Neonatal Intensive Care Program
Sutter Children’s Center, Sacramento
Caring for Infants

The Neonatal Intensive Care Program with units (NICU) located at Sutter Memorial Hospital, on the Sutter Medical Center, Sacramento Campus, and Sutter Roseville Medical Center provides immediate, advanced and lifesaving care to infants born prematurely or who need special medical attention. Opened in 1974, the NICU has grown to become Northern California’s largest and most advanced care center, serving doctors and families from more than 48 hospitals across 23 counties.

Supporting Families

Family-centered care is a hallmark of our approach. We welcome parents in the NICU and consider them important members of their baby’s care team who play critical roles in deciding the course of treatment.

Building Healthy Futures

While we attend to each infant’s immediate medical needs, we consider the NICU a place babies pass through on the way to happy, healthy childhoods. Our team of support specialists, Developmental Follow-Up Clinic staff and parent support groups extend care beyond our walls and well into the future.
From Our Leadership

The birth of a child is one of life’s most joyful events. But that joy turns quickly to fear when a child comes too soon, weighs too little, suffers from a serious medical condition or becomes critically ill. In difficult times, we’re proud that our Neonatal Intensive Care Unit serves as a lifeline for newborns’ around-the-clock medical care and parents’ continuing emotional support.

As the region’s largest Level III tertiary care NICU, we deliver advanced treatment for all neonatal conditions—and have for almost 40 years. Our board-certified neonatologists are experts in the fight for newborn survival. Together, they bring several decades of experience to each infant’s care. Their expertise combined with the skill of our exceptional nursing staff, more than six dozen neonatal and pediatric subspecialists and a highly trained support staff provides immeasurable benefit to our tiny patients and their families.

In this booklet, we present information on our NICU capabilities, along with comparative outcomes data that support our belief that our NICU teams offer struggling infants an excellent start on the path to strong and healthy futures.
Our Program

Approved as a Level III NICU by the California Children’s Services (CCS), the NICU cares for multiples, premature and low-birth-weight babies, infants born with congenital anomalies, and critically ill newborns.

Comprehensive, Collaborative Care

Each year, the NICU ushers more than a thousand infants through its 55-bed unit in Sacramento and 16-bed unit in Roseville. Though geographically separate, the Sacramento and Roseville units operate collaboratively as part of the advanced medical services available through Sutter Women’s Services and Sutter Children’s Center, Sacramento.

Nationally Recognized

A children’s “hospital within a hospital,” Sutter Children’s Center, Sacramento is nationally recognized as a center for excellence by the National Association of Children’s Hospitals and Related Institutions (NACHRI). In addition, Sutter is the only non-university facility in Northern California granted associate membership with the California Children’s Hospital Association (CCHA).

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**Overview/General Highlights**

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<th>2009 LENGTH OF STAY</th>
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**2009 SURVIVAL**

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Higher Is Better

**2009 LENGTH OF STAY**

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Lower Is Better

Combined admissions to the Sacramento NICU and its Roseville extension totaled 1,491 in 2009. Survival rates in each of the age groups for the units consistently surpass the national average as reported to the Vermont Oxford Network (VON).

Complete Continuum of Care

Care for NICU infants often begins before birth and extends well into childhood. This care continuum ensures that each infant admitted to the NICU receives treatment at the earliest possible moment and the ongoing support needed to achieve the highest level of health.

Preparing for Birth

Many infants come to the NICU through the High-Risk Maternity Program of Sutter Women’s Services and personal consultations with our perinatal/neonatal specialists. Because of the need for immediate medical treatment, doctors encourage mothers to deliver in the high-risk delivery room close to the NICU. When on-site delivery is not possible, our transport team can attend local hospital births to provide care before transporting the infant to the NICU.

High-Tech, High-Touch Care

Fragile infants need the right combination of medically advanced care and focused individual attention. Within our NICU, they receive both in ample measure. We offer the latest medical treatments and technology proven to improve outcomes, along with one-to-one, -two or -three nursing ratios, depending on the infant’s level of need. We care for our most critical infants at the Sacramento NICU, where a board-certified neonatologist remains on site 24 hours a day.

