Resource usage and outcomes in a facilitated discharge service in Christchurch, New Zealand

Oliver H Menzies, H Carl Hanger

Abstract

Aim To describe the type and level of support provided by a facilitated discharge team to frail older patients discharging from a 113-bed elderly rehabilitation hospital and the outcomes achieved.

Method Prospective data detailing reasons for referral, services provided and retrospective data on outcomes, were obtained to 90 days post discharge on visits to new patients during 21/2/08 to 15/7/08.

Results Seventy-four patients (mean age 82, 58% female) were included. The mean duration of intervention was 19 days with the most common reasons for referral being poor mobility/falls risk, poor cognition, hygiene concerns. The average number of contacts was 6.5. Patients with the highest number of contacts were those referred with patient anxiety/low confidence (7.4), and family concern (8.4). The most common interventions were family contact and management of carer stress, liaison with medical staff. Unplanned readmission (within 90 days) occurred in 32% whereas 12% and 8% were in residential care or had died respectively.

Conclusion Managing the transition from hospital to home for older people requires a large range of interventions, particularly in this highly selected group. Unplanned readmission occurred in a third of this very frail elderly group, yet only 12% needed residential care, suggesting the reasons for readmission could be resolved. Patient or family anxiety resulted in more follow-up visits to patients, and inpatient teams should be mindful of this when planning discharges.

Returning home after a stay in hospital can sometimes be a difficult process for both hospital staff and patients. During an admission, and particularly for patients with longer stays, changes in physical and psychological functioning, as well as social supports may occur which alter the ability of patients to transition home successfully. The older person themselves, their family and also staff may all have their concerns about the potential success of the return home. Various different interventions, both home and hospital based, have been used to maximise the success of discharge. One such intervention is a facilitated or supported discharge (FD) team.

Studies have looked at particular patient groups, including those with hip fractures, stroke, and heart failure. However there has been variable success of the discharge interventions. A 2007 meta-review\(^1\) noted that “Based on 15 high quality systematic reviews, there is some evidence that some interventions, particularly those with educational components and those which combine pre-discharge and post-discharge interventions, may have a positive impact”. Evidence of benefit for (early) supported discharge programmes for stroke patients is established.\(^2\) There are sound reasons...
why FD for frail older people should be effective, but evidence supporting FD is mixed in this group.\cite{3-5,10}

The Princess Margaret Hospital (TPMH) is a 113-bed rehabilitation teaching hospital in Christchurch, New Zealand. A Facilitated Discharge (FD) Service was set up in 2000, initially with the aim of improving discharge processes (including earlier discharge from hospital and greater supports during the transition), preventing early re-admission, and reducing the length of stay in hospital for patients over 65 years of age. The project also aimed to improve communication between primary providers and hospitals. Due to a variety of factors (including changes of staff and funding), the aims of this FD service changed to supporting the transition of frail older patients from our specialist unit to home. In practice, this has meant those very frail patients whose discharge is perceived as “dodgy” or precarious\cite{6} by the inpatient teams at TPMH.

In this outreach FD service, a multidisciplinary team of individuals, mainly nurses, provides comprehensive and coordinated services in the patients home, during the transition to home phase (usually the first 3 weeks). Initially there was funding for part time physiotherapist (PT) and occupational therapist (OT) as well as a nurse. In recent years, the FD has consisted of just nurses and an OT. Expertise from other disciplines such as PT, dieticians and social work were accessed from the wider community team as required. Referral for the service is initiated by inpatient clinical teams for patients undergoing rehabilitation in which there was a question of whether their discharge home would be safe or durable. Patient details and reasons for referral are provided to the service from the inpatient team. Ideally the FD service visited the patient on the ward prior to discharge.

Initially this was a combined service—it included stroke rehabilitation patients as well as general.

The stroke service was later split off into a separate service.\cite{7} The data discussed in this study pertain only to non-stroke patients.

The aims of this study were to describe the type and level of support provided by an outreach Facilitated Discharge Team to frail older patients discharging from a 113-bed elderly rehabilitation hospital together with some of the outcomes achieved.

Methods

The research comprised two parts:

- Prospective data detailing reasons for referral and services provided to patients in the community.
- Retrospective data on outcomes, obtained for up to 90 days post discharge on visits to new patients carried out during the study period.

The study period was 21/2/08 to 15/7/08.

Prospective data was obtained by a survey form which was completed by each of the FD team on each visit to a patient during the survey period. The survey form collected the services which were provided by the FD Team, and who provided them.

Retrospective data was obtained by review of patient’s notes for reasons for referral. The reasons for referral were recorded on the standard referral form to the FD team. The reasons for referral were as given by the inpatient-based multidisciplinary team (MDT).

A database on patient contacts held at TPMH supplied additional visit information on the number of visits, dates, and types of services provided for each patient. Domiciliary status post discharge and
Readmission rates were determined from computerised patient management databases at both Christchurch Public Hospital and TPMH. The FIM™ instrument is routinely used for all patients on discharge from TPMH to quantify the functional abilities of patients. Data was entered into a spreadsheet using Microsoft® Excel™. Data analysis was carried out.

