

NEONATOLOGY

**FOCUSED ON LONG-TERM
OUTCOMES IN NEONATAL-
PERINATAL MEDICINE**

children'shealth?
Children's Medical Center

UTSouthwestern
Pediatric Group

Specialty care provided by UT Southwestern physicians

BUILDING ON A LEGACY, LEANING INTO THE FUTURE

MISSION

Since 1913, the mission of Children's HealthSM has been to make life better for children. Our unique skills and expertise, combined with leading-edge techniques and technology, allow us to provide award-winning neonatal and perinatal care to children in Texas and beyond.

These attributes, along with our dedication to research, patient care and medical education, have allowed us to achieve our vision of making Children's Health among the very best medical centers, ranking in all 10 pediatric specialties by *U.S. News & World Report*.

In fact, as the eighth-largest pediatric health care provider in the nation, we saw nearly 300,000 children in 2019 alone with nearly 800 NICU admissions and 200 fetal consults. There is just no better affirmation of our mission than seeing healthy patients leave the hospital.

ACADEMIC AFFILIATION

Our success is the result of a close collaboration with UT Southwestern. In addition to extending our academic mission of training the next generation of physicians, this one-of-a-kind relationship affords patients access to world-renowned expertise in every aspect of fetal and neonatal care. With leading research, high-quality care and life-saving treatment options like the EXIT surgery and ECMO, we offer a full continuum of care from fetus to five years of age and beyond.

DEAR COLLEAGUES,

Even after more than 30 years as a neonatologist, I still find a baby's in utero development, birth and growth awe-inspiring. My colleagues and I work collaboratively with specialists, subspecialists, advanced practice providers, nurses, respiratory therapists and many other disciplines to give every baby the very best start in life. That commitment is what inspired me to come to Children's HealthSM and UT Southwestern more than 15 years ago with the vision of building the world's most comprehensive, technologically advanced and highest-quality Neonatal-Perinatal Medicine program.

We've made tremendous progress. We built a Level IV NICU, now with 47 beds, that serves more than 750 fragile newborns each year. We offer a comprehensive Fetal Center that provides antenatal consultation with access to over 50 specialties and subspecialties. We pioneered a TeleNICU program, the first in Texas, that connects physicians in our program with nine partner sites. Originally founded by Liz Heyne, PA-C, Psy.D., and directed by her husband Roy Heyne, M.D., we expanded the Thrive Program (formerly the Low Birth Weight Clinic) that offers families of NICU graduates a primary home for comprehensive care, as well as neurodevelopmental follow-up until age 5. Altogether, our program touches more than 2,000 lives each year with outstanding outcomes.

Therefore, our Neonatal-Perinatal Medicine program delivers comprehensive care from fetus to age 5 and focuses on achieving excellence in clinical care, advancing new discoveries and training the next generation of expert neonatologists. We are committed to saving lives for lifetimes and working to raise the bar even higher by:

- Launching one of the nation's first TeleTransport programs, where every neonatal transport will be equipped with telehealth tools. This will enable neonatologists to evaluate babies from afar, so we can guide the transport team on which immediate treatments to deliver en route.
- Equipping our transports with active and monitored whole-body cooling.
- Building the infrastructure for a fetal intervention program that will ensure babies have access to the most advanced prenatal care and interventions, all under one roof.

Our commitment to excellence and innovation, combined with outstanding outcomes, helps explain why families from across our region turn to us for care – and why *U.S. News & World Report* continues to rank our neonatology program among the best in the country. I invite you to learn more about our program and to contact me anytime to collaborate with our team.

Rashmin Savani, MBChB

*Division Chief, Neonatal-Perinatal Medicine at Children's Health
Professor, UT Southwestern*



Rashmin Savani, MBChB, welcomes NICU graduates and their families to the annual NICU Reunion. In 2020, the team held the event virtually to accommodate COVID-19 precautions.



POWERFUL OUTCOMES

- **RANKED ONE OF THE TOP 20**
BY *U.S. NEWS & WORLD REPORT*
- **CALLING DALLAS, TEXAS, HOME SINCE 2007**

Driving breakthroughs
across **4** distinct programs

- FETAL Center/TeleFETAL/Fetal Heart
- Level IV NICU
- TeleNICU/TeleTransport/TeleCooling
- Thrive Program

31 neonatologists, leading **6**
disease-specific teams

- Bronchopulmonary Dysplasia & Pulmonary Artery Hypertension
- ECMO
- Congenital Diaphragmatic Hernia
- Intestinal Failure and Rehabilitation
- Neonatal Resuscitation
- Transition-to-Home Program

**GAME-CHANGING
RESEARCH**



**80+ ONGOING
STUDIES**



**50+ SUB-
SPECIALTIES**



NICU parents and their babies are surrounded and supported by ancillary services such as case managers, child life specialists, speech language therapists, lactation consultants, chaplains and psychologists.

CLOSING PDA IN PREMATURE INFANTS – WITHOUT SURGERY.

Born at just 26 weeks, baby Austen faced health challenges from the start, including pulmonary hypertension, E. coli, sepsis, cleft lip and palate, and an eventual genetic diagnosis of trisomy 9p.

