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Papers

Transitional care facility for elderly people in hospital awaiting a long term care bed: randomised controlled trial

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Abstract

Objective To assess the effectiveness of moving patients who are waiting in hospital for a long term care bed to an off-site transitional care facility.
Design Randomised controlled trial.
Setting Three public hospitals in Southern Adelaide.
Participants 320 elderly patients (mean age 83 years) in acute hospital beds (212 randomised to intervention, 108 to control).
Interventions A transitional care facility where all patients received a single assessment from a specialist elder care team and appropriate ongoing therapy.
Main outcome measures Length of stay in hospital, rates of readmission, deaths, and patient's functional level (modified Barthel index), quality of life (assessment of quality of life), and care needs (residential care scale) at four months.
Results From admission, those in the intervention group stayed a median of 32.5 days (95% confidence interval 29 to 36 days) in hospital. In the control group the median length of stay was 43.5 days (41 to 51 days) (95% confidence interval for difference 6 to 16 days). Patients in the intervention group took a median of 21 days (6 to 27 days) longer to be admitted to permanent care than those in the control group. In both groups few patients went home (14 (7%) in the intervention group *v* 9 (9%) in the control group). There were no significant differences in death rates (28% *v* 27%) or rates of transfer back to hospital (28% *v* 25%).
Conclusions For frail elderly patients who are awaiting a residential care bed transfer out of hospital to an off-site transitional care unit with focus on aged care "unblocks beds" without adverse effects.

Introduction

Each winter hospitals fill with elderly people, who often require time and treatment to recover from illness. Instead of creating new hospital beds, alternative solutions at the interface between hospital and long term care with the potential to allow elderly people to recover and return home are being tried. Transfers from acute hospital wards to step-down units and off-site nursing homes for patients awaiting long term care are common policy initiatives, but the introduction of such units has been controversial.[1–3] They usually have low ratios of nursing staff to patients, and clinicians have questioned their safety and effectiveness.[2]

We assessed the effectiveness of a 36 bed off-site transitional care facility servicing three public hospitals for patients awaiting a long term care bed compared with usual care (waiting in hospital for long term care accommodation). We determined the effects of transfer to the transitional care facility on patients' outcomes and use of hospital.

Methods

Setting and participants

Our study took place in the three public hospitals (totalling 850 beds) in southern Adelaide, Australia, with a regional population of about 350 000. In Australia, entry to long term care (nursing home) can occur only after an independent clinical assessment by the aged care assessment team (ACAT), who determine level of dependency. The team does not see patients until they are assessed as unsuitable for other rehabilitation or community discharge support programmes. Hospital social workers and families then search for long term care accommodation while the patient remains in hospital. Between 14 July 2003 and 4 February 2004 (30 weeks), patients awaiting long term care across the three hospitals were approached to take part in the trial. Patients were eligible if it was decided they were to go to long term care, an assessment had been performed, they were medically stable and ready for hospital discharge, and no long term care bed was available. Patients with dementia and behavioural problems were eligible for randomisation provided no additional nursing staff were thought necessary for their care. Families of patients with dementia were approached for proxy consent.

Recruitment and randomisation

We used a Zelen randomised consent design.[4] This design has been used in health service studies in which a new treatment is compared with the best available standard treatment and when standard consent procedures may lead to unnecessary distress and confusion.[5]

We invited eligible patients to participate in a four month follow-up study and obtained written consent. After baseline assessments, we randomly allocated those who consented to transfer to the transitional care facility or to remain in hospital and receive usual care. All patients were allocated on the day they gave consent. Allocations were computer generated, stratified by referring hospital, and randomised in blocks of 12. The allocation ratio was 2:1 (intervention:control) to allow the facility to become fully operational over winter.

Once randomised, patients allocated to the intervention group were approached a second time for consent to transfer to the transitional care facility to await long term care. Those allocated to receive usual care were not approached again after their initial consent.

The study biostatistician generated the randomisation sequence using the random number generator in Microsoft

Excel and created opaque sealed envelopes containing group allocation for participants. The trial nurse enrolled the participants, and a clinical trials pharmacist managed group assignment according to the randomisation schedule.

The transitional care unit

The hospitals and a private long term care provider developed and ran the off-site transitional care facility, which was 5-25 km from the study hospitals. The private provider supplied accommodation, catering, cleaning, nursing (5.0 full time equivalents in 24 hours), and carer staff (10.0 full time equivalents in 24 hours) while the hospitals provided the allied health staff (4.4 full time equivalents), medical staff, and a transitional care nurse coordinator (1.0 full time equivalent). The whole team assessed all patients on admission to the transitional care unit and had weekly case conferences. Specialist medical staff visited the site for the case conferences and reviewed all admissions. On-call medical care was available 24 hours a day.

