Comprehensive geriatric assessment for older adults admitted to hospital (Review)

Ellis G, Whitehead MA, O'Neill D, Langhorne P, Robinson D

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[Intervention Review]

Comprehensive geriatric assessment for older adults admitted to hospital

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ABSTRACT

Background

Comprehensive geriatric assessment (CGA) is a multidimensional, interdisciplinary diagnostic process to determine the medical, psychological and functional capabilities of a frail elderly person in order to develop a co-ordinated and integrated plan for treatment and long-term follow up.

Objectives

We sought to evaluate the effectiveness of CGA in hospital for older adults admitted as an emergency.

Search strategy

We searched the Cochrane Effective Practice and Organisation of Care (EPOC) Group Register, the Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library)*, the Database of Abstracts of Reviews of Effects (DARE), MEDLINE, EMBASE, CINAHL and AARP Ageline, and handsearched high-yield journals.

Selection criteria

We searched for randomised controlled trials comparing CGA (whether by mobile teams or in designated wards) to usual care.

Data collection and analysis

Two review authors initially assessed eligibility and trial quality and extracted published data.

Main results

Twenty-two trials evaluating 10,315 participants in six countries were identified. Patients in receipt of CGA were more likely to be alive and in their own homes at up to six months (OR 1.25, 95% CI 1.11 to 1.42, P = 0.0002) and at the end of scheduled follow up (median 12 months) (OR 1.16, 95% CI 1.05 to 1.28, P = 0.003) when compared to general medical care. In addition, patients were less likely to be institutionalised (OR 0.79, 95% CI 0.69 to 0.88, P < 0.0001). They were less likely to suffer death or deterioration (OR 0.76, 95% CI 0.64 to 0.90, P = 0.001), and were more likely to experience improved cognition in the CGA group (OR 1.11, 95% CI 0.20 to 2.01, P = 0.02). Subgroup interaction in the primary outcomes suggests that the effects of CGA are primarily the result of CGA wards.

Authors' conclusions

Comprehensive geriatric assessment increases a patient's likelihood of being alive and in their own home at up to 12 months.

PLAIN LANGUAGE SUMMARY

Comprehensive geriatric assessment for older adults admitted to hospital

This review investigates whether specialist, organised and co-ordinated geriatric care (normally referred to as comprehensive geriatric assessment or CGA) is better for patient outcomes than conventional care in a hospital setting. There is a clear and significant improvement in the chances of a patient being alive and in their own home at up to a year after an emergency hospital admission if they receive co-ordinated specialist services. This effect is consistently seen from trials of geriatric wards where patients are admitted to a dedicated ward area and receive care from a specialist multidisciplinary team. This effect was not clearly seen where patients remained in a general ward and received assessment from a visiting specialist multi-disciplinary team.

BACKGROUND

Hospital admissions for emergencies have continued to increase year on year. The largest increases have occurred in the over 65 age group (DOH 2006; OECD 2004; Wood 2001), leading some epidemiologists to conclude that the future of inpatient emergency medical care is the care of the older adult (Wood 2001).

Observing high rates of institutionalisation in the frail elderly population, Warren and colleagues identified the lack of a comprehensive assessment of the medical, social, functional or psychological needs of this high-risk group (Mathews 1984). They also observed the inadequacy of provision for readily recognisable and remedial problems. This observation led to the development of one of the cornerstones of modern geriatric care: the comprehensive geriatric assessment (CGA). Comprehensive geriatric assessment is defined as a "multidimensional interdisciplinary diagnostic process focused on determining a frail elderly person's medical, psychological and functional capability in order to develop a co-ordinated and integrated plan for treatment and long term follow up" (Rubenstein 1991).

Models of CGA have evolved in different healthcare settings and to meet differing needs. Common to these interventions are several key features that have been attributed with their effectiveness. The key components include:

- co-ordinated multidisciplinary assessment;
- geriatric medicine expertise;
- identification of medical, physical, social and psychological problems; and
- the formation of a plan of care including appropriate rehabilitation.

In addition, several key components have been associated with improved CGA outcomes (Stuck 1993). These were highlighted in a systematic review as:

- the ability to directly implement treatment recommendations made by the multidisciplinary team; and
- long-term follow up.

In 1993, Andreas Stuck and colleagues conducted a meta-analysis of different service-based interventions for older people (Stuck 1993). This meta-analysis provided a framework for the definition of inpatient and outpatient models of CGA. Inpatient CGA was divided into two types. The first was delivered by a team in a discrete ward, with control over the delivery of the multi-disciplinary team recommendations (these are sometimes known as a Geriatric Evaluation and Management Units (GEMU) or alternatively Acute Care for Elders Units (ACE)). The second was a multidisciplinary team assessing patients and delivering recommendations to the physicians caring for older patients (known as the Inpatient Geriatric Consultation Service (IGCS)). Results of this meta-analysis showed a benefit on short-term mortality, reduced institutionalisation and readmission, improved cognitive functioning and, for some models, improved physical functioning. Since this meta-analysis, a number of studies have reported trials of CGA (Asplund 2000; Cohen 2002; Counsell 2000; Landefeld 1995; Nikolaus 1999; Reuben 1995; Saltvedt 2002). In addition there have been a number of systematic reviews and meta-analyses of various subgroups of CGA. One meta-analysis looked specifically at ACE units (Baztan 2009) and included case-control studies. One evaluated a subgroup of postacute geriatric wards in combination with orthogeriatric rehabilitation units (Bachmann 2010).

A third has evaluated the subgroup of Geriatric Evaluation and Management Units (GEMU) (Van Craen 2010). Other review articles of in-hospital care for older people with or without meta-analysis also exist (Bakker 2011; Ellis 2005). An updated and systematic review of all these subgroups and meta-analyses is now required.

OBJECTIVES

To determine the effectiveness of inpatient comprehensive geriatric assessment (CGA) for frail older adults admitted to hospital as an unplanned emergency in comparison to routine or general medical acute care in hospital.

METHODS

Criteria for considering studies for this review

Types of studies

We only considered randomised controlled trials and cluster-randomised trials.

Types of participants

We defined participants as adults 65 years or older admitted to hospital care as an emergency with medical, psychological, functional or social problems (or other similar admissions referred to as 'non-elective', 'urgent', 'acute', 'unplanned' or 'unscheduled').

Types of interventions

We looked for studies comparing comprehensive geriatric assessment (CGA) with usual care, such as general medical ward care. Comprehensive geriatric assessment (or CGA) is a simultaneous, multi-level assessment of various domains by a multidisciplinary team to ensure that problems are identified, quantified and managed appropriately. This includes assessment of medical, psychiatric, functional and social domains followed by a management plan including rehabilitation. Usually the multidisciplinary team will include as a minimum experienced medical, nursing and therapy staff. This care is usually delivered in two distinct forms. The first is a discrete specialist (geriatric) ward. Patients are admitted to this setting and their care is taken over by the specialist team. This team would then conduct a formal assessment across a variety of domains and may use standardised assessment tools to gather information in a semi-structured fashion. This might include (for example) the Barthel scale for Activities of Daily Living (Collin 1988), the Get Up and Go test for mobility assessment (Mathias 1986), or the Mini Mental State Examination for cognition (Folstein 1975). The team would then discuss the assessment findings in a multidisciplinary meeting and a plan of treatment would be developed. Members of that multidisciplinary team would then be responsible for delivering the recommended treatment or rehabilitation plan (such as physiotherapy input or occupational therapy, diagnostics or medical treatment).

The second model is CGA delivered by a mobile or peripatetic team who conduct a multidisciplinary assessment of a patient in the general medical setting they are admitted to. They may use similar domains of assessment such as medical, cognitive, functional etc. and may use the same assessment tools to collect data. This would then be discussed in a multidisciplinary team meeting to develop a recommended plan for treatment. The team would then pass on their recommendations to the parent team (medical and nursing staff) and may or may not be involved in delivering direct care (e.g. physiotherapy input). The process of CGA in the two models is described in more detail in Figure 1.

Figure 1. Components of in-hospital CGA

● = present or carried out ○ = recommendation made or staff accessed from general pool
Where it was unclear or not explicitly stated in the paper, it has been left blank.

		Organisation							Core Team Members											
	Trial	Comprehensive assessment	MDT ≥1 weekly	Goal Setting	Assessment Tools	Protocols	Ward Environment	OP Follow Up	Attending Geriatrician	Geriatric Fellow	Trained Nursing	Social Work	Physiotherapy	Occupational Therapy	Dietetics	Pharmacy	Speech and Language	Audiology	Dentistry	Psychology
Teams	Hogan 1987	●	●	○					●		●		●							
	Kircher 2007	●	●	●					●		●	●	○	○						
	McVey 1989	●	●	○	●				●	●	●	●								
	Naughton 1994	●	●	●				●	●			●								
	Reuben 1995	●	●	○	●			●	●		●	●								
	Thomas 1993	●	●	○	●				●		●	●	●			●				
	Winograd 1993	●	●	○					●	●	●	●								
Wards	Applegate 1990	●	●	●				●	●		●	●	●	●	●	●	●	●		
	Asplund 2000	●	●	●					●		●		●	●	●					
	Cohen 2002	●	●	●	●			●	●		●	●								
	Collard 1985	●	●	●				●			●	●	●	●						
	Counsell 2000	●	●	●		●	●	●	●		●	●	●	●						
	Fretwell 1990	●	●		●			●	●		●	●	●			●				
	Harris 1991	●					●		●		●	●	●	●						
	Kay 1992	●	●		●				●		●	●	●	●	●	●				
	Landefeld 1995	●	●	●	●	●	●		●	●	●	●	●	●	●					
	Nikolaus 1999	●			●			●			●	●	●	●						
	Powell 1990																			
	Rubenstein 1984	●	●	●	●			●	●	●	●	●	●	●	●			●	●	●
	Saltvedt 2002	●	●	●		●			●		●		●	●						
	Shamian 1984	●			●				●		●	●	○	○						
	White 1994	●	●	●	●				●		●	●	●	●	●	●	●			

We excluded studies of condition-specific organised care (e.g. Stroke units, Geriatric Orthopaedic Rehabilitation) (Handoll 2009; SUTC 2007). We excluded studies that did not evaluate comprehensive geriatric assessment in an inpatient setting.

Types of outcome measures

Primary outcome measure

- Living at home; which is the inverse of death or institutionalisation combined and describes the odds of someone being alive and in their own home at a point in time.

Secondary outcome measures

- Death
- Institutionalisation
- Dependence
- Death or dependence
- Activities of daily living
- Cognitive status
- Readmissions
- Length of stay
- Resource use

Subgroup analysis

- Ward versus team
- Ward and team by admission criteria (i.e. age alone versus age plus other criteria)
- Timing of admission
- Outpatient follow up versus none

Search methods for identification of studies

We reviewed the Cochrane Effective Practice and Organisation of Care (EPOC) Group Register and the database of studies awaiting assessment. We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library)* (April 2010) and checked the Database of Abstracts of Reviews of Effects (DARE) (latest issue) for relevant reviews and reviewed their reference lists. We also searched the following bibliographic databases: MEDLINE (from 1966 to April 2010); EMBASE (from 1980 to April 2010); CINAHL (from 1982 to April 2010); (ACP) and

AARP Ageline (from 1978 to April 2010). In addition, we checked reference lists of all papers and reviews as well as conference proceedings of the American Geriatrics Society and the British Geriatrics Society.

The search strategy for MEDLINE is shown in Appendix 1 and for EMBASE in Appendix 2. We adapted this for the other databases.

Data collection and analysis

Selection of studies

Three independent review authors (GE, DR and MW) screened titles and abstracts of papers identified by the literature searches for their potential relevance. We excluded any papers that did not meet the inclusion criteria at this stage. Where there was a disagreement, we considered the paper as potentially relevant and proceeded to the next stage. We retrieved all papers of potential relevance and three independent review authors (GE, DR and MW) assessed the full text for inclusion in the review. Where there was disagreement, GE and DO'N moderated; reasons for excluding full papers are reported.

Data extraction

We performed data abstraction using a pre-designed data abstraction form on all studies that fulfilled the inclusion criteria. Two review authors (DR and MW) abstracted the data independently, including data on design characteristics, the study population, the intervention, outcome measures used and length of follow up. We determined classification of the intervention by characteristics of the form of CGA used (discrete geographical unit versus mobile team) and the components of the interventions. Disagreements were resolved by the moderators (GE and DO'N).

Assessment of quality

We assessed all relevant trials to evaluate and record potential sources of bias using recognised methods (Cochrane 2011; Hayden 2006). This included assessment of quality of randomisation procedure, concealment of treatment allocation and blinding of participants.

Analysis

We considered study characteristics such as population, time to enrolment and length of follow up in the analysis and grouped studies based on these characteristics.

For the purpose of the outcome institutionalisation, we combined the presence of the patient in a care home, a hospital ward or long-term institutional care to avoid differences in outcomes related to the healthcare system of the country in which the trial was conducted. Only those discharged to their own home (rather than residential care, etc.) were classified as at home.

The original intention in the protocol was to use a primary outcome of independent survival. This combined outcome is the inverse of death, institutionalisation or disability together and might be defined as the odds of someone surviving in the community without being dependent. It was not possible to measure this as many studies that reported disability did not report this separate to institutionalisation. For this reason it was not possible to exclude double-counting. Thus we performed the analysis using the primary outcome 'living at home' (the inverse of death or institutionalisation) or the odds of a patient being alive and in their own home at a defined time point.

Outcome measures were dichotomous, ordinal and continuous. Many of the outcome scales were ordinal and where necessary, we converted these to dichotomous data (e.g. in the calculation of dependency). Results are presented separately for 'wards' and 'teams' for each domain of outcome and where it was possible to dichotomise data, we calculated odds ratios and 95% confidence intervals for each study and presented the results for each subgroup. Where significant heterogeneity existed we applied a heterogeneity (I^2 statistic) threshold of 70% as the level at which data would not be pooled for analysis. No meta-analysis was performed where grossly differing outcome measures precluded combination. Where it was not possible to dichotomise the data, or continuous scales were used, we attempted meta-analysis using weighted mean differences. Results are presented with numbers needed to treat where results are statistically significant, however it must be noted that these must be interpreted as representing a pooled result and will be dependent on the control event rate.

Subgroup interaction is reported only where the results of overall analysis are significant and the differences between subgroups are also statistically significant.

RESULTS

Description of studies

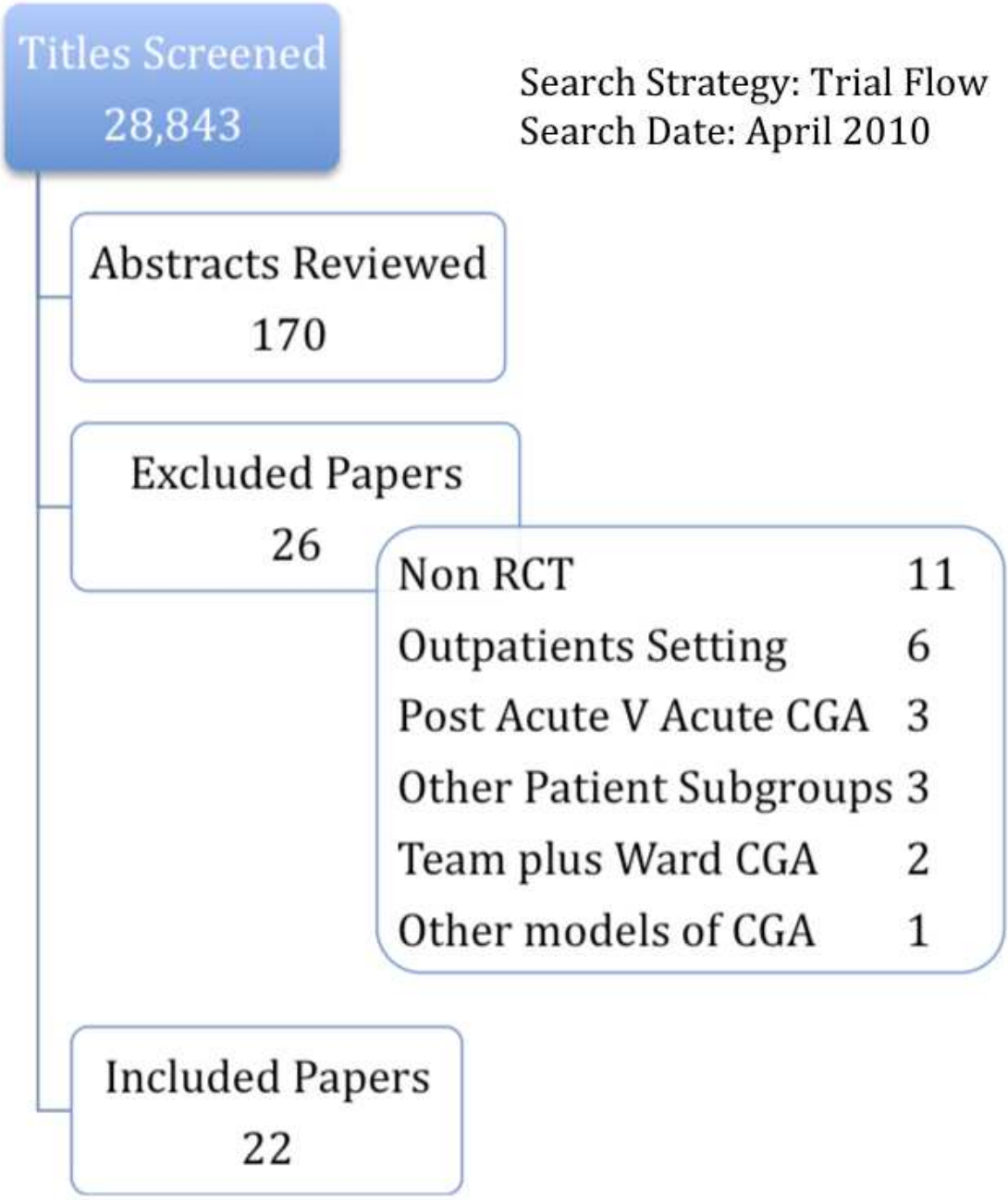
See: Characteristics of included studies; Characteristics of excluded studies.

(See also Characteristics of included studies; Characteristics of excluded studies).

We retrieved a total of 28,843 titles (search date April 2010, Figure 2). We reviewed 170 abstracts and selected 48 papers for full-text screening. We excluded 26 studies. Eleven studies did not use randomised controlled trial methodology (Boult 1994; Campion 1983; Gayton 1987; Hogan 1990; Ledesert 1994; Liem 1986; Meissner 1989; Miller 1996; Mudge 2006; Reuben 1992). We identified no cluster-randomised controlled trials. Six studies evaluated CGA in an outpatient or elective setting (Cunliffe 2004;

Epstein 1990; Gill 2003; Karppi 1995; Rubin 1992; Trentini 2001). Three studies compared postacute organised (CGA care) with acute organised (CGA) care (Fleming 2004; Garåsen 2007; Young 2005). Three studies evaluated organised (CGA) care for subgroups of patients (e.g. dementia - Cole 1991; Volicer 1994; cancer - Retornaz 2007). Two trials evaluated CGA teams prior to patient transfer to CGA wards (Germain 1995; Harari 2007). One trial evaluated a different multidisciplinary method of working within a CGA environment (Landi 1997). We identified 22 relevant randomised controlled trials giving information on 10,315 participants across six countries.

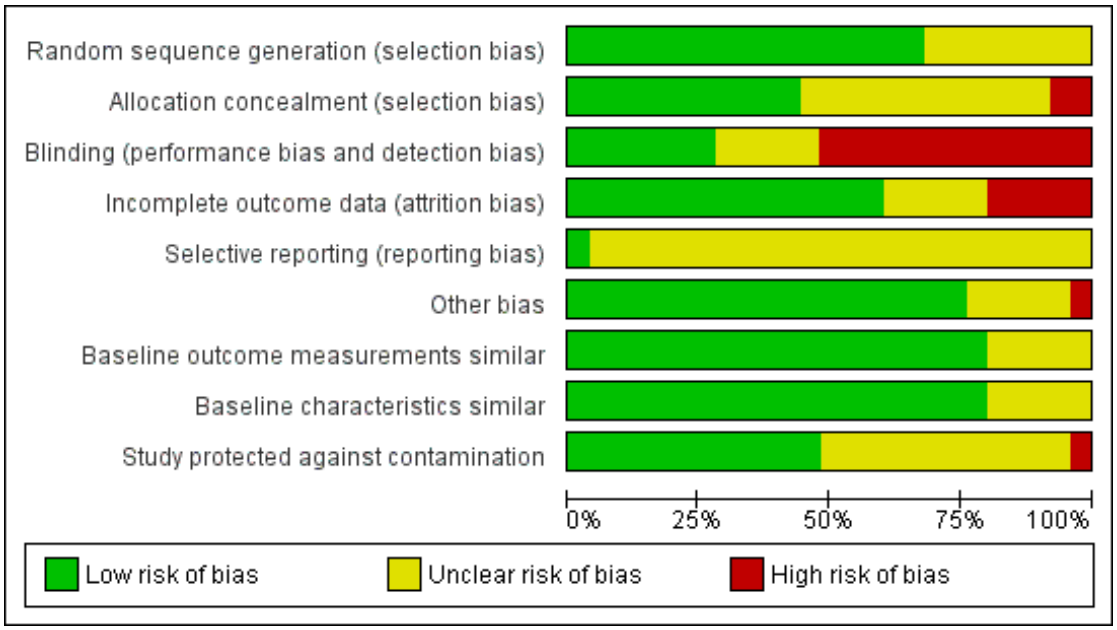
Figure 2.



