



Summer 2016

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Nickens, Kathleen and Fauble, Ceara, "Age, Frequency, and Precautions in Relation to Stimulation in the NICU" (2016). *Occupational Therapy Graduate Student Evidenced-Based Research Reviews*. 8.
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Age, Frequency, and Precautions in relation to Stimulation in the NICU

Kathleen Nickens, OTS and Ceara Fauble, OTS

Case

In a Neonatal Intensive Care Unit (NICU), occupational therapists work with infants and their families to provide the appropriate stimulation and environmental adaptations necessary for growth and development. Occupational therapists are utilized in the NICU setting to contribute to a multidisciplinary approach, as well as focus holistically on an infant's neurobehavioral development, sensorimotor regulation, and developmentally-appropriate occupations. One key component of an occupational therapist's role in the NICU is determining appropriate stimulation in regards to their gestational age and providing protocols to prevent overstimulation.



1 Ask: Research Question

What is the appropriate gestational age, frequency, and precautions to follow when implementing stimulation protocols in the Neonatal Intensive Care Unit (NICU)?

2a Acquire: Search Terms

Patient/Client group: Preterm infants receiving care in a Neonatal Intensive Care Unit (NICU)

Intervention: Sensory stimulation, ATVV (Auditory, Tactile, Visual, Vestibular programs)

Comparison: Sensory stimulation/ATVV programs in conjunction with routine care versus receiving only routine care

Outcome: Developmental advances, feeding progression, neuromotor development, neurobehavioral development, sensorimotor development, alertness/arousal, length of stay, mother-infant interaction during play and feeding

2b Acquire: Selected Articles

White-Traut et al. (2013): A randomized clinical trial (RCT) that examined the impact of the H-HOPE intervention on mother-premature infant interaction patterns 6-weeks corrected age (CA).

White-Traut et al. (2002): A randomized controlled trial (RCT) to determine whether an auditory, tactile, visual, and vestibular intervention (ATVV) reduced the length of hospitalization of 37 preterm infants by increasing the proportion of alert behavioral states, thereby improving their feeding progression.

Kanagasabai et al. (2013): A randomized block design to investigate the effect of ATVV on neuromotor development in preterm infants.

3a Appraise: Study Quality

White-Traut et al. (2013): Preponderant. Large sample size, N=198. Significant findings related to H-HOPE intervention paired with ATVV protocols on mother-infant interaction.

White-Traut et al. (2002): Preponderant. Small sample size, N=37. Significant findings related to ATVV intervention and length of stay, alertness, and feeding progression.

Kanagasabai et al. (2013): Preponderant. Small sample size, N=50. Significant findings related to ATVV as a multisensory stimulation intervention and an increase of neuromotor scores.

3b Appraise: Study Results

Literature from the studies suggest that developmental programs involving sensory stimulation should begin at 33 weeks of gestational age, as this is the age when most sensory pathways are fully developed. Auditory, tactile, visual, and vestibular (ATVV) programs previously discussed are appropriate starting points for infants, consisting of ten minutes of, tactile stimulation, followed by five minutes of vestibular stimulation, while engaging the infant with auditory and visual stimulation throughout the entire fifteen minutes.

By monitoring the infant's heart rate, behavioral state, sleep patterns, and feeding progression, healthcare practitioners and caregivers can adjust the amount of stimulation an infant receives. In doing so, care providers are able to optimize the effectiveness of ATVV programs on growth and development, as well as, recognize and prevent overstimulation of the infant as it nears corrected age.

4 Apply: Conclusions for Practice

Based on the evidence of the effectiveness of stimulation protocols when implemented at 33 weeks of gestational age, occupational therapists should be proactive, yet cautious during implementation of stimulation. Practitioners must utilize their clinical reasoning skills, as well as monitor the infant's particular responses, in order to recognize and adapt to the infant's particular medical and developmental needs. Lastly, evidence suggests that stimulation protocols, such as the ATVV programs, must be thought of as a collaborative approach to intervention among health care practitioners and the infant's family members.

References:

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White-Traut, R., Norr, K. F., Fabyi, C., Rankin, K. M., Li, Z., & Liu, L. (2013). Mother-infant interaction improves with a developmental intervention for mother-preterm infant dyads. *Infant Behavior & Development*, 36, 694-706. doi:10.1016/j.infbeh.2013.07.004

Stimulation protocols should be implemented beginning at 33 weeks gestational age to promote the well-being and development of infants in the NICU, while monitoring the infant's physiological responses, behavioral state, sleep patterns, and feeding progression to prevent overstimulation.

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