

Geriatric interventions: the evidence base for comprehensive health care services for older people

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Abstract

Specialist geriatric services apply a comprehensive, multidisciplinary evaluation and management approach to the multidimensional and usually interrelated medical, functional and psychosocial problems faced by at-risk frail elderly people. This paper examines currently available data on geriatric interventions and finds ample evidence supporting both the efficacy and the cost-effectiveness of these specialist interventions when utilised in appropriately targeted patients. It is proposed that substantial investment in these programs is required to meet the future demands of Australia's ageing population.

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FRAIL ELDERLY PATIENTS frequently pose complex and interrelated medical, functional and psychosocial challenges. To address the need for comprehensive holistic management approaches to these multidimensional problems, specialist geriatric medical units were established in Australian hospitals during the 1960s. The scope of these specialist services was expanded in the 1980s following the introduction of multidisciplinary Geriatric Domiciliary Care/Aged Care Assessment Teams, with specialised medical, nursing, physiotherapy, occupational therapy and social work inputs. Staff providing these inputs continue to form the nucleus of modern acute hospital, rehabilitation and outpatient health care services for older people and represent the technology of geriatric medicine today.

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What is known about the topic?

There have been generally positive reviews of comprehensive, multidisciplinary approaches to acute and rehabilitation health care for older adults.

What does this study add?

The literature review conducted by these authors provides evidence that continues to support the benefits of inpatient and outpatient geriatric evaluation and management services, as well as inpatient geriatric consultation services.

What are the implications for practice?

This paper suggests the need to invest in these services to address the impact of the projected ageing of the Australian population, and in particular to ensure sufficient health professionals are trained and available for these designated health services for older adults.

Programs instituted by Australian health service providers for older people are modeled on the principles of Comprehensive Geriatric Assessment (CGA) and Geriatric Evaluation and Management (GEM). CGA is a technique that aims to uncover the multidimensional problems of at-risk frail elderly people, with the purpose of planning and/or implementing coordinated medical, psychosocial and rehabilitative care tailored to the patient's specific needs.¹⁻³ The term GEM is appropriate when CGA is coupled with some therapy.^{2,4} GEM models have been implemented and their effectiveness evaluated in both inpatient and outpatient settings.

Evaluation of the evidence for geriatric interventions is challenging for a variety of reasons. Firstly, older patients are often excluded from intervention studies, with results frequently extrapolated from data in younger subjects.⁵ Outcome measures for therapeutic interventions in younger cohorts (eg, cure rates, survival) are not always the most appropriate markers of treatment success in frail elderly patients. Furthermore, even studies comparing the effectiveness of specialist geriatric services with "usual medical care" occasionally apply only age-

related admission criteria, thereby inappropriately recruiting elderly patients with single diagnoses but no other features suggesting the need for specialist geriatric intervention.⁶ This literature review discusses the effectiveness of geriatric interventions based on currently available data, mainly focusing on data from randomised controlled trials comparing GEM related interventions with usual medical care in elderly patients presenting with multidimensional problems. The main outcome measures reported are those particularly relevant to geriatric populations, including functional status, quality of life and avoidance or delay of nursing home admission.

Inpatient GEM interventions

Rubenstein and colleagues undertook a comparison of inpatient GEM interventions with usual medical care in an acute hospital setting in 1984.⁷ In this 1-year follow up study, frail elderly patients undergoing GEM-model inpatient care demonstrated significantly greater improvements in functional status (48% more GEM patients with improvements on the Personal Self Maintenance Scale), fewer initial discharges to nursing homes (58% fewer), less time spent in nursing homes and acute care hospitals (mean 42% and 25% less, respectively), as well as fewer acute care hospital readmissions (30% less).⁷ The GEM intervention was also associated with improved morale, much lower mortality (51% lower) and lower direct costs for institutional care (19% lower). All these benefits were sustained 1 year after the intervention.

Rubenstein's work was the catalyst for subsequent research that now forms the evidence base for inpatient GEM interventions. The most recognised recent study of GEM interventions is a multicentre randomised controlled trial conducted by Cohen and colleagues.⁸ In this study, frail hospitalised patients aged 65 years and older were randomised to receive care in either an inpatient geriatric unit or the usual inpatient unit, with subsequent follow-up in either an outpatient geriatric clinic or a usual clinic (see later for discussion of outpatient intervention outcomes). Unlike Rubenstein's study, Cohen and colleagues failed to demonstrate any survival benefits with GEM unit

intervention. However, at discharge, inpatient GEM unit care did lead to reduction in functional decline (physical performance and basic activities of daily living) and improved health-related quality of life (including pain management).⁸ Only improvements in pain management were sustained at 1 year. The authors argued that the more modest benefits seen in their study when compared with Rubenstein's findings might be attributable to the smaller and more homogeneous sample in the initial trials.⁸ Conversely however, Cohen's results may have been influenced by significant volunteer bias (fewer than 3% of screened patients chose to enrol), restrictive exclusion criteria (which included previous hospitalisation in a GEM unit or unspecified severe disabling disease), as well as low-intensity of the intervention, which in many cases consisted of a single follow-up visit. It is also likely that these differences may at least partly reflect a shifting standard of baseline usual inpatient care.