**Results**

88 new patients were seen by the FD service during the study interval. Fourteen patients were excluded (Table 1), leaving 74 included for analysis.

### Table 1. Reasons for exclusion of patients from study

<table>
<thead>
<tr>
<th>Reasons for exclusion</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke patients</td>
<td>5</td>
</tr>
<tr>
<td>Wrongly identified – no inpatient stay, or incorrectly coded</td>
<td>7</td>
</tr>
<tr>
<td>Psychiatric patient</td>
<td>1</td>
</tr>
<tr>
<td>Discharged directly to residential care</td>
<td>1</td>
</tr>
</tbody>
</table>

The average age was 82.4 years (31 Male, 43 Females). The average FIM™ score for this cohort was 93, compared with 103 for all other community discharges from TPMH during the time of this study.

There were 486 patient contact episodes. The types of patient contact episodes, and what percentage they made up of the total contact episodes were:

- Home visit (61%). All home visits were post discharge, many patients requiring more than one.
- Telephone contact (34%).
- Inpatient contact before discharge (5%)—this was mainly to establish rapport with the patient before discharge home.

The mean number of contacts with each patient was 6.5. The mean time to first contact after referral was 2.2 days. The mean time to contact after discharge was 2.3 days. The mean duration of intervention (first visit to last) was 19 days, with a range 1–59 days.

### Table 2. Reason for referral as identified by referring inpatient multidisciplinary team

<table>
<thead>
<tr>
<th>Reason category</th>
<th>N</th>
<th>Individual referral reasons categorised to this reason category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Mobility/Falls risk</td>
<td>17</td>
<td>Falls risk, increased alcohol use, decreased mobility</td>
</tr>
<tr>
<td>Poor cognition</td>
<td>13</td>
<td>Decreased cognition, poor problem solving</td>
</tr>
<tr>
<td>Hygiene Concerns</td>
<td>11</td>
<td>Difficulty with hygiene, incontinence</td>
</tr>
<tr>
<td>Patient Anxiety/Low confidence</td>
<td>5</td>
<td>Patient anxiety about discharge</td>
</tr>
<tr>
<td>Family concern</td>
<td>5</td>
<td>Support to family, family concern regarding safety</td>
</tr>
<tr>
<td>Other – multiple reasons</td>
<td>23</td>
<td>Meds check or monitoring, ensure services commenced, carer stress and/or ability to cope with patient, BSL monitoring, decreased endurance, limited social supports</td>
</tr>
<tr>
<td>Uncertain</td>
<td>19</td>
<td>Documentation not available or found</td>
</tr>
</tbody>
</table>

*Note: Total of 94 as more than 1 referral reason could be specified for a single patient.*
Was there a particular reason for referral which resulted in a higher resource use?—There was a trend at 90% confidence level (Figure 1) to higher resource use (i.e. more visits or telephone contact) for patients who were referred for the reasons of patient anxiety or low confidence, and family concern. There was a trend to lower resource use when the referral reason was poor mobility or falls risk.

Figure 1. Resource usage (patient contacts) for different referral reasons (CI=confidence interval)

Likelihood of unplanned readmission within 90 days post discharge—The frequency of re-admission to either Christchurch Hospital or the Princess Margaret Hospital within 90 days of discharge was 32% (24 out of 74 patients). This is higher than other patients discharged from TPMH to home (24.6%), but this figure includes both planned and unplanned readmissions).

Of the 24 that were readmitted there was a trend to higher readmission rates amongst those patients in which there was family concern (Figure 2).
Change in domicile and death—The number of patients that changed from home to residential care at 30 days was 4 out of 74 (5%) and at 90 days was 9 out of 74 (12%). The number of patients who died (this research excludes palliative care patients) was 2 (3%), and 6 (8%) at 30 and 90 days respectively. One of the patients who died by 90 days had been in residential care at 30 days.

Was there a particular reason category that resulted in a higher rate of change of domiciliary status or death?—Despite greater resource use and/or higher risk of readmission, there were no deaths or admissions to residential care in either patients who were referred because of patient anxiety or low confidence, or referred because of family concern (Figure 3).
Figure 3. Frequency of change of domiciliary status or death by 90 days

Note: The percentage of patients dying or entering residential care at 90 days was 20%.

Interventions supplied—The interventions supplied were part of the smaller prospective survey component of the study, and so have smaller numbers (33). They are mainly nursing interventions, with limited allied health input (Table 3). Assessment of risk / monitoring of Instrumental Activities of Daily Living was considered a universal intervention.

