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Comprehensive geriatric assessment for older hospital patients

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In-patient comprehensive geriatric assessment (CGA) may reduce short-term mortality, increase the chances of living at home at 1 year and improve physical and cognitive function. We systematically reviewed the literature and found 20 randomized controlled trials (10 427 participants) of in-patient CGA for a mixed elderly population. This includes seven more recent randomized controlled trials that update a previous review. Newer data confirm the benefit of in-patient CGA, increasing the chance of patients living at home in the long term. Overall, for every 100 patients undergoing CGA, three more will be alive and in their own homes compared with usual care [95% confidence interval (CI) 1–6]. Most of the benefit was seen for ward-based management units (four patients per 100 treated, 95% CI 1–7) with little contribution from team-based care (no patients per 100, 95% CI –4 to +5). However, CGA does not reduce long-term mortality. This evidence should inform future service developments.

Why do we need comprehensive geriatric assessment?

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Health service provision for the older adult is an issue of increasing importance, especially in industrialized nations. The over-65s account for ~15% of the population, and it is anticipated that by 2050 the dependence ratio of older people (i.e. those aged ≥65 as a proportion of those aged 20–64) will have risen from the current figure of 22% to 46%.[1] Hospital admissions for emergencies have continued to increase year on year, with the largest increases in the over-65s. Indeed, some epidemiologists have concluded that the future of in-patient emergency medical care is the care of the older adult.[2]

Older adults have an age-related increase in comorbidity and disability.[2–4] Frailty, which can be described as a complex interplay of health and illness, attitudes, resources and dependence on others, leading to a decreased ability to withstand illness without loss of function,[5,6] is also seen with increasing frequency with age. Some have called frailty 'reduced functional homeostasis'.[7] This increase in a frail and dependent population

makes the design and delivery of health care of paramount importance. Finding the optimal model of care for the older adult has been the subject of research since the origins of geriatric medicine. At that time, observing high rates of institutionalization in the frail elderly population, Marjory Warren identified the lack of a comprehensive assessment of the medical, social, functional and psychological needs of this high-risk group. She also observed the inadequacy of provision for readily recognizable and remediable problems.[8] This observation was to lead not only to the birth of the speciality of geriatrics, but also to one of the cornerstones of modern geriatric care: the comprehensive geriatric assessment (CGA).

What is comprehensive geriatric assessment?

CGA is defined in Box 1.[9] More than a diagnostic process in the recognition of needs alone, CGA implies the delivery of treatments to meet those needs and as such moves from the diagnostic approach to intervention itself. The aim of this multifaceted intervention is the restoration of healthy function and independence, where possible, as well as the amelioration of disability and distress. The theoretical benefits of CGA have been described as improvements in diagnostic accuracy, optimization of medical treatment, improved prognosis, restored and maintained function, support for loss of autonomy and improved quality of life, ideally in a cost-effective model.[10] Several different models of CGA have been described. In this review we focus on two in-patient models of care: the Geriatric Evaluation and Management Unit (GEMU) (Box 2) and the In-patient Geriatric Consultation Service (IGCS) (Box 3).[11]

Box 1 Comprehensive geriatric assessment (CGA)

A multidimensional interdisciplinary diagnostic process focused on determining a frail elderly person's medical, psychological and functional capability in order to develop a coordinated and integrated plan for treatment and long-term follow-up.

Box 2 In-patient Geriatric Consultation Service (IGCS) team

A multidisciplinary team which assesses, discusses and recommends a plan of treatment for frail older in-patients.

Box 3 Geriatric Evaluation and Management Unit (GEMU) ward

A ward that admits frail older in-patients for a process of multidisciplinary assessment, review and therapy.

The evidence for in-patient CGA

CGA has been the subject of randomized controlled trials (RCTs), controlled clinical trials and systematic reviews. We updated the original review[11] with a literature search across MEDLINE, EMBASE, CINAHL, DARE, the Cochrane Database of Systematic Reviews and the Cochrane Controlled Trials Register using the following search terms: *aged, over 65, elderly, geriatric, health services for aged, comprehensive, comprehensive health care, assessment, nutrition assessment, needs and process assessment, functional assessment, nursing assessment, risk assessment, geriatric assessment, rehabilitation, patient care team, activities of daily living, in-patients, hospitals*. In addition we searched the bibliographies of retrieved trials to identify others and conducted a limited hand-search of relevant journals. We identified 20 RCTs (10 427 participants) of in-patient CGA for a mixed elderly population with relevant patient outcomes for our review. An outline of the relevant trials identified[12–31] is presented in Tables 1 and 2.

