



TITLE: Single-Bed versus Multi-Bed Rooms for the Prevention of Hospital Acquired infections: Clinical Effectiveness and Guidelines

DATE: 28 May 2013

RESEARCH QUESTIONS

1. What is the clinical evidence for the effectiveness of treating patients in a single-bed hospital room compared with a multi-bed room or a hallway bed, in order to prevent or reduce the risk hospital acquired infections?
2. What are the evidence-based guidelines regarding treating patients in a single-bed hospital room compared with a multi-bed room or a hallway bed in order to prevent or reduce the risk of hospital acquired infections?

KEY MESSAGE

One systematic review and four non-randomized studies were identified regarding the effectiveness of treating patients in a single-bed hospital room compared with a multi-bed room or a hallway bed, in order to prevent or reduce the risk hospital acquired infections.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library (2013, Issue 4), University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2008 and May 15, 2013. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

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RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

One systematic review and four non-randomized studies were identified regarding the effectiveness of treating patients in a single-bed hospital room compared with a multi-bed room or a hallway bed, in order to prevent or reduce the risk hospital acquired infections. No health technology assessments or randomized controlled trials were identified. Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

A decrease in the acquisition and transmission of infectious organisms (including *Clostridium difficile*,⁴ vancomycin-resistant *Enterococcus* species,⁴ and methicillin-resistant *Staphylococcus aureus*^{4,5}) between patients in intensive care units was observed with the use of single-patient rooms,³⁻⁵ particularly upon conversion from a multi-bed design.⁴

In the pediatric setting, one systematic review was identified but did not find any evidence to either validate or negate the use of cohorting or room isolation measures in neonates infected or colonized with candida.¹ In contrast, one non-randomized study indicated that a single family room in the neonatal intensive care unit resulted in reduced nosocomial sepsis and mortality.²

REFERENCES SUMMARIZED

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-analyses

1. Pammi Mohan, Eddama Oya, Weisman Leonard E. Patient isolation measures for infants with candida colonization or infection for preventing or reducing transmission of candida in neonatal units. Cochrane Database Syst Rev [Internet]. 2011 [cited 2013 May 23]; CD006068. Available from: <http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD006068.pub3/abstract>. Structured abstract available from: http://www.crd.york.ac.uk/NIHR_CRDWEB/ShowRecord.asp?AccessionNumber=1000006068&UserID=0

Randomized Controlled Trials

No literature identified.

Non-Randomized Studies

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3. Levin PD, Golovanevski M, Moses AE, Sprung CL, Benenson S. Improved ICU design reduces acquisition of antibiotic-resistant bacteria: a quasi-experimental observational study. Crit Care [Internet]. 2011 [cited 2013 May 23];15(5):R211. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3334755>
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4. Teltsch DY, Hanley J, Loo V, Goldberg P, Gursahaney A, Buckeridge DL. Infection acquisition following intensive care unit room privatization. Arch Intern Med. 2011 Jan 10;171(1):32-8.
[PubMed: PM21220658](#)
5. Cheng VC, Tai JW, Chan WM, Lau EH, Chan JF, To KK, et al. Sequential introduction of single room isolation and hand hygiene campaign in the control of methicillin-resistant Staphylococcus aureus in intensive care unit. BMC Infect Dis [Internet]. 2010 [cited 2013 May 23];10:263. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2944349>
[PubMed: PM20822509](#)

Guidelines and Recommendations

No literature identified.

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APPENDIX – FURTHER INFORMATION:

Non-Randomized Studies – Patient Cohorting

6. Ashish A, Shaw M, Winstanley C, Humphreys L, Walshaw MJ. Halting the spread of epidemic pseudomonas aeruginosa in an adult cystic fibrosis centre: a prospective cohort study. JRSM Short Rep [Internet]. 2013 Jan [cited 2013 May 23];4(1):1. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3572656>
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[PubMed: PM22856512](#)
8. Griffiths AL, Wurzel DF, Robinson PJ, Carzino R, Massie J. Australian epidemic strain pseudomonas (AES-1) declines further in a cohort segregated cystic fibrosis clinic. J Cyst Fibros. 2012 Jan;11(1):49-52.
[PubMed: PM21907639](#)
9. Kassis-Chikhani N, Saliba F, Carbonne A, Neuville S, Decre D, Sengelin C, et al. Extended measures for controlling an outbreak of VIM-1 producing imipenem-resistant Klebsiella pneumoniae in a liver transplant centre in France, 2003-2004. Euro Surveill. 2010 Nov 18;15(46).
[PubMed: PM21144428](#)
10. Morgan H. Single and shared accommodation for young patients in hospital. Paediatr Nurs. 2010 Oct;22(8):20-4.
[PubMed: PM21066944](#)
11. Apisarnthanarak A, Pinitchai U, Thongphubeth K, Yuekyen C, Warren DK, Fraser VJ, et al. A multifaceted intervention to reduce pandrug-resistant acinetobacter baumannii colonization and infection in 3 intensive care units in a Thai tertiary care center: a 3-year study. Clin Infect Dis. 2008 Sep 15;47(6):760-7.
[PubMed: PM18684100](#)

Guidelines - Patient Isolation

12. Joanna Briggs Institute. The effectiveness of isolation measures of patients infected with vancomycin resistant enterococcus (VRE) or multi-resistant gram negative bacteria (MRGN) in reducing the length of hospital stay and in reducing the spread of infection to other patients [Internet]. Adelaide: National Health and Medical Research Council, Australian Government; 2009 [cited 2013 May 23]. Available from: [http://www.nhmrc.gov.au/files_nhmrc/file/guidelines/Infection%20Control%20Guidelines/cg_attachment%20a\(iii\)%20-%20Isolation%20and%20MROs%20-%20JBI%20systematic%20review.pdf](http://www.nhmrc.gov.au/files_nhmrc/file/guidelines/Infection%20Control%20Guidelines/cg_attachment%20a(iii)%20-%20Isolation%20and%20MROs%20-%20JBI%20systematic%20review.pdf)

Guidelines – Methodologies Unclear

13. Rose P, Blythe S. Use of single rooms on the children's ward, Part 2: Guideline for practice. *Paediatr Nurs*. 2009 Feb;21(1):31-5.
[PubMed: PM19266781](#)

Position Statements

14. CHICA-Canada position statement: healthcare facility design position statement [Internet]. Winnipeg (MB): CHICA-Canada; 2008 [cited 2013 May 23]. Available from:
<http://www.chica.org/pdf/HFDposition.pdf>
See: Statement 4 and 5

Review Articles

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[PubMed: PM20647797](#)
16. Ulrich RS, Zimring C, Zhu X, DuBose J, Seo HB, Choi YS, et al. A review of the research literature on evidence-based healthcare design. *HERD*. 2008;1(3):61-125.
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Additional References

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[PubMed: PM18821886](#)
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[PubMed: PM18440417](#)
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<http://www.cdc.gov/mrsa/prevent/healthcare/precautions.html>
See: Contact Precautions 1) Patient Placement