

# Comprehensive Geriatric Assessment in hospital and hospital-at-home settings: a mixed-methods study

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## Scientific summary

### CGA in hospital and hospital-at-home settings

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# Scientific summary

## Background

Providing sustainable, safe health care to an ageing population continues to be a major concern as the number of older people increases. If admitted to hospital, older people are at risk of further decline in functional and cognitive ability and at increased risk of delirium and institutionalisation. This is partly explained by the hospital environment, which limits their range of activities and leads to a lack of familiarity that can add stress.

Evidence is required on how to provide high-quality and cost-effective health care to greater numbers of people with limited resources. Efforts to improve the delivery of health care to older people in hospital have often focused on the Comprehensive Geriatric Assessment (CGA), a multidisciplinary diagnostic process that determines a frail older person's medical, functional, psychological and social capability. The intention of the CGA is that it will lead to a co-ordinated plan for the management of problems identified and their follow-up. Typically, the multidisciplinary team includes, at a minimum, specialist medical, nursing and therapy staff, who are responsible for delivering the recommended treatment or rehabilitation plan (such as physiotherapy or occupational therapy input, diagnostics or medical treatment). The benefits of the CGA, delivered in a dedicated unit or ward in hospital (e.g. a reduction in the need for long-term care), have been confirmed in several systematic reviews of randomised controlled trials (Stuck AE, Siu AL, Wieland D, Adams J, Rubenstein LZ. Comprehensive Geriatric Assessment: a meta-analysis of controlled trials. *Lancet* 1993;**342**:032–6; Craen K, Braes T, Wellens N, Denhaerynck K, Flamaing J, Moons P, *et al.* The effectiveness of inpatient geriatric evaluation and management units: a systematic review and meta-analysis. *Journal of the American Geriatrics Society* 2010;**58**:83–92).

Over the past 30 years, the CGA has evolved and it is now being delivered at different levels of intensity and in different settings. Although there is little disagreement among clinicians that the CGA is a worthwhile process, there are questions about the implementation of the CGA at the interface of hospital and community care, the cost-effectiveness of hospital-based CGA, the core components, who to target and how this type of care is experienced by patients and family caregivers. The study aimed to improve our understanding of the effectiveness, implementation and cost-effectiveness of the CGA across secondary care and acute hospital-at-home settings.

## Objectives

1. To improve our understanding of the effectiveness and cost-effectiveness of the CGA across hospital and hospital-at-home settings.
2. To describe the content and process of implementing the CGA and the barriers to implementing the CGA, from a patient, carer or health service perspective, across acute hospital and hospital-at-home settings.
3. To improve understanding and to develop consensus of the key components of the CGA through an incremental synthesis of the data collected across the programme of research.

## Design

The study employed a range of methods to assess the effectiveness and cost of the CGA, and the experience of implementing and receiving health care that was organised along the lines of the CGA in hospital and community settings. The study also explored assumptions that may underpin the CGA, using the theory of change to guide a qualitative analysis of professionals' understandings of the CGA activities, outcomes and impact and the significance placed on these by patients and caregivers.

## Methods

This programme of research was organised as five projects:

