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Innovative Therapies in the Management of Neonatal Respiratory Distress at Thomas Jefferson University Hospital

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Innovative Therapies in the Management of Neonatal Respiratory Distress at Thomas Jefferson University Hospital

Thomas Jefferson University Hospital (TJUH) was the first Delaware Valley hospital to provide extracorporeal membrane oxygenation (ECMO) in 1985. This innovative therapy for treatment of severe neonatal respiratory failure has improved the chances of survival for these infants from less than 20% to greater than 80%, a dramatic reversal in outcome. Jefferson's experience with this therapy is one of the largest in the country and the overall survival rates here (approximately 84%) are higher than the national average. Jefferson has continued to pursue innovations in ECMO techniques and procedures in an effort to further enhance the survival rate for these infants. Some of these new developments include: l) provision of better blood flow via a reconstruction of the right carotid artery, a technique pioneered by Jefferson pediatric surgeon Philip J. Wolfson, MD; 2) use of venovenous ECMO, a technique which completely spares the infant from the need for right carotid artery catheterization; and 3) participation in a national evaluation of the concomitant use of exogenous lung surfactant and ECMO, a procedure which could decrease the duration (and thus long-term consequences) of ECMO therapy.

Because of the highly specialized nature of this therapy, Jefferson has actively negotiated with many Delaware Valley hospitals for referral of infants who require the special services of its intensive care nursery (ICN), where ECMO is provided. The quality of services provided by Jefferson's ICN and neonatal physicians have resulted in the ability of the unit to negotiate a pre-approved rate for ECMO hospitalization with many third-party payors. This rate, developed through TJUH's finance office, further enables Jefferson to attract infants with these specialized needs.

Two additional, though experimental, approaches to the management of infants with neonatal respiratory distress are also underway at Jefferson. TJUH is now one of five medical centers in the US participating in an FDA evaluation of liquid ventilation utilizing perfluorochemical liquids to more closely approximate the fluid-filled conditions of lungs before birth. Another technique, ventilation with a mixture of oxygen and nitric oxide (NO), is also undergoing evaluation at Jefferson. The goal is for both of these techniques to be attempted in infants prior to using ECMO. Both are less invasive and, if successful, may provide a way to avoid the use of ECMO completely. Jefferson physicians hold Investigation New Drug exemptions for both of these techniques.

Of interest to neonatologists and others in the health care community are the clinical outcomes of infants who as neonates have respiratory compromise or other risk factors for neurologic damage. Clinical outcomes are being evaluated for these infants at Jefferson via two multi-year NIH funded projects. The division of pediatric neurology, under the direction of Leonard J. Graziani, MD, and the high risk follow-up clinic, under the direction of Shobhana A. Desai, MD, follow these infants at Jefferson to better understand the long-term effects of these lifesaving techniques. The ultimate goal of all of these techniques is to provide the greatest chance for survival, recovery, and normal growth and development to these extremely high risk infants.

Stephen Baumgart: Innovative Therapies in the Management of Neonatal Respiratory Distress

About the Author

Stephen Baumgart, MD, is a Professor of Pediatrics and Medical Director, ECMO, at Thomas Jefferson University and Thomas Jefferson University Hospital.