Advanced care therapies include:
- Extracorporeal membrane oxygenation (ECMO)
- High-frequency ventilation
- Bubble CPAP
- Inhaled nitric oxide therapy
- Body cooling, also called therapeutic hypothermia or mild systemic hypothermia (MSH)

Looking Toward Home and Beyond

Infants who start life in the NICU undergo comprehensive testing and evaluations to determine any additional medical care required. Child Life Specialists and Social Workers work with families to help them prepare for the transition to home and discharge planners help parents determine next steps in care. Parents of children at risk for developmental delays can take part in our Developmental Follow-Up Clinic, where an interdisciplinary team monitors each child’s progress and provides information, support and referrals to community programs, agencies and consultants, as needed.
**One NICU, Two Locations**

Our Sacramento and Roseville NICUs operate as a single unit, providing many similar services. While both are Level III NICUs, the Sacramento NICU cares for infants in the most critical need. Served by the same board-certified neonatologists, the NICUs operate collaboratively to ensure infants receive the care needed to prosper. Both NICUs welcome parents and encourage them to take an active role in their baby’s care and treatment decisions. In addition to standard care areas, the NICUs each offer a family sleep room that allows parents to stay overnight with their babies before taking them home for the first time.

**Sutter Medical Center, Sacramento**

In operation since 1974, the 55-bed Sacramento NICU offers around-the-clock, on-site care by one of our nine board-certified neonatologists and a highly trained and experienced nursing staff. Referring physicians who call the NICU speak directly to a neonatologist—any time of the day or night.

The NICU was the first in Northern California to offer extracorporeal membrane oxygenation therapy to infants and remains on the leading edge of neonatal treatment and technology advances. Babies enter the NICU after mothers give birth in the nearby high-risk maternity suite, Family Birth Center or through referral and transport by our Sutter NICU Transport Team.
Sutter Roseville Medical Center

Opened in 2008 as an extension of the Sacramento NICU, the 16-bed unit offers families in Placer County and surrounding areas the convenience of care closer to home. Designed with active input from doctors, nurses, clinical staff and parents, the Roseville NICU boasts many family-friendly features, including warm, spacious design for every room and four private rooms, the region’s only private rooms for NICU patients. Babies come to the NICU through the adjacent Family Birth Center or through our Sutter NICU Transport Team. The Roseville NICU offers an on-site helipad, enabling babies referred from outlying areas to arrive by ambulance or helicopter.

Neonatal Intensive Care Program Services:

- Direct telephone consultations for physicians, 24 hours a day
- High-Risk Pregnancy Program, including fetal diagnostics
- High-risk delivery suite with on-site obstetric anesthesiologists and neonatologists 24 hours a day
- Sutter NICU Transport Team
- Extracorporeal membrane oxygenation (ECMO)*
- High-frequency ventilation
- Bubble CPAP
- Inhaled nitric oxide therapy
- Body cooling, also called mild systemic hypothermia (MSH)*
- Pediatric subspecialty services
- Surgical services, including pediatric cardiovascular surgery, neurosurgery, orthopedics, otolaryngology, laser eye surgery and urology*
- Lactation and infant feeding support
- Developmental assessment and therapy
- Diagnostic testing of breathing, hearing, lung function, vision and hearing
- Child Life services focusing on emotional and developmental well-being of infant and the family*
- Discharge planning
- Developmental Follow-Up Clinic
- Ongoing parent support groups

*Infant may have to be transferred for higher level services offered only at the Sacramento NICU
Referrals & Transportation

It’s always to the baby’s advantage to be born in a room close to our Sacramento or Roseville NICU. When possible, we arrange for mother’s transport so that she can deliver her baby near the NICU. Since it’s not always possible to predict when a baby will be born prematurely or with medical issues requiring NICU care, our Sutter NICU Transport Team is on call and ready to be on the road or in the air within 45 minutes to assist at the delivery or provide immediate transport to the NICU.

Contacting the NICU
To help referring doctors achieve the fastest transfers possible, our neonatologists answer physician calls directly, 24 hours a day. Whether doctors need to arrange a transfer or simply ask questions about a pregnancy or delivery, our neonatologists welcome doctors’ calls and answer each one personally.

