The effectiveness of inpatient geriatric evaluation and management units: a systematic review and meta-analysis

CRD summary
This review examined the effectiveness of inpatient geriatric evaluation and management units and found that they may add value to the care of frail older people, but that more and better quality primary research was needed. Not enough detail about the review process was provided, but the cautious conclusion appears appropriate given the evidence provided.

Authors' objectives
To examine the effectiveness of inpatient geriatric evaluation and management units (GEMUs).

Searching
Five databases were searched, including MEDLINE and EMBASE, for relevant papers published in English, Dutch or French from inception until October 2007. Search terms were specified. Reference lists of retrieved articles were searched for further relevant papers. Authors of included studies were contacted to identify other relevant papers, unpublished data and ongoing trials.

Study selection
Studies were assessed as eligible for inclusion if they: used a prospective controlled design; patients were at least 65 years old and had been hospitalised for at least 48 hours; and the GEMU (which the authors defined as a ward that admits frail older inpatients for a process of multidisciplinary assessment, review and therapy) was the primary intervention. Eligible studies needed to measure at least one of the following types of outcome: mortality, institutionalisation, functional decline, readmission and duration of stay. Trials were excluded if they assessed inpatient geriatric consultation services (IGCSs) instead of GEMUs or described a single-disease management model.

Mean age of participants varied from 74.2 years to 82.4 years. Countries included USA, Austria, Germany and Norway. Hospital types included Veterans Affairs medical centres, community hospitals, medical centres, university hospitals and geriatric hospitals. Patients may have been admitted from medical or surgical wards, home, emergency departments or long-term care institutions. No gender and ethnicity details were included.

It was unclear how many reviewers performed the study selection, whether selection was conducted independently and how disagreements between reviewers were resolved.

Assessment of study quality
Two reviewers independently assessed trials according to the following quality criteria: whether the GEMU was clearly described; randomisation; blinding of patients and outcome assessors; comparability between control and intervention groups at baseline; clarity of inclusion and exclusion criteria; comparability of standard programmes for control and intervention groups; use of intention-to-treat analysis; completeness of follow-up; and comparability of outcome appraisal in control and intervention groups.

If study details were insufficient to allow assessment according to a criterion, study authors were contacted for further details. For each criterion, studies were assigned a score of between zero (criterion was not met or unclear) and two (fully met); scores were summed to produce a total trial quality score of between zero and 20.

Scoring disagreements were resolved through adjudication with a third reviewer until consensus was achieved.

Data extraction
Binary outcome effectiveness data including mortality and institutionalisation data (at three, six, and 12 months after
discharge), functional decline data (at discharge and 12 months after discharge) and readmission data (12 months after discharge) were extracted. Continuous outcome effectiveness data such as length of stay (mean number of days) were extracted. Precise details about what data were extracted from papers were unclear.

It was unclear how many reviewers performed data extraction, how extracted data were checked and how discrepancies were resolved.

**Methods of synthesis**
Outcomes (relative risks (RRs) for binary data and Hedges' $g$ effect sizes for continuous data, with 95% CIs) were pooled for each outcome listed in the data extraction field using a random-effects model.

No assessment of heterogeneity was reported. No subgroup analyses were performed.

**Results of the review**
Seven studies (n=4,759 patients, range 123 to 1,531 patients) were included in the review. All studies were assessed as fully or partly meeting the criteria: clear description of GEMU; randomisation; comparable groups at entry; clearly defined selection criteria; identical standard programmes for both groups; and identical appraisal of outcomes. All except one study (n=267 patients) used an intention-to-treat analysis and partially or fully met the complete follow-up criterion. Only one study (n=123 patients) partly met the patient blinding criterion and no study fully met this criterion. No study had adequate assessor blinding. All except one study (n=651 patients) had 12-month follow-up for at least one outcome. Trial quality scores ranged from 8 to 15 out of 20.

**Mortality:** No statistically significant differences were reported after three, six or 12 months.

**Institutionalisation:** A statistically significant difference (RR 0.78, 95% CI 0.66 to 0.92; four studies) that favoured GEMUs was reported 12 months after discharge, but not after three or six months.

**Functional decline:** A statistically significant difference (RR 0.87, 95% CI 0.77 to 0.99; two studies) that favoured GEMUs was reported at discharge, but not 12 months later.

**Readmission:** No statistically significant difference in readmission rates 12 months after discharge was found.

**Length of stay:** No statistically significant difference in mean length of stay was found.

**Authors' conclusions**
The authors concluded that GEMUs may add value to the care of frail older people admitted to the hospital, but limitations in data quality confirm the need for well-designed studies using more explicit comprehensive geriatric assessment and structured and coherent assessment instruments.

**CRD commentary**
The research question was clear and supported by relevant inclusion criteria. The authors used a number of methods to reduce risks of error and bias: several relevant databases were searched for papers published in a range of languages; attempts were made to identify unpublished studies; and a study quality assessment was conducted in duplicate. However, it was unclear from the review how many reviewers were involved in the search, study selection and data extraction and how these stages of the process were conducted. The study design criterion within the study selection was not transparent. No control group details and no assessment of statistical heterogeneity were presented. Although clinical heterogeneity in the organisation of GEMUs was mentioned in the discussion, no testing of the possible effects of such heterogeneity on outcomes (such as subgroup analyses) were reported and so the effects of such differences in practice were uncertain. Not enough detail about the review process was provided, but the cautious conclusion appears appropriate given the evidence available.

**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 was needed to prove the effectiveness of GEMUs and identify specific characteristics that may have a beneficial effect on the effectiveness of a GEMU.

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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.