



Paternal Voice as Regulator of Neurobehavioral Development in Premature Infants

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Abstract: Preterm infants have been observed to suffer from various physiological and neurobehavioral disorders as a result of paternal disruptions due to hospitalization within the NICU. The neurobehavioral developmental disorders are attributed to lack of increased parental interaction and attachments with their premature infants. One study found that absence of maternal voice as a form of auditory sensory deprivation has only been postulated in humans, but research with primate and other nonhuman species has demonstrated dramatic short and long-term physiological and neurobehavioral effects when offspring are either separated and/or subjected to alterations in maternal stimulation.

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Preterm infants have been observed to suffer from various physiological and neurobehavioral disorders as a result of paternal disruptions due to hospitalization within the NICU. The neurobehavioral developmental disorders are attributed to lack of increased parental interaction and attachments with their premature infants.¹ One study found that absence of maternal voice as a form of auditory sensory deprivation has only been postulated in humans,² but research with primate and other nonhuman species has demonstrated dramatic short and long-term physiological and neurobehavioral effects when offspring are either separated^{3,4} and/or subjected to alterations in maternal stimulation.⁵⁻⁶ Noise, procedures and the bright lights of the Neonatal Intensive Care Unit (NICU) represent altered stimulation for preterm infants and have the potential to greatly reduce maternal interaction or stimulation.⁶ To date, we have focused our research on improving health outcomes for preterm infants by providing paternal nurturing (father's voice) while infants remain in the NICU. Based on previous results and other researchers' findings regarding disruptions in maternal nurturing, we now turn our attention to investigate the effect these disruptions appear to have on preterm

neurobehavioral outcomes ranging from progression in feeding to autonomic nervous system development.^{3, 5, 7} Exposure to maternal voice improved weight gain and significantly reduced the number of days to achieve enteral feeds⁸. In addition to quantifying infants' progression to oral feeding, we have been able to reliably measure another indicator of neurobehavioral development: autonomic nervous system development⁹. Weekly measures of high frequency tone varied significantly by the length of exposure to maternal recordings ($p < .05$) with consistently higher levels of tone in infants hearing longer (6 weeks) compared to infants hearing only for 2 weeks. At 33 weeks PMA heart rate varied significantly between groups ($p < .05$). However, little emphasis has been undertaken in evaluating the effect of father's voice on neurobehavioral development in preterm infants. This forms the basis of the research problem statement in which the research undertaken will evaluate whether father's voice can enhance positive neurodevelopment among preterm infants. Undertaking the research will be of vital importance in the sense that it will offer an understanding of how a father's voice can potentially enhance neurobehavioral regulation among preterm infants.

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