The first comprehensive systematic review and meta-analysis of the effects of CGA was conducted in 1993.[11] This review included in-patient and out-patient CGA models. The in-patient component of the review included 12 RCTs (2455 participants) of mixed elderly populations. We excluded two trials of CGA in an orthopaedic patient group. As evidence of condition-specific organization of care has been demonstrated elsewhere, our review will focus on general CGA in an at-risk population.[32,33]

Unpacking the 'black box' of CGA

Who benefits from CGA?

There has been considerable discussion in the literature about the admission criteria for entry to geriatric care[10,11,34,35] CGA consensus conferences have supported targeting to maximize the benefit of CGA.[36] The most common targeting criteria are a combination of age, physical disease, geriatric syndromes, impairment of functional ability and social problems. These targets are often seen as methods of focusing care on those who are likely to benefit most by excluding those who are too well (functionally independent) or too sick (terminal illness and advanced dementia). Controlled trials using these criteria have shown significantly decreased nursing-home placement, improved survival, improved functional status, improved mental status and fewer discharge medications.[36] The patient groups targeted in the trials we identified are described in Tables 1 and 2.

Table 1 Trials of in-patient geriatric consultation service (IGCS) teams

Trial	Year	Patients	Interventions	Comparisons	Outcome
Epstein[21]	1990	>70 years and high risk or all >74 years	MDT assessment and intervention	MDT assessment and recommendations; a third arm was assessed by an internist as a second opinion versus usual care	Mortality Functional data Perceived health status
Fretwell[22]	1990	>75 years admitted to acute care	MDT assessment and intervention	MDT assessment and recommendations. Patients were housed inspecial nursing unit but treated by routine physicians versus usual care	Mortality Length of stay Costs Functional outcome Cognitive function Emotional outcome
Gayton[23]	1987	All >70 years admitted to general medical wards	MDT assessment and intervention	MDT assessment versus usual medical care	Mortality Institutionalization Length of stay Functional outcome Cognitive outcome
Hogan[24]	1987	>75 years admitted to medical ward with specific geriatric syndromes	MDT assessment and intervention	MDT assessment and therapy versus usual medical care	Mortality Institutionalization Hospitalization Functional outcome Cognitive outcome
Hogan[25]	1990	All >75 years admitted to department of medicine	MDT assessment and intervention	MDT assessment and therapy with follow-up versus usual medical care	Mortality Institutionalization Hospitalization Functional outcome
Naughton[26]	1994	All >70 years admitted to general medical wards	MDT assessment and intervention	MDT assessment and therapy with follow-up versus usual medical care	Mortality Institutionalization Costs
Reuben[27]	1995	>65 years with one of 13 screening criteria admitted to medical wards	MDT assessment and intervention	MDT assessment and recommendations versus usual care	Mortality Self- or proxy-reported functional outcome Mental health Social activities
Saltz[28]	1988	All over 75 years admitted toin-patient care (medical, surgical, psychiatric)	MDT assessment, recommendation and review	MDT assessment and follow-up to encourage implementation of recommendations versus assessment and recommendations alone	Mortality Institutionalization
Thomas[29]	1993	>70 years admitted to hospital	MDT assessment and intervention	MDT assessment and recommendations versus usual care	Mortality Functional outcome Length of stay Institutionalization
Winograd[30]	1993	>65 years with frailty or functional impairment admitted to medical wards	MDT assessment and intervention	MDT assessment and recommendations versus usual care	Mortality Functional outcome Cognitive outcome Length of stay Hospitalization Institutionalization Morale