Sutter NICU Transport Team: Before, During and After Delivery
We’re proud of the skillful transportation services our Sutter NICU Transport Teams provide more than 250 times each year. The team’s neonatal nurses and respiratory care practitioners are specially trained in managing airways and stabilizing critically ill and premature infants during transport. Working in partnership with CALSTAR for helicopter and fixed-wing aircraft transport and ambulance teams for ground transfers, team members transport newborns in special incubators equipped with high-frequency ventilation, conventional ventilation and nitric oxide delivery equipment. Services our transport team can provide include:

On-site delivery support – When labor is too far along for mothers to be transferred, our NICU Transport Team can be present in the delivery room to stabilize the newborn prior to transport.

High-frequency and conventional ventilation – Depending on the infant’s needs, teams have both ventilation therapies available to stabilize infants while en route to the NICU.

Inhaled nitric oxide – Our transport program is one of only a handful in the country that offers nitric oxide therapy during transport. This capability is especially important when infants are not responding well to other respiratory support methods.

Extracorporeal Membrane Oxygenation (ECMO) – Our Transport Team is trained and equipped to transport infants to our NICU for ECMO Therapy when this high-level procedure is necessary.

Bubble continuous positive airway pressure (bubble CPAP) – For infants breathing on their own, bubble CPAP provides breathing support and prevents lungs from collapsing.

Therapeutic Hypothermia (body cooling) – Body cooling within the first six hours of life can prevent complications associated with hypoxic ischemic encephalopathy. Our Transport Team can provide body cooling in transport to assure this timeline is met.

The Sutter NICU Transport Team is available around the clock, 365 days a year. Within 45 minutes of a transport call, a team is on its way, narrowing the critical gap between a baby’s delivery and arrival at the NICU.
A perinatology/neonatology specialist is available 24 hours a day, seven days a week to arrange a transfer or provide emergency consultation.
Our Team

Behind every infant and family we serve is a corps of more than 250 medical professionals working in unison to deliver care to the highest standards.

Neonatologists

Our team is led by nine board-certified neonatologists, with at least one neonatologist on site in the Sacramento NICU 24 hours a day. Our experienced neonatologists work collaboratively, bringing each infant the combined knowledge gained from years of experience.

Pediatric Specialists and Subspecialists

As part of Sutter Children’s Center, our NICU care teams have easy, immediate access to more than 75 neonatal and pediatric specialists and subspecialists, including general and specialty pediatric surgeons. The ability to call in the right medical expert improves care in the NICU and connects families with medical care and support after their child goes home.

Nursing Staff

At any hour of the day or night, infants are under the watchful eyes and skillful hands of at least one of our more than 150 nurses, many certified in advanced life support (ALS). Our nurses are the soul of the NICU and our tiny patients are fortunate to have the attention of professionals totally dedicated to their care, whose commitment to working in the NICU often spans decades.

Support Network

In addition, care teams receive the support of the NICU Transport Team, neonatal respiratory care practitioners and Child Life Specialists who help parents and siblings adjust and cope with their hospital stay, and provide education and support so that parents feel confident providing care when they bring their child home. The team also includes clinical social workers who help address the daily-life issues families face and help connect them with agencies and community resources. The vast care network also includes lactation consultants, physical and occupational therapists, pharmacists, and technicians—all specifically trained to serve infants with critical needs and their families.

Referring doctors and pediatricians

We understand that our place at the start of a child’s health care story requires sharing information with an infant’s previous and future doctors. Our neonatologists send reports to referring physicians and are happy to talk to and answer questions from pediatricians who are providing ongoing care to our former patients.

Beyond the NICU

Care does not end when an infant leaves the NICU. In addition to ongoing care from pediatric specialists that often begins in the NICU, children at risk for developmental delays take part in the outpatient Developmental Follow-Up Clinic through age three. Here they receive the support of a new interdisciplinary team of medical experts whose members include:

- Developmental pediatrician
- Pediatric nurse practitioner
- Pediatric physical therapist
- Pediatric occupational therapist
- Clinical psychologist
- Clinical social worker
- Ophthalmologist, as indicated
- Audiologist, as indicated

Children visit the clinic three to four times during the first three years of life, a much longer period than most programs offer. The clinic team provides evaluations and exams, monitors progress and provides guidance and resources to help parents promote their child’s development. They also provide referrals to community programs, agencies and consultants who offer more information or support for the family and child’s needs.
Direct, immediate contact with a NICU neonatologist

Neonatal Intensive Care Program
- Two locations
- 24/7 on-site, board-certified neonatologist
- Highly trained nurses
- Pediatric subspecialists

