

Characteristics of a rural geriatric rehabilitation service

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Abstract

The aim of this article is to examine the role of two geriatric rehabilitation units in a large rural area, and compare them with published data about rehabilitation units in urban settings. We look at the inputs to the units and the measurable outputs, including length of stay, discharge disposition of patients and changes in patient activities of daily living. We show that rehabilitation services provided in the rural environment have lengths of stay and improvements in activities of daily living that are similar to those found in urban areas.

Introduction

The Northern Rivers Area Health Service in northern New South Wales covers a geographical region stretching from Grafton in the south to Tweed Heads in the north, and from Byron Bay in the east to Bonalbo and Urbenville in the west. The total population in the area is about 250 000. The area centres on Lismore (on the banks of the Wilson River) – a town with a population of about 43 800. The north coast of New South Wales is a popular area for retirement. Approximately 17.5% of the population is aged over 65 and 7.2% is aged over 75.

The aim of this article is to examine the role of two geriatric rehabilitation units in this large rural area, and compare them with published data about rehabilitation units in urban settings. We will look at the inputs to the unit (staffing, budgeting and the philosophy of service) and the measurable outputs – especially length of stay, discharge disposition of patients and changes in patient activities of daily living. The study is based upon a retrospective review of the records of all patients admitted to the geriatric rehabilitation units in the first six months of 1998. We hope that by looking at the units in this way, we will provide a benchmark to assess other units and our own future performance.

Description of the services

The major geriatric rehabilitation unit for the region is the 25-bed KG Lawrance Rehabilitation Unit, situated at St Vincent's Hospital, Lismore. The unit director is a geriatrician. A career medical officer is employed 24 hours each week, and a geriatrics registrar is available for community-based work. Patients are reviewed by the medical team once a week and by the full multidisciplinary team on another day each week.

There are approximately 12.6 full-time equivalent nursing staff including the unit manager, a clinical nurse specialist, registered nurses and enrolled nurses. All nursing staff are trained in rehabilitation techniques and are creative in promoting independence and the restoration of function.

There are two physiotherapists and their support staff designated to the rehabilitation unit. There is a fully-equipped gym and a hydrotherapy pool. The Physiotherapy Department uses a range of techniques based upon the motor relearning program of Carr and Shepherd (1990). Most patients have a physiotherapy session every weekday.

Two occupational therapists staff the Occupational Therapy Department with their support staff and there is a dedicated area for occupational therapy. The occupational therapists emphasise functional activities and most patients are seen three or four times a week. Occupational therapy home visits are performed by the therapists attached to the inpatient unit or, when patients live at a distance from the unit, by community occupational therapists. All patients have a Barthel score performed on admission and most have further Barthels when they appear to be improving and before discharge.

Other paramedical units include speech pathology, social work and neuropsychology. These units see patients as they are referred.

The Coraki District Hospital Rehabilitation Unit is situated at Coraki Hospital, about 20 kilometres from Lismore. This unit was originally intended for 'slow-stream' rehabilitation. Patients are mostly admitted to this unit if they do not need specialised rehabilitation services such as hydrotherapy, neuropsychology or speech therapy.

Patients are admitted under the care of the geriatrician. They are seen twice-weekly by the senior registrar and every second week by the geriatrician. There are approximately 10.5 full-time equivalent experienced rehabilitation nursing staff. There is no clerical or management support within the unit.

There are physiotherapy and occupational therapy hours allocated to the rehabilitation unit. There is a large gym area where both activities are carried out. Because of the geographical isolation of this ward, there was a large turnover of paramedical staff during the study period, which is reflected in the less complete documentation of patients treated in this area.

Method of study

All patient records were examined from the Lismore and Coraki rehabilitation units. Records were coded by a registered nurse. The information coded from data taken at admission included date of birth, sex, marital status, country of birth, preferred language, place of usual residence, postcode of usual residence, usual living arrangements, usual support services, referral date and source, admission date, reason for delays in admission, reason for referral, whether the rehabilitation program was interrupted, the major diagnosis, any other diagnoses, the mental status on admission (expressed as a percentage), and the presence of paramedical input.