Table 2 Trials of geriatric evaluation and management unit (GEMU) wards

Trial	Year	Patients	Interventions	Comparisons	Outcomes
Applegate[12]	1990	>65 years with medical or surgical problems and at risk of NH placement	Geriatric assessment unit (sub-acute or rehabilitation)	Assessment and rehabilitation unit versus usual medical care	Mortality Functional outcome Institutionalization Length of stay
Asplund[13]	2000	>70 years with medical problems admitted acutely to hospital	Geriatric assessment unit	Assessment and therapy in specialized MDT care versus usual medical care	Mortality Functional outcome Institutionalization Costs
Cohen[14]	2002	>65 and frail, impaired ADL, admitted to acute medicine or with specific geriatric problems	Geriatric assessment unit	Geriatric assessment and follow-up; geriatric assessment and no follow-up; usual care and geriatric follow-up; usual care and no follow-up	Mortality Functional outcome Institutionalization Costs
Collard[31]	1985	>65 years with medical or surgical problems	Geriatric assessment units	Assessment and managed care by primary nurse with MDT meetings and input plus nurse-led follow-up	Mortality Institutionalization Self related health Length of stay Costs
Counsell[15]	2000	>70 years admitted to medical ward or family practice as an in-patient	Geriatric assessment unit	Assessment and therapy in specialized protocolized care versus usual medical care	Mortality Functional outcome Mobility Institutionalization Costs
Harris[16]	1991	>70 years admitted to acute medical ward	Geriatric assessment unit	Assessment and therapy in unit with special interest and enhanced rehabilitation resources	Mortality Institutionalization Functional outcome Length of stay
Landefeld[17]	1995	>70 years admitted to acute medical ward	Geriatric assessment unit	Assessment and therapy in specialized protocolized care versus usual medical care	Mortality Institutionalization Functional outcome Length of stay Costs
Nikolaus[18]	1999	>65 years with medical or surgical problems and at risk, frail or with functional problems	Geriatric assessment unit plus supported discharge, or geriatric assessment unit, or assessment but usual medical care	Assessment unit plus supported discharge, assessment unit and no supported discharge, or assessment only but usual medical care	Mortality Functional outcome Institutionalization Hospitalization Length of stay Costs
Rubenstein[19]	1984	>65 years with functional problems after 1 week of acute illness	Geriatric assessment unit	Assessment and therapy in specialized MDT care versus usual medical care	Mortality Length of stay Institutionalization Hospitalization Functional outcome Costs
Saltvedt[20]	2002	>75 years with frailty or functional problems admitted to medical ward	Geriatric assessment unit	Assessment and therapy in specialized protocolized care versus usual medical care	Mortality

ADL, activities of daily living.

Who should deliver CGA?

A detailed breakdown of the components of the 'black box' in reported trials of in-patient CGA is shown in Table 3. Members of the CGA multidisciplinary team are illustrated as individuals with dedicated time and experience who form the core component of the intervention assessed (Box 4). Referral to other therapists without dedicated time and experience is not included in this description. Key to most trials is the role of a senior physician with experience in geriatric medicine, a coordinating or specialist nurse and a social worker. A variable number of additional team members reflect the complexity of these trials. Physiotherapists and occupational therapists form the next most frequent team

Table 3 Core Team Members and Processes of Care

	Trial	Organization							Core team members												
		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	Pastoral care
Teams	Epstein[21]	•	•	○	•				•		•	•									
	Fretwell[22]	•	•	○	•				•		•	•	•			•					
	Gayton[23]	•	•	○					•		•	•	•	•							
	Hogan[24]	•	•	○					•		•		•								
	Hogan[25]	•	•	○				•	•		•	•	•	•	•						•
	Naughton[26]	•	•	•				•	•			•									
	Reuben[27]	•	•	○	•			•	•		•	•									
	Saltz[28]	•	•	○	•				•	•	•	•									
	Thomas[29]	•	•	○	•				•		•	•	•			•					
	Winograd[30]	•	•	○					•	•	•	•									
	Applegate[12]	•	•	•				•	•		•	•	•	•	•	•	•	•			
	Asplund[13]	•	•	•					•		•		•	•	•						
	Cohen[14]	•	•	•	•			•	•		•	•									
	Collard[31]	•	•					•			•	•	•	•							
Wards	Counsell[15]	•	•	•		•	•		•		•	•	•	•							
	Harris[16]	•										•	•	•							
	Landefeld[17]	•	•	•		•	•		•		•	•	•	•	•						
	Nikolaus[18]	•			•			•			•	•	•	•							
	Rubenstein[19]	•	•	•	•			•	•	•	•	•	•	•	•			•	•	•	
	Saltvedt[20]	•	•	•		•			•		•		•	•							

○ = recommendations alone

Box 4 Multidisciplinary team

A core team of experienced individuals drawn from different medical, nursing and associated health professions. They share responsibility for the coordinated assessment, discussion and recommendation or implementation of treatment plans.

members, and referral to these services was seen as necessary for teams that did not have dedicated therapy members.

