Observational Study of Positive Distending Pressure Generated by Humidified High-Flow Nasal Cannula as Compared to Nasal Continuous Positive Airway Pressure

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Introduction

Babies born prematurely, who are hospitalized in the neonatal intensive care unit (NICU), may face significant challenges with breathing because their lungs are underdeveloped. Ventilation delivered by nasal continuous positive airway pressure (NCPAP) requires special nasal prongs which may be uncomfortable and necessitates intensive nursing care. A newer, less invasive alternative is a humidified high-flow nasal cannula (HHNC), which is very well tolerated by the babies and is much simpler to use. It has the potential to deliver continuous positive airway pressure like NCPAP. Although HHNC systems are very popular around the country, almost no information is available to guide their use. This study analyzed chest pressure using NCPAP versus HHNC.

Methods

Those studied were babies in the NICU who had ongoing breathing difficulties that required use of NCPAP and extra oxygen at the time they started the study. The study was nonblinded and observational, with each patient serving as his or her own control. First, pressures delivered by NCPAP were measured and recorded. Then, babies were switched to HHNC, and measurements were made at different flow rates for comparison to NCPAP.

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Lampland Finds Research Has Daily Applications for NICU Care

Andrea Lampland, MD, finds that research in improving treatments for babies who are born prematurely applies to her daily work in a Children's neonatal intensive care unit (NICU).

From 2004 to 2007, Lampland was a University of Minnesota fellow in neonatology at Children's. Part of the fellowship involved research. Lampland was awarded the Stephen J. Boros Fellowship to support her research at Children's – St. Paul under the direction of neonatologist Mark Mammel, MD. She was also awarded a Discovery Labs Fellowship Research Grant during her fellowship. After finishing her training, she joined the neonatology staff in St. Paul.

Like Mammel, Lampland's research interests focus on the respiratory support of newborn infants. In one study, she compared the effectiveness of two types of respiratory support for NICU infants, working closely with Mammel to design and carry out the study. The results of that study are in press and will be published in the medical journal *Critical Care Medicine*. She also designed and worked with the Infant Pulmonary Research Center team on the high-flow nasal cannula study.

"Research into these respiratory interventions for premature babies addresses questions and dilemmas I face every day," says Lampland. She continues to work on new studies and hopes to advance innovations in NICU research at Children's.