We based the intervention on a medical rehabilitation model that included setting goals, early multidisciplinary assessment (pharmacist, geriatrician, rehabilitation medicine physician, physiotherapist, social worker, general practitioner), weekly case conferences, and family meetings to discuss goals with the patient and family. A hospital based transition care nursing coordinator was responsible for liaison with each family and ensured appropriate transfer of case notes and other information from the hospital to the transitional care facility.

Patients randomised to usual care remained in hospital and discharge was managed as usual. They did not routinely receive specialist assessment from the geriatric or rehabilitation teams.

Sample size

The primary outcome was length of hospital stay from admission to discharge from hospital. Assuming $\alpha = 0.05$, power = 0.90, and a one sided test, we needed 243 participants (162 intervention, 81 control) to show a mean reduction in length of stay of 10 days (SD 25) in the treatment group. We then increased the sample size to allow for 20% attrition.

Baseline assessment

Before randomisation, the transitional care coordinator collected baseline information including demographic information, admission date, reason for admission, and date of assessment team approval. Patients were also assessed with a modified Barthel index[6] and a quality of life scale (AQoL).[7]

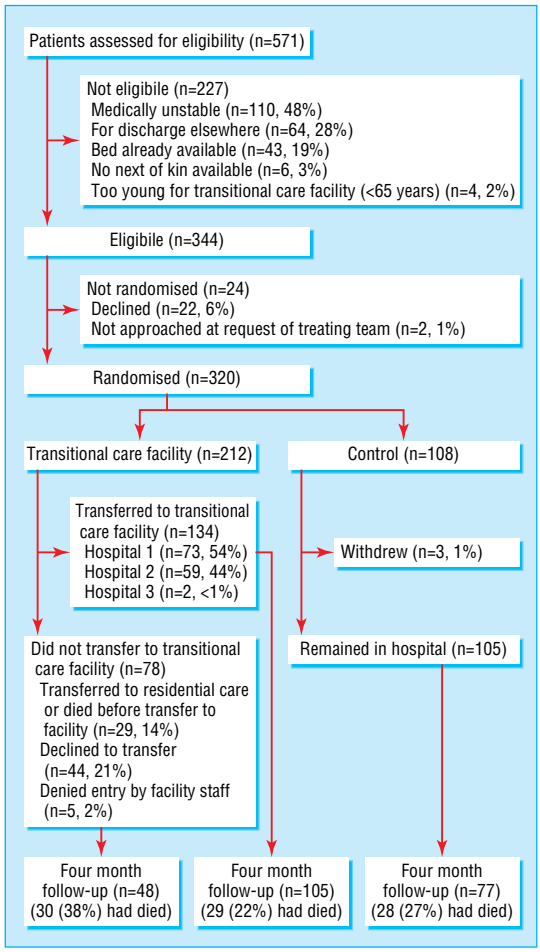
Follow-up

Four months after randomisation a research nurse blind to allocation visited all participants and documented their current place of residence and the date of admission for residents in long term care facilities. The research nurse also administered the quality of life scale, the Barthel index, and the resident classification scale. The resident classification scale assesses the patient's level of dependence and is used by all long term care facilities in Australia.

The research nurse collected data on readmissions to any public hospital in the metropolitan area within four months of the initial discharge from hospital by searching the public hospitals' database and matching name, date of birth, and admission date for each patient. Days of hospital use included time spent in hospital until death for participants who died before the end of follow-up.

Statistical analysis

We analysed data according to the random allocation and calculated means and 95% confidence intervals for normally distributed continuous variables and medians and 95% confidence intervals[8] for continuous variables with a skewed distribution. We used independent samples *t* tests or Mann-Whitney U tests to compare intervention and control groups for continuous variables, and χ^2 tests of association for categorical variables to test for differences between groups. Analyses of the outcomes at four months were calculated for all available data. Analyses were carried out with SPSS for Windows 11.5 and Stata version 7.0.



Recruitment flow of participants

Results

A total of 571 patients were assessed for eligibility. Of 344 eligible patients, 320 were randomised: 212 to transitional care and 108 to remain in hospital (fig 1). Twenty four (7%) eligible patients were not randomised and were not included in the study as they either declined to participate or were not approached at the request of the referring clinicians. A further three patients withdrew after randomisation, and therefore data were available on 317 patients. In 250 (79%) cases, we obtained proxy consent, and this rate did not differ between the groups.

