



## Implementing a Stroke Rehabilitation Area: the first six months

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### Abstract

**Aims** To describe the development of a stroke rehabilitation area (SRA) for the elderly.

**Methods** Key steps in establishing the SRA are outlined. Using a 'before and after' study design, outcomes, including length of stay (LOS) in hospital and discharge domicile, were measured.

**Results** Difficulties in changing service delivery within a large organisation are outlined. Median LOS in hospital was reduced significantly by 8.0 days, without adversely affecting discharge domicile.

**Conclusions** We have shown that implementing a SRA in a New Zealand health setting is feasible and can significantly reduce LOS.

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Stroke units save lives, reduce dependency and increase the likelihood of the stroke person returning home.<sup>1</sup> Despite this clear literature evidence supporting the introduction of such units or organised stroke care, there have been only minimal changes to the way stroke care is delivered in New Zealand.<sup>2,3</sup> In February 2001, a dedicated stroke rehabilitation ward was established at The Princess Margaret Hospital (TPMH), initially on a six-month trial basis. This paper describes the implementation process and some of the outcomes for the first six months.

### Methods

The Elder Care Canterbury (ECC) integration project was established in 1997 as a joint venture between clinicians in Older Persons Health, Healthlink South Ltd and Canterbury Health Ltd (both are now part of the Canterbury District Health Board) and Christchurch general practitioners (Pegasus Health). Stroke was one of the three lead clinical projects. Integration across different sectors was a major focus and an underpinning philosophy was for services to be designed around the patient, rather than be constrained by existing services. In 1998 the ECC Stroke team recommended an integrated overall stroke service in Christchurch. This included an Acute Stroke Area (ASA) at Christchurch Hospital (CH), a stroke rehabilitation area (SRA) at The Princess Margaret Hospital (TPMH) and a Community based Interdisciplinary Stroke Rehabilitation Team (CISRT), together with improved linkages between the different phases of care. A specialist nurse educator bridging ASA, SRA and CISRT was also proposed. Implementation teams for these three subgroups were set up in 1999, and yet again in 2000. There was no progress until November 2000, when approval for a dedicated SRA was given. The 23-bed unit took over an existing general assessment, treatment and rehabilitation (ATR) ward in Older Person's Health, TPMH, with additional funding of \$96 000 for extra allied health professional staff. This funding was conditional on the development of a clinical pathway for stroke and a six-month trial phase. The key outcome decreed for this trial was LOS in hospital, with no emphasis on improved patient outcomes. Funding was also sought for psychology and dietitian time, but was explicitly declined, as it would not reduce LOS. Approval was also given for an additional 0.5 FTE physiotherapist and a stroke liaison nurse, both at CH. This allowed the following staffing levels (FTE per 23 beds): physiotherapy 2.9, occupational therapy 2.9, speech language therapy 1.4, social work 1.0 and dietitian 0.3 (bolstered to 0.7 later). At the time of writing, these CH positions have just been approved (again) but not yet implemented. No other progress was made on ASA or CISRT. No other changes in service delivery or practice have been made during this time. The SRA was for all stroke patients (65 years and over) who needed inpatient rehabilitation and was opened on 19/2/01. When demand for beds exceeded availability, frail elderly people with stroke and other major comorbidities were admitted to a general ATR ward. The new ward provides a goal-oriented approach, with flexibility as to where the rehabilitation was provided (some home based), together with strong multidisciplinary teamwork and early

communication with and involvement of families/carers. Regular visits to the ward by a Stroke Foundation field officer and strong links with the day hospital helped bridge the difficult transition from hospital to home. A stroke register of all patients admitted to TPMH with an acute stroke (using the WHO definition,<sup>4</sup> but excluding subarachnoid haemorrhage) has been maintained since late 1999. This was used to compare those admitted between 19/2/01-19/8/01 (new cohort includes both SRA and other ATR wards) and those admitted the previous year. Change in function was assessed by Functional Independence Measures (FIM)<sup>5</sup> for the new cohort only.

Mann-Whitney U tests were used for LOS data and categorical data were compared using Chi-squared analysis.

## Results

The demographic characteristics of the groups were comparable (Table 1). During the study, the proportion of transfers to TPMH remained stable at approximately 50% of all strokes admitted to CH. Of the 164 patients who came to TPMH for further rehabilitation, 112 (68%) were admitted to the SRA, with the remainder treated in other ATR wards. LOS at both CH and TPMH fell significantly during the trial (Table 2). Domicile on discharge from hospital and mortality was not significantly altered between the cohorts ( $X^2=9.5, p=0.09$ ). In the new cohort, the mean admission and discharge FIM scores were 65.8 (IQ range 44-87) and 90.1 (IQ range 71-115) respectively.

