Casemix and rehabilitation: evaluation of an early discharge scheme

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Abstract

This paper presents a case study of an early discharge scheme funded by casemix incentives and discusses limitations of a casemix model of funding whereby hospital inpatient care is funded separately from care in other settings. The POSITIVE Rehabilitation program received 151 patients discharged early from hospital in a twelve-month period. Program evaluation demonstrates a 40.9% drop in the average length of stay of rehabilitation patients and a 42.6% drop in average length of stay for patients with stroke. Other benefits of the program include a high level of patient satisfaction, improved carer support and increased continuity of care. The challenge under the Australian interpretation of a casemix model of funding is ensuring the viability of services that extend across acute hospital, non-acute care, and community and home settings.

Introduction

The POSITIVE rehabilitation team was funded in 1996 for a period of twelve months by the Home Support Scheme, which is administered by Queensland Health Casemix Incentives. POSITIVE is an acronym for Physiotherapy, Occupational, Speech, Integrated Therapy Initiative Very Early Rehabilitation.

The intention was to support the development of community-based services and to encourage hospital efficiencies. There was the incentive that efficiency gains would be used to sustain the developed service in subsequent years. Program goals were to reduce length of stay, improve continuity of care and achieve optimal outcomes for each patient referred.

Models for providing post-acute rehabilitation therapies include hospital outpatient departments, day hospitals, outreach models and domiciliary services. Studies that present stratified randomised trials evaluating different models of care include the Bradford community stroke trial (Young & Forster, 1992) and the DOMINO study (Gladman, Whynes & Lincoln, 1994). The Bradford trial compared day hospital and home physiotherapy and found that home physiotherapy was more effective and resource efficient than day hospital attendance. Gladman et al. (1994) compared domiciliary and hospital-based rehabilitation including physiotherapy and occupational therapy for stroke patients and concluded that outpatient departments were the cheapest care option. Neither study included a speech therapy component, which is peculiar considering the frequent high speech therapy needs of stroke patients. A later analysis of these two studies (Gladman et al. 1995) concluded that home therapy was less costly when all costs including transport were considered. Based on a number of measures, including a Barthel score improvement, they suggest that the intensity of home therapy should be 15 to 20 visits per patient to achieve optimal patient benefits. Bairstow et al. (1997) report on a home-based rehabilitation service (HBRS), which operated concurrently to the POSITIVE program presented here. They boast an estimated 19-day reduction in length of stay, the release of 10 extra beds annually and provide costing information in Australian dollars.

Other published studies that deal with early discharge and allied health have an emphasis on orthopaedic early discharge (Byers & Parker 1992; Burns & Park 1992; Kirkland & Mitchell 1994; Brandis, Murtagh & Solia 1998) and the theoretical effect of casemix funding on therapy services (Griffen 1993; Williams & Shah 1995). The views of the patient and carer, transition from home to hospital, and hospital in the home trials have been well reported (Closs et al. 1995; Gage, Cook & Fryday-Field 1996; Tierney et al. 1994; Widen Holmqvist et al. 1996). The scheme presented here expanded on the concepts presented in the literature. However, it targeted specific rehabilitation groups by diagnosis related groups (DRG) as reported elsewhere (Brandis 1996, Brandis 1998), and utilised a combination of models including outreach, community centre and home-based interventions.

The Gold Coast Hospital is a 500-bed general public hospital with a designated 25-bed general adult rehabilitation unit servicing a district population of approximately 350,000. This hospital has been the pilot site for a number of clinical costing projects, which provide a range of costing and casemix data.

Method

The POSITIVE team employed a fulltime occupational therapist, physiotherapist and therapy assistant and a half-time speech pathologist. Social work was accessed via another program for those patients with specific needs. Patient services included discharge planning, therapy treatment, and community reintegration. A team member attended regular case conferences in the rehabilitation unit to identify suitable patients for the scheme. All patients consenting to be discharged to the POSITIVE program were provided a rehabilitation plan within five days. Using a case management approach, individual goals were documented and the patient's progress assessed against these.