Risk of bias in included studies

The studies identified were heterogeneous in quality (Figure 3). All employed some method of individual patient randomisation, however reporting of key issues such as allocation concealment varied. Outcome assessment was seldom blinded. This is less significant for hard outcomes such as death or institutionalisation, but becomes more important for outcomes such as activities of daily living or cognition.

Figure 3. 'Risk of bias' graph: review authors' judgements about each risk of bias item presented as percentages across all included studies.



We extracted data from published information only. We did not contact trialists for additional data. Reporting of outcomes was variable. Different reporting mechanisms were used for description of some data (for example, activities of daily living, which could be reported as a categorical or variable outcome). For this reason, we did not combine some outcomes for meta-analysis. Data quality was also variable with some trialists reporting data with standard deviations, some reporting interquartile ranges and some reporting standard errors.

We noted attrition in some trials (Collard 1985; Harris 1991) for functional outcomes. In some cases (Collard 1985) this exceeded 25%. We felt that the possibility of attrition bias might be introduced for outcomes that could be unduly influenced by an unblinded trial design. Results from this trial have been included for the outcome of dependence, however the results must be interpreted with some caution.

Effects of interventions

Comparison 1: Comprehensive geriatric assessment (CGA) versus usual care

The first primary outcome summarises data from 22 trials of 10,315 participants comparing CGA with usual care (e.g. on a general medical ward). We analysed this using the main subgrouping of CGA wards and CGA teams versus usual care. Subgroup

results are only reported where significant subgroup interaction exists.

Comparison 1.1: living at home (up to six months)

'Living at home', as reported previously, is the inverse of death or institutionalisation and is worded in the positive as it is felt to represent an outcome vital to patients themselves. We analysed data from 14 studies (5117 participants). The odds of a patient being alive and in their own home at interim analysis (median six months, range six weeks to six months) were significant (odds ratio (OR) 1.25, 95% confidence interval (CI) 1.11 to 1.42, P = 0.0002; Chi^2 = 25.57, P = 0.02, I^2 = 49%). This equates to a number needed to treat of 17 (95% CI 50 to 10) to avoid one unnecessary death or institutionalisation. Subgroup interaction exists, suggesting a difference between CGA wards and CGA teams (Chi ^{2} = 4.43, P = 0.04, I^2 = 77%), although the confidence intervals for the subgroups overlap. In addition there is some heterogeneity within the results for CGA wards. CGA wards were associated with a significantly improved odds of being alive and at home at six months (OR 1.31, 95% CI 1.15 to 1.49, P < 0.0001; Chi^2 = 20.36, P = 0.03, I^2 = 51%) equating to a number needed to treat of 13 to avoid one unnecessary death or institutionalisation compared with general medical care. By contrast, results for the smaller CGA teams subgroup were not significant (three studies, 493 participants, OR 0.84, 95% CI 0.57 to 1.24, P = 0.39; Chi^2 = 0.87, P = 0.65, I^2 = 0%). Estimates were similar when analysed using the random-effects model.

Comparison 1.2: living at home (end of follow up)

The odds of a patient being alive and in their own homes at the end of scheduled follow up (median 12 months, range six weeks to 12 months) were significantly higher for those patients who were in receipt of CGA (18 studies, 7062 participants, OR 1.16, 95% CI 1.05 to 1.28, P = 0.04; Chi^2 = 28.49, P = 0.04, I^2 = 40%). Subgroup interaction exists (Chi^2 = 9.06, P = 0.003, I^2 = 89%) suggesting that there was a subgroup effect with the overall result largely occurring because of a significant difference from the effect of CGA wards (14 studies, 6290 participants, OR 1.22, 95% CI 1.10 to 1.35, P = 0.0002; Chi^2 = 17.66, P = 0.17, I^2 = 26%) whereas mobile CGA teams were not associated with a benefit (four studies, 772 participants, OR 0.75, 95% CI 0.55 to 1.01, P = 0.06; Chi^2 = 1.86, P = 0.60, I^2 = 0%). Confidence intervals for the two subgroups did not overlap and tests for heterogeneity did not reveal significant heterogeneity within subgroups (CGA wards Chi ^{2} = 17.66, P = 0.17, I^2 = 26%, CGA teams Chi^2 = 1.86, P = 0.60, I ^{2} = 0%). Estimates were similar when analysed using the random-effects model. The overall difference for the effects of CGA equate to a number needed to treat of 33 to prevent one unnecessary death or institutionalisation compared to general medical care. This effect is most pronounced for CGA wards where the NNT would be 20 to avoid one unnecessary death or institutionalisation compared to general medical care.

Comparison 1.3: mortality (up to six months)

Comparison of mortality at interim analysis (median six months, range six weeks to six months) did not reveal any significant difference between patients who were in receipt of CGA and those who were not (19 studies, 6786 participants, OR 0.91, 95% CI 0.80 to 1.05, P = 0.20; Chi^2 = 32.3, P = 0.01, I^2 = 47%). No statistically significant subgroup interaction exists (Chi^2 = 0.92, P = 0.34, I^2 = 0%).

Comparison 1.4: mortality (end of follow up)

Similarly, analysis of mortality at the end of scheduled follow up (median 12 months, range six weeks to 12 months) did not differ significantly between intervention and control groups (23 studies, 9963 participants, OR 0.99, 95% CI 0.90 to 1.09, P = 0.97; Chi^2 = 24.15, P = 0.29, I^2 = 13%). No statistically significant subgroup interaction exists (Chi^2 = 0.05, P = 0.83, I^2 = 0%).

Comparison 1.5: institutionalisation (up to six months)

Comparison of institutionalisation alone at interim analysis (median six months, range six weeks to six months) demonstrated an overall decrease of patients in receipt of CGA in institutional care at up to six months (14 studies, 4925 participants, OR 0.72, 95% CI 0.61 to 0.85, P = 0.0001; Chi^2 = 14.43, P = 0.34, I^2 = 10%). This equates to a number needed to a NNT of 20 to avoid one unnecessary institutionalisation at up to six months compared to general medical care. No statistically significant subgroup interaction exists (Chi^2 = 3.64, P = 0.06, I^2 = 72.5%).

Comparison 1.6: institutionalisation (end of follow up)

Analysis of data for institutionalisation at the end of scheduled follow up (median 12 months) revealed a significant reduction in institutionalisation for patients in receipt of CGA (19 studies, 7137 participants, OR 0.78, 95% CI 0.69 to 0.88, P < 0.0001; Chi^2 = 18.36, P = 0.43, I^2 = 2%). This equates to a NNT of 25 to avoid one unnecessary death or institutionalisation compared to general medical care. However, subgroup interaction exists with slight overlap of confidence intervals (Chi^2 = 6.06, P = 0.01, I^2 = 83.5%). There is a difference between the benefits of CGA wards (14 studies, 6252 participants, OR 0.73, 95% CI 0.64 to 0.84, P < 0.00001; Chi^2 = 10.64, P = 0.64, I^2 =0%) and CGA teams (five studies, 485 participants, OR 1.16, 95% CI 0.83 to 1.63, P = 0.39; Chi^2 = 1.83, P = 0.77, I^2 = 0%). This suggests that the overall benefit results from trials of CGA wards. This difference would equate to a NNT of 20 from CGA wards to avoid one unnecessary institutionalisation compared to a general medical ward.

Comparison 1.7: dependence

Eight studies (4128 participants) reported data on dependence. All of the studies tested CGA wards. No usable dependence data were recorded for CGA teams. There was no statistically significant difference between intervention and control groups for the outcome of dependence (OR 0.94, 95% CI 0.81 to 1.10, P = 0.44; Chi^2 = 9.68, P = 0.21, I^2 = 28%). Trial data from one trial (Collard 1985) have been included despite a significant dropout rate for this one outcome. The results must be interpreted with caution. Analysis without results for this trial does not alter the result significantly (seven studies, 3669 participants, OR 0.89, 95% CI 0.76 to 1.06, P = 0.19; Chi^2 = 7.40, P = 0.29, I^2 = 19%).

Comparison 1.8: death or dependence

There was no significant difference for the outcome of death or dependence (three studies, 1212 participants, OR 0.98, 95% CI 0.77 to 1.25, P = 0.87; Chi^2 = 0.57, P = 0.90, I^2 = 0%). No usable dependence data was recorded for CGA teams.

Comparison 1.9: death or deterioration

Death or deterioration is a combined outcome that looks at both mortality and functional decline (measured as an increase in dependence). Analysis is combined since a reduction in mortality in one group may be offset by an increasing dependence in survivors and so the two need to be considered together.

Analysis of data for the outcome of death or deterioration (five studies, 2622 participants) revealed a significant reduction in death or deterioration (OR 0.76, 95% CI 0.64 to 0.90, P = 0.001; Chi^2 = 2.81, P = 0.59, I^2 = 0%). This equates to a number needed to treat of 17 to avoid one unnecessary death or deterioration compared to general medical care. No statistically significant subgroup interaction exists (Chi^2 = 0.54, P = 0.46, I^2 = 0%) although the CGA teams subgroup (two studies, 317 participants) is considerably smaller than the CGA wards subgroup (three studies, 2305 participants).

Comparison 1.10: activities of daily living (ADL)

Data for analysis of activities of daily living (ADL) were available for five studies (1296 participants). The data did not reveal any significant difference between groups (standardised mean difference (SMD) 0.06, 95% CI -0.06 to 0.17, P = 0.33; Chi^2 = 4.35, P = 0.50, I^2 = 0%). No statistically significant subgroup interaction exists (Chi^2 = 2.05, P = 0.15, I^2 = 51.1%).

Comparison 1.11: cognitive function

Data were more limited for this outcome (five studies, 3317 participants), but did reveal an overall benefit on cognitive measures (SMD 0.08, 95% CI 0.01 to 0.15, P = 0.02; Chi^2 = 7.65, P = 0.11, I^2 = 48%) for patients in receipt of CGA. There was no statistically significant subgroup interaction (Chi^2 0.05, P = 0.83, I^2 0%), although data were only available from one CGA ward study (375 participants).

Comparison 1.12: length of stay

Length of stay data were analysed for 12 studies (4034 participants); there was significant heterogeneity (Tau^2 = 12.67, Chi^2 = 84.50, P < 0.00001, I^2 = 86%) and for this reason meta-analysis was not retained. For the ward subgroup length of stay ranged from a mean reduction of -9.20 days to 9.00 days more, and for the team subgroup length of stay ranged from a mean difference of -0.79 days to an increase of 3.60 days for CGA.

Comparison 1.13: readmissions

No significant difference existed between the groups for the outcome of re-admission to hospital (nine studies, 3822 participants, OR 1.03, 95% CI 0.89 to 1.18, P = 0.72; Chi^2 = 7.52, P = 0.48, I^2 = 0%). No statistically significant subgroup interaction exists (Chi^2 = 0.75, P = 0.39, I^2 = 0%).

Comparison 1.14: resource use

Trials reported the costs of CGA differently and with differing outcome measures. For this reason, we deemed combining these costs in a meta-analysis impractical and it ran the risk of providing an incomplete picture. Instead, we have compiled a table with the costs quoted by the papers that reported resource use with a brief explanation of how they were reported Table 1. Most of the costs reported are those incurred by the trial establishment (i.e. the hospital) and only rarely have the costs of nursing home care been taken into consideration. Most of the differences in cost in the trials are attributed to differences in length of stay or differences in the type and number of investigations requested between the intervention and the control group. Some institutions have described environmental changes necessary to run the trial (e.g. redecoration, installation of clocks and furnishings etc.) (Counsell 2000). In these cases the costs associated with this work have been set against the intervention group. This may appear to overestimate the costs of the intervention group. Many of the hospital costs (although not exclusively) seem to demonstrate a reduction in cost associated with CGA (Asplund 2000; Cohen 2002; Collard 1985; Counsell 2000; Fretwell 1990; Landefeld 1995; Naughton 1994). Some trials reported greater costs in the treatment group (Applegate 1990; Hogan 1987). If nursing home costs are taken into consideration, the potential benefit of CGA may be greater. The few trials that reported these costs demonstrated reduced costs in the CGA group (Applegate 1990; Cohen 2002; Nikolaus 1999; Rubenstein 1984).

Table 1. Cost analysis

Cost Analysis					
Trial	**Year**	**Country**	**Treatment Arm**	**Costs**	**Comments**
Cohen	2002	USA (US Dollars)	Geriatric Unit + Usual Care Outpatient|	36,592 (1844 SD)	Cost-Cost analysis separated into institutional costs and costings estimated for Nursing Home admissions based on standardized HMO rates.
			Usual Care Inpatient + Usual Care Outpatient (Control)	38,624 (2037)	
			Geriatric Unit + Geriatric Outpatient	35,935 (1829)	
			Usual Care Inpatient + Geriatric Outpatient (Control)	35,951 (1827)	
Collard	1985	USA (US Dollars)	Choate (Experimental)	4015.17 (SE 0.03)	Cost - cost analysis (hospital costs only)
			Choate (Control)	4545.13 (SE 0.03)	
			Symmes (Experimental)	3591.42 (SE 0.03)	
			Symmes (Control)	4155.54 (SE 0.02)	
Fretwell	1990	USA (US Dollars)	Experiment	3,148 (7,210 SD)	Cost - cost analysis (hospital costs only)
			Control	4,163 (18,406)	
Applegate	1990	USA (US Dollars)	Geriatric Unit (Rehab Diagnosis)	32,978 (35,130 SD)	Health and Social Care costs up to 1 year after randomization
			Geriatric Unit (Medical/ Surgical Diagnosis)	25, 846 (29,628)	
			Usual Care (Rehab/Diagnosis)	18,409 (16,555)	
			Usual Care (Medical/ Surgical Diagnosis)	15,248 (13,152)	
Asplund	2000	Sweden (Swedish Kronar)	Experiment	10,800 (9,300 - 12,300 IQR)	Cost - cost analysis (hospital costs only)
			Control	12,800 (11,500 - 14,100)	

Table 1. Cost analysis (*Continued*)

Counsell	2000	USA (US Dollars)	Experiment	5,640	Included in experimental group costs are costs of renovation of Geriatric Unit
			Control	5,754	
Hogan	1987	Canada (Canadian Dollars)	Experiment	98.36	Monthly costings for physician services only
			Control	77.68	
Landefeld	1995	USA (US Dollars)	Experiment	6,608	Cost - cost analysis (hospital costs only)
			Control	7,240	
Nikolaus	1999	Germany (Deutschmark)	Geriatric Unit + ESD	3,365,000 (1,922,400)	Costs for Hospital Care ad Nursing Homes (estimated as costs per 100 people per year)
			Geriatric Unit only	3,983,000 (2,276,000)	
			Control	4,145,000	
Rubenstein	1984	USA (US Dollars)	Experiment	22,597	Costs per year survived including Hospital and Nursing Home costs
			Control	27,826	
Naughton	1994	USA (US Dollars)	Experiment	4,525 (5,087 SD)	Cost - cost analysis (hospital costs only)
			Control	6,474 (7,000)	
White	1994	USA (US Dollars)	Experiment	23,906	Cost - cost analysis (hospital costs only)
			Control	45,189	

Comparison 2: CGA versus usual care (targeting)

This subgrouping is intended to reflect differences between trials that attempt to target CGA at the frailest or most at-risk patients in contrast to those that target on age alone. Targeting criteria as described in the studies are illustrated in the Characteristics of included studies tables. Typically they include descriptive criteria that might include geriatric syndromes, perceived risk of nursing home admission and functional or cognitive impairment. Trials have also been subgrouped according to whether they evaluate ward or team CGA for illustrative purposes.

Comparison 2.1: living at home (up to six months)

As before, there is a significant overall benefit from CGA on the odds of a patient being alive and in their own home at interim analysis as a result of being in receipt of CGA (14 studies, 5117 participants, OR 1.25, 95% CI 1.11 to 1.42, P = 0.0002; Chi^2 = 25.57, P = 0.02, I^2 = 49%). Differences in subgroups appear not to mirror differences in patient selection (e.g. 'targeting criteria' versus 'age alone' criteria) but differences between wards and teams. For patients admitted to a CGA ward on the basis of their age alone the NNT is 25 (six studies, 3993 participants, OR 1.20, 95% CI 1.05 to 1.38, P = 0.008; Chi^2 = 5.20, P = 0.39, I^2 = 4%) to allow one more person to be alive and in their own home at six months compared to general medical care. For patients admitted to a CGA ward on the basis of need (according to pre-defined target criteria), the NNT is six (five studies, 601 participants, OR 2.20, 95% CI 1.56 to 3.09, P < 0.00001; Chi^2 = 4.85, P = 0.30, I^2 = 18%) to allow one more person to be alive and in their own home at up to six months compared to general medical care. There was no statistically significant evidence of benefit from CGA teams, however study numbers are significantly lower for

these subgroups (teams with needs-related admission criteria, one study, 197 participants, OR 0.71, 95% CI 0.38 to 1.33, P = 0.29) and teams with age-related admission criteria (two studies, 296 participants, OR 0.94, 95% CI 0.57 to 1.55, P = 0.80; Chi^2 = 0.41, P = 0.52, I^2 = 0%) and this may represent under-powering.

Comparison 2.2: living at home (end of follow up)

Analysis of the subgroups for the odds of a patient being alive and in their own home at the end of scheduled follow up (median 12 months) shows as before an improved outcome for patients in receipt of CGA (18 studies, 7062 participants, OR 1.16, 95% CI 1.05 to 1.28, P = 0.003; Chi^2 = 28.49, P = 0.04, I^2 = 40%). As above, differences in subgroups appear to mirror differences between wards and teams rather than differences in patient selection (e.g. 'targeting criteria' versus 'age alone' criteria). For patients admitted to a CGA ward on the basis of need, the NNT would be 13 (nine studies, 2564 participants, OR 1.36, 95% CI 1.16 to 1.60, P = 0.0001; Chi^2 = 7.88, P = 0.44, I^2 = 0%) to allow one more patient to be alive and in their own home at the end of follow up compared to a general medical ward. Earlier differences in the odds of a patient being alive and at home for wards that had 'age only' admission criteria become non-significant at final follow up, OR 1.13, 95% CI 0.98 to 1.29, P = 0.09; Chi^2 = 6.58, P = 0.16, I^2 = 39%. There was no benefit on the odds of patients being alive and in their own homes for CGA teams that used 'age alone' criteria (two studies, 296 participants, OR 0.74, 95% CI 0.45 to 1.20, P = 0.22; Chi^2 = 1.70, P = 0.19, I^2 = 41%) or those that assessed according to predefined 'need' (OR 0.75, 95% CI .051 to 1.11, P = 0.15; Chi^2 = 0.16, P = 0.69, I^2 = 0%), but again the numbers were significantly smaller in these subgroups and the possibility exists of under powering for these subgroups.

Comparison 3: CGA versus usual care (timing of admission)

We trichotomised trials into three distinct groups depending on the timing of their intervention (whether admission to a CGA ward or review by a CGA team). We analysed trials according to whether they admitted directly from the Emergency Department ('direct'), whether they admitted within 72 hours ('acute') or whether they admitted after this time (e.g. 'stepdown').

Comparison 3.1: living at home (up to six months)

As before, there remains a significant benefit in the odds of being alive and in their own homes at interim analysis (median six months) for patients in receipt of CGA (14 studies, 5117 participants, OR 1.25, 95% CI 1.11 to 1.42, P = 0.0002; Chi^2 = 25.57, P = 0.02, I^2 = 49%). No statistically significant pattern emerged between CGA by direct admission or stepdown admission. Previous differences remained between wards and teams. No data were available for trials of acute admission CGA wards for this outcome.

Comparison 3.2: living at home (end of follow up)

Similarly, as before, the odds of a patient remaining alive and in their own home at the end of scheduled follow up (median 12 months) remain significant (OR 1.16, 95% CI 1.05 to 1.28, P = 0.003; Chi^2 = 28.49, P = 0.04, I^2 = 40%). Significant differences did not emerge in relation to the timing of CGA. The differences observed between wards and teams remains. Interestingly, there is an overlap between the use of admissions criteria and the timing of assessment or admission to CGA. Trials of CGA wards that admitted direct from the Emergency Department used age criteria alone. Trials of CGA wards that admitted in a stepdown fashion (72 hours or more after admission) tended to have targeted admission/assessment criteria with the exception of one trial of a CGA ward (Shamian 1984) based on age criteria alone that admitted in the postacute phase. CGA assessment teams were less markedly divided in the under 72 hour ('acute') setting. Nevertheless, no significant pattern emerges except the distinction between wards and teams as before.

Comparison 4: CGA versus usual care (outpatient follow up)

Outpatient follow up is suggested to be one of the key aspects of CGA that benefits patients longer-term after their admission to hospital as an emergency (Stuck 1993). We divided studies according to whether they provided outpatient follow up or not, including one study (Cohen 2002) that created subgroups in order to test this hypothesis. A number of trials did not describe explicit arrangements for CGA follow up and therefore could not be categorised (Asplund 2000; Harris 1991; Hogan 1987; Kay 1992; Landefeld 1995; McVey 1989; Powell 1990; Thomas 1993). There is therefore a risk that the results are not representative.

Comparison 4.1: living at home (up to six months)

There was significant heterogeneity when studies were combined for this outcome (nine studies, 3542 participants, Chi^2 = 21.93, P = 0.005, I^2 = 64%, range OR 4.33 to OR 0.71) and this becomes more marked in the group with no outpatient follow up (Chi^2 = 11.71, P = 0.008, I^2 = 74%, range OR 4.33 to OR 0.71) and less marked for the group with outpatient follow up (Chi^2 = 6.46, P = 0.17, I^2 = 38%, range OR 1.02 to OR 2.37). For this reason, meta-analysis has not been retained.

