinary Quality Improvement Team in the Section of Endocrinology at Nationwide Children's Hospital, led by Manmohan Kamboj MD, FAAP, chief of Endocrinology, developed a brief risk screening tool evaluating patients with type 1 diabetes as a possible predictor of future poor diabetes care. A study was designed to determine whether this brief risk assessment tool can be used for risk stratification of patients and families at the time of the initial diagnosis of type 1 diabetes mellitus. The study also was used to determine whether the high risk assessment is associated with increased acute health care utilization and future glycomic control.

A total of 158 patients were included in the study. As explained by Don Buckingham, MBOE, CPHQ, lead coordinator, Quality Improvement Services at Nationwide Children's, the data analysis validated the screening tool to be of greatest utility in differentiating patients with versus patients without any acute health care utilization with excellent discriminatory ability, sensitivity and specificity. He notes, “Use of statistical analysis tools helps families and hospitals build confidence in endocrinology assessment initiatives.”

Psychosocial and socioeconomic factors contribute to poor diabetes care in children and adolescents with type 1 diabetes. “These factors are important when treating the patient and family as a whole,” says K. Ming Hong, MSW, LISW-S, Clinical Services and Care Coordination at Nationwide Children’s. “This research exemplifies the important interdisciplinary team building among social work, quality improvement, and medical providers.”

“Our ability to identify needs early allows us to provide targeted interventions and resources that foster resiliency and coping while preventing future admissions and medical complications,” adds Bethany Glick, MSSA, LISW-S, Clinical Services and Care Coordination at Nationwide Children’s.

“We believe that use of such a tool and consequent high risk assessment at the initial diagnosis of type 1 diabetes may facilitate clinicians to identify alternative diabetes management pathways to optimize care,” says Dr. Kamboj.


“We believe that use of such a tool and consequent high risk assessment at the initial diagnosis of type 1 diabetes may facilitate clinicians to identify alternative diabetes management pathways to optimize care.”

– Manmohan Kamboj, MD, FAAP, Chief of Endocrinology
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. These include, but are not limited to, type 1 and type 2 diabetes mellitus, insulin resistance and prediabetes, obesity, metabolic syndrome, hypoglycemia, polycystic ovarian syndrome, disorders of growth and puberty, thyroid and adrenal gland disorders, disorders of bone metabolism, genetic syndromes with hormone disturbances, diabetes insipidus and differences of sexual development and gender identification.

The section collaborates closely with other disciplines to offer endocrine expertise in the multidisciplinary clinic format to facilitate patient care. At present, these include Metabolic Bone Disease, Cystic Fibrosis-Related Diabetes, Prader-Willi Syndrome Clinic, Bone Marrow Transplant Long-term Follow-up Clinic, Muscular Dystrophy Clinic, Thyroid Nodule/Cancer, Type 2 Diabetes Mellitus clinics, fertility consultations, Sickle Cell Clinic, Diabetes Adult Transition Clinic, and THRIVE (differences of sexual development).

The section maintains a robust quality improvement portfolio that includes over 15 active projects designed to achieve best outcomes for patients with diabetes mellitus and endocrine disorders. As a member of the National T1D Exchange QI Collaborative, the section participates in initiatives to further expand the reach of QI best practices nationally.

The Section of Endocrinology is a major referral center for children and adolescents in and beyond central Ohio and is a consultative resource for the Ohio Department of Health Newborn Screening Program for congenital hypothyroidism and congenital adrenal hyperplasia.

GRANTS AWARDED
JULY 1, 2018 – JUNE 30, 2019
$467,494

SELECTED PUBLICATIONS


SELECTED PUBLICATIONS


Gastroenterology, Hepatology and Nutrition

Investigating Race, Insurance and ED Visits in Pediatric Crohn’s Disease

In what may be the first nationally representative study evaluating the impact of race and insurance status on emergency department treatment for Crohn’s disease, a team from Nationwide Children’s Hospital found that black children and those insured by Medicaid make more repeat visits and receive somewhat fewer treatments than white and privately insured peers.

But in contrast to earlier literature demonstrating disparities in the kind of treatments received, adjusted analyses found no significant differences in the use of imaging, laboratory testing and medication among the populations. Small treatment differences were found when analyzing race and payer status separately, but controlling for one of these variables often mitigated the differences found with the other.

The study was published in *Inflammatory Bowel Diseases*.

“We did not always find that race or insurance explains differences in treatments for these patients with Crohn’s disease,” says Jennifer Dotson, MD, MPH, a gastroenterologist at Nationwide Children’s and principal investigator in the Center for Innovation in Pediatric Practice. “We did find in some cases that there are fewer treatments for black children than white children, or for children with Medicaid than children with private insurance, but there are likely larger socioeconomic forces at work.”

Among the possible explanations: children with lower socioeconomic status may use emergency services for routine care more frequently, receiving fewer services per emergency department visit, the authors suggest.

The study included records of 2,168 children with a diagnosis of Crohn’s disease; 77% were white and 23% were black. They made a total of 3,779 visits at 38 hospitals. White children were more likely to have private insurance and have a higher median neighborhood income.

Among children with repeat visits, 33% were black, 22% white; 27% had Medicaid, 21% private insurance. The findings highlight the need for strategies that address emergency department use for all patients, especially for those who do not have optimal access to health care, the authors write.

“We need to use this opportunity for better outpatient management of children with IBD, assuring that everyone receives the appropriate care when they need it, and that non-emergent problems are more effectively handled in the office setting,” says Dr. Dotson.


“We did find in some cases that there are fewer treatments for black children than white children, or for children with Medicaid than children with private insurance, but there are likely larger socioeconomic forces at work.”

– Jennifer Dotson, MD, MPH, Principal Investigator, Center for Innovation in Pediatric Practice
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.

Monique Goldschmidt, MD
Jennifer Lee, MD
Peter Lu, MD
Ross Malitz, MD
Ethan Menoff, MD
Carol J. Potter, MD
John M. Russo, MD
Ala K. Shakkah, MD
Alex Weymann, MD
Kent C. Williams, MD
Frederick W. Woodley, PhD
Denise Yacob, MD

The Division of Gastroenterology, Hepatology and Nutrition at Nationwide Children’s provides comprehensive care through multiple multidisciplinary clinics and services for children from all over the world. It has consistently been ranked among the top programs in the country for the past 10 years by U.S. News & World Report and is nationally recognized for its expertise in a number of gastrointestinal disorders. The Motility Center remains a national leader in caring for children with neuro-motor and functional disorders. The Motility Center leadership includes Carlo Di Lorenzo, MD, chief of Gastroenterology, and Denise Yacob, MD, the center’s medical director, as well as Katala Vaz, MD, Nenu Bali, MD, and Peter Lu, MD. In partnership with the Center for Colorectal and Pelvic Reconstruction at Nationwide Children’s, the Motility Center provides an exceptionally high level of comprehensive medical and surgical services for children with complex motility disorders. The Inflammatory Bowel Disease Center at Nationwide Children’s, co-directed by Brendan Boyle, MD, and Jennifer Dotson, MD, is a leader in providing standardized care for children with Crohn’s disease and ulcerative colitis, and boasts one of the highest remission rates in the country. The Intestinal Rehabilitation Service, led by Molly Dienhart, MD, and Ethan Menoff, MD, follows a large cohort of children with intestinal failure and has some of the best outcomes in the country in the care of children with short bowel syndrome. The Celiac Disease Center, led by Tracy Ediger, MD, and Section Chief Ivor Hill, MD, is a leader in providing more standardized care to improve long-term outcomes for children with celiac disease. In addition, Steven Erdman, MD, is a world leader in the care of children with polysyndactyly syndromes. The division also provides specialized care for children with eosinophilic esophagitis, autoimmune and gastrointestinal disorders, muscular dystrophy, pancreatic and biliary disorders, congenital heart diseases, cystic fibrosis and auto-immune disorders. A comprehensive Liver Disease Center, including a liver transplant program, is led by Alex Weymann, MD, and includes hepatologists Cheryl Gaetano, MD, Monique Goldschmidt, MD, and Carol Potter, MD, and a highly skilled transplant surgeon, Ken Wushub, MD.

Ivor D. Hill, MD
Section Chief

FACULTY

Monique Goldschmidt, MD
Jennifer Lee, MD
Peter Lu, MD
Ross Malitz, MD
Ethan Menoff, MD
Carol J. Potter, MD
John M. Russo, MD
Ala K. Shakkah, MD
Alex Weymann, MD
Kent C. Williams, MD
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Denise Yacob, MD

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The Section of General Pediatrics at Nationwide Children’s Hospital includes community physicians in pediatrics and internal medicine/pediatrics who are affiliated with Nationwide Children’s. Many of these physicians participate in the Pediatric Education in Community Sites program that provides residents with a very different kind of outpatient experience than that of a traditional hospital-based practice. Beginning in their second year, each resident is assigned to an additional half-day continuity experience in a private practice. This offers thorough exposure to general pediatric practice and reinforces the relationship between Nationwide Children’s and the community physicians.

David E. Henderson, MD
Christopher B. Hours, MD
Elizabeth M. Jacob, MD
Julie R. Jovinek, MD
Erwan F. Kansere, MD
Stephen L. Kebe, MD
Lisa A. Kelch, MD
Andrew M. Kelley, MD
Sara M. Kelly, MD
Richard A. Kern, MD
Cheryl K. Kirkby, MD
Adam M. Kirkland, MD
Elizabeth L. Kirkland, MD
William E.C. Knobschock, MD
Erwin P. Konnen, MD
Stephen C. Koesters, MD
Maurer P. Kolls, DO
Andrew S. Koreil, MD
Katherine J. Krucek, MD
Justin K. Krueger, MD
Lisa A. Krumm, MD
Emily T. Ferguson, MD
Alicia D. Fenn, MD
Emily T. Ferguson, MD
Nikola T. Al-ain, MD
Robert W. Snyder, MD
Nikola T. Al-ain, MD
Robert W. Snyder, MD

Robert W. Snyder, MD
Chief

Wahaha A. Abaza, MD
Nikola T. Al-ain, MD
Ilona B. Albrecht, MD
Benjamin P. Almasanu, DO
Mary S. Applegate, MD
Nardia S. Ataman, MD
Jennifer E. Bachman, MD
Taylor A. Ballenger, MD
Richard A. Ballenger, MD
Lauren C. Bar-Lev, MD
Carrie J. Barnes-Mullett, MD
Breann M. Baron, DO
Ryan M. Barson, MD
Courtney R. Bartsch, MD
Ryan M. Barson, MD
Brent M. Barson, DO
Carrie J. Barnes-Mullett, MD
Lauren C. Bar-Lev, MD
Richard A. Baltisberger, MD
Taylor A. Ballenger, MD
Nardia S. Ataman, MD
Benjamin P. Almasanu, DO
Nikola T. Al-ain, MD
Robert W. Snyder, MD
Nikola T. Al-ain, MD
Robert W. Snyder, MD
FAST FACTS

July 2018 through June 2019

<table>
<thead>
<tr>
<th>Inpatient Discharges:</th>
<th>165</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation and Outpatient-in-a-Bed Discharges:</td>
<td>129</td>
</tr>
<tr>
<td>Total Discharges:</td>
<td>294</td>
</tr>
<tr>
<td>Average Length of Stay*:</td>
<td>4.7</td>
</tr>
</tbody>
</table>

| Average Daily Census*: | 2.1 |
| Patient Days*: | 777 |

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

2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM

CLINICAL FELLOWSHIP IN QUALITY & SAFETY LEADERSHIP

Tara Cosgrove, MD
Veronica M. Mruk, MD
Anja Zanet, MD

GENETIC AND GENOMIC MEDICINE

The mission of the Division of Genetic and Genomic Medicine at Nationwide Children’s Hospital is to deliver compassionate, family-centered care via genetic/genomic diagnostic and therapeutic services while providing counseling, education 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 Centers for Gene Therapy and Cardiovascular Research.

FACULTY

Kim L. McBride, MD, MS
Division Chief

Dennis W. Bartholomew, MD
Section Chief

Kim L. McBride, MD, MS
Division Chief

Dennis W. Bartholomew, MD
Section Chief

FULL-TIME NATIONWIDE CHILDREN’S FACULTY

Scott E. Hickey, MD
Kundalamaraga (Murugu) Manickam, MD
Matt Mori, MD
Krysta Truxal, MD

PART-TIME NATIONWIDE CHILDREN’S FACULTY

Britton D. Rink, MD

Over the last year, our division has focused on increasing our ability to provide genetic services. We have greatly expanded our group of genetic counselors from 10 to 16, two of which are shared with the Steve and Cindy Rasmussen Institute for Genomic Medicine. Nationwide Children’s also has two genetic counselors in Hematology/Oncology, and four in the clinical labs of the Steve and Cindy Rasmussen Institute for Genomic Medicine. Service lines with assigned genetic counselors include Child Development Center, Complex Epilepsy, Heart Center and Neuromuscular Clinics. Multidisciplinary clinics with genetic counselors include Metabolic Bone, MDA, Spinal Muscular Atrophy, Cystic Fibrosis, Prader-Willi Syndrome, Williams Syndrome, 22q Deletion Syndrome, Myelomeningocele and THRIVE clinics. Our genetics nurse practitioner group of Melanie Goff, CPNP-PC, and Sarah Swager, CPNP-PC, has expanded with the addition of Stacie Leeper, CPNP-AC. We are also excited to welcome three geneticists: Mari Mori, MD, from Hasbro Children’s Hospital started January 2019. Bimal Chaudhari, MD, MPH, from our own Genetics training program started September 2019. Stephen G. Kaler, MD, from the National Institutes of Health started September 2019. The residency program led, by Scott Hickey, MD, and assisted by Murugu Manickam, MD, and Dennis Bartholomew, MD, received accreditation for a third-year option of a funded Medical Biochemical Genetics fellowship starting in 2019.

Individuals of the division have been involved in setting national guidelines for many areas of clinical genetics, particularly in the utility of new genetic testing modalities. Faculty have presented at national and international meetings on 22q11 deletion syndrome (Dr. Hickey) and use of medical records analysis combined with genome sequencing in large populations (Dr. Manickam). A number of clinical research projects are led by faculty including hypophosphatasia (Dr. Hickey), Down syndrome (Dr. Manickam), and PKU (Dr. McBride).
Department of Pediatrics

HEALTHY WEIGHT AND NUTRITION

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

FACULTY

Ihuoma U. Eneli, MD, MS, FAAP
Director

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

Eileen Chaves, PhD
Jane Ham-Lambert, PhD
Belinda Mills, MD
Amy R. Sternstein, MD, FAAP

As part of our commitment to the community, the center supports the Primary Care Obesity Network (PCON), a program within primary care pediatric practices that supports the health care provider on obesity treatment and prevention beyond the walls of a clinician’s office and into the community. We participate at several wellness community events including the Columbus Marathon, partners with after-school programs through the activities of our Fitness and Nutrition (FAN) club, the public health department, grocery stores and several community organizations. At the regional and national level, the center participates and provides leadership on the National Academy of Medicine (NAM) Roundtable on Obesity Solutions, the Obesity Medicine Association (OMA) and the Ohio Chapter of the American Academy of Pediatrics (OAAAP). To enhance collaborative activities, the center hosts a bimannual Symposium on Early Childhood Nutrition and Wellbeing.

The center remains committed to providing educational opportunities at all levels and in several multidisciplinary disciplines. These include a fourth-year medical student elective, a residency elective rotation, a childhood obesity fellowship, in addition to serving as an expert to obesity programs around the United States and internationally. The center has federal, industry and foundation research funding. It participates in two National Institutes of Health (NIH) multicenter studies on the long-term outcomes of adolescent bariatric surgery and the use of family behavioral therapy programs with a physician, psychologist, dietitian, physical therapist, and athletic trainer for intensive weight management. In addition, the center offers adolescent bariatric surgery and has obtained the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program certification.
SELECTED PUBLICATIONS


FAST FACTS

July 2018 through June 2019

| Bariatric Clinic Visits: | 564 |
| Healthy Weight and Nutrition Clinic Visits: | 1,995 |
| Hilliard Healthy Weight Clinic Visits: | 461 |
| Westerville Healthy Weight Clinic Visits: | 965 |
Hematology, Oncology & Blood and Marrow Transplant

Ewing Sarcoma: Breaking Through the Therapeutic Ceiling

A study led by researchers at Nationwide Children’s Hospital has found no biomarkers of sensitivity in Ewing sarcoma cell lines for the proposed therapeutic agent SP-2509, for the simple and surprising reason that every cell line tested had sensitivity to SP-2509.

This is good news for the newly opened Phase 1 clinical trial of the agent SP-2577, or Seclidemstat. And it appears to be a step toward finding a more targeted therapy for the aggressive tumors.

“I guess you could say that we failed to find what we were looking for. We actually haven’t found a patient-derived cell line that is resistant to the agent,” says Stephen Lessnick, MD, PhD, director of the Center for Childhood Cancer and Blood Diseases at Nationwide Children’s and senior author of the study. “Of course, that gives us great hope about the agent’s effectiveness against Ewing sarcoma.”

The study, published in *Molecular Cancer Therapeutics*, is part of an effort among Ewing sarcoma researchers and clinicians to move beyond traditional chemotherapies, which appear to have reached a “therapeutic ceiling” for the disease.

Those efforts have focused on the EWS/FLI chromosomal translocation, common to virtually every form of Ewing sarcoma and the driver of tumor development. While that mutation has proven difficult to target, the companion protein KDM1A (also known as lysine specific demethylase 1, or LSD1) can be targeted. KDM1A/LSD1 is overexpressed in a number of solid and hematological malignancies. The agent used in the recent study, SP-2509, is a KDM1A/LSD1 inhibitor.

The authors introduced SP-2509 to 17 Ewing sarcoma cell lines, and sensitivity was found in all of them. Of note, many cell lines were resistant to another KDM1A/LSD1 inhibitor, GSK-LSD1, suggesting that future Ewing sarcoma therapies based on GSK-LSD1 would be ineffective.

The researchers also investigated how SP-2509 targets KDM1A/LSD1; it seems to engage the endoplasmic reticulum stress response, leading to apoptosis.

A clinical trial of a therapy based on the inhibitor began recruiting patients in summer 2019. (Dr. Lessnick is a scientific advisor to Salarius Pharmaceuticals, the company behind the trial.)

CITATION:

“I guess you could say that we failed to find what we were looking for. That gives us great hope about the agent’s effectiveness against Ewing sarcoma.”

– Stephen Lessnick, MD, PhD, Director, Center for Childhood Cancer and Blood Diseases
The Hematology, Oncology & Blood and Marrow Transplant Department at Nationwide Children’s Hospital treats patients with one of a full array of blood disorders, 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 disorders and cancer as well as other diseases treated by cellular therapies. 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 at Nationwide Children’s, we seek to transform the way patients with cancer and blood disorders are cared for by fully integrating research, cutting-edge therapies and multidisciplinary teams.

Through research, patient care and psychosocial support, the Division of Hematology, Oncology & Blood and Marrow Transplant provides a strong foundation for our patients, families and care teams. For the past six years, we have been ranked in the top 10 of U.S. News & World Report, most recently in the top four. Our discoveries, clinical trials and new treatments offer new hope for patients and families affected by cancers and hematologic diseases not only at Nationwide Children’s but around the world.

In 2018, we announced a partnership with The Ohio State University Wexner Medical Center and the Arthur G. James Cancer Hospital and Richard J. Solove State University Wexner Medical Center and the Arthur G. James Cancer Hospital Institute for Genomic Medicine to central Ohio. As doctors can better control where the proton beam deposits their energy, this makes it an important treatment option for certain pediatric cancers.

