Randomized controlled trial of an early discharge rehabilitation service: the Belfast community stroke trial

Donnelly M, Power M, Russell M, Fullerton K

Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Home-based rehabilitation and community care was compared to hospital-based rehabilitation (HBR) care for stroke patients. The community-based multidisciplinary stroke team (CST) service consisted of a team comprising 0.33 coordinator, 1 occupational therapist, 1.5 physiotherapists, 1 speech and language therapist, and 2 rehabilitation assistants. On average, patients received 2.5 home visits per week (each lasting 45 minutes) over a 3-month period. Patients receiving CST care were to be discharged as soon as the liaison therapist had assessed their home and ensured that any necessary aids and equipment were in place. For patients receiving HBR care, discharge and after care were arranged in the usual way by the hospital-based multidisciplinary team. This care comprised inpatient rehabilitation in a stroke unit and follow-up rehabilitation in a day hospital.

Type of intervention
Rehabilitation.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients who had suffered a stroke. Eligible patients had to meet the following criteria: (1) had experienced a stroke during the 4 weeks preceding admission; (2) had the potential to benefit from further rehabilitation; (3) was not a resident in a nursing or residential home; and (4) had no pre-existing physical or mental disability judged to make further rehabilitation inappropriate.

Setting
The study settings were the community and secondary care. The economic study was carried out in Belfast, UK.

Dates to which data relate
The dates during which effectiveness data were collected were not reported. The price year was not reported.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing was undertaken retrospectively on a sub-sample of 38 patients that formed part of the effectiveness sample.

Study sample
A sample size of approximately 110 patients was calculated using a power of 80% at the 5% level of detection for a 2.5 to 3 point difference in the Barthel Index (see the "Analysis of Effectiveness" section below) based on a standard deviation (SD) value of 4. 896 patients with stroke were admitted to hospital over 2 years. Of these, 783 (87%) were not randomised, 205 (23%) patients died in hospital, 571 (64%) were discharged home, 110 (12%) were discharged to a nursing/residential home, 5 (0.6%) patients refused to participate, and a further 10 (1%) were not included for other reasons. 113 patients were included in the study. Of these 113 patients, 54 were included in the HBR group and 59 patients in the early discharge and CST group. The median age was 68 years in the CST group and 71 years in the HBR group.

Study design
The study design was a randomised controlled trial. Randomisation was carried out using a list of computer-generated randomly assigned care options prepared by a statistician and administered solely by a named secretary. No research team member or hospital staff member had access to this list. Groups were followed-up for a period of 12 months. At 12 month follow-up 4 patients had died and 4 were lost to follow-up in the HBR group. In the early discharge and CST group 1 patient had died and seven were lost to follow-up. The research nurses were not involved in providing patient care and were blind at baseline to the group to which a patient was assigned.

Analysis of effectiveness
The analysis of the clinical study was based on treatment completers only. The outcomes used in the analysis were the Barthel Index, the Nottingham ADL measure, the Short-Form 36, quality of life, patient and carer satisfaction and the Carer Strain Index. There were no statistically significant differences between the two groups at baseline in terms of sex or age, and they were also comparable in terms of baseline Barthel Index, Nottingham ADL measure, SF-36 scores, quality of life, patient and carer satisfaction and the Carer Strain Index.

Effectiveness results
The two groups did not differ at 12 months with respect to assessments of dependency, activities of daily life, mobility, and quality of life. Both groups showed a similar improvement in quality of life.

The only statistically significant difference between the two groups was a higher satisfaction with services experienced by CST patients: 42.62 (+/- 11.19) for HBR patients versus 50.00 (+/- 9.66) for CST patients (p=0.001).

Clinical conclusions
There were no statistically significant differences between HBR and CST on the outcome measures at 12 months. However, CST patients experienced greater satisfaction than HBR patients with the services provided.

Measure of benefits used in the economic analysis
The authors did not derive a measure of health benefit. The analysis was therefore a cost-consequences study.

Direct costs
Quantities and costs were not reported separately. The direct costs included were those of the health service which included the following costs: inpatient hospital stay, occupational therapy, physiotherapy, speech therapy, social work, rehabilitation assistants, GP visits, outpatient visits, day hospital visits and meals-on-wheels. Resource use was determined from 38 patients (20 in HBR group and 18 in CST group) for whom information about service use were collected. There were no significant differences between the characteristics of these 38 patients and the rest of the study. Service use was determined through a Service Use Questionnaire completed at 6 and 12 months. Financial accounts were used to cost hospital care, while the Service Use Questionnaire and Unit Costs of Health and Social Care provided the basis for calculating community care. As all costs were incurred over a period of one year, discounting was not relevant, and, appropriately, not performed. The study reported average costs. The price year was not reported.
Statistical analysis of costs
Resource use and costs were treated in a stochastic manner. The authors reported that an unpaired Student t-test was used to test the significance of point estimates. The level of significance was defined at 5%.