Comparison 4.2: living at home (end of follow up)

Similarly, no significant subgroup effect exists for the analysis of outpatient follow up on the primary outcome, living at home at the end of scheduled follow up (14 studies, 5754 participants, OR 1.17, 95% CI 1.05 to 1.30, P = 0.005; Chi^2 = 22.23, P = 0.05, I^2 = 42%). There was no statistically significant subgroup interaction, however there was some heterogeneity within the 'no follow up' group (Chi^2 = 12.78, P = 0.05 I^2 = 53%).

DISCUSSION

Main analysis

This review investigates whether specialist, organised and co-ordinated geriatric care (normally referred to as comprehensive geriatric assessment or CGA) is effective in delivering better patient outcomes than conventional care in a hospital setting.

There are some limitations to this meta-analysis. Firstly, for certain outcomes in particular (e.g. living at home (up to six months)) there are differences in the size of the subgroups, with the smaller subgroups (CGA teams) showing a non-significant result. The possibility exists that these results represent under-powering in one subgroup. Similarly for the analysis of cognition, data were only available for one study in the CGA ward subgroup. Secondly, these trials span a significant time period and a number of healthcare settings. This does not preclude comparisons of complex interventions (SUTC 2007) but may explain the heterogeneity that arises when trying to compare lengths of stay.

Despite these limitations, there appears to be a clear and significant improvement in the odds of a patient being alive and in their own home if they receive CGA. This effect is consistently seen from trials of geriatric wards and is not so clearly seen for geriatric teams although it should be noted these subgroups are smaller. As a consequence, whilst it is possible to conclude that CGA is beneficial, the benefits appear to arise predominantly from trials of geriatric wards.

This effect is very similar to the differences observed between stroke wards and stroke teams (Evans 2001; SUTC 2007) and may have multiple explanations. Firstly, a dedicated ward with more time focused exclusively on older peoples' care allows greater learning within the team, fostering the development of greater skills and expertise. In addition, working in close proximity as a team allows more efficient and effective multidisciplinary working and team-building. Secondly, mobile teams often find it difficult to modify the behaviour of other health professionals directly involved in the patient's care. As a consequence, recommendations for treatment and therapy are not always carried through (Allen 1986) and having control over this process seems to lead to a better outcome.

There is evidence that specialisation within the ward team (for example, medical, physiotherapy and occupational therapy) is critical to the successful multidisciplinary team outcome and this may be especially true in relation to gerontological nursing (Pound 1999). As with stroke wards, the role of nursing in delivering direct care 24 hours a day may be critical to the success of care and can include both the avoidance of complications and the creation of an enabling therapeutic environment (Langhorne 2005). In addition nursing staff are often the primary point of contact for communicating with family members and patients and this may be key to goal setting or discharge planning.

Other factors that appear to benefit discrete units include the development of protocols of care for the management of key conditions, which can be implemented and acted on with a higher degree of consistency. Discharge-planning or goal-setting may be better co-ordinated in a dedicated ward area that is able to enact its own recommendations. Finally, a modified ward environment more suitable for the promotion of independence or reducing the risk of delirium is also important.

A summary of the key processes and staff in each study is provided in Figure 1.

Analysis of the primary endpoint ('living at home') at up to six months as well as at the end of follow up might be deemed by some to be an unnecessary distinction. Analysis at multiple time points for the same outcome can risk over-representation of results. The results are presented here without correction for multiple analysis. It could be argued that improvements in final outcome (at one year) could mask longer or higher rates of institutional care in the short term (at up to six months). Patients might consider this to be a high price to pay. Differences at up to six months might reflect differences in clinical care for patients who are likely in some instances to have extended lengths of stay, whereas differences in outcomes at one year (or the end of scheduled follow up) are likely to reflect differences in real clinical outcomes from organised care. In a group with a high mortality rate, both time scales might be considered important.

The evaluation spans trials in different healthcare systems across different countries. Thus, rates of institutionalisation may vary across different healthcare settings. Nevertheless, randomisation makes comparisons within the same healthcare setting, and therefore reductions (for example in institutionalisation) can be trusted to represent different patient outcomes derived from CGA itself.

Analysis of length of stay is complex for this patient group given that a patient's length of stay may span more than one ward or institutional move. Wide variation in length of stay figures between studies may reflect organisational differences, and because of this heterogeneity firm conclusions cannot be safely drawn, requiring further research.

Subgroup analysis

Comparison 2: targeting

We conducted comparison between inclusion criteria in order to provide clarity over the question of who is appropriate for CGA. The simplest method of dichotomising the data is to group trials according to those that prioritise patients on the basis of 'age alone' and those that include on the basis of 'need' (defined as age plus a number of specific criteria) as illustrated in the 'Characteristics of included studies' tables. These needs-related criteria are generally descriptive, including classic geriatric presentations (falls, delirium etc.) and some consideration of 'at risk' criteria (such as functional impairment or risk of nursing home admission). Analysis is presented in wards and teams because these are intuitively separate and subgroup interaction exists between these two subgroups.

Again, analysis suggested that where subgroup interaction exists, it is between wards and teams. Both geriatric wards that admit patients on an age-related basis and those that admit on a needs-related basis appear to result in improved outcomes. Similarly, the teams that reviewed patients on an age-only basis and those that reviewed on a needs-related basis did not significantly benefit patient care.

Comparison 3: timing of admission

Analysis by timing of admission was felt to be appropriate given that, traditionally, many feel that the appropriate place for CGA is after an acute illness has settled (in a postacute setting). Trials of acute geriatric wards (sometimes called ACE Units) demonstrate improved patient outcomes when compared to general medical settings at up to six months. Direct comparison between acute geriatric wards and postacute wards is not possible from this analysis. In addition, the consistent subgroup heterogeneity that exists is between geriatric wards and geriatric teams. Further, the trials of acute geriatric wards and postacute geriatric wards (sometimes called Geriatric Evaluation and Management Units) in this analysis differ in their admission criteria. Trials evaluating direct admission from the Emergency Department all have an 'age-related' admission criteria whereas trials evaluating postacute care all have 'needs-related' criteria (the exception being Shamian 1984) where no outcome data were available for the primary endpoint. This makes comparison difficult. It may be that the optimal model of CGA for hospitals includes both acute and postacute models.

Comparison 4: outpatient follow up

Follow up of elderly patients discharged from the acute hospital setting has been cited as a key part of CGA. Despite this, we could not find a clear indication of a link between the presence of outpatient follow up and an improved outcome. It should be noted, however, that a number of studies were not clear in their published information as to whether they included CGA follow up. For this reason the results may be incomplete. In addition there was significant heterogeneity for the outcome of living at home at up to six months. Accepting these limitations means that caution must be exercised about any conclusions; the available data do not suggest a definite relationship.

Costs and benefits

Analysis of costs was conducted in a number of trials. Differences in reporting mechanisms meant that meta-analysis was not attempted. However, these costs analyses have been set out in Table 1. Precise costs will not be reflective of current healthcare costs (depending on when they were reported), nevertheless, inter-patient costs are relevant. Reporting mechanisms varied depending on whether the healthcare organisation also billed for nursing home care. Most chose to report direct costs to the host organisation (hospital costs). For this reason, gains in nursing home avoidance and reduced dependence on paid support were not included in most analyses. Despite this, most trials reported equitable or cost-effective care from CGA in a hospital setting. Most of the variability on costs described was from differences in length of stay, multidisciplinary staff costs, prescribing or variations in diagnostic test requests.

Further economic evaluation is worthwhile considering the demographic changes and potential societal costs from healthcare for an ageing population.

AUTHORS' CONCLUSIONS

Implications for practice

More older patients are likely to survive and return home if they receive comprehensive geriatric assessment (CGA) whilst an inpatient. Fewer will suffer death or deterioration. These effects are consistently demonstrated from trials of geriatric wards, but not replicated from trials of mobile peripatetic geriatric consultation teams on general wards although trial and participant numbers are much lower for this subgroup. CGA also appears to result in improved cognitive functioning.

Timing of admission is less critical than place of admission and there is evidence of benefit from trials recruiting in the acute stage (admission from the Emergency Department) through to the postacute stage (step down rehabilitation wards). The benefit of CGA is adequate to justify the reorganisation of services where possible. This does not appear to result in increased costs to hospitals and from a societal standpoint appears to result in potential cost reductions. Systems evaluating compliance with best care are required to ensure healthcare providers are accountable for the delivery of in-hospital CGA for this growing sector of society.

Implications for research

Further evaluation of CGA teams in isolation seems difficult to justify, although due to the possibility that CGA team subgroups in the analysis are under-powered, the potential benefit of these forms of CGA cannot be entirely ruled out. Comparisons of different forms of CGA with each other seems reasonable (e.g. ward versus teams) but comparisons with usual care seem difficult to justify.

Whilst the question of where patients should be treated appears relatively clear, the question of 'who' should optimally be treated with CGA remains. We have attempted in this analysis to compare trials that have treated 'all comers' over a certain age from those who have tried to differentiate patients on the basis of a need (e.g. classic geriatric syndromes, functional impairment etc.). Consistent objective and reproducible methods of identifying those most appropriate for CGA do not exist at present.

Comparison between admission in the acute setting to CGA wards and in the postacute setting is not possible with existing trials. Questions remain as to when patients should be optimally treated. The evidence across the spectrum of the patient journey appears to point to a benefit from CGA and some may feel that this question is irrelevant. It would appear necessary for healthcare organisations to justify their provision of adequate geriatric beds both in the acute and stepdown settings. Further delineating the roles of acute and stepdown models of CGA would be justified.

Further evaluation of these remaining questions is warranted. The contact author would be happy to hear from trialists addressing these questions or further trials of in-hospital CGA.

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* *Indicates the major publication for the study*

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Applegate 1990

Methods	Year: 1990 Location: Memphis, USA (1500-bed rehabilitation hospital) Team/ward?: ward Timing: stepdown Trial methodology: randomised controlled trial
Participants	Numbers (total): 155 Mean age: 78.8 Male:female ratio: 24% male Inclusion criteria: over 65, at risk for nursing home placement and/or functional impairment Some patients under 65 were considered if they met the criteria Exclusion criteria: unstable medical conditions; short-term monitoring required; survival less than 6 months; serious chronic mental impairment; nursing home placement inevitable Patient selection criteria: selected
Interventions	Team members: specialist nurse, ward nurses, social workers, physiotherapists, occupational therapists, dieticians, speech and language pathologists, audiologists, psychologists Team organisation: comprehensive assessment, multidisciplinary meetings at least weekly, regular use of standard assessment tools
Outcomes	Outcomes: mortality, ADL, days spent in nursing homes, mood, and cognition at 6 months and 1 year Trial conclusions: improved function and reduced nursing home admission
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer-generated random number sequences stratified by patient risk of nursing home admission
Allocation concealment (selection bias)	Unclear risk	No data available
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Patient and staff were not blinded to allocation. Outcome assessments were conducted by staff not involved in routine care but blinding of outcome assessors to treatment allocation is not clear.

Applegate 1990 (*Continued*)

Incomplete outcome data (attrition bias) All outcomes	Low risk	Intention-to-treat analysis
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Low risk	No apparent evidence of selection bias or attrition bias
Baseline outcome measurements similar	Low risk	Identical baseline measurements conducted
Baseline characteristics similar	Low risk	Both groups are well-matched at baseline
Study protected against contamination	Unclear risk	Patients in control and treatment group treated by different staff

Asplund 2000

Methods	Year: 2000 Location: Umea, Sweden (University Hospital) Team/ward?: ward Timing: direct from Emergency Ward Trial methodology: randomised controlled trial
Participants	Numbers (total): 413 Mean age: 81 Male:female ratio: 40% male Inclusion criteria: all patients over 70 admitted acutely Exclusion criteria: patients requiring specialist unit (ICU, CCU, Stroke) Patient selection criteria: unselected Patient selection criteria details: N/A
Interventions	Team members: senior geriatrician, ward nurses, social workers, physiotherapists, occupational therapists, dieticians Team organisation: comprehensive assessment
Outcomes	Outcomes: global outcome (death, institutionalisation, dependence or psychological outcomes), death, institutionalisation, Barthel Index, cognitive function, psychological outcomes Trial conclusions: reduced institutionalisation
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**

Asplund 2000 (*Continued*)

Random sequence generation (selection bias)	Unclear risk	Sequence generation is not described although the block randomisation is described in detail
Allocation concealment (selection bias)	Low risk	Sealed opaque envelopes
Blinding (performance bias and detection bias) All outcomes	High risk	No blinding of patients, staff or outcome assessment
Incomplete outcome data (attrition bias) All outcomes	High risk	Analysis per protocol
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Low risk	No evidence of other forms of selection, attrition or performance bias
Baseline outcome measurements similar	Low risk	Identical baseline measurements
Baseline characteristics similar	Low risk	Both groups are fairly similar at baseline
Study protected against contamination	Low risk	Staff were changed during study period to reduce the risk of a staff-related effect

Cohen 2002

Methods	Year: 2002 Location: USA (VA multicentre study) Team/ward?: ward +/- outpatient follow up Timing: stepdown Trial methodology: randomised controlled trial, 2 x 2 factorial design, inpatient geriatric ward versus usual care and outpatient geriatric follow up versus usual care
Participants	Numbers (total): 1388 Mean age: 74 Male:female ratio: 98% male Inclusion criteria: age at least 65, hospitalised on a medical ward, expected length of stay > 2 days, frailty (presence of stroke, history of falls, inability to perform ADLs, prolonged bed rests, incontinence) Exclusion criteria: admissions from nursing home, terminal illness Patient selection criteria: selected Patient selection criteria details: as above
Interventions	Team members: senior geriatrician, specialist nurse, social workers, physiotherapists, occupational therapists, dieticians, pharmacists Team organisation: comprehensive assessment, at least weekly MDT meeting

Cohen 2002 (*Continued*)

Outcomes	Outcomes: death, perceived health status, basic and extended ADL, costs Trial conclusions: no overall effects on survival. Improved physical function with inpatient care, improved cognitive function with outpatient care
Notes	This trial was subdivided into 4 groups in a 2 x 2 factorial design. It explored the hypothesis that CGA out-patient follow up was associated with a significantly improved outcome. The first subgroup of the trial evaluated Geriatric Evaluation and Management Clinic (GEMC) follow up post-discharge from inpatient care. This splitting of the data has been done to enable meta-analysis for the outpatient follow up subgroup. The second subgroup of the trial evaluated Usual Care Outpatient (UCOP) follow up following discharge from inpatient care

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Computerised random numbers in two-by-two factorial design with stratification according to functional status
Allocation concealment (selection bias)	Low risk	Randomisation remote at co-ordinating centre
Blinding (performance bias and detection bias) All outcomes	Low risk	Blinding of outcome assessor only
Incomplete outcome data (attrition bias) All outcomes	Low risk	Intention-to-treat analysis
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Low risk	No evidence to suggest selection, performance or attrition bias
Baseline outcome measurements similar	Low risk	Identical baseline assessments
Baseline characteristics similar	Low risk	Similar baseline characteristics
Study protected against contamination	Low risk	Care conducted on different units with different groups of staff

Cohen 2002 GEMC

Methods	This is the subgroup of the trial that evaluated Geriatric Evaluation and Management Clinic (GEMC) follow up post-discharge from inpatient care. This splitting of the data has been done to enable meta-analysis for the outpatient follow up subgroup
Participants	Numbers (total): 1388 Mean age: 74 Male:female ratio: 98% male Inclusion criteria: age at least 65, hospitalised on a medical ward, expected length of stay > 2 days, frailty (presence of stroke, history of falls, inability to perform ADLs, prolonged bed rests, incontinence) Exclusion criteria: admissions from nursing home, terminal illness Patient selection criteria: selected Patient selection criteria details: as above
Interventions	Team members: senior geriatrician, specialist nurse, social workers, physiotherapists, occupational therapists, dieticians, pharmacists Team organisation: comprehensive assessment, at least weekly MDT meeting
Outcomes	Outcomes: death, perceived health status, basic and extended ADL, costs Trial conclusions: no overall effects on survival. Improved physical function with inpatient care, improved cognitive function with outpatient care
Notes	See above

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Computerised random numbers in two-by-two factorial design with stratification according to functional status
Allocation concealment (selection bias)	Low risk	Randomisation remote at co-ordinating centre
Blinding (performance bias and detection bias) All outcomes	Low risk	Blinding of outcome assessor only
Incomplete outcome data (attrition bias) All outcomes	Low risk	Intention-to-treat analysis
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Low risk	No evidence to suggest selection, performance or attrition bias
Baseline outcome measurements similar	Low risk	Identical baseline assessments

Cohen 2002 GEMC (*Continued*)

Baseline characteristics similar	Low risk	Similar baseline characteristics
Study protected against contamination	Low risk	Care conducted on different units with different groups of staff

Cohen 2002 UCOP

Methods	This is the subgroup of the trial that evaluated Usual Care Outpatient (UCOP) follow up following discharge from inpatient care. This splitting of the data has been done to enable meta-analysis for the outpatient follow up subgroup.
Participants	Numbers (total): 1388 Mean age: 74 Male:female ratio: 98% male Inclusion criteria: age at least 65, hospitalised on a medical ward, expected length of stay > 2 days, frailty (presence of stroke, history of falls, inability to perform ADLs, prolonged bed rests, incontinence) Exclusion criteria: admissions from nursing home, terminal illness Patient selection criteria: selected Patient selection criteria details: as above
Interventions	Team members: senior geriatrician, specialist nurse, social workers, physiotherapists, occupational therapists, dieticians, pharmacists Team organisation: comprehensive assessment, at least weekly MDT meeting
Outcomes	Outcomes: death, perceived health status, basic and extended ADL, costs Trial conclusions: no overall effects on survival. Improved physical function with inpatient care, improved cognitive function with outpatient care
Notes	See above

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Computerised random numbers in two-by-two factorial design with stratification according to functional status
Allocation concealment (selection bias)	Low risk	Randomisation remote at co-ordinating centre
Blinding (performance bias and detection bias) All outcomes	Low risk	Blinding of outcome assessor only
Incomplete outcome data (attrition bias) All outcomes	Low risk	Intention-to-treat analysis

Cohen 2002 UCOP (*Continued*)

Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Low risk	No evidence to suggest selection, performance or attrition bias
Baseline outcome measurements similar	Low risk	Identical baseline assessments
Baseline characteristics similar	Low risk	Similar baseline characteristics
Study protected against contamination	Low risk	Care conducted on different units with different groups of staff

Collard 1985

Methods	Year: 1987 Location: Boston, USA (2 community hospitals) Team/ward?: ward Timing: direct Trial methodology: randomised controlled trial (1:2 allocation, treatment:control)
Participants	Numbers (total): 695 Mean age: 78 Male:female ratio: 40% male (approx) Inclusion criteria: over 65, under the care of a participating physician, either medical or surgical admissions Exclusion criteria: none given Patient selection criteria: unselected Patient selection criteria details: over 65
Interventions	Team members: ward nurses, social workers, senior physician, physiotherapist, occupational therapist Team organisation: at least weekly multidisciplinary meetings, specialised ward environment, comprehensive assessment, protocolised care, standardised assessment tools
Outcomes	Outcomes: death, length of stay, complications, institutionalisation, dependence, self-rated health Trial conclusions: no conclusions drawn
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Not described

Collard 1985 (*Continued*)

Allocation concealment (selection bias)	Unclear risk	Not described
Blinding (performance bias and detection bias) All outcomes	High risk	No patient, staff or outcome assessment blinding
Incomplete outcome data (attrition bias) All outcomes	High risk	There were significant differences in the outcome rates for some outcomes. Mortality was recorded at the end of follow up as was institutionalisation for other outcomes such as dependence was incomplete with high dropout rates.
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Unclear risk	No evidence to exclude performance bias but no clear attrition bias
Baseline outcome measurements similar	Unclear risk	Measurements at baseline are similar but differences exist in the reporting numbers
Baseline characteristics similar	Unclear risk	Baseline characteristics are broadly similar however because of differences in baseline numbers it is not entirely clear if the populations are identical
Study protected against contamination	Low risk	Care is delivered in different physical units with separate staffing arrangements

Counsell 2000

Methods	Year: 2000 Location: Akron City, Ohio, USA (Community Teaching Hospital) Team/ward?: ward Timing: direct (ACE) Trial methodology: randomised controlled trial
Participants	Numbers (total): 1531 Mean age: 80 Male:female ratio: 40% male (approximately) Inclusion criteria: community-dwelling persons aged 70 or older admitted to medical or family practice service Exclusion criteria: transferred from other hospital, nursing home, required speciality unit admission, elective admissions, LOS < 2 days Patient selection criteria: unselected

Counsell 2000 (*Continued*)

Interventions	Team members: senior geriatrician, specialist nurse, ward nurses, social workers, physiotherapists Team organisation: comprehensive assessment, at least weekly multidisciplinary meetings, standardised assessment tools, specialised ward environment, protocolised care
Outcomes	Outcomes: death, activities of daily living, institutionalisation, dependence Trial conclusions: improved combined outcomes of functional decline or nursing home admission in intervention group
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Computer-generated random number
Allocation concealment (selection bias)	Low risk	Numbered sequential opaque envelopes
Blinding (performance bias and detection bias) All outcomes	High risk	No patient or staff blinding. No blinding of outcome assessor
Incomplete outcome data (attrition bias) All outcomes	Low risk	Intention-to-treat and analysis per protocol described
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Low risk	No evidence to suggest attrition bias, selection bias or performance bias
Baseline outcome measurements similar	Low risk	Identical baseline measurements
Baseline characteristics similar	Low risk	Similar baseline characteristics
Study protected against contamination	Unclear risk	Patients treated in separate units