After being transferred to the Level IV NICU at Children's Health in Dallas, Austen faced one significant challenge – her ductus arteriosus hadn't closed properly.

"The ability to access every medical and surgical subspecialty within our hospital system can quickly bring to light complex conditions that require immediate and life-saving treatment," says Dr. Rashmin Savani, Division Chief of Neonatal-Perinatal Medicine at Children's Health and Professor at UT Southwestern.

Austen's medical team, consisting of UT Southwestern physicians who are experts in interventional cardiology, cardiothoracic surgery, radiology and neonatal-perinatal medicine, and her parents decided that a transcatheter patent ductus arteriosus (PDA) closure would give her the best chance for a positive outcome. Transcatheter closure in premature babies is relatively new. Only a few centers in the country, including The Heart Center at Children's Health, offer it for babies as small as two pounds. The smallest premature baby who underwent successful PDA device closure at Children's Health so far weighed about 2 pounds (900 grams).

"New devices have made transcatheter closure an option for extremely small babies," says Surendranath Veeram Reddy, M.D., pediatric cardiologist at Children's Health and Associate Professor at UT Southwestern, who specializes in interventional cardiology. "In the past, these patients would have been sent to the operating room for surgical PDA ligation via the lateral thoracotomy approach. Transcatheter closure is a win for patients because the procedure is less invasive and offers fewer risks and much shorter recovery."



Jamie King, RN, RCIS, Cardiology Cath Lab at Children's Health, and Dr. Suren Reddy, pediatric cardiologist at Children's Health and Associate Professor at UT Southwestern, perform a procedure in the Cardiology Cath Lab.

ONE IN FIVE PREMATURE INFANTS HAVE PDA.

Before birth, the aorta and pulmonary artery are connected by the ductus arteriosus – a channel essential to fetal blood circulation. This duct closes shortly after birth in most infants. But the likelihood of spontaneous closure is less than 15% in extremely low birthweight infants born prior to 24 weeks.

That makes PDA one of the most common heart problems in premature infants. Nearly one in five will have a PDA. They should be evaluated thoroughly to see if they have a hemodynamically significant PDA that is causing them harm or delaying their growth. Left untreated, PDA can cause signs of heart failure and eventually lead to chronic lung disease and pulmonary hypertension.

GOING BEYOND MEDICATION AND SURGERY.

In premature infants, clinically significant PDAs are usually treated with a combination of fluid restriction and diuresis, as well as intravenous indomethacin or ibuprofen. Some preemie babies may need respiratory support with nasal cannula or positive pressure ventilation. Medical therapy is successful for about 50 to 65% of patients. Patients who fail medical therapy were previously referred for surgical ligation.

Both options can have drawbacks. Because of their vasoconstrictive properties, indomethacin and ibuprofen can have serious side effects, including kidney failure, intestinal ischemia and bleeding. Surgical ligation has fallen out of favor because of its risks and long-term side effects, including neurological disability.

Recognizing the need, Dr. Reddy began searching for a transcatheter option for extremely premature infants. He gleaned best practices from the experience of his peers and incorporated those within MVP plug treatment protocols. He started the Preemie Duct Occlusion Program (PDOP) in December 2017.

Dr. Reddy opened the first specialized hybrid catheterization lab/MRI suite in Texas at Children's Health.



Neonatal Division Chief, Dr. Rashmin Savani: "We bring together neonatologists, cardiologists, interventional cardiologists and cardiac surgeons to treat PDA in the least-invasive and most-effective way, so children can grow up healthy and lead their best possible lives."

FASTER, SAFER PDA CLOSURE.

"We currently have two device options for PDA device closure in extremely premature babies," Dr. Reddy says. "We started the program with the microvascular plugs that were used off-label for PDA closures. Following FDA approval in January 2019, we successfully used the Piccolo device for PDA closure in a set of twin brothers. These devices can be advanced through 1- to 2-mm catheters that are well-tolerated by premature babies."

Because these devices are deployed in a minimally invasive procedure, many infants are able to be weaned from artificial respirator support soon after the procedure. The procedure also offers fewer risks and shorter recovery than lateral thoracotomy/duct ligation.

PUSHING THE BOUNDARIES.

So far, we've implanted PDA closure devices in more than 60 premature babies, including Austen. She recovered quickly after the procedure and has been hitting her developmental milestones. As devices and techniques advance, transcatheter closure of PDA could become the first-line treatment for even the most premature infants.

"The devices have made transcatheter closures possible, but it's our team's collaboration that really makes the difference," says Dr. Savani. "We bring together neonatologists, cardiologists, interventional cardiologists and cardiac surgeons to treat PDA in the least invasive and most effective way, so children can grow up healthy and lead their best possible lives."

COORDINATING EXIT PROCEDURES: HOW 30+ PROVIDERS WORK TOGETHER TO HELP MOTHERS AND BABIES THRIVE.

When an expectant mother went in for a prenatal ultrasound at 32 weeks' gestation, a large neck mass was identified to be compressing the baby's trachea. The imaging was referred to the ex-utero intrapartum treatment (EXIT) team at Children's Health that determined that an EXIT procedure addressing the airway obstruction prior to delivery was appropriate.

