

The Allied Health BONE Team: An interdisciplinary approach to orthopaedic early discharge and admission prevention

SUSAN BRANDIS, SHELLEY MURTAGH AND ROBYN SOLIA

Susan Brandis is Director of Occupational Therapy Services and Project Manager, Allied Health BONE Team, Gold Coast District Health Service. Shelley Murtagh is the Senior Occupational Therapist with the Team. Robyn Solia is the Senior Physiotherapist with the Team.

Abstract

This paper presents the conceptual framework, activities and outcomes of the Allied Health BONE (Best Orthopaedic New Enterprise) Team, an early discharge incentive at the Gold Coast Hospital. The clinical team of a physiotherapist, occupational therapist and social worker provided services within an interdisciplinary model of care with the aim of reducing the length of stay of acute adult orthopaedic patients. The team provided intervention in the community, the accident and emergency department, pre-admission clinic and orthopaedic wards to patients with hip and knee replacements, back pain and upper femoral fractures. This paper reports data from the first six months of the project, demonstrating success in improving the continuity of care provided to orthopaedic patients and reducing the length of stay in target groups by 24%.

Introduction

The literature documents many examples of improved efficiency in the management of orthopaedic patients by involving teams of allied health professionals, nursing and medical staff (Brown 1990; Burns & Park 1992; Byers & Parker 1992; Currie et al. 1994; Kirkland & Mitchell 1994; Street, Hill & Gray 1994). Sikorski, Davies and Senior (1985) reported a rapid transit system for patients with fractures of proximal femur and concluded that, although there

were major economic gains to be achieved by early discharge, the main benefits were medical and social. In 1986 Lord and Sinnett presented the high cost implications of an ageing Australian population and projected increasing bed use by people with femoral fractures. They concluded that slow-stream rehabilitation beds and early discharge were a solution. All of these studies give particular interest to supported discharge for people with upper femoral fractures and demonstrate good clinical outcomes and positive reductions in hospital length of stay.

Other studies have demonstrated the usefulness of pre-admission measures and post-discharge follow-up of patients booked for elective joint replacement surgery in promoting efficiencies and increasing continuity of care and quality outcomes (Orr 1990; Turner & Whitten 1992; Erickson & Perkins 1994; Spalding 1995). Many of the studies to date have had a narrow focus (for example, targeting patients with hip fractures only) and have been preliminary programs for trial (Burns & Park 1992; Byers & Parker 1992; Kirkland & Mitchell 1994; Street, Hill & Gray 1994).

A review of the literature indicates that there is nothing new about orthopaedic early discharge. However, while earlier studies have proven the effect of length of stay reductions in specific target groups, there is limited reporting of the use of an interdisciplinary approach that allows continuity of care from hospital to community.

The Allied Health BONE Team described in this paper has had the opportunity to expand on the concepts presented thus far in the literature. In addition, it has focused on a broader orthopaedic target group and has included activities to prevent admission to hospital from the accident and emergency department within a casemix-funded environment.

The Gold Coast Hospital is a 500-bed general hospital servicing a district population of approximately 350 000 people in south-east Queensland. The Allied Health BONE Team was funded through the Home Support Scheme under the auspices of the Casemix Development and Implementation Unit, Queensland Health, for 12 months. The intention of this scheme was to support the development of community-based services to encourage efficiencies in the hospital system. Projects funded were not intended to constitute research but, rather, services were to be developed on accepted regimes of treatment.

Conceptual framework

Casemix is a method of funding for clinical activity that aims to improve the efficiency and effectiveness of health resources. Casemix classification groups health care products on the basis of clinical similarity and homogeneous use of resources into diagnosis related groups (DRGs). Clinical costing allows the calculation of the cost of a particular DRG. One of the parameters included in this cost is the number of hospital bed-days or average length of stay of each patient. Although a DRG is assigned on discharge, it is easy to predict to what group elective orthopaedic patients will be assigned and to specifically target these. Given that the fixed costs of a hip replacement, for example, include such things as the hip prosthesis, theatre costs and post-operative nursing care, two areas where allied health interventions can effect savings are in the costs related to length of stay and in bed management by preventing hospital admission.

The original proposal for the Allied Health BONE Team identified long lengths of stay in orthopaedic DRGs, particularly in the groups of joint replacements, upper femoral fractures and back pain. Before the project commenced, the length of stay for orthopaedic patients at the Gold Coast Hospital was 6.15 days compared to the Queensland State average of 4.97 days. Issues that may have contributed to a long length of stay included an absence of allied health input in the pre-operative stage of elective surgery, and limited flexibility and resources required to address the immediate and short-term patient needs that exist at the hospital/community interface. Funding was granted to establish the Allied Health BONE Team, with the aim of targeting particular DRGs and providing early discharge services to patients admitted under an orthopaedic surgeon. This was a further refinement of the concepts put forward in an earlier paper by Brandis (1996).

Griffin (1996) has described the differences between multidisciplinary and interdisciplinary team structures. In a multidisciplinary team, the client is usually seen individually by a number of health professionals, with each profession having their own treatment plan and set of goals. In an interdisciplinary team, goals are set collaboratively and assessment and treatment may be done co-jointly. There is often no designated leader or senior and this gives team members greater autonomy to explore ways of solving problems. The interdisciplinary team depends a lot on the initiative and creativity of the worker, while the multidisciplinary team is restricted by rules and established professional boundaries. The concept of teams is well-known to most health workers and most discharge planning requires the input of more than one professional group, so a team approach to discharge planning is an extension of accepted practice. Burns and Park (1992) and Erikson and Perkins (1994) have reported the

successful implementation of an interdisciplinary model in managing elderly orthopaedic patients.

The Allied Health BONE Team was established as an interdisciplinary team, operationally accountable to the project manager, but professionally accountable to the respective professional heads. Clinical decisions were made by collaboration with existing hospital health professionals, including nursing and medical staff at various contact points through the organisation.

The Australian Council on Healthcare Standards (1996) defines continuum of care as:

the cycle of care incorporating access, entry, assessment, care planning, implementation of care, evaluation, separation and community management.

One risk of per case funding is that patients are discharged back into the community with little or no follow-up and with the risk of readmission and poor clinical outcome. One of the aims of the Allied Health BONE Team was to improve the continuity of care to make allied health services accessible to the patient at all stages of the care cycle. This meant access at pre-admission, in the accident and emergency department, in the hospital ward, and in the community.

Activities

The team employed an occupational therapist, physiotherapist, part-time social worker (.6) and a part-time administrative officer. Services were designed to facilitate early discharge and prevent readmission of orthopaedic patients. The team also had the goal of preventing admission to hospital so as to better manage available beds and reduce waiting times. This improved continuity of care and enhanced the integration of hospital and community-based services. The patients were divided into four target groups – hip and knee replacements, back pain, upper femoral fractures, and other orthopaedics (including orthogeriatrics and falls). Those patients with acute medical or psychiatric conditions were excluded.

Areas of service provision

Anti-admission activities

The Allied Health BONE Team provided on-call services to the Gold Coast Hospital accident and emergency department. This department consists of a 20-bed outpatient emergency area and a 10-bed observation ward for short-stay admissions of less than 36 hours. Immediate assessment and treatment in the observation ward was provided for those patients who required physiotherapy or

occupational therapy intervention to ensure safe discharge. This included patients unable to mobilise due to pain or injury, with multiple presentations due to falls, or with an injury impeding functional independence and safety. The social worker addressed carer and community support issues and all team members provided follow-up as required.

Pre-admission activities

The team reviewed all public patients booked for hip or knee replacement surgery. With medical approval, they accessed referrals from the hospital operation bookings list six weeks before surgery. Physiotherapy interventions included the prescription of gentle home exercise, strengthening programs and hydrotherapy as appropriate.

The occupational therapist and social worker conducted consultations at the pre-admission clinic two weeks before surgery when the patient attended for medical and nursing assessments. Occupational therapy interventions included a review of activities of daily living, and pre-operative home visiting. This allowed the timely organisation of equipment and home modifications. Post-operative movement precautions were discussed and an educational booklet provided. The social worker reviewed existing social circumstances and support networks. Patients were informed of community services available and were encouraged to plan discharge activities before admission.

Early discharge and post-acute community follow-up

A team member attended the weekly orthopaedic ward discharge planning meeting to report on patients seen pre-admission, and to identify patients requiring pre-discharge and post-acute follow-up. The team did not conduct any therapy in the ward. High-risk patients could be transported home by a team member at discharge, with the provision that the patient was able to be returned to the hospital if they were assessed as unsafe in the home.

An equipment loan pool containing mobility aids and assistive devices was established. In the first six months of activity, home visiting represented a major portion of community follow-up, with 71% of all patients referred receiving home visiting services. This allowed for the identification and resolution of immediate post-discharge problems such as environmental risk factors, and a review of the patient's ability to cope both physically and functionally. Regular reassessment to progress functional status in the home and monitoring over the phone was also provided. The team social worker provided ongoing intervention to address psychosocial and carer support issues.