Fretwell 1990

Methods	Year: 1990 Location: Providence, Rhode Island, USA (Teaching Hospital) Team/ward?: ward Timing: direct Trial methodology: randomised controlled trial
Participants	Numbers (total): 436 Mean age: 83 Male:female ratio: 28% male Inclusion criteria: > 75, physician given consent, did not require CCU or ICU Exclusion criteria: none given Patient selection criteria: unselected Patient selection criteria details: over 75s
Interventions	Team members: specialist nurses, ward nurses, senior geriatrician, pharmacist, physiotherapist, dietician, social worker Team organisation: at least weekly multidisciplinary meetings, goal-setting, standardised assessment tools
Outcomes	Outcomes: death, cognition, dependence, mood, costs, institutionalisation Trial conclusions: no significant difference observed between the groups
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Not described
Allocation concealment (selection bias)	Unclear risk	Not described
Blinding (performance bias and detection bias) All outcomes	High risk	Patients and staff were not blinded to allocation. Outcome assessor not apparently blinded
Incomplete outcome data (attrition bias) All outcomes	Low risk	Attrition rates also described and compared. Intention-to-treat analysis
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Low risk	No apparent evidence of attrition, performance or selection bias evident
Baseline outcome measurements similar	Low risk	Identical baseline measurements
Baseline characteristics similar	Low risk	Similar baseline characteristics

Fretwell 1990 (*Continued*)

Study protected against contamination	Low risk	Care delivered in discrete units by separate staff

Harris 1991

Methods	Year: 1991 Location: Adelaide, Australia Team/ward?: ward Timing: direct from emergency department Trial methodology: randomised controlled trial
Participants	Numbers (total): 267 Mean age: 78 Male:female ratio: 40% male (approximately) Inclusion criteria: over 70 years of age, non-elective, not re-admitted, non-nursing home dwellers, resident in Southern Health Region Exclusion criteria: none given Patient selection criteria: unselected Patient selection criteria details: no selection criteria
Interventions	Team members: senior geriatrician, social workers, occupational therapists, physiotherapists, ward nurses Team organisation: not specified
Outcomes	Outcomes: death, institutionalisation, dependency, cognitive status, length of stay Trial conclusions: no evidence of benefit from admission to a Geriatric Assessment Unit for unselected adults over 70 years.
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Not clearly described
Allocation concealment (selection bias)	High risk	Cards selected in sequence, however these were open and error rates are recorded
Blinding (performance bias and detection bias) All outcomes	High risk	No blinding of patients, staff or outcome assessment
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Analysis by intention-to-treat

Harris 1991 (*Continued*)

Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item. Data presented in some cases in graphical form only
Other bias	High risk	Some evidence of attrition bias was evident for functional outcomes, although follow up was complete for outcomes such as death or institutionalisation. Data from functional outcomes were not available for use in analysis. Selection bias unclear with open randomisation. Baseline characteristics appear similar
Baseline outcome measurements similar	Low risk	Demographic and other baseline measurements identical between groups
Baseline characteristics similar	Low risk	No significant differences between groups
Study protected against contamination	Low risk	Care delivered by different staff in separate units

Hogan 1987

Methods	Year: 1987 Location: Halifax, Canada (Community Hospital) Team/ward?: team Timing: stepdown Trial methodology: randomised controlled trial
Participants	Numbers (total): 113 Mean age: 82 Male:female ratio: 30% male (approximately) Inclusion criteria: all patients over 75 admitted to Dept of Medicine on an emergency basis, with confusional state, impaired mobility, falls, urinary incontinence, polypharmacy, living in a nursing home or admission within previous 3 months Exclusion criteria: ICU, stroke, permission refused by patient or attending physician Patient selection criteria: selected Patient selection criteria details: screened within 48 hours. Seen by consultation team - geriatrician, nurse and physiotherapist - most within a week of hospitalisation, criteria as above
Interventions	Team members: senior geriatrician, specialist nurse, physiotherapists Team organisation: comprehensive assessment, at least weekly MDT
Outcomes	Outcomes: death, institutionalisation, cognitive status, readmissions, length of stay, costs Trial conclusions: improved cognitive status, reduced polypharmacy and reduced short-term mortality demonstrated

Hogan 1987 (*Continued*)

Notes		
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Random number generation
Allocation concealment (selection bias)	High risk	Not described. Allocation by assessor not responsible for delivering care.
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Outcome assessment only
Incomplete outcome data (attrition bias) All outcomes	Low risk	Analysis appears to be per protocol
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Unclear risk	Evidence of selection bias unclear due to lack of clarity in description of randomisation method
Baseline outcome measurements similar	Low risk	Measurements appear similar
Baseline characteristics similar	Low risk	Slight differences exist in the male:female proportion which may reflect the small sample size
Study protected against contamination	Unclear risk	Four patients in the control group were removed from analysis after a review was requested from the intervention team according to clinical need

Kay 1992

Methods	Year: 1992 Location: Toronto, Canada (Community Hospital) Team/ward?: ward Timing: stepdown Trial methodology: randomised controlled trial (patients 'randomly assigned')
Participants	Numbers (total): 59 Mean age: 81 Male:female ratio: 45% male

Kay 1992 (*Continued*)

	Inclusion criteria: over 70, medically stable, possible acute confusion, functional impairment, multiple geriatric problems Exclusion criteria: medically unstable, chronic cognitive impairment, independent Patient selection criteria: selected Patient selection criteria details: over 70, medically stable, possible acute confusion, functional impairment, multiple geriatric problems
Interventions	Team members: specialist nurses, social workers, occupational therapists, physiotherapists, pharmacists, dietitian Team organisation: comprehensive assessment, at least weekly MDT, standardised assessment tools
Outcomes	Outcomes: Institutionalisation, activities of daily living, cognitive function Trial conclusions: inadequate evidence of benefit from a Geriatric Assessment Unit
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Not described
Allocation concealment (selection bias)	Unclear risk	Not described
Blinding (performance bias and detection bias) All outcomes	High risk	Patients moved to unit with different staff and no patient blinding possible
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not described in methods
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Low risk	No apparent selection, performance or attrition bias
Baseline outcome measurements similar	Low risk	Identical measurements
Baseline characteristics similar	Low risk	Similar baseline characteristics evident between groups
Study protected against contamination	Unclear risk	Staff working in separate unit

Kircher 2007

Methods	Year: 2007 Location: Tubingen, Germany Team/ward?: team Timing: stepdown Trial methodology: multicentre randomised controlled trial with a separate control group for external comparison
Participants	Numbers (total): 435 Mean age: 78 Male:female ratio: 33% males (approximately) Inclusion criteria: over 65, with evidence of functional impairment, potential breakdown of the home situation Exclusion criteria: nursing home patients, independent patients with no functional impairment, a terminal condition, severe dementia, not able to speak German, living further than 60 miles from the hospital Patient selection criteria: selected. Patient selection criteria details: as above
Interventions	Team members: senior geriatrician, social worker, specialist nurse plus other associated health professionals as required Team organisation: comprehensive assessment and treatment recommendations, at least weekly multidisciplinary meetings, discharge planning, follow up telephone calls
Outcomes	Outcomes: death, institutionalisation, activities of daily living, cognition, mood, number of drugs Trial conclusions: care by CGA teams did not improve re-hospitalisation or nursing home admissions
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Not described
Allocation concealment (selection bias)	Unclear risk	Not described
Blinding (performance bias and detection bias) All outcomes	Low risk	Blinding of outcome assessors only
Incomplete outcome data (attrition bias) All outcomes	High risk	No intention-to-treat analysis described
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item

Kircher 2007 (*Continued*)

Other bias	Low risk	No apparent selection, attrition or performance bias. Lack of patient and staff blinding make detection bias difficult to assess
Baseline outcome measurements similar	Low risk	Identical baseline measurements recorded
Baseline characteristics similar	Low risk	Similar baseline characteristics between groups
Study protected against contamination	Unclear risk	Staff worked as part of a mobile team between ward environments

Landefeld 1995

Methods	Year: 1995 Location: Cleveland, Ohio, USA (Teaching Hospital) Team/ward?: ward (ACE) Timing: direct Trial methodology: randomised controlled trial
Participants	Numbers (total): 651 Mean age: 80 Male:female ratio: 35% male (approximately) Inclusion criteria: 70 or older admitted for general medical care Exclusion criteria: patients admitted to a speciality unit - ICU, cardiology, telemetry, oncology Patient selection criteria: unselected Patient selection criteria details: all over 70s
Interventions	Team members: trainee geriatrician, ward nurses, social worker, physiotherapists, occupational therapists, dieticians Team organisation: at least weekly MDT, use of standardised assessment tools, protocolised care, specialised ward environment
Outcomes	Outcomes: death, institutional care, cognition, dependence Trial conclusions: fewer patients discharged to a nursing home, Improved functional outcomes at discharge
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Computer-generated random numbers

Landefeld 1995 (*Continued*)

Allocation concealment (selection bias)	Low risk	Allocation administered by staff member remote to study
Blinding (performance bias and detection bias) All outcomes	Unclear risk	No patient, outcome assessor or staff blinding
Incomplete outcome data (attrition bias) All outcomes	Low risk	Multiple data sources used to collect missing data Analysis by intention-to-treat
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Low risk	No apparent selection, attrition or performance bias
Baseline outcome measurements similar	Low risk	Identical baseline measurements
Baseline characteristics similar	Low risk	Similar characteristics between populations
Study protected against contamination	Low risk	Care provided in different settings by different staff

McVey 1989

Methods	Year: 1989 Location: Durham, NC, USA (VA Centre) Team/ward?: team Timing: acute (within 48 hours) Trial methodology: randomised controlled trial
Participants	Numbers (total): 178 Mean age: 81 Male:female ratio: 96% male Inclusion criteria: patients 75 or older Exclusion criteria: admitted to ICU, had previously received geriatric care, expected length of stay less than 48 hours Patient selection criteria: unselected Patient selection criteria details: over 75s
Interventions	Team members: senior geriatrician, trainee geriatrician, specialist nurse, social worker Team organisation: comprehensive assessment and recommendations made, at least weekly multidisciplinary meetings, standardised assessment tools
Outcomes	Outcomes: activities of daily living/dependence, institutionalisation, death Trial conclusions: no significant effect on functional decline

McVey 1989 (*Continued*)

Notes		
Risk of bias		
Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Computerised randomisation scheme
Allocation concealment (selection bias)	Unclear risk	Not described
Blinding (performance bias and detection bias) All outcomes	Low risk	No blinding of staff in CGA team. No patient blinding. There was blinding of the outcome assessor
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Analysis as per protocol after initial exclusion of some patients
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Low risk	No clear evidence of selection bias, performance bias or attrition bias
Baseline outcome measurements similar	Low risk	Baseline measurements were the same
Baseline characteristics similar	Low risk	Baseline characteristics were very similar
Study protected against contamination	Unclear risk	The team operated in different wards

Naughton 1994

Methods	Year: 1994 Location: Chicago, Il, USA (Urban Teaching Hospital) Team/ward?: team Timing: direct from the emergency department Trial methodology: randomised controlled trial
Participants	Numbers (total): 111 Mean age: 80 Male:female ratio: 40% male (approximately) Inclusion criteria: 70 years admitted from ED to medicine service and did not regularly receive care from attending internist on staff at study hospital at time of admission. Exclusion criteria: admission to ITU or transferred to a surgical service Patient selection criteria: unselected Patient selection criteria details: over 70s admitted as an emergency

Naughton 1994 (*Continued*)

Interventions	Team members: senior geriatrician, social worker, specialist nurse, physiotherapist Team organisation: geriatrician and social worker comprise core GEM team with nurse specialist and physiotherapist as required. Carried out systematic evaluation of patient's medical, mental, functional and psychosocial status and needs. Team conference 2 to 3 times weekly.
Outcomes	Outcomes: death, institutionalisation, costs, length of stay Trial conclusions: reduced hospital costs
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Permuted block design
Allocation concealment (selection bias)	Low risk	Opaque sealed sequential envelopes
Blinding (performance bias and detection bias) All outcomes	High risk	No blinding of patient, staff or outcome assessor
Incomplete outcome data (attrition bias) All outcomes	High risk	Analysis per protocol
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Low risk	No clear evidence of selection, attrition or performance bias
Baseline outcome measurements similar	Low risk	Same baseline measurements conducted
Baseline characteristics similar	Low risk	Very similar baseline characteristics
Study protected against contamination	Unclear risk	Consultation team in medical ward, therefore contamination possible

Nikolaus 1999 plus ESD

Methods	Year: 1999 Location: Heidelberg, Germany (University Hospital) Team/ward?: ward Timing: acute (within 48 hours) Trial methodology: randomised controlled trial with 2 intervention arms - geriatric assessment and management with early supported discharge (home intervention team) or geriatric assessment alone versus usual care
Participants	Numbers (total): 545 Mean age: 81 Male:female ratio: unclear Inclusion criteria: elderly patients with multiple chronic conditions or functional deterioration or who were at risk of nursing home placement Exclusion criteria: terminal illness, severe dementia, patients who lived > 15 km away Patient selection criteria: selected Patient selection criteria details: as above
Interventions	Team members: senior geriatrician, specialist nurses, physiotherapists, occupational therapists, social workers. (The home intervention team consisted of 3 nurses, a physiotherapist, an occupational therapist, a social worker and secretarial support) Team organisation: comprehensive assessment, standardised assessment tools, outpatient follow up (HIT team)
Outcomes	Outcomes: Institutionalisation, readmission, costs, length of stay, perceived health status, dependence Trial conclusions: comprehensive geriatric assessment in association with early supported discharge improves functional outcomes and may reduce length of stay
Notes	For analysis this study has been divided into the 2 interventions: CGA Ward plus Early Supported Discharge (ESD) and CGA Ward (no ESD)

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Random number sequence generation
Allocation concealment (selection bias)	Low risk	Sealed opaque envelopes
Blinding (performance bias and detection bias) All outcomes	Low risk	Initial staff blinding. Blinded outcome assessment
Incomplete outcome data (attrition bias) All outcomes	Low risk	Intention-to-treat analysis
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item

Nikolaus 1999 plus ESD (*Continued*)

Other bias	Low risk	No apparent selection bias, performance bias or attrition bias
Baseline outcome measurements similar	Unclear risk	Baseline measurements described but not tabulated
Baseline characteristics similar	Unclear risk	Baseline characteristics not tabulated
Study protected against contamination	Low risk	Separate staff working in discrete units

Nikolaus 1999 Ward

Methods	Trial methods are described above under Nikolaus 1999 plus ESD. These are 2 separate arms of a trial comparing a CGA ward ('Nikolaus 1999 Ward' with usual care and in a second arm of the trial a CGA ward with early supported discharge team support ('Nikolaus 1999 plus ESD') with usual care.
Participants	Numbers (total): 545 Mean age: 81 Male:female ratio: unclear Inclusion criteria: elderly patients with multiple chronic conditions or functional deterioration or who were at risk of nursing home placement Exclusion criteria: terminal illness, severe dementia, patients who lived > 15 km away Patient selection criteria: selected Patient selection criteria details: as above
Interventions	Team members: senior geriatrician, specialist nurses, physiotherapists, occupational therapists, social workers Team organisation: comprehensive assessment, standardised assessment tools
Outcomes	Outcomes: Institutionalisation, readmission, costs, length of stay, perceived health status, dependence Trial conclusions: comprehensive geriatric assessment in association with early supported discharge improves functional outcomes and may reduce length of stay
Notes	See above

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Random number sequence generation
Allocation concealment (selection bias)	Low risk	Sealed opaque envelopes

Nikolaus 1999 Ward (*Continued*)

Blinding (performance bias and detection bias) All outcomes	Low risk	Initial staff blinding. Blinded outcome assessment
Incomplete outcome data (attrition bias) All outcomes	Low risk	Intention-to-treat analysis
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Low risk	No apparent selection bias, performance bias or attrition bias
Baseline outcome measurements similar	Unclear risk	Baseline measurements described but not tabulated
Baseline characteristics similar	Unclear risk	Baseline characteristics not tabulated
Study protected against contamination	Low risk	Separate staff working in discrete units

Powell 1990

Methods	Year: 1990 Location: Manitoba, Canada Team/ward?: ward Timing: direct Trial methodology: randomised controlled trial
Participants	Numbers (total): 203 Mean age: uncertain Male:female ratio: uncertain Inclusion criteria: acute medical admissions over 74 years Exclusion criteria: requiring psychiatric or surgical care Patient selection criteria: unselected Patient selection criteria details: uncertain. Unselected 75 and over patients
Interventions	Team members: unknown Team organisation: unknown
Outcomes	Outcomes: death, institutionalisation, cognitive function, depression, dependence Trial conclusions: non-significant differences in favour of the treatment group
Notes	Abstract only available

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**

Powell 1990 (*Continued*)

Random sequence generation (selection bias)	Unclear risk	Not described
Allocation concealment (selection bias)	Unclear risk	Not described
Blinding (performance bias and detection bias) All outcomes	Unclear risk	No blinding of patients or staff apparent. Outcome assessment blinded
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Inadequate information
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Unclear risk	Inadequate information to judge
Baseline outcome measurements similar	Unclear risk	No baseline measurements available
Baseline characteristics similar	Unclear risk	No baseline measurements available
Study protected against contamination	Unclear risk	Inadequate published information to allow any conclusions to be drawn

Reuben 1995

Methods	Year: 1995 Location: Los Angeles, Ca, USA (multicentre HMO) Team/ward?: team Timing: stepdown Trial methodology: multicentre randomised controlled trial
Participants	Numbers (total): 2353 Mean age: 78 Male:female ratio: 53% male (approximately) Inclusion criteria: over 65, with one of 13 criteria: stroke, immobility, impairment ADL, malnutrition, incontinence, confusion or dementia, prolonged bed rest, falls, depression, social or family problems, unplanned re-admission, new fracture, over 80 Exclusion criteria: admitted for terminal care, lived outside HMO area, did not speak English, were admitted from a nursing home Patient selection criteria: selected Patient selection criteria details: as above
Interventions	Team members: senior geriatrician, nurse specialist, social workers, physiotherapists Team organisation: comprehensive assessment, at least weekly MDT, standardised assessment tools, outpatient follow up

Reuben 1995 (*Continued*)

Outcomes	Outcomes: death, institutionalisation, dependency, cognitive status, perceived health status Trial conclusions: no significant differences identified in mortality, functional status or perceived health
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Random number tables in blocks of 4
Allocation concealment (selection bias)	Unclear risk	Not described
Blinding (performance bias and detection bias) All outcomes	High risk	No blinding of patient, staff or outcome assessor. Baseline blinded assessments only
Incomplete outcome data (attrition bias) All outcomes	Low risk	Intention-to-treat analysis. Some selective subgroup reporting however
Selective reporting (reporting bias)	Low risk	Prior documented description of trial design and rationale
Other bias	Low risk	No apparent selection bias or attrition bias
Baseline outcome measurements similar	Low risk	Measurements at baseline consistent between groups
Baseline characteristics similar	Low risk	Both groups appear similar in baseline characteristics
Study protected against contamination	Unclear risk	Not described. Mobile team assessing patients in different wards. Contamination (e.g. of routine ward staff practices) possible.