Only 134 (63%) of those allocated to the transitional care facility actually transferred. Of the 78 people who did not transfer, 44 declined, 29 died before transfer or secured a permanent bed so did not need to transfer, and the transitional care facility refused to admit five (because of severe disruptive behavioural symptoms that would require additional staffing). Of those who

Table 1 Baseline comparisons between groups of patients by treatment allocation. Figures are numbers (percentages) of patients unless stated otherwise

Variable	Control (n=105)	Intervention (n=212)
Mean (SD) age (years)	83.0 (7.2)	82.8 (8.3)
Men	53 (51)	102 (48)
Veterans	28 (27)	49 (23)
Residence before admission:		
Own home	97 (92)	196 (93)
Aged care facility (low care)	6 (6)	14 (7)
Other	2 (2)	2 (1)
Median (95% CI) length of hospital stay at randomisation (days)	27.0 (23.0 to 29.0)	25.0 (23.0 to 27.8)
Mean (SD) modified Barthel score*	50.5 (29.7)	45.8 (30.7)
Mean (SD) quality of life score (AQoL) †	24.8 (5.4)	24.8 (4.7)

*Scale 0-100, low score=low level of physical function.
†Scale 0-45, low score=better quality of life.

declined to transfer, 15 (34%) thought it was too far from relatives and friends and 20 (45%) only wanted one transition to long term care.

The demographic, functional, and quality of life characteristics of the study groups were similar at baseline (table 1). Participants were frail with a mean age of 82.9 (SD 7.9), a mean Barthel score of 47.3 (SD 30.4), and a mean quality of life score of 24.8 (SD 4.9). The median time between hospital admission and randomisation was 26 days (95% confidence interval 24 to 27 days). The high proportion of men (50%) was due to one hospital providing services for veterans. Almost 30% had been admitted to hospital with musculoskeletal problems (falls, fractures, and soft tissue injuries).

Table 2 gives details of length of hospital stay and hospital use in the four months after randomisation. Patients in the intervention group stayed in hospital a median of 11 days (6 to 16 days) less than the control group overall. Patients in the intervention group took a median of 21 days (6 to 27 days) longer to be admitted to permanent care than those in the control group. When we calculated hospital use to examine the whole four months and included days of readmission to hospital as well as initial length of stay after randomisation, the intervention group spent a median of 10.5 days (6 to 11 days) less in hospital than the control group. There was no significant difference in the proportion of patients who were readmitted to hospital over the four month follow-up period (28% *v* 25%).

Twenty four patients were still in the transitional care facility at the four month follow-up. The median length of stay in the transitional care facility was 46 days (35.5 to 53.6 days). We noticed a maturation effect as the process to help patients and their families find long term care accommodation improved over time. Patients who were recruited in the second half of the study (November to February) stayed a median of 28 days (21.3 to 46.7 days) compared with 58 days (40.4 to 80.3) for patients in the first half (July to October; P = 0.001).

Table 2 Hospital use and outcomes at four months after assessment. Values are medians (95% confidence intervals) in days

Variable	Control (n=105)	Intervention (n=212)	P value†	Median difference (95% CI†)
Length of hospital stay from admission to discharge*	43.5 (41.0 to 51.0)	32.5 (29.0 to 36.0)	<0.001	11 (6 to 16)
Days in hospital from randomisation to discharge*	16 (13 to 20)	6 (5 to 7)	<0.001	10 (6 to 11)
Time from hospital admission to admission to permanent care (n=224)	51.5 (44.0 to 63.0)	72.5 (62.0 to 81.9)	0.003	–21 (–27 to –6)
Hospital use after randomisation	18 (15 to 21)	7.5 (7.0 to 9.0)	<0.001	10.5 (6.0 to 11.0)

*One control participant not discharged from hospital in four month follow-up period
†Comparison of control and intervention in intention to treat analysis.

Table 3 Mean (SD) scores on modified Barthel score (MBS), quality of life scale (AQoL), and residential care scale (RCS) at four month follow-up

	Control (n=77)*	Intervention (n=153)*	Mean difference (95% CI)	P value
MBS†	56.7 (27.2)	55.2 (25.1)	1.5 (–5.6 to 8.6)	0.678
AQoL‡	22.9 (4.9)	24.0 (4.4)	–1.1 (–2.3 to 0.2)	0.099
RCS§	56.6 (23.6)	58.7 (22.0)	–2.1 (–8.3 to 4.1)	0.506

*28 in control group and 59 in intervention died in during follow-up.
†Scale 0-100, low score=low level of physical function.
‡Scale 0-45, low score=better quality of life.
§ Scale 0-104, low score=less dependence.

No significant differences were found for the remaining outcome measures at four months (table 3).

Neither the rate of returning home nor the resident classification scale differed significantly at four months. Fourteen participants (7%) in the intervention group were home at four months compared with nine (9%) in the control group (table 4). Mortality at four months was substantial in both groups (28% in the intervention group and 27% in the control group).

