Home-based reach-to-grasp training for people after stroke: a pilot randomised controlled trial.

Ailie Turton
Joining Forces, June 2017
Collaborators

• Professor Paulette van Vliet, University of Newcastle, Australia
• Professor Cath Sackley, University of East Anglia, UK
• Professor Frederike van Wijck, Glasgow Caledonian University, UK
• Professor Keith Wheatley and Dr Sue Jowett, University of Birmingham, UK
• Professor Steven Wolf, Emory University, Atlanta, USA
• Dr Chris Rogers, University of Bristol, UK

• Trial manager - Paul Cunningham, Assessors: Emma Heron and Verity Longley, University of the West of England, Bristol, UK

• Principal investigators NHS: Rebecca Woodward, Bryony Williams Chris Easton Rhiannon Ferguson Thomas Colin Domaille, Martin Boyd Fiona Henchie
Rationale for Study

• Only about 40% with moderate to severe stroke recover useful arm and hand movement.

• Interventions which deliver high-intensity, task-specific training most promising for improving motor function (Langhorne, 2009).

• Insufficient evidence for task-specific training for the upper limb (French et al, 2007; updated 2016):
  ‘Further research should focus on the type and amount of training, including ways of measuring the number of repetitions actually performed by participants.’

Aim – To determine feasibility of a large phase III trial of home based task specific training for stroke
Study Objectives

10 objectives:

- Estimate identification and recruitment rates to the trial
- **Determine the characteristics of the sample**
- **Determine the dose and content of treatment delivered**
- Estimate the adherence to independent practice;
- **Estimate the completeness of outcome data;**
- Determine the most appropriate primary outcome measure
- Calculate sample size for a subsequent definitive trial
- Collect and synthesize the views from participants to determine acceptability of the intervention
- **Determine the frequency of adverse reactions in both groups;**
- Collect health and social care resource use data to inform data collection in the subsequent definitive trial.
Eligibility Criteria

- Within 12 months post-stroke
- Discharged home
- Unable to pick up a 6mm ball bearing from the table top, between index finger and thumb, and place it on a shelf 37 cm above table
- Able to lift hand off lap
- Able to reach to grasp before stroke
- No fixed contractures elbow or wrist (i.e. grade 4 on the modified Ashworth scale)
- Informed written consent
Intervention

- Reach-to-grasp is the most common arm movement needed in everyday
- Suitable for wide range of motor impairment
- Intensive training of whole or part actions
- Manual of graded goal directed activities involving objects
- Dose: 14 visits from a research therapist over 6 weeks, – target range 100-300 reps per visits, plus practice in absence of therapist one hour/day
Outcome measures

• Primary:
  – Action Research Arm Test
  – Wolf Motor Function Test

• Secondary:
  – Motor Activity Log
  – Stroke Impact Scale
  – Caregiver Strain Index
  – Health and social care questionnaire
  – User views Questionnaire
Completeness of outcome data

Consented: n=48

Screened for inclusion: n=102

Baseline assessments: n=47

Randomisation

Task specific reach to grasp training (6 weeks): n=24

Post intervention assessment: n=23

3 month follow up assessment: n=23

6 month follow up assessment: n=16

Usual care (6 weeks): n=23

Post intervention assessment: n=22

3 month follow up assessment: n=21

6 month follow up assessment: n=16

The project duration allowed us to follow up participants to three months post randomisation, but only a proportion to six months:
Participants Characteristics

N=48
Median time post stroke 18 weeks
73% >3 months

85% scored <29/57 on the Action Research Arm Test
38% had no active hand function (only able to lift their hand off their lap)
# Dose of upper limb treatment

<table>
<thead>
<tr>
<th></th>
<th>Reach-to-Grasp group (n=24): Median (IQR)</th>
<th>Usual care group (n=23): Median (IQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visits completed</td>
<td>14 (13,14)</td>
<td>10.5 (5, 14) (18pts)</td>
</tr>
<tr>
<td>Duration visit (mins)</td>
<td>60.7 (59.8, 62.1)</td>
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</tr>
<tr>
<td>Duration active practice/visit (mins)</td>
<td>38.5 (35.4, 48.8)</td>
<td>38.6 mins (30, 45)</td>
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<tr>
<td>total training hours</td>
<td>8.4 (7.7, 9.3)</td>
<td>5.3 (4.2,8.0)</td>
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<td>repetitions of actions per therapist’s visit</td>
<td>157 (96, 211)</td>
<td>16.3 (6, 24)</td>
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<tr>
<td>hours independent practice recorded</td>
<td>6.5 (1.5, 12.8)*</td>
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</tbody>
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Adverse reactions

Incidences of UL pain/hand pain/oedema similar between groups:

Baseline: RtG 22, Usual care 19

all post intervention assessments:
RtG 27; usual care 25
(incl. repeat reports from 18 participants)

Falls reported at post intervention assessments
Reach-to-Grasp 3; usual care 6
Outcome: treatment group over time

**ARAT**

![ARAT Graphs](image)

**WMFT**

![WMFT Graphs](image)
Conclusions

• Conducting a randomised controlled trial to compare home-based task-specific Reach-to-Grasp training with usual care practice after stroke is feasible and safe.

• Undertaking a relatively high number of repetitions; 10 times as many as in usual care, without additional adverse effects is feasible.
Next steps

Reach to Grasp Australia - Improving arm function after stroke using task specific training,
CI: Paulette van Vliet, $832,000 (£488,800)

Collaboration with Newcastle Reach to grasp and RAFTAS

Repetitive Arm Practice for Post STroke Arm Recovery

RAPPStAR
Further information

Study protocol www.trialsjournal.com/content/14/1/109

Study findings in Clinical Rehabilitation
- development and description of intervention
  http://journals.sagepub.com/doi/full/10.1177/0269215515603438
- pilot trial results
  http://journals.sagepub.com/doi/full/10.1177/0269215516661751

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