Rubenstein 1984

Methods	Year: 1984 Location: Los Angeles, Ca, USA (VA hospital) Team/ward?: ward Timing: stepdown Trial methodology: randomised controlled trial
Participants	Numbers (total): 123 Mean age: 78 Male:female ratio: 96% male Inclusion criteria: patients over 65 still in hospital one week after admission with persistent medical, functional or psychosocial problem Exclusion criteria: severe dementia or disabling disease resistant to further medical management; those with no social supports; those functioning well who would definitely return to community Patient selection criteria: selected Patient selection criteria details: as above - functional impairment, but independent or severely ill and dependent patients excluded
Interventions	Team members: senior geriatrician, trainee geriatrician, specialist nurses, ward nurses, social workers, physiotherapists, occupational therapists, dietician, audiologists, dentists and psychologists Team organisation: at least weekly MDT meetings, standardised assessment tools, outpatient follow up
Outcomes	Outcomes: death, institutionalisation, costs, cognitive status, morale Trial conclusions: reduced mortality, reduced institutionalisation, improved functional status and morale
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Unclear risk	Not described
Allocation concealment (selection bias)	Unclear risk	Not described
Blinding (performance bias and detection bias) All outcomes	High risk	No blinding of patient, staff or outcome assessor
Incomplete outcome data (attrition bias) All outcomes	Low risk	Analysis of outcomes by intention-to-treat
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item

Rubenstein 1984 (*Continued*)

Other bias	Low risk	No clear selection, performance or attrition bias
Baseline outcome measurements similar	Low risk	Measurements at baseline were identical
Baseline characteristics similar	Low risk	Baseline characteristics between groups broadly similar
Study protected against contamination	Low risk	Patients treated in separate unit with separate staff

Saltvedt 2002

Methods	Year: 2002 Location: Trondheim, Norway (Community Hospital) Team/ward?: ward Timing: acute Trial methodology: randomised controlled trial
Participants	Numbers (total): 254 Mean age: 82 Male:female ratio: 35% male (approximately) Inclusion criteria: frail patients: acute impairment of ADL, imbalance, dizziness, impaired mobility, chronic disability, weight loss, falls, confusion, depression, malnutrition, vision or hearing impairment, mild or moderate dementia, urinary incontinence, social or family problems, polypharmacy Exclusion criteria: nursing home patients, fully independent, cancer with metastasis, severe dementia Patient selection criteria: selected Patient selection criteria details: as above (functionally impaired, with independent or previously institutionalised patients excluded)
Interventions	Team members: senior geriatrician, trainee geriatrician, specialist nurse, social workers, physiotherapists, occupational therapists, dentists Team organisation: at least weekly MDTs, protocolised care, early mobilisation
Outcomes	Outcomes: mortality Trial conclusions: a reduction in short-term mortality, no difference in long-term mortality
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**

Saltvedt 2002 (*Continued*)

Random sequence generation (selection bias)	Low risk	Provided by independent research office using permuted block randomisation with unknown and varied block size
Allocation concealment (selection bias)	Low risk	Opaque sealed envelopes
Blinding (performance bias and detection bias) All outcomes	Unclear risk	No patient or clinician blinding. Outcome assessment blinding unclear
Incomplete outcome data (attrition bias) All outcomes	Low risk	Analysis by intention-to-treat
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Low risk	No apparent selection, performance or attrition bias
Baseline outcome measurements similar	Low risk	Identical baseline measurements
Baseline characteristics similar	Low risk	Similar baseline characteristics
Study protected against contamination	Low risk	Staff worked in separate units

Shamian 1984

Methods	Year: 1984 Location: Montreal, Canada (University Teaching Hospital) Team/ward?: ward Timing: stepdown Trial methodology: randomised controlled trial evaluating temporary relocation to a geriatric ward
Participants	Numbers (total): 36 Mean age: uncertain Male:female ratio: 40% male Inclusion criteria: over 65s, medically stable, awaiting transfer Exclusion criteria: acutely unwell, on priority list for transfer to geriatric care or a long-term care institution Patient selection criteria: unselected Patient selection criteria details: ambulant, medically stable patients awaiting long term placement
Interventions	Team members: senior geriatrician, senior geriatric nurse, experienced geriatric nurses, social workers, physiotherapists and occupational therapists only by referral Team organisation: use of standardised assessment tools

Shamian 1984 (*Continued*)

Outcomes	Outcomes: death, medication use, activities of daily living Trial conclusions: geriatric wards can result in reduced drug prescribing, and aid transfers
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Random number tables
Allocation concealment (selection bias)	Unclear risk	None described
Blinding (performance bias and detection bias) All outcomes	High risk	Blinding of outcome assessment but not of staff or patients
Incomplete outcome data (attrition bias) All outcomes	High risk	No intention-to-treat analysis apparent
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Unclear risk	It is unclear if there was likely to be any selection bias
Baseline outcome measurements similar	Low risk	Similar baseline measurements used
Baseline characteristics similar	Low risk	Baseline characteristics similar
Study protected against contamination	Unclear risk	Staff were shared across units

Thomas 1993

Methods	Year: 1993 Location: Winston-Salem, NC, USA (Community Hospital) Team/ward?: team Timing: acute (within 48 hours) Trial methodology: randomised controlled trial
Participants	Numbers (total): 132 Mean age: 77 Male:female ratio: 35% (approximately) Inclusion criteria: all patients over 70 Exclusion criteria: refusal of patients, ICU, CCU, obvious terminal illness, renal haemodialysis, place of residence greater than 50 miles from hospital Patient selection criteria: unselected

Thomas 1993 (*Continued*)

	Patient selection criteria details: all over 70s
Interventions	Team members: senior geriatrician, geriatric nurse specialist, social worker, dietician, pharmacist, physiotherapist Team organisation: comprehensive assessment, and recommendations made in patients' charts as well as follow up visits versus assessment with no recommendations in the control group
Outcomes	Outcomes: death, dependence Trial conclusions: short-term reductions in mortality which still remain at one year. Additional trends to better functional status and reduced readmission
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Computer-generated random numbers
Allocation concealment (selection bias)	Unclear risk	Not described
Blinding (performance bias and detection bias) All outcomes	High risk	No blinding of staff or outcome assessment
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Analysis as per protocol
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Low risk	No apparent attrition bias. No obvious performance bias.
Baseline outcome measurements similar	Low risk	Baseline measurements are the same
Baseline characteristics similar	Low risk	Baseline characteristics are similar
Study protected against contamination	High risk	Mobile team in different wards. Contamination (e.g. of routine ward staff practices) possible.

White 1994

Methods	Year: 1994 Location: Nashville, Tennessee, USA (University Hospital) Team/ward?: ward Timing: stepdown from acute wards Trial methodology: randomised controlled trial
Participants	Numbers (total): 40 Mean age: 76.5 Male:female ratio: 37% Inclusion criteria: age 65 or over, medically stable, "potential for making improvement in physical, functional or psychological function", complicated discharge or awaiting placement. Terminal patients accepted. Exclusion criteria: not explicitly stated. Patient selection criteria: selected Patient selection criteria details: as above
Interventions	Team members: senior geriatrician, geriatric nurse specialist, social worker, dietician, pharmacist, physiotherapist, occupational therapist, speech and language therapist Team organisation: admission to a 6-bedded stepdown ward. Weekly multidisciplinary meetings, full comprehensive assessment, therapy and discharge planning. Review of medications and appropriate limits on investigations. Control group were reviewed by senior nurse and geriatrician and recommendations were made to usual care team.
Outcomes	Outcomes: death, nursing home admission, functional status, 30-day readmissions and costs Trial conclusions: CGA is cost-effective and improves patient outcomes without increasing length of stay
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Random numbers table
Allocation concealment (selection bias)	Unclear risk	Not described
Blinding (performance bias and detection bias) All outcomes	High risk	Patients experienced a change in staff and ward placement. No blinding of outcome assessment.
Incomplete outcome data (attrition bias) All outcomes	Low risk	Intention-to-treat analysis
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item

White 1994 (*Continued*)

Other bias	Unclear risk	Selection bias not clear with randomisation method. Attrition bias not apparent
Baseline outcome measurements similar	Unclear risk	Baseline measurements not recorded
Baseline characteristics similar	Unclear risk	Baseline measurements not recorded
Study protected against contamination	Unclear risk	Differing staff delivered the intervention

Winograd 1993

Methods	Year: 1993 Location: Palo Alto, Ca, USA (VA Teaching Hospital) Team/ward?: team Timing: stepdown Trial methodology: randomised controlled trial
Participants	Numbers (total): 197 Mean age: 76 Male:female ratio: 100% male Inclusion criteria: all male patients 65 or over, expected to stay > 96 hours, within 2-hour drive, not enrolled in geriatric/rehab programme, functionally impaired "frailty": confusion, dependence in ADLs, polypharmacy, stressed caregiver system Exclusion criteria: independent, permanent nursing home resident, less than 6 months life-expectancy Patient selection criteria: selected Patient selection criteria details: proxy measures of frailty to exclude independent patients or those already dependent
Interventions	Team members: senior geriatrician, trainee geriatrician, specialist nurse input, social work, dietician Team organisation: comprehensive assessment, standardised assessment tools
Outcomes	Outcomes: death, institutionalisation, cognition, dependence Trial conclusions: no evidence of benefit from geriatric consultation team
Notes	

Risk of bias

Bias	**Authors' judgement**	**Support for judgement**
Random sequence generation (selection bias)	Low risk	Random number table with variable block permutation
Allocation concealment (selection bias)	Low risk	Numbered sequential opaque sealed envelopes

Winograd 1993 (*Continued*)

Blinding (performance bias and detection bias) All outcomes	High risk	Only blinding of baseline assessments
Incomplete outcome data (attrition bias) All outcomes	Low risk	Intention-to-treat analysis
Selective reporting (reporting bias)	Unclear risk	No a priori documentation could be found to judge this item
Other bias	Low risk	No evidence to suggest selection, attrition or performance bias
Baseline outcome measurements similar	Low risk	Baseline measurements similar
Baseline characteristics similar	Low risk	Baseline characteristics similar
Study protected against contamination	Unclear risk	Mobile consultation team. Potential for contamination of routine ward practices exists.

ADL: activities of daily living
CCU: coronary care unit
CGA: comprehensive geriatric assessment
ED: emergency department
ESD: early supported discharge
GEM: geriatric evaluation and management
HIT: Home intervention team
HMO: health maintenance organization
ICU: intensive care unit
ITU: intensive treatment unit
LOS: length of stay
MDT: multidisciplinary team

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Borok 1994	Controlled clinical trial of an inpatient geriatric consultation service
Boult 1994	Controlled trial of outpatient geriatric evaluation and management
Campion 1983	Controlled clinical trial of an interdisciplinary consultation service

(*Continued*)

Cole 1991	Evaluation of inpatient geriatric psychiatry
Cunliffe 2004	Randomised controlled trial of early supported discharge
Epstein 1990	Trial of outpatient geriatric assessment and management
Fleming 2004	Randomised controlled trial of geriatric rehabilitation in a care home setting for postacute care
Garåsen 2007	Randomised controlled study comparing postacute (intermediate care) in a community hospital as opposed to an acute hospital. Whilst the description of intermediate care is similar to CGA this appears to be a trial of timing and setting rather than a care approach (e.g. CGA versus general medical care).
Gayton 1987	Controlled clinical trial
Germain 1995	Randomised controlled trial of a geriatric consultation team prior to transfer to a geriatric ward
Gill 2003	Randomised controlled trial of outpatient rehabilitation
Harari 2007	Before and after study of a geriatric screening and liaison prior to potential transfer to a geriatric ward
Hogan 1990	Controlled clinical trial of an interdisciplinary consultation service
Karppi 1995	Randomised controlled trial comparing admission to a geriatric unit with usual care at home (control group was not admitted)
Landi 1997	Controlled clinical trial of multidisciplinary care in a geriatric unit
Ledesert 1994	Case-controlled study
Liem 1986	Uncontrolled study
Meissner 1989	Controlled clinical trial
Miller 1996	Controlled clinical trial of a consultation service in the emergency department
Mudge 2006	Controlled clinical trial of a multidisciplinary team
Retornaz 2007	Retrospective comparison of patients with cancer only
Reuben 1992	Prospective cohort study evaluating targeting criteria to identify older at risk adults
Rubin 1992	Randomised controlled trial of outpatient geriatric care management and treatment programme
Trentini 2001	Randomised controlled trial of outpatient geriatric assessment
Volicer 1994	Case-controlled study of a specialist dementia care unit

(*Continued*)

Young 2005	Randomised controlled study of comparison between Community Hospital care (CGA) and District General Hospital care (CGA)

CGA: comprehensive geriatric assessment

DATA AND ANALYSES

Comparison 1. CGA versus usual care

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Living at home (up to 6 months)	14	5117	Odds Ratio (M-H, Fixed, 95% CI)	1.25 [1.11, 1.42]
1.1 Ward	11	4624	Odds Ratio (M-H, Fixed, 95% CI)	1.31 [1.15, 1.49]
1.2 Team	3	493	Odds Ratio (M-H, Fixed, 95% CI)	0.84 [0.57, 1.24]
2 Living at home (end of follow up)	18	7062	Odds Ratio (M-H, Fixed, 95% CI)	1.16 [1.05, 1.28]
2.1 Ward	14	6290	Odds Ratio (M-H, Fixed, 95% CI)	1.22 [1.10, 1.35]
2.2 Team	4	772	Odds Ratio (M-H, Fixed, 95% CI)	0.75 [0.55, 1.01]
3 Mortality (up to 6 months)	19	6786	Odds Ratio (M-H, Fixed, 95% CI)	0.91 [0.80, 1.05]
3.1 Ward	14	6048	Odds Ratio (M-H, Fixed, 95% CI)	0.93 [0.81, 1.08]
3.2 Team	5	738	Odds Ratio (M-H, Fixed, 95% CI)	0.74 [0.47, 1.17]
4 Mortality (end of follow up)	23	9963	Odds Ratio (M-H, Fixed, 95% CI)	0.99 [0.90, 1.09]
4.1 Ward	16	6593	Odds Ratio (M-H, Fixed, 95% CI)	0.98 [0.87, 1.11]
4.2 Team	7	3370	Odds Ratio (M-H, Fixed, 95% CI)	1.00 [0.86, 1.18]
5 Institutionalisation (up to 6 months)	14	4925	Odds Ratio (M-H, Fixed, 95% CI)	0.76 [0.66, 0.89]
5.1 Ward	10	4319	Odds Ratio (M-H, Fixed, 95% CI)	0.72 [0.61, 0.85]
5.2 Team	4	606	Odds Ratio (M-H, Fixed, 95% CI)	1.07 [0.73, 1.57]
6 Institutionalisation (end of follow up)	19	7137	Odds Ratio (M-H, Fixed, 95% CI)	0.78 [0.69, 0.88]
6.1 Ward	14	6252	Odds Ratio (M-H, Fixed, 95% CI)	0.73 [0.64, 0.84]
6.2 Team	5	885	Odds Ratio (M-H, Fixed, 95% CI)	1.16 [0.83, 1.63]
7 Dependence	8	4128	Odds Ratio (M-H, Fixed, 95% CI)	0.94 [0.81, 1.10]
7.1 Ward	8	4128	Odds Ratio (M-H, Fixed, 95% CI)	0.94 [0.81, 1.10]
8 Death or dependence	4	1212	Odds Ratio (M-H, Fixed, 95% CI)	0.98 [0.77, 1.25]
8.1 Wards	4	1212	Odds Ratio (M-H, Fixed, 95% CI)	0.98 [0.77, 1.25]
9 Death or deterioration	5	2622	Odds Ratio (M-H, Fixed, 95% CI)	0.76 [0.64, 0.90]
9.1 Ward	3	2305	Odds Ratio (M-H, Fixed, 95% CI)	0.78 [0.65, 0.93]
9.2 Team	2	317	Odds Ratio (M-H, Fixed, 95% CI)	0.65 [0.41, 1.03]
10 Activities of daily living	6	1296	Std. Mean Difference (IV, Fixed, 95% CI)	0.06 [-0.06, 0.17]
10.1 Ward	4	967	Std. Mean Difference (IV, Fixed, 95% CI)	0.11 [-0.03, 0.24]
10.2 Team	2	329	Std. Mean Difference (IV, Fixed, 95% CI)	-0.08 [-0.30, 0.14]
11 Cognitive function	5	3317	Std. Mean Difference (IV, Fixed, 95% CI)	0.08 [0.01, 0.15]
11.1 Ward	1	375	Std. Mean Difference (IV, Fixed, 95% CI)	0.06 [-0.14, 0.27]
11.2 Team	4	2942	Std. Mean Difference (IV, Fixed, 95% CI)	0.09 [0.01, 0.16]
12 Length of stay	13	4034	Mean Difference (IV, Random, 95% CI)	1.12 [-1.11, 3.35]
12.1 Ward	8	3303	Mean Difference (IV, Random, 95% CI)	1.73 [-1.56, 5.02]
12.2 Team	5	731	Mean Difference (IV, Random, 95% CI)	-0.79 [-2.34, 0.75]
13 Readmissions	9	3822	Odds Ratio (M-H, Fixed, 95% CI)	1.03 [0.89, 1.18]
13.1 Ward	8	3543	Odds Ratio (M-H, Fixed, 95% CI)	1.01 [0.87, 1.17]
13.2 Team	1	279	Odds Ratio (M-H, Fixed, 95% CI)	1.25 [0.78, 2.01]

Comparison 2. CGA versus usual care (targeting)

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Living at home (up to 6 months)	14	5117	Odds Ratio (M-H, Fixed, 95% CI)	1.25 [1.11, 1.42]
1.1 Wards with needs-related admission criteria	5	631	Odds Ratio (M-H, Fixed, 95% CI)	2.20 [1.56, 3.09]
1.2 Wards with age-related admission criteria	6	3993	Odds Ratio (M-H, Fixed, 95% CI)	1.20 [1.05, 1.38]
1.3 Teams with needs-related admission criteria	1	197	Odds Ratio (M-H, Fixed, 95% CI)	0.71 [0.38, 1.33]
1.4 Teams with age-related admission criteria	2	296	Odds Ratio (M-H, Fixed, 95% CI)	0.94 [0.57, 1.55]
2 Living at home (end of follow up)	18	7062	Odds Ratio (M-H, Fixed, 95% CI)	1.16 [1.05, 1.28]
2.1 Wards with needs-related admission criteria	9	2564	Odds Ratio (M-H, Fixed, 95% CI)	1.36 [1.16, 1.60]
2.2 Wards with age-related admission criteria	5	3726	Odds Ratio (M-H, Fixed, 95% CI)	1.13 [0.98, 1.29]
2.3 Teams with needs-related admission criteria	2	476	Odds Ratio (M-H, Fixed, 95% CI)	0.75 [0.51, 1.11]
2.4 Teams with age-related admission criteria	2	296	Odds Ratio (M-H, Fixed, 95% CI)	0.74 [0.45, 1.20]

Comparison 3. CGA versus usual care (timing of admission)

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Living at home (up to 6 months)	14	5117	Odds Ratio (M-H, Fixed, 95% CI)	1.25 [1.11, 1.42]
1.1 Wards (direct admission)	6	3993	Odds Ratio (M-H, Fixed, 95% CI)	1.20 [1.05, 1.38]
1.2 Wards (stepdown admission)	5	631	Odds Ratio (M-H, Fixed, 95% CI)	2.20 [1.56, 3.09]
1.3 Teams (direct admission)	1	111	Odds Ratio (M-H, Fixed, 95% CI)	1.18 [0.50, 2.80]
1.4 Teams (acute admission)	1	185	Odds Ratio (M-H, Fixed, 95% CI)	0.83 [0.45, 1.55]
1.5 Teams (stepdown admission)	1	197	Odds Ratio (M-H, Fixed, 95% CI)	0.71 [0.38, 1.33]
2 Living at home (end of follow up)	18	7062	Odds Ratio (M-H, Fixed, 95% CI)	1.16 [1.05, 1.28]
2.1 Wards (direct admission)	5	3726	Odds Ratio (M-H, Fixed, 95% CI)	1.13 [0.98, 1.29]
2.2 Wards (acute admission)	2	545	Odds Ratio (M-H, Fixed, 95% CI)	1.21 [0.84, 1.74]
2.3 Wards (stepdown admission)	7	2019	Odds Ratio (M-H, Fixed, 95% CI)	1.40 [1.17, 1.67]
2.4 Teams (direct assessment)	1	111	Odds Ratio (M-H, Fixed, 95% CI)	1.18 [0.50, 2.80]
2.5 Teams (acute assessment)	2	464	Odds Ratio (M-H, Fixed, 95% CI)	0.65 [0.44, 0.96]

2.6 Teams (stepdown assessment)	1	197	Odds Ratio (M-H, Fixed, 95% CI)	0.82 [0.46, 1.48]

Comparison 4. CGA versus usual care (outpatient follow up)

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Living at home (up to 6 months)	9	3542	Odds Ratio (M-H, Fixed, 95% CI)	1.26 [1.09, 1.46]
1.1 Outpatient follow up	5	2896	Odds Ratio (M-H, Fixed, 95% CI)	1.18 [1.00, 1.38]
1.2 No outpatient follow up	4	646	Odds Ratio (M-H, Fixed, 95% CI)	1.71 [1.22, 2.41]
2 Living at home (end of follow up)	14	5754	Odds Ratio (M-H, Fixed, 95% CI)	1.17 [1.05, 1.30]
2.1 Outpatient follow up	7	3861	Odds Ratio (M-H, Fixed, 95% CI)	1.13 [0.99, 1.30]
2.2 No outpatient follow up	7	1893	Odds Ratio (M-H, Fixed, 95% CI)	1.24 [1.03, 1.50]

Analysis 1.1. Comparison 1 CGA versus usual care, Outcome 1 Living at home (up to 6 months).

