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The Restoration of Life's Blood

ECMO's Elite Nursing Corps Leads the Field

Laura Klee, Sue Bugsch

By Steven K. Wagner

By any measure, the numbers are sensational: 16 years of service, longer than most Extracorporeal Membrane Oxygenation (ECMO) programs. A staff of six dozen highly trained nurses. Nearly 700 critically ill patients treated. Four out of five brought back from the brink of death. The bottom line: the Childrens Hospital Los Angeles ECMO program, thanks in large part to its elite nursing corps, is one of the finest.

“They’re outstanding,” says Nancy Blake RN, MN, CCRN, CNAA who, as Director of Critical Care Services, oversees all the units that treat ECMO patients. Those include the Neonatal Intensive Care Unit (NICU), the Pediatric Intensive Care Unit (PICU), and the Cardio Thoracic Intensive Care Unit (CTICU).

“Our ECMO staff is probably the finest anywhere,” Blake says.

Established in 1987, the ECMO program is truly a nursing specialty. Two nurses are assigned to each child, one to manage the patient and the other to continuously observe and manage the ECMO pump, requiring constant assessment and vigilance by both. While the physician has ultimate oversight, significant decision-making latitude is given to the ECMO nurses.

In recent years, ECMO, which former program coordinator Laura Klee RN, MSN, PNP, Clinical Manager, NICU, describes as “a rescue therapy,” has evolved from a program serving patients only in the NICU to a point-of-service program that now cares for children in the PICU and CTICU as well.

“We’re an all-RN program,” says Sue Bugsch RN, BSN, the ECMO coordinator. “Our nurses have considerable autonomy. They have the autonomy to take the parameters that have been set down for each child and make decisions regarding the management of the ECMO therapy. I think that’s one of

the things that makes being an ECMO team member so attractive.”

While attractive, ECMO care demands clinical expertise and critical thinking. A heart-lung bypass procedure similar in scope to the cardiopulmonary bypass that heart surgery patients undergo, it requires a high degree of skill and constant vigilance.

With ECMO, blood is pumped from the patient’s heart, through a tube, out of the body and through a membrane lung into a reservoir, where oxygen is added and carbon dioxide removed. The blood is heated to body temperature, and then returned to the patient via a vein or artery. Used primarily to treat critically ill patients when conventional care has been exhausted, the goal of ECMO is to oxygenate the body while giving the heart and lungs a chance to rest and heal.

At Childrens Hospital Los Angeles, ECMO is performed on patients from birth through age 18. Patients range from those suffering with respiratory failure, congenital diseases and meconium aspiration syndrome to those with persistent pulmonary hypertension and cardiac problems, including birth defects. Patients can remain on ECMO from three days to eight weeks, and during a typical day an average of two children are undergoing ECMO treatment simultaneously.

“It’s so important to our patients,” Bugsch says. “We’re able to offer a therapy to children we would otherwise have to transfer out to another facility or who would otherwise die. This gives them another chance for survival.”

At Childrens Hospital Los Angeles, patients must have an 80%-90% likelihood of mortality to be considered for the procedure—a standard guideline for ECMO centers worldwide. In sharp contrast, those who undergo ECMO, on average, have an 80% chance of survival.

To achieve such impressive numbers a high level of nursing competence is required. First and foremost, candidates must choose to join the ECMO team and meet eligibility criteria. To be eligible each nurse must have at least one year of experience in critical care, be clinical experts, and take a six-day ECMO training course led by Bugsch, complete eight hours of pump time every two months, and undergo annual recertification.

“We’re looking not only for someone who has good clinical skills, but for someone who is calm, motivated, enthusiastic about learning and interested in ECMO simply because the therapy can be so beneficial,” Bugsch says. “Nurses must have self confidence and be assertive. And, they must be able to work as part of a team and get along with most people, because they’ll always be working side-by-side with a multidisciplinary team of nurses, physicians, respiratory therapists, social workers and others.

“In my mind, our nurses are the ECMO program,” Bugsch states.

That’s an understatement, if the joy on the faces of children who are saved by the ECMO team, sent home to recover and return to visit the ECMO staff later on are any indicator.

It’s very rewarding,” Blake explains. “When children return to visit us and we’re able to see them living healthy, normal lives after almost not surviving in the first place, it confirms for us that we’re doing what we’re supposed to be doing.”

Klee cites two children who have come to symbolize the program’s two-pronged goal of saving lives and enabling patients to live as normal a life as possible. One is Peter, who was near death when he underwent ECMO at Childrens Hospital Los Angeles as a newborn. He recovered, returning several years later to show staff some photographs taken during his recent Caribbean cruise.

Another is Wendy, who at age 4 was transferred to Childrens Hospital Los Angeles while in massive cardio, respiratory and renal failure. Herdisease, rhabdomyolysis, is not commonly treated using ECMO, however the procedure was her only hope. After undergoing ECMO and spending recovery time in the PICU and rehabilitation units, Wendy was discharged. During recent visits, her fun-loving, inquisitive and humor-filled personality reinforced the teamís belief that Wendy is a true ECMO miracle.

Such stories are a reflection of the outstanding care that nurses provide these young patients day in and day out, says Klee.

“Our nurses have a huge amount of expertise, considering the average ECMO center does only ten patients a year and we do 25 to 30 at Childrens Hospital Los Angeles,” she says. “Other centers (of the few in Los Angeles County and handful in Southern California, the Childrens Hospital Los Angeles program is the largest) are simply not going to build up the knowledge base and level of experience that our nurses have built up, because they only do four to six patients per year. We’re really the best of the best.”

Toni Nield, the infant assessment coordinator, echoes that belief.

“They’re excellent,” says Nield, who ensures that patients who are discharged to their referring hospital return for follow-up. “These are children who otherwise might not live, and our survival rate has consistently been at or above the national average. That speaks volumes about our ECMO team.”

ECMO Training