



KEY POINT SUMMARY

OBJECTIVES

The objective of this research was to compare the rates of acquisition of infectious organisms in an ICU before and after patients were moved from multi-bed rooms to single-bed rooms.

Infection Acquisition Following Intensive Care Unit Room Privatization

Teltsch, D. Y., Hanley, J., Loo, V., Goldberg, P., Gursahaney, A., & Buckeridge, D. L. 2011 | *Archives of Internal Medicine*. Volume 171, Issue 1, Pages 32-38

Key Concepts/Context

The authors state that healthcare-associated infections (HAIs) affect about 30% of patients in intensive care units (ICUs), subsequently affecting patient outcomes. Although single-patient rooms are recommended by the Facilities Guidelines Institute, the American Institute of Architects Academy of Architecture for Health and the U.S. Department of Health and Human Services, the authors indicate that studies on the effect of the single-bed room on rates of infection have been inconclusive. This study was conducted in two hospitals. The intervention hospital was the facility where its patients had been moved to a new ICU unit with single-patient rooms; the comparison hospital was under the system that featured multi-bedded ICU rooms. Data analysis showed that the rate of acquisition of bacteria and yeast decreased by 50% in the new unit having single-patient rooms.

Methods

Montreal General Hospital (MGH) in Quebec, Canada, replaced its multi-bed older ICU with a new ICU with single-patient rooms in 2002 – this was the intervention hospital. The Royal Victoria Hospital (RVH) located a mile away serves the same community and has multi-bed ICUs – this was the comparison hospital. The two hospitals shared the same infection control service, policies, and practices. The patient- nurse ratio was the same in both hospitals. Three types of data were collected (for both hospitals) from three different sources; 1) admission times of patients to specific beds, transfers to other beds, and discharge times from the admissions-discharge database; 2) results of testing for microbes and yeasts for all ICU patients from the laboratory information system; and 3) information on patient infections from the ICU information system. The patient volume remained constant both before and after the move in both hospitals. The data was collected for patients admitted to the two ICUs between 2000 and 2005. The data was analyzed statistically, using regression models.



Findings

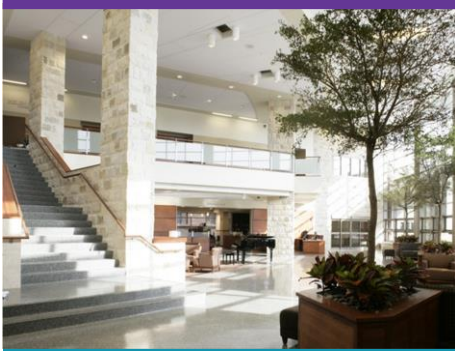
The following were the findings of the study:

- In MGH, 3084 incident-positive cultures for different bacteria and yeast were found in the ICU in the study period, while in RVH, 2513 were found.
- Between 2002 and 2004, both hospitals experienced a bacterial epidemic which increased the number of acquisition cases. The average length of stay (LOS) at RVH steadily increased, whereas in MGH, the average LOS fluctuated without increasing.
- The number of patients who acquired *Clostridium difficile*, vancomycin resistant enterococcus species (VRE), and methicillin-resistant *Staphylococcus aureus* (MRSA) infections (from external sources) decreased after moving to the new ICU at MGH. The acquisition rate of *Acinetobacter* species also decreased. There was a reduction in acquisition rates of other externally sourced bacteria and fungi, but these were not statistically significant.
- There was a statistically significant decrease in patients acquiring infections from yeast, *Enterobacter* and *Klebisella* species (source: either external or patient's body). There was a decrease in the acquisition rates of other such bacteria, but these were not statistically significant.
- The move to the new ICU unit did not affect the rate of bacteria otherwise commonly found in a patient's body.

Limitations

The authors considered the following to be limitations of their study:

- Although acquisition was considered a more sensitive method of detecting the presence of bacteria in a patient rather than infection rates, the difference in time between the acquisition of a bacteria and its colonization (leading to infection) depends on factors other than transmission.
- The bacterial epidemic that affected the two ICUs in the post-intervention period impacted the data. However, it is noted that infection control measures used in both facilities were the same following the epidemic.
- Most ICU patients had spent time in hospital wards prior to their move to ICUs. Routine cultures for infections were not conducted on their admission to the ICUs.



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Design Implications

Single-bed patient rooms in ICUs (and the resultant decrease in patient transfers) were considered more effective in reducing infections. The design of these patient rooms may take into account accessible sinks (both inside and outside the rooms) to promote improved hand hygiene compliance as well as features to promote infection control practices such as ease of cleaning.

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