Barthel scores, the use of mobility aids, the use of benzodiazepenes, major tranquillisers, antidepressants and antiparkinsonian agents, and the requirement for assistance with medications were all scored on admission and discharge. Patients' discharge destination, living arrangements and use of community support agencies were also recorded. Data were analysed using Microsoft Excel.

The impairment codes chosen for this study are those being currently used in the Australian National Sub-Acute and Non-Acute Patient data collection. The Modified Barthel Index was used for the measurement of functional gains. The Modified Barthel Index is the best-known and most popular activities of daily living scale (Gompertz, Pound & Ebrahim 1994, p 233). It has also been validated for use in Australia (Shah, Cooper & Maas 1992) and for use in direct observation, direct interview, telephone interview and by postal questionnaire (Shinar, Gross & Bronstein 1987; Barer & Murphy 1993; Gompertz, Pound & Ebrahim 1994).

Results

During the study period, 169 patients were admitted to the two units: 109 to KG Lawrance and 60 to Coraki. The median age of patients was 78 years (average age 73.8 years) and 55% were female. Although a number of younger patients were treated, 85% of patients were aged 60 or over. The age breakdown is shown in Table 1.

Ethnicity

Only 12 of the 169 patients (7.1%) were born outside Australia and all but one patient stated that English was their preferred language. This is consistent with the cultural homogeneity of the Northern Rivers area, with 89.3% of the local population born in Australia, 4.5% from other English speaking countries and only 3.1% from non-English speaking countries (Northern Rivers Area Health Service 1998).

Three patients treated in the rehabilitation units identified themselves as being of Aboriginal descent (1.8% of admissions). Again this is consistent with the background population of the region where approximately 0.4% of the population aged greater than 65 are of Aboriginal descent (Australian Bureau of Statistics 1998).

Table 1: Age breakdown of population

Age group	Frequency
10–19	1
20–29	4
30–39	5
40–49	4
50–59	4
60–69	33
70–79	50
80–89	55
90+	13

Access to services

Patients are referred to the service from across the region either by general practitioners or after review by the geriatrician or registrar who visit the outer parts of the region at least every two weeks. Access to services for major centres varied from 1.9 admissions per 1000 population aged >60 in Grafton (postcode 2460) to 7.9 admissions per 1000 population aged >60 in Lismore (postcode 2480) during the study period (Figure 1). There were no admissions from the northern parts of the region (postcodes 2484 and above) where rehabilitation services are provided by the Murwillumbah service.

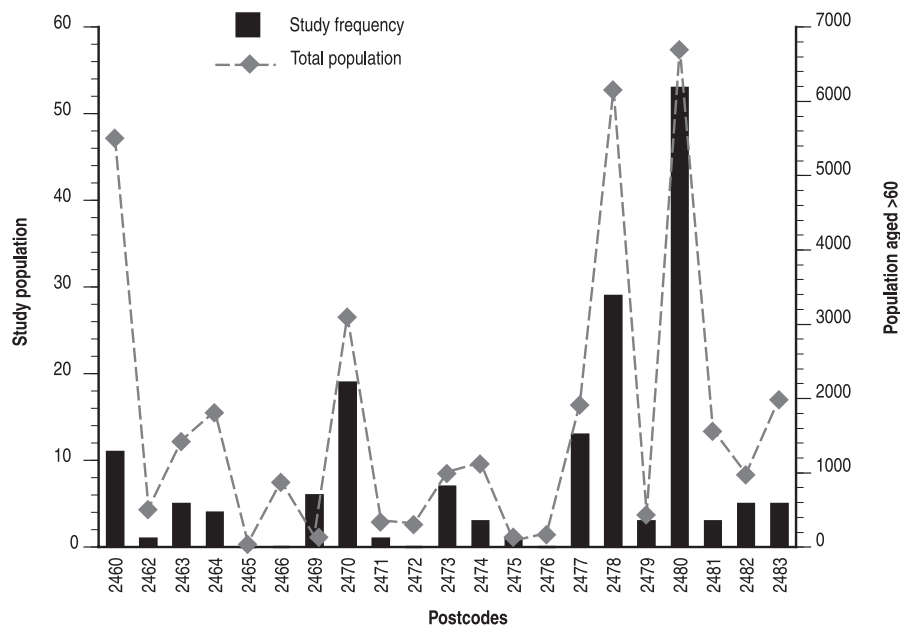


Figure 1: Geographical access to services

Waiting times

For the 126 patients for whom the original referrals were documented, the median waiting time was nine days and the mean was 14 days.

