

Research evaluates neurodevelopmental and medical outcomes in single family room NICU

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The prevalence of preterm birth – the birth of an infant prior to 37 weeks of pregnancy – is a significant health problem that has increased over the past two decades. According to the Centers for Disease Control and Prevention (CDC), preterm birth affects nearly 500,000 babies each year, or one of every eight born in the U.S. While medical care has improved survival rates for preterm infants, questions remain about ways to positively impact the neurodevelopmental outcomes of preterm infants.

Research led by Barry M. Lester, PhD, director of the Brown Center for the Study of Children at Risk at Women & Infants Hospital of Rhode Island and professor of psychiatry and pediatrics at The Warren Alpert Medical School of Brown University, and James F. Padbury, MD, pediatrician-in-chief and chief of Neonatal/Perinatal Medicine at Women & Infants Hospital and the William and Mary Oh - William and Elsa Zopfi Professor of Pediatrics for Perinatal Research at the Alpert Medical School, entitled "Single Family Room Care Improves Neurobehavioral and Medical Outcomes in Preterm Infants," is published in the October issue of *Pediatrics*.

The researchers found that a single-family room environment provides for appropriate levels of maternal involvement, developmental support, and staff involvement, which are essential to provide the kind of care that can optimize the medical and neurodevelopmental outcome of the

preterm infant and lead to the development of preventive interventions to reduce later impairment.

As [medical care](#) has improved the [survival rates](#) for [preterm infants](#), especially those born weighing less than 1,000 grams, nearly half of these infants still suffer long-term neurodevelopmental impairment and/or serious health consequences. Drs. Lester and Padbury led a research team that performed a prospective, longitudinal study to examine associations between the open bay vs. single family room NICU and medical and neurobehavioral outcomes at hospital discharge. They also examined, for the first time, factors that could help explain, or mediate, potential differences in NICUs.

"There are few studies that have compared the individual single family room neonatal intensive care unit (NICU) with the traditional 'open bay' model of care. In particular, two critical issues have not been systematically addressed," explained Dr. Padbury. "First is the effect of the single family room NICU on neurodevelopmental outcome. The second is how and why positive or negative effects of the single family room NICU occur."

In September 2009, Women & Infants Hospital, a U.S. News 2014-15 Best Children's Hospital in Neonatology, opened what was at the time the largest single family room NICU in the country. Prior to that, approximately 1,400 [babies](#) each year were cared for in the hospital's open bay NICU. The single family room model also offered an opportunity to more comprehensively implement a family centered model of care, where families are now more actively involved in their baby's care and care team.

Dr. Lester explained, "We hypothesized that infants cared for in the single family room NICU would have better medical and neurobehavioral outcomes than infants cared for in the open baby NICU,

as well as that medical and neurobehavioral differences between NICUs could be explained, in part, by developmental support, parenting factors and the adoption of family centered care."

Approximately 400 infants born weighing less than 1,500 grams were enrolled at Women & Infants Hospital – 151 were cared for in an open bay NICU and 252 were cared for in the single family room NICU. The open bay data were collected consecutively over 18 months in 2008 and 2009 prior to the opening of the hospital's new NICU. After a three-month hiatus (no new patients were enrolled during the first three months in the new single family room NICU, and no patients were enrolled who were cared for in both settings), data were again collected consecutively over 31 months from 2010 to 2012 in the single family room NICU.

The results showed that the infants cared for in the single family room weighed more at discharge, had a greater rate of weight gain, required fewer medical procedures, and had a lower gestational age at full enteral feed and less sepsis. In addition, these [infants](#) showed better attention, less physiological stress, less hypertonicity, less lethargy, and less pain.

"What we found was that the single family room provides more opportunities to do things that improve outcomes, such as increased maternal involvement and increased developmental support," said Dr. Lester. "If you build a single-family room unit and do not change how you care for the babies, it would be unrealistic to expect to see any significant improvement."

Provided by Women & Infants Hospital

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