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 1 CGA versus usual care

Outcome: 1 Living at home (up to 6 months)

Study or subgroup	Favours control n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
1 Ward					
Applegate 1990	62/78	47/77		2.0 %	2.47 [1.21, 5.06]
Asplund 2000	121/190	134/223		9.4 %	1.16 [0.78, 1.74]
Collard 1985	163/218	319/477		10.6 %	1.47 [1.02, 2.10]
Counsell 2000	536/767	531/764		33.6 %	1.02 [0.82, 1.27]
Fretwell 1990	104/221	92/215		10.4 %	1.19 [0.81, 1.73]
Harris 1991	67/97	106/170		5.0 %	1.35 [0.79, 2.29]
Kay 1992	16/30	17/29		1.7 %	0.81 [0.29, 2.26]
Landefeld 1995	260/327	233/324		10.1 %	1.52 [1.06, 2.18]
Rubenstein 1984	46/63	32/60		1.9 %	2.37 [1.12, 5.03]
Saltvedt 2002	101/127	79/127		3.4 %	2.36 [1.35, 4.14]
White 1994	14/20	7/20		0.4 %	4.33 [1.15, 16.32]

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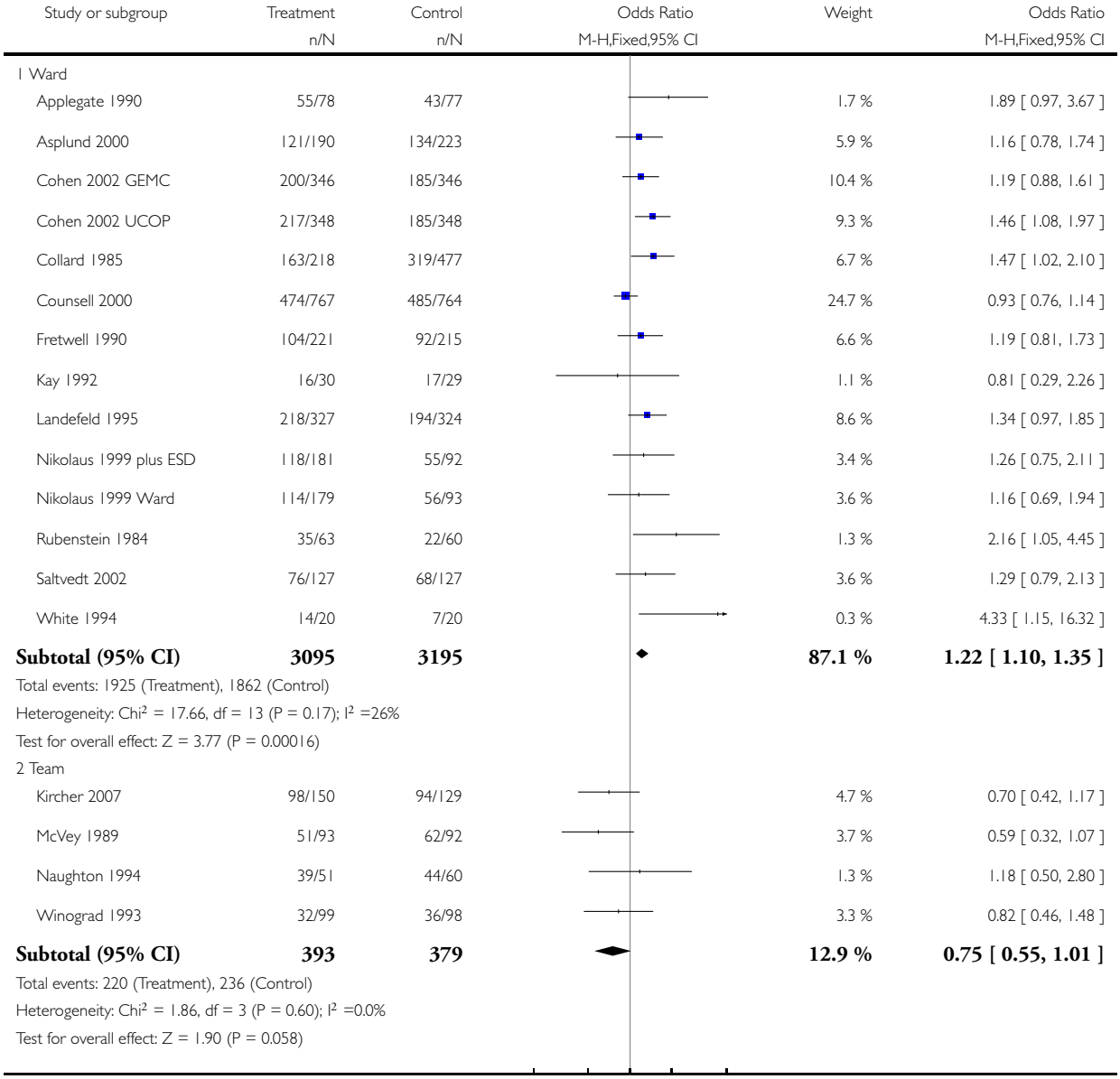
Study or subgroup	Favours control n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
Subtotal (95% CI)	**2138**	**2486**		**88.5 %**	**1.31 [1.15, 1.49]**
Total events: 1490 (Favours control), 1597 (Control)					
Heterogeneity: Chi² = 20.36, df = 10 (P = 0.03); I² =51%					
Test for overall effect: Z = 4.17 (P = 0.000031)					
2 Team					
McVey 1989	61/93	64/92		4.6 %	0.83 [0.45, 1.55]
Naughton 1994	39/51	44/60		2.0 %	1.18 [0.50, 2.80]
Winograd 1993	68/99	74/98		4.9 %	0.71 [0.38, 1.33]
Subtotal (95% CI)	**243**	**250**		**11.5 %**	**0.84 [0.57, 1.24]**
Total events: 168 (Favours control), 182 (Control)					
Heterogeneity: Chi² = 0.87, df = 2 (P = 0.65); I² =0.0%					
Test for overall effect: Z = 0.86 (P = 0.39)					
Total (95% CI)	**2381**	**2736**		**100.0 %**	**1.25 [1.11, 1.42]**
Total events: 1658 (Favours control), 1779 (Control)					
Heterogeneity: Chi² = 25.57, df = 13 (P = 0.02); I² =49%					
Test for overall effect: Z = 3.70 (P = 0.00021)					
Test for subgroup differences: Chi² = 4.43, df = 1 (P = 0.04), I² =77%					

Analysis 1.2. Comparison 1 CGA versus usual care, Outcome 2 Living at home (end of follow up).

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 1 CGA versus usual care

Outcome: 2 Living at home (end of follow up)



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Study or subgroup	Treatment n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
Total (95% CI)	**3488**	**3574**	◆	**100.0 %**	**1.16 [1.05, 1.28]**
Total events: 2145 (Treatment), 2098 (Control)					
Heterogeneity: Chi² = 28.49, df = 17 (P = 0.04); I² =40%					
Test for overall effect: Z = 2.96 (P = 0.0031)					
Test for subgroup differences: Chi² = 9.06, df = 1 (P = 0.00), I² =89%					

Analysis 1.3. Comparison 1 CGA versus usual care, Outcome 3 Mortality (up to 6 months).

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 1 CGA versus usual care

Outcome: 3 Mortality (up to 6 months)

Study or subgroup	Treatment n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Odds Ratio M-H,Fixed,95% CI
1 Ward				
Applegate 1990	8/78	16/77		0.44 [0.17, 1.09]
Asplund 2000	21/190	17/223		1.51 [0.77, 2.95]
Cohen 2002 GEMC	58/346	52/346		1.14 [0.76, 1.71]
Cohen 2002 UCOP	46/348	46/348		1.00 [0.64, 1.55]
Collard 1985	8/218	39/477		0.43 [0.20, 0.93]
Counsell 2000	173/767	172/764		1.00 [0.79, 1.27]
Fretwell 1990	47/221	38/215		1.26 [0.78, 2.03]
Harris 1991	15/97	36/170		0.68 [0.35, 1.32]
Kay 1992	2/30	0/29		5.18 [0.24, 112.57]
Landefeld 1995	24/327	24/324		0.99 [0.55, 1.78]
Rubenstein 1984	9/63	9/60		0.94 [0.35, 2.57]
Saltvedt 2002	15/127	34/127		0.37 [0.19, 0.71]
Shamian 1984	1/20	1/16		0.79 [0.05, 13.69]

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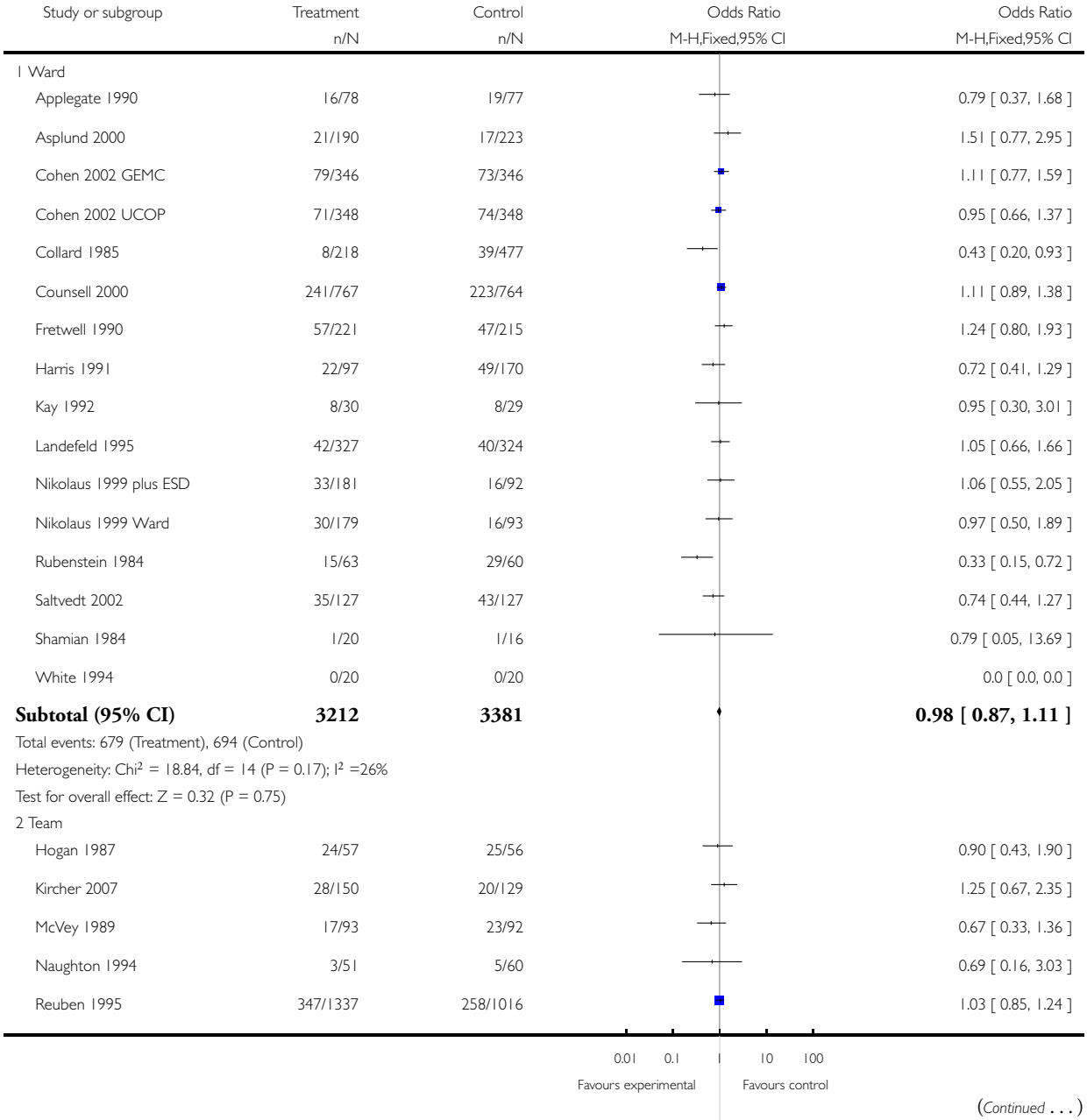
Study or subgroup	Treatment n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Odds Ratio M-H,Fixed,95% CI
White 1994	0/20	0/20		0.0 [0.0, 0.0]
Subtotal (95% CI)	**2852**	**3196**	◆	**0.93 [0.81, 1.08]**
Total events: 427 (Treatment), 484 (Control)				
Heterogeneity: Chi^2 = 21.00, df = 12 (P = 0.05); I^2 =43%				
Test for overall effect: Z = 0.93 (P = 0.35)				
2 Team				
Hogan 1987	10/57	17/56		0.49 [0.20, 1.19]
McVey 1989	7/93	8/92		0.85 [0.30, 2.46]
Naughton 1994	3/51	5/60		0.69 [0.16, 3.03]
Thomas 1993	3/68	12/64		0.20 [0.05, 0.75]
Winograd 1993	14/99	6/98		2.53 [0.93, 6.87]
Subtotal (95% CI)	**368**	**370**	◆	**0.74 [0.47, 1.17]**
Total events: 37 (Treatment), 48 (Control)				
Heterogeneity: Chi^2 = 10.50, df = 4 (P = 0.03); I^2 =62%				
Test for overall effect: Z = 1.30 (P = 0.19)				
Total (95% CI)	**3220**	**3566**	◆	**0.91 [0.80, 1.05]**
Total events: 464 (Treatment), 532 (Control)				
Heterogeneity: Chi^2 = 32.30, df = 17 (P = 0.01); I^2 =47%				
Test for overall effect: Z = 1.28 (P = 0.20)				
Test for subgroup differences: Chi^2 = 0.92, df = 1 (P = 0.34), I^2 =0.0%				

Analysis 1.4. Comparison 1 CGA versus usual care, Outcome 4 Mortality (end of follow up).

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 1 CGA versus usual care

Outcome: 4 Mortality (end of follow up)



Study or subgroup	Treatment n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Odds Ratio M-H,Fixed,95% CI
1 Ward				
Applegate 1990	16/78	19/77		0.79 [0.37, 1.68]
Asplund 2000	21/190	17/223		1.51 [0.77, 2.95]
Cohen 2002 GEMC	79/346	73/346		1.11 [0.77, 1.59]
Cohen 2002 UCOP	71/348	74/348		0.95 [0.66, 1.37]
Collard 1985	8/218	39/477		0.43 [0.20, 0.93]
Counsell 2000	241/767	223/764		1.11 [0.89, 1.38]
Fretwell 1990	57/221	47/215		1.24 [0.80, 1.93]
Harris 1991	22/97	49/170		0.72 [0.41, 1.29]
Kay 1992	8/30	8/29		0.95 [0.30, 3.01]
Landefeld 1995	42/327	40/324		1.05 [0.66, 1.66]
Nikolaus 1999 plus ESD	33/181	16/92		1.06 [0.55, 2.05]
Nikolaus 1999 Ward	30/179	16/93		0.97 [0.50, 1.89]
Rubenstein 1984	15/63	29/60		0.33 [0.15, 0.72]
Saltvedt 2002	35/127	43/127		0.74 [0.44, 1.27]
Shamian 1984	1/20	1/16		0.79 [0.05, 13.69]
White 1994	0/20	0/20		0.0 [0.0, 0.0]
Subtotal (95% CI)	**3212**	**3381**		**0.98 [0.87, 1.11]**
Total events: 679 (Treatment), 694 (Control)				
Heterogeneity: Chi² = 18.84, df = 14 (P = 0.17); I² =26%				
Test for overall effect: Z = 0.32 (P = 0.75)				
2 Team				
Hogan 1987	24/57	25/56		0.90 [0.43, 1.90]
Kircher 2007	28/150	20/129		1.25 [0.67, 2.35]
McVey 1989	17/93	23/92		0.67 [0.33, 1.36]
Naughton 1994	3/51	5/60		0.69 [0.16, 3.03]
Reuben 1995	347/1337	258/1016		1.03 [0.85, 1.24]

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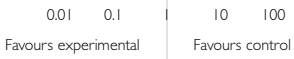
Study or subgroup	Treatment n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Odds Ratio M-H,Fixed,95% CI
Thomas 1993	7/68	13/64		0.45 [0.17, 1.21]
Winograd 1993	41/99	35/98		1.27 [0.72, 2.26]
Subtotal (95% CI)	**1855**	**1515**		**1.00 [0.86, 1.18]**
Total events: 467 (Treatment), 379 (Control)				
Heterogeneity: Chi² = 5.29, df = 6 (P = 0.51); I² =0.0%				
Test for overall effect: Z = 0.03 (P = 0.97)				
Total (95% CI)	**5067**	**4896**		**0.99 [0.90, 1.09]**
Total events: 1146 (Treatment), 1073 (Control)				
Heterogeneity: Chi² = 24.15, df = 21 (P = 0.29); I² =13%				
Test for overall effect: Z = 0.23 (P = 0.82)				
Test for subgroup differences: Chi² = 0.05, df = 1 (P = 0.83), I² =0.0%				



Analysis 1.5. Comparison 1 CGA versus usual care, Outcome 5 Institutionalisation (up to 6 months).

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 1 CGA versus usual care

Outcome: 5 Institutionalisation (up to 6 months)

Study or subgroup	Treatment n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
1 Ward					
Applegate 1990	8/78	14/77		3.3 %	0.51 [0.20, 1.31]
Asplund 2000	48/169	72/206		11.9 %	0.74 [0.48, 1.15]
Collard 1985	47/218	119/477		15.1 %	0.83 [0.56, 1.21]
Counsell 2000	58/767	61/764		14.5 %	0.94 [0.65, 1.37]
Fretwell 1990	70/221	85/215		15.1 %	0.71 [0.48, 1.05]
Kay 1992	12/30	12/29		1.9 %	0.94 [0.33, 2.67]
Landefeld 1995	43/327	67/324		15.0 %	0.58 [0.38, 0.88]
Rubenstein 1984	8/63	19/60		4.4 %	0.31 [0.13, 0.79]
Saltvedt 2002	11/127	14/127		3.3 %	0.77 [0.33, 1.76]

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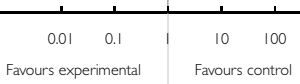
Study or subgroup	Treatment n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
White 1994	6/20	13/20		2.3 %	0.23 [0.06, 0.87]
Subtotal (95% CI)	**2020**	**2299**		**86.8 %**	**0.72 [0.61, 0.85]**
Total events: 311 (Treatment), 476 (Control)					
Heterogeneity: Chi^2 = 10.27, df = 9 (P = 0.33); I^2 =12%					
Test for overall effect: Z = 3.95 (P = 0.000079)					
2 Team					
Hogan 1987	23/57	22/56		3.4 %	1.05 [0.49, 2.22]
McVey 1989	25/93	20/92		3.8 %	1.32 [0.67, 2.60]
Naughton 1994	9/51	11/60		2.1 %	0.95 [0.36, 2.52]
Winograd 1993	17/99	18/98		3.9 %	0.92 [0.44, 1.91]
Subtotal (95% CI)	**300**	**306**		**13.2 %**	**1.07 [0.73, 1.57]**
Total events: 74 (Treatment), 71 (Control)					
Heterogeneity: Chi^2 = 0.60, df = 3 (P = 0.90); I^2 =0.0%					
Test for overall effect: Z = 0.37 (P = 0.71)					
Total (95% CI)	**2320**	**2605**		**100.0 %**	**0.76 [0.66, 0.89]**
Total events: 385 (Treatment), 547 (Control)					
Heterogeneity: Chi^2 = 14.43, df = 13 (P = 0.34); I^2 =10%					
Test for overall effect: Z = 3.49 (P = 0.00049)					
Test for subgroup differences: Chi^2 = 3.64, df = 1 (P = 0.06), I^2 =73%					



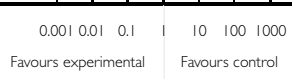
Analysis 1.6. Comparison 1 CGA versus usual care, Outcome 6 Institutionalisation (end of follow up).

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 1 CGA versus usual care

Outcome: 6 Institutionalisation (end of follow up)

Study or subgroup	Treatment n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
1 Ward					
Applegate 1990	7/78	15/77		2.3 %	0.41 [0.16, 1.06]
Asplund 2000	48/169	72/206		7.9 %	0.74 [0.48, 1.15]
Cohen 2002 GEMC	67/346	88/346		12.0 %	0.70 [0.49, 1.01]
Cohen 2002 UCOP	60/348	89/348		12.5 %	0.61 [0.42, 0.88]
Collard 1985	47/218	119/477		9.9 %	0.83 [0.56, 1.21]
Counsell 2000	52/767	56/764		8.9 %	0.92 [0.62, 1.36]
Fretwell 1990	70/221	85/215		10.0 %	0.71 [0.48, 1.05]
Kay 1992	12/30	12/29		1.2 %	0.94 [0.33, 2.67]
Landefeld 1995	67/327	90/324		12.2 %	0.67 [0.47, 0.96]
Nikolaus 1999 plus ESD	30/181	21/92		3.9 %	0.67 [0.36, 1.25]
Nikolaus 1999 Ward	35/179	21/93		3.8 %	0.83 [0.45, 1.53]
Rubenstein 1984	13/63	9/60		1.2 %	1.47 [0.58, 3.75]
Saltvedt 2002	16/127	16/127		2.4 %	1.00 [0.48, 2.10]
White 1994	6/20	13/20		1.5 %	0.23 [0.06, 0.87]
Subtotal (95% CI)	**3074**	**3178**		**89.6 %**	**0.73 [0.64, 0.84]**
Total events: 530 (Treatment), 706 (Control)					
Heterogeneity: Chi² = 10.64, df = 13 (P = 0.64); I² =0.0%					
Test for overall effect: Z = 4.64 (P < 0.00001)					
2 Team					
Hogan 1987	23/57	22/56		2.2 %	1.05 [0.49, 2.22]
Kircher 2007	24/150	15/129		2.3 %	1.45 [0.72, 2.90]
McVey 1989	12/93	7/92		1.0 %	1.80 [0.67, 4.80]
Naughton 1994	9/51	11/60		1.4 %	0.95 [0.36, 2.52]
Winograd 1993	26/99	27/98		3.4 %	0.94 [0.50, 1.76]
Subtotal (95% CI)	**450**	**435**		**10.4 %**	**1.16 [0.83, 1.63]**
Total events: 94 (Treatment), 82 (Control)					
Heterogeneity: Chi² = 1.83, df = 4 (P = 0.77); I² =0.0%					



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Study or subgroup	Treatment n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
Test for overall effect: Z = 0.86 (P = 0.39)					
Total (95% CI)	**3524**	**3613**		**100.0 %**	**0.78 [0.69, 0.88]**
Total events: 624 (Treatment), 788 (Control)					
Heterogeneity: Chi^2 = 18.36, df = 18 (P = 0.43); I^2 =2%					
Test for overall effect: Z = 4.04 (P = 0.000054)					
Test for subgroup differences: Chi^2 = 6.06, df = 1 (P = 0.01), I^2 =83%					

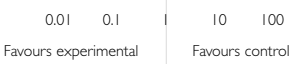
Analysis 1.7. Comparison 1 CGA versus usual care, Outcome 7 Dependence.

