Abstract

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Project Title: Preterm Infants: Light Effects on Health and Development

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Abstract: DESCRIPTION (provided by applicant): Health and developmental outcomes vary even among the healthiest preterm infants. These variations in outcome have led to speculation that the neonatal intensive care unit environment, and light in particular, may impact outcomes. Recently, cycled light has shown short-term benefits over near darkness, but it is unclear at what gestational age cycled light should be initiated and whether these benefits continue long term. Some evidence suggests that at 28-weeks gestational age the visual sensory system is capable of handling light stimulation since the brain has a full complement of neurons, migration and differentiation is beginning, and the suprachiasmatic nuclei is innervated by the retina and responsive to light. The proposed study evaluates the timing and effects of early versus late cycled light throughout hospitalization on short-and long-term health and developmental outcomes in infants born at < 28 weeks gestation. Utilizing a longitudinal randomized experimental design, 140 infants will be assigned to either: (1) early cycled light (28 weeks post-conceptional age [PCA]) or (2) late cycled light (36 weeks PCA). Infants will be followed throughout hospitalization to evaluate the short-term outcomes of weight gain, number hospital days, sleep-wake state development, retinopathy of prematurity, and auditory acuity. Infants will be followed after discharge until 24 months corrected age to evaluate weight gain, sleep patterns, visual acuity, development (cognitive, motor, language) and neurological outcomes. Data, a mixture of continuous and categorical variables, will be analyzed using mixed general linear models, generalized estimating equations, multiple analysis of variance, and chi-square. Preterm infants receiving early cycled-light are expected to have better outcomes because they will receive cycled light when it can be utilized. While most NICUs across the country modify the light environment in some fashion, a national standard of care for environmental light does not exist, therefore it is important to determine when cycled light or near darkness is most appropriate.

Thesaurus Terms: