

THE MOST ADVANCED NEONATOLOGY CARE IN THE REGION

CHILDREN'S MERCY KANSAS CITY PEDIATRIC NEONATOLOGY

With more than 30 neonatologists, the Division of Neonatology at Children's Mercy Kansas City provides the latest treatment options for children facing chronic lung disease, birth defects or complications of prematurity. The division provides advanced treatments like ECMO and therapeutic whole-body cooling that only leading programs can offer.

Children's Mercy has the only Level IV NICU between St. Louis and Denver, and offers nationally honored neonatal transport and care for babies from across the Midwest. Combined with the hospital's Elizabeth J. Ferrell Fetal Health Center, Children's Mercy offers the region's most advanced care before, during and after delivery for the most critically ill babies.

In addition, the hospital's expertise is extended to other hospitals in the region. Children's Mercy provides care for newborns in need of intensive care across the Kansas City metropolitan area by staffing their NICUs with neonatologists and neonatal nurse practitioners.

Designated as a Level IV NICU by the American Academy of Pediatrics.



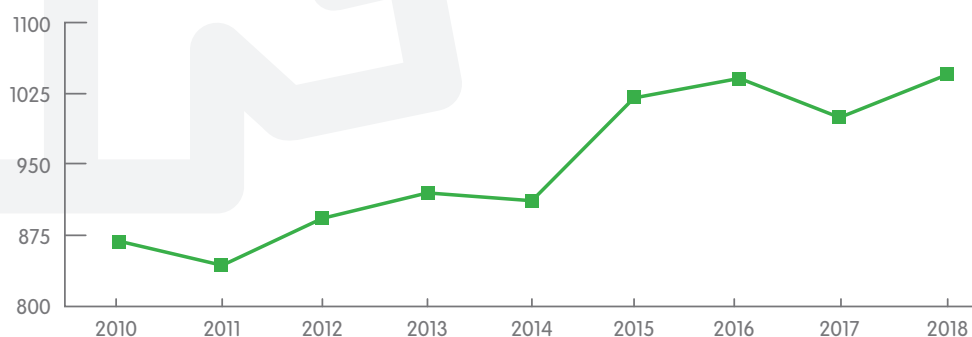
TOP-RANKED PROGRAM

Recognized as one of the top neonatology programs in the nation by *U.S. News & World Report*.

NICU BY THE NUMBERS

- 77.87% of infants discharged on partial or full mother's breast milk
- NICU CLABSI 0.5/1000 line days
- Unintended extubations: 1.24 per 100 vent days

NUMBER OF NICU ADMISSIONS PER YEAR



ADVANCING NEONATAL RESEARCH AND OUTCOMES

Children's Mercy is at the forefront of research and innovation. It improves outcomes for critically ill newborns through its Center for Infant Pulmonary Disorders, the Donald W. Thibeault Neonatal Lung and Immunology Laboratories and partnership with the hospital's Center for Pediatric Genomic Medicine.

The Center for Infant Pulmonary Disorders (CIPD) exists to reduce pain and improve the quality of life for preterm and full-term infants who are born with or develop pulmonary disorders. The center focuses on translational early-phase and pivotal clinical trials, as well as post-clinical trial surveillance, in our multifaceted approach to addressing this medical and public health problem.

The Donald W. Thibeault Neonatal Lung and Immunology Laboratories conducts studies into various aspects of neonatal lung disease and bowel disease.



Researchers at Children's Mercy are leading an ongoing study of the immunogenetic basis of NEC in preterm babies.

TRANSLATING RESEARCH FROM BENCH TO BEDSIDE

Necrotizing enterocolitis (NEC) is a devastating inflammatory disease of the intestinal tract that affects approximately 10 percent of preterm babies born at less than 32 weeks or weighing less than 1.5 kilograms. Researchers at Children's Mercy are leading an ongoing study of the immunogenetic basis of NEC in preterm babies. The research team's understanding of how genetic variation contributes to NEC is growing. This work is offering important new insights into the pathogenesis of NEC and creating the potential for more targeted care of infants with inherent susceptibility – including treatment to help them avoid the disease altogether. Venkatesh

Sampath, MBBS, Medical Director of the Donald W. Thibeault Lung and Immunology Laboratories at Children's Mercy Kansas City, published the first of only two articles on the genomics of NEC. International interest in study findings has led to multiple presentations.

19% of our neonates require intensive medical therapies at home.

CHILDREN'S MERCY FINDS LINK BETWEEN CRHR1 AND STEROID RESPONSE IN BPD

Bronchopulmonary dysplasia (BPD) is a frequent complication of extreme prematurity. With increasing survival of the most immature infants, rates of BPD are increasing. A common medication for BPD is systemic corticosteroids, but clinical response in preterm babies is highly variable. Tamorah Lewis, MD, PhD, neonatologist at Children's Mercy Kansas City, led a study¹ to better understand genetic variants within babies' DNA that can predict which babies will respond favorably to treatment.

