Effectiveness of acute geriatric unit care using Acute Care for Elders components: a systematic review and meta-analysis

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CRD summary
The authors concluded that acute geriatric unit care, with one or more elements of the Acute Care for Elders model, for older patients with acute illness or injury, had beneficial effects, over usual care, in reducing falls, delirium, functional decline, length of hospital stay, and costs. This was a well-conducted review; the conclusions reflect the evidence and seem reliable.

Authors' objectives
To compare the effectiveness of acute geriatric unit care, versus usual care, for acutely ill or injured older adults.

Searching
Seventeen databases, including The Cochrane Library, DARE, and EMBASE, were searched, and five internet search engines were used, to identify studies in English or French, from 1985 to the date of the search (not reported). Search terms were reported. Three journals, and the bibliographies of included articles and previous systematic reviews, were handsearched.

Study selection
Eligible for inclusion were randomised controlled trials (RCTs), or quasi-experimental trials, with parallel controls. Trials had to compare acute geriatric unit care (including at least one of five Acute Care for Elders model elements, as defined in the review), with usual care, for adults aged at least 65 years, with acute illness or injury. The primary outcomes were iatrogenic complications or functional decline. Secondary outcomes were length of hospital stay, discharge destination, mortality, costs, or hospital readmissions. Studies of patients undergoing elective surgical procedures or receiving palliative care, including social admissions, and studies with historical control groups, were excluded.

Most of the included studies were conducted in the USA; others were conducted in Spain, France, Sweden, Australia or Peru. The average age of participants was 81 years. Most participants were female (61.8%) and were admitted with an acute medical illness (81.3%). Other patients had fractures (6.9%), unspecified acute or critical illness (11.8%), or other morbidity. Acute geriatric unit care mostly consisted of patient-centred care, followed by frequent medical reviews, early rehabilitation, early discharge planning, and a prepared environment. This care was provided by teams of various health professionals. Usual care was standard nursing and medical care provided in medical, medical surgical, or surgical orthopaedic units.

It appears that three reviewers were involved in screening studies for inclusion.

Assessment of study quality
Study risk of bias was assessed, covering sequence generation; allocation concealment; blinding of participants, personnel, and outcome assessors; completeness of outcome data; selective reporting; and other sources of bias.

Two reviewers independently assessed the risk of bias and discrepancies were resolved by consensus with a third reviewer.

Data extraction
Two reviewers extracted the outcome data into standardised data extraction forms. The data were extracted on an intention-to-treat basis, where possible. Discrepancies were resolved by consensus with a third reviewer. Continuous outcomes were extracted to calculate mean differences, and dichotomous data were extracted to calculate risk ratios, along with their 95% confidence intervals. Study authors were contacted where necessary.

Methods of synthesis
A random-effects model was used to pool the weighted mean differences and risk ratios, and their 95% confidence intervals. Statistical heterogeneity was assessed using $I^2$. Where there was evidence of statistical heterogeneity, sensitivity analyses were performed by the unit of care and by the number of Acute Care for Elders model elements, to assess if the findings were robust.

**Results of the review**

Thirteen studies (nine RCTs and four quasi-experimental studies; 6,839 participants), in 19 articles, were included in the review. Three studies were at a high risk of bias for randomisation. One was at high risk of bias for inadequate allocation concealment. Three were double-blinded and at a low risk of bias, while three others were not double blinded and were at high risk of bias. Six studies were at high risk of bias for attrition. One was at high risk of bias for selective reporting.

**Iatrogenic complications:** With acute geriatric unit care, compared with usual care, there were statistically significantly fewer falls (RR 0.51, 95% CI 0.29 to 0.88; $I^2=0$; two studies) and a lower incidence of delirium (RR 0.73, 95% CI 0.61 to 0.88; $I^2=0$; three studies). There was no significant difference in the incidence of pressure ulcers (two studies).

**Functional decline:** Participants receiving acute geriatric unit care were statistically significantly less likely to experience functional decline, between their two-week pre-hospital admission status and discharge, than those receiving usual care (RR 0.87, 95% CI 0.78 to 0.97; $I^2=37%$; six studies). There was no significant difference in risk of functional decline, between baseline hospital admission status and discharge (four studies).

**Length of hospital stay:** Length of stay was statistically significantly shorter for patients receiving acute geriatric unit care (WMD -1.28, 95% CI -2.33 to -0.22; 11 studies). There was evidence of statistical heterogeneity ($I^2=87%$). Hospital readmissions were similar between groups, within one or three months of discharge (five studies).

**Mortality:** There was no statistically significant difference, in mortality in hospital, between the two treatment groups (11 studies).

The results for discharge destination and those of the sensitivity analyses were reported.

**Cost information**

There was no statistically significant difference in costs between acute geriatric unit care and usual care (six studies).

**Authors' conclusions**

Acute geriatric unit care, with one or more elements of the Acute Care for Elders model, in older patients with acute illness or injury, had beneficial effects over usual care, in reducing falls, delirium, functional decline, length of hospital stay, discharge to a nursing home, and costs, and increasing discharge to home.

**CRD commentary**

The review question and supporting inclusion criteria were clearly defined. A comprehensive literature search was undertaken, but there was some potential for language bias. Study quality was assessed, using appropriate criteria; most studies did not report sufficient data to allow an assessment of their risk of bias. Each stage of the review appears to have been performed in duplicate, minimising the risk of reviewer error and bias.

A large number of participants was included in the review, and appropriate methods appear to have been used to combine the study data and investigate heterogeneity. The confidence intervals for the costs were wide, indicating that these findings were not robust. Most of the outcome effects were relatively small and there was some evidence of heterogeneity, so the clinical relevance of these findings is unclear.

The authors’ conclusions reflect the evidence, and are likely to be reliable.

**Implications of the review for practice and research**

**Practice:** The authors stated that by implementing all or part of the Acute Care for Elders model, during the acute illness or injury phase, for older adults, small to moderate beneficial effects could be expected on the outcomes found to be significant in the meta-analyses.
Research: The authors stated that further research was needed to explore the effectiveness of the Acute Care for Elders model elements, particularly all elements together, and in surgical patients, and for older adults admitted to hospital other than via the emergency department.

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