

L'viv's Smallest Success Story

By Sudhakar Ezhuthachan, MD, DCH, and Christine Newman, MS, RNC

The infants are tiny enough to fit in the palm a nurse's hand, with hearts barely the size of a walnut and underdeveloped lungs struggling for oxygen. But with the help of the American partners at the Henry Ford Health System (HFHS) in Detroit, Michigan, these babies at the L'viv Oblast Clinical Hospital (LOCH) in L'viv, Ukraine now have a fighting chance.

"Little things really do count," said LOCH neonatologist Zoriana Salabay, referring to the improvements made in neonatal techniques that have helped save the lives of hundreds of premature infants.

From increased training of doctors and nurses to the use of mechanical ventilators, the L'viv-Detroit partnership has improved the level of infant care, not only at the Premature Baby and Neonatal Intensive Care Units (NICU) within LOCH, but to infants throughout the oblast. The partnership created a successful framework for care by adapting the principles of regionalization - a system of care based on the level of risk for the baby - used in the United States since the 1950s but new to Ukraine. Very ill babies from throughout the region now come to LOCH for treatment.

In 1993, infant mortality in Ukraine was 13.5 per 1,000 live births, compared with 8.2 per 1,000 live births in the United States, and 4.4 per 1,000 live births in Japan - the lowest in the world. However, unlike in the United States and Japan, the data from Ukraine do not include infants weighing less than 1,000 grams - meaning that the mortality rate is higher than the statistics indicate.

"We are fighting for every child's life," explained Head of the L'viv Oblast Health Administration Mykhola Khobzei.

The high infant mortality rate, coupled with declining birth rates, have made improved care for premature babies a priority for the Ukraine Ministry of Health, said Elena Sulima, MD, chief neonatologist with the Ministry of Health. Good management of low birth weight babies at partnership hospitals in L'viv produced some early positive results, added Sulima.

For example, last year 70 percent of the 80 newborns in critical condition brought to the NICU at LOCH within their first three days of life survived. In 1995, the NICU had a 45 percent survival rate for transported infants weighing under one kilogram, compared to a 25 percent survival rate at regional birth houses. The use of modern approaches to improve newborn care at LOCH has decreased length of stay from 32.1 days in 1993 to 29.8 days in 1995.

Prior to 1993, L'viv Oblast did not have a neonatal intensive care unit. Partners selected neonatology as the most critical area of focus for the partnership to respond to the high infant mortality level in Ukraine. The partnership's four-part model addresses all the responsibilities of a Level III (the most intensive) regional neonatal center as outlined in the "Guidelines of Perinatal Care," published by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists, including clinical service, education, quality assurance and unit management.

An important initial step in the creation of the unit was the development of the Collaborative Practice Committee, comprised of unit nurses and physicians to oversee issues as they relate to patient and staff concerns and analyze outcomes. Members of the committee were educated on principles of quality management and encouraged to use them to run their monthly meetings, identify priority issues and analyze results.

Technical Advances in Care

In 1995, an eight-bed intensive care area was established at the Premature Baby Unit, and was equipped with equipment donated from the health care community in southeastern Michigan, local equipment vendors and colleagues within the Henry Ford Health System.

Advances in technology introduced in the neonatal unit at LOCH included mechanical ventilation, regulated oxygen delivery, continuous positive airway pressure through the nose, cardio-respiratory and oxygen saturation monitoring, controlled infusion therapy, phototherapy (including use of a biliblanket to keep the baby warm), and appropriate dosing and administration of antibiotics. Guidelines for clinical practice were developed and translated into Ukrainian, and are available as a pocket-sized reference for unit staff.

Introduction of mechanical ventilation was not without problems, however; use of mechanical ventilators drained existing meager oxygen supply, and voltage differences made transformers essential. With increasing experience on the use of this technology, the average duration of ventilation has increased over time, and ventilated infants have been surviving in greater numbers.

One of the main issues identified by the partnership is the inability to ensure that sick infants reach the regional center in a timely fashion. Typically, only those critically ill infants who lived longer than seven days were transported to LOCH. In most instances, however, they arrived very sick and cold (with a body temperature less than 35 degrees Celsius), and in some instances, efforts to keep the infants warm with hot water bottles resulted in extensive burns. Hypothermia is still a frequent problem since most infants are transported by car.

A regional infant transport program, is key to effectively transporting sick infants to LOCH. A donation from Detroit's Ukrainian community last winter helped with the purchase of an infant transporter, which now can carry critically ill newborns to the LOCH referral center from distant birth houses and hospitals (see CommonHealth, Winter 1996). Reliable ambulance support is needed, however, to ensure that this effort continues uninterrupted.