In most teams senior geriatricians had responsibilities for team leadership as well as for thorough clinical assessment including medication reviews, medical reviews and interventions. Experienced nursing was almost universal in the trials assessed. The roles described varied from clinical consultancy involving functional and physical assessments and advice to coordination of teams and services. Trials evaluating discrete units (GEMUs) frequently specifically mentioned nurse training and education or experience, as distinct from non-specialist nursing. Nursing protocols for the identification and prevention of problems such as pressure sores, immobility, confusion, unnecessary catheterization etc. were often employed to guide nursing care (these are highlighted in Table 3). In contrast, in the IGCS (geriatric teams) trials, daily nursing care was not specialized in the care of older people. The role of social workers was not universal in the trials but reflected the need to identify and address social and community needs. Although not present in all trials as core team members, the role of physical and occupational therapists is apparent in nearly all the trials identified. The design and make-up of the team members in each trial appears to owe much to differences in resourcing and health care delivery models.

How is CGA delivered?

A process of assessment is present in all of the trials and is at the core of this review. This always involved a coordinated multidisciplinary assessment process comprising the identification and documentation of medical, physical, social and psychological problems. The methodology of this process appeared to differ in style more than substance between trials. Some trialists used local assessment standards, but in a number of trials attempts were made to use existing assessment tools (Table 3).

The assessment process in most trials included the development of a plan of care incorporating appropriate rehabilitation. This formation of a programme of therapy is almost universally decided by the interdisciplinary team and implies a process of multidisciplinary team (MDT) working. In the majority of trials this methodology, including the frequency of team meetings, is explicit (Table 3).

The formation of patient-centred goals is frequently seen as another key component of MDT working. Some trials explicitly stated this component of their intervention (see Table 3.) Trials of IGCS assessment often described problems where recommendations for therapy were made to

the patient's usual care physician, but were not implemented directly by the assessment team (this is illustrated in Table 3 with open circles).

Descriptions of the type and amount of interdisciplinary therapy are limited in the studies, and therefore few comparisons can be made about standardization of practice or intensity and type of therapy by the rehabilitation staff.

Previous reviews have addressed the question of control over recommendations and delivery of team goals.[9,11] In specific instances IGCS teams have documented poor control over the implementation of their recommendations, which may have accounted for negative outcomes.[11,27,37]

The description of GEMU wards often included details of a prepared ward environment designed to address the needs of frail older patients (e.g. brightly lit wards with adequate provision of grab-rails and with clocks and calendars to aid orientation). This was not a universal provision, but some trials mentioned dedicated therapy facilities and gyms within the GEMU environment.

Where should CGA be delivered?

Clearly the distinction between IGCS and GEMU hinges on the place as well as the method of CGA delivery. The original review of CGA in 1993 suggested a benefit on 6 month mortality, likelihood of living at home and physical function from GEMUs, as well as benefits on cognitive outcomes of combined GEMU and IGCS provision of care.[11] It has been argued that this difference may be due to the degree of control over the implementation of recommendations made by the MDT. Additionally, given the similarity of the MDT members in the groups investigated, extra gain may be attributed to experienced nursing staff giving day-to-day care, which is the other main difference between the two methodologies. It does not seem possible at present to derive evidence from the literature to test this theory.

Separate components of CGA

It might be reasonable to expect the different components of CGA to have been evaluated separately in the literature. For example, the prevention and treatment of delirium is a priority in the care of the frail older adult.[10,38,39] In a controlled trial, Inouye *et al.*[40] found that simple protocolized care and predictive measures reduced the incidence of delirium in an at-risk population by nearly 40% compared with the control group.

The prevention of falls in both institutional care and the community is a complex problem identified as a priority in at-risk patients commonly

admitted to geriatric care.[10,34,41] A Cochrane review[41] of the trial literature found evidence of benefit from different interventions targeting at-risk populations.

The impacts of physiotherapy and occupational therapy have been studied separately,[42] as has the impact of exercise on improving physical function in an elderly population admitted to acute care.[43]

Returning to the community in an independent or supported state often requires discharge planning and support. This has been evaluated in RCTs which found reductions of 10–15% in readmission rates, reduced institutionalization, and reduced resource use and costs in the intervention groups who employed specific discharge support team planning[44–46] or planning alone.[47]

Nutrition is often seen as a measure of frailty and a predictor of prognosis,[6,10] and interventions to address the needs of frail undernourished adults is the subject of a Cochrane review which showed a mortality reduction for a group treated with nutritional supplements.[48]

The general process of CGA has also been investigated in condition-specific contexts such as orthopaedic care,[49,50] where evidence of benefit remains uncertain, and stroke care,[51] where the evidence of benefit is beyond reasonable doubt.