The Division of Hematology, Oncology & Blood and Marrow Transplant continues to prioritize quality improvement to achieve best outcomes for its patients. Our multidisciplinary quality improvement teams have achieved significant reductions in preventable harm. Since 2016, interventions have yielded a 30% reduction in administration adverse drug events and a 65% reduction in health care acquired respiratory infections. Through our preeminent clinical and research programs, our division has realized growth in referrals from patients from across the globe. Division Chief Tim Crisp, MD, traveled to Dubai in early 2019 to highlight the world-class care available at Nationwide Children’s and to develop relationships with medical professionals in the Middle East. We also host International Tumor Boards with countries in Latin America. Through our clinical and research work, we are driven to remain on the cutting edge of solutions for our patients worldwide. With more than 100 clinical trials, we continue to collaborate in an effort to advance pediatric care.

Center for Childhood Cancer
See page 182 for information about the Center for Childhood Cancer in the Abigail Wexner Research Institute at Nationwide Children’s Hospital.

GRANTS AWARDED TO CENTER AND DIVISION CLINICAL AND RESEARCH FACULTY

Tamm K. Young-Salem, PhD
Kristin Zajo, MS, LGC

FELLOWS

First Year
Ashleigh Kausman, MD
Lynda Villegas, MD

Second Year
Jennifer Belkey, DO
Kyle Davis, MD
Brian Tullius, MD

Third Year
Richard Graham, MD
Margaret Lamb, MD
Pritpal Pannu, DO

Fourth Year (BMF)
Nabnita Bhunia, MBBs

Fourth Year (Neuro-Oncology)
Vibhuti Agarwal, MD

Fourth Year (Sarcoma)
Mary Francis Wedekind, DO

Through research, patient care and psychosocial support, the Division of Hematology, Oncology & Blood and Marrow Transplant provides a strong foundation for our patients, families and care teams. For the past six years, we have been ranked in the top 10 of U.S. News & World Report, most recently in the top four. Our discoveries, clinical trials and new treatments offer new hope for patients and families affected by cancers and hematologic diseases not only at Nationwide Children’s but around the world.

In 2018, we announced a partnership with The Ohio State University Wexner Medical Center and the Arthur G. James Cancer Hospital and Richard J. Solove State University Wexner Medical Center and the Arthur G. James Cancer Hospital Institute for Genomic Medicine to central Ohio. As doctors can better control where the proton beam deposits their energy, this makes it an important treatment option for certain pediatric cancers.

The Division of Hematology, Oncology & Blood and Marrow Transplant continues to prioritize quality improvement to achieve best outcomes for its patients. Our multidisciplinary quality improvement teams have achieved significant reductions in preventable harm. Since 2016, interventions have yielded a 30% reduction in administration adverse drug events and a 65% reduction in health care acquired respiratory infections. Through our preeminent clinical and research programs, our division has realized growth in referrals from patients from across the globe. Division Chief Tim Crisp, MD, traveled to Dubai in early 2019 to highlight the world-class care available at Nationwide Children’s and to develop relationships with medical professionals in the Middle East. We also host International Tumor Boards with countries in Latin America. Through our clinical and research work, we are driven to remain on the cutting edge of solutions for our patients worldwide. With more than 100 clinical trials, we continue to collaborate in an effort to advance pediatric care.

Center for Childhood Cancer
See page 182 for information about the Center for Childhood Cancer in the Abigail Wexner Research Institute at Nationwide Children’s Hospital.

GRANTS AWARDED TO CENTER AND DIVISION CLINICAL AND RESEARCH FACULTY

JULY 1, 2018 – JUNE 30, 2019

$15,617,978

SELECTED PUBLICATIONS


**HOSPITAL PEDIATRICS AND ADULT HOSPITAL MEDICINE**

The Section of Hospital Pediatrics at Nationwide Children's Hospital, which also includes newborn and adult hospital medicine, is home to a 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.

**FACULTY**

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>Beth W. Lison, MD, PhD</td>
<td>Division and Section Chief</td>
</tr>
<tr>
<td>Jamie R. Macdonald, MD</td>
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<tr>
<td>Kathleen Matis, MD</td>
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<tr>
<td>Daniel J. McFarlane, MD</td>
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<tr>
<td>Gerd B. McGowrie, MD, PhD</td>
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<tr>
<td>Lucas V. McKnight, MD</td>
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<tr>
<td>Christy Mulligan, MD</td>
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<td>Saji Perera, MD</td>
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<td>Michael Perry, MD</td>
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<tr>
<td>Laura Plachta, MD</td>
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<td>Charles R. Redman, MD</td>
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<td>Allison Rossitti, MD</td>
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<td>Christine A. Schmerge, MD</td>
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<td>Catherine C. Sinclair, MD</td>
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<td>Melissa L. Skag, MD</td>
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<td>Isaac Spears, MD</td>
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<td>Audrey Splinter, MD</td>
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<td>Anuja Sriparameswaran, MD</td>
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<td>Devon Swick, DO</td>
<td></td>
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<td>Kimberly M. Tarraglia, MD</td>
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**FAST FACTS**

<table>
<thead>
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<th>July 2018 through June 2019</th>
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<tr>
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</tr>
<tr>
<td><strong>Inpatient Discharges:</strong> 1,380</td>
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<td><strong>Observation and Outpatient-in-a-Bed Discharges:</strong> 255</td>
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<td><strong>Total Discharges:</strong> 4,693</td>
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<td><strong>Patient Days:</strong> 8,285</td>
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<td><strong>Total Surgical Procedures:</strong> 838</td>
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<td><strong>BMT Transplants:</strong> 53</td>
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<td><strong>Apheresis and Pheresis Procedures:</strong> 840</td>
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<tr>
<td><strong>BMT Clinic Visits:</strong> 3,325</td>
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</table>
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 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.

The section experienced significant growth and program development in all facets — clinical, educational, safety, quality improvement and research. Clinical encounters and average daily census increased over the prior academic year while overall length of stay decreased by 10%. We were successful in adding four new faculty members. We have expanded our clinical scope and expertise with increasing consultation roles, including partnering with critical care physicians in our hospital’s rapid response team.

The Section of Hospital Pediatrics is also dedicated and committed to the education of future pediatricians with an emphasis and excellence in the 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 get 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.

**SELECTED PUBLICATIONS**


**FAST FACTS**

July 2018 through June 2019

- Inpatient Discharges: 2,035
- Observation Discharges: 3,634
- Total Discharges: 6,169
- Average Length of Stay*: 4
- Average Daily Census*: 25
- Patient Days*: 9,204
- Complex Health Care Clinic Visits: 3,303

*Excludes observation and inpatient-in-a-bed patients.
Understanding Viral Load Dynamics Can HelpInform RSV Treatment Decisions

Respiratory syncytial virus (RSV) lower respiratory tract infection is a leading cause of hospitalization and mortality in infants worldwide, but a vaccine has not yet been developed, in part due to the incomplete understanding of RSV pathogenesis.

While investigating the relationship between RSV viral loads and disease severity in infants, researchers at Nationwide Children’s Hospital found that higher viral loads at presentation and a faster and consistent viral load decline were associated with less severe RSV disease.

“This is counterintuitive because you would expect that greater amount of virus in nasal secretions during the acute infection would be associated with more severe disease, but this is not the case with RSV. It appears that higher RSV loads trigger a more robust immune response, then in turn is associated with better outcomes,” says Asuncion Mejias, MD, PhD, senior author of the study and principal investigator in the Center for Vaccines and Immunity at the Abigail Wexner Research Institute at Nationwide Children’s.

The findings, published in the *Journal of Infectious Diseases*, were from a prospective study conducted at Nationwide Children’s that included 150 children who were less than 2 years of age: 39 outpatients with mild RSV disease and 111 inpatients with severe RSV bronchiolitis. The study compared viral loads and disease severity among outpatients and inpatients in the ward and the pediatric intensive care unit (PICU).

When adjusting for age, the team found that results were reproducible and that infants of similar ages with RSV infection and a mild disease phenotype had higher RSV loads at presentation than their counterparts with severe RSV infection. Additionally, after excluding infants treated with steroids, those hospitalized in the ward had also higher viral loads than those in the PICU with more severe disease.

“In the inpatient setting, patients that received systemic steroids, which are not routinely indicated for the management of RSV infection, cleared the virus at a slower pace and had worse outcomes,” says Octavio Ramilo, MD, chief of Infectious Diseases and principal investigator in the Center for Vaccines and Immunity at Nationwide Children’s. “This observation is specifically relevant for children with severe RSV infection hospitalized in the PICU, for whom treatment with steroids should be avoided.”

INFECTION 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-compromised and competent 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, Neonatology/Infectious Disease, Host Defense, and the Family AIDS Clinic Education Services (FACES) Program Clinics located on the Nationwide Children’s main campus. Additionally, our division offers consults 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.

OSU-AFFILIATE FACULTY
Susan L. Kolter, MD
Carlos Malaveutoro, MD, MPH
David A. Winninger, MD

The Division of Infectious Diseases continues to expand clinical activities 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, Neonatology/Infectious Disease, Kawasaki and PANDAS). With plans to add a nurse practitioner, we continue to expand our team to optimize the preventative and therapeutic care of our immmunocompromised children through our Host Defense Program.

This year we welcomed two new faculty members, Matthew Washam, MD, as the new chief of Epidemiology and Infection Prevention, and Su Jin Joo, MD. Dr. Joo will work with Julisha Watson, MD, the director of our Antimicrobial Stewardship Program, to advance the program’s goals to optimize antibiotic therapy in both inpatient and outpatient settings. Jonathan Honegger, MD, through the Hepatitis C Clinic, will soon begin treating children with hepatitis C infections. Pablo Sanchez, MD, through the Neonatology/Infectious Diseases Clinic, is caring for the increasing number of children with infection due to CMV and syphilis. We continue to strengthen our research collaborations with colleagues in the Center for Microbial Pathogenesis and the Center for Vaccines and Immunity in the Abigail Wexner Research Institute, as well as national and international collaborators.

FACULTY
Jeffrey Auletta, MD
Michael T. Brady, MD
Megan Brundel, MD
Kevin Cassidy, MD
Juan Chaparro, MD
Galiz Erdem, MD
Charitha Gowda, MD, MPH
Jonathan R. Honegger, MD
W. Garrett Hunt, MD, MPH, DTM&CH
Su Jin Joo, MD
Maria Asumciom Mejias, MD, PhD, MSCS
Christopher Ouellette, MD
Pablo J. Sanchez, MD
Masako Shimamura, MD
Eunkyung Song, MD
Rebecca Wallihan, MD
Matthew Washam, MD, MPH
Joshua Watson, MD

CLINICAL MICROBIOLOGY
Amy Leber, PhD
Director
Huanyu Wang, PhD
Assistant Director

SELECTED PUBLICATIONS


OSU-CLINICAL MICROBIOLOGY
Joshua Watson, MD
Matthew Washam, MD, MPH
Rebecca Wallihan, MD
Masako Shimamura, MD


William B. Susan C. Joo, Mariana M. Mejias, MD, Christopher E. Back, MD, Friedrich G., David A. Winninger, MD. Approaching Fatal Perinatal EBV Infection with High-...
### FAST FACTS

*July 2018 through June 2019*

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
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<td>Total Discharges</td>
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<td>Average Length of Stay*</td>
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<td>Patient Days*</td>
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<td>Inpatient Consults</td>
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<td>Infectious Disease Clinic Visits</td>
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<tr>
<td>Immunodeficient Clinic Visits</td>
<td>2,273</td>
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</tbody>
</table>

**Tuberculosis Clinic Visits**

- Dublin Tuberculosis Clinic Visits: 42
- Hilltop Tuberculosis Clinic Visits: 37
- Northland Tuberculosis Clinic Visits: 151
- Sharon Woods Tuberculosis Clinic Visits: 73
- Tuberculosis Clinic Visits: 702

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

### 2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM

**PEDIATRIC INFECTIOUS DISEASES**

- Dana Danino, MD (Host Defense Fellowship)
- Alejandro D. Diaz, MD
- Shaina Hecht, MD
- Aspasia Katragkou, MD
- Mariana Lanata, MD
- Stephanie Smith, MD
- Jeannette Tavoras, DO
Enhanced Biofilm Formulation May Increase Protection Against NEC

Pathogenic microbes form fortress-like biofilms making them resistant to the immune system and current antimicrobials.

But what if biofilms could be used for good? Researchers at Nationwide Children’s Hospital are investigating how. They have designed a delivery system to treat premature infants with necrotizing enterocolitis (NEC) that may have applications beyond the neonatal intensive care unit (NICU).

Researchers at Nationwide Children’s from Pediatric Surgery and the Center for Microbial Pathogenesis had already shown that a formulation of Lactobacillus reuteri biofilm grown on microspheres protect against experimental NEC. A new iteration of the technology may help further reduce its incidence.

“NEC is a devastating problem for premature infants. Despite decades of research, 10% of infants born under 1500 grams will develop NEC, and mortality remains as high as 30% for these babies,” says Gail Besner, MD, chief of Pediatric Surgery at Nationwide Children’s.

The newest results, reported in American Journal of Physiology, shows a single dose L. reuteri biofilm microspheres enhanced with sucrose or maltose not only reduced the incidence of NEC in animals but also improved animal survival, reduced intestinal mucosal barrier breakdown and limited intestinal inflammation.

Microspheres loaded with maltose also augmented the persistence of numerous Lactobacillus species in the intestinal tract and shifted the gut microbiome to be more similar to that of breast-fed babies.

“Given the microbiome disruption observed in preterm infants who go on to develop NEC, a treatment that preserves the microbiome holds great promise as an intervention to prevent NEC,” says Dr. Besner, who is also a principal investigator in the Center for Perinatal Research at Nationwide Children’s. “Furthermore, our novel probiotic delivery system limits the expansion of pathogenic bacteria such as Enterobacter species, providing further evidence that it attenuates detrimental NEC-induced dysbiosis.”

“As we continue to learn more about the microbiome and its relationship to health and disease, probiotic administration may play an increasingly important role in disease prevention and management,” she adds.

Drs. Besner, Steve Goodman, PhD, Michael Bailey, PhD, and Lauren Bakaletz, PhD are the scientific founders of a preclinical stage company – Scioto Biosciences – created to bring microbiome therapeutics to the marketplace. They are currently in talks with the U.S. Food and Drug Administration to design a clinical trial to test the delivery system in humans.

CITATION:

“Despite decades of research, 10% of infants born under 1500 grams will develop NEC, and mortality remains as high as 30% for these babies.”
– Gail Besner, MD
NEONATOLOGY

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

FACULTY

Leif D. Nelin, MD
Division Chief

Sudarshan Jadcherla, MD
Associate Division Chief for Academics

Ahmed Osman, MD
Pablo J. Sanchez, MD
Amy L. Schlegel, MD
Ruth B. Seabrook, MD
Vanessa L. Shanks, MD
Jonathan L. Slaughter, MD, MPH
Michael R. Steinger, MD
Maria M. Talavera, DO
Christopher J. Timan, MD
Jennifer K. Trettmann, MD, MPH
Sreekanth K. Veyilavan, MD
Shoria D. Wilson, MD

COMMUNITY-BASED FACULTY

Craig W. Anderson, MD
Jaseh J. Corriveau, MD
Joshua H. Goldberg, MD
Barry Halpern, MD
Nancy B. Hansen, MD
Jeffrey S. Keyes, MD
Corin Cozzi Linsey, MD
Wendy A. Luce, MD
Benjamin A. McDonald, MD
Randy R. Miller, MD
Juli M. Richter, MD
Janet R. Seguin, MD
Jana D. Seto, MD
Michael Shomaker, MD
Gary E. Snyder, MD
Anthony R. Thiele, DO
Allison Vanlief, MD
Natalie D. White, DO
Jonathan R. Wispe, MD

NEONATOLOGY ADMINISTRATION

Lee Ann Walker, MBA, BSN, RN, NEA-BC
Vice President Neonatal Services

Lawrence Bajaks, MHA
Service Line Administrator

Section Chief

Edward G. Shepherd, MD

NEONATAL SERVICES DIRECTORS

Renee Gandikes-Gingery, MSN, RN
Marissa Larouere, RN, BSN, MBA
Winifred Payne, MSN, RN, NEA-BC

DIRECTOR OF NEONATAL ADVANCED PRACTITIONERS

Era Keel, DNP, APRN, NN-BC

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 neonatal care, but also has 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. These programs include the comprehensive Center for Bronchopulmonary Dysplasia, the Infant Feeding Disorders Program, the Congenital Infections Program and the Neonatal Behavioral Scale Follow-up Program. The Center for Bronchopulmonary Dysplasia has the only dedicated unit (C4A) for the care of infants with BPD in the country. The BPD unit draws patients from all over the United States including as far away as California, Oregon and Utah. The BPD unit has excellent outcomes including a very low mortality rate and tracheostomy rate. Furthermore, we recently examined neurodevelopmental outcomes and found that 50% of patients have no evidence of neurodevelopmental impairment, despite the fact that 78% of the patients in this cohort had severe BPD. The Infant Feeding Disorders Program provides advanced care and treatment to optimize outcomes for infants with feeding disorders. The Infant Feeding Disorders Program’s ongoing QI initiative — the feeding enhancement program — has significantly and sustainably shortened the length of time for preterm infants to achieve full oral feeds, which has resulted in a significant and sustained shorter length of stay. The Small Baby Program continues to positively impact the outcomes of extremely preterm infants (those born at <27 weeks gestation). This year the small baby program published results demonstrating that a more conservative approach to the patent ductus arteriosus was associated with improved survival and no increase in morbidity. The Congenital Infections Program is a multidisciplinary program targeting babies born with congenital viral infections, and this...
year implemented universal screening for congenital cytomegaloviral infections in the Nationwide Children’s Neonatal Network. Finally, for our patients to reach their full potential requires longer term outpatient neurodevelopmental care available through our Neonatal Follow-up Program, which was the first program in the United States to implement the international guidelines for early diagnosis and intervention for cerebral palsy.

Perinatal Research: See page 190 for information about the Centers for Perinatal Research in the Abigail Wexner Research Institute at Nationwide Children’s.

### CLINICAL FAST FACTS

**July 2018 through June 2019**

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<th>Main Campus</th>
<th>Inpatient Discharges</th>
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<td><strong>Newborn Intensive Care Unit at Grant Medical Center</strong></td>
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<td><strong>Newborn Intensive Care Unit at Doctor’s Hospital West</strong></td>
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Average Length of Stay* | 15.8 |
Average Daily Census* | 5.0 |
Patient Days* | 1,029 |
Newborn Special Care Nursery at Dublin Methodist Hospital Total Discharges | 159 |
Average Length of Stay* | 8.3 |
Average Daily Census* | 3.6 |
Patient Days* | 1,327 |
Newborn Intensive Care Unit at St. Ann’s Hospital Total Discharges | 306 |
Average Length of Stay* | 17.6 |
Average Daily Census* | 14.8 |
Patient Days* | 5,388 |
Newborn Intensive Care Unit at The Ohio State University Wexner Medical Center Inpatient Discharges | 714 |
Total Discharges | 715 |
Observation and Outpatient-in-a-Bed Discharges | 1 |
Average Length of Stay* | 18.2 |
Average Daily Census* | 19.5 |
Patient Days* | 12,975 |
Patient Days* | 13,087 |
*Excludes admission and outpatient-in-a-bed patients
Nephrology
Common Clinical Markers Predict End-stage Renal Disease in Children with Obstructive Uropathy

Frequently measured clinical markers can predict end-stage renal disease in children with obstructive uropathy, a multicenter, collaborative study in Pediatric Nephrology shows.