1. We updated a Cochrane review of the CGA for older adults admitted to hospital, using standard Cochrane methods, and conducted a cost-effectiveness analysis using individual patient data (IPD) and published data. We also surveyed the trialists of the studies included in the review to obtain detailed information about the characteristics of the intervention and the context of the trial. We searched electronic bibliographic databases and a trial registry for randomised trials that might be eligible for inclusion in the update of the review. The main outcomes were living at home, death, admission to a nursing home, dependence, activities of daily living (ADL), cognitive function, length of stay, re-admission, cost and cost-effectiveness. We combined published data using fixed-effect meta-analysis for primary and secondary outcomes. We conducted a cost-effectiveness analysis, using IPD and results from the meta-analysis, to examine whether or not costs and health outcomes differed between those receiving inpatient CGA and those not receiving the CGA. We used the GRADE (Grades of Recommendation, Assessment, Development and Evaluation) framework to grade our confidence in the evidence.
2. We designed and conducted an online national survey of community health-care trusts and health boards in the UK, and conducted follow-up interviews with a sample of providers to assess the range of geriatrician-led services provided in the community that provide an alternative to inpatient health care.
3. We used patient-level data from the Information Service Division National Health Service Scotland to compare populations that had been admitted to hospital with those that had received health care through a hospital-at-home service, in three Scottish health boards. We included people who were aged  $\geq 65$  years and used the admission criteria applied by the hospital-at-home services to select the populations. Data were available for each person for 2 years prior to their index admission and from the point of their index admission to 6 months after index discharge from hospital at home or hospital. We assessed mortality and cost during and 6 months after index admission, and we used propensity score matching in combination with regression analysis to reduce observed confounding.
4. We used qualitative methods to examine the meaning and delivery of the CGA in different health-care settings. We had discussions with key members of staff, reviewed local documents, undertook focus groups of patients and carers and observed multidisciplinary team meetings. We conducted interviews with staff involved in delivering the CGA and with patients and their caregivers. We used a comparative approach for the analysis of the qualitative data across health-care services, guided by the proposed components and intended functions of the CGA. We developed a theory of change for the CGA from patients' and caregivers' perspectives.
5. We used a Delphi exercise to combine the findings from the different studies by adapting the standard Delphi methods used to produce core outcome sets to identify the key components and content of the CGA. We recruited participants who had experience of providing health care to older people, and older people and caregivers who had experience of receiving health care.

## Ethics review

We obtained permission to conduct the interview study from the Oxford C National Research Ethics Service (NRES) Committee South Central (Health Research Authority) (reference number 15/SC/0266). We obtained signed release forms from each health board's Caldicott guardian.

## Results

We included 29 trials recruiting 13,766 participants in the update of the Cochrane review of the CGA. Older people admitted to hospital who receive the CGA may be more likely to be alive and in their own homes at 3–12 months' follow-up [relative risk (RR) 1.06, 95% confidence interval (CI) 1.01 to 1.10] and less likely to be admitted to a nursing home during 3–12 months' follow-up (RR 0.80, 95% CI 0.72 to 0.89).

Health-care costs per participant in the CGA group were, on average, £234 (95% CI –£144 to £605) higher than in the usual-care group. The CGA may lead to a slight increase in quality-adjusted life-years of 0.012 (95% CI –0.024 to 0.048), a slight increase in life-years of 0.037 (95% CI 0.001 to 0.073) and a slight increase in life-years living at home of 0.019 (95% CI –0.019 to 0.155).

Of the 27 community trusts or health boards contacted, 19 (70%) completed the survey. Community-based services that provided a hospital-at-home admission avoidance function were the most frequently reported service, and it was not uncommon for these services to also provide early supported discharge. The addition of a geriatrician, greater involvement of general practitioners (GPs) and the provision of 24-hour care were described as the main areas that could be improved.

There were differences between the population that were admitted to hospital at home and the population that received inpatient hospital health care, in each of the three health boards that provided data. Those who received hospital-at-home care were, on average, 3–4 years older than those admitted to hospital and were more likely to be female. A higher proportion of patients had more than four long-term conditions compared with patients admitted to hospital. The largest difference between those admitted to hospital at home and those admitted to hospital in two of the health boards was in the proportion of patients with dementia (10 percentage points higher in the hospital-at-home cohorts); whereas in the third health board, the largest difference was the proportion of patients with renal failure (also 10 percentage points higher in the hospital-at-home cohort). After propensity score matching and regression analysis, the health-care cost in site 1 (during the entire follow-up period of index admission plus 6 months after discharge) was, on average, 18% lower in the hospital-at-home population (ratio of means 0.82, 95% CI 0.76 to 0.89). Excluding the cost of the index admission to hospital at home or hospital, the costs during the 6 months following discharge for those who had been admitted to hospital at home were, on average, 27% higher (ratio of means 1.27, 95% CI 1.14 to 1.41) than the costs for patients who had been admitted to hospital. In site 2, the difference in costs between the cohorts was close to zero (ratio of means 1.00, 95% CI 0.92 to 1.09) during the entire follow-up period of index admission plus 6 months after discharge and may be 9% higher in hospital at home (ratio of means 1.09, 95% CI 0.95 to 1.24) in the 6 months following discharge (i.e. excluding the index admission). In site 3, patients admitted to hospital at home had, on average, 15% higher costs during the entire follow-up period (index admission plus 6 month follow-up after discharge) (ratio of means 1.15, 95% CI 0.99 to 1.33) and 70% higher costs during the 6 months after discharge (excluding the index admission) (ratio of means 1.70, 95% CI 1.40 to 2.07) than patients admitted to hospital. After propensity score matching and regression analysis, we found that there may be an increased risk of mortality in all three hospital-at-home cohorts (site 1: RR 1.09, 95% CI 1.00 to 1.19; site 2: RR 1.29, 95% CI 1.15 to 1.44; site 3: RR 1.27, 95% CI 1.06 to 1.54) compared with the hospital cohorts during the 6-month follow-up period.