Does CGA really improve outcomes?

Mortality

The systematic review of 1993 demonstrated an early (6 month) relative risk reduction in mortality from in-patient CGA [odds ratio (OR) 0.73, 95% confidence interval (CI) 0.61–0.88]. This effect was greatest for GEMU care compared with usual care (OR 0.65, 95% CI 0.46–0.91). This effect was not sustained at 12 months for either GEMU or IGCS care alone, however, the combined results of IGCS and GEMU in-patient care showed a significant reduction on 12 month mortality (OR 0.78, 95% CI 0.62–0.97). Part of the reason for this apparent declining effect may have been the high mortality rate of patients in both the treatment and control groups, which was as high as 20–40% at 12 months in some studies,[12,20,24] reflecting the frail high-risk patient group studied. When we updated the original systematic review using the same methodology we estimated that the mortality rates at the end of study follow-up were 0.95 (95% CI 0.84–1.08, n = 6047) for GEMU care and 0.95 (95% CI 0.83–1.10, n = 4380) for IGCS. Overall this gives an OR of 0.95 (95% CI 0.87–1.05, n = 10 427) for in-patient CGA. Therefore we found that CGA had no significant beneficial effects on mortality.

Living at home

Mortality is sometimes seen as an inappropriate primary endpoint for studies that evaluate a frail and potentially disabled patient group, since improving mortality at the expense of a disabled and dependent outcome might not be considered beneficial. One simple dichotomous outcome is the measure of death or institutionalization (which can be more positively described as the odds of living at home as a result of the intervention). The review by Stuck *et al.*[11] showed a clear benefit from GEMU care on the odds of being alive and at home at 6 months (OR 1.80, 95%CI 1.28–2.53) and 12 months (OR 1.68, 95% CI 1.17–2.41). This effect was not seen for IGCS, but it was seen for in-patient CGA at both 6 months (OR 1.26, 95%CI 1.04–1.52) and 12 months (OR 1.47, 95% CI 1.13–1.90). Using similar methodology, we analysed the trials that provided adequate information for analysis (n = 15 studies, 5933 patients). In-patient CGA was associated with an increased likelihood of being alive at home at the end of follow-up (OR 1.16, 95% CI 1.04–1.30). This benefit is equivalent to three extra patients being alive in their own homes at the end of follow-up for every 100 patients treated with CGA. Thus 33 patients need to be treated to have one extra person alive and living in his or her own home. Most of this effect was derived from trials of GEMU (ward) care, where four extra patients would be alive and at home for every 100 treated (95% CI 1–7 more patients living at home). No significant effect was seen for IGCS (team) care where no additional patients would be alive and at home for every 100 patients treated (95% CI –4 to +5 living at home). Different analytical approaches did not affect the results..

Physical function

Physical outcome data from the 1993 review[11] showed an improvement in physical function from GEMU interventions which was maintained at 12 months (OR 1.72, 95%CI 1.06–2.80). This benefit was not seen for IGCS interventions or for the combined in-patient CGA. Several trials subsequent to this initial meta-analysis have reported data on this end-point. A summary of these results is illustrated in Table 4. Most trials showed no significant improvement in physical functioning when CGA was compared with the control group.[13,15,18] One trial[14] showed initial improvements at time of discharge which were not maintained at 12 months, and two trials[17,27] showed a non-significant deterioration. The reasons for this are not clear. Details of the amount and frequency of therapist time are lacking, making it hard to interpret comparisons between intervention and control groups, and differences in results between trials.

Table 4 Recent trial outcomes

Study	Length of follow-up (months)	ADL at follow-up	Mobility at follow-up	Cognition at follow-up	Costs	Length of stay	Home at follow-up
Asplund[13]	3	NSD	NA	NSD	NA	Shorter (mean 1.4 days)†	63% vs 58%
Cohen[14]	12	NSD	NSD	NA	NSD	Longer (mean 7 days)†	NA
Counsell[15]	12	NSD	NA	NA	NSD	NSD	62% vs 64%
Landefeld[17]	3	Improved	NSD	NSD	Intervention group costs lower	Shorter (mean 1 day)	72% vs 65%
Nikolaus[18]	12	Improved†	NA	NA	Intervention group costs lower	Shorter (mean 12 days in supported discharge arm)†	64% vs 60%
Reuben[19]	12	NSD	NA	NSD	NA	NA	NA
Rubin[53]* (IGCS)	12	NA	NA	NA	Intervention group costs lower	NA	NA
Saltvedt[20]	12	NA	NA	NA	NA	NA	NA

ADL, activities of daily living; NSD, no significant difference; NA, no data available.