Indirect Costs
The indirect costs were not included in the analysis.

Currency
UK pounds sterling ( ).

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
This is a cost-consequences analysis: the reader is referred to the "Effectiveness Results" section above.

Cost results
The mean cost of inpatient care for the CST group was (non-significantly) lower than for the HBR group (7,831 versus 9,864; p=0.737).

Community-based services also cost (non-significantly) more for the HBR group than for the CST group (3,655 versus 3,468; p=0.962).

Overall, the CST group cost less at 12 months than the HBR group (9,680 versus 11,734), although this difference was not statistically significant (p=0.916).

Synthesis of costs and benefits
The costs and benefits were not combined.

Authors' conclusions
The authors concluded that a mixed model of hospital-based and community-based rehabilitation services was likely to lead to increased patient choice and satisfaction, at least for patients with less severe strokes. The authors also concluded that the community stroke service appeared to be cost-effective.

CRD COMMENTARY - Selection of comparators
A justification was given for using hospital-based rehabilitation as the comparator, in that it represented current practice in the authors' setting. You should decide if this is a widely used health intervention in your own setting.

Validity of estimate of measure of effectiveness
The analysis was based on a randomised controlled trial, which was appropriate for the study question, because well-conducted RCTs are considered to be the gold standard study design when comparing health interventions. The authors made appropriate comparisons between the patients included in the study and those excluded. The authors found that patients who were in the study were more likely to score in the moderate to higher-functioning Barthel categories. Study group members were also more likely to be younger (p=0.001) and less likely to be single or widowed (p=0.001). At baseline, patient groups were shown to be comparable in terms of age and sex, and also in terms of key outcomes. The authors appropriately reported the method of randomisation, and reported that the research nurses were blinded to the
patient's assignment group. However, the analysis of the clinical study was based on treatment completers only. Despite this limitation, the authors found that those lost to follow-up did not differ significantly from patients who were followed-up successfully at one year.

Validity of estimate of measure of benefit
The authors did not derive a measure of health benefit. The analysis was therefore, in effect, a cost-consequences study (please see commentary above at “Validity of estimate of measure of effectiveness”).

Validity of estimate of costs
All categories of cost relevant to the perspective adopted were included in the analysis, and all relevant costs for each category appear to have been included in the analysis. Quantities and costs were not reported separately, which will limit the generalisability of the results. Resource use was derived from a sub-sample of 38 patients in the study. Even though actual resource units were not reported, the authors did provide results of the statistical tests of resource use between the two groups. Unit costs were derived from the authors’ settings and from published sources. Appropriate statistical techniques were undertaken to test for statistically significant differences between the two groups. Since all costs were incurred over one year, discounting was unnecessary. The price year was not reported, which will hamper any future inflationary exercises.

Other issues
Despite sparse research regarding the effectiveness of community stroke rehabilitation services, the authors made appropriate comparisons of their findings with those from other studies, which found similar results. The issue of generalisability to other settings was not addressed. The authors do not appear to have presented their results selectively, and their conclusions reflected the scope of the analysis. The authors reported a further limitation to their study, in that the proportion of eligible patients in their study (13%) was very low, and much lower than in other similar studies. The conclusion that CST is more cost-effective than HBR needs to be treated with caution due to the non-significant cost differences found in the study.

Implications of the study
The authors reported that because it would appear that many patients and their carers would like to have the option of receiving some or all of their stroke rehabilitation at home, further research and service development are needed to maximise the match between patient and type of rehabilitation. To detect significant differences in costs of CST and HBR, a larger sample of patients would be needed.

Source of funding
Funding from the Northern Ireland Heart and Stroke Association.

Bibliographic details

PubMedID
14671238

DOI
10.1161/01.STR.0000106911.96026.8F

Other publications of related interest
Early Supported Discharge Trialists. Services for reducing duration of hospital care for acute stroke patients. The Cochrane Database of Systematic Reviews 2005, Issue 2. Art. No.: CD000443, DOI:


**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Caregivers /statistics & numerical data; Community Health Services /economics /utilization; Early Ambulation /methods /statistics & numerical data; Health Resources /utilization; Home Nursing /economics /utilization; Humans; Length of Stay /statistics & numerical data; Northern Ireland; Outcome Assessment (Health Care) /statistics & numerical data; Patient Discharge /statistics & numerical data; Physical Therapy Department, Hospital /economics /utilization; Quality of Life; Rehabilitation Centers /economics /utilization; Stroke /economics /mortality /rehabilitation; Survival Rate

**AccessionNumber**
22004000124

**Date bibliographic record published**
30/04/2005

**Date abstract record published**
30/04/2005