Roar No More: A Quality Assurance Project to Reduce Sound Levels in the NICU

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Background & Significance

An important area of concern for neonatal nurses is the delivery of developmentally sensitive care to infants in the Neonatal Intensive Care Unit (NICU). This means customizing care to the needs and sensitivities of each infant by accounting for gestational stage of development as well as individual responsiveness to handling and care provision. Sound protection for infants is an important aspect of developmental care. Excessive sound levels above 70dBA have been associated with detrimental physiological effects such as decreased heart rate and saturation levels. In addition, exposure to increased sound levels significantly decreases the duration of quiet/deep sleep. It is the current recommendation of the Consensus Committee on Recommended Standards for Newborn ICU Design that sound levels be kept at 45 dBA with transient sounds not to exceed 65 dBA in order to preserve a large portion of each hour for infant sleep. The purpose of this quality assurance project is to evaluate the current level of environmental sound exposure for infants and staff in the NICU at Penn State Children's Hospital following an educational intervention on sound awareness and to offer recommendations to staff for sound reduction.

Methods

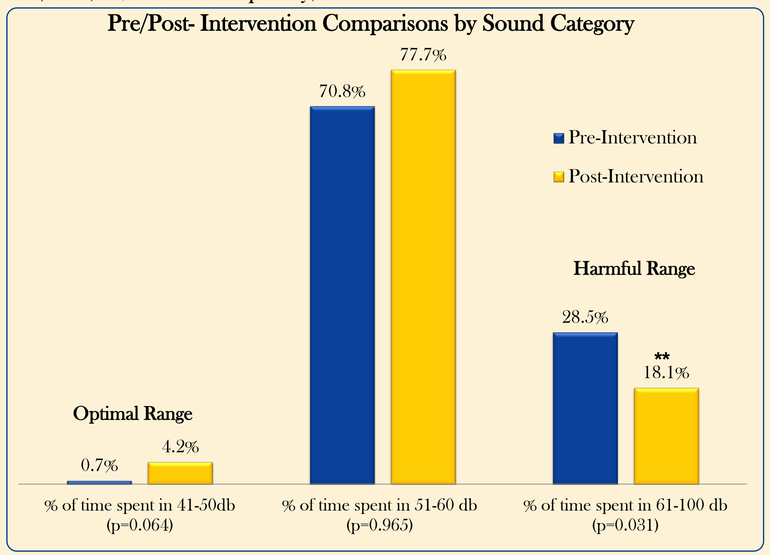
This descriptive pre/post intervention design used the following measurement approach:

- A calibrated Extech Sound Level Meter® Model 407764 was used at frequency A Fast Mode to record decibel (dBA) levels of sound in 15 min increments 80-95cms from the edge of the infant's crib space.
- Sound audits were obtained during expected peak activity times of 0200-0500, 0730-1030,1530-1830 and at geographic locations in proximity to high activity areas throughout the NICU.

The intervention consisted of a mandatory staff nurse CE program on sound awareness, implementation of sound protective measures (padding trashcans/hampers, adjusting monitor and IV pump alarm levels to safety standards), posting "Quiet Zone" signs in key activity areas, and wearing "Roar No More" quiet awareness buttons.

Results

- Sound level audits were taken during an average daily census at pre-intervention of 25/36 (69% bed occupancy) and post-intervention of 26/36 (72% bed occupancy).



- By independent samples *t* test there was a significant difference between pre/post intervention sound audits in the 61-100dB range (p=0.031).

Mean Relative Change Post-Intervention By Shift		
Day Shift	Evening Shift	Night Shift
• 66% less time in 61-100 db	• 8% less time in 61-100 db	• 47% less time in 61-100 db

- While day and night shift audits showed a dramatic reduction in sound levels in the harmful range post-intervention, evening shift sound audits showed minimal change post-intervention.

Conclusions

The results showed that after a staff CE program on sound awareness and implementation of sound protective measures there was a significant reduction in sound levels within the harmful range. However, post-intervention more than 75% of measured ambient sound levels were in a range above those recommended for promoting infant sleep and well-being. Thus, ongoing strategies to reduce sound are needed.

Clinical Implications

- Promote staff participation in ongoing sound awareness education.
- Remove barriers to physician/nurse participation in these programs.
- Provide increased support and role modeling of quiet behaviors in NICU for new nurses/physicians, ancillary staff, and families.
- Encourage committee work to enforce standards of safety regarding sound levels in the NICU.
- Explore approaches to improve efficiency in care delivery and communication as an intervention to reduce sound levels.
- Consider NICU design modification strategies to reduce sound.

Selected References

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