Neonatal Intensive Care
Outcomes 2016

INOVA
Children’s Hospital
Dear Colleague:

Forty years ago, Fairfax Hospital -- forerunner of today’s Inova health system--opened one of the first neonatal intensive care units in the nation. That early move established the hospital as a leader and innovator in the care of premature and critically ill infants, an arc that continues today.

Creativity has been a hallmark of the NICU ever since founder Lloyd Kramer, MD, designed the first transporter specifically for premature infants in the mid-1970s. Today, it is manifested in our continual, flexible yet data-driven pursuit of ever better practices, processes and protocols.

Consistency in care and an emphasis on patient safety also contribute greatly to our superior outcomes. So, too, do collaboration and the NICU’s collegial environment. Our staff of over 20 neonatologists, 10 neonatal nurse practitioners and scores of highly-trained nurses, technicians and others follow a systematic, methodical approach with tightly orchestrated steps and seamless processes. Respiratory therapists, NICU dietitians and pharmacists round out our multi-disciplinary team. Low turn-over promotes highly developed, cooperative working relationships.

Together, these qualities contribute to some of the best survival and outcomes nationwide, even for micro-preemies, the smallest of our sick infants. But we never want to rest on past success. To make sure we continue to improve, we joined the Children’s Hospitals Solutions for Patient Safety in 2013 as a complement to our long-standing membership in the Vermont Oxford Network.

Lastly, while sending previously sick babies home with their parents is our greatest joy and reward, recognition of our accomplishments by professional organizations is an added plus. Toward that end, we are pleased to report that we were re-awarded The Joint Commission’s Gold Seal of Approval for Prematurity in 2014 -- repeating our distinction as being the first in the nation to receive the prestigious designation in 2011.

In the pages that follow, we highlight some of the milestones, current and past, that have helped guide and shape Inova Children’s Fairfax Neonatal Associates NICU over the years. We’re proud of our contributions to date in advancing the field of neonatology and, especially, in helping the many newborns and families entrusted to our care. Looking forward, we’re excited about what the future holds: the opportunity to provide many more years of increasingly better and more innovative care for premature and critically ill infants in a new, state-of-the-art facility.

Sincerely,

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We’ve Been Growing All Along, Just Like Our Newborns

In the beginning, the Intensive Care Nursery consisted of two rooms and 35 beds, but a constant need to keep pace with demand kept us growing and moving every few years – usually to a different floor to add another room.

With the 1992 opening of the new Women’s Center and Pediatric Building, the NICU went from 3,000 to 20,000 square feet overnight. The extra space allowed for 54 beds, the latest technology and other features like an in-unit laboratory; environmental lighting and sound controls to reduce external stimulation for infants; wall units to support equipment and more. Then state-of-the-art, the facility served as the NICU’s home for more than two decades.

All along, growing needs, technological advancements and our commitment to not turning patients away have continued to force the NICU to adapt. In 2011, for instance, intermediate and intensive neonatal care were split, with infants requiring less intervention housed in a separate section.

The new hospital once again brings all the infants in our care into a central location, and will help meet the needs of the community we serve for years to come.

On the Move

For the third time in its 40 year history, the NICU—with approximately 1,000 in-house births and more than 100 transfers annually for an average daily census of 100—had once again outgrown its space. So we’ve expanded to meet the need, with a brand new state-of-the-art home for Inova Women’s Hospital and Inova Children’s Hospital that opened on the Inova Fairfax Medical Campus in January 2016.

The 655,000 square-foot, 12-story building—the largest construction project in Inova’s history—includes 108 NICU beds, underscoring our status as the largest and most comprehensive Level IV unit in the area. To improve the experience for families, most isolettes are housed in private rooms with the remainder in twin rooms. Breast-feeding lounges, comfortable family support areas and enlarged patient rooms add to the comfortable and welcoming environment.

Beyond the NICU, the new Inova Children’s Hospital features all-private pediatric rooms and expanded pediatric intensive care units. Several play areas and Ronald McDonald House family room further contribute to a more home-like setting for patients and families alike.

To complement Inova’s continuum of maternal fetal care, the newly expanded Inova Women’s Hospital includes a 48-bed, all-private High Risk Perinatal unit, on-site satellite Antenatal Testing Center and women’s labor and delivery, and family centered care.
40 Years of Delivering the Best for Babies

One of the first Neonatal Intensive Care Units in the nation, the NICU at Inova Children’s Hospital has consistently remained among the largest and the best at caring for highly vulnerable, high-risk infants since its founding in 1974. Today, it stands as a national leader in clinical care and Northern Virginia’s most comprehensive 108-bed Level IV unit, with more than 35 medical and surgical subspecialties. Each year, the NICU treats an average of 1,100 premature and critically ill newborns.

