Inpatient fall prevention programs as a patient safety strategy: a systematic review
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CRD summary
This update to four reviews concluded that in-patient multi-component programmes were effective in reducing falls, and several components were consistently associated with successful implementation. The structure of this review did not allow a comprehensive critical appraisal of the evidence, but given the results of the previous pooled analyses, the conclusion is likely to be reliable.

Authors' objectives
To update systematic reviews evaluating the benefits and harms of falls prevention programmes, for in-patients in the acute care setting, and to assess the factors associated with their implementation.

Searching
The included studies of four systematic reviews were examined as a basis for this review (Cameron, et al. 2010, Coussement, et al. 2008, Oliver, et al. 2007, and DiBardino, et al. 2012, see Other Publications of Related Interest). To update these, and find studies to refute their findings, PubMed, CINAHL, and Web of Science were searched for publications, in English, from 2005 to 2012. Search terms were reported. Experts were contacted to locate further studies.

Study selection
Eligible for inclusion were randomised controlled trials (RCTs), with at least 1,000 participants, that assessed multi-component falls prevention interventions in acute care hospitals. Interventions had to target the general population or older adults.

The included trials from the four systematic reviews were conducted in various countries across the world, including the UK. Those from the update were conducted in medical units in Singapore or the USA. The included interventions, from the update, were the Falls Prevention Tool Kit, comprising information technology-based risk assessment, tailored signage, patient education, and a plan of care; and an assessment tool that matched high-risk patients to appropriate interventions, alongside education. Control groups received usual care, which included environmental modification, manual documentation in patient records, or generic fall prevention advice. Implementation trials were included. The outcomes were falls prevented and harms.

Two reviewers selected studies for inclusion.

Assessment of study quality
Trial quality was assessed using the 27-item Downs and Black checklist, and a judgement was made about the risk of bias. The authors did not state how many reviewers assessed quality.

Data extraction
The data were extracted for the effect sizes and 95% confidence intervals, for fall rates and risk reduction. Details of the implementation that were considered to be important for understanding the effectiveness of the programmes were extracted.

The authors did not state how many reviewers extracted the data.

Methods of synthesis
The pooled results of the previous reviews were presented, with a narrative on the additional trials from the update.

Results of the review
Nineteen effectiveness trials were included in the four reviews, and two new trials were found by the update. The quality scores for the trials from the four reviews ranged from 8 to 27, with most scoring 14 or more. Both new trials had low risks of bias (scoring 25 and 27), and their results consistently supported the success of the falls prevention
programmes from the previous reviews. Eleven implementation trials were included in the update.

The first new trial (eight medical units; number of patients not reported) found a lower adjusted rate of falls with the Falls Prevention Tool Kit (3.15 per 1,000 patient-days, 95% CI 2.54 to 3.90) than in control units (4.18 per 1,000 patient-days, 95% CI 3.45 to 5.06). The rate difference was statistically significant (1.03, 95% CI 0.57 to 2.01), and the effect was stronger in patients aged 65 years or older (difference 2.08 falls per 1,000 patient-days, 95% CI 0.61 to 3.56).

The second new trial (1,822 patients), evaluating the matched assessment tool, showed greater reductions in fall rates in the intervention group (patients with at least one fall 0.4%, 95% CI 0.2 to 1.1), than in the control group (1.5%, 95% CI 0.9 to 2.6). The relative risk reduction was significant at 0.29 (95% CI 0.1 to 0.87).

Factors that affected implementation (across 11 studies) were summarised as leadership support, engagement of frontline clinical staff, use of multidisciplinary committees to oversee interventions, pilot testing of the intervention, use of information systems on falls data, attitude change away from the inevitability of falls, and education or training to promote adherence to implementation.

Most trials did not report any harms, and they were unclear whether this outcome was assessed. The potential for harm from falls prevention programmes had been suggested in previous reviews.

**Authors' conclusions**

In-patient multi-component programmes were effective in reducing falls, and several components were consistently associated with successful implementation, but there was no strong evidence on which components were most important for success.

**CRD commentary**

The review question was clear, and the inclusion criteria for the update were specified. Relevant data sources were searched, but language and publication restrictions could mean that relevant trials were overlooked. The selection process included attempts to minimise error and bias, but it was unclear whether the same applied to data extraction and quality assessment. The quality results were provided and study details were presented. The results of the new trials from the update were reported alongside those of the previous reviews. This did not allow a full critical appraisal of the evidence, and a reanalysis incorporating the additional trials would have been helpful.

In view of the positive results from the previous pooled analyses, the conclusion is 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 future research should examine whether an optimal mixture of components existed, and the extent to which their effectiveness was determined by success in their implementation.

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