

## EDITORIALS

# Community rehabilitation for older people: day hospital or home-based services?

The geriatric day hospital (GDH) has been a cornerstone of geriatric medicine internationally for over four decades. It remains a unique service. Only the GDH has been able to offer an outpatient service comprising multidisciplinary, comprehensive geriatric assessment and rehabilitation. It has therefore fulfilled an obvious need for frail older people living at home. Long before the modern concept of intermediate care became a health care policy, the GDH was discussed in terms of preventing admissions, aftercare and ‘saving hospital beds’ [1]. Early randomised controlled trials demonstrated that rehabilitation provided in GDHs was associated with improved outcomes compared with usual care (essentially observational control groups) [2]. However, concerns about the costs of GDH care, particularly the inherent non-pay costs of facility overheads and ambulance travel [3], have undermined confidence in the service. Recent national reports from Belgium and New Zealand have questioned the role of the GDH in the overall provision of health care for older people [4, 5].

Home-based rehabilitation (HR) has emerged as a viable and attractive alternative to the GDH. It is argued that HR has the potential to be more patient-centred. First, because there is no ambulance travel for the patient and therefore no anxiety associated with preparing the person to leave the home. Second, HR is more likely to address the life-restricting issues for the individual patient with a focus on the rehabilitation domain of participation rather than the less patient-centred domain of activity limitation. Lastly, there are greater opportunities to involve the family carer(s) and other community staff in the rehabilitation process. On the other hand HR may lack sufficient treatment intensity, may not be sufficiently multidisciplinary, may put too many demands on carers, or may be impractical due to a cramped environment.

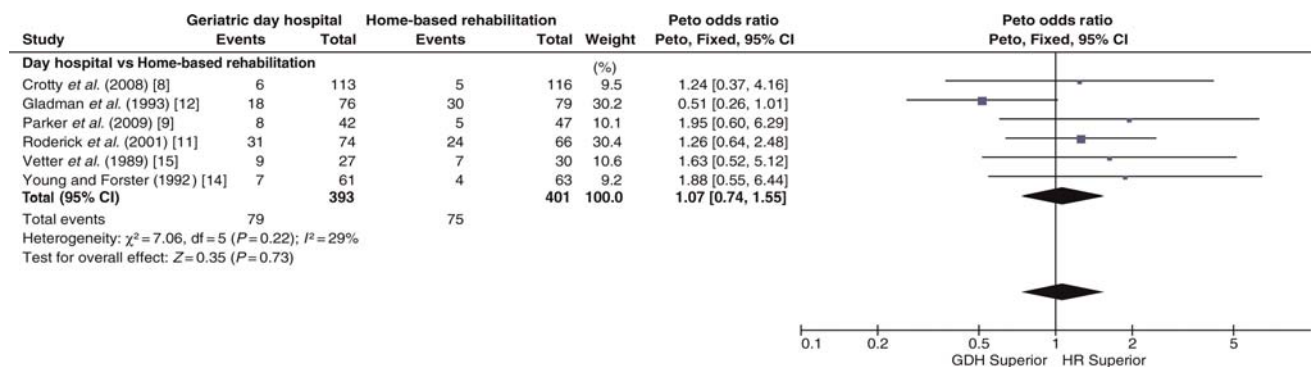
## Methods

A systematic review of the literature was conducted to identify randomised controlled clinical trials (RCTs) that investigated outcomes from one or more GDHs. All relevant electronic databases were searched including MEDLINE; EMBASE; CINAHL and PsycINFO (for full list see parent Cochrane review [6]). The searches for this paper were completed in December 2008. A GDH was defined as an outpatient facility where older patients attend for a full or near full day and receive multidisciplinary rehabilitation in a health-care setting. This is consistent with previous definitions [7] and excluded trials evaluating social day centres, other types of day

hospitals such as psychiatric day hospitals for patients with dementia or psychiatric conditions. The primary question was whether older patients attending a GDH would experience better outcomes (in terms of death, dependency or institutionalisation) than those receiving alternative forms of care. In anticipation of incomplete reported data, a global ‘poor outcome’ was constructed comprising death or one of the following (in order of preference) new resident in institutional care, severe dependency at end of follow-up, recurrent stroke and a 6-month Barthel score of <14, or deterioration in physical function during follow-up. Resource use and costs were identified as secondary questions. We calculated inpatient resource use as the average use of hospital beds (in days) per patient recruited to each trial group. Where available we extracted rehabilitation resource use in terms of reported treatment schedules delivered to patients (GDH attendances or HR visits). Three comparison groups were identified against which the GDH was compared: comprehensive geriatric assessment, no comprehensive geriatric assessment (usual care) and HR. This report relates only to the trials comparing the GDH against HR. Search methods, assessment of study quality and data extraction were carried out as described in the Cochrane review [6]. Studies were analysed on an intention-to-treat basis. We calculated odds ratios (ORs) (with 95% confidence intervals (CIs)) for the dichotomous outcomes using standard methods. Between study heterogeneity was investigated with the  $I^2$  statistic.