Obstructive uropathy is a “blanket diagnosis,” explains Daryl McLeod, MD, a member of the Section of Urology at Nationwide Children’s. The term encompasses several complications that can occur during fetal development or after birth that impede urine flow and can ultimately injure the kidneys.

“A lot of damage has already occurred to the kidneys and urinary tract before we are able to intervene,” says Dr. McLeod. “We need a better way to identify which kids are going to have a worse course than others because up to 40 or 50% of these kids end up requiring dialysis or kidney transplant.”

“This study looks at a large prospective cohort of children with obstructive uropathy and identifies distinguishing features in their urine testing and serum chemistries that predict future need for renal replacement therapy,” says Brian Becknell, MD, PhD, a member of the Division of Nephrology and principal investigator in the Center for Clinical and Translational Research at Nationwide Children’s.

The researchers performed a retrospective review of data from the longitudinal dataset called CKiD, Chronic Kidney Disease in Children. After matching children who received renal replacement therapy with children who did not, the researchers found that all markers demonstrated some predictive value either at baseline, over time, or both.

The markers studied included: glomerular filtration rate, urine protein/Cr, urine microalbumin/Cr, serum hemoglobin, serum phosphate, serum albumin and serum CO2.

“This study had a lot of heterogeneity with regard to diagnosis,” says Dr. Becknell, who is also an assistant professor at The Ohio State University College of Medicine. “These kids might have had an obstruction, but we don’t know the level of that obstruction or the manner in which it was managed. That’s a really big deal. We need more uniform diagnostic groups of children to see how well these vital markers really perform. Then, we can ask how well they perform five, 10 or 15 years out; because in certain instances, children may require renal replacement therapy as adolescents instead of in the first several years of life.”

NEPHROLOGY

The Division of Nephrology 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 and kidney transplantation.

FACULTY

John David Spencer, MD  
Section Chief

Hiren P. Patel, MD  
Section Chief

Brian Becknell, MD, PhD  
Ray Bignall II, MD  
Mahmoud Kallash, MD  
William E. Smoyer, MD  
John D. Mahan, MD  
Beth A. Vogt, MD

In 2018, the Division of Nephrology welcomed two new nephrologists – Ray Bignall II, MD, and Beth A. Vogt, MD. Dr. Bignall is a junior nephrologist with a national reputation in patient advocacy and is actively involved in both the American Society of Nephrology and American Society of Pediatric Nephrology Public Policy Committees. Locally, Dr. Bignall is actively involved in the Healthy Neighborhoods Healthy Families initiative. Dr. Vogt is a senior nephrologist and nationally recognized educator who routinely lectures for the American Academy of Pediatrics. Dr. Vogt serves as the director of our acute and chronic dialysis program.

The Division of Nephrology continues to work closely and in collaboration with multiple clinical and surgical divisions. Clinical operations in the combined Urology-Nephrology Clinic have nearly doubled. While doing so, we have standardized clinical care for children with urinary tract obstruction and integrated preclinical and translational research efforts into nearly every patient visit. Additionally, we have increased patient volumes in our multidisciplinary Metabolic Bone Clinic as well as the Lupus Clinic, which is managed in collaboration with the Division of Rheumatology.

The Division of Nephrology maintains an active and highly-funded research program in the Abigail Wexner Research Institute. Three of our physician-scientists maintain actively funded National Institutes of Health (NIH) research programs. Additionally, our division participates in over 40 IRB-approved clinical and translational studies that are supported by five new clinical research coordinators. 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. Many of these studies are performed in conjunction with the Pediatric Nephrology Research Consortium. John D. Mahan, MD, serves as this consortium’s president. This past year, William E. Smoyer, MD, received added funding to spearhead the Cure Glomerulonephropathy Network (CureGN), a multi-center study funded by the National Institutes of Health (NIH) research programs. Additionally, our division maintains actively funded National Institutes of Health (NIH) research programs. Additionally, our division maintains actively funded National Institutes of Health (NIH) research programs.

SELECTED PUBLICATIONS


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 30 unique, peer-reviewed publications, some of which are highlighted here.

Research: See page 185 for information about the Center for Clinical and Translational Research in the Abigail Wexner Research Institute at Nationwide Children’s.

GRANTS AWARDED

JULY 1, 2018 – JUNE 30, 2019

$973,520

2018-2019 Annual Report

Nationwide Children’s Hospital

Department of Pediatrics
Neurology
Lower Socioeconomic Status Is Associated With Worse Childhood Arterial Ischemic Stroke Outcomes

An international study found that low household income is associated with poorer arterial ischemic stroke (AIS) outcomes in pediatric patients. This trend held true even when children from lower- and middle-income countries were excluded.

Senior author Warren Lo, MD, a member of the Division of Neurology at Nationwide Children’s Hospital, collaborated on the study with colleagues at the Hospital for Sick Children in Toronto and the University of California San Francisco.

"Good evidence exists that lower socioeconomic status and poverty are associated with a greater incidence, frequency and severity of stroke and worse outcomes in adults," says Dr. Lo. "So, it seemed obvious that we should ask this question in children."

The study included 355 children at 37 international centers in 9 countries between 2010 and 2014. Lower annual family income was associated with worse patient outcome. Very-low-income patients (<$10,000) had more than 3 times the risk for worse 1-year outcomes compared with high-income children (>-$100,000).

Income did not correlate with the receipt of rehabilitation services, although the quality and frequency of services received was not assessed. Further, low income and decreased consciousness at presentation were highly correlated so that decreased consciousness was excluded from the analysis. This association, however, suggests that children from very-low-income families may have been far sicker at the time of presentation.

While the authors were not able to identify the cause for worse outcome after stroke in very-low-income children, they suggest that examination of unmeasured variables such as nutritional status could help clarify this relationship and warrant further investigation.

Dr. Lo, who is director of the Stroke Clinic at Nationwide Children’s and professor of Pediatrics at The Ohio State University College of Medicine, speculates that children who are extremely poor may have less access to high-quality health care, preventative health care and/or adequate vaccination. Previous studies found that children who were under-vaccinated were at a higher risk for developing stroke than children who were fully-vaccinated. Additionally, after a stroke, their parents may not have the resources or time to take off from work to commit to chronic rehabilitation if necessary.

The new publication was part of the larger, National Institutes of Health-funded Vascular Effects of Infection in Pediatric Stroke (VIPS) project for which Dr. Lo was a site investigator.

CITATION:

"Good evidence exists that lower socioeconomic status and poverty are associated with a greater incidence, frequency and severity of stroke and worse outcomes in adults, so, it seemed obvious that we should ask this question in children."

— Warren Lo, MD, Director, Stroke Clinic
NEUROLOGY

The Division of Neurology providers at Nationwide Children’s Hospital deliver comprehensive care for children with a wide variety of disorders. These include simple and complex epilepsy, primary and secondary headache and migraine, tics and movement disorders, muscular dystrophy, spinal muscular atrophy and neuropathy. 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.

FACULTY

Monica P. Islam, MD
Mariam L. Freimer, MD
Kevin Flanigan, MD
Shawn Aylward, MD
William D. Arnold, MD
Dara Albert, DO
Section Chief

Anne M. Connolly, MD
Division Chief

Anup D. Patel, MD
Section Chief

Dara Albert, DO
William D. Arnold, MD
Kristen Arredondo, MD
Shawn Aylward, MD
Melissa Chang, MD
Emily De Los Reyes, MD
John L. Eichkoltz III, MD
Kevin Hagins, MD
Mariat F. Feimen, MD
Melissa Hutchinson, MD
Monica P. Islam, MD
Laif Khuhrs, MD
Neil Kulkarni, MD
Lenora Lehwald, MD
Neil Kulkarni, MD
Zarife Sahenk, MD, PhD
Chang-Yong Tsao, MD
Laurel Slaughter, MD
Zarife Sahenk, MD, PhD
Mellissa Hutchinson, MD

In 2019 the U.S. Food and Drug Administration approved gene transfer for infants with spinal muscular atrophy (SMA), and ongoing research continues to develop gene therapy to older children with SMA, Duchenne and other forms of muscular dystrophy. This past year remained busy for the section with 30 physicians, and 10 advanced health care providers. Members of the section oversee comprehensive programs for children with epilepsy, headache, movement disorders, neurodegenerative diseases and neuromuscular diseases. For children with complex disorders we use a multidisciplinary clinical approach. These clinics include the first Batten Disease Center of Excellence, the first Pediatric Intracranial Hypertension (pseudotumor cerebri) Clinic, and the first PPMD Duchenne muscular dystrophy center. Additional ongoing multidisciplinary programs include the Brain Tumor Program, Cerebrovascular Disease Clinic, Concussion Clinic, Epilepsy Clinic, Epilepsy Surgery Program, Muscular Dystrophy Clinic, Spinal Muscular Atrophy Clinic, Stroke Clinic and Tuberous Sclerosis Clinic.

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

Research: See page 184 for information about the Center for Gene Therapy in the Abigail Wexner Research Institute at Nationwide Children’s.

Neurosurgery: See page 144 to learn about the Division of Neurosurgery at Nationwide Children’s.

GRANTS AWARDED TO CENTER FOR GENE THERAPY AND NEUROLOGY CLINICAL AND RESEARCH FACULTY

July 1, 2018 – June 30, 2019

$15,622,507

SELECTED PUBLICATIONS


CLINICAL FAST FACTS

July 1, 2018 through June 2019

Neurology

Findlay Neurology Clinic Visits: .......................................................... 83
Hekzerne Neurology Clinic Visits: .................................................. 54
Neurology Clinic Visits: .......................................................... 9,032
New Albany Neurology Clinic Visits: .................................................. 7
Westerville Neurology Clinic Visits: .................................................. 1,198
Total Neurology Clinic Visits: .................................................. 16,349

Neuromuscular Disorders

MDA Clinic Visits: .................................................................. 628
Westerville Neuromuscular Clinic Visits: .................................................. 23
Neuromuscular Disorders Clinic Visits: .................................................. 943
Spiral Muscular Atrophy Clinic Visits: .................................................. 199
Total Neuromuscular Clinic Visits: .................................................. 1,683

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

Epilepsy

Inpatient Consults: .............................................................. 968
Blanchard Neurology (PA) Visits: .................................................. 3
Complex Concussion Clinic Visits: .................................................. 423
Stroke Clinic Visits: .............................................................. 226
Dublin Neurology Clinic Visits: .................................................. 3,142
East Broad Neurology Clinic Visits: .................................................. 991

Neurology Department of Pediatrics

2018-19 Annual Report
2018 – 2019 NATIONWIDE CHILDREN’S RESIDENCY AND FELLOWSHIP PROGRAM

RESIDENCY PROGRAMS

CHILD NEUROLOGY
Daniel Clark, MD
Alexandra B. Keenley, MD
Matthew Martin, MD
Thomas Murray, DO
Lisa Butler, MD
Melissa D. Squier, MD
Whitney Woodhall, MD

FELLOWSHIP PROGRAMS

GENE TRANSFER FELLOWSHIP
Nicolas Abreu, MD

NEUROMUSCULAR GENETIC THERAPEUTICS
Renatta Knox, MD, PhD

CLINICAL NEUROPHYSIOLOGY
Stephanie Abreu, DO
Daniel Freedman, DO
PEDIATRIC PSYCHOLOGY AND NEUROPSYCHOLOGY

Pediatric Psychology and Neuropsychology is a Section of the Department of Pediatrics at Nationwide Children's Hospital that concentrates clinical services in three 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); and Intellectual and Developmental Disability Psychology provides specialized assessment and intervention services for children and adolescents impacted by various genetic and neurodevelopmental disabilities, including autism spectrum disorders. See page 131 for details and for information about all Behavioral Health services.

FACULTY

Eric M. Butter, PhD
Chief

Charles Albrigts, PhD
Jessica Bailey, PhD
Amy E. Baughcum, PhD
Doug Bodin, PhD
Shalonda Brooks, PhD
Catherine Buzz, PhD
Jennifer E. Cas, PhD
Eileen Chaves, PhD
Sarah Connolly, PhD
Andrea Coppens, PhD
Carrie Conord, PhD
Nicole Dempster, PhD
Robert M. Dempster, PhD
Jackie Donix-King, PhD
Christine Eishelberger, PhD
Jenny Evans, PhD

Lauren Fishelbin, PhD
Amy Freidelch, PsyD
Lauren Garbacz, PhD
Molly Gardner, PhD
Cynthia A. Gerhardt, PhD
Alana Goldstein-Leever, PhD
Amy Hahn, PhD
Jane Hamel-Lambert, PhD
Jennifer Hansen, PhD
Sharnita Harris, PhD
Rebecca Helfenhal, PhD
Jessica Hoehn, PhD
Ariana Hoet, PhD
Kristen E. Hoskinson, PhD
Cody Hostutler, PhD
Parker Huston, PhD
Cara Inglis, PsyD
Jamie Jackson, PhD
Katie Johanning Gray, PhD
Chrissie Koterba, PhD
Ashley Kroom Van Diest, PhD
Elizabeth Keysak, PhD
Kathleen L. Lemonak, PhD
Ann Levine, PhD
Carrika Litzenburg, PhD
Barbara Mackinon-Kouns, PhD
Laura M. Mackner, PhD
Matllee Martens, PhD
Kelly A. McNally, PhD
Margaret Mehling, PhD
David Michaels, PhD
Alana Moses, PhD
James A. Mulick, PhD
Caroline Murphy, PhD
Emily Newton, PhD
Megan Norris, PhD
Jessie Palha, PhD
Ari Rabkin, PhD
Natalie Raff, PhD
Whitney Ragan-Bignall, PhD
Courtney Rice, PsyD
Claire Russell, PsyD
Rebecca Saldana, PhD
Michelle Silva, PhD
Tyanna Snider, PsyD
Janet Souder, PsyD
Jack H. Stevens, PhD
Karen Tabern, PhD
H. Gerry Taylor, PhD
Kristen Trott, PhD
Natalie Truba, PhD
Kathryn A. Vannatta, PhD
Lindsey Vare, PsyD
Sarah N. VerLee, PhD
Megan Norris, PhD
Jessica Palha, PhD
Ari Rabkin, PhD
Natalie Raff, PhD
Whitney Ragan-Bignall, PhD
Courtney Rice, PsyD
Claire Russell, PsyD

GRANTS AWARDED
JULY 1, 2018 – JUNE 30, 2019
$828,018

SELECTED PUBLICATIONS


Shahidullah JD, Hostutler CA, Foreman S. (2019). Ethical Considerations in Medication-related Roles for Pediatric Primary Care Psychologists. Clinical Practice in Pediatric Psychology. 2019 Jan

Wade R, Caudy A, McNally KA, Kameda KC, Kolodner AW, Stuever T, Taylor R. A Randomized Comparative Effectiveness Trial of Family-Problem Solving Treatment for Subtle Motion-Induced Motion Overreaction From the Coping with Head Injury through Problem Solving (CHIPS) Study. J Head Trauma Rehabil. 2019 Apr;34(2):[5 pages ahead of print]

FAST FACTS

July 2018 through June 2019

Inpatient Consultations: ........................................ 4,162
Psychology Clinic Visits: ........................................ 11,570
Psychology Medical Clinic Visits/Outpatient Consultation Visits: ........................................ 14,022
PHYSICAL MEDICINE AND REHABILITATION

The Section of Physical Medicine and Rehabilitation at Nationwide Children’s Hospital specializes in the diagnosis and management of children with physically disabling conditions. Our physicians are board-certified specialists in Physical Medicine and Rehabilitation with additional certification in pediatric rehabilitation medicine and are members of the departments of Pediatrics, and Physical Medicine and Rehabilitation at The Ohio State University College of Medicine. In addition, Carl D. Gelfius, MD, is board certified in electrodiagnostic medicine. Carl D. Gelfius, MD, Karl Klamar, MD, and Reginald D. Talley, MD, are board certified in brain injury medicine.

FACULTY

Michelle A. Miller, MD
Chief

Rosalind J. Bailey, MD
Carl D. Gelfius, MD
Karl W. Klamar, MD
Wilawan Nopkhun, MD
Jonathan S. Pedrick, MD
Reginald D. Talley, MD

Physical Medicine and Rehabilitation was actively involved in the teaching of medical students, medical residents and fellows over the past year. We now offer a pediatric rehabilitation rotation to the Physical Medicine and Rehabilitation residents from Larkin Community Hospital. Presentations on pediatric rehabilitation, concussion, neuromuscular disorders, myelomeningocele, botulinum toxin, and non-accidental traumatic brain injury.

SELECTED BOOK CHAPTER

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

FAST FACTS

July 2018 through June 2019

Inpatient Discharges: 734
Observation and Outpatient-in-a-Bed Discharges: 1
Total Discharges: 735
Average Length of Stay*: 13.8
Average Daily Census*: 0.9
Patient Days*: 2,014
Inpatient Consults: 437
Number of Beds: 12
Physical Medicine Clinic Visits: 6,081
Myelomeningocele (Spina Bifida) Clinic Visits: 669
School-based Seeding Clinic Visits: 6

2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM

PEDIATRIC REHABILITATION MEDICINE

Elisabeth A. Barrett, MD
Amy Hiller, DO

2018-19 Annual Report
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.

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. Two important areas of this work include safe sleep for infants and HPV vaccination in adolescents. In 2019, the Primary Care Network was awarded the Ohio Patient Safety Institute’s Primary Care Patient Safety Best Practice Award for improving provider-patient continuity. The division also houses the Center for Healthy Weight and Nutrition, a national model for multidisciplinary comprehensive care for obese children and adolescents.

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.

**SELECTED PUBLICATIONS**


**2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM**

**ACADEMIC GENERAL PEDIATRICS**

Meredith Middey, DO
The American Thoracic Society (ATS) authorized a panel of experts to develop the first national clinical practice guidelines for home oxygen therapy in children, and published the recommendations in 2019.

“Home oxygen is often needed for children with chronic lung and pulmonary vascular diseases,” says Don Hayes, Jr., MD, MS, MEd, chair of the working group and lead author on the document. “However, there is a striking lack of empirical evidence regarding its implementation, monitoring and discontinuation in children. These guidelines, developed by a panel of highly respected experts, offer an evidence-based approach to using home oxygen to benefit pediatric patients.”

To assist in determining which children should receive home oxygen, the expert panel completed a meta-analysis and defined chronic hypoxemia in the pediatric population.

The following recommendations are based on the panel’s confidence in the estimated effects, the balance of benefits and potential harms, patient values and preferences, and cost and feasibility. The report is in the *American Journal of Respiratory and Critical Care Medicine*.

The guidelines strongly suggest the use of home oxygen therapy for the following patient populations:

- Children with cystic fibrosis complicated by severe chronic hypoxemia
- Children with bronchopulmonary dysplasia complicated by chronic hypoxemia
- Children with sleep-disordered breathing complicated by chronic hypoxemia who cannot tolerate treatment
- Children with sickle cell anemia complicated by chronic hypoxemia
- Children with pulmonary hypertension without congenital heart disease complicated by chronic hypoxemia
- Children with interstitial lung disease complicated by severe chronic hypoxemia

Home oxygen therapy is conditionally recommended, or applicable in most situations, in the following cases:

- Patients with cystic fibrosis and mild hypoxemia and dyspnea on exertion
- Patients with sleep disordered breathing complicated by severe nocturnal hypoxemia who cannot tolerate positive airway pressure therapy or are awaiting surgical treatment of the disordered breathing
- Patients with sickle cell disease complicated by severe chronic hypoxemia
- Patients with interstitial lung disease with mild chronic hypoxemia and either dyspnea on exertion or desaturation during sleep or exertion

Critical to optimal benefit, oxygen equipment should be an appropriate size for children and function properly, the guidelines say. Oxygen therapy should be titrated to maintain an oxygen saturation level greater than 90% at all times and providers should use pulse oximetry to titrate and monitor therapy.