Other studies have confirmed Rubenstein's reported benefits to patient functional status⁹⁻¹² as well as nursing home admission^{11,12} and acute care hospital readmission rates¹³ associated with GEM interventions compared with usual hospital care. The establishment of innovative "acute care of the elderly" (ACE) units within acute care hospitals¹⁴ has, in particular, been shown to improve functional status, mobility, mood and residential care admission rates despite somewhat shorter hospital stays and shorter times for recovery before discharge.¹⁵ These interventions are said to differ from earlier GEM interventions by the physical redesign of the hospital unit, the pivotal role played by designated nurses in case management and assessment as well as daily scheduling of interdisciplinary team rounds.¹⁵

A similar picture emerges of sustained benefits to function in walking ability and activities of daily living (seven out of eight basic care activities improved in GEM patients; zero out of eight improved in controls), reduced nursing home placement (23% less), and mortality (4.3 times lower risk of death at 6 months) when the GEM model is compared with usual care in a rehabilitation hospital setting.¹⁶⁻¹⁸ In recent years, Stroke Units have

become accepted as the optimal environment for inpatient management of elderly patients with strokes.¹⁷ These units are modeled on GEM principles of multidisciplinary care, and have been shown in more than 20 trials to be associated with improved survival (17% fewer deaths at 1 year), functional independence and increased likelihood of living at home one year after stroke (24% fewer patients institutionalised at 1 year).¹⁷

Studies evaluating the cost-effectiveness of GEM-based inpatient services have demonstrated either cost neutrality^{8,10,15,16} or long-term cost benefits^{9,11-13} compared with usual inpatient hospital care. Decreased laboratory and pharmacy usage contributed to the latter finding.^{9,11} GEM-modeled discharge planning can also reduce bed occupation in acute-care hospitals by patients awaiting placement in long-term care by up to 50%.¹⁹

Therefore, in appropriately targeted elderly patients, inpatient GEM can provide substantial multifaceted, cost-effective benefits far exceeding those offered by traditional hospital approaches.

Geriatric inpatient consultation services

The effectiveness of direct geriatric consultative input is perhaps best illustrated by orthogeriatric services for elderly patients with hip fractures. Orthopaedic and multidisciplinary geriatric teams within such services are dually responsible for provision of comprehensive collaborative pre-, peri- and post-operative care. Compared with usual (orthopaedic) care, orthogeriatric liaison services result in shorter hospital lengths of stay (up to 46% less),²⁰⁻²³ greater functional independence with consequently higher rates of home discharge and lower nursing home placement (about 69% less),^{20,21} and are cost effective (up to 16% reduction in costs per patient).²⁴

In contrast, inpatient geriatric consultation services providing management recommendations but without a mandate to implement these recommendations appear to have little impact on in-hospital complication rates, lengths of stay, mortality and subsequent re-admission rates.²⁵⁻²⁸ These shortcomings are at least partially attributa-

ble to modest compliance rates (<70%) with recommendations, unsuitability of responsible caregivers to successfully implement the recommendations, and the absence of extended ambulatory follow-up.

In summary, geriatric inpatient consultation services are more likely to be effective when they exert primary control over medical recommendations, including their implementation and longer-term follow up.^{28,29}

Outpatient GEM interventions

Outpatient GEM programs for community clients are more heterogeneous and have been less frequently studied compared with the inpatient interventions described above. Patients managed by these outpatient programs are more likely to be referred by non-physicians, including family members and social service providers, and are usually less incapacitated at baseline than patients managed by inpatient GEM units. Consequently, quantifiable benefits derived from outpatient interventions are likely to be smaller in magnitude, and outcome measures such as mortality rates of less relevance. In Australia, outpatient GEM programs are usually coordinated by hospital-based Geriatric Domiciliary Care/Aged Care Assessment Teams and are implemented in a variety of settings, including within the patient's home, through hospital outpatient clinics, or Geriatric Day Hospitals. The mode and frequency of interventions undertaken by these outpatient services differs considerably depending on the setting. Hence, studies of their effectiveness are likely to produce heterogeneous results.

Despite these obstacles, considerable evidence now exists for sustained benefits to patient function from outpatient GEM interventions compared with no comprehensive geriatric care, or usual outpatient/general practitioner care. These benefits to functional status are apparent for interventions instituted within the patient's home,^{30,31} through hospital ambulatory clinics,³²⁻³⁴ by Geriatric Day Hospitals^{35,36} or by combinations of the latter two.³⁷ Almost all the reported outpatient programs incorporate longitudinal

follow-up and appear to be equally efficacious irrespective of the intervention environment.^{35,36} Synergistic effects between these environments have not been evaluated.

In addition to benefits to patient function, outpatient GEM programs may also reduce emergency room use,³⁸ nursing home and acute-hospital admissions,^{30,35,36,38-40} and rates of polypharmacy, despite an increased number of medical diagnoses.³² Improvements in patient mental status and morale are also regularly reported,^{8,30,32,34,37} as is considerable patient satisfaction.^{32,33,38} Not surprisingly, only a handful of studies are able to demonstrate a survival benefit from outpatient GEM interventions.^{31,33,39,41} In general, costs associated with outpatient GEM services do not differ significantly from usual outpatient care,^{30,33,34,37,42} and may decline with continued implementation of the service, suggesting a possible investment effect.⁴²

In summary, although of smaller magnitude than for inpatient GEM interventions, substantial evidence exists for the effectiveness of outpatient GEM interventions in maintaining and/or improving function of community patients, irrespective of the intervention environment.

Conclusions

Despite considerable diversity in the mode of implementation of GEM programs, on reviewing the literature, a consistent picture emerges of improvements to patient functional status, as well as reductions in rates of hospitalisation and long-term institutionalisation related to these interventions. These programs are cost-effective and have their greatest impact when they appropriately target elderly with multidimensional problems. GEM-interventions require long-term follow up for optimal effectiveness, and are heavily reliant on the highly skilled health professionals who provide these services with specialised medical, nursing, physiotherapy, occupational therapy and social work inputs. Substantial additional investment is required to further develop these proven interventions if Australia is to cope with the future projected demands of the ageing population.

Competing interests

None identified.

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