"An EXIT is a complicated procedure," says Sushmita Yallapragada, M.D., MSc, FAAP, Medical Director of the FETAL Center at Children's Health and Assistant Professor of Pediatrics at UT Southwestern. "The team must simultaneously manage multiple health considerations for the mother and the baby."

MULTIDISCIPLINARY EVALUATION OF EXIT PROCEDURE CANDIDATES.

At Children's Health and Parkland Health, the first step toward a successful EXIT is a multidisciplinary team meeting with 30+ physicians and medical staff, including maternal fetal medicine specialists, surgeons and neonatologists. The team evaluates whether the baby is an appropriate candidate, while weighing medical considerations that might also complicate the mother's well-being or threaten her future fertility.

"The meeting gives everyone a chance to ask questions and offer input," says Patricia Santiago-Muñoz, M.D., a high-risk pregnancy specialist and Associate Professor at UT Southwestern.

Dr. Santiago-Muñoz and Dr. Yallapragada evaluated a case alongside David Schindel, M.D., EXIT Team Director, Fetal Co-Director, pediatric surgeon at Children's Health and Associate Professor at UT Southwestern.

In this case, the mother had safely delivered two previous babies and was otherwise healthy. Despite the airway obstruction, advanced prenatal imaging suggested the fetus' lungs were developing appropriately.

TEAMWORK IS KEY.

An EXIT potentially combines multiple procedures, including intubation, tracheostomy, neck mass resection, chest tube placement, central line placement and thoracotomy, into a single procedure.

"There's a significant amount of equipment and personnel that need to be managed and organized so everything's ready at a moment's notice," Dr. Schindel says. "And the team needs to be prepared to work together seamlessly in a variety of potential situations."

For this EXIT case, Dr. Schindel guided the team through three simulated procedures, during which every team member was in the operating room to rehearse even the smallest details.



Dr. David Schindel prepares for ex-utero intrapartum treatment (EXIT) at Children's Medical Center Dallas, a program he created in 2007.

EXIT PROCEDURE IN UNDER 30 MINUTES.

Early in the morning, the OB anesthesia team placed the mother under general anesthesia. The anesthesiologist had to sedate the mother to relax her uterus. The degree of uterine relaxation had to be enough to prevent the uterus from contracting and prematurely delivering the placenta during the EXIT.

At 7:42 a.m., the team delivered the baby girl's head and shoulders, keeping her lower body within the uterus. The fetus receives oxygenated blood via the umbilical cord using the mother's uteroplacental circulation, which Dr. Schindel refers to as "the world's most efficient heart-lung machine ever devised."

"The baby's neck mass was mobile enough that we could move it off the airway, allowing an endotracheal tube to be passed beyond it," Dr. Schindel says.

After three comprehensive exams, Dr. Santiago-Muñoz clamped the cord and fully delivered the baby at 8:03 a.m.

"Our neonatal resuscitation team stabilized the infant and put in IV lines prior to transferring her to the Children's Health NICU for additional imaging and surgical repair," Dr. Yallapragada says.

A HEALTHY OUTCOME.

The mother's recovery was smooth. The baby's tumor was completely resected 48 hours after birth at Children's Health by Dr. Schindel, and she was home breathing and feeding normally just two weeks later. Pathologists determined the mass to be an immature teratoma.

"For the EXIT to work, every provider needs to be at the top of their game," Dr. Yallapragada says. "Expert imaging, precise coordination from multiple specialists and subspecialists, and supportive care for mom as we prepared for delivery led to a truly successful outcome."



**"THE UMBILICAL CORD/PLACENTA IS THE WORLD'S
MOST EFFICIENT HEART-LUNG MACHINE EVER DEvised."**

—Dr. David Schindel

QUALITY INITIATIVES IMPROVE NICU CARE.

Central line-associated blood stream infections (CLABSIs), unplanned extubations (UEs) and increased opioid use are just some of the many challenges faced by critically ill patients in neonatal ICUs across the country. At the Level IV NICU at Children’s Health Children’s Medical Center Dallas, we are committed to tackling these challenges as we strive to provide the best care for our patients and their families.

We’ve made significant strides in these areas, thanks to a culture that encourages every team member – from nurses to physicians – to ask hard questions and lead the search for answers.

“Quality improvement methodology involves a rigorous, data-driven evaluation of processes that are continually measured, refined and then sustained in an attempt to deliver the best care to our patients. Our quality initiatives have helped us achieve many things, like making our central line infection rates among the best within level IV NICUs across the nation,” says Vedanta Dariya, M.D., neonatologist at Children’s Health and Assistant Professor at UT Southwestern. “We’re eager to share our solutions and collaborate with other centers to make care even better.”

A TEAM APPROACH TO PREVENTING INFECTIONS.

CLABSIs are often at highest risk of occurring at the time of dressing changes. The traditional approach to care of the central line involved the bedside nurse changing the dressing for their own patients. We were part of a large, national trial that showed significantly improved outcomes when a select team of nurses is responsible for the care of all central lines. We were quick to adapt our staffing needs to provide the support needed to meet these recommendations – that’s how our BSI team was born.