The retrospective cohort study was performed using prior-collected data from a large number of infants enrolled in a multisite randomized controlled trial.^{2,3} Through its work, the team identified a genetic variant, a SNP in a gene called *CRHR1*, that was associated with systemic steroid response in preterm infants. The team concluded that genetic variability in *CRHR1* is associated with corticosteroid responsiveness in preterm infants with evolving BPD. The next step is to validate the findings in a larger cohort of babies.

ADVANCED CLINICAL PROGRAMMING IMPROVES OUTCOMES FOR PREMIES

NEONATOLOGY CREATES A MEDICAL HOME FOR BABIES ON LONG-TERM BREATHING SUPPORT

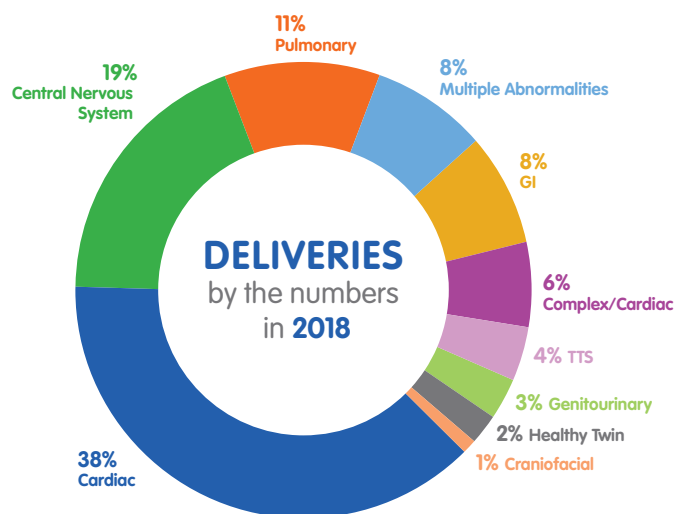
To improve the level of care provided to premature babies who require long-term breathing support, Children's Mercy developed the Infant Tracheostomy and Home Ventilator Program in 2005. Led by Winston

Manimtim, MD, neonatologist and Medical Director for the program, it offers babies the opportunity to be sent home at 6 or 7 months old – much earlier than ever before. These babies tend to thrive in their home environment while still receiving complex medical care from Children’s Mercy.

This program is the only one in the U.S. where neonatologists serve as both primary care provider and intensivist for each tracheostomy and home ventilator patient. After patients are discharged to home, the Children’s Mercy cohort survival rate is approximately 95 percent. This is slightly higher than the 90 percent national average.

FETAL HEALTH BY THE NUMBERS

- More than 2,300 integrated consults*
- More than 1,050 deliveries in the Fetal Health Center*
- 77 fetal interventions in 2018 (including 11 myelomeningocele repairs)



* Data from 2011-2018

ELIZABETH J. FERRELL FETAL HEALTH CENTER

The Fetal Health Center provides state-of-the-art care to offer a broad range of highly advanced prenatal services to assist with diagnosis, family counseling and treatment for congenital defects.

The center includes a fetal surgery team providing advanced techniques in the antenatal treatment of certain congenital anomalies and complications of pregnancy. These procedures are performed on the developing fetus during pregnancy, in utero, to treat disabling and life-threatening birth defects and promote prolongation of pregnancy with the intention of better outcomes for the baby and family. The Fetal Health Center offers minimally invasive procedures as well as open-uterus fetal surgery.

The Elizabeth J. Ferrell Fetal Health Center at Children’s Mercy has delivered more than 1,000 high-risk babies, with more than one-third having complex heart disease.

CHILDREN’S RESEARCH INSTITUTE

The Children’s Research Institute (CRI) at Children’s Mercy Kansas City is an integrated research environment where no boundaries exist between science and medicine. Here physicians, scientists, academic colleagues and philanthropic partners are collaborating to change the future for children. Research areas include genomics, precision therapeutics, immunotherapy and health outcomes, among many others. To enhance its research endeavors, a new building, future home to the CRI, is under construction. This building has been carefully designed so research and clinical care work as cross-functional teams, aligned together, to find answers to pediatric medicine’s most challenging questions.

SOURCES

¹ Genetic Variation in *CRHR1* is Associated with Short-Term Respiratory Response to Corticosteroids in Preterm Infants at Risk for Bronchopulmonary Dysplasia. Lewis T, Truog W, Norberg M, Ballard PL, Torgerson D. *Pediatric Research* (November 2018); <https://doi.org/10.1038/s41390-018-0235-1>.

² Randomized Trial of Late Surfactant Treatment in Ventilated Preterm Infants Receiving Inhaled Nitric Oxide. Ballard RA, Keller RL, Black DM, et al. *Journal of Pediatrics*; 168:23-29 e24 (2016).

³ The Randomized, Controlled Trial of Late Surfactant: Effects on Respiratory Outcomes at 1-Year Corrected Age. Keller RL, Eichenwald EC, Hibbs AM, et al. *Journal of Pediatrics*; 183:19-25 e12 (2017).

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