



KEY POINT SUMMARY

OBJECTIVES

To determine whether visibility of patients correlates with mortality and/or other clinical outcomes.

Relationship Between ICU Design and Mortality

Leaf, D. E., Homel, P., Factor, P. H., 2010 | *Chest*. Volume 137, Issue 5, Page 1022-1027

Key Concepts/Context

While it is widely accepted that the architectural design of healthcare facilities can influence patient health outcomes, there is a lack of research exploring whether patients receiving treatment in intensive care unit (ICU) beds with poor visibility from a central nursing station have different health outcomes compared to patients with greater visibility to healthcare staff.

Methods

This study took place in a large urban hospital that accepts patients 24 hours a day. 664 patients were included in this study. Data were gathered from January to December in 2008. Patients were not allocated to specific rooms based on severity of condition, excluding a small number of patients placed in a negative pressure room for treatment. APACHE II ratings were used to quantify the severity of the patient illnesses. Residents worked with a critical care fellow seven days a week for eight weeks each year while the nurses worked 12-hour shifts and were assigned to patients on a 1:3 or 1:2 ratio. A fully-staffed day at the ICU has six or seven nurses on shift, each with one 60-minute lunch break and two 15-minute breaks. The 12 patient rooms in the ICU were categorized as low-visibility rooms (LVRs) and high-visibility rooms (HVRs) based on their location relative to the central nursing station. The primary measurement of the study was patient mortality (death before hospital discharge), while secondary measurements were ICU mortality (death in the ICU specifically, and overall ICU length of stay (LOS)). Researchers cross-checked their data logs of patient admissions and discharges with the hospital's own records to ensure accuracy.



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Findings

Severely ill patients (APACHE II > 30) had significantly higher hospital mortality rates when assigned to LVRs when compared to similarly ill patients treated in HVRs (82.1% and 64.0%, respectively). For this same subgroup of patients, ICU mortality rates were significantly higher in those assigned to LVRs compared to those treated in HVRs (66.7% and 46.7%, respectively). No difference in patient LOS was found in overall and subgroup analysis.

Limitations

The authors note that this study did not examine whether differences in patient outcomes were due to clinical deterioration, decreased time spent by healthcare workers at the patient bedside, or other variables. This study took place in a single location over a relatively short period of time; therefore, as with most studies, its results may not be universally applicable to all ICUs.

Design Implications

This study suggests that installing additional mobile computer stations for nurses closer to patient rooms could be a more practical solution for enhanced visibility, as opposed to a complete redesign of the ICU itself. Equipping low-visibility patient rooms with bedside video monitoring systems is another way to improve visibility that is gaining popularity as the demand for ICU beds exceeds the supply of physicians.

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