Whitney Lewis, BSN, RN, CPN, contributes to ongoing quality improvements as a NICU Nurse Manager.



This team follows a strict two-person process: One nurse performs all tasks that need to be sterile, such as changing caps, while the second nurse does all non-sterile tasks, such as opening the incubator.

“This has been a huge success,” says Lisa Wulz, RN, who manages our neonatal-perinatal quality improvement programs. “Before creating this team, our rate was 1.7 infections per 1,000 line days – and now it’s down to and stays at 0.3.”

PREVENTING UNPLANNED EXTUBATIONS IN THE NICU.

Babies that experience unplanned extubations can have complications such as airway trauma, code events, hypoxia and increased length of stay. These can be especially hard to prevent in small, critically ill neonates. Nationally, NICUs average approximately one UE for every 100 ventilator days. The rate in our NICU is currently around half the national average, thanks to a series of new practices. These include a standardized method of securing our tubes, a rigorously enforced team approach to moving intubated babies and daily discussions of tube position on medical rounds.

“Our rates first started coming down when we standardized the method of securing the endotracheal tubes in all patients,” says Whitney Lewis, BSN, RN, CPN, clinical manager of the NICU. “It solves the problem of having tape come loose because of oral secretions.”

Our team also posts signs to indicate which patients have a higher UE risk, such as babies who weigh under 1,000 grams or those with a history of a previous UE. And whenever a baby is moved, two nurses are assigned to the job — one to move the child and one to manage the tube.

We’ve also taken extra steps to minimize UE risk during kangaroo care.

“Our team fits the parent with a cushioned device that keeps the baby in position, and we provide a handout for parents with instructions such as not using their phones while holding their child,” Whitney says. “Parents having direct contact with their babies is so important, we do everything we can to enable it while protecting their airway and keeping the babies intubated.”

REDUCING OPIOID USE IN THE NICU.

Adequate pain control during painful procedures is beneficial to the developing nervous system of the newborn. However, medical opioid use has increased in NICUs across the country and carries risks for patients. We recently launched a quality improvement initiative to strike the balance between adequate pain control and decreased opioid use for our patients after surgery. As part of this, one of our NICU nurse practitioners developed a clinical algorithm that guides the team through an objectively determined evaluation of pain and strictly monitored pharmacological and non-pharmacological support after minor surgeries.

“With the help of this tool, we have a pain management plan before the baby leaves the operating room,” Whitney says.

“It’s another way we’re standardizing pain management and avoiding opioids unless they’re absolutely necessary,” says Lebanon David, who developed the tool based on practices and results from other children’s hospitals as part of a large national, multi-center initiative through the Children’s Hospitals Neonatal Consortium.



NICU advanced practice manager Marcia Bishop, MS, APRN, NNP-BC, and nurse managers Whitney Lewis, BSN, RN, CPN, and Kymeyone Lanehart, BSN, RN, CPN, created a NICU Solution Board that is now implemented systemwide.

NURSES TAKE THE LEAD.

The essence of quality improvement is not a system that assigns errors to individuals and seeks punitive reform, but one that fosters the engagement of invested, dedicated hard-working health care professionals and identifies how the system can better support staff to provide the highest-quality care to patients.

In addition to a monthly safety meeting strictly for nurses, Lisa leads a monthly meeting that involves leaders from several teams — from social work to speech therapy — to troubleshoot problems and find better ways to work together in the NICU.

“The multidisciplinary approach works for safety just like it does for providing care: We draw on all perspectives to find the best solutions,” says Lisa Mason, DNP, RN, NEA-BC, Senior Director, Fetal Neonatal Program.

Nurses also play a key role in identifying important questions — and in leading the search for answers. We kickstart this process by requiring all first-year nurses to identify a quality improvement project, research potential solutions and propose one to our team.

“This creates an atmosphere where nurses feel empowered to ask hard questions, which is the critical first step toward improving care,” Whitney says.

To solicit ideas more widely, the NICU installed a “solution board” in a hallway. This is a large display onto which anyone — from nurses and providers to clinical techs — can post a comment about something that would improve their work. We have found that even the “smallest suggestion” has the potential to vastly improve workflow, efficiency and satisfaction.

“The solution board does wonders for staff engagement — which leads to higher performance and better care for our patients,” Whitney says.

The Texas Department of State Health Services cited our safety record and commitment to quality when we were recently re-designated with Level IV status. Dr. Dariya says the supportive and solution-oriented culture of the NICU extends from its ties to UT Southwestern.

SPECIALIZED CARE TEAMS.

In close collaboration with UT Southwestern, we are actively involved in large, national studies to better understand and provide optimal care for babies on these specialized care teams:

Extracorporeal membrane oxygenation (ECMO): Children’s Health has been a leader in ECMO for more than 25 years. We have been designated an ECMO Center of Excellence by the Extracorporeal Life Support Organization and are highly experienced in using this technique to help the tiniest babies.

Congenital diaphragmatic hernia (CDH): This complex condition requires a dedicated, multidisciplinary team of highly trained experts that help families and their babies achieve a successful outcome. Our CDH team first meets families in the FETAL Center and offers comprehensive evaluation and imaging; a delivery plan that will enable prompt support and care; and surgery by some of the nation’s top pediatric surgeons, using the latest surgical techniques.