**Table 1. Demographic characteristics of new and historical cohorts.**

	<b>New Cohort (19/2/01-19/8/01)</b>	<b>Historical Cohort (1/1/00-31/12/00)</b>
N =	164	310
<b>Age (years)</b>		
Mean	79.1	78.0
Median	79	79
Range	58-98	54-96
<b>% Female</b>	64.6	59.0
<b>Source of Admission to TPMH (%)</b>		
Transfer from Christchurch Hospital	83	84
Own Home	8	11
Rest Home	7	5
Transfer from other hospital	2	0
<b>Type of Stroke</b>		
Haemorrhage / Infarct (%)	9 / 91	11 / 89

TPMH = The Princess Margaret Hospital.

## Discussion

We have shown that implementing a dedicated SRA in a New Zealand health setting is not only feasible, but also reduces LOS in hospital. The estimated savings from fewer bed days used would far outweigh the additional staff costs. Whilst these bed days may not actually be saved, existing resources are used more efficiently.

Our positive results have come from only one change in stroke care, namely SRA implementation. Reorganising acute stroke care, with greater emphasis on consistency of investigations and acute management, together with early activation/mobilisation and a

coordinated approach to rehabilitation may have a similar impact.<sup>6</sup> The proposed stroke liaison nurse and additional physiotherapy personnel could have been a positive first step towards achieving this – hopefully this will soon be realised.

**Table 2. Length of stay in hospital for new and historical cohorts.**

	New Cohort (19/2/01-19/8/01) N=164	Historical Cohort (1/1/00-31/12/00) N=310	Difference between medians (95%CI)
<b>LOS CH</b>			
Mean	9.6	12.2	
Median	8.0	11.0	-2.0
IQ range	6-13	7-15	(-3, -1)
Range	1-43	1-63	P<0.001
<b>LOS TPMH</b>			
Mean	29.6	38.1	
Median	23.0	29.0	-6.0
IQ range	14-29	16-53	(-9, -2)
Range	0-108	3-177	P=0.003
<b>Total LOS</b>			
Mean	37.6	48.0	
Median	32.0	39.0	-8.0
IQ range	21-47	25-64	(-12, -3)
Range	1-129	3-181	P=0.003

LOS = length of stay; CH = Christchurch Hospital; TPMH = The Princess Margaret Hospital.

The ideal for both patient and the health service is a co-ordinated stroke service<sup>7</sup> that encompasses acute care, inpatient rehabilitation, facilitated early discharge and domiciliary rehabilitation.<sup>8,9</sup> The ECC Stroke Project had, and still has this vision but we were able to implement only one part (SRA). Possible reasons for our failure to achieve greater change include: a) a small team trying to change several areas simultaneously, b) working in three different locations (CH, TPMH and the community) each with a different focus, staff and funding, c) artificial separation of funding into 'personal health' and 'disability support services', preventing funding following the patient, d) a resistance to change from both managerial and clinical staff, e) inertia to structural change within a large organisation, and f) difficulty accessing 'seeding' grants to demonstrate the effectiveness of the proposals.

The ECC project seemed ideal for integrating all the different phases of stroke care. Despite some of the limitations above, this integration project has been invaluable in achieving change. Two successful elements have been discussions between primary and secondary care staff and keeping the stroke person at the forefront whilst they cross many different sectors during the course of their one illness. As a result, the patient's pathway has begun to be streamlined. Paradoxically, it is this multi-sector, integration approach that nearly caused the project to falter, as no one sector could or would take overall clinical or fiscal responsibility. Savings achieved in one area (e.g. reduced need for institutional care) could not be freed for use in another phase of care (e.g. rehabilitation in the community). This made achieving change very difficult. The formation of district health boards (DHBs) responsible for funding

both primary and secondary care, together with the impending transfer of disability funding (age related) to DHBs will hopefully minimise these problems in the future.

The evidence favouring organised stroke care is unequivocal<sup>1</sup> and was helpful in supporting, but insufficient by itself, to achieve change in service delivery. Indeed, despite this high level evidence<sup>10</sup> it was disconcerting to have managers of varying seniority make repeated requests for a further randomised controlled trial (RCT) to demonstrate effectiveness locally. We considered such a trial unethical. If a drug were shown to have a benefit of the same magnitude as organised stroke care, it would be licensed and used immediately. It is disappointing that reorganising service delivery to achieve similar outcomes was so much harder. Persistence was, however, eventually rewarded.

Several limitations of our study need to be considered. A RCT was considered unethical and therefore we relied on historical controls with their known limitations. There was no change in which patients should be transferred to TPMH and as both cohorts were comparable, selection bias seems unlikely. We were unable to show better (but no worse either) patient outcomes (lower mortality or more returning home). Possible reasons for this include first, the control group was already treated in a highly organised, multi-disciplinary rehabilitation team environment (ATR);<sup>11</sup> second, only two thirds of all stroke patients admitted to TPMH were able to be managed in the SRA, thus diluting the effectiveness; and third, our inability (so far) to reorganise the acute phase of care.

We have shown that implementation of a dedicated SRA is feasible in New Zealand, but it is only a first step in reorganising overall stroke services.<sup>7-10</sup> Implementation of comprehensive, organised stroke services across New Zealand is awaited with interest.

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