Sharing Knowledge to Enhance Neonatal Neurocritical Care

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Neonatal neurocritical care has become a rapidly evolving subspecialty, harnessing the interest and clinical acumen of several health care disciplines including neonatal nursing and respiratory therapy as well as medicine and surgery. The establishment of neonatal neurocritical care units reflects collaborative efforts in bridging research, education, and clinical care. Important neurological care advances have been established and implemented in NICU to moderate the effects of brain injury in an effort to positively impact outcomes. Remarkable bedside technology innovations requiring astute interpretation have transformed our evaluation of brain function, such as bedside amplitude-integrated electroencephalography (aEEG) monitoring. Each of these factors inspire practitioners and promote excellence in advancing neonatal neurocritical care.

SickKids NICU in Toronto, Canada, is a 36-bed, out-born unit providing tertiary and quaternary care for infants with various medical and surgical problems, including those with a rare or common neurological focus. Our neonatal neurocritical care program was established in 2012 and incorporates 25 percent of patients admitted to our NICU. About 80–100 infants per year undergo therapeutic hypothermia therapy in our integrated neonatal neurocritical care unit. We provide an evidence-based early intervention approach in managing preterm infants with posthemorrhagic ventricular dilatation in an effort to preserve their vulnerable white matter. Infants experiencing neonatal seizures undergo intensive evaluation and management which is augmented by bedside aEEG or continuous video EEG monitoring. Support for newborn infants who have experienced neonatal stroke is collaboratively provided through consultation with our established pediatric stroke program. We work closely with pediatric general surgery and neurosurgery services in the collaborative management of congenital malformations such as myelomeningocele and sacrococcygeal teratoma. This complex environment provides neonatal nurses, nurse practitioners, and other multidisciplinary health care providers with a tremendously stimulating yet intricate and specialized environment in which to practice. At the center remains a baby and family unit that relies on the abilities of team members to observe, interpret, and communicate clinical findings that can assist in providing direction in decision-making and care plans.

In this edition of *Neonatal Network*, we hope to influence the knowledge of neonatal health care professionals with our series of articles which are designed to focus on understanding physiology, developing clinical acumen, and implementing specialized neonatal neurocritical care for infants with central nervous system problems and their sequelae. In an effort to recognize and understand the evolution of clinical problems, seasoned mentors would remind us to go back to the baby, with honed examination skills—what does the baby tell you? When you examine the baby, what do you observe? Sophisticated technological advances benefit critically ill newborns; however, assessment skills remain central to our practice and as a result, the theme of assessment weaves a common thread in several articles contained in this issue. Additionally, this series highlights the integration of physiology principles into clinical practice, particularly for complex clinical problems including hypoxic ischemic injury, glucose homeostasis, ventricular dilatation, and spinal cord involvement from a complex sacrococcygeal teratoma, in an effort to make a difference in patient outcomes.

http://dx.doi.org/10.1891/0730-0832.39.3.115