Intestinal failure: Children’s Health offers comprehensive care for intestinal failure via a team that includes neonatologists, surgical specialists and gastroenterologists, along with nutrition support, to provide intestinal adaptation. We see more babies and children with intestinal failure and related disorders than almost any center in North Texas, giving us the experience and expertise to match each patient with the treatment that delivers the best opportunity for a good outcome.

Neonatal resuscitation: Children’s Health and UT Southwestern have specialized resuscitation teams at our partner delivery hospitals. Our practiced and collaborative team attends the birth at partner hospitals, and the team strives to better understand and optimize the resuscitative practices of neonates within Level IV NICUs through the Children’s Hospitals Neonatal Consortium.

The Neonatal team has access to 52 subspecialties and state-of-the-art services such as ECMO on transport for resuscitation and life-saving support.



REACHING BABIES BEFORE THEY REACH THE NICU:

Launching one of the Nation's First Neonatal TeleTransport Programs

When neonates and infants are ill, time is of the essence. That's why Children's Health Children's Medical Center Dallas in collaboration with UT Southwestern recently became one of the nation's first hospitals to launch a neonatal TeleTransport program, enabling our experts to evaluate patients and guide their care, even when they are miles away.

Using TeleTransport, UT Southwestern neonatologists with expertise in Level IV neonatal care can work with the Transport team at the outside hospital to assess the patient and their imaging and test results; speak with the referring doctors and parents; and help optimize the baby's condition before transport. Importantly, the virtual connection continues during transport where the physicians can monitor the patients in real-time and provide minute-by-minute care to keep them as stable as possible.

"TeleTransport allows us to bring Level IV expertise to the patient's bedside at the earliest possible moment," says Dr. Rashmin Savani. "That's going to help more babies survive and thrive, and our experience building the program could be informative to other hospitals who want to create one of their own."

TAILORING TECHNOLOGY FOR THE MOBILE NICU.

Dr. Vedanta Dariya has observed the ever-growing need for technology in NICU care. He recalls one recent case where a critically ill newborn with huge pneumothoraces was being resuscitated at a freestanding ER and then transported to Children's Health.

"I stayed on the phone with the Transport team for about 45 minutes," says Dr. Dariya. "And every one of those minutes I was thinking, 'If I could look at this baby, I wouldn't need to have the transport team telling me what's happening while they're trying to resuscitate the baby.'"

Dr. Rashmin Savani discusses a TeleTransport case after the first successful transfer.



Important hurdles had to be overcome to establish the program. Putting telemedicine on wheels requires light, mobile equipment that doesn't delay transport teams. The technology for both the NICU team and Transport nurses has to be extremely user-friendly. And TeleTransport equipment has to transmit clear video, audio and telemetry data from medical devices without interruption, even as connectivity fluctuates in rural and urban areas and inside hospitals.

To solve these puzzles, the transport team is equipped with a cellular-enabled tablet, routers in ambulances to provide Wi-Fi hotspots and software that is simple and intuitive.

"The platform was designed so that, no matter what needs to be done, the nurses and doctors can get to the solution with the smallest number of clicks," says Eric McKenney, I.S. architect at Children's Health.

PILOTING TELETRANSPORT.

To pilot the project, the Transport team was educated to use the equipment and incorporate it into their teamwork and their emergency procedures. Early cases showed the difference that the remote connection could make.

The first baby to benefit from TeleTransport had "an initial blood gas that was near death," relates Dr. Savani. "The pH was 6.89, and CO2 was unrecordably high."

He visually assessed the baby, watched the monitors relaying the baby's vital signs and collaborated with the Transport team to change ventilator settings and administer medications – including blood pressure support and nitric oxide – to stabilize the baby's critical condition.

"I was able to do almost exactly what I would have done if I was there physically, and when the baby showed up in our NICU four or five hours later, the blood gas was pH 7.40 and PCO2 42, both completely in the normal range," says Dr. Savani. "All the interventions that were made during the transport improved the baby's physiological condition, and the baby's life was saved."

TeleTransport also allows the physicians and the Transport team to "meet" the parents virtually. "The Transport team can engage with the family so that they can understand the specialty care being provided and also meet our physicians who are caring for their baby early in the process," says Scotti Floyd, Director of Transport Services at Children's Health.

With the first baby TeleTransported, Dr. Savani was able to counsel the parents as to the critical nature of the baby's condition and keep them updated about the progress being made.

"If parents are able to meet the neonatologist and team virtually before transport," says Kristin Carlton, Program Director for Telespecialty and Clinical Outreach, "when they arrive at Children's Health, they see familiar faces, adding some level of comfort to a very stressful time."

JUMPSTARTING THERAPEUTIC COOLING.

TeleTransport allows Level IV care to start before the babies reach the NICU. One important example is therapeutic hypothermia for babies with hypoxic-ischemic encephalopathy.

"When babies have been severely depressed at birth and deprived of oxygen or blood flow to the brain, their brain is at risk," says Lina Chalak, M.D., neonatologist, Director of the Neonatal NeuroNICU Program and Professor at UT Southwestern. Hypothermia is the only treatment currently shown to reduce death or disability but only if the encephalopathy is recognized immediately and treatment is initiated in the first six hours after birth – the sooner, the better.



