Rehabilitation for community-dwelling people with stroke: home or centre based? A systematic review

Hillier S, Inglis-Jassiem G

CRD summary
The review found home-based rehabilitation to be superior to centre-based rehabilitation for community-based adults following stroke, at least in the short term, regardless of the format used. Limitations in the review, notably the inappropriate pooling of potentially skewed data, mean that the authors’ conclusions do not appear reliable.

Authors’ objectives
To compare the effectiveness of rehabilitation delivered at home versus rehabilitation in an outpatient setting for community-dwelling people with stroke.

Searching
The Cochrane Library, MEDLINE, AMED, EMBASE, AgeLine, CINAHL and PEDro were searched from inception to December 2008. Search terms were reported. Reference lists of retrieved studies were checked. No language restrictions were applied. Unpublished articles were excluded.

Study selection
Randomised controlled trials (RCTs) that compared stroke rehabilitation delivered at home versus in a centre (outpatient clinic or day hospital setting) were eligible for inclusion. Participants were required to be adults at any stage of recovery following any type of stroke. Rehabilitation could be provided by any single or multidisciplinary service (allied health, medical and/or nursing). The primary outcome of interest was functional independence. Secondary outcomes included carer satisfaction and cost effectiveness.

All participants in the included studies were recruited within a year of stroke, in most cases on discharge from hospital-based rehabilitation. Mean age was around 70 years. Study inclusion criteria differed with regard to participant clinical characteristics. Home rehabilitation was usually delivered by a multidisciplinary team. Controls usually received centre-based rehabilitation; in two studies controls received only a follow-up review or no intervention. Rehabilitation varied widely in intensity and duration and ranged from three weeks to eight months in most cases. The only measure of overall functioning that was common to most studies was the (original or modified) Barthel Index. Other outcomes reported in the studies included physical, psychological, functional and service-provision measures, reported post intervention and (in most cases) also at three to 12 months post intervention. Most studies were set in UK.

Two reviewers selected the studies.

Assessment of study quality
Study validity was assessed with the 11-point PEDro scale of eligibility criteria for randomisation, allocation concealment, baseline group comparability, blinding, outcomes measurement, use of intention-to-treat (ITT) analysis, follow-up and statistical reporting. Two reviewers allocated scores and reached agreement by consensus.

Data extraction
Risk ratios (RRs) were calculated for dichotomous outcomes and mean differences (MDs) for continuous outcomes, with 95% confidence intervals (CIs). Most studies reported outcomes as medians and interquartile ranges. Means were assumed to be equivalent to medians. Standard deviations were calculated from interquartile ranges.

Two reviewers extracted the data.

Methods of synthesis
Studies were combined (where possible) to calculate pooled risk ratios and mean differences, with 95% CIs, using a
random-effects model. Heterogeneity was assessed using the $I^2$ statistic. Subgroup analyses were conducted to investigate the impact of single versus multidisciplinary service provision. Other findings were combined in a narrative synthesis.

### Results of the review

Eleven RCTs were included (n=1,711 participants). Mean quality score was 7.9 out of 11 points (range 7 to 9). The main limitation in study quality was lack of blinding.

Compared to controls, Barthel Index scores were significantly higher in the groups treated at home at six to eight weeks post intervention (MD 1.00, 95% CI 0.12 to 1.88; two RCTs, n=245) and at three to six months (MD 4.07, 95% CI 0.81 to 7.34; two RCTs, n=245). There was no statistical heterogeneity ($I^2$=0%).

At six months there was no statistically significant difference between the groups (six RCTs, n=912) and significant heterogeneity ($I^2$=80%). Omission of one RCT (n=327) reduced heterogeneity and resulted in a mean difference that significantly favoured home rehabilitation (MD 1.04, 95% CI 0.05 to 2.04; five RCTs, n=585, $I^2$=59%).

The narrative synthesis reported that seven RCTs found some significant benefit for home-based treatment, four RCTs found no significant difference between the groups and none found significant benefits from centre-based rehabilitation. No adverse events were reported.

Subgroup analyses did not alter the main findings.

### Cost information

Direct costs were found to be better with home care in two of three studies that considered cost effectiveness.

### Authors' conclusions

Home-based rehabilitation was superior to centre-based rehabilitation for community-based adults following stroke, at least in the short term, regardless of the format used.

### CRD commentary

The objectives and inclusion criteria of the review were clear. Relevant sources were searched for studies. There were no date and language restrictions. Exclusion of unpublished studies meant that the review was at risk of publication bias; it did not appear that this was formally assessed. Inclusion of studies without a control group receiving centre-based rehabilitation did not conform with the inclusion criteria and had potential to bias findings in favour of the home-based group. Study processes were performed by two reviewers, which reduced potential for reviewer bias and error. The assumption that median values in primary studies were equivalent to means did not appear justifiable. Use of medians suggested that data were skewed, in which case statistical pooling was inappropriate. Most of the analyses included very few small studies and/or had high levels of heterogeneity. Heterogeneity in the analysis at six months was not adequately addressed, as there was no clinical or methodological rationale for excluding the largest study. Two studies had more than half of the participants missing from analysis without explanation.

Limitations in the review, notably the inappropriate pooling of potentially skewed data, mean that the authors’ conclusions do not appear reliable.

### Implications of the review for practice and research

**Practice:** The authors stated that there should be increased provision of home-based rehabilitation services for community-based adults following stroke, taking cost-effectiveness into account. They suggested that client preference should be used to determine the delivery style of services.

**Research:** The authors stated that high-quality studies were needed to measure costs and benefits for all stakeholders of stroke rehabilitation programmes for adults in the community, particularly regarding the impacts of different health professionals delivering the intervention, the effect of home rehabilitation on carers and the optimum timing and intensity of rehabilitation programmes.
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