Several therapy groups aimed at promoting maximal use of time were established in the district's community health centre. These groups assisted the development of a friendly and supportive therapeutic environment and included exercise, hand therapy, craft, carer support, memory and language. As the program was intended as an early discharge scheme, therapy was limited to six to eight weeks at which time patients with ongoing requirements were referred to non-government service providers. Upon graduating from the program, individual rehabilitation summaries were sent to the referring consultant, general practitioner, and hospital medical records.

The team was structured on an interdisciplinary model with a separate cost centre that was operationally independent from the large hospital-based departments. Evaluation of the program after one year was by a patient feedback survey, a staff survey, review of patient outcomes, casemix data, and cost-benefit analysis.

Results

In the first twelve months of the project, the team received 151 referrals. The average age of the patients was 67 years with 65% over the age of 65. Twenty two percent of direct therapy treatment time was conducted in the home environment. Activity data are presented in Table 1. The diagnostic groups of referred patients included stroke (55.63%), orthopaedic conditions (19.9%), medical (11.5%), neurology (11.2%) and acquired brain injury (1.3%). The source of referrals was 1.9% from specialist outpatients, 3.3% from accident and emergency, 46.3% from the rehabilitation unit, and 48.3% from the acute wards. Twenty two percent of patients admitted to the rehabilitation unit were discharged early through the scheme.

Table 1: POSITIVE Activity Data, 1996-97

	Occupational Therapist	Physiotherapist	Speech Therapy	TOTAL
Number of referrals	114	108	40	151
Average hours per patient	10.07	8.54	6.73	18.19
Average therapy sessions per patient	8.37	9.29	6.2	16.99

Evaluation

Patient feedback survey

On discharge from the scheme, all patients were asked to complete a written questionnaire. This was for internal quality assurance and not intended for statistical analysis, and therefore has a number of limitations. Results are shown in Table 2, using a five-point ordinal scale where 1 was the lowest score and 5 was the highest score.

Table 2: patient feedback survey

Question I felt ...	N/A	1 Poor (very difficult)	2	3	4	5 Excellent (very easy)
My involvement in the planning of my program was:					16%	84%
The education and care given to me and my family was:						100%
The involvement of my spouse/carer in my rehabilitation program was:	37%				10%	53%
Travelling to and from therapy was:	32%				10%	58%
The surroundings at the community centre were:	37%			5%	5%	53%
I would have liked to have had therapy: (1 is less often, 5 is more often)	5%			74%	16%	5%
After therapy I am able to manage at home:					37%	63%

Staff survey

The 58 staff who referred to the program were surveyed with twenty-six respondents returning forms. These included five clinical nurses (100% response rate), fourteen allied health (50% response rate), and seven medical practitioners (29% response rate). Questions and responses are shown in Table 3.

Table 3: staff survey responses

Question	Yes	No	Neither
Did you feel the team members were easy to contact?	85%	15%	
Were you given adequate feedback on patients referred?	54%	42%	4%
Were you clear that the admission criteria were early discharge, intensive rehabilitation and appropriate for community therapy?	69%	21%	
Was it easy to select appropriate patients in the target groups?	85%	15%	
Do you feel the POSITIVE service was valuable for your patients?	81%	12%	7%

Patient outcomes

An attempt was made to evaluate individual patient outcomes by use of standardised instruments. The Modified Barthel Index (Williams and Shah 1995) the Functional Index Measure (Lee et al. 1994) and Resource Utilisation Groups (Carpenter, Main, & Turner 1995) were considered but each had limitations. These related to difficulties assessing functional return across the environments of acute care, rehabilitation unit, community centre and home. The main shortcoming was the inability of any of these tools to adequately identify small gains in function (for

example improved hand function or improved articulation), or to recognise lifestyle or instrumental daily living skills. It is for this reason that an individual goal achievement approach was used. A similar finding and approach has been reported by Bairstow et al. (1997). The POSITIVE program provided therapy for the acute period of 8 weeks and Table 4 shows discharge outcomes.

Table 4: discharge outcome of patients referred to POSITIVE first year

Discharge Outcome	Number of Patients	Percentage
No further services required	63	41.7%
Ongoing therapy other agencies	30	19.90%
Domiciliary nurses	21	13.9%
Day respite	11	7.28%
Returned to work	6	4%
No service required/possible - assessment only	5	3.3%
Refused treatment once home	4	2.65%
Hospital outpatient therapy	4	2.65%
Commonwealth Rehabilitation Service	4	2.65%
Readmitted	2	1.2%
Deceased	1	66%

Casemix data

As a casemix-funded project within the scope of the Queensland Health Casemix model at the time (1996-97), the team had the goal of reducing hospital stay. The model assumed that the hospital is the centre of all care, therefore any reduction in hospital stay would generate significant cost savings and or greater efficiencies in the health system. For the purpose of evaluation, we compared the average length of stay for the target groups before and after the commencement of the project. The introduction of the POSITIVE program was accompanied by a drop in length of stay for rehabilitation patients by 40.9% from 25.7 days in 1995/96 to 15.18 days in 1996/1997, while the state average remained constant at 15.5 days. A decrease of 42.6% in the average length of stay in DRG 34 cerebrovascular accident was observed for the twelve months that the scheme operated. This dropped from 21.20 days to 12.16 days having been constant at between 21-23 days for the five previous years that casemix codes had been recorded. The annual number of admissions had been similar ranging from 241 to 266, and coding systems remained consistent.

Cost-benefit analysis

The reduction in length of stay of DRG 34 represents a theoretical saving of 1,874 bed days, with efficiencies in the rehabilitation unit estimated to have released a further 1,452 bed days. As a site for clinical costing, costs of rehabilitation patients were recorded as $357 per hospital bed day. This represents a theoretical saving in excess of one million dollars, or the equivalent of nine hospital beds. The total budget of the program for the year (including rent, salaries and travel costs) was $149,111. Each POSITIVE patient cost an average of $987, with an average cost of $58.13 per therapy session. Before the program commenced the average cost of inpatient care (not including outpatient therapies) for DRG 34 was $7,568. At the end of the program, this was $4,467 including the POSITIVE component of care.

Discussion

When we asked the patients what were the benefits of being discharged home through the POSITIVE program, none of them mentioned saving the hospital money. The consistent response was a high level of satisfaction with early return to their home environment and with therapy provided to suit individual needs. The development of a community-based centre improved physical access for the client group and was perceived as a friendlier, less institutionalised environment than the hospital. As the therapists met the patient while in hospital, been involved in discharge planning including home visits and modifications, there was improved continuity of care and improved follow up. Carer support was an unanticipated positive outcome identified during the evaluation process. Several carers preferred the transitional model which gently eased the patient home, while providing education and support at the same time. Carers were encouraged to assist in treatment in the privacy and comfort of their home or at group sessions. A carer support group was established while patients attended group sessions. Several commented that the hospital departments although friendly, were not as amenable to carer involvement and establishing supportive networks. Unlike hospital therapy services, the POSITIVE personnel remained unchanged, and this was also seen as preferable for continuity of care. This aspect is hard to value, but of significant benefit to longer-term patients with complex needs.

The survey of the referring staff indicated that 42% would have preferred more feedback. Several staff commented that although the patient was no longer under their care, they were interested in how these people had progressed once discharged. A shortcoming of early discharge from the health professionals perspective is the increasing focus on acute care, and the loss of the personal satisfaction derived from longer-term involvement with the patient. More research is suggested on this aspect.

At eight weeks, 25% of patients still required ongoing therapy. Only two patients were readmitted and this was for medical reasons. These findings indicate that early discharge using a range of service settings is suitable for 75% of the target group. Prior to the program (and indeed after its closure), these people remained in hospital to receive follow-up via hospital-based outpatients. Speech pathology was the most commonly required continued service due the longer-term nature of speech therapy programs. Analysis of staff feedback also indicated that this group of professionals were less satisfied with the operation of the program.

Measuring functional outcomes was not achieved due to the limitations of standardised assessments. None are sensitive enough to pick up minor variations of improved functioning across a number of parameters in different service settings. The therapists observed that patient satisfaction and motivation was strongly related to the patient formulating and achieving their set goals. For example, one patient wanted to be able to make a sandwich for herself, and was ecstatic when she achieved this as this meant she was less reliant on community supports. While both the DOMINO and Bradford trials report using Barthel assessments, a client-centred and goal-oriented approach became evident as the preferred method to record individual outcomes.

The HBRS (Bairstow et al. 1998) reports an average marginal costing of $67 per day. Using their methodology, the POSITIVE program had a marginal cost of $45 per day. They also report an inpatient cost of $630 from their hospitals annual report. In the absence of clinical costing systems, one would question the reliability of this estimate for rehabilitation patients. Other differences in efficiency may be attributable to different staff mix and State awards, the inclusion of group interventions in a community-based centre rather than home-based treatment only, and differences in geographical distances. Comparison of throughput shows POSITIVE saw an average of 12.58 patients per month, whereas HBRS reports 7.52 patients per month. The reporting on DRG data would allow a more reliable analysis.

While the further categorisation of rehabilitation patients into functional groups has progressed in Australia, the focus remains on the patient occupying a hospital bed. The recent study by Eagar et al. (1997) describes a method of coding sub- and non-acute patient (SNAP) episodes in hospital but does not include post acute needs in its scope. This additional classification divides what was previously one acute episode into several that may include an acute admission, a SNAP component, and often another acute or SNAP episode. This further fragments the episode of care and has resulted in an added administrative burden to ensure that all changes of

admission status are captured. The episode of care for rehabilitation patients does not finish upon discharge and if a continuum of care is to be achieved, then there must be continuity of reimbursement. Funding models need to remunerate care of the patient that crosses boundaries between acute, subacute, non-acute and ambulatory care irrespective of service setting (Price, 1994). The shortcoming of the casemix model at the time was that there were no incentives to provide community access to rehabilitation therapies. If the community centre visits and domiciliary visits were recognised as ambulatory occasions of service, the program would in theory have generated $76,950 under the casemix model for Queensland Health at the time. By improving access to therapy in the home or a community-based centre, we forgo an outpatient encounter.

A per diem payment for rehabilitation inpatient services provides little incentive for improved bed management strategies, and no reward for providing more economical community options. This method of reimbursement encourages high bed occupancy rates with the potential movement of admission and discharge criteria to and from rehabilitation units according to service demand to ensure beds are filled. In effect this could result in unnecessary hospital stay and inefficient use of resources. Expanded DRGs are one solution to the imbalance of funding, but significant work is still required in this area. Unfortunately changes in clinical practice have preceded the development of appropriate assessment and funding models supporting the philosophies of transitional and continuity of care, early discharge and client focus.

The POSITIVE rehabilitation team experience revealed that while we could value add in an early discharge program, decision makers were unprepared to sacrifice resources to ensure long term viability of the initiative. It was hypothesised that the program had assisted the freeing of beds to be used for other patients and had allowed a more efficient use of services. In reality, inexpensive non-acute bed days were replaced with expensive acute bed days hence total hospital costs increased. The only way to release resources was to close beds and transfer funds from acute care to the new service. In an area of high demand, this was politically unacceptable and POSITIVE closed when the original grant money had been spent.

The project did not use a formal research design because the service agreement specified that successful goal achievement would ensure long-term viability. Twelve months after this closure, the data have been revisited. The length of stay for DRG 34 is difficult to compare as coding groups have changed, and transfer to rehabilitation is accompanied by a change in episode of care into a designated SNAP category. Of interest is that the length of stay for the rehabilitation unit is back to 22.55 days, and all follow-up therapy is provided via hospital outpatients.

Conclusion

The POSITIVE case study presented here was successful in reducing length of hospital stay for stroke and rehabilitation patients and highlights a number of limitations with funding models for rehabilitation patients. It is concluded that a range of service delivery options including centre-based and home-based models will provide the optimal mix of care to meet the needs of the patients in an environment of cost containment. If a continuum of care is to be achieved, then there must be continuity of reimbursement that crosses the boundaries between hospital and home and improved ways of recognising and rewarding functional outcomes. A more equitable funding model would ensure that such initiatives are not short lived.

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