As one of the busiest transport teams in the country, the Children's Health NICU nurses, paramedics and respiratory therapists on transit quickly adopted TeleTransport and TeleCooling.

“Literally speaking, time is brain” says Dr. Chalak. “We invested in FDA-approved technology that allows active cooling on transport and trained the team on the use of this cooling device as a part of the TeleTransport program.”

The sooner the cooling begins, the better the baby’s chances.

“To determine what babies qualify for this intervention, we need to be able to examine them remotely,” says Dr. Dariya. “Then, with certainty, we can tell our transport team, ‘Start cooling this baby now.’” The baby can then be actively cooled during transport, starting this critical therapy sooner.

IMAGINING THE FUTURE OF TELETRANSPORT.

TeleTransport marks the latest milestone in our push to extend Level IV care to babies across our region. In partnership with UT Southwestern, we developed one of the nation’s most comprehensive TeleNICU programs in 2013. We’ve virtually examined more than 200 neonates so far, and more than half of those patients have been able to remain in their home hospitals. Now we’re looking for ways to virtually connect with more patients and more providers.

“The underlying principle is that we want to extend the reach of our level of care, while collaborating with doctors at referring hospitals to enhance treatment,” Dr. Savani says.

The next goal is to provide TeleTransport capability on “any and every transport,” says Dr. Dariya. “And not just for the NICU. My hope is that our colleagues in the ER, Pediatric ICU and CVICU all find benefit doing this. Any service within this hospital should have the ability to evaluate a sick patient – before they get here.”

REDUCING TRANSFERS WITHOUT COMPROMISING QUALITY USING TELENICU.

In a state where it takes nearly 14 hours to drive from top to bottom, transferring every neonate to the Level IV NICU at Children’s Medical Center Dallas wouldn’t just be inefficient – it would be nearly impossible.

That’s why Children’s Health and UT Southwestern developed one of the nation’s most comprehensive TeleNICU programs. Along the way, we solved compliance and legal problems, built our own platform and created a model that makes it affordable for partner hospitals to get input from our specialists.

“It’s a win for families because it keeps them closer to home, and it’s a win for the health care system, because it lowers costs and lets smaller hospitals keep more neonates at their facility,” says Dr. Rashmin Savani.

STEP ONE: WORK WITH EXPERTS AS A COLLABORATIVE TEAM.

We spent two years developing privacy safeguards, custom software and tackling other key challenges before launching TeleNICU by Children’s Health Virtual Care. Our first step was to create a working group that met weekly. The group collaborated with medical, legal, compliance and technology experts, and we devised ways to:

- Efficiently gain parental consent for virtual care
- Ensure compliance with HIPAA, the Centers for Medicare & Medicaid Services and the Texas Medical Board
- Establish an efficient process to get physicians credentialed at the hospitals where they would be consulting
- Establish a secure way to transfer medical data, such as X-rays, ECHO and EEG

The next step was finding software that would meet our performance, privacy and security standards. After testing several programs, we opted to build our own platform, which gave us full control over the end product.

STEP TWO: USE STATE-OF-THE-ART TOOLS FOR REMOTE EXAMS.

Our mobile carts include digital otoscopes and stethoscopes, high-resolution cameras and a video laryngoscope. This enables the neonatologists here to conduct thorough exams from afar, and we can even give real-time input on things like how a distant team should intubate an infant.

“It means we can help outside providers pinpoint a baby’s condition and find ways to keep them stable,” Dr. Savani says.



The Transport team's Jimmy Puga and Frank Moreno were instrumental in the planning and implementation process of bringing this innovation to Texas families and referring hospitals.



Shonquatta Parson, APRN, NNP, attends to a family from Tyler who traveled to Children's Health for Level IV care. The goal with TeleNICU is to keep babies in their community hospitals, if possible.

STEP THREE: HELP REFERRING HOSPITALS KEEP THEIR PATIENTS.

We launched our TeleNICU in late 2013 with one partner site. We now have nine partners and are planning to add more in 2021.

We have virtually examined more than 200 neonates so far with diagnoses as varied as difficulty with ventilator management to an evaluation of gut inflammation to assessment of congenital anomalies. About half of the patients have been able to stay in their home hospitals. This has saved tens of thousands of dollars without jeopardizing patient care.

Just because our TeleNICU is advanced doesn't mean it's expensive for partner hospitals. Their costs – a one-time equipment purchase and a monthly service fee – are quickly recouped and even mitigated by state of Texas funding. If a hospital retains just one neonate, they will have covered the costs of one year's worth of TeleNICU fees, including the equipment.

PUTTING PATIENTS FIRST.

"TeleNICU enables our team, our partner physicians and even the parents to put the needs of the infant first," Dr. Savani says.

THRIVE PROGRAM.

After a NICU stay, care continues at our Thrive Program. For over 40 years, we've been helping your little miracle grow and thrive.

Once a baby comes home from the hospital, the Thrive Program at Children's Health provides specialized, comprehensive and ongoing follow-up care. Our interdisciplinary team of experts looks after a baby's overall health and well-being until their fifth birthday.