**CITATION:**
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.

FACULTY

Grace R. Paul, MD
Swarnop Pinto, MD
Shahid A. Sheikh, MD
Mark L. Slingluff, MD
Rohan A. Thompson, MD
Lisa Ulrich, MD
Pulmonary Medicine clinicians provide care at Nationwide Children’s main campus in Columbus and at regional Ohio locations in Westerville, Dublin and Lima Close To Home® Centers. Our 19 physicians collaborate to complete over 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, Endocrinology, 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. The 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 cardipulmonary 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.

GRANTS AWARDED

July 1, 2018 – June 30, 2019

$1,504,445

SELECTED PUBLICATIONS


SELECTED PUBLICATIONS

Fast Facts

JULY 2018 THROUGH JUNE 2019

Inpatient Discharges: 1,115
Lima Pulmonary Clinic Visits: 243
Observation and Outpatient-in-a-Bed Discharges*: 8,362
Lung Transplant Clinic Visits: 119
Total Discharges: 3,569
Pulmonary Clinic Visits: 7,957
Average Length of Stay*: 7.5
Pulmonary Rehab Clinic Visits: 771
Average Daily Census*: 19.4
Total Pulmonary Clinic Visits: 12,445
Patient Days*: 7,099
Westerville Pulmonary Clinic Visits: 2,376
Pulmonary Consults: 365
Dublin Pulmonary Diagnostics Clinic Visits: 16
CF with Endo Clinic Visits: 96
Pulmonary Diagnostics Clinic Visits: 282
Complex Asthma-Pulmonary Clinic Visits: 89
Westerville Pulmonary Diagnostics Clinic Visits: 16
Cystic Fibrosis Patients: 565
Total Pulmonary Diagnostics Clinic Visits: 296
Pulmonary Diagnostics Clinic Visits: 565
Dublin Pulmonary Clinic Visits: 611
*Excludes sleep studies.

SLEEP DISORDERS CENTER

Mark L. Slingluff, MD
Medical Director
A. Latif Khalevo, MD
Robert Kowalski, MD, PhD
Lenora M. Lehwald, MD

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 cardipulmonary 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.

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July 1, 2018 – June 30, 2019

$1,504,445

SELECTED PUBLICATIONS


SELECTED PUBLICATIONS

Fast Facts

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*Excludes sleep studies.

SLEEP DISORDERS CENTER

Mark L. Slingluff, MD
Medical Director
A. Latif Khalevo, MD
Robert Kowalski, MD, PhD
Lenora M. Lehwald, MD

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GRANTS AWARDED

July 1, 2018 – June 30, 2019

$1,504,445

SELECTED PUBLICATIONS


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, psychologists and graduate students at The Ohio State University. Over the past 12 years, 4,250 deep sleep 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. In 2018, the center performed over 2,100 polysomnographic studies and evaluated over 1,200 children in outpatient sleep clinics. The center has 23 registered polysomnographic technicians and two full-time pediatric nurse practitioners. 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.

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, Pulmonology, Plastic Surgery, the Center for Injury Research and Policy at Nationwide Children’s, and the Department of Mathematics at The Ohio State University. Recently completed studies by pediatric sleep medicine faculty include outcomes of different teaching formats for behavioral treatment of insomnia in toddlers and young children, improvement in quality of reporting results of sleep studies to parents and ability of different types of smoke alarms to awaken children during sleep.

**SELECTED PUBLICATIONS**


Selkin T, Kaswan RJ, Dehkordi S, Hongsiriphan N, Sivaraman V. Long-Term Functional Outcomes of Adolescents and Young Adults with Juvenile Idiopathic Arthritis: A Population-Based, Multicenter, Retrospective, Case-Controlled Study. Arthritis Care Res. 2019 Sep;71(9):1323-1331.

**FACULTY**

**PEDIATRIC PULMONOLOGY**

Anas Al-Turki, MD
Stacy Payne Ardoin, MD, MS
Fatima Barbas-Smiley, MD
Kyla Driest, MD
Gloria C. Higgins, MD (Emeritus)
Edward Oberle, MD
Valya Sivaraman, MD
Cagi Tisseray, MD

The Pediatric 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.

**RHEUMATOLOGY**

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, DPHT, has an appointment in Rheumatology Research, focusing on the relationship between complement genetics and rheumatic diseases. Rheumatology 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.

**FAST FACTS**

**July 2018 through June 2019**

Main Campus Sleep Clinic Visits ............................................ 361
Dublin Sleep Clinic Visits .................................................. 402
Westerville Sleep Clinic Visits .............................................. 480
Total Sleep Clinic Visits ..................................................... 1,303

**2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM**

**PEDIATRIC PULMONOLOGY**

Anas Al-Turki, MD
Courtney A. Goodwin, DO
Michelle Hays, MD
David Miklos, MD
Rohan Oneill, MD
Ben Winston, MD

**SELECTED PUBLICATIONS**


**GRANTS AWARDED**

**JULY 1, 2018 – JUNE 30, 2019**

$114,832

**SELECTED PUBLICATIONS**


**FAST FACTS**

<table>
<thead>
<tr>
<th>July 2018 through June 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient Discharges: 96</td>
</tr>
<tr>
<td>Observation and Outpatient-in-a-Bed Discharges: 84</td>
</tr>
<tr>
<td>Total Discharges: 457</td>
</tr>
<tr>
<td>Average Length of Stay: 4.1</td>
</tr>
<tr>
<td>Average Daily Census: 1.1</td>
</tr>
<tr>
<td>Patient Days: 390</td>
</tr>
</tbody>
</table>

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

**2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM**

**PEDIATRIC RHEUMATOLOGY**

Olaoluwaseun Badejo, MD
Laura R. Pettinger, MD
Evan Mulvihill, MD
Laura R. Ballenger, MD
Ohoud Al-Ahmed, MD

**FACULTY**

Thomas L. Pommeringer, DO

Chief

Steven C. Cuff, MD
Drew Duerson, MD
Anastasia N. Fischer, MD
Thomas L. Pommering, DO
Reno Ravindran, MD
Jonathan Napolitano, MD
Richard E. Rodenberg, MD
Amy E. Valasek, MD

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 any other necessary outside services.

**SPORTS MEDICINE**

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

**FACULTY**

Thomas L. Pommeringer, DO

Chief

Steven C. Cuff, MD
Drew Duerson, MD
Anastasia N. Fischer, MD
Thomas L. Pommering, DO
Reno Ravindran, MD
Jonathan Napolitano, MD
Richard E. Rodenberg, MD
Amy E. Valasek, MD

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 any other necessary outside services.

**Highlights:**

- Provided care for just under 16,000 patients at our eight locations
- Provided medical services at more than 2,100 events, affecting more than 200,000 athletes
- 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 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
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 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.

FACULTY

Marc J. Casavant, MD, FACEP, FACMT, FAACPT
Chief
Hannah L. Hays, MD, FACEP
Michael T. Kelley, MD, MPH, FACMT
Jason Russell, DO
Henry Spiller, MS, DABAT

Medical and pharmacy students, and physicians from emergency medicine, pediatrics, internal medicine, pediatric emergency medicine and child abuse training programs benefit from rotations with the Section of Toxicology and the Central Ohio Poison Center (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. The section is an important resource for Ohio’s childhood lead poisoning prevention program.

COPC serves the citizens of 64 Ohio counties. Specially trained, 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, COPC has been improving care of poisoned patients for 61 years.

With our nationally-recognized Be Poison Smart® public education program, COPC works to reduce the incidence of childhood poisonings throughout Ohio. Our Be Poison Wise® program helps older adults prevent poison exposures and medication mistakes. COPC plays an important role in toxicosurveillance, 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 our TOXICOLOGY program. Preparing and implementing policies, recommendations and educational programs benefit from toxicology research. The research and recommendations of the COPC are also important in reducing the incidence of poisoning throughout Ohio. The annual report of COPC provides updates on the public and patient care activities of the Clinic and a presentation of our current work in toxicology.

SELECTED PUBLICATIONS


FAST FACTS
July 2018 through June 2019

- Poison Center Consults: 3,920
- Toxicology Clinic Visits: 8
- Seizure Prevalence: 2,072
- Poison Control Exposure Cases: 30,873

SELECTED PUBLICATIONS


2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM

PEDIATRIC SPORTS MEDICINE
Cola Budinsky, MD

SELECTED PUBLICATIONS


2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM

PEDIATRIC SPORTS MEDICINE
Cola Budinsky, MD

SELECTED PUBLICATIONS


FAST FACTS
July 2018 through June 2019

- Illnesses Diagnosed at Sports Medicine Clinics: 1,072
- Tendonitis: 843
- Apophysisitis: 721
- Stress Fracture: 680
- Dislocation/Subluxation: 679
- Spondylolysis/Spondylolisthesis: 522
ANESTHESIOLOGY AND PAIN MEDICINE

The Department of Anesthesiology and Pain Medicine at Nationwide Children’s Hospital consists of fellowship-trained, board-certified pediatric anesthesiologists. The department provides anesthesiology and pain-management services for pediatric patients of all ages, from neonates through adolescents, requiring all types of surgical procedures, procedural sedation outside the operating room, acute and chronic pain management, and palliative care.

The Department of Anesthesiology and Pain Medicine at Nationwide Children’s Hospital consists of 43 pediatric anesthesiologists and 47 certified registered nurse anesthetists who provide care at 43 sites per day. Last year, the department provided anesthetic care and sedation services for more than 38,500 procedures. Members of the faculty are fellowship-trained in pediatric anesthesiology and board certified in anesthesiology and pediatric anesthesiology by the American Board of Anesthesiology. Additional board certification is held in pediatric critical care medicine (two faculty); pain medicine (eight faculty); and general pediatrics (four faculty). 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 physicians 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 four 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 all over the world. The current international fellows are from Saudi Arabia and Japan. Advanced subspecialty training is offered in pediatric cardiac anesthesia, pediatric regional anesthesia, acute pain management, chronic pain management and palliative care.

Departmental research initiatives are led by a Vice-Chair for Academic Affairs and supported by a PhD research scientist, two full-time clinical research nurses, a data analyst and two research associates. The department participates in an active clinical research program with numerous ongoing prospective investigations in various areas of pediatric anesthesiology, including novel approaches to airway management, perioperative implications of comorbid conditions including obstructive sleep apnea, the use of novel pharmacologic agents in the pediatric population, outcomes following solid organ transplantation and quality improvement initiatives. The department published more than 60 manuscripts in peer-reviewed journals and presented more than 60 abstracts at national meetings last year.

We anticipate the upcoming year will see continued growth of our surgical and procedural sedation volumes as well as expansion of our solid organ transplantation program. We also expect continued growth of chronic pain initiatives including expansion of palliative care services and the development of an inpatient rehabilitation program for pediatric patients with complex pain issues.

SELECTED PUBLICATIONS


Department Report

PATHOLOGY AND LABORATORY MEDICINE

The Department of Pathology and Laboratory Medicine at Nationwide Children’s Hospital provides a wide range of pediatric diagnostic services for hospitalized and ambulatory infants, children and adolescent patients. Laboratory services are provided through the main campus Anatomic and Clinical Pathology laboratories as well as multiple outpatient/reference laboratory testing facilities, Nationwide Children’s Clones To Home\(^{18}\) and Urgent Care centers, and our freestanding Emergency Department.

FACULTY

Samir Kahwash, MD
Sophonie Jean, PhD
Bonita R. Fung, MD
Miriam R. Conces, MD
Catherine Chung, MD
Dustin Bunch, PhD
Fang Bu, MD
Daniel R. Boue, MD, PhD
Peter B. Baker III, MD
Michael Arnold, MD, PhD
Roshini Abraham, PhD

Medical Director
Section Chief Anatomic Pathology & Interim Chief

Shamlal Mangray, MB, BS

FACULTY

Selene Kuo, MD, PhD
Amy L. Leber, PhD
Huifie Liu, MD, PhD
Rachel Mariani, MD
Erin K. Meyer, DO, MPH
Christopher R. Pierson, MD, PhD
Amy L. Pyle-Eidola, PhD
Nilu Del Carmen Ramirez-Milan, MD
Diana Thomas, MD
Huanya Wang, PhD

AFFILIATED FACULTY

Biochemical Genetics

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

Gastrointestinal Pathology

Diana Thomas, MD

Neuromuscular Pathology

Shalini C. Reshmi, PhD

Hematopathology

Zarifa Sahenk, MD, PhD

Kathleen K. Nicol, MD

Section Chief Clinical Pathology & Interim Medical Director

Roshini Abraham, PhD
Michael Arnold, MD, PhD
Peter B. Baker III, MD
Daniel R. Booe, MD, PhD
Fang Bu, MD
Dustin Bunch, PhD
Catherine Chung, MD
Miriam R. Conces, MD
Bonita R. Fung, MD
Sophie Jean, PhD
Samir Kahwash, MD

specimen collection and diagnostic services in multiple service centers across Ohio.

In 2018, Anatomic Pathology processed more than 10,000 surgical cases, 1,500 cytology specimens and 90 autopsies. Clinical laboratories performed more than 3.1 million tests in various subspecialty areas. We participated in multiple quality and service improvement projects. As part of our core mission, we were actively involved in undergraduate and graduate medical education, and our faculty served in multiple leadership roles locally and on the national scene. Faculty highlights include the recruitment of Roshini Abraham, PhD, as the director of a newly developed Primary Immunodeficiency Testing Lab, which was also recognized by the Jeffrey Modell Foundation. She also serves as director of Faculty Affairs for the department. Two board-certified hematopathologists were added to our staff and they serve as directors in the clinical lab, Huifie Liu, MD, (director of Flow Cytometry) and Rachel Mariani, MD, (director of Hemostasis and Thrombosis). Miriam R. Conces, MD, is the newly appointed director of Electron Microscopy and Immunopathology. We also added expertise in the areas of Dermatopathology and Neuropathology when Catherine Chung, MD, and Diana Thomas, MD, respectively, joined our faculty.

Our commitment to academic pathology continued with more than 50 publications and numerous local and national presentations. The faculty served on more than 50 extramural research grants and continued to play a key role in various national activities of the Children’s Oncology Group.

GRANTS AWARDED

JULY 1, 2018– JUNE 30, 2019

$746,255

SELECTED PUBLICATIONS


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 combined child and adolescent psychiatrist, 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 working alone, incorporates evidence-based practices into actual clinical settings and establishes 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 in the service line.

In June 2017, Nationwide Children's broke ground on 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 Big Lots Behavioral Health Pavilion, a new facility fully dedicated to children and adolescents with mental and behavioral health conditions. The pavilion will serve as a place to integrate medical and behavioral health care, serving 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 developmental behavioral pediatrics, post-doctoral psychology fellowships in Pediatric Psychology, Neuropsychology, Intellectual and Developmental Disabilities, Autism Treatment, and Child Clinical. A post-graduate 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, psychiatry, pediatric and family-practice residents, and nursing students have training experiences and rotations within the service line. The service line supports a diverse portfolio of research studies, many of which are led by investigators in the Center for Biobehavioral Health.

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 and adolescents and families living 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 subspecialty clinics. The Child Development Center services a network for Autism Treatment Network, a network of 13 sites across the United States and Canada.

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 disorders. Services include intensive behavioral intervention and consultation, school-based consultation, additional services, Appger's counseling, social skills groups, parent teaching, advocacy and community education.

Pediatric Psychology and Neuropsychology provides services to children and adolescents with a range of medical and neuropsychological disorders that impact thinking or behavior (e.g., brain tumors, epilepsy, seizure disorders, traumatic brain injury). The section provides care throughout the hospital, including inpatient medical units, medical specialty outpatient clinics and the Psychology Clinic at Nationwide Children's Hospital.

In 2018, Pediatric Psychology had continued growth in patient volume for both inpatient consultation and inpatient and outpatient services. One area of continued expansion has been integrating pediatric psychologists into our Primary Care Centers with two new integration sites added in 2018 and the launch of integrated care in Partners For Kids (“PFK”) practices through Project ECHO Behavioral Health. PFK is the accountable care organization affiliated to provide expertise in clinical care and to assist in the transition to the practice of biobehavioral health. The section provides care throughout the hospital, including inpatient medical units, medical specialty outpatient clinics and the Psychology Clinic at Nationwide Children’s Hospital.

In 2018, Pediatric Psychology also realized growth in integrated care within our Hematology, Oncology, Blood and Marrow Transplant at Nationwide Children’s, psychosocial leadership in areas of gastrointestinal care and the Newborn Intensive Care Unit, program leadership in the interdisciplinary feeding program for children with feeding aversions, and the comprehensive interdisciplinary pain program. Our psychologists act as liaisons to divisions within the Department of Pediatrics to provide expertise in clinical care and to assist in development of research and quality initiatives around the psychosocial care for patients and families. See page 111 for a list of faculty, selected publications and grants awarded.

The Center for Biobehavioral Health provides a list of faculty, selected publications and grants awarded.

PSYCHIATRY AND COMMUNITY BEHAVIORAL HEALTH

NATIONWIDE CHILDREN’S HOSPITAL

2018-19 Annual Report

NationwideChildrens.org/2019-Report

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NATIONWIDE CHILDREN’S HOSPITAL

2018-19 Annual Report

NationwideChildrens.org/2019-Report

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**PSYCHIATRY AND COMMUNITY BEHAVIORAL HEALTH**

Psychiatry and Community Behavioral Health at Nationwide Children’s Hospital is the largest and most clinically diverse section of Behavioral Health. This integrated program of care for pediatric mental disorders was created via collaboration between Nationwide Children’s Hospital and The Ohio State University Wexner Medical Center. The Child and Adolescent Division in The Ohio State University Department of Psychiatry and Behavioral Health has faculty at Nationwide Children’s and The Ohio State University. See page 131 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  
Scott Leibowitz, MD  
Molly Meers, PhD  
Jennifer Munoz, PhD  
Mary Ann Murphy, MD  
Sarah Nayern, MD  
Priti Parashar, MD  
Ujwal Ramtekkar, MD  
Jennifer Reese, PsyD  
Nadine Schwarz, MD  
Lacramioara Spetie, MD  
Griffin A. Stout, MD  
Glenn Thomas, PhD  
Raymond Troy, MD  
Pankhuree Vandana, MD  
Elizabeth Vickery, PhD  
Kelly Wesolowski, PsyD  
Kris West, PhD

**FULL-TIME NATIONWIDE CHILDREN’S FACULTY**

John Ackerman, PhD  
Benjamin Albrecht, DO  
Jeffrey A. Bridge, PhD  
Shannon M. Cheek, MD  
Nancy Cunningham, PsyD  
Mary Lynn Dell, MD  
Ben Fields, PhD  
Michael Flores, PhD  
Bela M. Gandhi, MD  
Richard H. Gilchrist, MD  
Jocelyn Hart, MD  
Karah Harvey, MD  
Joseph Hatcher, PhD  
Greta Libbey, MD  
Natalie Jacobowski, MD  
Kristina R. Jones, MD  
Anna Kerlek, MD

**OSU-AFFILIATE FACULTY**

Michael G. Aman, PhD  
L. Eugene Arnold, MD, MEd  
Mary Friestad, PhD  
Sathyan Gurumurthy, MD  
Amy B. Hoisington-Stabile, MD  
Natalie Jacobowski, MD  
Kristina R. Jones, MD  
Anna Kerlek, MD

**GRANTS AWARDED**

**JULY 1, 2018 – JUNE 30, 2019**

$203,776

**SELECTED PUBLICATIONS**


**FAST FACTS**

**July 1, 2018 through June 30, 2019**

**Psychiatry Inpatient Consultations:** 1,947  
**Psychiatry Inpatient Unit Discharges:** 573  
**Community-Based Visits:** 43,732  
**Outpatient Therapy Visits:** 79,752  
**Partial Hospital/Intensive Outpatient Program Visits:** 4,691  
**Psychiatry Clinic Visits:** 31,153  
**Emergency Department Assessments:** 5,236  
**Youth Crisis Stabilization Unit Discharges:** 946

**2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM**

**CHILD & ADOLESCENT PSYCHIATRY**

Cristen Collins, MD  
Charles W. Forman, DO  
Sarah Hamilton, MD
The Department of Pediatric Radiology at Nationwide Children's Hospital is one of the nation’s premier clinical imaging programs with subspecialty expertise in abdominal, cardiac, chest, fetal/neonatal, interventional, musculoskeletal, neuroimaging and nuclear medicine. 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. Our vision of the reinvented imaging department, the Children’s Imaging Biomarker Alliance (CIBA), was born with the following goals:

- Develop and validate imaging biomarkers specific to pediatric disease
- Determine quality, safety and cost-effectiveness of validated biomarkers
- Integrate imaging biomarkers across the basic/translational/clinical spectrum
- Integrate pediatric research across departments, imaging modalities and populations

We have a collaborative biomarker-based imaging program with a robust quality and safety infrastructure, optimized distribution of imaging resources, an integrated model of imaging informatics, and an advanced image processing program using 3D modeling and 3D printing for personalized treatment planning and creation of patient-specific devices.

