



## KEY POINT SUMMARY

### OBJECTIVES

To determine if NICU sound levels are lower in an enclosed space as opposed to an open space.

## The Influence of Neonatal Intensive Care Unit Design on Sound Level

Chen, H.-L., Chen, C.-H., Wu, C.-C., Huang, H.-J., Wang, T.-M., Hsu, C.-C., 2009 | *Pediatrics & Neonatology*. Volume 50, Issue 6, Pages 270-274

### Key Concepts/Context

Preterm infants receiving care in neonatal intensive care units (NICUs) are especially susceptible to adverse effects caused by excessive noise. Previous studies indicate that the physical designs of NICUs themselves hold a large influence over the overall noise level. Further research is needed to better understand how NICUs can be designed to reduce noise levels while maintaining high levels of care quality and overall operational efficiency.

### Methods

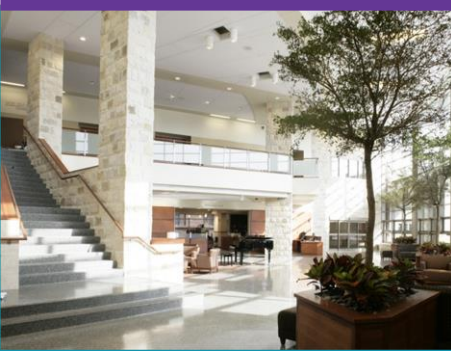
Sound-level meters installed near patient beds (both in an enclosed NICU space and an open NICU space of identical size) continually gathered sound level data over a 24-hour period. The enclosed room featured cement walls with one door, while the open space was situated near a nursing station and featured wooden closets acting as patient bed dividers. Patients were randomly assigned to rooms and beds based on availability. A total of five patients and four mechanical ventilators were involved in the study during the day of sound measurement. Sound levels were measured in A-weighted decibels.

### Findings

The enclosed NICU space had consistently lower noise levels than the open space, indicating that enclosed rooms that allow for as much personalized patient space as possible may be ideal for overall noise reduction.

### Limitations

All data from this study were gathered over a 24-hour period in a single NICU. Noise levels may vary greatly depending on the day and general occupancy of the



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observed rooms; the data observed in this single study may not accurately reflect the patterns of noise in all NICUs featuring both open and enclosed spaces. Private patient rooms, especially in NICUs, not only are less susceptible to high noise levels but also afford patients and families a degree of privacy.

### Design Implications

Since the noise level within a facility depends in large part on the physical environment, designers may consider a wide range of design decisions (ranging from simple to complex) in order to improve the sonic environment. Printers, telephones, and computers could be relocated within sensitive units such as NICUs to minimize their proximity to patients. Alarm volumes could be lowered, and doors could be designed to close more quietly.

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