



KEY POINT SUMMARY

OBJECTIVES

This study sought to test how acoustical foam effected noise levels in the incubator and examine infants' responses to changes in environment noise.

Neonatal Response to Control of Noise Inside the Incubator

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Key Concepts/Context

Premature infants are at risk for long-term neurologic, cognitive, and behavioral problems. Therefore, supporting these medically fragile infants as they adapt to life outside the womb by decreasing possible environmental stressors, such as noise, is important. The American Academy of Pediatrics (AAP) Committee of Environmental Hazards recommends that neonatal intensive care unit (NICU) sound levels below 45 dB. Yet these babies are often in incubators, which are associated with higher sound levels from the equipment and surrounding environment.

Methods

This study was a repeated measure, within subject, ABA comparative design.

The researcher collected data using a convenience sample of premature infants who were medically stable over 14 months from 1997 to 1999 at a large suburban community hospital located in the Mid-Atlantic region.

Each baby was put in an Ohmeda Care Plus incubator at least 12 hours before the study. The researcher placed a sound meter in an unobtrusive spot in each incubator and collected data between 12:00 p.m. and 4:00 p.m., as well as patient demographics. The author measured sound levels, oxygen saturation, and infant states and recorded the measurements every 2 minutes during three study conditions: per-study neonate in incubator (10 minutes), neonate in incubator with 5 x 5 x 1 inch acoustical foam placed in each of four corners (20 minutes), and poststudy recovery of neonate in incubator with foam removed (10 minutes).

Data were analyzed using SPSS 8.0 statistical software package for Windows.



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Findings

The study found that when the foam was used, the noise levels decreased by 3.27 decibels. The author notes that, while the foam decreased environmental noise levels in the incubator, those levels did not return to baseline immediately based on the principles of rebounding sound wave transmittal within the closed system incubator.

The author notes that the foam also improved oxygenation by more than one percentage point for the infants, and the effect continued for 10 minutes after the foam was removed. However, the author points out that the change can't be correlated with the intervention, as most people fluctuate with a range of normal.

At the onset of the study, the mean state was drowsy, semi dozing, but changed to a light REM sleep when the foam was used. The effect lasted for 10 minutes after the foam was removed.

Limitations

Study limitations prohibit generalization of the findings.

Design Implications

Although the findings were statistically significant, careful consideration must be taken in making recommendations for clinical practice. The overall effect of the foam must be compared with the cost. And while the foam helped to reduce noise, the overall noise level exceeded the recommended 45 dB. Designers must be aware of the fragile nature of the NICU environment as they space plan and make interior finish-material recommendations. Although the material used in this study was located directly within the incubator environment, results are compelling as it relates to the use of this material in other applications.