Education: The Key to Success

The most important component of L'viv's model and the key to establishing a high-quality Level III neonatal unit is education. Educational efforts included the development of a neonatal curriculum and clinical bedside training for physicians and nurses. Consisting of 40 lectures and instruction outlines, slides and audio-visual equipment donated by HFHS, the curriculum provided a template for continuing education efforts within the region. Practical bedside training in intubation, chest tube insertion, umbilical catheter insertion and suturing was an essential part of the curriculum. A library of western medical and nursing literature - books and journals donated by HFHS employees, Toronto Children's Hospital and several others - also was established at LOCH. Similarly, teaching videos, a television and a video cassette recorder were donated by US partners to assist with meeting the staff's educational needs. Over 160 health care providers from LOCH have been trained in neonatal resuscitation techniques. Supplemental, Ukrainian-language course material was also produced for staff with the aid of Malteiser Humanitarian Aid Organization.

"L'viv neonatologists are the first who have applied the new approaches to the care of the newborn," explained Nina Goida, MD, head of the Department of Maternal and Child Health Care at the Ukrainian Ministry of Health.

Speaking at the May 1996 regional conference on neonatal resuscitation and regionalization, Goida encouraged neonatologists to develop programs modeled after the LOCH program, which has introduced "a practical level of skills" to neonatologists and "affected declines in early neonatal mortality" at the LOCH Premature Baby Unit. These early positive outcomes prompted the Ministry to work with AIHA to introduce the LOCH Neonatal Resuscitation Program throughout Ukraine, Goida concluded.

LOCH physicians and nurses realized that in order for clinical care to improve, the existing role of the bedside nurse would have to be altered. A nurse educator position was created within the unit to help ensure sustainable improvements in care and provide ongoing education to nurses. The unit's first nurse educator, Olha Vlad, participated in an intensive, one-month training program at HFHS and continues to provide ongoing education and support to nurses in the NICU in L'viv.

And the outcomes of these courses are significant, noted Salabay. "We accomplish more in our unit thanks to the expanded role of our nurses."

Nurses in the unit now provide bedside care to small, sick infants on ventilators, and are responsible for routine monitoring of vital signs, interpretation of monitor and bedside laboratory data, listening to breathing through a stethoscope, endotracheal suctioning to clean the trachea, initiating IV therapy, and monitoring central blood pressure. Nurses in NICU also perform basic bedside laboratory testing, including microsedimentation rates to determine if a baby has an infection, hematocrit to determine hemoglobin count, urine specific gravity to measure urine concentration, and blood gas analysis - changes which necessitated major alterations in patient care documentation.

Dmytro Dobriansky, MD, a neonatologist at LOCH, and Andrew Tooziak, MD, a postgraduate student at the L'viv Medical Institute and LOCH, designed a bedside flowsheet to document patient data in the NICU, modeling it after the one used at Henry Ford Hospital. The information documented by the nurses is readily available to the physicians, who also use the flowsheet to write daily orders. This has greatly improved both communication and collaboration between physicians and nurses, contributing significantly to better patient care.

Education of support service staff in radiology, pharmacy and microbiology also addressed specific needs of sick infants, because if these staff do not function at peak efficiency, the critical care provided to these infants could be jeopardized.

Outreach efforts to neonatologists and nurses in the L'viv region culminated in the creation of two- to four-week training programs in patient management and bedside care. Physicians and nurses from district hospitals in western Ukraine visit LOCH for training. In addition, their realization that small babies had a chance to survive at LOCH has resulted in earlier transport of small and sick infants.

Parent education is an essential component of the neonatal education program. This includes conducting ongoing classes for parents and providing informational brochures on important issues related to their infant's care.

Evaluation of Program Outcomes

Collection of accurate data is the only way to evaluate any program or change. Morbidity and mortality data collection in Ukraine is currently not consistent with that of western nations.

Recently, a policy change in the L'viv Oblast required that all infants who die, including those less than 1,000 grams, be evaluated by a pathologist. This modification will allow data comparisons with western nations.

Computers donated to the partnership have aided the staff in developing a program that provides them an extensive database on many aspects of patient care. Staff physicians enter data into the computer on all patients at the time of discharge. Using this data, trends can be identified in the newly instituted practice of mechanical ventilation and care modified if needed. The computer support has facilitated regular communication through e-mail with colleagues in L'viv. This allows us to have an ongoing dialogue about issues and aid in problem solving in a very expeditious and cost-effective manner.

Though partner efforts have resulted in improvements in care, critical problems remain that threaten the ability to sustain the changes and successes achieved. The need for a steady stream of supplies, more equipment and - last but not least - the attitude of continuously challenging old, ineffective practices cannot be underestimated. We continue to be amazed at the dedication and commitment of our colleagues despite an unending series of obstacles. We have learned that collaboration, not only between the partners, but with other departments, organizations and the community, is vital to ensure that quality care can be provided even to the tiniest, most fragile patients at LOCH.

Sudhakar Ezhuthachan, MD, DCH, and Christine Newman, MS, RNC, are US partners from the Henry Ford Health System, Department of Pediatrics, Division of Neonatology and the Department of Nursing (Detroit, Michigan). Dmytro Dobriansky, MD, assistant professor at L'viv Medical Institute and a neonatologist at LOCH, provided numerical data.