Functional status

Eighty-four per cent of patients entering the units were scored using the Modified Barthel Index. This rates patients on a score of 0–100, with 0 representing complete dependence and 100 representing complete independence. The mean admission Barthel was 64.65 with a standard deviation of 24.98. Seventy-two per cent of patients admitted to the main unit at St Vincent's Hospital had Barthel scores repeated at least once before discharge. (Patients from the main unit who did not have a repeat Barthel tended to have an original Barthel score less than 10 or greater than 80.) The mean improvement in Barthel during the admission in these patients was 14.4 points (sd 16.482). Interestingly, patients admitted for medical assessment did show an improvement in their Barthel ($n = 21$, mean change in Barthel 7.4) although not to the same extent as those admitted for rehabilitation ($n = 57$, mean change in Barthel 17.3). Very few of the patients treated at Coraki Hospital had repeat Barthel scores.

Living conditions at admission and discharge

At the time of admission, 41% of patients lived alone, 11% of patients lived in a residential facility and 88% used mobility aids. Thirty-three per cent of patients living in the community before admission used community support services. At discharge, 29.5% of patients were discharged to a residential facility or hospital and 79% still used mobility aids. Sixty-nine per cent of patients discharged to the community had community support services arranged for them.

Medication use

On admission, 29.5% of patients used benzodiazepenes, 8.8% used major tranquillisers, 14.2% used antidepressants and 10.6% used antiparkinsonian agents. The only significant change on discharge was that an increased proportion of patients were using antidepressants (21.9%, $p = 0.0014$).

Comparisons with urban units – length of stay

The average length of stay in the Lismore units was 31 days. Admissions were categorised by 'reason for referral' as stated in the medical admission. Forty-nine patients were admitted for general assessment and 119 patients were admitted for rehabilitation. No patients were admitted solely for respite or dementia assessment as both of these

roles are performed mainly in the community. The average length of stay for patients admitted for assessment was 24.1 days whereas the average length of stay for patients admitted for rehabilitation was 33.2 days ($p = 0.035$ using two tailed t-test).

By comparison, a 1995 paper by Subramaniam, Gray and Farish looked at characteristics of patients admitted to Bundoora Extended Care Centre in urban Victoria. The mean length of stay was reported as 28 days. This study described length of stay in two ways:

- total length of stay – the total length of time a patient stayed in hospital, and
- actual length of stay – the time from admission until the patient was ready to be discharged.

Unless stated otherwise, the actual lengths of stay are quoted here. Patients were divided into four streams of care at admission – medical/assessment, rehabilitation, emergency respite and extended care. There was a marked difference in length of stay between these groups, with rehabilitation patients staying an average of 42 days whilst respite patients stayed only 12 days.

Subramaniam, Gray and Farish (1995) also looked at length of stay for different diagnostic groups (Table 2). It is apparent that the Bundoora rehabilitation unit deals with a very different population mix than do the Lismore units. In particular, the Lismore units do not deal with patients in the emergency respite and extended care streams used at Bundoora.

Table 2: Length of stay by primary diagnosis

Primary diagnosis	Lismore		Subramaniam, Gray and Farish (1995)	
	Length of stay (days)	percentage of cases	Length of stay total (actual)	percentage of cases
First stroke	40	24.00	56.89 (47.08)	9
Further recent stroke			59.14 (36.85)	1
Old stroke			21.61 (21.21)	10
Organic brain syndrome	94	(1 patient)	22.40 (18.22)	25
Functional psychiatric disorder			36.50 (36.50)	1
Recent fracture neck of femur	26	17.00	32.66 (24.61)	4
Other recent orthopaedic disorder	30	14.00	36.30 (34.54)	8
Arthropathy	17	5.00	22.86 (22.27)	13
Cardiac/respiratory	19	1.00	26.23 (22.25)	10
Neoplastic			26.72 (16.81)	2
Parkinson's disease	19	4.00	25.16 (17.26)	6
Other neurological	31	2.50	25.60 (25.60)	1
Other	29	31.00	20.72 (19.40)	10