The findings from the qualitative study revealed much common ground, regardless of setting (hospital or hospital at home). Patients and caregivers valued the relational aspects of health care, and findings suggest that a task-focused approach to the delivery of health care might limit engagement with patients and caregivers and, in particular, the integration within a CGA of patients' and caregivers' knowledge. A need to acknowledge the complexities of patient and caregiver interpersonal factors to facilitate inclusive decision-making was identified, and difficulties accommodating both health and social care needs were described, with particular reference to continuity after discharge. Findings highlight a risk of overshadowing patients' and caregivers' own capabilities, limitations, resources and ways of managing, when the focus is on professionals' processes.

Of the 78 people who registered to take part in the CGA Delphi exercise, 68% completed round 1 and 76% completed round 2. There was a high level of agreement that having age as the sole criterion to determine who should receive the CGA is not useful and that the CGA assessment should be tailored to the individual rather than all patients being assessed on all domains. The domains to be included in the assessment did not vary by location (hospital or hospital at home), and areas to be considered for inclusion centred around the clinical and physical aspects of health (to include mental well-being, delirium and

cognitive functioning), medication review, the impact of impairments and personal lifestyle factors. Patients and caregivers placed a higher priority on the inclusion of caregivers' well-being in the assessment and for targeting the CGA towards people with multimorbidity (defined as having more than one long-term condition) and recurrent hospital admissions; they also supported patients and caregivers having the option to attend multidisciplinary team meetings.

## Conclusions

There is a high level of certainty that older patients are more likely to be alive and in their own homes at follow-up if they receive the CGA on admission to hospital. The CGA may lead to a small increase in costs, but the evidence on cost-effectiveness is of low certainty because of imprecision and inconsistency among studies. We used two approaches to examine the delivery of CGA-guided health care in community settings; findings from the survey indicate that CGA admission avoidance hospital at home was the most frequently described service provided by community trusts and was described as a service that might reduce hospital admissions and increase patient and carer satisfaction. The comparison of populations that had been admitted to hospital with those that had received their health care through a CGA hospital-at-home service, in three health boards in Scotland, identified differences in the two populations and a higher cost in all three hospital-at-home cohorts than in the hospital cohorts during the 6 months following discharge. The analysis highlighted the importance of characterising populations eligible to receive these types of health-care services and of assessing subsequent use of health, social and informal care following admission to hospital at home or hospital. The research plan did not include an investigation of social care, although challenges relating to social care were raised by some patients and caregivers. Data on the cost of home, social or residential care were not available to include in the update of the Cochrane review of the CGA or the analysis of data from the three health boards in Scotland. The high value placed by patients and caregivers on the relational aspects of health care might sometimes be compromised by a more task-oriented approach, limited time available, inconsistent inclusion of caregivers in the CGA and the requirement for social/personal care. These findings were reinforced by patients and caregivers who participated in the Delphi exercise.

## Implications for research

Further research is required to examine mechanisms to strengthen engagement with family caregivers and to involve formal carers in care planning, particularly for those who do not have a family member. Other areas of research include how decision-making is assessed in busy health-care environments and how relational aspects of care can be strengthened; qualitative evidence synthesis and ethnographic research approaches could be considered. A comparison of different skill mixes that might reduce labour costs could provide hospitals with options to select a variation of the CGA that fits with their local health-care system. Different priorities given to outcomes suggest that there is scope to identify a set of core outcomes that are important to patients and their caregivers.

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