Community follow-up was available for eight weeks, with referral to other community agencies after this time.

Results

In the first six months of the project, the team received 222 referrals. Home visiting interventions were provided to 158 of these patients, with 406 occasions of service being conducted in the home. Summary data are presented in Table 1.

Table 1: Number of referrals and occasions of service in the first six months

	Occupational therapy	Physiotherapy	Social work ¹	Total
Number of patients seen				222
Percentage of referrals	79	76	53	
Occasions of service	439	372	187	998
Therapy hours	523	437	148	1108
Home visits	176	192	38	406
Hours per patient	2.95	2.59	1.26	4.99
Occasions of service per patient	2.48	2.58	1.6	4.5

Note:

1. Social worker = .6 full-time equivalent.

Of the 222 patients referred to the team, 89 (40%) had joint replacements, 49 (22%) were referred with back pain, 64 (29%) were people with other orthopaedic conditions, and 20 (9%) had upper femoral fractures. Ninety per cent of the group classified as 'other orthopaedic conditions' were aged over 65, while 73% were patients whose injury was the result of a fall. More detail of this group is presented in Table 2.

The source of all referrals was 78 from the pre-admission clinic, 76 from inpatient wards, 60 from the accident and emergency department, and 8 from other sources (for example, specialist outpatients). Of the 60 referrals from the accident and emergency department, 50% were back conditions, while the remainder were other orthopaedic conditions.

Table 2: Diagnostic categories and age of other orthopaedic group

Diagnosis	Age <65	Age >65	Total patients
Ankle fractures	1	9	10
Fractured humerus		9	9
Other lower limb orthopaedic diagnosis	2	5	7
Pelvic fractures		7	7
Other lower limb fractures	2	3	5
Soft tissue injury lower limb		3	3
Other upper limb fractures		3	3
Soft tissue injury upper limb		3	3
Ribs fracture/pain		3	3
Other upper limb orthopaedic diagnosis		3	3
Multi trauma	1	1	2
Multiple medical/back pain		1	1
Total	6	58	64

Conclusions

As a casemix-funded project, the team had a number of performance indicators. The outcomes were evaluated by comparing the average length of stay for the target groups before and after the commencement of the project and are presented in Table 3. Length of stay reductions were demonstrated in all targeted DRGs.

Table 3: Reduction in average length of stay in target groups

Target group	1995–96 average length of stay	96 q1, q2 average length of stay	Percentage change
Knee replacements	11.32	8.7	↓ 23.0
Upper femoral fractures	17.62	11.92	↓ 32.0
Back pain	4.62	3.82	↓ 17.0
Hip replacements	14.6	12.6	↓ 13.7
All orthopaedics	6.15	4.67	↓ 24.0

The reduction in length of stay for all orthopaedics by 24% represents a savings of 3005 bed-days, which has an estimated dollar value of \$1 081 800 when calculated at \$360 a day. The estimated saving per diagnostic group is shown in Table 4. The cost of the team for the six-month period, including rent and the establishment of the equipment pool was \$66 725. The cost of the team per patient seen was estimated to be \$300, with a cost of \$60.22 per occasion of service. The cost of each occasion of service included travel and support costs.

Table 4: Estimated theoretical savings by specific diagnostic groups

Target group	Occupied bed-days 'saved'	Estimated value
Knee replacements	117.4	\$42 264
Upper femoral fractures	1004.34	\$361 562
Back pain	152.66	\$54 957
Hip replacements	169.8	\$61 128
Total	1444.2	\$519 911

Also stated as a performance indicator was the number of orthopaedic patients prevented from hospital admission. In the first six months of the project, 60 patients were assessed in the accident and emergency department, with 55 patients prevented from admission. Three of this group re-presented, two of whom were eventually admitted (one with increasing pain due to a crush fracture, the other having a psychiatric component accompanying back pain). If the 53 patients had been admitted, the dollar value would have been \$89 103 when calculated at an average length of stay of 4.67 days at a cost of \$360 a day.

Anecdotal evidence from the nursing and medical staff suggested that patients were 'better prepared' for surgery. The provision of services in the accident and emergency department, and before admission to hospital and return to the community enabled an improved continuity of care which was not present before the team commenced. Patient and staff surveys were very positive. Patients appreciated the individual attention they received and rated highly the opportunity to be prepared for surgery and to return home sooner. People seen in the accident and emergency department were generally pleased not to be admitted to hospital, and appreciated receiving therapy in their home.