High-Risk Pregnancy Program, inpatient, outpatient and transport services

13 pediatric outpatient clinics and dozens of pediatric specialists ensure ongoing care

More than 75 neonatal and pediatric subspecialists

Childlife services, lactation support, clinical social workers

Long-term follow-up care through our Developmental Clinic

Dedicated NICU Transport Teams
Our Services

While infants come to the NICU for a number of reasons, most are premature and require high-tech support to complete their development, gain weight and learn to eat. In our NICU, we provide the full spectrum of proven technology advances and treatments that enable them to develop and grow. In addition to continuous monitoring around the clock, services we offer include:

**Extracorporeal membrane oxygenation (ECMO)** takes over when an infant’s heart and lungs cannot function properly. The ECMO system pumps blood from the heart, oxygenates it through an artificial lung and returns it to the infant’s body. We were the first NICU in Northern California to pioneer ECMO in the NICU setting and are still among a select number who can transport these very critically ill infants for ECMO therapy.

**High-frequency ventilation** reduces strain on immature lungs by keeping them open while delivering minute amounts of air and oxygen hundreds of times each minute.

**Bubble continuous positive airway pressure (bubble CPAP)** is a method doctors use to keep infants’ airways open and deliver the appropriate mix of air and oxygen. Doctors use bubble CPAP with babies who are breathing on their own to deliver a slight amount of pressure that keeps the baby’s lungs from collapsing.

**Body cooling**, also called therapeutic hypothermia or mild systemic hypothermia (MSH) helps reduce neurodevelopment problems that can occur when babies’ brains are deprived of oxygen during birth. Immediately after delivery, babies are placed on a cooling blanket that keeps their body temperatures slightly below normal, which studies show helps reduce the extent of brain injuries.

**Inhaled nitric oxide** may be administered with ventilation therapy to help blood vessels around the lungs relax. Studies show that nitric oxide improves a baby’s ability to absorb oxygen and reduces chronic lung problems.

**Surgery** is often the only option when a baby is born with a malformation that cannot be corrected through development alone. In those instances, our general and specialty pediatric surgeons can perform corrective surgeries to repair anomalies and enable growth. In addition to general pediatric surgery, surgical specialties include:

- Pediatric cardiovascular surgery
- Pediatric neurosurgery
- Pediatric orthopedic surgery
- Pediatric otolaryngology (ear, nose and throat) surgery
- Pediatric urological surgery
- Pediatric laser eye surgery

Our comprehensive approach to care helps ensure each infant that comes through our NICU leaves with the best chance to achieve optimal health.

“Every single nurse in the NICU not only took wonderful care of Caden, they took care of me and my husband. It’s an emotional time and the support that they offered was effortless on their part. It was natural because they genuinely care about each family. And they took us on as individuals and never made us feel our concerns were not valid. I wouldn’t want to have my baby anywhere else.” Lauren, mother of Caden who was born with breathing complications and needed assistance from CPAP.
"I was really impressed that the doctor still put her on my chest and did all the normal steps they do after birth to help with the bonding. And the staff and doctors supported me in my wish to exclusively use breast milk for feeding and provided lactation support when she was ready to breastfeed."

Sara, mother of Elizabeth who was born at 25 weeks weighing exactly 2 pounds.
Our Outcomes

To improve quality of care and safety in NICUs nationwide, the Vermont Oxford Network (VON) compiles, analyzes and compares outcome data on about 50,000 infants each year from more than 850 NICUs worldwide. The VON reports provide benchmarks hospitals can use to improve quality and provide to families, referring physicians and others.

Admissions between our two locations typically averages a little more than 1,400 infants each year. In 2009, our Sacramento NICU admitted 1,118 infants and the Roseville NICU, opened in 2008, admitted 373 infants.

Our survival rate for very-low birth weight (VLBW) infants from the time we began submitting data to VON in 1994 until 2009 (the latest date VON data is available) is shown in the chart below.

Full-term babies are typically born between 38 and 42 weeks gestation. Many infants we treat are born much earlier. The chart below shows our infant survival rates for babies born weighing less than 1,250 grams (about 2.75 pounds).

