



## KEY POINT SUMMARY

### OBJECTIVES

To determine if introducing a single-patient room policy decreases multi-drug-resistant bacteria transmission rates within an intensive care unit.

## Impact of single room design on the spread of multi-drug resistant bacteria in an intensive care unit

Halaby, T., Al Naiemi, N., Beishuizen, B., Verkooijen, R., Ferreira, J. A., Klont, R., Vandenbroucke-Grauls, C. 2017 | *Antimicrobial Resistance and Infection Control*. Volume 6, Issue 117, Pages 1-10

### Key Concepts/Context

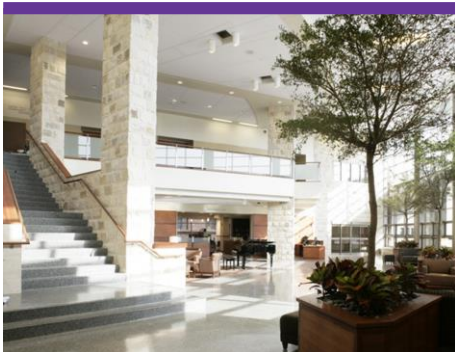
Previous studies have explored how intensive care units (ICUs) can foster cross-contamination of hospital-borne pathogens, and how isolating contaminated patients, coupled with the promotion of hand hygiene procedures, can mitigate the frequency of these contaminations. Various environmental factors, frequent invasive procedures, and instances of under-staffing have been identified as causes for higher levels of cross-contamination in ICUs. Further research is needed to explore whether or not the use of single-patient rooms themselves can help mitigate cross-contamination in an ICU. Through a retrospective study, the authors of this paper explore the long-term persistence of multi-drug-resistant gram-negative (MDR-GN) organisms within an ICU, even while extensive infection control precautions were in place.

### Methods

Data on the prevalence of MDR-GN bacteria from two time periods were retrospectively analyzed. Data from 2002 to 2009 accounted for the old ICU structure, which featured five single-patient rooms, while data from 2009 to 2013 accounted for the new ICU structure, which featured 18 single-patient rooms. Prevalence of MDR-GN bacteria was assessed through routine patient screenings that took place during admission and every two weeks afterward.

### Findings

After comparing data on the presence of MDR-GN in both the “old” and “new” ICU layouts, a significant decrease in MDR-GN presence was found in the “new” ICU layout. No significant changes to the number of ICU admissions occurred between these two periods. Considering the significant and sustained decrease in MDR-GN



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presence following the introduction of 13 additional single-patient rooms in the “new” ICU, the authors conclude there is substantial evidence indicating that single-room designs and policies can mitigate cross-contamination.

### Limitations

All data used in this study was retrospectively gathered and analyzed; reliance on hospital records and databases might not produce perfectly accurate figures. This study took place in one ICU; different ICUs may see different results depending on size, location, staffing, admissions numbers, and a variety of other factors.

### Design Implications

With or without any other extensive infection control procedures in place, the results from this study provide evidence for the efficacy of single-patient rooms in mitigating costly and dangerous cross-contaminations within ICUs, even with regard to drug-resistant bacteria. Single-patient rooms offer more variability for treatment options, and can even be designed with enhanced noise reduction in mind, potentially improving staff, patient, and institutional well-being in general.

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