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 1 CGA versus usual care

Outcome: 7 Dependence

Study or subgroup	Treatment n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
1 Ward					
Asplund 2000	93/190	113/223		15.8 %	0.93 [0.63, 1.37]
Collard 1985	90/162	134/267		13.4 %	1.24 [0.84, 1.84]
Counsell 2000	123/767	144/764		36.1 %	0.82 [0.63, 1.07]
Fretwell 1990	25/221	15/215		4.0 %	1.70 [0.87, 3.32]
Landefeld 1995	76/327	76/324		17.5 %	0.99 [0.69, 1.42]
Nikolaus 1999 plus ESD	16/179	9/92		3.2 %	0.91 [0.38, 2.14]
Nikolaus 1999 Ward	17/181	10/93		3.6 %	0.86 [0.38, 1.96]
Rubenstein 1984	27/63	37/60		6.5 %	0.47 [0.23, 0.96]
Total (95% CI)	**2090**	**2038**		**100.0 %**	**0.94 [0.81, 1.10]**
Total events: 467 (Treatment), 538 (Control)					
Heterogeneity: Chi^2 = 9.68, df = 7 (P = 0.21); I^2 =28%					
Test for overall effect: Z = 0.77 (P = 0.44)					

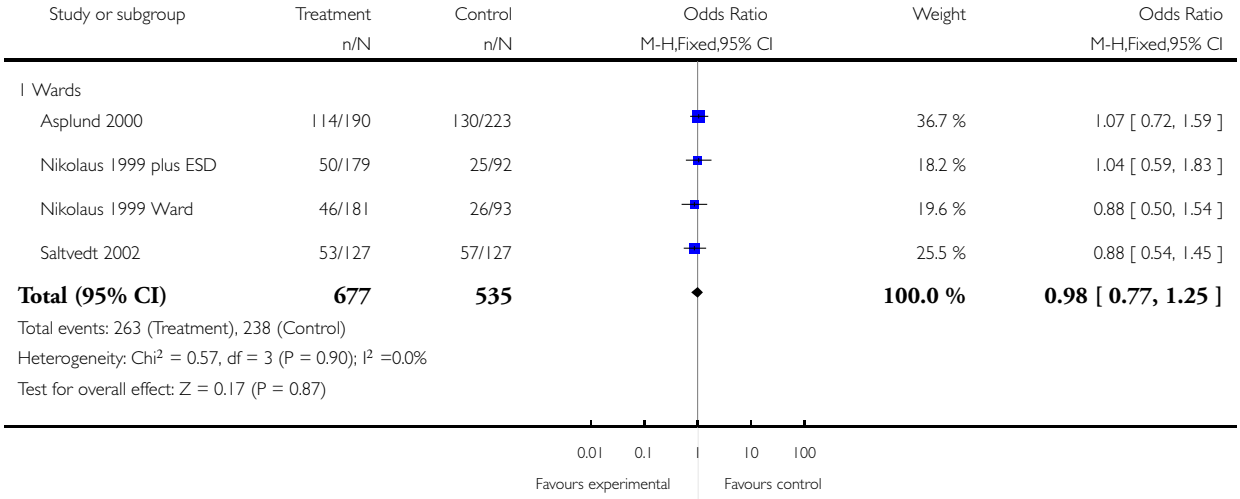


Analysis 1.8. Comparison 1 CGA versus usual care, Outcome 8 Death or dependence.

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 1 CGA versus usual care

Outcome: 8 Death or dependence



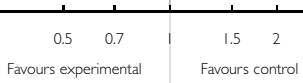
Analysis 1.9. Comparison 1 CGA versus usual care, Outcome 9 Death or deterioration.

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 1 CGA versus usual care

Outcome: 9 Death or deterioration

Study or subgroup	Treatment n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
1 Ward					
Counsell 2000	237/767	269/764		58.0 %	0.82 [0.66, 1.02]
Landefeld 1995	72/327	88/324		21.5 %	0.76 [0.53, 1.08]
Rubenstein 1984	26/63	36/60		6.7 %	0.47 [0.23, 0.96]
Subtotal (95% CI)	**1157**	**1148**		**86.2 %**	**0.78 [0.65, 0.93]**
Total events: 335 (Treatment), 393 (Control)					
Heterogeneity: Chi^2 = 2.19, df = 2 (P = 0.33); I^2 =9%					
Test for overall effect: Z = 2.76 (P = 0.0057)					
2 Team					
McVey 1989	32/93	40/92		8.2 %	0.68 [0.38, 1.24]
Thomas 1993	17/68	23/64		5.5 %	0.59 [0.28, 1.26]
Subtotal (95% CI)	**161**	**156**		**13.8 %**	**0.65 [0.41, 1.03]**
Total events: 49 (Treatment), 63 (Control)					
Heterogeneity: Chi^2 = 0.08, df = 1 (P = 0.78); I^2 =0.0%					
Test for overall effect: Z = 1.84 (P = 0.066)					
Total (95% CI)	**1318**	**1304**		**100.0 %**	**0.76 [0.64, 0.90]**
Total events: 384 (Treatment), 456 (Control)					
Heterogeneity: Chi^2 = 2.81, df = 4 (P = 0.59); I^2 =0.0%					
Test for overall effect: Z = 3.24 (P = 0.0012)					
Test for subgroup differences: Chi^2 = 0.54, df = 1 (P = 0.46), I^2 =0.0%					



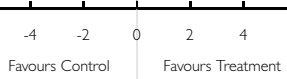
Analysis 1.10. Comparison 1 CGA versus usual care, Outcome 10 Activities of daily living.

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 1 CGA versus usual care

Outcome: 10 Activities of daily living

Study or subgroup	Treatment N	Mean(SD)	Control N	Mean(SD)	Std. Mean Difference IV,Fixed,95% CI	Weight	Std. Mean Difference IV,Fixed,95% CI
1 Ward							
Applegate 1990	78	1.1 (1.9)	77	0.64 (2.3)		12.7 %	0.22 [-0.10, 0.53]
Harris 1991	97	11.5 (4.9)	170	11 (5.2)		20.3 %	0.10 [-0.15, 0.35]
Nikolaus 1999 plus ESD	181	91.8 (14.4)	92	91.1 (15.9)		20.0 %	0.05 [-0.20, 0.30]
Nikolaus 1999 Ward	179	92.6 (14.3)	93	91.1 (15.9)		20.1 %	0.10 [-0.15, 0.35]
Subtotal (95% CI)	**535**		**432**			**73.1 %**	**0.11 [-0.03, 0.24]**
Heterogeneity: Chi^2 = 0.70, df = 3 (P = 0.87); I^2 =0.0%							
Test for overall effect: Z = 1.57 (P = 0.12)							
2 Team							
Thomas 1993	68	14.3 (3.5)	64	14 (3)		10.8 %	0.09 [-0.25, 0.43]
Winograd 1993	99	3.6 (2)	98	4 (2.1)		16.1 %	-0.19 [-0.47, 0.09]
Subtotal (95% CI)	**167**		**162**			**26.9 %**	**-0.08 [-0.30, 0.14]**
Heterogeneity: Chi^2 = 1.61, df = 1 (P = 0.20); I^2 =38%							
Test for overall effect: Z = 0.72 (P = 0.47)							
Total (95% CI)	**702**		**594**			**100.0 %**	**0.06 [-0.06, 0.17]**
Heterogeneity: Chi^2 = 4.35, df = 5 (P = 0.50); I^2 =0.0%							
Test for overall effect: Z = 0.97 (P = 0.33)							
Test for subgroup differences: Chi^2 = 2.05, df = 1 (P = 0.15), I^2 =51%							

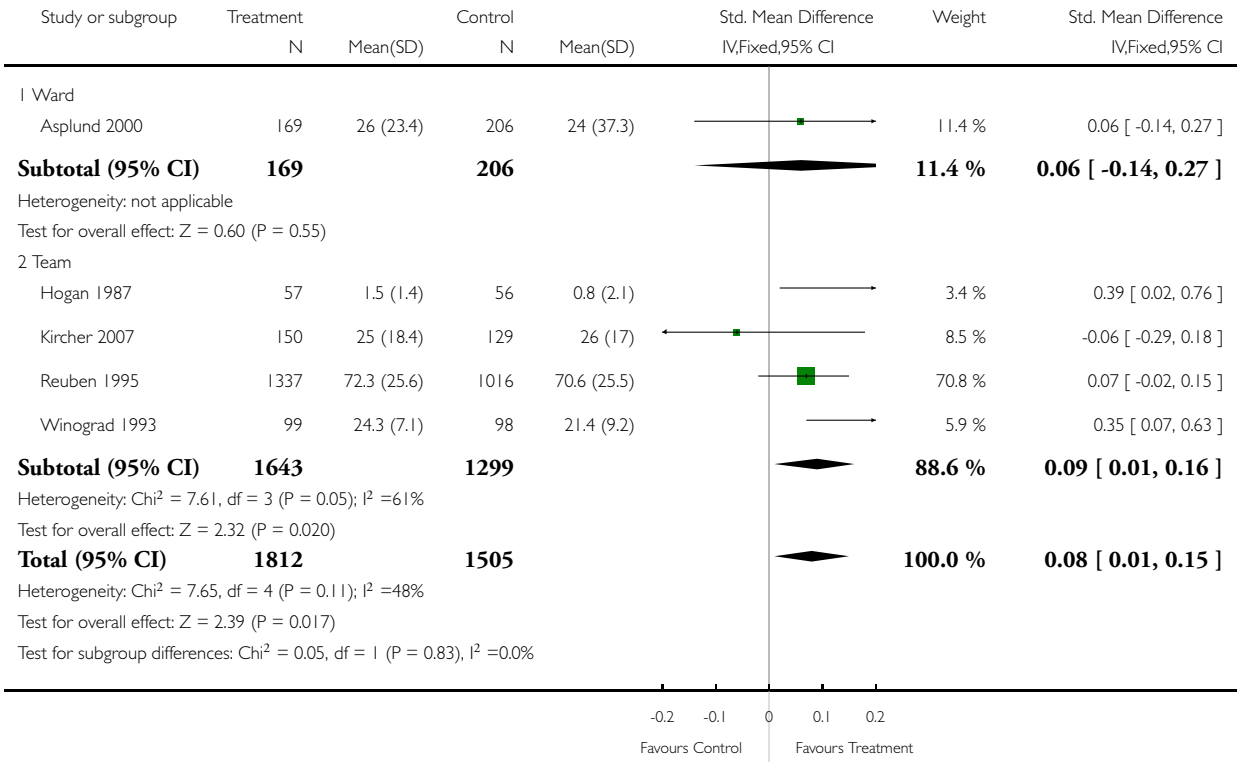


Analysis 1.11. Comparison 1 CGA versus usual care, Outcome 11 Cognitive function.

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 1 CGA versus usual care

Outcome: 11 Cognitive function

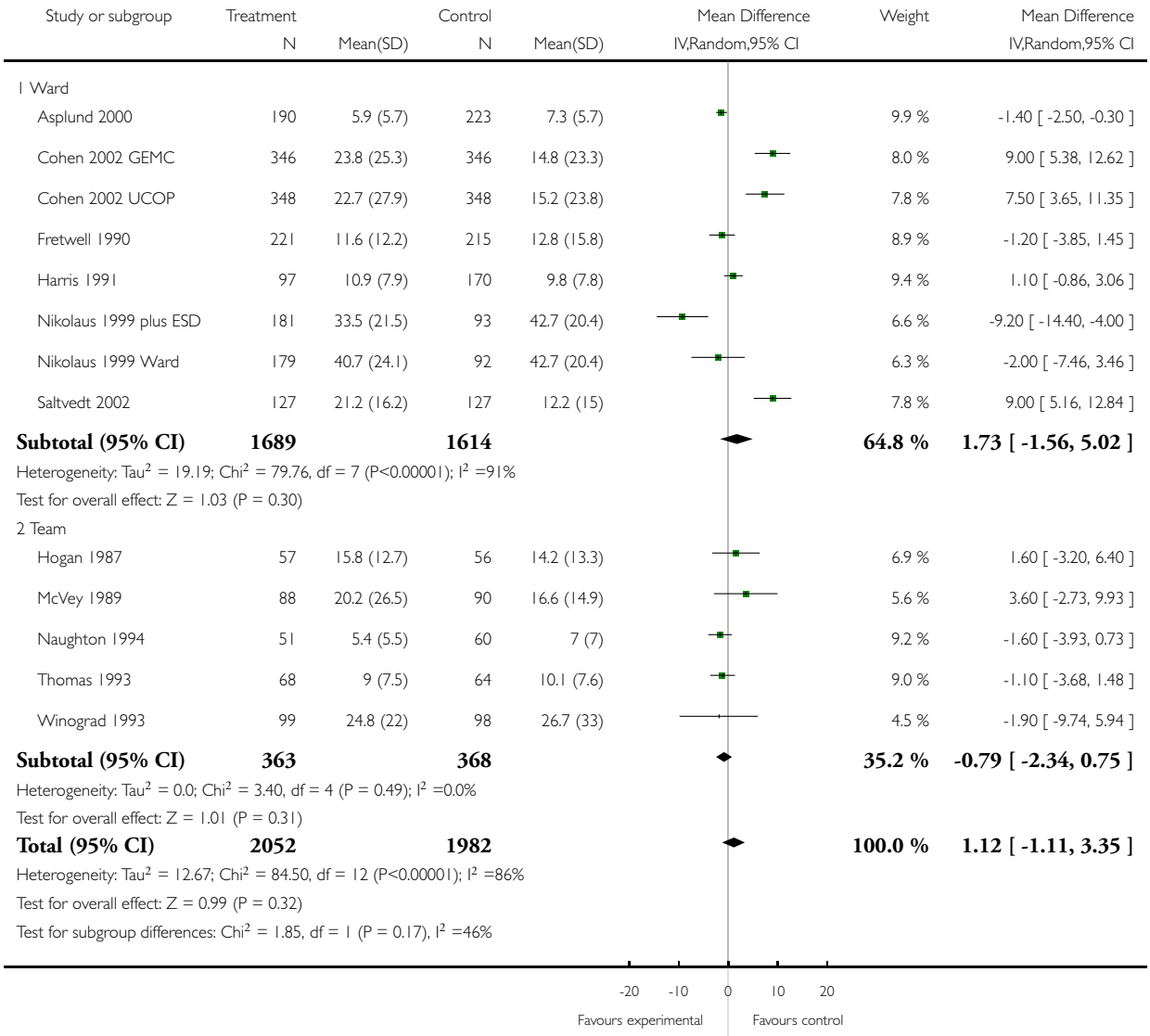


Analysis 1.12. Comparison 1 CGA versus usual care, Outcome 12 Length of stay.

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 1 CGA versus usual care

Outcome: 12 Length of stay

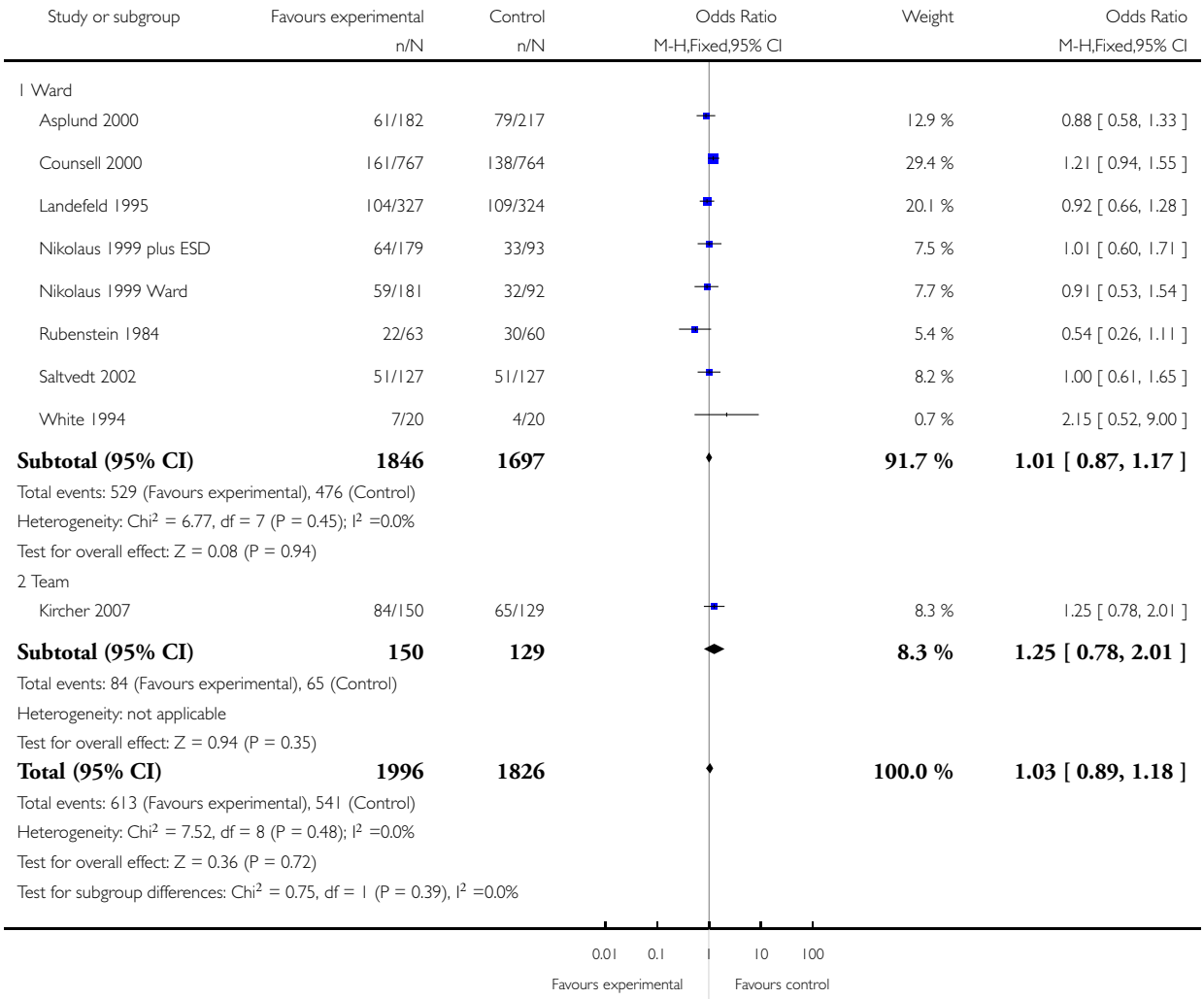


Analysis 1.13. Comparison 1 CGA versus usual care, Outcome 13 Readmissions.

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 1 CGA versus usual care

Outcome: 13 Readmissions



Analysis 2.1. Comparison 2 CGA versus usual care (targeting), Outcome 1 Living at home (up to 6 months).

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 2 CGA versus usual care (targeting)

Outcome: 1 Living at home (up to 6 months)

Study or subgroup	Experimental n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
1 Wards with needs-related admission criteria					
Kay 1992	16/30	17/29		1.7 %	0.81 [0.29, 2.26]
Saltvedt 2002	101/127	79/127		3.4 %	2.36 [1.35, 4.14]
Rubenstein 1984	46/63	32/60		1.9 %	2.37 [1.12, 5.03]
Applegate 1990	62/78	47/77		2.0 %	2.47 [1.21, 5.06]
White 1994	14/20	7/20		0.4 %	4.33 [1.15, 16.32]
Subtotal (95% CI)	**318**	**313**		**9.4 %**	**2.20 [1.56, 3.09]**
Total events: 239 (Experimental), 182 (Control)					
Heterogeneity: Chi^2 = 4.85, df = 4 (P = 0.30); I^2 =18%					
Test for overall effect: Z = 4.52 (P < 0.00001)					
2 Wards with age-related admission criteria					
Counsell 2000	536/767	531/764		33.6 %	1.02 [0.82, 1.27]
Asplund 2000	121/190	134/223		9.4 %	1.16 [0.78, 1.74]
Fretwell 1990	104/221	92/215		10.4 %	1.19 [0.81, 1.73]
Harris 1991	67/97	106/170		5.0 %	1.35 [0.79, 2.29]
Collard 1985	163/218	319/477		10.6 %	1.47 [1.02, 2.10]
Landefeld 1995	260/327	233/324		10.1 %	1.52 [1.06, 2.18]
Subtotal (95% CI)	**1820**	**2173**		**79.0 %**	**1.20 [1.05, 1.38]**
Total events: 1251 (Experimental), 1415 (Control)					
Heterogeneity: Chi^2 = 5.20, df = 5 (P = 0.39); I^2 =4%					
Test for overall effect: Z = 2.64 (P = 0.0082)					
3 Teams with needs-related admission criteria					
Winograd 1993	68/99	74/98		4.9 %	0.71 [0.38, 1.33]
Subtotal (95% CI)	**99**	**98**		**4.9 %**	**0.71 [0.38, 1.33]**
Total events: 68 (Experimental), 74 (Control)					
Heterogeneity: not applicable					
Test for overall effect: Z = 1.07 (P = 0.29)					
4 Teams with age-related admission criteria					
McVey 1989	61/93	64/92		4.6 %	0.83 [0.45, 1.55]
Naughton 1994	39/51	44/60		2.0 %	1.18 [0.50, 2.80]

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Study or subgroup	Experimental n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
Subtotal (95% CI)	**144**	**152**		**6.6 %**	**0.94 [0.57, 1.55]**
Total events: 100 (Experimental), 108 (Control)					
Heterogeneity: Chi² = 0.41, df = 1 (P = 0.52); I² =0.0%					
Test for overall effect: Z = 0.25 (P = 0.80)					
Total (95% CI)	**2381**	**2736**		**100.0 %**	**1.25 [1.11, 1.42]**
Total events: 1658 (Experimental), 1779 (Control)					
Heterogeneity: Chi² = 25.57, df = 13 (P = 0.02); I² =49%					
Test for overall effect: Z = 3.70 (P = 0.00021)					
Test for subgroup differences: Chi² = 15.19, df = 3 (P = 0.00), I² =80%					

Analysis 2.2. Comparison 2 CGA versus usual care (targeting), Outcome 2 Living at home (end of follow up).

