# Stroke rehabilitation

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**Abstract**

**The devastating consequences of stroke make rehabilitation a substantial challenge. The benefits of stroke units are well established; the collaborative work of the multidisciplinary team may be one of the most important factors. The evidence for the efficacy of occupational therapy is conflicting and a meta-analysis of community occupational therapy trials is under way. Greater physiotherapy input is associated with a reduction in death and deterioration. One third of all surviving stroke patients require speech and language therapy but most receive less than 45 minutes per week. More rehabilitation research needs to be conducted. In the absence of scientific evidence, expert opinion still has an important part to play in the rehabilitation process.**

**Key words:** stroke, rehabilitation, occupational therapy, physiotherapy, speech and language therapy, stroke units.

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## Introduction

Rehabilitation is defined by the World Health Organization as 'the combined and co-ordinated use of medical, social, educational and vocational measures for training or retraining the individual to the highest level of functional ability'.[1] The devastating consequences of stroke make rehabilitation a substantial challenge.

Stroke rehabilitation is primarily concerned with maximising the functional and cognitive abilities of the patient and resettling them back into the community. The resources required to facilitate this transition should ideally involve a multidisciplinary team of professionals with specialist knowledge in stroke care.[2] Though stroke rehabilitation is one of the most developed of the rehabilitation specialities, stroke services are still haphazard, fragmented and poor,[3,4] with many patients receiving minimal or no rehabilitation input.[5,6] In response to these findings the Royal College of Physicians' Intercollegiate Working Party for Stroke has produced a document entitled *National Clinical Guidelines for Stroke*[7] in an attempt to improve the standard of stroke care at national level. The guidelines are based on current evidence and are updated every six months on the Royal College of Physicians' website, as new evidence becomes available.

The benefits of stroke units are now well established,[2] but it is unclear which components are the catalysts of the stroke unit success story. All hospitals have the right to place a 'Stroke Unit' sign at the entrance to their stroke ward, but unfortunately this action alone does not reduce death and dependency. The collaborative work of the multidisciplinary team, involving regular team meetings, is thought to be one of the most important factors in the daily routine of the successful stroke unit. This work requires the skills and expertise of the nurse, occupational therapist, physiotherapist, speech and language therapist, psychologist, social worker and doctor. Each must understand other team members' roles, share an agreed vocabulary and common values, and work towards common goals.

Stroke rehabilitation practices have been primarily built on clinical experience and largely untested treatments.[8] However, in recent years there has been an exponential rise in experimental rehabilitation trials; therapists are now more analytical in their approach.

## Occupational therapy

Over the last decade, occupational therapists have rigorously evaluated their practice with regard to stroke patients in the community setting.[5,9-14] These trials, in the main, have demon-

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strated that assessment by an occupational therapist who has specialist knowledge in stroke care and who provides a pragmatic package of care, is beneficial in reducing disability following stroke and may also be beneficial in reducing carer strain. However, a recent large multicentre trial of occupational therapy and leisure indicated little benefit.[15] One possible explanation is that, in adhering to the trial protocol, therapists found it difficult to compartmentalise their intervention into activities of daily living (ADL) only or leisure therapy only. This practice is not in keeping with the biopsychosocial model[16] which is frequently adopted by occupational therapists when setting goals and implementing therapeutic practices.

In an attempt to resolve the dilemma of conflicting evidence for the efficacy of occupational therapy, an individual patient data meta-analysis for community occupational therapy trials (funded by the Stroke Association) is now under way. This will help us to understand whether the conflicting evidence is due to methodological differences, patient or therapist characteristics, heterogeneity of therapeutic interventions, or indeed something else. It is hoped that this secondary research will provide a more balanced interpretation and wider endorsement of the results. Analysis is ongoing and results will be available by Spring 2002.

## Physiotherapy

Physiotherapists have also attempted to base their practice on experimental evidence. Langhorne *et al*,[17] in their meta-analysis of physiotherapy after stroke, found that greater physiotherapy input was associated with a reduction in death and deterioration. Kwakkel and colleagues[18] conducted a similar meta-analysis of daily rates of both physiotherapy and occupational therapy; they too found that more frequent therapy was associated with better outcome. However, all authors noted that there were many confounding factors and that further research was required.

