Do geriatric interventions reduce emergency department visits: a systematic review  
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CRD summary
This review assessed the effects of comprehensive geriatric assessment on emergency department visits. The authors concluded that many out-patient or community-based interventions reduced emergency department visits, whereas hospital-based interventions had little effect. The lack of a quality assessment means that the reliability of the authors' conclusions is unclear.

Authors' objectives
To evaluate the effects of comprehensive geriatric assessment (CGA) on emergency department (ED) visits.

Searching
MEDLINE and the Cochrane Controlled Trials Register were searched from 1965 to 2004 using the reported search terms. In addition, the reference lists of relevant studies and reviews were screened and the authors' colleagues were consulted. The studies had to have been published in English or French.

Study selection

Study designs of evaluations included in the review
Studies with a control group were eligible for inclusion. The duration of the included studies ranged from one time or during admission to 24 months; some studies were ongoing.

Specific interventions included in the review
Studies that compared interventions of CGA with a no-CGA control intervention were eligible for inclusion. In the review, CGA interventions were defined as hospital-based geriatric evaluation and management units, hospital-based consultation services, home-based assessment services, hospital-home assessment services for patients recently discharged from hospital, and out-patient assessment services. The authors categorised the interventions into five categories: unidisciplinary assessment with referral and/or liaison; multidisciplinary assessment with referral and/or liaison; unidisciplinary assessment and management; multidisciplinary assessment and management; and case management. Interventions were also categorised by the level of involvement with the primary physician: the classification was 'integrated' if the primary physician was part of the multidisciplinary team and 'co-ordinated' if the intervention staff consulted with the primary physician.

Participants included in the review
Studies of older hospital and community-based populations were eligible for inclusion. The studies had to report the results for patients aged 60 years and older separately. Studies of nursing home or long-term care facility residents were excluded, as were studies that only included patients with a specific diagnosis or patients undergoing a specific procedure. The included studies recruited patients from the following settings: ED, hospital in-patient, out-patients and/or primary care, home care and the community. Most of the studies were in high-risk patients; some studies were in unselected patients.

Outcomes assessed in the review
Studies that assessed ED utilisation were eligible for inclusion. The included studies assessed the number of ED visits, the mean number of ED hours, ED return visits, unplanned ED return visits, number of ED visits not resulting in hospitalisation, annual number of ED visits, and time to first ED visit. The outcomes were assessed using self-report, telephone interviews, health-care utilisation diaries, follow-up by researcher, administrative data and medical records.

How were decisions on the relevance of primary studies made?
One researcher screened abstracts, while one of the authors reviewed all studies that were excluded because the intervention did not meet the inclusion criteria and any study where there was doubt about the eligibility.
Assessment of study quality
The authors did not state that they assessed validity. They reported that data on the method of analysis (adjustment for confounders and analysis by intention-to-treat and whether patients were randomised to interventions) were extracted but these data were not presented.

Data extraction
Two reviewers independently extracted the data and resolved any disagreements through discussion. One author classified the type of intervention and a second author checked the classification. For each study, measures of ED utilisation were extracted together with 95% confidence intervals (CIs) or p-values. The mean number of ED visits for the control group in each study was standardised over 12 months.

Methods of synthesis
How were the studies combined?
The studies were grouped by the setting in which the study was conducted and combined in a narrative.

How were differences between studies investigated?
Differences between the studies were described in the text and additional information was tabulated. Most of the results were discussed in relation to study design. The mean number of ED visits in the control groups over a 12-month period was compared amongst studies with respect to study setting (hospital versus non-hospital-based).

Results of the review
Twenty-six studies (n=11,273) were included: 17 RCTs (n=5,596), 3 non-randomised trials (n=2,556), 1 quasi-experimental study (n=482), 4 before-and-after studies (n=2,431) and 1 cross-sectional study (n=208).

Studies conducted in ED populations (7 studies including 2 RCTs, 1 non-randomised trial and 2 before-and-after studies).

Two of the 7 studies (1 non-randomised trial and 1 before-and-after study) reported that the interventions reduced return ED visits. One RCT reported that a long-term case-management intervention significantly increased ED visits, while 2 RCTs reported a non statistically significant short-term increase in ED visits. One RCT reported no statistically significant difference in ED visits between the intervention and control. The statistical significance of results from the seventh study (a before-and-after study) were unclear.

Studies conducted in hospital in-patients (2 RCTs, 1 non-randomised trial and 1 before-and-after study). None of the studies reported any statistically significant effect on return ED visits with the interventions.

Studies conducted in out-patients and/or primary care (9 RCTs and 1 cross-sectional study). Five of the 7 longer term (3 to 24 months) RCTs of geriatric evaluation and management reported a significant reduction in ED utilisation with the intervention compared with the control. The cross-sectional study reported a significant reduction in ED visits with the intervention. Two RCTs reported no significant reduction in ED utilisation.

Studies conducted in home care settings (2 RCTs, 1 quasi-experimental study and 1 non-randomised trial).

One RCT reported a significant reduction in the time to first ED visit with the intervention. The quasi-experimental study reported a significant reduction in ED utilisation in the control group compared with the intervention group. One RCT reported no significant difference between two models of case management. The short-term non-randomised trial reported a significant reduction in ED utilisation with the intervention.

Studies conducted in the community (1 before-and-after study). This study reported a significant reduction in ED visits after the intervention was implemented.

Comparison of ED utilisation between studies in control groups.
In general, higher rates of ED utilisation were reported in control groups in studies set in the ED and hospitals compared with non-hospital-based settings.

**Cost information**
One cross-sectional study set in out-patients reported that ED charges were $43 with the intervention versus $144 for the control. One RCT set in out-patients reported a statistically significant reduction in the mean cost per ED visit with the intervention versus the control ($325 versus $607, p=0.001). One RCT of home care reported no significant difference in the average daily cost of ED visits between the intervention and control. One before-after study set in an ED reported that the mean ED cost was $1,656 for the intervention compared with $1,803 for the control condition. One RCT set in in-patients reported no significant difference in the aggregate cost of ED use between the intervention and the control.

**Authors’ conclusions**
Many interventions based in out-patients and/or primary care or a home care setting, including geriatric assessment and management and case management, reduced ED visits. However, hospital-based interventions had little effect.

**CRD commentary**
The review addressed a clear question that was defined in terms of the participants, intervention, outcomes and study design; the inclusion criteria for study design were broad and this resulted in the inclusion of studies of varying design. The search was limited to two databases and consultation with colleagues, therefore some relevant studies might have been omitted. Publication bias was not assessed. There were limited attempts to reduce language bias. Methods were used to minimise reviewer errors and bias in the study selection and data extraction processes. Study validity was not assessed, so it is not possible to adequately comment on the reliability of the results presented. A narrative review was appropriate given the diversity of the studies. Overall, the lack of a quality assessment means that the reliability of the authors’ conclusions is unclear.

**Implications of the review for practice and research**
Practice: The authors stated that interventions for hospital-based populations may have to include elements of disease-management programmes if ED visits are to be reduced.

Research: The authors stated that there is a need to standardise outcome measures and that researchers should report the proportion of participants using the ED, and, amongst users, the mean (and standard deviation) and total number of ED visits. There is also a need to examine the effects of interventions that are more integrated with primary care and the effects of targeting interventions at high-risk patients.

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Record Status
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.