Discussion

Specific outcome measures were set in place to monitor the performance of the Allied Health BONE Team so that the benefits to the hospital could be calculated in terms of financial savings as a result of reduced hospital length of stay. Capturing costs to the community (for example, domiciliary nursing, meals on wheels) was not within the scope of the project. In hindsight, an opportunity was missed by not recording this information. A review of the literature shows a lack of published findings to allow comparison. Quality measures were needed to ensure that costs were not contained at the expense of quality of care. Providing a follow-up service into the community prevented cost-shifting by denying access to allied health services once prevention of admission or early discharge had been achieved. The drive to create efficiency was thus balanced with the need to ensure safe, supported early discharge.

The results shown represent statistics collated during the initial six months of operation. All performance indicators were met, including a 24% reduction in average length of stay across all orthopaedics at the Gold Coast Hospital. Similar results have been published by others (Street, Hill & Gray 1994).

It would be reasonable to attribute some of these gains to other influences working alongside and in conjunction with the team's service. Firstly, without existing community nursing and carer support networks, early discharge would fail in many cases. Secondly, the presence of the team may have improved hospital staff awareness of the possibility of early supported discharge, and prompted hospital staff to explore discharge options more thoroughly. This resulted in a change in the culture of admission and discharge planning of orthopaedic patients, facilitated by improved access to allied health services.

The target group demonstrating the highest reduction in average length of stay was the upper femoral fractures. This has also been demonstrated by others such as Kirkland & Mitchell (1995) who documented a drop in average length of stay from 24.1 days to 10.6 days at Westmead Hospital.

Providing an on-call service to the accident and emergency department prevented the admission of numerous people who previously would have been admitted to hospital. There was a steady increase in cases from this area as the medical staff became more aware of appropriate referrals. Anti-admission activities are currently not recognised for reimbursement under casemix. A DRG is assigned on discharge subsequent to admission, therefore prevention of admission is not rewarded by casemix funding.

One of the original performance indicators included reducing readmission rates. Although a worthy objective in a proposal for funding, it became problematic

to evaluate. For example, a patient seen with back pain may be readmitted for an unrelated condition. This is one of the shortcomings of current clinical coding practices, particularly with an elderly population with multiple medical problems.

The interdisciplinary model worked well. It did present a challenge to existing departmental structures and the team was not as well supported by some areas as would have been expected. Innovations such as the Allied Health BONE Team, by their mere presence, question the way in which health services have been provided traditionally. The service proved to be cost-effective and the staff were very outcome-oriented, customer-focused and conscious of quality. With a discrete budget, there seemed to be a greater accountability for the use of resources.

Although the team was effective in meeting all of its performance indicators and demonstrated a positive cost-benefit analysis, due to financial limitations and a range of other reasons it was not refunded. One of the traps the team faced was that, by reducing length of stay and creating efficiencies, they freed beds to admit other patients in need of acute care. The cost per case decreased, but the overall total expenditure for the hospital increased. Brown (1990) reported a similar finding in the Prince of Wales Hospital study. She concluded that cost-effectiveness needs to be evaluated at a State level and not locally. She suggests that the introduction of such management methods across many hospitals would decrease the need to provide additional beds as the population ages. The Allied Health BONE Team improved efficiencies and standards of care, however, these efficiencies cost the hospital more as activity was not capped. It became apparent that the only way savings could be realised in the short term was through the closure of hospital beds. This was politically unacceptable and the team finished when the original grant was spent. It is unfortunate that the efficiencies gained may be lost in subsequent years. Sufficient evidence has been published over the last 10 years demonstrating the cost-benefits of orthopaedic early discharge, yet incorporation of these methods as standard practice in many Australian hospitals still requires financial support. This needs to be both in the short and longer term if the health system is to cope with the increasing health demands of an ageing population.

In summary, the targeted activities of an interdisciplinary allied health team presented here have demonstrated significant reductions in length of stay of acute orthopaedic patients, improved quality and continuity of care, and the prevention of admission in some cases. It is recommended that this approach be adopted on a State basis, with a long-term view of reducing costs per episode of care and improving the quality of services.

Acknowledgements

We would like to thank Kathy Rutkin, Social Worker, and Sherrill Connelly, Administrative Officer, of the Allied Health BONE Team for their hard work and valued contribution. We are grateful for the cooperation and support of the medical and nursing staff in the pre-admission clinic, accident and emergency and orthopaedics departments, and to Carole Hanchett, Casemix Officer, Gold Coast Hospital, for valued information.

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