Specific aspects of physiotherapy interventions have also been investigated. Three trials have focused on the return of arm function following stroke. Sunderland and colleagues[19] compared routine arm therapy with enhanced arm therapy. Faster arm recovery was noted if some arm movement was present initially, but there was no long-term difference between the groups. Feys *et al*,[20] in a trial conducted in Belgium, found that additional sensory motor stimulation reduced motor impairment but did not improve arm disability. In short, the arm had more movement but this did not translate into functional improvement. Lincoln and colleagues in Nottingham[21] compared routine physiotherapy for the upper limb with routine therapy plus an additional 10 hours from a state-registered physiotherapist or from a trained therapy assistant. Results indicated that patients with severe arm impairment did not improve in any of the three groups. However, in the less severe group, significant benefits were found in those patients treated by the trained assistant, who supervised patients in their repetitive practice of movements.

It would appear then that, for the arm to recover, some arm movement is required before therapy commences and the intervention should involve many task-specific repetitions. These findings obviously have major implications for both patients and therapists. More research involving multiple centres and multiple therapists would help to clarify some of the issues raised in the treatment of the upper limb and would also establish the generalisability of the results.

## Speech and language therapy

One third of all surviving stroke patients will require the services of a speech and language therapist, but the majority of these patients will receive less than 45 minutes per week of such therapy. Speech and language therapists are looking for strategies to make amends for this lack of face-to-face intervention by supplementing therapy with the use of home-based computer technology. Trials are currently examining the efficacy of this intervention.

There has been great debate in the literature concerning whether speech and language therapy is effective, especially in the area of aphasia. There is little doubt that all stroke patients should receive assessment, attention and support from speech and language therapists. A recent systematic review[22] of this area considered 60 trials in detail, from which 12 trials were suitable for the review. The main conclusion was that speech and language therapy for aphasia after stroke has not yet been shown to be either clearly effective or clearly ineffective. A large multicentre trial, with adequate statistical power, is needed.

Stroke rehabilitation goals should be crafted to meet the individual needs of the patient as natural recovery and resettlement back into the community occur. This is a dynamic process. Interventions and approaches used should be evidence-based where possible; where no evidence exists, these areas should be subject to evaluation, leading to the development of clearer guidelines for a particular intervention, or interventions. There is concern at the present time about the speedy commissioning of services, especially with the emergence of Primary Care Trust status. Rehabilitation managers are commissioning services in many areas where little or no evidence exists. These services should be subject to evaluation as they are implemented but this is not happening.

Expert opinion, in the absence of scientific evidence, still has an important part to play in the rehabilitation process; it is imperative that we do not throw away years of clinical judgement, especially in an area as complex as stroke care. Specialist multidisciplinary groups such as SRR (Society for Research in Rehabilitation) and profession-specific bodies including NANOT (National Association of Neurological Occupational Therapists) and ACPIN (Association of Chartered Physiotherapists in Neurology) are essential networks from which future developments in stroke rehabilitation will flourish.

## Conclusion

As illustrated in the examples given above, stroke rehabilitation is a complex intervention, which makes evaluation difficult. A recent Medical Research Council document[23,24] provides an excellent basis from which to take forward a research strategy in stroke rehabilitation. The document emphasises the systematic investigation of techniques and combinations of techniques in

**Key messages**

- To effect stroke rehabilitation, a multidisciplinary team of professionals with specialist knowledge of stroke is ideal
- In recent years there has been an exponential rise in experimental rehabilitation trials
- More frequent occupational therapy and physiotherapy are associated with a better outcome
- Rehabilitation managers are commissioning services in many areas where little or no evidence exists
- More research is needed

exploratory, then definitive, pragmatic randomised controlled trials. If we follow this model, the future of stroke rehabilitation will truly be evidence-based. The journey, it would appear, has already started.

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