*An RCT of cost effectiveness only. No clinical data given.

†Significant ($p < 0.05$)

Cognition

The 1993 meta-analysis[11] showed a clear benefit from both types of in-patient CGA on cognition at 1 year follow-up. Patients treated in GEMUs were twice as likely to have improved cognitive functioning at 1 year compared with those in usual care (OR 2.0, 95% CI 1.13–3.55). IGCS team care was also associated with improved cognition at 1 year (OR 1.71, 95% CI 1.19–2.45). Later trials do not add additional evidence of benefit to this finding (see Table 4).

Discussion

Assessing the evidence for CGA is challenging and requires interpretation of complex interventions in different international health care settings. Treatment and control groups in trials of complex health care ('black box') interventions need explicit description to enable a better understanding of the nature of the difference between the groups that defines the intervention. This will aid future reproducibility as well as between-study comparisons to explore apparent differences in trial outcomes. Many of the trials in this review provided detailed descriptions of their in-patient interventions. Despite this, there were deficiencies in the details of the amount and type of personnel involvement that made comparisons difficult. Additionally, where comparisons are being made between health care contexts, details of the representativeness of the

population studied with respect to the general population are lacking. This is more marked in studies conducted within veteran populations.[14] It is also apparent from differences in admission criteria, length of stay and descriptions of the available CGA team that there are significant variations in the provision of in-patient CGA in these trials.

Despite these difficulties, it is possible to draw some general conclusions. First, the high mortality for this group has already been mentioned as a possible explanation for the reduction in mortality benefit seen over time. Variation in trial results for this outcome would merit further exploration. It might be argued that long-term mortality benefits should not be a primary concern for this frailest of patient groups. For this reason composite outcomes such as the odds of being alive and at home may have more meaning. Avoiding institutionalization, in addition to avoiding death, is an important outcome for patients who in some cases fear it more than death.[52]

Secondly, the benefit of CGA care on the odds of living at home at the end of follow-up appear to be robust, although it depends largely on the GEMU trials, IGCS trials did not have a clear benefit on the odds of living at home at end of follow-up. These results reflect the importance of functional and multidisciplinary assessment and intervention in addition to conventional medical care. However, the difference between the two methods of in-patient CGA appears more rather than less marked as a result of the additional trial data.

Deriving information on functional outcomes available data proved more difficult. This would best be derived by a meta-analysis of individual patient data and is outside the scope of this review. Evidence of the impact of CGA on disability, dependence and function would provide valuable information for clinicians and service providers alike. The previous review[11] showed that gains in placement and mortality were not obtained at the expense of quality of life or independence, however, the evidence was strongest for GEMU care only.

Information on cognition is also an outcome that carers and patients alike value highly, and the additional information on this outcome from these later trials is badly needed.

Information on readmission, resource use and costs could offer helpful information to those responsible for service design and provision.

Conclusions

There is a clear benefit to be seen from in-patient CGA. The evidence of early mortality benefits, the odds of living at home at 1 year, physical functioning and cognitive functioning have previously been reported.[11] The impact of more recent trials on functional and cognitive outcomes

merits further evaluation in a meta-analysis. The challenge for future practice will be to replicate and improve on the outcomes demonstrated in these trials. Future research should potentially focus on evaluating the differences between trials of CGA to improve understanding of the mode of effectiveness of this diverse intervention. Further clinical trials of models of CGA may be merited, but they require explicit descriptions of intervention and control groups that enable reproducibility and impact on the as yet unimproved outcomes. The evidence shown here for an improved likelihood of patients being alive and in their own home at the end of follow-up confirms previous results. Newer trial data appear to highlight a divergence of effect between the two models of in-patient CGA which should provide valuable information for decision-makers involved in the design and provision of services for the elderly acute patient.

The current evidence strongly suggests that ward-based comprehensive geriatric assessment should now be considered the evidence-based standard of care for the frail older in-patient.

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