## Results

The searches generated 23,529 titles, from which 381 articles were of potential interest and subsequently the full text of 59 studies were retrieved and reviewed. We identified seven RCTs ( $n = 894$  patients randomised) [8–16] that compared the GDH and HR. Four of these trials recruited stroke patients only [10–12, 14], and in two studies [10, 12] patients were referred to hospital-based services that included day hospital attendance. A synthesis of the results for the composite outcome of death or poor outcome is provided in Figure 1. The pooled OR for the seven RCTs is 1.07 (95% confidence limits 0.74–1.55). It proved possible to obtain a standardised measure of average hospital bed use per patient recruited. The results show a small reduction in bed use by patients allocated to the GDH groups (GDH 6.8 days; HR 9.2 days) over the varying follow-up period of the studies (6–12 months). Four of the studies included a comparison of treatment costs. Two studies reported that the GDH was more expensive [16, 17], and the other two that the costs



**Figure 1.** A summary of the randomised controlled trials comparing geriatric hospital care and home-based rehabilitation. The outcome is death or poor outcome (institutional care, disability or deterioration). No relevant data are available for Baskett *et al.* (1999).

**Table 1.** Treatment schedules in trials comparing day hospital attendance and home-based rehabilitation

Study	n	Duration	Day hospital attendances	Home rehabilitation visits
Baskett <i>et al.</i> (1999) [10] (Auckland, New Zealand)	100	3 Months	10* (7.2)	9* (5.3)
Crotty <i>et al.</i> (2008) [8] (Adelaide, Australia)	229	3 Months	67.8* (38.6)	23.5* (14.7)
Gladman <i>et al.</i> (1993) <sup>a</sup> [12]			(Nottingham, UK)	155
	19	6 Months	4 (1–11.5)	
Parker <i>et al.</i> (2009) [9] (UK)	89	6 Months	9.6**	8.5**
Roderick <i>et al.</i> (2001) [11] (Poole, UK)	140	6 Months	17 (N/R)	17 (N/R)
Young and Forster (1992) [14] (Bradford, UK)	124	6 Months	31 (22–43)	14 (8–24)

Values are medians (inter-quartile range).

\*Mean (Standard deviation) shown.

\*\*Mean N/R, not reported.

<sup>a</sup>Gladman *et al.*: only patients in the Health Care of the Elderly stratum included.

were similar [9, 11]. The treatment schedules for six of the studies are shown in Table 1.

### Discussion

GDH care and HR are established community services for older people. It has been unclear which type of service can

best optimise outcomes for older people in need of rehabilitation. The data presented here probably represent the best evidence currently available to address this issue.

Seven RCTs were identified through an extensive search of the literature. Although it is important to be mindful that the constituent studies are individually mostly small and there are some clinical differences (some studies recruited only stroke patients), tests for heterogeneity are negative ( $I^2 = 29\%$ ) and it is therefore statistically appropriate to combine the results. There are several statistically plausible interpretations of these data, but the main limitation is the lack of precision of the pooled estimate for the OR that is therefore consistent with similar outcomes associated with either service (OR = 1.07), or 26% reduction in death and poor outcome associated with GDH care, or 45% reduction in death and poor outcome associated with HR care. Additional RCT studies might improve the precision of the pooled OR estimate. However, it seems unlikely that either service will be demonstrated as statistically superior. To do so could require a very large future study and this may not be feasible—the most recent RCT of GDH care was abandoned because of insurmountable recruitment difficulties with only 9% of the requisite sample achieved [9]. Moreover, to demonstrate superiority, any new study would require an effect size much larger than anything previously observed. Thus, we may simply have to accept that there is an uncertainty in the research comparisons of GDH and HR care but that, pragmatically, the two services probably offer similar clinical outcomes.

Another useful perspective emerges from the consideration of the resource inputs required for the patients treated in these RCTs (see Table 1). Linking together the effectiveness estimates in the forest plot (Figure 1) with rehabilitation resources used (Table 1), indicates that for three of the six RCTs for which this information is available, the clinical outcomes were broadly similar but that this was achieved by approximately one-half to a third fewer HR visits compared with GDH attendances. For three RCTs the rehabilitation resource use was similar. Importantly, in no case was the GDH attendance rate less than the HR input. This is critical as the GDH non-pay

costs (facility overheads and ambulance travel) are considerable [3]. Not surprisingly, therefore, two of the RCTs that have incorporated a cost analysis report that GDH care is more expensive than HR [3, 16], the other two report equivalence [8, 11].

The traditional model of a GDH involves whole day patient attendances with a relatively standardised rehabilitation approach and considerable periods of inactivity—recorded as 72% during an average 5.8 h attendance time in one observational study [17]. This is the style of practice that has been investigated in the RCTs and therefore the research is only generalisable to GDH providing this particular service model. GDHs that offer rapid assessment for admission avoidance [18], or provide specialist, interventions, such as falls or memory clinics, should not be subsumed within this evidence base. Indeed, using the unique outpatient facility of the GDH for these types of specialist service that require complex multidisciplinary care may be a practical new role for the GDH nationally [19].

Nevertheless, the HR service model appears to deliver similar outcomes to GDH care but is more resource efficient. The implications for the GDH should be the development of a new model of care in which the emphasis is on outreach working with home-based assessments and treatments, with day hospital attendance for only a few purposefully selected patients.

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## Conflicts of interest

None declared.

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