Our team offers personalized medical care from advanced practice staff (including 24/7 after-hours access for urgent problems), under the supervision of an experienced pediatrician, with contributions from a clinical nutrition expert, developmental specialist, speech pathologist, child psychologist and social worker in Thrive, and in consultation with pediatric subspecialists, including ophthalmology; audiology; and speech, physical and occupational therapists, among others.

The THRIVE Program has made a positive impact in pediatric health care:

- Decreasing ED and intensive care visits
- Saving \$3,000 per patient, per year

Roy Heyne, M.D., Medical Director of the Thrive Program at Children's Health and Professor at UT Southwestern, leads a team that serves as the primary medical care home for fragile babies through their fifth birthday.



COMPREHENSIVE NEONATAL CARE BRINGS BIG SMILES FROM A TINY PATIENT.

A team of experts support a micro preemie through his long – and incredible – journey home

When Valerie was only a little more than halfway through her pregnancy with twins, Cruz and Cristiano, she began experiencing serious complications.

“I was 22 weeks, five days, and I began leaking amniotic fluid,” she says. “I went into the hospital to be monitored and learned that both babies were doing great, but I would need to remain on bed rest until their birth.”

But just a few days later, Valerie experienced a cord prolapse and was immediately taken into the operating room for an emergency cesarean section. She was exactly 23 weeks along.

Tragically, Cristiano, who was born first, passed away 22 minutes after birth. Cruz followed a minute later, weighing 1 pound, 6 ounces. After letting out a big cry, Cruz was immediately transferred to a NICU at a local Dallas hospital where he remained in critical condition for the next several months.

Cruz finds comprehensive care at Children's Health

Four months later, Cruz was growing stronger but still had significant difficulties breathing and remained on a ventilator. Looking for more options for Cruz, his family and doctors decided to transfer him to the Level IV NICU at Children's Medical Center Dallas. There, they met Dr. Vedanta Dariya.

From the very beginning, Drs. Dariya and Savani were honest about the challenges Cruz faced.

“Cruz's lungs never fully developed before birth, and one of the biggest challenges Cruz and his doctors previously faced was trying to decrease his ventilator settings,” Valerie says. “We were hopeful to have additional support from the experts at Children's Health.”

Soon after his arrival at Children's Health, Brett Whittemore, M.D., pediatric neurosurgeon at Children's Health and Assistant Professor at UT Southwestern, placed a ventriculoperitoneal (VP) shunt in Cruz's brain to help provide relief for the fluid collection that had occurred because of a grade IV brain bleed Cruz had since birth.

While Cruz recovered from surgery over the next month, his care team worked to decrease his ventilator settings, remove his breathing tube, which he had had since birth, and place a tracheostomy.

“The respiratory care team was excellent in supporting us and educating us throughout the whole trach process,” Valerie says. “They've made sure we have all the information we needed to help Cruz.”



Cruz had also developed retinopathy of prematurity (ROP), a condition that affects premature infants and causes abnormal blood vessels to grow in a patient's retina. This can cause the retina to detach and, ultimately, lead to blindness. Using laser therapy, Yu-Guang He, M.D., ophthalmologist at Children's Health and Professor at UT Southwestern, removed the abnormal growth in Cruz's eyes to correct his vision.

“Cruz still has some challenges focusing at times and will most likely need glasses, but it was amazing what an effective procedure it was,” Valerie says. “Dr. He even did it right in Cruz's hospital room!”

Cruz's journey to go home

Nine months after being born, Cruz was discharged from the NICU to Our Children's House, which provides transitional care and inpatient rehabilitation for patients between acute care and returning home. While Cruz was there, Andrew Scott Gelfand, M.D., pediatric pulmonologist at Children's Health and Associate Professor at UT Southwestern, worked with Cruz and his family to lower his ventilator settings even further. Four weeks later, Cruz was finally ready to go home.

Today, Cruz still requires 24/7 nursing care at home and relies on a ventilator to help him breathe. But Cruz is on track developmentally according to his adjusted age, and he now weighs nearly 17 pounds.

“Cruz is grabbing, reaching and following his toys and is beginning to sit up with some support,” says Valerie.

His dad, Robert, says thanks to the medical support Cruz has at home, their family enjoys their day-to-day, shared activities – both big and small.

“Cruz being home has been a huge adjustment, and we have been blessed with wonderful nurses who have become part of our family,” Robert says. “Whether it's the excitement of everyone sitting watching a movie, enjoying a great game of football or even the mundane task of doing laundry, life is great, and having Cruz there to experience all of it has been beautiful.”

As part of a comprehensive program that cares for babies from fetus to 5 years old, Cruz is followed in the Thrive Program to ensure that he and his family receive ongoing care and support through kindergarten.

For now, Cruz continues to work with occupational, speech and physical therapists to build up strength in his legs and learn to suck – but if there's one skill he has already mastered completely, it's smiling.

“Cruz is such a happy baby and is always, always smiling,” Valerie says. “We are not entirely sure what the future may hold for Cruz, but he has already brought so much joy to so many people and our faith will continue to carry us through.”