Rajesh Krishnamurthy, MD
Radiologist-in-Chief
Benjamin Thompson, DO
Patrick Warren, MD
Section Chief, Interventional Imaging
Cody Young, DO
Nicholas Zambere, MD

We are embarking on a program called the Children’s Imaging Biomarker Alliance, which brings together strategic partnerships and shared cutting-edge resources to create world-class imaging programs. The integrated model is based on dyads (or pairs), that have been created for key areas. The dyads can tap into an array of resources to approach complex issues. The resources are housed under the Pediatric Advanced Imaging Resource (PAIR), and include sub-specialized radiologists, medical imaging scientists, advanced imaging analysts, specialized technologists, novel imaging techniques, and centralized imaging hardware and software.

Interventional Radiology

We developed a comprehensive multidisciplinary vascular anomalies center, staffed by three interventional radiologists specialized in vascular anomalies, with notable developments including a weekly VAC clinic, and a new lytic channel imaging and intervention program. In addition, James Murakami, MD, is the recipient of a $1 million endowment to create and establish the Children’s Imaging Biomarker Alliance, which brings together medical imaging scientists, advanced imaging analysts, specialized technologists, novel imaging techniques, and centralized imaging hardware and software.

GRANTS AWARDED

JULY 1, 2018 – JUNE 30, 2019
$326,999

SELECTED PUBLICATIONS


Surgical Services

THE HEART CENTER / CARDIOTHORACIC SURGERY

The Cardiothoracic Surgery Program at Nationwide Children’s Hospital is dedicated to the treatment of all patients, from fetus to adulthood, with congenital heart defects ranging from the most straightforward to the extremely complex. As part of The Heart Center, we offer a comprehensive approach to heart care that is based on a multidisciplinary team model, which enables our team to constantly monitor quality of care and patient safety pre-and post-surgery to assure the best possible outcomes. See page 43 for details about The Heart Center.

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

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 groundbreaking 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 laparoscopic and robot-assisted laparoscopic surgery.

FACULTY

Mark E. Galantowicz, MD
Chief, Cardiopulmonary Mechanical Assist Program
Toshiharu Shinoka, MD, PhD
Director, Cardiovascular Tissue Engineering Program

SELECTED PUBLICATIONS


Oluyinka O. Olutoye, MD, PhD
Surgeon-in-Chief

GRANTS AWARDED TO HEART CENTER

AND CARDIOVASCULAR RESEARCH FACULTY

JULY 1, 2018 – JUNE 30, 2019

$3,290,050

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. It is clear that 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 1,000 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 from newborns, through toilet training, puberty, and adulthood, including bowel, urinary, and sexual function andchildbearing.

UROLOGY

Seth A. Alpert, MD
Christina B. Ching, MD
Daniel G. Daljaste, MD
Molly Fuchs, MD
V. Rama Jayanthi, MD

PROGRAM MANAGER

Julie Choquette, MSN, RN
Stephanie Vireyseth, BSN, RN

CLINICAL LEADERS

Meghan E. Fisher, BSN, RN
Marissa Condon, BSN, RN

ADVANCE PRACTICE NURSE COORDINATORS

Kristina Booth, MSN, CPNP
Omaluna Nash, MS, CPNP-PC

The Center for Colorectal and Pelvic Reconstruction has a growing transition of care program for children as they become young adults and adulthood. With the expertise of Dr. Alessandra Gasior, the first surgeon in the world of Dr. Alessandra Gasior, the first surgeon in the world, the care of surgical conditions is provided in collaboration with our adult colleagues.

The complex reconstruction program, working closely with urologists, gynecologists and gastroenterologists, continues to help children from around the world, thus far 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 robotic-assisted and pure laparoscopic surgical treatment of complex conditions, including bladder neck reconstruction, appendicovesicostomy and/or Malone procedures for severe incontinence, both urinary and fecal, and offering unique opportunities to share tissues among patients.

The nursing team has completed their first bowel management book with a focus on case presentations for a variety of diagnoses and specific patient populations. This book is set to be published by the end of 2019.

SELECTED PUBLICATIONS


FACS.

Specializing in Colorectal and Pelvic Reconstruction.

2018 Nov 19;5:68.


PEDIATRIC COLORECTAL SURGERY

Devin R. Halleran, MD

PEDIATRIC COLORECTAL RESEARCH

Raquel Martinez, RN

PEDIATRIC COLORECTAL SURGERY

Husain, MD

INTERNATIONAL PELVIC RECONSTRUCTION

Rapu Quintero Anzures, MD
(Hospital Albert Einstein, Guatemala City, Guatemala)

Marko Arnold, MBChB, MMed
(Rad Cross Women’s Memorial Children’s Hospital, South Africa)
DENTISTRY

The Department of Dentistry at Nationwide Children's Hospital is a team of dedicated pediatric dentists, orthodontists, oral surgeons, endodontists, general dentists, residents and team members who provide comprehensive preventive, therapeutic, urgent and emergency oral health care services for infants, children and adolescents, including those with special health care needs. Our mission is to optimize oral health for the children who need us most through a balanced program dedicated to providing quality clinical care and specialty services while advancing knowledge through research, advocacy and community partnerships within a premier educational environment. Scientific discoveries focus on caries prevention, behavior management, oral microbiome and dental trauma outcomes.

FACULTY

Janice A. Townsend, DDS, MS
Division and Section Chief

FULL-TIME NATIONWIDE CHILDREN'S FACULTY

Homa Amini, DDS, MS, MPH
Paul S. Casamassimo, DDS, MS, Daniel B. Claman, DDS
Catherine M. Flaitz, DDS, MS
Kimberly Hammersmith, DDS, MPh, MS
Program Director
Ashok Kumar, BDS, MS
Director of Clinical Operations and General Anesthesia
Rosa Ortega, DDS, MS

OSU-AFFILIATE FACULTY

Hany A. Elam, BDS, MS
Henry W. Fields, DDS, MS, Msd
Section Chief, Orthodontics
Ann L. Griffen, DDS, MS
Ehsan Azadani, DDS, MS, PhD
Erin L. Gross, DDS, PhD, MS
Courtney A. Jatana, DDS, MS, FACS
Kelly S. Kennedy, DDS, MS
Peter E. Larsen, DDS
Section Chief, Oral and Maxillofacial Surgery

Yoan-Mi L. Martazia, DMD, MS
Jeffrey T. Milkon, DDS, MS
Kara M. Morris, DDS, MS
Cecilia A. Moy, DDS, MS
Andrea M. Myers, DDS
Scott W. Nieman, DDS
Daudwin T. Norman, DDS
Colleen C. Orrillana, DDS, MS
Andree-Anne Page, DMD
Sachin S. Parulkar, DDS
Monica R. Patel, DMD, MS
Nira S. Patel, DDS
Matthew L. Pingel, DMD
Mindy A. Price, DDS, MS
Sidney D. Price, DDS, MS
Joel J. Richards, DDS
Shaun A. Rosenberg, DMD, MS
Annette K. Sandhu, DDS
Matlina M. Shah, DDS, MS
Ana Rhulala Shelat, DMD
Rajen K. Shekh, DMD
David S. Silverglade, DDS, MS
David A. Smeltzer, DMD
Randall M. Speer, DDS
Rob S. Steiner, DMD
Kumar Subramanian, DDS, MS
Claire E. Towner, DDS
Eric C. Van Gilder, DDS
Kevin T. Weinel, DMD, MS
Stephen Wilson, DMD

In the past year, the department has made considerable progress in improving access for patients. Overall patient visits have increased by 10% resulting in approximately 48,000 clinical visits and 3,700 surgical visits per year.

Additional highlights:
- Completed renovations for the dental surgery and sedation center in the hospital
- National and local faculty and resident recognitions:
  - Homa Amini, DDS, MS, MPH, received grants from two groups:
    - Primary investigator for Ohio Medicaid, Medicaid Equity Simulation Project; MEDTAPP: Access to Dental Care for Immigrant Families
  - Health Resources and Services Administration Dental Faculty Loan Repayment grants
- Ehsan Azadani, DDS, MS, was awarded a Dental Faculty Loan Repayment grant.
- Dan Claman, DDS, was appointed director of the Pediatric Fellow Program.
- Ann Griffen, DDS, MS, was awarded a new NIH grant for a collaborative project with investigators. Dr. Griffen is one of the team of four principle investigators on the project. NIH R01DE026603 MP; Geaves, Griffen, Leys, Sawyer, 2018-2023; Diabetes Reversal and the Subgingival Microbiota.
- Erin Gross, DDS, MS, received the Jeffrey Dalin, DDS, Give Kids A Smile Volunteer Award, 2018.
- Kimberly Hammersmith, DDS, MPh, MS, was appointed program director and assistant professor at The Ohio State College of Dentistry.

through the hiring of pediatric dentistry faculty member, Ehsan Azadani, DDS, MS, and the addition of general dentists to provide care within an appropriate scope of services. The department has been successful in providing a stable dental presence on interdisciplinary hospital teams through a Dental Hygiene Ambassador who provides health care education and facilitates patient scheduling.
Research (funded) highlights:

- Improved Access to Care with Homa Amini, DDS, MPH, MS
- Oral Microbiome Studies with Ann Griffin, DDS, MS, and research team, OSU College of Dentistry
- Teledentistry with Kimberly Hammersmith, DDS, MPH, MS

SELECTED PUBLICATIONS


FAST FACTS

July 2018 through June 2019

- Inpatient Discharges: 2
- Observation and Outpatient-in-a-Bed Discharges: 16
- Total Discharges: 18
- Average Length of Stay*: 1.0
- Patient Days*: 2
- Dental Clinic Visits: 46,010
- Mobile Dental Unit Visits: 170
- Dental Clinic and Sedation: 492
- Total Surgical Procedures: 5,119

*Exclude observation and inpatient-in-a-bed patients.

This document includes a list of selected publications by Ashok Kumar, DDS, MS, and provides an overview of the Pediatric Dentistry program at Nationwide Children's Hospital, including research highlights and statistics on patient care and surgical services.
national meetings over the last year. Annie I. Drapeau, MD, is now a faculty member working with both Nationwide Children’s and The Ohio State University Wexner Medical Center. She has a clinical and research focus on both adult and pediatric epilepsy, movement disorders and stereotactic surgery for gene and drug delivery.

Chief Jeffrey Leonard, MD, continues his focus on spasticity, cerebral palsy and improving treatment for childhood brain tumors. He has had multiple invited presentations both nationally and internationally in addition to receiving two visiting professorships. He served as co-editor for the book, Cerebrospinal Fluid Disorders: Lifelong Implications. Dr. Leonard is currently coordinating a clinical trial for gene and drug delivery.

SELECTED PUBLICATIONS


FACULTY

David L. Rogers, MD
Chief

FULL-TIME NATIONWIDE CHILDREN’S FACULTY

Don L. Bremer, MD
Gyrol B. Casavant, MD
Richard P. Golden, MD
Hillary E. Inger, MD
Catherine Olson Jordan, MD
Julie M. Lange, MD
Mary Lou McGregor, MD
Gary L. Rogers, MD
Amanda L. Way, MD

OSU-AFFILIATE FACULTY

N. Douglas Baker, MD
Lance Bodily, MD
Dominic M. Buzzaicos, MD
Kenneth V. Cahill, MD
Colleen M. Cebulla, MD
Megan M. Chambers, MD

The Department of Ophthalmology at Nationwide Children’s Hospital is dedicated to serving the eye care needs of children of all ages regardless of the family’s ability to pay. The department includes the Eye Clinic and the Electrophysiology Testing Laboratory at Nationwide Children’s. The Eye Clinic serves in-house patient referrals, comprehensive outpatient eye care and offers special testing on the patients of community based physicians. The clinic staff includes pediatric ophthalmologists, optometrists, 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 specialty clinics staffed by ophthalmologists and other specialists and professionals for patients with issues related to glaucoma, retina, ocularplastics, intracranial hypertension and low vision.

FACULTY

Brandon C. Cho, MD
Raymond I. Cho, MD
Louis J. Chorisch, III, MD
Mary A. Craven, MD
Frederick H. Davidorf, MD
Jill A. Foster, MD
Andrew J. Hendershot, MD
Charles J. Hickey, MD
Steven E. Katz, MD
Curtin G. Kelley, MD
Johnstone M. Kim, MD
Dino D. Klisovic, MD
Rebecca A. Kuenten, MD
Carrie A. Lembach, MD
Thomas F. Mauger, MD
Cameron B. Nabavi, MD
Matthew P. Ohr, MD
Tyler Oostery, MD
Daniel G. Straka, MD
Matthew P. Ohr, MD
Curtin G. Kelley, MD
Jill A. Foster, MD

The Department of Ophthalmology supports research and teaching programs that ensure delivery of the highest quality pediatric care now and in the future. We are participating in several amblyopia and retnopathy of prematurity (ROP) studies sponsored by the Pediatric Eye Disease Investigator Group. Recently, we were selected as one of only 10 sites from this group who will participate in a large, multicultural...
study investigating the use of low-dose Atropine 0.01% eye drops to prevent myopia progression. Research continues on projects concerning infantile cataracts, fourth cranial nerve palsy and convergence insufficiency.

The Visual Electrophysiology Clinic at Nationwide Children’s is led by Julie Racine, PhD. This clinic performs electrotoretinograms, multifocal electrotoretinograms, electro-oculograms and visual evoked potential on patients of all ages, including adults, to assess retinal and retino-cortical function. The department also houses 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, treatment and prevention, and to provide free eye patches and other important services to help families of 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), autorefraction, tonometry, color vision and contrast sensitivity. The number of patients served remains strong and continues to grow.

We are also one of 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 live with much more normal visual function. These lenses are not FDA approved, and we expect this study will help gain approval.

**SELECTED PUBLICATIONS**


The number of patients served remains strong and continues to grow.

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**GRANTS AWARDED**

**JULY 1, 2018 – JUNE 30, 2019**

$595,521

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**SELECTED PUBLICATIONS**


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**FAST FACTS**

July 2018 through June 2019

Observation and Outpatient-in-a-Bed Discharges: 7

Total Discharges: 7

Total Surgical Procedures: 1,804

Inpatient Consults: 2,334

Eye Clinic and Low Vision Eye Clinic Visits: 9,870

---

*Excludes observation and outpatient-in-a-bed patients.*
Orthopaedics
How Much Opioid Medication Should Pediatric Orthopedic Patients Receive?

Doctors have traditionally used opioids as the primary component of pain management after orthopedic surgery in pediatric patients. But with the misuse and abuse of prescription opioids a growing public health concern, doctors are looking to limit what they prescribe to the minimum amount needed for pain relief.

Researchers from Nationwide Children’s set out to evaluate the opioid prescribing patterns of their orthopedic team for post-surgical pediatric orthopedic fracture patients. They reviewed the charts of all patients aged 18 years and younger who underwent surgery for elbow, forearm, wrist, femur, tibia and ankle fractures between 2014 and 2016.

The researchers found that their pediatric orthopedic trauma patients were receiving generic numbers of opioid pain medication doses after surgery due to universal, rather than injury-specific, prescribing patterns. In other words, patients with surgery to fix a femur or tibia fracture were receiving a similar amount of medication to a patient undergoing an elbow fracture pinning.

The researchers say this standardized approach to prescribing the same number of doses to every patient can potentially result in some over- or under-prescribing. They conclude that in order to limit the amount of unnecessary opioids in the community, it is important to determine the appropriate amount of medication needed to safely manage each type of pediatric orthopedic patient.

“The goal is to make a tailor-made prescription pattern for each common injury that we see,” says Christopher Iobst, MD, a pediatric orthopedic surgeon at Nationwide Children’s. “For instance, a femur fracture, which is a potentially more painful injury, might require more doses of pain medication than an elbow fracture.”

Since the time of data collection for this study, Dr. Iobst says the Orthopaedics team at Nationwide Children’s has become more restrictive in its use of opioid pain medication and more likely to prescribe non-narcotic pain medications, such as acetaminophen and anti-inflammatory drugs.

“We are cognizant of the fact that excess opioid pain medication can be dangerous because it can be misused or abused if it’s lying around the house,” he says. “We’re actively working to prescribe just the appropriate amount necessary for the patient’s particular injury.”

This study, along with a successful Quality Improvement program led by Otolaryngology to reduce opioid prescriptions, has inspired the Orthopaedics team at Nationwide Children’s to take action by standardizing prescribing patterns, using e-prescriptions and increasing patient and provider education. As a result, the team is prescribing fewer doses of opioids at discharge for surgical patients.

CITATION:
Iobst CA, Singh S, Yang JZ. Opioid Prescription Patterns for Pediatric Orthopaedic Fracture Patients. Journal of Clinical Orthopaedics and Trauma. August 2018. [Epub ahead of print]

“"The goal is to make a tailor-made prescription pattern for each common injury that we see."”
– Christopher Iobst, MD, Director, Center for Limb Lengthening and Reconstruction
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.

FACULTY

Kevin E. Klingele, MD
Chief

FULL-TIME NATIONWIDE CHILDREN’S FACULTY

Allan C. Beebe, MD
Matthew C. Branan, MD
Christopher A. Iobst, MD
John R. Kean, MD
Jan E. Klamar, MD
Lee M. Hlad, DPM
Michael S. Lefkowitz, MD
James E. Popp, MD
Daniel P. Quinn, MD
Desmond J. Stutzman, DO
Corey L. Van Hoff, MD
Marla O. VanSeyn, MD
Raymond K. Wurapa, MD

In 2018, the Department of Orthopaedics continued its ascent to becoming a national leader in the research of pediatric orthopaedic conditions. With the development of an expanded and dedicated research team, the department published 68 peer-reviewed articles, authored 14 book chapters, eight case reports and nine posters. Academic productivity resulted in 36 podium presentations representing Nationwide Children’s at 26 regional, national and international conferences. Sixteen presentations and posters by residents and medical students are the result of fostering a fertile learning environment for the next generation. Continued involvement in 11 multicenter collaborative studies, such as International Perthes Study Group, CoULD, GOAL and PROOF, have led to a concentrated engagement with colleagues across the globe for best outcomes for our patients.