Discussion

We investigated a transitional care unit for elderly people awaiting a long term care bed and have shown that the programme reduced the use of acute hospital beds by a median of 11 days per patient. The estimated effect of the intervention may be diluted as more than a third of patients randomised to the intervention group did not want to transfer to the transitional care facility and thus received usual care in hospital. Consequently, the true effect of the transitional care facility is possibly larger. Similar outcomes were reported in both groups. While there was little difference between the groups, at four months mortality and rates of transfer back to hospital were high, suggesting the patients were frail.

This model included a specialist therapy team and a weekly visit from a geriatrician or rehabilitation medicine physician and therefore differs from many of the nurse led inpatient studies.[9] Cross sectional work suggests that outcomes were better patients in long term care who received rehabilitation,[10 11] but to date there is no evidence from intervention studies to support offering rehabilitation in a long term care setting or on the effectiveness of alternate sites and approaches.[12]

Similar proportions of elderly people in both groups went home. Despite providing extra time and a multidisciplinary rehabilitation approach, there were still substantial obstacles in the provision of transitional care. Premature decision making at hospitals was driven by the urgency to move these patients out of the acute care system. This was compounded by the view of many

Table 4 Status of participants at four months. Figures are numbers (percentage) of patients

	Control (n=105)	Intervention (n=212)
Permanent care	62 (59)	104 (49)
Home	9 (9)	14 (7)
Died	28 (27)	59 (28)
Transitional care facility	—	23 (11)
Hospital	5 (5)	10 (5)
Respite	1 (1)	2 (1)

patients and families about the incapacity of elderly people to be sufficiently supported to enable them to return home.

The length of stay in the transitional care unit decreased in the second half of the trial, suggesting a maturation effect. The staff became better at securing long term care beds as time passed, raising a question about whether the trial should have occurred before procedures were fully established. However, there are substantial difficulties in convincing health services to evaluate the effects of changes in policy. Much research on new services for older people occurs against a background of urgency and crisis, and providing usual care to a group of patients is difficult once a new service has been established.

Overall we showed that the transitional care unit was suitable and acceptable to about two out of three (63%) of those randomised to receive it. Though the randomised consent process we used has been associated with high rates of refusal,[13 14] it allowed us to include a sample that was representative of hospital populations awaiting long term care beds and to monitor acceptability. As expected, many frail patients were unable to transfer because of deteriorating health, but importantly 21% declined to make the transfer. Those patients who declined or were too ill to transfer were not in geriatric wards and had poorer outcomes, suggesting that off-site wards and programmes are unsuitable for many of the growing number of elderly inpatients. Before transfer few of the patients in our study had seen a team specialising in the care of the elderly as 84% were transferred from medical wards and 12% from surgical wards.

Implications of results

Policy changes such as the introduction of transitional care units are rarely evaluated,[15] and programmes for patients who are perceived to have low medical but high care needs have been controversial.[16] Others have suggested that such programmes represent a return to "workhouse" wards with inadequate treatment and rehabilitation.[1] The high mortality and high rate of transfer to hospital in our participants confirmed that these people were frail with both medical and accommodation needs. Nevertheless, our results suggest such care can be provided outside hospital.

In considering these results, it is important to recognise that introducing a new health service is sensitive to local conditions and existing available services, and an important determinant of the usefulness of the service is the flow of patients through the facility. Local modelling is needed to establish the optimal size of these units for the population in a region with a given number of hospital beds.[17 18] Our area has rehabilitation beds, and patients in the trial had already been rejected by existing postdischarge services (hospital and community). This is reflected in the characteristics of our patients, who were more frail and dependent than those studied in the UK nurse led interim care ward, where the average Barthel scores at entry were 63.5 and 60.0, and at 6 months the mortality was 21%.[5] In our study the groups' average entry Barthel score was 47.3 and at four months mortality was 27%. Despite their frailty, 7% of patients assessed in hospital as requiring long term care were at home four months later, suggesting that they required more time before relinquishing their homes and moving into care.

Some older patients in hospital never fully recover their functional level and require long term care. The transition to long term care is traumatic for patients and families and compounded by elderly patients being stigmatised as "bed blockers." Transitional care units can provide a useful substitution for hospital care for frail elderly patients awaiting a long term care bed.

What is already known on this topic

Elderly patients in hospital who are waiting for a residential care bed are often stigmatised as "bed blockers," and transitional care units where patients wait and receive low levels of treatment are often proposed as alternative solutions

Such units are controversial and evidence concerning their effectiveness is limited

Staffing levels, the safety records of such care, and the real hospital substitution effect are issues of concern

What this study adds

An off-site transitional care unit can reduce length of stay in hospital without adverse effects for patients but at the cost of an overall increase in the time it takes to reach a long term facility

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