NICU graduate Matthew (left) hugs brother William and is thriving today after a CDH diagnosed in utero.

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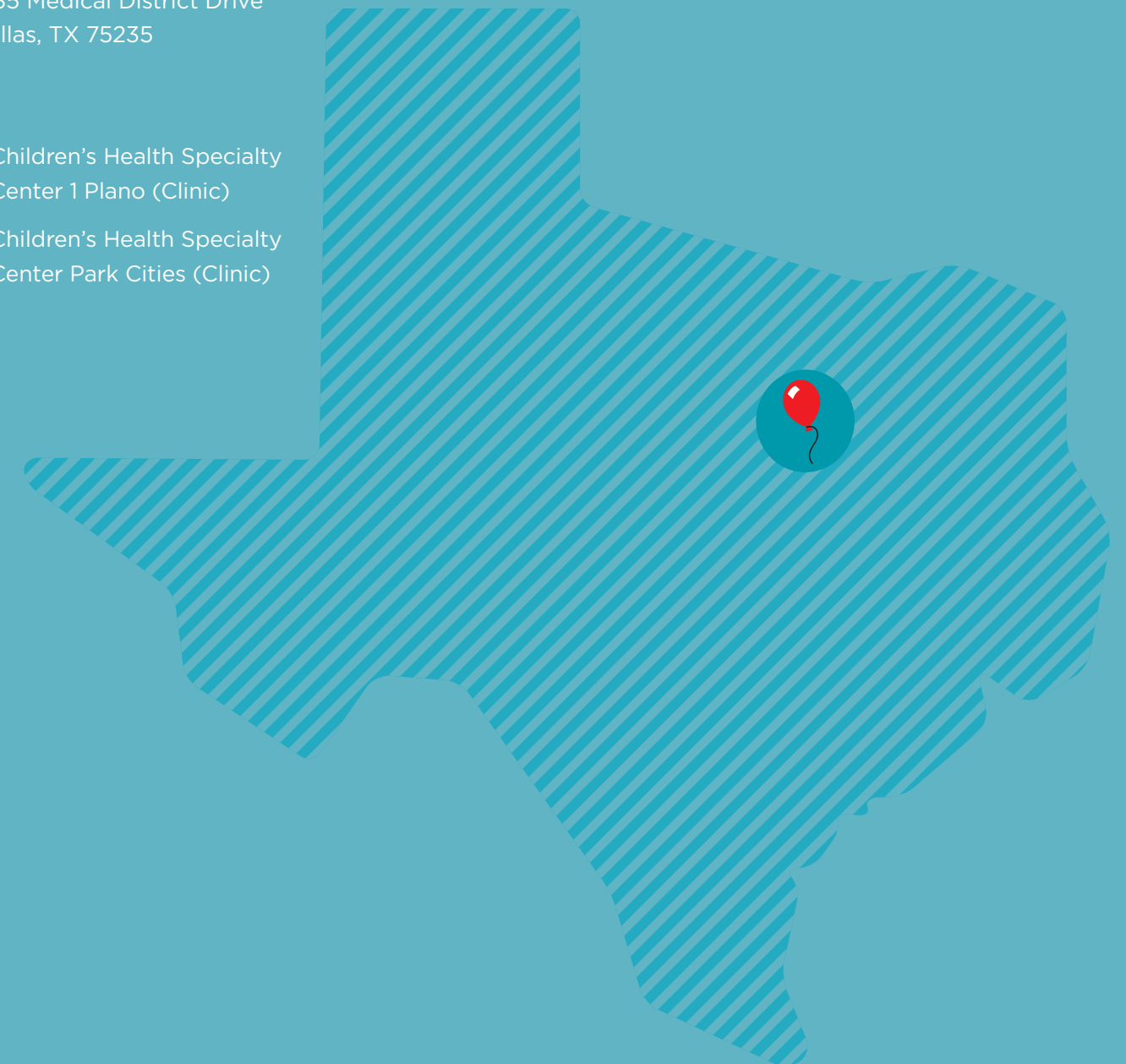
We are the only NICU in North Texas designated by OptumHealth™ as a Neonatal Center of Excellence. We achieved this distinction because we provide the best possible care for a broad range of health issues, with an emphasis on preventing avoidable complications. As a member of the Children's Hospitals Neonatal Consortium, we work with other top-ranked NICUs to improve quality and safety at NICUs across the country. We're also proud to serve as a regional referral center for other NICUs that send babies to us from across North Texas and beyond.

With more than 30 UT Southwestern Pediatric Group neonatologists, more than 10 pediatricians and around 35 advanced practice providers, as well as respiratory therapists, pharmacists and dietitians, we collaboratively and effectively care for the most fragile babies.

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Specialty care provided by UT Southwestern physicians

Cover photo:
***Comprehensive care for
congenital diaphragmatic
hernia (CDH)***

Myra Wyckoff, M.D., a UT Southwestern Pediatric Group neonatal-perinatal medicine specialist practicing at Children's Health, heads a specialized neonatal resuscitation team. An all-hands-on-deck approach with the FETAL Center and pediatric surgeons gave Matthew and his family access to expert, collaborative care for CDH.