

[NM-238] Sleep-wake cycles of children after major surgery: An actigraphic analysis

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Background and Objective: Children admitted to the PICU after surgery and anesthesia are exposed to a multitude of risk factors for sleep disruption, including surgical pain, residual effects of anesthesia, noise, light and frequent ICU interventions. This sleep disruption may have a negative effect on recovery. The overall objective of this study is to characterize the sleep patterns of infants and children in the hospital after major cardiac, orthopedic or urologic surgery using actigraphy and describe changes in sleep-wake cycles from PICU admission to hospital discharge. We hypothesized that long-term continuous actigraphy will demonstrate significant disruption of sleep-wake cycles with prolonged recovery to normal cycles after PICU and hospital discharge.

Methods: 50 children admitted post-operatively to the PICU after undergoing surgery for major cardiac, orthopedic or urologic procedures had actigraphy monitoring placed on post-operative day #1, with continuation of monitoring through hospital discharge

Measurements and Main Results: Sleep was severely fragmented in the PICU with a lack of day-night cycle, with several awakenings during nighttime hours. This fragmentation improved over time through transfer to the floor, although sleep fragmentation persisted. Increased sleep fragmentation was associated with increased length of mechanical ventilation and exposure to sedatives and analgesics.

Conclusions: Children admitted to the PICU after anesthesia for major surgery experience severe sleep disturbances that may have important implications for outcomes. Future studies will investigate the effect of specific anesthetic regimens, sedatives and analgesics on sleep-wake cycles as well as the role non-pharmacologic sleep hygiene protocols to improve sleep during recovery.
