Internationally renowned, UH Rainbow Babies & Children's Hospital is a full-service children's hospital and pediatric academic medical center with experts in 16 medical divisions and 11 surgical specialties who offer nationally ranked care not available at other institutions in the region, including a center dedicated to adolescent and young adult cancer treatment and Northeast Ohio's only single-site provider of advanced maternal fetal medicine and neonatology services. As the primary pediatric affiliate of Case Western Reserve University School of Medicine and the only Level I Pediatric Trauma Center in the region, UH Rainbow Babies & Children's Hospital offers novel therapies, advanced technologies and clinical discoveries to children long before they are available nationwide. Our pediatric specialists – all of whom also serve on the faculty at the School of Medicine – are engaged in today's most advanced clinical research and are widely regarded as the best in the nation – and in some specialties, the best in the world. Learn more at Rainbow.org.

The Department of Pediatrics at Case Western Reserve University School of Medicine is third in the nation in National Institutes of Health funding for pediatric research, securing $30.4 million in 2013.

UH Rainbow Babies & Children's Hospital is ranked one of America's Best Children's Hospitals in eight children's specialties by U.S. News & World Report, including Orthopaedics, Neonatology and Pulmonology. Learn more at Rainbow.org/USNews.

Visit UHhospitals.org/CME for the latest in live, webinar and on-demand Continuing Medical Education events.
The Angie Fowler Adolescent & Young Adult Cancer Institute combines the expertise of pediatric oncologists at UH Rainbow Babies & Children’s Hospital with specialists in medical, surgical and radiation oncology at UH Seidman Cancer Center – a founding member of the Case Comprehensive Cancer Center at Case Western Reserve University School of Medicine, a National Cancer Institute-designated Comprehensive Cancer Center – to eliminate barriers to treatment, develop early diagnosis strategies and improve access to lifesaving clinical trials.

The Angie Fowler Institute's outpatient unit opened in spring 2014 to change both the treatment experience and outcomes for adolescents and young adults – ages 15 to 30 – with cancer. Often caught between pediatric and adult oncology, adolescents and young adults face unique challenges – their cancers, treatments and social needs are very different from young children and older adults.

The Angie Fowler Institute promotes early diagnosis and offers nurse navigator services, survivorship programs and supportive services that address fertility preservation, isolation, lack of insurance and other issues that impact this age group. Age-appropriate facilities provide a comfort zone that includes a workout space, a rooftop respite garden and digital technology.

Robin Norris, MD, Director of the Center for Developmental Therapeutics at the Angie Fowler Institute, and Assistant Professor of Pediatrics at the School of Medicine, said the family-centered care model combines the resources of the pediatric and adult cancer centers to provide access to the best individualized treatment plans depending on each patient's specific needs. A major initiative is just raising awareness of access to clinical trials.

"We know that, nationally, patients who are under age 15 have about 60 percent enrollment in clinical trials. Among ages 15 to 19, the participation level drops to 15 percent. In 20-year-olds, the participation level drops to 2 percent," Dr. Norris said. "The pediatric and adult oncologists at our center decide together the best course of therapy and allow the patients access to clinical trials. This furthers science and, ultimately, improves outcomes."

CLINICAL RESEARCH
A team focus on translational research is bringing new therapies, drugs and medical devices to pediatric cancer patients to change the way cancer is treated. These clinical initiatives are tied to a strong, federally funded, preclinical development program that is supported by numerous NIH grants through the School of Medicine, currently providing more than $7 million.

According to Dr. Norris, the long-term goal is to translate basic science into tumor vaccines and immunotherapeutic clinical trials, with a focus on pediatric sarcomas and other solid tumors.

All National Institutes of Health (NIH) funding for basic and clinical research is awarded to the School of Medicine at Case Western Reserve University.
CLINICAL ADVANCES

PULMONOLOGY: Amy Marie DiMarino, DO, a pediatric pulmonologist in the Division of Pulmonology, Allergy and Immunology, and Assistant Professor of Pediatrics at Case Western Reserve University School of Medicine, and James Hill, MD, FAAP, FACC, an interventional pediatric cardiologist in the Division of Pediatric Cardiology and Assistant Professor of Pediatrics at the School of Medicine, are leading UH Rainbow Babies & Children’s Hospital’s implementation of the multispecialty Pulmonary Hypertension Clinic that optimizes the management of pediatric pulmonary hypertension patients through a pediatric pulmonologist and cardiologist. The primary goal of this pediatric-specific program is to improve a child’s quality of life by focusing on early detection and treatment, including oral, intravenous and inhaled therapies. The clinic was established to coordinate management and diagnosis of pediatric pulmonary hypertension patients to prevent the need for lung transplantation.

NEONATOLOGY: Hypothermia therapy is the most promising treatment available for infants born with birth asphyxia. The goal of treatment is to minimize brain damage by inducing mild hypothermia within the first six hours of birth and continuing for three days. Birth asphyxia is a serious global problem and causes nearly one million newborn deaths worldwide. Hypothermia therapy is not widely available due to lack of a low-cost and effective hypothermia device. Sreekanth Viswanathan, MD, a neonatologist at UH Rainbow Babies & Children’s Hospital and Assistant Professor of Pediatrics at the School of Medicine, and members of the Department of Biomedical Engineering at Case Western Reserve University, are leading efforts to design a portable cooling unit for treating hypoxic neonates. The unit aims to use low-cost technology to quickly and accurately cool the body surface using AC/DC power. The unit aims to adjust the temperature of a platform on which an infant lies to receive hypothermic therapy. The temperature of the cooling pad is adjusted through monitoring of an infant’s core temperature. The portable unit eliminates the drawbacks of the current system by reducing costs, maintaining a constant temperature and eliminating the need for a water source.

CRITICAL CARE: Philip Toltzis, MD, a critical care specialist at UH Rainbow Babies & Children’s Hospital, and Professor of Pediatrics at Case Western Reserve University School of Medicine, led UH Rainbow Babies & Children’s Hospital’s site participation in a statewide collaborative among eight pediatric hospitals in Ohio to reduce surgical site infections (SSI). Using measures tested in adult patients, the Ohio Children’s Hospitals Solutions for Patient Safety (OCHSPS) collaborative used Model for Improvement techniques to develop an SSI bundle for selected cardiac, orthopaedic and neurologic operations that included the avoidance of razors for site preparation, the use of chlorhexidine-alcohol for incisional site disinfection and appropriate timing of preoperative prophylactic antibiotics. The program resulted in a dramatic, sustained reduction in SSI incidents of around 65 percent in children across Ohio – including a similar reduction specifically at UH Rainbow Babies & Children’s Hospital.

CARDIOLOGY: Dr. James Hill has initiated the Hearts at HOME (High-risk Outpatient Monitoring and Education) program with Nurse Practitioners Jodi Zalewski, CPNP, and Kathryn Wheller, CPNP, for infants with hypoplastic left heart syndrome, who are at the highest risk for mortality during their first six months. The program provides families with scales and pulse oximeters for daily monitoring of infants’ weight and blood oxygen levels, along with extensive education, weekly calls and clinic visits, and 24/7 mobile phone access to Hearts at HOME specialists. To date, patients in the program have shown increased oxygen levels and improved growth. Dr. Hill is working on a Hearts at HOME mobile app that will facilitate medical care, communications and visual examination of patients via live video.

CONNECT: Contact any of the pediatric specialists featured in this publication via email at Peds.Innovations@UHhospitals.org.
All National Institutes of Health (NIH) funding for basic and clinical research is awarded to the School of Medicine at Case Western Reserve University.

IMPROVED NICU OUTCOMES LEAD TO RENEWED INTEREST IN LUNG INJURIES IN PREMATURE INFANTS

Richard J. Martin, MD, Drusinsky-Fanaroff Chair in Neonatology at UH Rainbow Babies & Children’s Hospital, and Professor of Pediatrics at the School of Medicine, is leading groundbreaking research in developmental respiratory neurobiology as it pertains to the control of breathing and airways in premature infants.

Respiratory instability and the need to stabilize oxygenation are significant clinical problems. Underdevelopment of the lungs and the resulting lung injuries, along with this respiratory instability, lead to frequent episodes of profound and recurrent hypoxemia.

Dr. Martin’s discoveries in respiratory control during development have contributed greatly to the understanding of what regulates breathing during early development. A major focus of his efforts is to gain greater understanding of the consequences of these hypoxic episodes.

Another major problem faced by premature infants is a very high incidence of wheezing disorders, or asthma. There is a growing need to understand the epidemiology and pathogenesis of asthma that persists in the preterm survivors of neonatal intensive care.

Dr. Martin’s studies are using newborn animal models to unravel some of the mechanisms of how airway injuries occur, opening the door for future therapies.

Michael W. Konstan, MD, Chair of the Department of Pediatrics at UH Case Medical Center and Case Western Reserve University School of Medicine, Austin Ricci Chair in Pediatric Pulmonary Care and Research at UH Rainbow Babies & Children’s Hospital, and Gertrude Lee Chandler Tucker Professor at the School of Medicine, was the lead investigator on a Phase III international study of an investigational new drug in treating patients with nonsense mutation cystic fibrosis (nmCF), one of the most severe forms of CF. Current treatments focus on alleviating symptoms and reducing infections, while ataluren – a protein restoration therapy – targets the underlying cause of disease. Promising results from this study support further clinical testing of ataluren as a potential first-in-class treatment for nmCF patients.

Raymond Liu, MD, a pediatric orthopaedic surgeon at UH Rainbow Babies & Children’s Hospital, and Assistant Professor of Orthopaedics and Pediatrics at the School of Medicine, is investigating guided growth for limb deformity correction, a new field of orthopaedic practice that uses a plate the size of a paper clip to encourage gradual correction of a deformity.

Faruk H. Örge, MD, William R. and Margaret E. Althans Chair in Pediatric Ophthalmology & Adult Strabismus, UH Eye Institute and UH Rainbow Babies & Children’s Hospital; and Associate Professor of Ophthalmology & Visual Sciences and Pediatrics at the School of Medicine, is the principal investigator of a study incorporating a NASA-developed device that measures blood flow and tissue oxygenation as a screening tool for retinopathy of prematurity (ROP). Scanning laser flowmetry offers a gentler way of screening and potentially revolutionizes the screening process.

Carol L. Rosen, MD, J.S. Rube Endowed Chair in Pediatric Sleep Medicine; Medical Director of the Pediatric Sleep Center at UH Rainbow Babies & Children’s Hospital; and Professor of Pediatrics at the School of Medicine, was the lead author of a multicenter study that found children with sickle cell anemia are more likely to suffer from obstructive sleep apnea syndrome than otherwise healthy children. The paper was one of several manuscripts to come out of the National Institutes of Health-sponsored Sleep and Asthma Cohort study, a longitudinal cohort study of children with sickle cell anemia.

The commitment to exceptional patient care begins with revolutionary discovery. University Hospitals Case Medical Center is the primary affiliate of Case Western Reserve University School of Medicine, a national leader in medical research and education and consistently ranked among the top research medical schools in the country by U.S. News & World Report. Through their faculty appointments at Case Western Reserve University School of Medicine, physicians at UH Case Medical Center are advancing medical care through innovative research and discovery that bring the latest treatment options to patients.
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