With established expertise in caring for the most complex cases and micro-preemies, Inova also serves as a regional referral center for nearly 20 hospitals throughout the mid-Atlantic region, whose combined transfers make up the remaining 10 percent of the annual NICU census. For those infants, our specialized pediatric critical care ambulance and neonatal transport team can provide highly sophisticated, in-transit care, anywhere within a 200-mile radius.

Stemming from an historic commitment to promoting the best outcomes, Inova Children’s is a longstanding member of the Vermont Oxford Network (VON)—a voluntary collaboration of 900 neonatal intensive care units around the world. While all are dedicated to improving the quality and safety of newborn care, we are proud to report that our NICU consistently ranks in the top 10 percent of the majority of VON measures. To further our commitment to improved care, we also joined the Children’s Hospitals Solutions for Patient Safety, and were recognized immediately for our success in controlling Central Line Acquired Blood Stream Infections.

Advanced Maternal-Fetal Medicine

The best care for high-risk, critically ill newborns actually begins with the best care before birth. At Inova Fairfax Medical Campus, our combined experience in maternal fetal medicine and advanced expertise in neonatal surgical and medical care assure both mother and child of the full complement of services and technology they may need, all in one setting.

The process often begins with an obstetrician’s referral to a maternal fetal medicine physician, who specialize in testing and caring for women with complex pregnancies and congenital abnormalities. In addition to ultrasound, nuchal translucency and amniocentesis, at Inova Children’s Hospital fetal MRI to detect brain, spine, cardiac and other structural abnormalities, and fetal echocardiography, and the pediatric specialists necessary to read these tests are an integral part of the diagnostic and treatment team as well. Specially trained genetic counselors can discuss results from amniocentesis, chorionic villus sampling and other tests, and explain diagnoses of inherited diseases and disorders.

When a congenital abnormality is identified, the multidisciplinary Inova Children’s Hospital Fetal Care Center coordinates medical prenatal care with neonatal surgical treatment planning for the best possible outcomes. A patient navigator guides expectant mothers throughout the entire process from prenatal treatment planning to delivery to high-risk newborn procedures. Besides the quality and safety benefits of addressing all phases of pregnancy, birth and neonatal follow-up in one place, Inova’s comprehensive capabilities allow mother and baby to remain together and bond after birth.
Creating a Better Future for Premature Newborns

At Inova Children’s NICU, retrospective reviews of our large database and observational studies regularly contribute to enhancements in neonatal procedures, processes and practice, here and elsewhere.

Now the Inova Translational Medicine Institute (ITMI) is leading the world in genomic research, with the potential to transform the future of clinical care for high-risk mothers, premature infants, and infants with certain inherited medical conditions.

Preterm birth is a good example: In nearly 50% of incidences, physicians can’t determine the cause. However, ITMI’s full genomic sequencing program—the first of its kind—is providing some important clues to the poorly understood phenomenon.

Through the Preterm Infant Study, launched in 2011, researchers are comparing genomic sequencing for 570 full-term infants delivered at Inova Women’s and 305 preemies admitted to Inova Children’s NICU. In the process, they combine literally billions of bits of data about each individual’s DNA, RNA, medical and family history, and other factors, then apply sophisticated modeling techniques to tease out biological markers. Results could lead to better and earlier diagnostic tests to identify both high-risk mothers and the factors that trigger preterm labor for improved antepartum management.

Related studies are looking at the role of genetic changes in birth defects, with promising results. To date, ITMI researchers have identified the genetic causes in a number of infants in the NICU, including a new explanation for a genetic disease. Additional studies focus on conditions with a genetic component that could surface later in life—like arthritis, diabetes and high cholesterol. Forewarned about the disease potential, doctors and families could provide the most precise and proactive care from birth or even earlier and be more alert to possible symptoms later on.

Other work may improve newborn screening panels, develop biologic guides for the most effective medication and dosage for each individual, and otherwise contribute to the growing field of personalized medicine.

We feel the personalized care we offer to the tiny, fragile infants makes a difference for the rest of their lives. At Inova Children’s Fairfax Neonatal Associates NICU, we are trying to optimize the future of the next generation of premature babies.”

- Robin Baker, MD, Chief, Neonatology

The Vermont Oxford Network (VON) - 2014 Outcomes

In 1995, Inova Fairfax was among the first wave of hospitals to join the Vermont Oxford Network (VON)—a non-profit voluntary collaboration of health care professionals dedicated to improving the quality and safety of medical care for newborn infants and their families. Through clinical trials, long-term follow-up studies, epidemiology and outcomes research, VON maintains a comprehensive database on the care and outcomes of high-risk newborns, sharing and comparing annual results among its current membership of more than 900 units worldwide.

