



KEY POINT SUMMARY

OBJECTIVES

Examine the impact of design changes from closed-bay to open-bay infant units on staff behavior in a NICU.

Predesign and Post-Occupancy Analysis of Staff Behavior in a Neonatal Intensive Care Unit

Shepley, M.M.

2002 | Children's Health Care

Volume 31, Issue 3, Pages 237-253

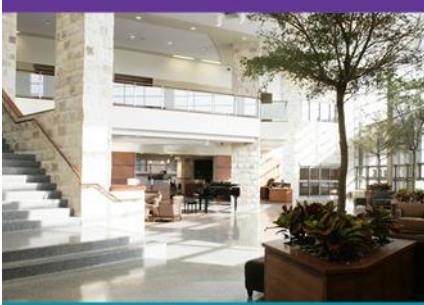
Key Concepts/Context

Advances in technology have resulted in an increase in the neonatal intensive care unit (NICU) population; allowing care for newborn babies who might have died in the absence of advanced medical care. The design of NICUs has therefore become an important concern in healthcare, and an ongoing debate is the merit of open bays over closed bays. Changes in design have a direct impact on staff experience, and potentially staff behavior, which in turn can impact patient care. The purpose of the study was to provide research data to support a knowledge-based approach to NICU design, with a focus on staff behavior in open bay compared to closed bay units.

Methods

Predesign research on the pre-existing closed-Bay NICU was conducted in July 1993. The post occupancy of the open floor plan redesign of closed bays units evaluation was taken in 1996-1997, after the new facility was occupied for more than a year.

The study utilized multimethodology approach, including behavioral mapping, questionnaires, interviews, and calibrated measures of walking (pedometers), noise and temperature. T-tests were conducted on obtained data. For behavioral mapping, observations over 3 hour period were taken. For questionnaires nominal Likert-type-scale and open-ended questions were asked.



The Center for Health Design: Moving Healthcare Forward

The Center for Health Design advances best practices and empowers healthcare leaders with quality research providing the value of design in improving patient and performance outcomes in healthcare facility planning, design, and construction, optimizing the healthcare experience and contributing to superior patient, staff, and performance outcomes.

Learn more at
www.healthdesign.org

Findings

- The amount of time staff spent working with babies and families in 1996-97 (new NICU unit) was more, but not significant statistically.
- The ratio of time spent traveling to a total unit area was less in open plan bay though the amount of time staff spent walking was not less.
- The amount of time staff spent washing hands increased significantly in open-bay units.
- Large increases in transactions of nurses with infants in the new unit (open-bay) were found.
- Family room had a lot of use, but family showers didn't. Families rarely used medical gases located in family rooms.
- Breast feeding room was used frequently.
- Well-baby nursery was underused.
- Decentralized storage of supplies did not work. The amount of time dedicated to storage and supplies activities did not decrease, individual activities performed by staff were quicker.
- Staff area, intensive care unit and exam room were rated highly.
- Rolling equipment monitor cart was underused.

Limitations

- Behavioral mapping data was limited due to unpredicted field conditions and protocol of disregarding a few minutes of data at the beginning of observation due to preparation.
- Small sample size in the original unit
- Pedometers were not sufficiently accurate.
- Handwritten recording of data had opportunity of human error transfer to statistical programs.

Design Implications

- Staff time spent working with families or infants is not impacted by whether NICU layout is open-bay or closed-bay
- Open-bay units promote staff handwashing which has infection control implications
- Open-bay unit design promotes the amount of time staff spends with infants.
- Family room at NICUs promotes parent-infant interaction.
- Breast feeding room promotes parent-infant interaction.
- Decentralized storage of supplies does not decrease the amount on time staff spends with supplies; however individual activities performed by staff become quicker.