The infection control management of MRSA in acute care

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CRD summary
This review found that multifaceted interventions could reduce transmission of methicillin-resistant Staphylococcus aureus (MRSA) both during outbreaks and in settings where MRSA was endemic. The authors reported that the varied combinations of interventions used and methodological weaknesses of the studies made it difficult to make specific recommendations for practice. These conclusions reflect the limitations of the evidence and appear reliable.

Authors' objectives
To systematically review the best available research regarding the efficacy of infection control practices for controlling endemic methicillin-resistant Staphylococcus aureus (MRSA) and MRSA outbreaks in acute hospitals.

Searching
The authors searched MEDLINE, CINAHL, EMBASE, the Cochrane Library and the Joanna Briggs Institute Evidence Library to August 2005. Search strategies were reported in an appendix. Reference lists of retrieved articles were screened for additional studies and a number of journals (listed) were searched by hand. Searches were restricted to English language studies.

Study selection
Studies of any design that focused on infection control measures for endemic MRSA or nosocomial outbreaks of MRSA in acute care settings were eligible for the review. Studies could involve patients of any age. Interventions had to be clearly defined and implemented after collection of baseline data. The main outcome of interest was the presence or absence of a change in the rate of nosocomial MRSA acquisition following the intervention. Studies that failed to meet a quality threshold were excluded (see 'Validity assessment').

Included studies dealt with both endemic MRSA and MRSA outbreaks. All evaluated a range of infection control measures, details of which varied between studies. Intervention duration ranged from two to 27 months for MRSA outbreaks and six to 53 months for endemic MRSA.

One reviewer selected studies for the review. A second reviewer was consulted in cases of uncertainty.

Assessment of study quality
Studies were initially assigned a level of evidence based on their study design. Studies of level III and IV (non-randomised comparative studies and case series) were assessed for quality using a specifically designed quality tool. This covered description of the sample, setting, method of sampling, history of MRSA, type of study method of data collection, cleaning regime, research design, blinding, type of analysis, clinical significance and consistency of results. Studies scoring less than 29 out of a possible 36 points were excluded from the review.

Validity assessment was performed by two independent reviewers.

Data extraction
Data were extracted by two independent reviewers using a standard form. Discrepancies were resolved by discussion with a third reviewer.

Methods of synthesis
Studies were synthesised narratively by type of intervention. Studies of MRSA outbreaks and endemic MRSA were treated separately. Differences between studies were shown in tables and discussed in the text.

Results of the review
Eleven studies were included in the review, of which five dealt with MRSA outbreaks and six with endemic MRSA. All
the studies used non-randomised comparative or descriptive designs.

The studies provided limited information on the effectiveness of individual interventions for controlling MRSA outbreaks. All the studies of endemic MRSA reported significant improvements in outcomes following application of an intervention but differences in outcomes and interventions made it difficult to draw comparisons between studies.

Authors' conclusions
The use of multifaceted interventions can reduce nosocomial transmission of MRSA both during outbreaks and in settings where MRSA is endemic. The varied combinations of interventions used and methodological weaknesses of the studies make it difficult to aggregate data and develop specific recommendations for practice.

CRD commentary
The review had clear but broad inclusion criteria for interventions and study designs. These seem appropriate to the topic and the range of available evidence. The authors searched a range of relevant sources but no attempt was made to locate unpublished studies. The authors mentioned publication bias as a possible factor in the review, but risk of publication bias was not evaluated. Only English language studies were included, so the review could be at risk of language bias. Validity was assessed and used as an inclusion criterion, which suggests that the review was limited to the best available studies. Measures were taken to minimise errors and bias during the review process. Relevant details of included studies were presented. The authors' decision to perform a narrative synthesis appropriately reflected the heterogeneity of the included studies. The authors' conclusions reflect the limitations of the evidence and are likely to be reliable.

Implications of the review for practice and research
**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that further research into infection control measures for MRSA should clearly describe the interventions being implemented, use outcomes that are sensitive to the various components of the intervention and should identify potential confounding variables. Further specific recommendations for research were listed in the paper.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.