Composed of a research scholar, several coordinators, engineers, resident and medical student rotators, the research team helped maintain and produce 64 active institutional review board studies encompassing all aspects of pediatric orthopaedics and quality improvement initiatives.

Dr. Baruch Danino served as the department’s first international exchange visitor research scholar in the Department of Orthopaedic Surgery at Nationwide Children’s.

His year at Nationwide Children’s was devoted to time within the Iobst Biomechanical Lab and the Center for Limb Lengthening and Reconstruction performing surgery on large-animal models. He also worked on multiple studies in collaboration with the Center for Hip Preservation, producing an algorithm to predict sequential, contralateral slipped capital femoral epiphysis (SCFE).

SELECTED PUBLICATIONS


FAST FACTS

July 2018 through June 2019

<table>
<thead>
<tr>
<th>Inpatient Discharges:</th>
<th>602</th>
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<td>Observation and Outpatient-in-a-Bed Discharges:</td>
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<td>Average Length of Stay*:</td>
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<td>Average Daily Census*:</td>
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<tr>
<td>Patient Days*:</td>
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<td>Total Surgical Cases:</td>
<td>2,000</td>
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</tbody>
</table>

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

2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM

PEDICIAN ORTHOPEDICS

Rachel Randall, MD

Surgical Services
Surgical Services

OTOLARYNGOLOGY

The Department of Pediatric Otolaryngology at Nationwide Children’s Hospital provides comprehensive diagnosis and treatment for children who have diseases of the ears, nose and throat. These problems include congenital and acquired diseases of the head and neck, hearing loss, ear infections, tonsillitis, sinusitis, acute and chronic nasal problems, airway disorders, voice disorders, sleep apnea, skull base tumors, salivary gland problems and many other related diseases.

FACULTY

Charles A. Elmaraghy, MD, FAAP, FACS
Chief

FULL-TIME NATIONALWIDE CHILDREN’S FACULTY

Oliver F. Adakua, MD, FACS
Ethan Bassert, MD
Tendi Chiang, MD
Jonathan M. Grischkan, MD, FAAP, FACS
Kris R. Jatana, MD, FAAP, FACS
Spencer Lindsey, MD
Brandon Kim, MD
Leslie R. Kim, MD, MPH
James K. Mattingly, MD
Aaron C. Moberly, MD
Matthew O. Old, MD
Bradley A. Otto, MD
Robert S. Pema, DO
Minka L. Schofield, MD

COMMUNITY-BASED FACULTY

Patrick L. Bockemstedi, MD
Jacobs P Burkhart, DO
Roberto J. Castellon, MD
Daniel W. Chae, MD
Subnave Das, MD
Timothy P. Dregkwaler, DO
Alexander A. Fanug, MD
Alfred J. Fleming Jr., MD
Akash Gupta, MD
Joseph E. Hall, MD
Jeffrey B. Hildbrand, MD
Steven M. Hausch, MD
Clifton R. Houd, DO
Richard T. Irene, MD
Scott T. Kramer, MD
Michael J. Loomis, MD
James D. Lower, MD
Michael D. Martyn, MD
Douglas D. Massick, MD
Timothy J. Nash, DO
Stephen J. Nogan, MD

Blair A. O’Brien, MD
David M. Powell, MD
Cherie Ryoo, MD
John M. Ryaneman, MD
Ashish Shah, MD
Thomas M. Sherrick, DO
Stephen P. Smith Jr, MD
Adam C. Spieu, MD
Eran J. Tobin, MD
Darryl N. Witter, MD

The Department of Pediatric Otolaryngology continues its clinical growth of services with over 32,000 clinic visits and over 9,000 surgical procedures. The department has grown both clinically and academically. New clinical programs include our same-day ear tube surgery pilot program that allows for a single visit for evaluation and surgery. We have published over 40 original research manuscripts in peer-reviewed journals and added a summer research program for undergraduates and medical students led by Tendi Chiang, MD, Kris R. Jatana, MD, FAAP, FACS, created a transitional care unit for patients eligible for discharge following surgery that may in the past be admitted overnight. This has allowed for a streamlined process that helps enhance the patient experience while being responsible with inpatient resources. Meredith Merz-Lинд, MD, FAAP, FACS, was elected President of Medical Staff and has been an important advocate for changes in by-laws and policies improving patient care.

GRANTS AWARDED

JULY 1, 2018 – JUNE 30, 2019

$31,299

SELECTED PUBLICATIONS


FELLOWSHIP PROGRAM

2018-2019 NATIONWIDE CHILDREN’S HOSPITAL

ENT (Main Campus) Clinic Visits: 2018-19 Annual Report

July 1, 2018 through June 30, 2019

<table>
<thead>
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<th>July 2018 through June 2019</th>
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<td>Inpatient Discharges: 73</td>
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<td>Observation and Outpatient-in-a-Bed Discharges: 2,834</td>
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<td>Average Length of Stay*: 3.6</td>
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<td>Average Daily Census*: 9.8</td>
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<tr>
<td>Patient Days*: 796</td>
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<tr>
<td>Total Surgical Cases: 9,657</td>
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<tr>
<td>Inpatient Consults: 792</td>
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<tr>
<td>Dublin ENT Clinic Visits: 9,958</td>
</tr>
<tr>
<td>ENT (Main Campus) Clinic Visits: 15,924</td>
</tr>
</tbody>
</table>

2016 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM

PEDEATRIC OTOLARYNGOLOGY

Vikram Thirmapurp, MD
The Section 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)

The Fertility and Reproductive Health Program provides comprehensive care for patients with anorectal malformations born with anorectal malformations across their life span. This work encompasses direct surgical and medical care, research projects and educational initiatives.

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. An Endometriosis Support Group has been established and meets quarterly. Other initiatives within this program include quality improvement and patient and provider education.

The Teen and Pregnant Program provides focused and specialized care for patients at risk of diminished fertility. Nationwide Children’s is part of the international Oncofertility Consortium, and we are successfully performing ovarian tissue cryopreservation procedures inside of an IRB protocol. We are also working collaboratively with oncology to ensure these patients have higher rates of contraception after delivery with long-acting reversible contraception (LARC) methods than the national average for teenaged mothers.

SELECTED PUBLICATIONS


McCracken K, Whiteside S, Yenger N, Nalesnik L. Examining Predictors and Outcomes of Fertility Consults among Children, Adolescents and Young Adults with Cancer. Pediatric Blood Cancer. 2018 Dec;65(12):e27409.

Yeager N, Nahata L. Examining Predictors and Outcomes of Fertility Consults among Children, Adolescents and Young Adults with Cancer. Pediatric Blood Cancer. 2018 Dec;65(12):e27409.

FAST FACTS

July 2018 through June 2019

Downtown Teen and Pregnant Clinic Visits: 1,781
Dublin Pediatric and Adolescent Gynecology Clinic Visits: 816
Linden Teen and Pregnant Clinic Visits: 603
Main Campus Pediatric and Adolescent Gynecology Clinic Visits: 3,584
Westerville Pediatric and Adolescent Gynecology Clinic Visits: 954

Total Pediatric and Adolescent Gynecology Clinic Visits: 8,560
Total Surgical Procedures: 7,800

The Teen and Pregnant Program clinic continues to see patients in the Livingston Ambulatory Center building and in the Linden neighborhood. The preterm delivery rate for the Teen and Pregnant Program continues to be lower than the Franklin County rate and the overall Ohio rate of preterm deliveries. Additionally Teen and Pregnant Program patients have higher rates of contraception after delivery with long-acting reversible contraception (LARC) methods than the national average for teenaged mothers.

SELECTED PUBLICATIONS


McCracken K, Whiteside S, Yenger N, Nalesnik L. Examining Predictors and Outcomes of Fertility Consults among Children, Adolescents and Young Adults with Cancer. Pediatric Blood Cancer. 2018 Dec;65(12):e27409.
**Pediatric Surgery**

**Development of Innovative Scoring Systems for Sickness and Tissue Damage From Clostridium difficile Colitis**

Two novel scoring systems consistently and efficiently assess sickness and tissue injury during antibiotic-associated *Clostridium difficile* colitis in a murine model, researchers at the Abigail Wexner Research Institute at Nationwide Children's Hospital report in the *Journal of Investigative Surgery*.

The serious health threat causes approximately 500,000 infections in patients of all ages and over 30,000 deaths, and results in an estimated $4.8 billion for associated health care costs in the United States annually. To address the threat, Gail Besner, MD, chief of Pediatric Surgery at Nationwide Children's, teamed with colleagues with expertise in various backgrounds.

After establishing reproducible infection in the model, the team scored signs of sickness using their novel clinical sickness score (CSS; range 0–12). Scores of 6 or higher were consistent with *C. difficile* colitis.

Intestinal tissue was then analyzed to define a histologic injury score (HIS; range 0-9) to assess tissue damage. Scores of 4 or higher were consistent with *C. difficile* colitis.

Twenty-three percent of mice receiving antibiotics alone and 65% receiving antibiotics and *C. difficile* showed signs of sickness. Eight percent of mice receiving antibiotics alone and 75% receiving antibiotics and *C. difficile* had histologic injury.

“My laboratory has collaborated for several years with those of Dr. Steven Goodman and Dr. Michael Bailey. Each one has expertise in different areas: animal models of human diseases; the biofilms and probiotics; and the microbiome,” says Dr. Besner, who is also a professor of Surgery and Pediatrics at The Ohio State University College of Medicine and senior author of the study.

“The sum of what we can accomplish working together is more than just the additive effects of three laboratories had we been working independently. We have discovered that a novel probiotic delivery system, in which we administer the probiotic *Lactobacillus reuteri* in its biofilm state, can protect the intestines from injury.”

Dr. Besner says the team is completing an analysis, using these grading systems, demonstrating that this novel probiotic delivery system can both prevent and treat the disease.

*CITATION:*

“We have discovered that a novel probiotic delivery system, in which we administer the probiotic *Lactobacillus reuteri* in its biofilm state, can protect the intestines from injury.”

– Gail Besner, MD, Chief, Pediatric Surgery
PEDIATRIC SURGERY

The mission of the Department of Pediatric Surgery at Nationwide Children’s Hospital is to provide collaborative, comprehensive and 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 and research.

FACULTY

Hosam F. El Sayed, MBBCh, PhD
Amalia L. Cochran, MD
Richard J. Wood, MD
Rajan K. Thakkar, MD
Oluyinka O. Olutoye, MD, PhD
Benedict C. Nwomeh, MD, MPH
Peter C. Minneci, MD, MHSc
Marc P. Michalsky, MD
Denis R. King, MD
Brian D. Kenney, MD, MPH
Ihab Halaweish, MD
Jonathan I. Groner, MD
Jeremy G. Fisher, MD
Renata B. Fabia, MD, PhD
Karen A. Diefenbach, MD
Katherine J. Deans, MD, MHSc
David R. Brigstock, PhD
Christopher K. Breuer, MD
Jennifer H. Aldrink, MD
Chief

Gail E. Benner, MD

FULL-TIME NATIONWIDE CHILDREN’S FACULTY

Jennifer H. Aldrink, MD
Christopher K. Breuer, MD
David R. Brigstock, PhD
Katherine J. Deans, MD, MHS
Karen A. Diefenbach, MD
Renata B. Fabia, MD, PhD
Jeremy G. Fisher, MD
Jonathan I. Groner, MD
Ihab Halaweish, MD
Brian D. Kenney, MD, MPH
Denis R. King, MD
Marc P. Michalsky, MD
Peter C. Minneci, MD
Nadejda C. Nwomeh, MD, MPH
Oleksiyka O. Olayeye, MD, PhD
Rajan K. Thakkar, MD
Richard J. Wood, MD

OSU-AFFILIATE FACULTY

Amalia L. Cochran, MD
Hosam F. El Sayed, MBBCh, PhD
Michael R. Geo, MD
Mounaj J. Hauram, MD
Bradley J. Needelman, MD
Kristine Orion, MD
Amer Raja, MD, PhD
Timur Sarac, MD
Jean E. Stain, MD
Patrick S. Vaccaro, MD
William K. Washburn, MD

Pediatric Surgery is one of the largest and most diverse departments of its kind in the United States. It includes one of the most well-established and sought after training programs in pediatric surgery, as well as multiple additional specialty training programs. Each faculty member brings individual strengths and talents to the department and is recognized for their expertise in clinical care, research and education.

The department maintains active clinical programs focused on general pediatric surgery, minimally invasive surgery, robotic surgery, surgical oncology, surgical endocrinology, trauma, burns, chest wall deformities, bariatric surgery, inflammatory bowel disease, hepatobiliary surgery, neuroendocrine and pediatric colorectal surgery.

The department continues to have one of the busiest robotic surgery programs of any children’s hospital in the United States. It is the only program that uses a multidisciplinary surgical approach through close collaboration between multiple surgical services, including Pediatric General Surgery, Urology, Bariatric Surgery, colorectal surgery.

Pediatric Surgery remains a leader in quality improvement initiatives within the hospital and nationally. One of the most in-depth systems for conducting Morbidity & Mortality Conferences has been established within Pediatric Surgery, was presented nationally this year at the Children’s Hospital Association Quality & Safety in Children’s Health Conference, and is now being rolled out to many other departments within the hospital.

Researchers in the department continue to have more federally funded research projects than any other program in the country. At present, 11 faculty members in Pediatric Surgery at Nationwide Children’s hold externally funded grants, including Drs. Aldrink, Breuer, Brigstock, Deans, Diefenbach, Fisher, Groene, Michalsky, Minneci and Thakkar.

The research conducted in the department is broad and encompasses a range of basic science, clinical, translational and outcomes research projects. The department continues as a leader in the nation in presentations at national academic meetings. For the eighth 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 33 in the past eight years.

GRANTS AWARDED
JULY 1, 2018 – JUNE 30, 2019

$6,604,689

SELECTED PUBLICATIONS


2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM

Pediatric Minimally Invasive Surgery

Daniel Curry, MD

Pediatric Surgery

James T. Huntington, MD
Abdul Kallayla, MD

Surgical Critical Care

Juan Guerra, MD

Bariatric Surgery

Kees Vada, MD

2018 – 2019 INPATIENT DISCHARGES

Inpatient Discharges: 1,806
Observation and Outpatient-in-a-Bed Discharges: 621
Total Discharges 2,629
Average Length of Stay*: 5
Daily Census**: 23
Patient Days*: 8,004
Total Surgical Procedures: 4,916
Inpatient Consults: 2,274
Colonial Clinic Visits: 251
Dublin Surgery Clinic Visits: 40
Surgery/Burn Clinic Visits: 6,156
Westerville Surgery Clinic Visits: 303
Total Surgery Clinic Visits: 9,083

*Exclude observation and outpatient-in-a-bed patients.
The Section 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, and congenital and traumatic hand and upper extremity anomalies.

**FACULTY**

Richard E. Kirschner, MD, FAAP, FACS  
Chief

**FULL-TIME NATIONWIDE CHILDREN’S FACULTY**

Adriane Baylos, PhD, CCC-SLP  
Kim Bjoeklund, MD  
Ibrahim Khansa, MD  
Ana Mercado, DMD, PhD  
Kara Morris, DDS, MS  
Kim Bjorklund, MD  
Adriane Baylis, PhD, CCC-SLP

**OSU-AFFILIATE FACULTY**

Albert Chan, MD  
Jeffrey E. Janis, MD  
Clara N. Lee, MD  
Stephan J. Potetz, MD  
Steven Schulz, MD  
Geoffrey Suk, MD  
Roman Skoracki, MD  
Ian Valerio, MD

The section continues its strong commitment to patient safety and quality outcomes through quality improvement, business process improvement, and patient and family education initiatives, including the creation of clinical protocols, educational tools for families and nursing competency requirements.

The section hosted the second International Symposium on Velopharyngeal Dysfunction (VPD) in September 2018 with attendees from around the world gathering to share the latest research and clinical insights on VPD management. Finally, with surgical missions and educational efforts carried out abroad, the team continued its commitment to improving the quality of life for underprivileged children around the world.

**SELECTED PUBLICATIONS**


**SELECTED GRANTS**

- *2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM*

- *PEDIATRIC PLASTIC SURGERY*

  Benjamin Lempelman, MD

- *CRANIOFACIAL SPEECH*

  Jill Daruge, MA, CCC-SLP

**FAST FACTS**

<table>
<thead>
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<th>July 2018 through June 2019</th>
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</thead>
<tbody>
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<td>Inpatient Discharges:</td>
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<tr>
<td>Observation and Outpatient-in-bed Discharges:</td>
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<tr>
<td>Total Discharges:</td>
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<td>Average Length of Stay*:</td>
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<td>Total Surgical Procedures:</td>
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<td>East Broad Plastic Surgery Clinic Visits:</td>
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<tr>
<td>Total Plastic Surgery Clinic Visits:</td>
</tr>
</tbody>
</table>

*Excludes observation and in-patient visits to a few patients.**
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.

**PROGRAM LEADERSHIP**

- **Abdominal Transplant**
  - Medical Director: Hiren P. Patel, MD
  - Clinical Director: W. Kenneth Washburn, MD

- **Liver Transplant**
  - Medical Director: Alexander Weymann, MD
  - Surgical Director: Patrick McConnell, MD

- **Heart Transplant**
  - Medical Director: Robert J. Gajarski, MD, MHSA

- **Lung and Heart-Lung Transplant**
  - Clinical Director: Stephen E. Kirkby, MD
  - Surgical Director: Mark E. Galantowicz, MD

- **Blood and Marrow Transplant**
  - Medical Director: Jeffery J. Aslett, MD
  - Surgical Director: Rolla F. Abu-Arja, MD
  - Medical Director: June C. Davis, MD

- **Kidney Transplant**
  - Medical Director: Amer Rajab, MD, PhD
  - Clinical Director: Don Hayes Jr., MD, MS, MEI

- **TRANSPLANT**

**Surgical Services**

**ABDOMINAL TRANSPLANT**

The Abdominal Transplant Program at Nationwide Children’s 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 the past year, the Nationwide Children’s Kidney Transplant program performed six transplant surgeries, one of which was from a living donor. The Nationwide Children’s Liver Transplant Program performed one liver transplant in 2018.

**BLOOD AND MARROW TRANSPLANT**

The Blood and Marrow Transplant (BMT) Program uses a family-centered, holistic care model in utilizing hematopoietic cell transplantation as the definitive care for pediatric and adolescent/young-adult patients with malignant and nonmalignant disorders. Our team is dedicated to optimizing clinical applications of hematopoietic cell transplantation 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 Cell Therapy Laboratory at The James Cancer Hospital and Solove Research Institute at The Ohio State University (OSU), which offers unique forms of stem cell graft manipulation and processing. Our Cellular Therapy and Cancer Immunotherapy Program (CTCI/P) provides logistic support for manufacturing and protocol development of novel investigator-initiated cellular therapies. Lastly, the program educates the next generation of hematopoietic cell transplant and 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) and the Center for International Blood and Marrow Transplant Research (CIBMTR), and is associated with the Children’s Oncology Group (COG), Pediatric Blood and Marrow Transplant Consortium (PBMTC), Primary Immune Deficiency Treatment Consortium (PIDTC), Blood and Marrow Transplant Clinical Trials Network (BMT CTN), Sickle 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 OSU’s 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 HLA-matched and haploidentical, related donors as well as HLA-matched, unrelated donors.
In the last year, patients have been treated with a wide range of modified stem cell grafts and cellular therapies. Our program is a National Organ Procurement Organization and a member in good standing within the Ohio Department of Health and Human Services and approved by the American Society of Transplantation. The program is certified by UNOS, approved by the American Society of Transplantation, and remains a member in good standing within the Ohio Solid Organ Transplant Consortium.