VON tracks 15 core measures important to the health and survival of Very Low Birth Weight (VLBW) infants—those weighing 1,500 grams or less at birth—or other critically ill infants born between 22 weeks to 29 weeks 6 days gestational age. On the majority of VON performance measures, Inova regularly ranks in the top 25 percent as shown throughout this report of 2014 findings. In some cases – such as central line associated blood stream infections (CLABSI) – our results are among the very best in the nation, leading to site visits from other NICU teams eager to learn how to improve their own practices.

Despite our consistently high performance, Inova’s commitment to continuous quality improvement continues. In 2013, we joined the Children’s Hospitals Solutions for Patient Safety (SPS), a national coalition designed to reduce preventable risks and harm. Currently numbering 90, SPS’s membership represents more than 50 percent of all pediatric admissions in the United States each year.

Through these and other efforts, Inova assesses its performance and outcomes against similar institutions, learning from our experience and that of others. Together, we help shape best practices for use here and nationwide.

NOTE: All VON measurements shown reflect data for very low birth weight (VLBW) babies—those weighing less than 1,500 grams at birth—or those whose gestational age was between 22 and 29 weeks 6 days at birth—in the NICU at Inova Children’s Hospital from January 1 through December 31, 2014.

Our NICU consistently ranks in the Top 25% of VON measures.
Breast Milk and Necrotizing Enterocolitis

The value of breast milk to newborns—particularly colostrum, its "liquid gold"—is well documented, especially in helping to prevent, or reduce the severity of, necrotizing enterocolitis (NEC)—death of the intestinal tissue. Within the last decade, Inova’s NICU launched an aggressive approach to nutrition for premature and other critically ill infants, with a key factor being the introduction of breast milk within the first few days of life.

Toward that end, Inova has NICU nurses who are also board-certified lactation consultants available 24/7 to help new mothers pump breast milk within an hour of delivery. For those who can’t express, Inova can substitute donor milk from accredited milk banks, all of which adhere to strict national standards. As a result, 80 percent of infants in Inova’s NICU will have received breast milk before discharge as compared to the national NICU average of 50 percent.

Those higher numbers translate into reduced rates of NEC. In fact, Inova achieved one of the lowest rates of NEC incidence in the nation—2.4 percent—on 2014 VON measures.
Infection Control

Inova Children’s Hospital’s NICU performs exceptionally well on all VON measures of infection control, with our success at controlling central line acquired blood stream infections (CLABSI) the leading example. Inova’s NICU CLABSI rate for 2013 VON measures is .05 with an ultimate goal of zero, and in 2014 the NICU achieved more than 400 days without a CLABSI.

That achievement is the product of the NICU’s decision to attack CLABSI with a standardized approach, launched about five years ago, and staff adoption and strict adherence to patient protocols that cover every step: from what doctors and nurses do at bedside to how central lines are handled to educating families on hand washing. Based upon our success, Children’s Hospital Solutions for Patient Safety invited us to present best practices on CLABSI prevention to its network of 78 children’s hospital on multiple occasions.

VON 2014 Outcomes

Intraventricular Hemorrhage

Intraventricular hemorrhage (IVH) and severe IVH (SIVH)—bleeding inside or around the ventricles, the spaces in the brain containing the cerebral spinal fluid—can put pressure on the nerve cells and damage them, leading to brain injury and other problems with neonatal development. The rate of both IVH and SIVH at Inova’s NICU is quite low, thanks to the system’s experienced high-risk ob/gyn practice and the high-risk perinatal unit. As a result, outcomes for infants born in-house are significantly better than for those transferred in.

Chronic Lung Disease

When newborns require extra oxygen after 36 weeks from conception, they are considered to have chronic lung disease. The disease is a result of premature lung development and/or the amount of time a baby spends receiving respiratory support and extra oxygen, which can damage the lungs.

Retinopathy of Prematurity

Retinopathy of prematurity (ROP) is abnormal blood vessel development in the retina of the eye of a premature infant that is most often seen in VLBW premature infants. ROP is associated with chronic vision problems and may result in blindness if not treated adequately.
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Specialized Transport for the Region’s Tiniest Infants

At Inova Children’s Hospital, specialized neonatal care begins before an infant even arrives at our NICU. Through the One Call admissions and transport team, neonatal and critical care pediatric ground ambulance and air transport service assures on-board pediatric care and a seamless transition for the region’s sickest infants.

Staffed by a dedicated team of neonatal nurse practitioners, neonatal nurses, respiratory therapists, EMTs and paramedics, the mobile pediatric intensive care unit accommodates every level of need—from the most basic to highly advanced. State-of-the-art equipment includes invasive and non-invasive cardio-respiratory monitoring, ventilators, emergency medications, chest drainage systems, and the capability to use nitric oxide and heliox if needed.

Coordinated neonatal patient referral, transfer and transport is available 24-7 by calling 877.900.9KID (877.900.9543).