

**Final report summary:**

# Targeted arm & hand training at home: Reach-to-grasp

Pilot study for a randomised controlled trial of  
task-specific reach-to-grasp training at home

## Why did we fund this research?

Reaching to grasp objects is the most common arm activity performed in everyday life. So losing this ability can be devastating. In fact, arm weakness is a key indicator of loss of independence in daily living after stroke.

A stroke causes weakness in one arm in about 85% of stroke survivors. For about half of these people, the affected arm isn't working at all when they are discharged from hospital. Over the years, the length of stay in hospital has generally been reduced, with more rehabilitation taking place in stroke survivors' homes. This change has been shown to be highly beneficial for their recovery, but brings new problems, like sticking to treatment exercises performed alone.

Background research has also shown that depending on the task being performed, people change how they use their brains and arm muscles. It is thought that after stroke, task-specific training may be an effective way of recovering movement for important daily activities, such as combing ones hair or zipping up a jacket. But there is still not enough evidence to prove this.

The Reach-to-Grasp study was carried out by researchers at the University of the West of England and took place at three community therapy centres in the UK.

It was a 'feasibility study', where the researchers investigate whether certain things are possible or not before attempting to conduct a larger study to answer their deeper questions. The researchers hoped that the trial could ultimately lead to producing a manual of exercises for therapists to use with stroke survivors at home.

In the study, the researchers compared task-specific 'reach to grasp' training with 'usual care' over a period of six weeks. Most of the stroke survivors who took part (85%) had moderate to severe arm disability. Both the 'reach to grasp' and 'usual care' groups were tested with measures of their arm function, but only the 'reach to grasp' group were given questionnaires asking what difference they felt the treatment had made for them.

Other important factors were also investigated, including assessment for cognitive problems, how many participants would be needed for a larger definitive study and how much the 'reach to grasp' group stuck to the training.

## What did the researchers find?

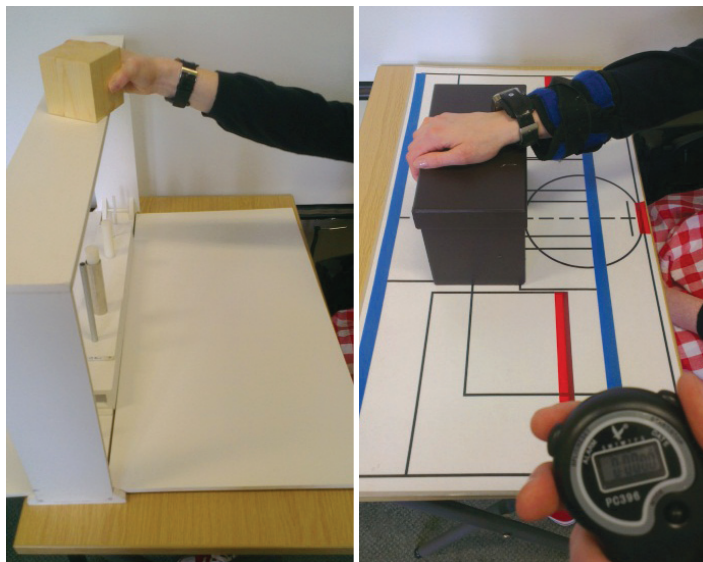
The 'reach to grasp' training was well accepted, with 94% of therapist treatment visits completed, and a lot of exercise achieved in the time given: about 2,000 repetitions of exercise movements were completed for each participant in the 'reach to grasp' group, compared to just 40 repetitions for the 'usual care' group. This is an important measure of practice of the therapy.

In addition, over two thirds of these participants thought that the number of visits with a therapist, and an hour of independent practice a day were acceptable. They also reported increased confidence and morale.

One problematic area was found to be in completing forms. When left to practise on their own, many participants in the 'reach to grasp' group did not keep a full record of their activity.

Participants were also allowed to join up to a year after their stroke, and it was found that they generally decided to join the study after any involvement with early support rehabilitation services had finished. This meant that just over two-thirds of them took part over three months after having their stroke – past the period of most rapid recovery.

The researchers also found that the test they used to measure participants' cognitive impairment was unsuitable, and a more appropriate test which can be used with participants with aphasia (people who have problems understanding and producing language) would need to be found in a subsequent trial.



ARAT

WMFT

Two types of test for arm function were tried in both groups: WMFT (Wolf Motor Function Test) and ARAT (Action Research Arm Test). More participants preferred WMFT because they perceived ARAT to be too hard for them. Nevertheless, ARAT will be used in further study, because it is the only test with which participants showed sustained improvement.

This study also enabled the researchers to determine that they would need many more participants (around 500) for a larger, Randomised Controlled Trial (RCT), which could demonstrate whether 'reach to grasp' training was more effective than current 'usual care'.

Finally, a questionnaire was used with participants at three and six months after their use of services to gauge the difference in cost between the 'reach to grasp' group and the 'usual care' group. This will help in a subsequent RCT.

In summary, this pilot study achieved its main objectives by showing that a larger RCT could be feasible, safe, and accepted by stroke patients. The researchers have plans to expand such a future RCT by collaborating with another group of Stroke Association funded researchers, who have been carrying out their own feasibility study of home based, task-specific, training.

With government policy shifting health care from hospital to the community, it is timely for an intervention to be developed that will 'travel' with the stroke survivor along their stroke pathway. A parallel study is also being prepared by collaborators in Australia. Together, both the UK and Australian trials could create a convincing argument for the uptake of 'reach to grasp' training by the international stroke rehabilitation community.

## What does this mean for stroke survivors?

For many with arm weakness, task-specific exercises could lead to improvement in independence in activities of daily living. The findings from the study highlight barriers to implementing task-specific training at home, including the need to motivate patients to practise in the absence of a therapist. The study also showed the 'reach to grasp training' to be safe to deliver at home, and that it should be possible to conduct a full trial to demonstrate whether 'reach to grasp' training is more effective for stroke survivors than current treatment.

## We are the Stroke Association

The Stroke Association is the leading stroke charity in the UK. We believe in the power of research to save lives, prevent stroke and ensure that people make the best recovery they can after a stroke.

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