Chronic Lung Disease

One of the most difficult challenges NICUs face is ensuring infants can breathe on their own following respiratory therapies that assist or take over breathing for immature lungs. The respiratory outcomes chart below shows the average of infants still requiring oxygen at 36 weeks gestational age by their gestational age at birth. In this case, lower numbers are better, as they indicate fewer infants who require oxygen to breathe at 36 weeks gestational age.
Initial Resuscitation

Babies that cannot breathe well enough on their own need a breathing tube inserted for assistance. Because this method is more invasive, it has greater risk for infection. In this case, lower numbers are better.

“We are so impressed with how Chase has grown as a student, athlete and role model. He is a testament to what you can accomplish with faith, hard work and dedication.”

Jonathan, father of Chase who was transferred to Sutter Memorial Hospital after birth with transposition of the great vessels and needing immediate cardiac surgery. Chase didn’t let his health condition slow him down and was an all-star kicker on his highschool’s football team.

Family-Centered Care

Our goal for your infant’s stay with us is simple. We want you to take home a healthy infant you can care for comfortably and confidently.

While we consider our role vital to your baby’s health, we recognize that it is fleeting. Long after we become a faded memory, you will be caring for your child’s daily needs. That fact is the guiding principle behind our approach to care.

When your newborn infant is a NICU patient, we welcome, encourage and do everything possible to support your involvement. Our nurses include you in feeding, changing diapers and, of course, holding your baby. We encourage all mothers to breastfeed and offer lactation consultants who help make that possible. We also give you straightforward information and our professional opinions on the pros and cons of various treatment options and look to you to help decide the course of treatment we follow.

Beyond the NICU is a web of support that includes Child Life Specialists, social workers, discharge planners, Developmental Follow-Up Clinic, parent support group and annual reunions.

“If you can’t be the one caring for your baby, the staff at Sutter is the next best thing. The NICU team is not only nurses, but teachers too. They provide what I would describe as a full hands-on education for your baby. Having a premature son was scary because we did not know what would come next or how to take care of him. The NICU team understands that and teaches parents how to overcome these fears. It is a nurturing environment that is essential to the baby’s well-being.” Yolanda, patient of the High Risk Maternity Unit and mom of Michael who was born at 28 weeks, 5 days weighing 3 pounds, 4 ounces.
Looking Forward

In 2012, our Sacramento NICU will move into its new home within the Women’s and Children’s Center at Sutter Medical Center, Sacramento. And yes, we’re excited. The Sacramento NICU is a busy place and we know that while families are always welcome, they may not always feel comfortable visiting their infants in our current space. The new NICU changes all that.

Just as our nurses and doctors helped design the new Roseville NICU, which is among the most parent-friendly NICUs you’ll find, they guided the design of the new Sacramento NICU. Family-friendly features include:

- More space and greater privacy for parents and infants to promote bonding and make breastfeeding easier
- Sound-deadening materials in the walls and individualized lighting and sound so that infants get the restful quiet they need

We’re also grateful to our downtown neighbors for allowing the new center to include a rooftop heliport. Helicopter access will speed and simplify transport, reducing the time between birth and NICU admission for our fragile patients and helping us bring high-risk maternity patients to the center for delivery.

The current NICU houses a wonderful staff and all the technological advances needed to care for infants. The new NICU will provide a nursery environment that matches and gives parents and infants a peaceful place to bond and grow.

Rendering of the future Women’s and Children’s Center

(Top) The “one in eleven million” naturally occurring identical Khamsa quadruplets were born at Sutter Memorial in 2002.
(Bottom) Khamsa quadruplets attended the Women’s and Children’s Center Groundbreaking in 2008.
Neonatal Physicians

The following physicians are part of Sutter Children’s Center Neonatal Intensive Care Program and are board-certified/fellowship trained in neonatal-perinatal medicine:

Stephen R. Butler, M.D.  Eva Granzow, M.D.  Chiwan Kim, M.D.  Cindy Korte, M.D.  Arthur B. Lyons, M.D.

Erlinda Manalo, M.D.  J. Fernando Rosas Carrillo, M.D.  Gustavo Sosa, M.D.  Andrew W. Wertz, M.D.
“I think everybody needs to know that if your child ever needs to be in this situation, they couldn’t be in better hands. It’s a difficult situation, certainly, but knowing our babies are being tended to by such wonderful people makes all the difference.”

Danielle, mother of quads born at 27 weeks, weighing between 1.15 and 2.2 pounds each.