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Decreasing sound and vibration during ground transport of infants with very low birth weight

Judy Prehn
William Carey University, USA

Premature infants with very low birth weight (VLBW) are at risk for germinal matrix (GMH) and intraventricular hemorrhage (IVH). Infants with VLBW are most vulnerable to hemorrhage during the first 24 to 72 hours following birth, which is the time they are likely to be transported from local hospitals to regional medical centers. In addition, preterm infants' sensory systems are immature and unable to adapt or habituate to auditory and vestibular input. Premature infants respond negatively to intense sensory stimulation such as sudden, loud sound that can produce an increase in respiration and heart rates, increase in intracranial pressure and decrease in oxygenation. This study measured the effectiveness of modifications to reduce sound and vibration during ground transport of a model infant with VLBW (1368 grams) and prematurity (estimated gestational age 30 weeks). We modified the incubator mattress and found that the combination of a gel mattress over an air chambered mattress was effective in significantly decreasing vibration levels. Infant weight influenced the effectiveness of mattresses in decreasing vibration transmitted to the infant. Modifications that decreased vibration for infants weighing 2000 g were not effective for infants weighing 1368 g. Incubator cover modifications did not decrease sound levels inside the transport incubator, suggesting that sound was transmitted into the incubator as a low-frequency vibration through the incubator's contact with the ambulance floor. Interprofessional collaboration is needed for transport redesign to protect infants born prematurely with VLBW from excessive physical strain during vulnerable periods of brain development.

Biography

Judy Prehn completed her Physical Therapy degree from the Medical University of South Carolina. She completed her Doctoral degree in Rehabilitation Science from the University of Oklahoma Health Sciences Center. Her current research on infant transport was published in the *Journal of Perinatalogy* in 2015. She is a faculty member at William Carey University, where she teaches pediatric physical therapy and motor learning concepts, and continues research activities into developmentally supportive practices for infants born prematurely.

jprehn@wmcarey.edu

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