Over the past year, we continued to experience growth in our transplant referrals and subsequent transplant volumes, with nearly 50% increases in both areas over the last few years, and with sustained excellence in our early post-transplant outcomes. Our team supported four patients who underwent ventricular assist device (VAD) implants for refractory heart failure while awaiting transplant, and Nationwide Children’s was the first pediatric center to implant the new HeartMate III VAD in Ohio. With more comprehensive clinical services available and additional personnel, we anticipate continued VAD program growth. This would include meeting the needs of an increasing population of older pediatric and young adult patients with congenital heart disease, as well as being a research site for novel pediatric VAD designs as they enter clinical trials. In collaboration with our oncology colleagues, we have also formally initiated our cardio-oncology program to provide ongoing comprehensive cardiac care to long-term survivors of childhood cancers known to have increased risk for cardiomyopathy. Finally, our program has become an active member of a recently formed multi-center international quality research consortium, ACTION (Advanced Cardiovascular Therapies Improving Outcomes Network), and our physicians have assumed leadership roles in the VAD education, team communication and quality improvement modules.

LUNG AND HEART-LUNG TRANSPLANT

The Lung and Heart-Lung Transplant programs are 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 ambulatory extracorporeal membrane oxygenation (ECMO) to children with advanced lung disease, including acute respiratory decompensation, and have the capability of transporting patients to our center on lung assist devices and ECMO.

In the past year, the Lung Transplant Program received a record number of referrals from pediatric institutions throughout the United States and internationally. With a growing research portfolio at Nationwide Children’s, the depth of the research performed by the Lung Transplant Program significantly contributes to the medical literature on advanced lung disease and lung transplantation.

SELECTED PUBLICATIONS


Haas DJ, Flick JO, Britsch RD, Buxton MB. Cell Therapy for Cytoxic Liver-Disease: Regenerative Cell-Based Cell Amplification. SANDOZ CELLULAR THERAPEUTICS. 2018 Mar;102(3):197-205.

Haas DJ, Flick JO, Britsch RD, Buxton MB. Cell Therapy for Cytoxic Liver-Disease: Regenerative Cell-Based Cell Amplification. SANDOZ CELLULAR THERAPEUTICS. 2018 Mar;102(3):197-205.

2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM

PEDDICTIVE BONE MARROW TRANSPLANT

Nabana Bhuta, MD

PEDDICTIVE RENAL TRANSPLANT

Jessica Green, MD

Ruchi Kumar, MD

Emily Stensboodt, MD

Jason Thomason, MD

FAST FACTS

July 2018 through June 2019

Blood and Marrow Transplantations: 53

Heart Transplantations: 5

Lung Transplantations: 1

Kidney Transplantations: 9

Liver Transplantations: 1

SELECTED PUBLICATIONS


Haas DJ, Flick JO, Britsch RD, Buxton MB. Cell Therapy for Cytoxic Liver-Disease: Regenerative Cell-Based Cell Amplification. SANDOZ CELLULAR THERAPEUTICS. 2018 Mar;102(3):197-205.

Haas DJ, Flick JO, Britsch RD, Buxton MB. Cell Therapy for Cytoxic Liver-Disease: Regenerative Cell-Based Cell Amplification. SANDOZ CELLULAR THERAPEUTICS. 2018 Mar;102(3):197-205.

2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM

PEDDICTIVE BONE MARROW TRANSPLANT

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Haas DJ, Flick JO, Britsch RD, Buxton MB. Cell Therapy for Cytoxic Liver-Disease: Regenerative Cell-Based Cell Amplification. SANDOZ CELLULAR THERAPEUTICS. 2018 Mar;102(3):197-205.
TRAUMA

Nationwide Children’s Hospital is one of the largest Level 1 pediatric trauma centers in the nation to be verified by the American College of Surgeons. We are also one of the few free standing pediatric burn centers in the United States to be verified by the American Burn Association. The trauma and burn programs provide clinical care for injured children, a robust quality improvement program to ensure that the highest quality of care is provided, and research to improve outcomes through the Center for Pediatric Trauma Research at Nationwide Children’s. Our nationally recognized trauma and burn service provides care for injured children from infancy through adolescence. Pediatric trauma and burn experts are involved in all aspects of patient care, 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.

FACULTY

Jonathan I. Groner, MD
Medical Director

Rajan Thakkar, MD
Associate Trauma Medical Director
Co-Director Burn Program

Renata Fabia, MD
Co-Director Burn Program

TRAUMA SURGEONS

Jennifer H. Aldrink, MD
Gail E. Besner, MD
Christopher K. Breuer, MD
Katherine J. Deans, MD
Jeremy Fisher, MD
Brian D. Kenney, MD, MPH
Marc P. Michalsky, MD
Peter C. Minneci, MD
Benedict C. Nwomeh, MD
Rajan K. Thakkar, MD
Richard Wood, MD

PHYSICIAN TRAUMA/BURN LIAISONS

Sri Aravappali, MD (Emergency Medicine)
Graziela Argote-Romero, MD (Anesthesia)
Allan Beebe, MD (Orthopedics)
Greg Cambier, MD (Anesthesia)
Maria Estrada, DO (Critical Care)
Mark Hogan, MD (Radiology)
Jeff Lutmer, MD (Critical Care)
David Martin, MD (Anesthesia)
Ellen McManus, MD (Emergency Medicine)
Eric Srbnik, MD (Neurosurgery)

TRAUMA PROGRAM MANAGER
Kathy Haley, MS, RN

Highlights from the past year:

• Jonathan Groner, MD, and Kathy Haley, RN, were re-appointed as board members of the Central Ohio Trauma System.
• Rajan Thakkar, MD, provided leadership for the Pediatric Injury Quality Improvement Collaborative, national injury quality collaborative.
• Jonathan Groner, MD, served as a member of the Committee on Trauma of the American College of Surgeons.
• Rajan Thakkar, MD, was awarded a K08 grant from the National Institutes of Health for his study, “Pediatric Immune Function Following Thermal Injury.” This is a four-year career development award.
• The Burn Program launched its Laser Therapy Program for burn scar reconstruction.
• The Burn Program, in collaboration with the other centers in the Pediatric Quality Improvement Collaborative, was awarded first place in the Quality Improvement category for its poster, “Identifying Best Practices in Burn Care across Five Children’s Hospitals” at the 2019 American Burn Association Annual Conference.

The Trauma team provides expertise and leadership locally through the Central Ohio Trauma System, the state trauma system, and nationally through the Pediatric Trauma Society, the Verification Review Committee of the American College of Surgeons, and other national trauma and burn organizations.

CENTER FOR PEDIATRIC TRAUMA RESEARCH

RESEARCH CENTER FACULTY

Henry Xiang, MD, MPH, PhD
Director

Jonathan I. Groner, MD
Medical Director

Julie Leonard, MD, MPH
Associate Director
FACULTY
Jennifer Cooper, PhD
Renata Fabia, MD, PhD
Brian Kenney, MD, MPH
Jeffrey Leonard, MD
Eric Sobnich, MD, PhD
Rachel Stanley, MD
Gerry Taylor, PhD
Rajan Thakkar, MD
Ginger Yang, PhD, MPH

AFFILIATE FACULTY
Allan C. Berge, MD
Mark Hall, MD, FAAP, FCM
Bo Lu, PhD (The Ohio State University)
Jennifer Lundine, PhD, CCC-SLP, BC-ANCDS
Keith Yeates, PhD

NURSE RESEARCHERS
Carla Coffey, BSN, RN
Kathy Hales, MS, RN
Sheila Giles, RN, BSN
Dana Noffsinger, CPNP-AC
LizAnn Wurster, MS, RN, CPNP

RESEARCH PROGRAM MANAGER
Kris K. Wheeler, MS

Center for Pediatric Trauma Research Achievements
• The Pediatric Trauma and Burn Research Affinity Group was awarded Research Institute funding to support collaborative efforts between clinicians at Nationwide Children’s and researchers at the Abigail Wexner Research Institute.
• Julie Leonard, MD, MPH, is serving as co-principal investigator on a National Institutes of Health (NIH) grant to validate the use of the PsySTART tool in the emergency department and to determine a cutpoint for risk factors that will most accurately distinguish those children who are at highest risk of developing post-traumatic stress disorder.
• Jonathan I. Groner, MD, was named to lead the pediatric focus group for the National Trauma Research Action Plan (NTRAP). Henry Xiang, MD, MPH, PhD, and Rajan Thakkar, MD, will participate as experts.
• Ginger Yang, MD, PhD, received an NIH grant to determine the effectiveness of parent-focused driving safety interventions on safe driving practices among teen drivers who have committed a traffic violation.

GRANTS AWARDED
JULY 1, 2018 – JUNE 30, 2019
Trauma-related research funding spans multiple centers which include Emergency Medicine, Pediatric Surgery, Center for Injury Research and Policy, and Center for Innovation in Pediatric Practices.
$3,900,726

SELECTED PUBLICATIONS

FAST FACTS
July 2018 through June 2019
Admissions: ............................................................... 1,457
Average Length of Stay: .............................................. 3.0
Blunt Injury Admissions: ........................................... 1,147
Penetrating Injury Admissions: .................................. 101
Burn Injury Admissions: ............................................ 177
Asphyxial Injury Admissions: .................................... 32
Orthopedic Trauma Admissions: .............................. 481
Neurosurgery Trauma Admissions: ........................... 171
Pediatric Surgery Trauma Admissions: ..................... 607
Other Service Trauma Admissions: ......................... 128
Pushing the Boundaries of Regional Anesthesia for Complex Urological Surgery

In an effort to extend more regional anesthetic options to children undergoing urological procedures — and to obviate concerns about airway safety and theoretical neurocognitive effects of general anesthesia in the very young — a team of anesthetists and surgeons at Nationwide Children’s Hospital developed a Spinal Anesthesia Program that now includes formal protocols for the use of combined spinal/caudal catheter (SCC) anesthesia. The combined approach has made it possible to perform even lengthy, complex procedures, such as ureteral implantation, under regional anesthesia.

“In most places, it’s almost expected that any child who comes to the operating room has general anesthesia,” says Rama Jayanthi, MD, chief of Urology at Nationwide Children’s and lead author on a Journal of Pediatric Urology study detailing his team’s experience in SCC. “We’re suggesting that doesn’t have to be the case. There are options. One can do more complex surgeries under regional anesthesia, and there may be some advantages to doing so.”

Spinal anesthesia, which involves a single anesthetic injection into the subdural space, provides localized, lower-body anesthesia for 60-90 minutes. In 2015, surgeons at Nationwide Children’s began employing it for routine procedures lasting less than 90 minutes such as circumcisions and revisions, orchidopexy, hernia repair and distal hypospadias repairs.

The study team began to place a caudal epidural catheter in selected cases to prolong the duration of the surgical block, refining their protocol as they gained experience. Now, 60 minutes after spinal anesthesia is administered, children receive an automatic bolus of chloroprocaine through the caudal catheter. This maintains pain relief, allowing for seamless anesthesia as the spinal block recedes. Children also receive an intravenous bolus of dexmedetomidine prior to catheter placement, as well as a gradual infusion throughout the surgery.

The study included 23 children, with a mean age of 16.5 months, in whom they attempted SCC. Spinal anesthesia was unsuccessful in three children, who were switched successfully to general anesthesia. The remaining 20 patients completed operations such as ureteral implantations, ureterocele excisions and reimplantations, megaureter repairs, feminizing genitoplasties and open pyeloplasty. All SCC children spontaneously breathed room air and completed surgery without airway intervention or other complications.

“Successfully starting a program requires a surgeon who is motivated and an anesthetist who wants to push the envelope,” says Dr. Jayanthi. “I hope other hospitals will pursue this. We should be accepting that SCC may have specific advantages, with minimal use of systemic medications and lack of airway manipulation.”

CITATION:
UROLOGY

The Section of Urology at Nationwide Children’s Hospital provides comprehensive diagnostic and therapeutic services for a wide range of urological disorders in children of all ages, including teenagers and young adults. Advanced services include reconstructive surgery of the urinary tract, genitalia and urinary sphincter, as well as consultations for urinary tract abnormalities detected in utero. The section participates in several multispecialty clinics, including THRIVE (a program specializing in care for differences of sexual development, complex urological problems and gender concerns), Center for Colorectal and Pelvic Reconstruction, Urology-Nephrology Clinic, the Stone Clinic and the Myelomeningocele Clinic.

The mission of the Section of Urology is to provide the highest quality pediatric urological care in the safest and most child-friendly environment. The section includes members who are full-time pediatric urologists, hold faculty appointments in the Department of Urology at The Ohio State University College of Medicine and are committed to cutting-edge medical research and surgical education.

The Section of Urology continues to provide care to multiple areas in the region, acknowledging that it is vital for a premier program to go to families as opposed to always having them come to main campus. To that end we have expanded long distance Ohio outreach clinics in Lima, Mansfield and Wheeling. In addition, the joint venture with Dayton Children’s Hospital continues to serve southwest Ohio, with two Nationwide Children’s Urology faculty members offering full-time service to the Dayton metropolitan area.

The Robot-Assisted Surgery Program is robust, performing a wide range of surgical procedures, from routine kidney level operations, such as pyeloplasties and nephrectomies, to more complex procedures such as bladder neck reconstructions and appendicovesicostomy. Only a handful of centers around the country are performing the latter but at Nationwide Children’s they have become commonplace. Our six robotically trained pediatric urologists are among the most active in the country with regard to surgical volumes.

Urology continues to place great importance on multiprofessional collaborative clinics. These include the THRIVE program for differences in sexual development (DSD); the Center for Colorectal and Pelvic Reconstruction, and the Uro-Nephrology Clinic. The latter specifically has doubled over the last academic year allowing for more children with complex urinary pathologies and chronic kidney disease to be simultaneously evaluated and managed by both Urology and Nephrology.

The division continues to be an active member of the Pediatric Urology Midwest Alliance (PUMA), which consists of urology divisions in five major Midwestern children’s hospitals (Nationwide Children’s, Cincinnati, Riley, Lucile and the Mayo Clinic). The group continues to perform collaborative multicenter research of uncommon conditions. In addition, the group held its second annual exstrophy surgical mission in India, caring for 18 children.

GRANTS AWARDED

JULY 1, 2018 – JUNE 30, 2019

$163,495

SELECTED PUBLICATIONS


2018 – 2019 NATIONWIDE CHILDREN’S FELLOWSHIP PROGRAM

PEDIATRIC UROLOGY

Ketan Kheter, MD

Alex Robbels, MD

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. The AWRI occupies more than 500,000 square feet of dedicated research space on the Nationwide Children’s campus. 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.

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

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

William E. Smoyer, MD
Vice President, Clinical Research

Veronica J. Vieland, PhD
Vice President, Computational Research

INSTITUTES AND CENTERS OF EMPHASIS

- Battelle Center for Mathematical Medicine
- Biopathology Center
- Center for Biobehavioral Health
- Center for Cardiovascular 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 Innovation in Pediatric Practice
- Center for Microbial Pathogenesis
- Center for Perinatal Research
- Center for Regenerative Medicine
- Center for Vaccines and Immunity
- Steve and Cindy Rasmussen Institute for Genomic Medicine
BATTENEL 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.

FACULTY

Veronica J. Vieland, PhD
Director
Christopher W. Bartlett, PhD
Jayajit Das, PhD
David A. Greenberg, PhD
Susan Hodge, DSc
Andrzej Kloczkowski, PhD
Paola Malerba, PhD
William C. Ray, PhD
William Stewart, PhD

The center was pleased to have a new faculty member join us, Paola Malerba, PhD, a mathematician who specializes in brain wave patterns during sleep and their roles in various clinical conditions.

GRANTS AWARDED

JULY 1, 2018 – JUNE 30, 2019

$606,214

SELECTED PUBLICATIONS


BIOPATHOLOGY CENTER

The Biopathology Center, part of the Abigail Wexner Research Institute at Nationwide Children’s Hospital, provides a full range of services related to biospecimen procurement, banking, processing, testing and distribution. The center is accredited by the College of American Pathologists Biorepository Accreditation Program and houses numerous National Cancer Institute (NCI) funded biospecimen collection efforts, including the biospecimencollections of the Children’s Oncology Group, NRG Oncology-Columbus and SWOG. Also part of the Biopathology Center are the NCI-funded Pediatric Division of the Cooperative Human Tissue Network (pCHTN), the Biospecimen Core Resource of the Center for Cancer Genomics, and the Children's Oncology Group Reference Laboratories as well as numerous biospecimen collections from other sponsors (e.g., Nationwide Children's-funded investigators, the SARC Foundation).

FACULTY

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

Julie M. Garnet Foster, PhD, FACMG
Principal Investigator

We continuously pursue grant-supported, biobased studies aimed to advance medical research. This year the Biopathology Center-based Biospecimen Core Resource was awarded contracts to support pathology review and nucleic acid isolation for the NCI Division of Cancer Epidemiology and Genetics (to study environmental causes of cancer), the NCI Center for Cancer Genomics’ Cancers of Unknown Primaries Project (to better understand metastatic tumors of unknown origin), and the Translational Breast Cancer Research Consortium’s AURORA project (to investigate metastatic breast cancer genomes and identify potential targets to prevent tumor spread).

The pCHTN grant was awarded to Nilsa Del Carmen Ramirez-Milan, MD, FCAP for the period from 2019 to 2024; the Biopathology Center has hosted this grant since 1989, with her as PI since 2007. The Cooperative Human Tissue Network is comprised of five adult divisions and one pediatric division and provides access to biospecimens for discovery phase research that contributes to discoveries in cancer diagnosis and treatment. Julie M. Garnet-Foster, PhD, FACMG, participated in several NCI-sponsored grant review committees. As part of international efforts, Dr. Garnet-Foster presented at the Latin-American Symposium and Training in Biobanking of the Barretos Cancer Hospital in Brazil and Dr. Ramirez-Milan presented at the 11th Asian Network of Research Resource Centers Conference in Seoul, South Korea.
SELECTED PUBLICATIONS

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 diseases and to foster preventive strategies and promote cardiovascular health in adults.

FACULTY

Aaron J. Trask, PhD
Patrick I. McConnell, MD
Brenda Lilly, PhD
Madhumita Basu, PhD
Director
Vidu Garg, MD

Our cardiovascular research spans 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 Hospital. Areas of focus include investigation into the genes and environment interactions that contribute to congenital heart defects, molecular pathways regulating normal cardiac heart valve and blood vessel development and signaling cascades that regulate valve and vascular remodeling and function during disease development and progression. The center faculty receive funding from the National Institutes of Health (NIH) and the American Heart Association (AHA) to support their cutting-edge research. This funding includes a new three-year NIH Heart Association (AHA) training award that supports summer research experience for undergraduate students.

The Center for Cardiovascular Research is comprised of investigators from many disciplines and includes those who focus on the genetic and molecular pathways that regulate normal cardiac, vascular and smooth muscle development and function, as well as those who focus on the progression of cardiovascular disease. The research focus of the investigators spans basic, translational and clinical research to understand how the genes and environment interact to contribute to congenital heart defects, molecular pathways regulating normal cardiac heart valve and blood vessel development and signaling cascades that regulate valve and vascular remodeling and function during disease development and progression.