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 2 CGA versus usual care (targeting)

Outcome: 2 Living at home (end of follow up)

Study or subgroup	Favours control n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
1 Wards with needs-related admission criteria					
Applegate 1990	55/78	43/77		1.7 %	1.89 [0.97, 3.67]
Cohen 2002 GEMC	200/346	185/346		10.4 %	1.19 [0.88, 1.61]
Cohen 2002 UCOP	217/348	185/348		9.3 %	1.46 [1.08, 1.97]
Kay 1992	16/30	17/29		1.1 %	0.81 [0.29, 2.26]
Nikolaus 1999 plus ESD	118/181	55/92		3.4 %	1.26 [0.75, 2.11]
Nikolaus 1999 Ward	114/179	56/93		3.6 %	1.16 [0.69, 1.94]
Rubenstein 1984	35/63	22/60		1.3 %	2.16 [1.05, 4.45]
Saltvedt 2002	76/127	68/127		3.6 %	1.29 [0.79, 2.13]
White 1994	14/20	7/20		0.3 %	4.33 [1.15, 16.32]
Subtotal (95% CI)	**1372**	**1192**		**34.6 %**	**1.36 [1.16, 1.60]**
Total events: 845 (Favours control), 638 (Control)					

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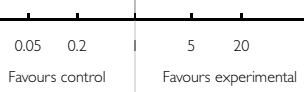
Study or subgroup	Favours control n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
Heterogeneity: Chi² = 7.88, df = 8 (P = 0.44); I² =0.0%					
Test for overall effect: Z = 3.81 (P = 0.00014)					
2 Wards with age-related admission criteria					
Asplund 2000	121/190	134/223		5.9 %	1.16 [0.78, 1.74]
Collard 1985	163/218	319/477		6.7 %	1.47 [1.02, 2.10]
Counsell 2000	474/767	485/764		24.7 %	0.93 [0.76, 1.14]
Fretwell 1990	104/221	92/215		6.6 %	1.19 [0.81, 1.73]
Landefeld 1995	218/327	194/324		8.6 %	1.34 [0.97, 1.85]
Subtotal (95% CI)	**1723**	**2003**		**52.5 %**	**1.13 [0.98, 1.29]**
Total events: 1080 (Favours control), 1224 (Control)					
Heterogeneity: Chi² = 6.58, df = 4 (P = 0.16); I² =39%					
Test for overall effect: Z = 1.71 (P = 0.088)					
3 Teams with needs-related admission criteria					
Kircher 2007	98/150	94/129		4.7 %	0.70 [0.42, 1.17]
Winograd 1993	32/99	36/98		3.3 %	0.82 [0.46, 1.48]
Subtotal (95% CI)	**249**	**227**		**7.9 %**	**0.75 [0.51, 1.11]**
Total events: 130 (Favours control), 130 (Control)					
Heterogeneity: Chi² = 0.16, df = 1 (P = 0.69); I² =0.0%					
Test for overall effect: Z = 1.45 (P = 0.15)					
4 Teams with age-related admission criteria					
McVey 1989	51/93	62/92		3.7 %	0.59 [0.32, 1.07]
Naughton 1994	39/51	44/60		1.3 %	1.18 [0.50, 2.80]
Subtotal (95% CI)	**144**	**152**		**5.0 %**	**0.74 [0.45, 1.20]**
Total events: 90 (Favours control), 106 (Control)					
Heterogeneity: Chi² = 1.70, df = 1 (P = 0.19); I² =41%					
Test for overall effect: Z = 1.22 (P = 0.22)					
Total (95% CI)	**3488**	**3574**		**100.0 %**	**1.16 [1.05, 1.28]**
Total events: 2145 (Favours control), 2098 (Control)					
Heterogeneity: Chi² = 28.49, df = 17 (P = 0.04); I² =40%					
Test for overall effect: Z = 2.96 (P = 0.0031)					
Test for subgroup differences: Chi² = 12.29, df = 3 (P = 0.01), I² =76%					



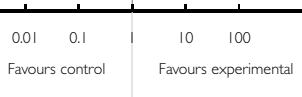
Analysis 3.1. Comparison 3 CGA versus usual care (timing of admission), Outcome 1 Living at home (up to 6 months).

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 3 CGA versus usual care (timing of admission)

Outcome: 1 Living at home (up to 6 months)

Study or subgroup	Experimental n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
1 Wards (direct admission)					
Asplund 2000	121/190	134/223		9.4 %	1.16 [0.78, 1.74]
Collard 1985	163/218	319/477		10.6 %	1.47 [1.02, 2.10]
Counsell 2000	536/767	531/764		33.6 %	1.02 [0.82, 1.27]
Fretwell 1990	104/221	92/215		10.4 %	1.19 [0.81, 1.73]
Harris 1991	67/97	106/170		5.0 %	1.35 [0.79, 2.29]
Landefeld 1995	260/327	233/324		10.1 %	1.52 [1.06, 2.18]
Subtotal (95% CI)	**1820**	**2173**		**79.0 %**	**1.20 [1.05, 1.38]**
Total events: 1251 (Experimental), 1415 (Control)					
Heterogeneity: Chi^2 = 5.20, df = 5 (P = 0.39); I^2 =4%					
Test for overall effect: Z = 2.64 (P = 0.0082)					
2 Wards (stepdown admission)					
Applegate 1990	62/78	47/77		2.0 %	2.47 [1.21, 5.06]
Kay 1992	16/30	17/29		1.7 %	0.81 [0.29, 2.26]
Rubenstein 1984	46/63	32/60		1.9 %	2.37 [1.12, 5.03]
Saltvedt 2002	101/127	79/127		3.4 %	2.36 [1.35, 4.14]
White 1994	14/20	7/20		0.4 %	4.33 [1.15, 16.32]
Subtotal (95% CI)	**318**	**313**		**9.4 %**	**2.20 [1.56, 3.09]**
Total events: 239 (Experimental), 182 (Control)					
Heterogeneity: Chi^2 = 4.85, df = 4 (P = 0.30); I^2 =18%					
Test for overall effect: Z = 4.52 (P < 0.00001)					
3 Teams (direct admission)					
Naughton 1994	39/51	44/60		2.0 %	1.18 [0.50, 2.80]
Subtotal (95% CI)	**51**	**60**		**2.0 %**	**1.18 [0.50, 2.80]**
Total events: 39 (Experimental), 44 (Control)					
Heterogeneity: not applicable					
Test for overall effect: Z = 0.38 (P = 0.70)					
4 Teams (acute admission)					
McVey 1989	61/93	64/92		4.6 %	0.83 [0.45, 1.55]
Subtotal (95% CI)	**93**	**92**		**4.6 %**	**0.83 [0.45, 1.55]**



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Study or subgroup	Experimental n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
Total events: 61 (Experimental), 64 (Control)					
Heterogeneity: not applicable					
Test for overall effect: Z = 0.58 (P = 0.56)					
5 Teams (stepdown admission)					
Winograd 1993	68/99	74/98		4.9 %	0.71 [0.38, 1.33]
Subtotal (95% CI)	**99**	**98**		**4.9 %**	**0.71 [0.38, 1.33]**
Total events: 68 (Experimental), 74 (Control)					
Heterogeneity: not applicable					
Test for overall effect: Z = 1.07 (P = 0.29)					
Total (95% CI)	**2381**	**2736**		**100.0 %**	**1.25 [1.11, 1.42]**
Total events: 1658 (Experimental), 1779 (Control)					
Heterogeneity: Chi^2 = 25.57, df = 13 (P = 0.02); I^2 =49%					
Test for overall effect: Z = 3.70 (P = 0.00021)					
Test for subgroup differences: Chi^2 = 15.60, df = 4 (P = 0.00), I^2 =74%					

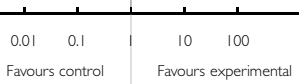
Analysis 3.2. Comparison 3 CGA versus usual care (timing of admission), Outcome 2 Living at home (end of follow up).

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 3 CGA versus usual care (timing of admission)

Outcome: 2 Living at home (end of follow up)

Study or subgroup	Experimental n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
1 Wards (direct admission)					
Asplund 2000	121/190	134/223		5.9 %	1.16 [0.78, 1.74]
Collard 1985	163/218	319/477		6.7 %	1.47 [1.02, 2.10]
Counsell 2000	474/767	485/764		24.7 %	0.93 [0.76, 1.14]
Fretwell 1990	104/221	92/215		6.6 %	1.19 [0.81, 1.73]
Landefeld 1995	218/327	194/324		8.6 %	1.34 [0.97, 1.85]
Subtotal (95% CI)	**1723**	**2003**		**52.5 %**	**1.13 [0.98, 1.29]**
Total events: 1080 (Experimental), 1224 (Control)					
Heterogeneity: Chi^2 = 6.58, df = 4 (P = 0.16); I^2 =39%					
Test for overall effect: Z = 1.71 (P = 0.088)					
2 Wards (acute admission)					
Nikolaus 1999 plus ESD	118/181	55/92		3.4 %	1.26 [0.75, 2.11]
Nikolaus 1999 Ward	114/179	56/93		3.6 %	1.16 [0.69, 1.94]
Subtotal (95% CI)	**360**	**185**		**6.9 %**	**1.21 [0.84, 1.74]**
Total events: 232 (Experimental), 111 (Control)					
Heterogeneity: Chi^2 = 0.05, df = 1 (P = 0.82); I^2 =0.0%					
Test for overall effect: Z = 1.02 (P = 0.31)					
3 Wards (stepdown admission)					
Applegate 1990	55/78	43/77		1.7 %	1.89 [0.97, 3.67]
Cohen 2002 GEMC	200/346	185/346		10.4 %	1.19 [0.88, 1.61]
Cohen 2002 UCOP	217/348	185/348		9.3 %	1.46 [1.08, 1.97]
Kay 1992	16/30	17/29		1.1 %	0.81 [0.29, 2.26]
Rubenstein 1984	35/63	22/60		1.3 %	2.16 [1.05, 4.45]
Saltvedt 2002	76/127	68/127		3.6 %	1.29 [0.79, 2.13]
White 1994	14/20	7/20		0.3 %	4.33 [1.15, 16.32]
Subtotal (95% CI)	**1012**	**1007**		**27.6 %**	**1.40 [1.17, 1.67]**
Total events: 613 (Experimental), 527 (Control)					
Heterogeneity: Chi^2 = 7.33, df = 6 (P = 0.29); I^2 =18%					
Test for overall effect: Z = 3.74 (P = 0.00018)					



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(. . . *Continued*)

Study or subgroup	Experimental n/N	Control n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
4 Teams (direct assessment)					
Naughton 1994	39/51	44/60		1.3 %	1.18 [0.50, 2.80]
Subtotal (95% CI)	**51**	**60**		**1.3 %**	**1.18 [0.50, 2.80]**
Total events: 39 (Experimental), 44 (Control)					
Heterogeneity: not applicable					
Test for overall effect: Z = 0.38 (P = 0.70)					
5 Teams (acute assessment)					
Kircher 2007	98/150	94/129		4.7 %	0.70 [0.42, 1.17]
McVey 1989	51/93	62/92		3.7 %	0.59 [0.32, 1.07]
Subtotal (95% CI)	**243**	**221**		**8.4 %**	**0.65 [0.44, 0.96]**
Total events: 149 (Experimental), 156 (Control)					
Heterogeneity: Chi^2 = 0.20, df = 1 (P = 0.66); I^2 =0.0%					
Test for overall effect: Z = 2.16 (P = 0.031)					
6 Teams (stepdown assessment)					
Winograd 1993	32/99	36/98		3.3 %	0.82 [0.46, 1.48]
Subtotal (95% CI)	**99**	**98**		**3.3 %**	**0.82 [0.46, 1.48]**
Total events: 32 (Experimental), 36 (Control)					
Heterogeneity: not applicable					
Test for overall effect: Z = 0.65 (P = 0.52)					
Total (95% CI)	**3488**	**3574**		**100.0 %**	**1.16 [1.05, 1.28]**
Total events: 2145 (Experimental), 2098 (Control)					
Heterogeneity: Chi^2 = 28.49, df = 17 (P = 0.04); I^2 =40%					
Test for overall effect: Z = 2.96 (P = 0.0031)					
Test for subgroup differences: Chi^2 = 14.40, df = 5 (P = 0.01), I^2 =65%					

Analysis 4.1. Comparison 4 CGA versus usual care (outpatient follow up), Outcome 1 Living at home (up to 6 months).

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 4 CGA versus usual care (outpatient follow up)

Outcome: 1 Living at home (up to 6 months)

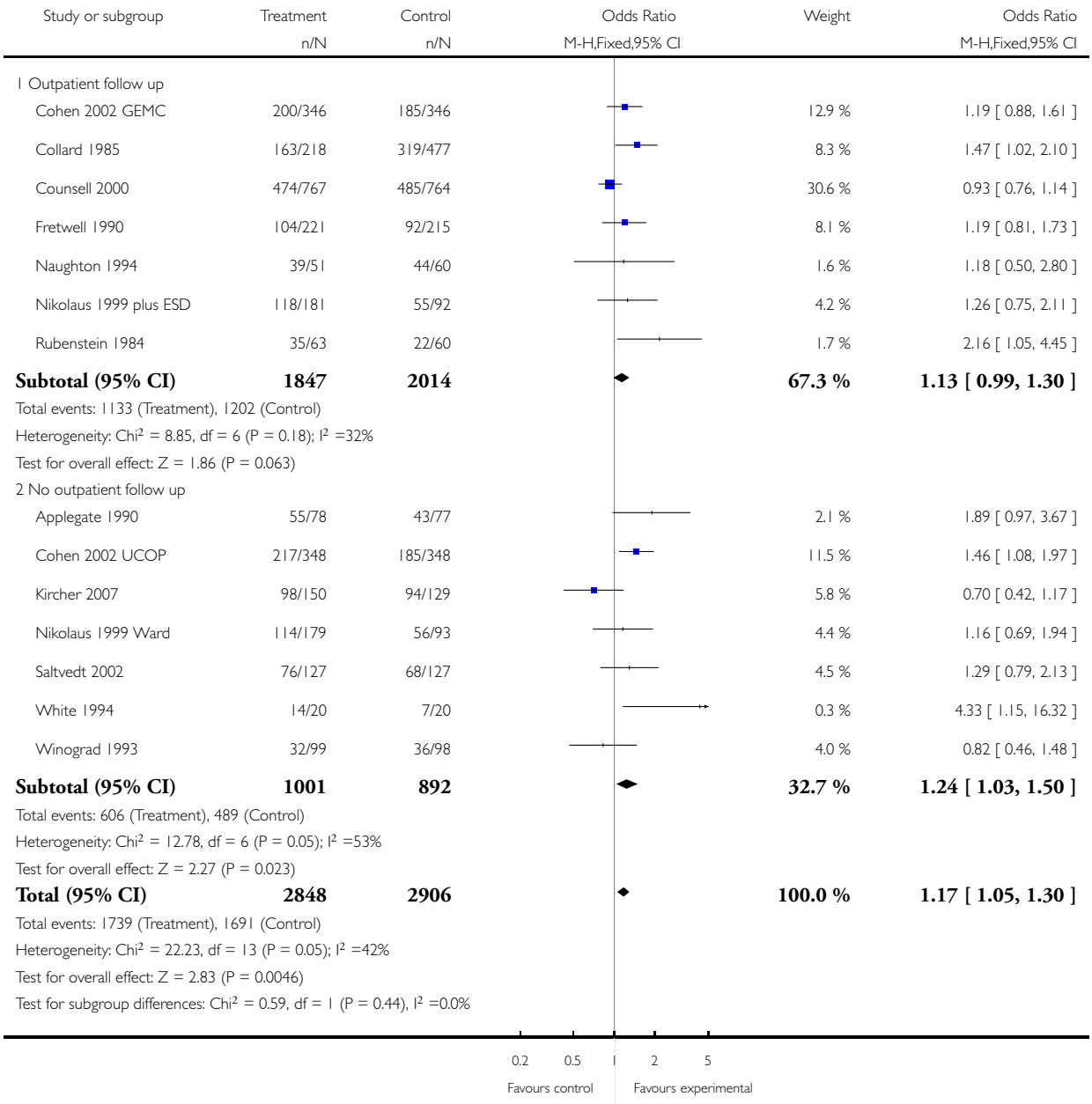
Study or subgroup	Control n/N	Treatment n/N	Odds Ratio M-H,Fixed,95% CI	Weight	Odds Ratio M-H,Fixed,95% CI
1 Outpatient follow up					
Collard 1985	163/218	319/477		15.3 %	1.47 [1.02, 2.10]
Counsell 2000	536/767	531/764		48.6 %	1.02 [0.82, 1.27]
Fretwell 1990	104/221	92/215		15.0 %	1.19 [0.81, 1.73]
Naughton 1994	39/51	44/60		2.9 %	1.18 [0.50, 2.80]
Rubenstein 1984	46/63	32/60		2.7 %	2.37 [1.12, 5.03]
Subtotal (95% CI)	**1320**	**1576**		**84.5 %**	**1.18 [1.00, 1.38]**
Total events: 888 (Control), 1018 (Treatment)					
Heterogeneity: Chi^2 = 6.46, df = 4 (P = 0.17); I^2 =38%					
Test for overall effect: Z = 2.01 (P = 0.044)					
2 No outpatient follow up					
Applegate 1990	62/78	47/77		2.9 %	2.47 [1.21, 5.06]
Saltvedt 2002	101/127	79/127		4.9 %	2.36 [1.35, 4.14]
White 1994	14/20	7/20		0.6 %	4.33 [1.15, 16.32]
Winograd 1993	68/99	74/98		7.1 %	0.71 [0.38, 1.33]
Subtotal (95% CI)	**324**	**322**		**15.5 %**	**1.71 [1.22, 2.41]**
Total events: 245 (Control), 207 (Treatment)					
Heterogeneity: Chi^2 = 11.71, df = 3 (P = 0.01); I^2 =74%					
Test for overall effect: Z = 3.11 (P = 0.0019)					
Total (95% CI)	**1644**	**1898**		**100.0 %**	**1.26 [1.09, 1.46]**
Total events: 1133 (Control), 1225 (Treatment)					
Heterogeneity: Chi^2 = 21.93, df = 8 (P = 0.01); I^2 =64%					
Test for overall effect: Z = 3.16 (P = 0.0016)					
Test for subgroup differences: Chi^2 = 3.83, df = 1 (P = 0.05), I^2 =74%					

Analysis 4.2. Comparison 4 CGA versus usual care (outpatient follow up), Outcome 2 Living at home (end of follow up).

Review: Comprehensive geriatric assessment for older adults admitted to hospital

Comparison: 4 CGA versus usual care (outpatient follow up)

Outcome: 2 Living at home (end of follow up)



APPENDICES

Appendix 1. MEDLINE search strategy

1 Geriatric Assessment/
2 Health Services for the Aged/
3 needs assessment/
4 risk assessment/
5 exp Diagnostic Services/
6 "Health Services Needs and Demand"/
7 exp Health Services/
8 exp "Delivery of Health Care"/
9 exp "Outcome and Process Assessment (Health Care)"/
10 or/3-9
11 geriatrics/
12 10 and 11
13 1 or 2 or 12
14 geriatric assessment.tw.
15 (geriatric adj2 consultation).tw.
16 (geriatric adj2 evaluation).tw.
17 or/13-16
18 randomized controlled trial.pt.
19 controlled clinical trial.pt.
20 intervention studies/
21 experiment$.tw.
22 (time adj series).tw.
23 (pre test or pretest or (posttest or post test)).tw.
24 random allocation/
25 impact.tw.
26 intervention?.tw.
27 chang$.tw.
28 evaluation studies/
29 evaluat$.tw.
30 effect?.tw.
31 comparative studies/
32 animal/
33 human/
34 32 not 33
35 or/18-31
36 35 not 34
37 17 and 36

Appendix 2. EMBASE search strategy

1. geriatric assessment/
2. health services for the aged/
3. aged/ or "aged, 80 and over"/ or frail elderly/ or geriatrics/
4. needs assessment/
5. *risk assessment/
6. diagnostic services/
7. "health services needs and demand"/
8. *health services/
9. *health status/

10. *"outcome and process assessment (health care)"/ or *"outcome assessment (health care)"/
11. "delivery of health care"/ or "delivery of health care, integrated"/
12. patient care team/
13. or/4-12
14. 3 and 13
15. ((geriatric or aged or elderly or old age) adj5 (assess$ or evaluation or consultation)).tw.
16. (gemu or gemus).tw.
17. 3 and (multidisciplinary adj5 assess$).tw.
18. 1 or 2 or 14 or 15 or 16 or 17
19. randomized controlled trials/
20. controlled clinical trials/
21. random allocation/
22. double-blind method/
23. single-blind method/
24. clinical trials/
25. (clin$ adj5 trial$).tw.
26. ((singl$ or doubl$ or tripl$ or trebl$) adj5 (blind$ or mask$)).tw.
27. (random$ or quasi-random$ or quasi random$).tw.
28. research design/
29. meta-analysis/
30. control groups/
31. ((control or intervention) adj5 group$).tw.
32. (metaanalysis or meta-analysis or meta-analysis or systematic review).tw.
33. program evaluation/
34. or/19-33
35. 18 and 34

HISTORY

Protocol first published: Issue 4, 2006

Review first published: Issue 7, 2011

Date	Event	Description
12 November 2008	Amended	Minor changes
12 November 2008	Amended	Converted to new review format.

CONTRIBUTIONS OF AUTHORS

G Ellis was lead review author. M Whitehead and D Robinson were responsible for the selection of trials and extraction of data. D O'Neill and P Langhorne moderated.

DECLARATIONS OF INTEREST

All review authors are geriatricians. None have received financial support related to the subject of the review.

SOURCES OF SUPPORT

Internal sources

- No internal sources of support were sought, UK.

External sources

- No sources of support supplied

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

Analysis of the joint primary outcome 'independent survival' was not possible for reasons highlighted above. Similarly, comparisons of cost in a meta-analysis have not been attempted because of the differences in reporting style described above.