Table 3. Interventions supplied to patients in their homes

<table>
<thead>
<tr>
<th>Intervention category</th>
<th>Patients receiving</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family contact, education, management of carer stress</td>
<td>97%</td>
<td></td>
</tr>
<tr>
<td>Doctor liaison regarding management</td>
<td>91%</td>
<td>General Practitioner or hospital doctor</td>
</tr>
<tr>
<td>Review of medication management</td>
<td>88%</td>
<td>Diabetes, pain, compliance, administration check, ensuring correct medications</td>
</tr>
<tr>
<td>Service coordination, facilitate change in domiciliary status</td>
<td>82%</td>
<td></td>
</tr>
<tr>
<td>Management of bowels or urine</td>
<td>70%</td>
<td>Constipation, Urinary Tract Infection, Indwelling Urinary Catheters, stomas (filling service provision gap)</td>
</tr>
<tr>
<td>Other</td>
<td>10%</td>
<td>Management of anxiety or depression, pressure areas</td>
</tr>
</tbody>
</table>
Discussion

There were a large variety of different interventions supplied to patients in their own homes. Poor mobility or falls risk and poor cognition were the most common single reasons for referral to the FD service. Patient anxiety / low confidence, and family concern referral reasons had a trend to needing more resources than the average (14% and 29% higher respectively). However, poor mobility or falls risk had a trend to using fewer resources than the average (17% lower).

There was a relatively high unplanned re-admission rate (32%), but the chance of death or residential care was relatively low. FIM™ data indicated that the group in this study were the most frail of an already frail group of patients. Despite this frailty, 80% of patients were alive and in their own homes at 90 days.

If there was family concern, there was a 60% likelihood of readmission within 90 days. Family concern had the highest likelihood of readmission at 90 days. This therefore may be a useful predictor of readmission at the time of discharge.

Interestingly, if there was family concern, this high readmission rate did not subsequently result in either death or admission to residential care. It would appear that these concerns were able to be addressed to enable a more successful subsequent discharge.

Comparisons to other studies—There are a number of studies that have taken different approaches to early discharge. Various terms are used to describe similar interventions. One such approach is ‘hospital at home’. This is a service that provides active treatment by healthcare professionals in a patient’s home for a condition that would otherwise require inpatient care.

A Cochrane review that summarises recent studies, but also includes stroke patients, was published in 2009. This review found that for older people with a mix of conditions there was a significantly increased risk of readmission for those allocated to hospital at home compared with standard inpatient care; Hazard Ratio (HR) 1.57 at 3 months, readmission rate 22%. However, significantly fewer were in residential care at one-year follow-up—relative risk 0.69.

A 2005 study in Auckland, New Zealand, which was included in the above review noted significantly higher levels of satisfaction in the hospital at home group, but increased costs. The readmission rate in this study was 31% at 90 days. The FIM™ for this group was 99.5 on entry to the intervention. This compares to our study with a slightly higher readmission rate (32%), but lower FIM™ (93).

A 2003 study by Lim et al in Victoria found that a post acute coordinator (assisting in developing a discharge plan and being involved in post-acute service provision) improved quality of life, and reduced bed utilisation. The unplanned readmission rate within 6 months post discharge was 25%. In comparison to this study, our study showed a higher rate of readmission. This may be because we focused on the most frail of a frail group of patients. The average age of patients in our study was 6 years older than those in the Australian study.
It is difficult to compare our study with others because of the differences in the composition of the post-discharge team and other local factors. Our discharge support program did contain an educational component, but was mainly focused on post-discharge care. Also, this study was not a comparative study between post-discharge care or none, it’s aim rather was to describe the outcomes from our interventions.

This study used a measure of average number of contacts to quantify the level of input supplied to a patient. This is a crude measure, and encompassed all types of contacts—home visits, telephone contact, and inpatient contact before discharge from hospital. Total time spent in contact may have been a more useful measure, however, the time spent on individual contacts was not recorded.

Future research investigating family concern about discharge would be useful, as this was the main factor that showed a trend to significance in the chance of a patient being readmitted. The referral data did not contain sufficient information to make meaningful conclusions about the types of family concerns expressed, and ways to address these. It would also be useful to examine the reasons for readmission in this particular group, to see if there are common problems that could be addressed further prior to discharge.

**Conclusions**

This study is useful to inform the inpatient discharging team of the possible outcome of a referral to a facilitated discharge team. There was a trend for more resource use if a patient or their family was concerned about discharge. However if the family were concerned, although this had a trend to more admissions to hospital, this did not seem to translate into more admissions to residential care.

Geriatric inpatient teams should be reminded by this study that patient and family concerns about discharge are important. In light of this, effort should be made to clarify and address family concerns prior to discharge.

It would be useful for future studies to look at family concern and what could be done to alleviate this, and if this reduced the number of readmissions.

**Competing interests:** None.

**Author information:** Oliver H Menzies, Medical Registrar, Auckland City Hospital, Auckland; H Carl Hanger, Geriatrician, Older Persons Health Specialist Service, The Princess Margaret Hospital, Christchurch

**Acknowledgements:** We thank Decision Support at The Princess Margaret Hospital & Christchurch Hospitals plus the Facilitated Discharge Team at The Princess Margaret Hospital.

**Correspondence:** Dr Oliver Menzies, Medical Registrar, Auckland City Hospital, Auckland, New Zealand. Email: omenzies@xtra.co.nz

**References:**

1. Mistiaen P, Francke AL, Poot E. Interventions aimed at reducing problems in adult patients discharged from hospital to home: a systematic meta-review. BMC Health Serv Res. 2007 Apr 4;7:47