Comparisons with urban units – stroke patients

Forty-one patients were admitted for stroke rehabilitation during the study period. Their average age was 72.7 years and 39% were female. Thirty-seven patients were given an initial Barthel score, averaging 64. Twenty-four patients had repeat Barthel scores with an average improvement of 17.6 points. Twelve per cent of patients were admitted from a residential facility and 9.7% of patients were discharged to one.

In this study, the average length of stay for the 41 patients with stroke was 40.1 days (sd 26.47 days). This compares favourably with urban study results. Flicker et al. (1987) recorded an average length of stay in a stroke unit in Sydney of 39 days. Subramaniam, Gray and Farish (1995) found length of stay in the Bundoora Extended Care Centre in Melbourne varied between 47 and 57 days, depending upon how it was calculated. In this study, sixty-five per cent of patients returned to living in non-residential care, similar to results reported by Flicker et al. (1987).

In a 1989 review by Shah and Bain, 258 stroke survivors in Brisbane who were referred for inpatient rehabilitation were identified. The length of rehabilitation averaged 61 days and the mean Barthel score on admission was 44, compared with 78 on discharge. In our study, the average admission Barthel score of stroke patients was 63.8 and on discharge it was 81. The length of stay was shorter than that reported by Shah and Bain, consistent with the fact that admission Barthel scores were higher (indicating that we were treating a less disabled population).

Slow-stream rehabilitation

Slow-stream rehabilitation has been defined as rehabilitation for those who would not normally qualify for a medical rehabilitation program because they do not meet normal admission criteria such as sufficient motivation or sufficient intellectual capacity. The emphasis in slow-stream units is on convalescence more than active rehabilitation, with the aim being to avoid nursing home admission of patients for whom this would otherwise have been necessary.

In a study of a Sydney slow-stream rehabilitation unit, O'Neill, McCarthy and Newton (1987) reported that there was an average length of stay of 81 days and a standard deviation of 62 days. Of 53 patients admitted to the unit, 8 (15%) died, 19 (36%) returned home and 26 (49%) went to nursing homes. Twenty-six per cent of the patients had significant dementia. By contrast, the average length of stay in Coraki Hospital was 25.7 days. Out of 60 admissions in the period, two patients (3%) died, 40% of patients were discharged to residential care facilities or hospital (many of those discharged to hospitals were awaiting residential care) and 55% returned home. Thirty-six per cent of patients had evidence of cognitive loss.

Conclusions

The aim of this study was to examine the practice of two rural rehabilitation units, and to compare our performance against urban areas. We have shown that rehabilitation services provided in the rural environment have similar outcomes to those in other settings, since lengths of stay and improvements in activities of daily living are similar to those found in urban areas. Although the overall length of stay in the Lismore units is longer than that reported from urban areas, this is largely a result of patients not being taken for respite care and of few patients being admitted to the assessment stream.

We have also shown that this unit had some difficulties in providing an equitable distribution of services across the region. The urban centres of Grafton and Maclean are approximately 120 kilometres and 90 kilometres respectively from Lismore, and the area is visited weekly by registrars from the Lismore units. However, our impression is that the discrepancy in service rates between the areas is not only due to unmet demand, but that demand for rehabilitation services is also less in these areas. Part of the reason for this may be that local referral agencies are less aware of services offered from Lismore.

The use of the Coraki unit as a slow-stream rehabilitation unit has evolved into something quite different – an area where patients with less specialised needs for rehabilitation can be treated. We have found the whole concept of slow-stream rehabilitation to be quite difficult to define and suggest it needs further definition.

We conclude that rehabilitation can be effectively and equitably provided in a large rural area using a centralised service. We hope that our results will provide benchmarks against which other units (and our own) will be able to compare future performance.

Acknowledgement

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