The Center for Cardiovascular Research works closely to study how cells grow, divide and function, how these basic processes are usurped to promote cancer development, including in leukemia and sarcoma. A particular focus is on how these processes function normally where DNA is generally transcribed into RNA (and less gene expression) and where DNA is generally compacted and associated with histones. This organization also includes three-dimensional packing of the DNA into the nucleus, and the writing, reading and erasing of specific epigenetic marks on chromatin that help to define its function. Dr. Stanton's research focuses on how large molecular machines organize DNA (as chromatin) in the nucleus of cells. This organization includes the nuclear functions of cancer-driving genes, including the role of RNA-splicing in health and in cancer, and her work has demonstrated that changes in the splicing pattern of certain RNAs, such as the RNA that encodes the MDM2 protein, lead to cancer formation. Ryan Roberts, MD, PhD, has brought new technology to our center in the form of single-cell RNA-seq to understand the interplay between tumor cells and normal host tissues, such as the lung, during the spread of cancer from its primary site of disease to distant metastatic sites.

The mission of the Center for Childhood Cancer and Blood Diseases in the Abigail Wexner Research Institute at Nationwide Children’s Hospital, as well as with national and international colleagues, is to translate these findings to the patient. The theme of “nuclear function” continues to grow in the center. Stephen Lessnick, MD, PhD, director of the center, was recently awarded a significant grant from the National Institutes of Health to study the nuclear functions of cancer-causing protein EWS/FLI in Ewing sarcoma, including how EWS/FLI changes the epigenetic state of the cell to cause tumors. Dawn Chandler, PhD, has been focused on the role of RNA-splicing in health and in cancer, and her work has demonstrated that changes in the splicing pattern of certain RNAs, such as the RNA that encodes the MDM2 protein, lead to cancer formation. Ryan Roberts, MD, PhD, has brought new technology to our center in the form of single-cell RNA-seq to understand the interplay between tumor cells and normal host tissues, such as the lung, during the spread of cancer from its primary site of disease to distant metastatic sites.

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The Center for Childhood Cancer and Blood Diseases, Dr. Stanton’s research focuses on how large molecular machines organize DNA (as chromatin) in the nucleus of cells. This organization includes creating areas of “open” chromatin where DNA is generally transcribed into RNA (and ultimately translated into proteins) and “closed” chromatin where DNA is generally more compacted and associated with less gene expression. This organization also includes three-dimensional packing of the DNA into the nucleus, and the writing, reading and erasing of specific epigenetic marks on chromatin that help to define its function. Dr. Stanton’s particular focus is on how these processes function normally in the nucleus, and how they function abnormally during cancer development, including in leukemia and sarcoma.
**CENTER FOR CLINICAL AND TRANSLATIONAL RESEARCH**

The Center for Clinical and Translational Research in the Abigail Wexner Research Institute at Nationwide Children’s Hospital is committed to improving the diagnosis, treatment and outcomes of society’s most important pediatric diseases by integrating high-caliber basic science research with innovative patient-centered care.

**FACULTY**

Rajan K. Thakkar, MD
Eric A. Sribnick, MD, PhD
John David Spencer, MD
Lance M. Relland, MD, PhD
Jennifer A. Muszynski, MD
Bryce A. Kerlin, MD
Mark W. Hall, MD, FAAP, FCCM
Mitchell H. Grayson, MD
Christina B. Ching, MD
Andrea E. Bonny, MD
Shipra Agrawal, PhD
Director
William E. Smoyer, MD, FASN

**FACULTY**

**SELECTED PUBLICATIONS**

Chung M, Sperling JS, Sperling S, Zemeloff S, Sibley WA, Martin CR, Steadly K, Sperling RS, Murphy MP, Hall MW.

**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 engineered therapeutics 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 Drug and Device Development Services, and the Nationwide Children’s Good Manufacturing Practice Clinical Manufacturing Facility. This integrated approach allows us to accelerate the transfer of promising therapies from the bench to the bedside.

**FACULTY**

Kevin M. Flanigan, MD

**DIRECTOR**

**PRINCIPAL INVESTIGATORS**

Scott Harper, PhD
Linda Lowes, PhD
Paul Martin, PhD
Jerry R. Mendell, MD
Katrin Meyer, MD
Zarife Sahenk, MD
Megan Waldrop, MD
Nicolas Wein, MD

**ASSOCIATE FACULTY**

Kim McBride, MD
Christopher Walker, PhD

**SUPPORT STAFF**

**Kathleen Church, Project Manager**

Tahatuka Simmons, PhD, Project Manager

The Center for Gene Therapy has once again had a highly productive year. Collaborative interactions among faculty continued to grow, facilitated by the NIH/NIAMSS P50-funded Center of Research Translation in Muscular Dystrophy Therapeutic Development, which focuses on rapidly moving innovative therapies toward the clinic. This year was marked by a particularly gratifying event: the approval by the FDA of a Nationwide Children’s-developed adenosine-associated virus (AAV) gene therapy for the devastating disorder spinal muscular atrophy type 1. The landmark paper reporting the results of the trial, conducted by the team led by Jerry Mendell, MD, was published in the New England Journal of Medicine in November 2017, and the vector received FDA approval for widespread use in May 2019.

Several other clinical trials using AAV are underway, including a trial in Duchenne muscular dystrophy (DMD) patients using a miniaturized version of the gene encoding partial functional version of the missing protein (a microdystrophin gene). An alternate approach to DMD is to deliver a surrogate gene that can substitute for dystrophin function. One such gene, for which a clinical trial is underway, is the GALGT2 gene. The lab of Paul Martin, PhD, showed that systemic delivery of GALGT2 is protective of the heart. Other ongoing trials include a novel dual-viral vector approach in limb-girdle muscular dystrophy type 2B (LGMD2B) subjects and gene transfer of gamma-sarcoglycan for LGMD type 2D. Planning is underway for a trial of viral-based exon skipping in patients with duplications of exon 2 within DMD, with an expected outcome of full-length dystrophin expression.

Other AAV therapy trials include systemic delivery of the missing gene in each of two forms of Sanfilippo syndrome – SGSH in mucopolysaccharidosis (MPS) type IIA, and Naglu with MPS type IIIB – with evidence of biological effects and a promising safety profile, and intrathecal delivery of the CLN3 or CLN6 genes for the devastating disorder spinal muscular atrophy type 1.

One highlight of the center’s basic science efforts was the description of a novel mouse model of facioscapulohumeral muscular dystrophy (FSHD), one of several animal models that provide important insights into the pathophysiology of bladder dysfunction in urinary tract obstruction, burn injury, abdominal sepsis, hepatic fibrosis, adolescent addiction and interventions for traumatic brain injury, mechanisms behind viral infection and allergic disease, spinal cord injuries, neonatal pain assessments and how inadequate pain control may have detrimental effects on immune function.

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 our care for the next child will be improved.

Clinical Research Services is a core service provided within the Center for Clinical and Translational Research and is designed to be a portal through which clinical investigators can access streamlined coordination of services necessary to initiate clinical research projects, regardless of the funding source. Clinical Research Services supports all clinical research studies, providing staff and/or services to manage investigators’ studies according to good clinical practice and federal, state and institutional regulations and guidelines.

**GRANTS AWARDED**

**JULY 1, 2019 – JUNE 30, 2019**

|$3,369,076|

**SELECTED PUBLICATIONS**

Chung M, Sperling JS, Sperling S, Zemeloff S, Sibley WA, Martin CR, Steadly K, Sperling RS, Murphy MP, Hall MW.

**FACULTY**

**SELECTED PUBLICATIONS**

FACULTY
the most common forms of muscular dystrophy, which is caused by a unique and complex molecular mechanism. This year the laboratory of Scott Harper, PhD, described a new mouse model that should become the standard for research into the disease, and uses this model to work on promising therapies for FSHD.

Neurology: See page 105 for related information about the Section of Neurology at Nationwide Children’s.

GRANTS AWARDED TO CENTER FOR GENE THERAPY AND NEUROLOGY CLINICAL AND RESEARCH FACULTY JULY 1, 2018 – JUNE 30, 2019

SELECTED PUBLICATIONS

Project. Long-Range Genomic Regulators of THBS1 and LTBP4 Modify Disease Severity

Weiss RB, Vieland VJ, Dunn DM, Kaminoh Y, Flanigan KM; United Dystrophinopathy [Epub 2019 Apr 19]


2019

SMA Type 1 Receiving Single-Dose Gene Replacement Therapy.

Mendell J.

Alfano LN, Arnold WD, Shell R, Prior TW, McColly M, Lehman KJ, Church Lowes LP, JCI Insight.


The Center for Injury Research and Policy located in the Abigail Wexner Research Institute at Nationwide Children’s Hospital works globally to reduce injury-related pediatric death and disability. Established in 1999, the center serves as a pioneer by translating cutting-edge injury research into education, advocacy and advances in clinical care. From design changes in consumer products to new public policy, the Center for Injury Research and Policy’s influence is leading the way to a safer world.

FACULTY

Gary A. Smith, MD, DPh

Director

Julie C. Leonard, MD, MPh

Lara B. McKenzie, PhD, MA

Henry Xiang, MD, MPH, PhD

Jinghua (Ginger) Yang, PhD, MPH

Motao Zhu, MD, MS, PhD

The Center for Injury Research and Policy works from local to global levels to reduce death and disability due to injuries through research, education, advocacy and advances in clinical care. The center aims to improve the scientific understanding of the epidemiology, prevention, acute treatment, rehabilitation and biomechanics of injuries. It provides leadership in the development, implementation and scientific evaluation of public policy regarding control of injuries.

The center has been awarded designation as an Injury Control Research Center (ICRC) by the Centers for Disease Control and Prevention since 2008. This designation was renewed through 2024. ICRC has one of only 9 centers nationally with this designation, and 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, 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® 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 60,000 times since early 2015.

GRANTS AWARDED JULY 1, 2018 – JUNE 30, 2019 $3,556,477

SELECTED PUBLICATIONS


Research Institute Reports

The Center for Injury Research and Policy located in the Abigail Wexner Research Institute at Nationwide Children’s Hospital works globally to reduce injury-related pediatric death and disability. Established in 1999, the center serves as a pioneer by translating cutting-edge injury research into education, advocacy and advances in clinical care. From design changes in consumer products to new public policy, the Center for Injury Research and Policy’s influence is leading the way to a safer world.

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Henry Xiang, MD, MPH, PhD

Jinghua (Ginger) Yang, PhD, MPH

Motao Zhu, MD, MS, PhD

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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 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 in less than two 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 60,000 times since early 2015.

GRANTS AWARDED JULY 1, 2018 – JUNE 30, 2019 $3,556,477

SELECTED PUBLICATIONS


The mission of the Center for Innovation in Pediatric Practice in the Abigail Wexner Research Institute at Nationwide Children's Hospital is to improve the health of children and their families through research on novel methods for delivering health services in the community. These methods include new computer and information technologies, as well as new statistical, therapeutic and communication techniques.

In 2018, the Center for Innovation in Pediatric Practice celebrated its founding director, Kelly J. Kelleher, MD, MPH, as he transitioned out of center leadership to focus on novel methods for delivering health services in the community. These methods include new computer and information technologies, as well as new statistical, therapeutic and communication techniques. As director, Dr. Kelleher oversaw the center’s comprehensive program to increase sickle cell trait knowledge and awareness among parents of infants identified by newborn screening (Craig, NHLBB R33). Additionally, Dr. Chisolm joined the faculty of The Ohio State University main campus and around the state in the $65.9 million Optimizing HEALing in Ohio Communities award (NIMH U54) designed to significantly reduce statewide opioid mortality.

High impact publications explored changes in adolescent suicide rates in the wake of the “13 Reasons Why” Netflix series (Bridge, J Am Acad Child Adolesc Psychoph). As an approach to healing “sick” neighborhoods (Kelleher, Pediatr), and novel approaches to patient activation (Minneci, GRANTS AWARED)

**SELECTED PUBLICATIONS**


**Research Institute Reports**

**CENTER FOR PERINATAL RESEARCH**

The Center for Perinatal Research in the Abigail Wexner Research Institute at Nationwide Children’s 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.

**FACULTY**

**Lynette K. Rogers, PhD**
*Interim Director*

Carl H. Backes, MD
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Rodney Britt, PhD
Bernadette Chom, MD
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Jennifer K. Trittman, MD, MPH

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 (Nelin, Chen, Trittman) and asthma (Britt), infection and inflammation (Liu), use of stem cell therapy in diagnosing and treating neuro-developmental disorders (Hosler) and cystic fibrosis (Reynolds), and GI disorders such as necrotizing enterocolitis (Besser, Talavera). Our diverse clinical research delves into prematurity prevention and maternal health (Klíbanoff), infant feeding disorders (Jadhav), infectious diseases (Sanchez), comparative effectiveness in pharmacoeconomics (Slaughter), cardiopulmonary deficiencies (Backes), and development of novel treatments of approaches for improving outcomes in infants with neurological disorders or injuries (Mairé, Neal, Benninger). The center also is home to one of the sites 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 highest risk newborns. In addition, our accomplished investigators have filed multiple patents for devices to improve infant outcomes.

**Neonatology** See page 95 for information about Neonatology, home to one of the largest networks of clinical neonatal care in the United States.

**GRANTS AWARDED TO NEONATOLOGY**

**CLINICAL AND RESEARCH FACULTY**

**JULY 1, 2018 – JUNE 30, 2019**

$6,540,917

**SELECTED PUBLICATIONS**


**SELECTED PUBLICATIONS**


Research Institute Reports

CENTER FOR REGENERATIVE MEDICINE

The Center for Regenerative Medicine in the Abigail Wexner Research Institute at Nationwide Children’s Hospital applies the principles of engineering, computer modeling and life sciences to develop biological substitutes to restore or improve tissue function. Regenerative medicine is the process of creating living, functional tissues to repair or replace tissue or organ functions, lost primarily due to congenital defects or disease. The center currently focuses on producing blood vessels, valvular patches and heart valves, offering a positive impact on children with congenital heart disease. Other areas of regenerative medicine research in progress include intestinal and tracheal replacement.

FACULTY

Christopher K. Breuer, MD

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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. The Center for Regenerative Medicine has the ability to turn promising laboratory discoveries into proven treatments and make them available to patients.

GRANTS AWARDED

JULY 1, 2018 – JUNE 30, 2019

$6,879,122

SELECTED PUBLICATIONS


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 leading to a new generation of safe, protective vaccines against infection, cancer and allergy.

FACULTY

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Nine investigators in the Center for Vaccines and Immunity study viral diseases of childhood. The respiratory syncytial virus (RSV) is the leading cause of hospitalization for young children. Over the past year, a team of center investigators (Meja, Rinaldo, Pepples) made notable advances in RSV vaccine design and our understanding of factors contributing to the severity of airway disease. A group of center researchers (Feng, Kapoor, Honeymeg, and Walker) study hepatitis virus infections. The hepatitis C virus (HCV) that causes a persistent life-long infection is of particular concern as it is transmitted to children from mothers at birth, and by injection drug use during adolescence. Dr. Kapoor made significant progress towards a small animal model of HCV infection. This model will almost certainly facilitate studies of protective immunity against HCV and how it can be reproduced by vaccination. Of note, Dr. Feng who studies hepatitis virus infection was awarded the prestigious Ann Palmberg Young Investigator Prize by the American Society for Virology for his significant contributions to the field of virology and exceptional future promise. Cytomegalovirus (CMV) is a leading cause of hearing loss in very young children and also a significant medical problem in those with compromised immunity. Dr. Shimamura studies rejection of transplanted kidneys caused by CMV infection. Her research provides insight into immune responses that contribute to rejection of transplanted kidneys in CMV infected patients with compromised immunity. Finally, the Center welcomed its newest faculty member this year, Dr. Xu moved from the University of Texas Southwestern Medical Center. He brings a wealth of experience in bioinformatic analysis of how human genes respond to virus infection, and their role in providing immunity and protecting against severe disease.

Infectious Diseases: See page 89 for information about the Division of Infectious Diseases at Nationwide Children’s.

GRANTS AWARDED

JULY 1, 2018 – JUNE 30, 2019

$6,842,926

SELECTED PUBLICATIONS


STEVE AND CINDY RASMUSSEN INSTITUTE FOR GENOMIC MEDICINE

The Steve and Cindy Rasmussen Institute for Genomic Medicine at Nationwide Children’s Hospital is passionate about improving outcomes for our patients with genetic disorders, cancer and undiagnosed disease. 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. The institute also emphasizes educational opportunities for care providers and all levels of students, encouraging their training as a means to make genome-based results accessible and meaningful to the patients and families we serve.

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In 2018, the Steve and Cindy Rasmussen Institute for Genomic Medicine launched a comprehensive protocol studying the genomes of children with cancer and hematologic disease. With a focus on rare, relapsed or treatment-refractory cancers, we can identify new treatment options, potentially leading to improved outcomes. All pertinent research results are confirmed under CAP/CLIA standards and communicated to our oncology providers to inform patient management, including prognostication, diagnosis and eligibility for targeted therapeutics and clinical trials. To date, we have studied more than 100 pediatric cancer patients on this protocol.

Similarly, when pediatric patients display treatment refractory epilepsy, DNA from the affected brain tissue removed by surgery for curative intent can be evaluated by highly sensitive exome sequencing to detect mosaic genetic variation associated with disease. These results inform diagnosis, treatment and management options. Importantly, these results have dual benefit: They better inform patients and parents about the root cause of the seizures, and they fuel additional research into how these altered genes lead to epilepsy. This is just one example of the virtuous cycle of discovery leading to treatment leading to discovery that fuels advances in our understanding of genetic diseases and their optimal treatment.

In 2018, the institute launched several new programs in genomic medicine, including:

• A microbiome research platform utilizing novel laboratory and computational approaches to assess the role of microbial communities in pediatric disease
• An exploratory program to provide rapid turnaround, whole genome sequencing-based diagnosis of patients in our neonatal intensive care unit who exhibit signs of genetically linked difficulties
• Initial discussions to apply the basic genomic discoveries around autism and psychiatric genetics of bipolar disease and suicidality/depression in families who are being treated in the new Big Lots Behavioral Health Pavilion

For children with rare or undiagnosed diseases, genomic testing often can provide additional resolution of the genetic causes, information relevant to reproductive decisions, and new treatment directions. Since early 2017, the institute has performed clinical exome sequencing to identify alterations in the protein-coding regions (“exons”) of all human genes. This testing has elucidated a genetic diagnosis for greater than one-third of families. For patients in whom this test does not reveal a diagnostic answer, enrollment in the institute’s Rare Disease Genomics Study examines the genome more broadly for genetic clues underlying their disease. Clinical genetic testing was further expanded in 2019 to include Fragile X testing of a genetic locus associated with intellectual disability and developmental delays.

The Big Data nature of genome-based clinical tests and research studies requires state-of-the-art cloud computing and bioinformatics pipelines to rapidly analyze and interpret the billions of data points from each patient’s genome. Our Computational Genomics Group provides accurate and timely analysis of the complex genomic data required to move Nationwide Children’s into the era of
precision medicine. We are advancing the understanding of the molecular underpinnings of genetic disease through the development of novel computational tools and the application of big data technologies. By combining novel laboratory methods, state-of-the-art bioinformatics solutions and machine learning technologies, we are driven to create a future where no child with genetic disease goes undiagnosed and every child with cancer receives optimal treatment based upon their genomic profile.

GRANTS AWARDED
JULY 1, 2018 – JUNE 30, 2019
$1,665,085

SELECTED PUBLICATIONS


GO INTERACTIVE

Visit NationwideChildrens.org/2019-Report for a fully interactive experience based on this publication, including Video Interviews, Patient Stories and Related Features. You can also access practice tools, referral information and training opportunities – including residencies and fellowships – at NationwideChildrens.org/For-Medical-Professionals.

PediatricsNationwide.org is an online publication providing articles on global pediatric issues, clinical programs, professional commentaries and novel research.
Acknowledgements

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