Home-based Reach-to-Grasp training for people after stroke is feasible: a pilot randomised controlled trial

Turton, A; Cunningham, Paul; van Wijck, Frederike; Smartt, H; Rogers, CA; Sackley, Catherine; Jowett, Sue; Wolf, Steven L; Wheatley, Keith; van Vliet, P

Document Version
Peer reviewed version

[Link to publication on Research at Birmingham portal](#)

Tables Home-based Reach-to-Grasp training for people after stroke is feasible: a pilot randomised controlled trial

Turton et al. 2016

Table 1. Content of home-based reach to grasp intervention after stroke

(For the full intervention description, please refer to Cunningham et al., (2015) [9])

Elements (from the TIDIER checklist)	Reach to grasp intervention
Essential elements of the intervention	A progressive training programme comprising practice of whole reach-to-grasp tasks and, where required, practice of the component parts that can be systematically reassembled into the whole task, with the aim of improving reach-to-grasp ability in daily activities.
Materials	Intervention manual, with a total of 122 illustrated activities (part and whole reach to grasp actions). Activity sheets are designed for both therapist and for patient to use in the absence of a therapist. A booklet about recovery from stroke; highlighting the potential for 'rewiring' the brain through task practice.
Procedures / Role of therapist	At the initial intervention visit, the therapist carried out an observational biomechanical analysis of the participant's functional reach-to-grasp movements against a checklist of the invariant kinematic features. Following this assessment, the therapist selected activities to practise from the manual and provided the participant with copies of activity sheets. At each subsequent visit, the therapist re-assessed the reach-to-grasp actions and progressed/amended activities as appropriate for the individual. During each supervised session the therapist aimed to maximise the number of repetitions of activities performed and encouraged participants to self-practise a maximum number of repetitions daily between visits.
When and How much -	***When*** - The intervention was designed to be delivered once participants had returned home from hospital and within the first 12 months after stroke.
	Dose - a total target dose of 56 hours; consisting of 14, one hour, therapist visits over six weeks and additional self-monitored practice recommended for an hour a day, seven days a week. The frequency of therapist visits was tapered, x3 a week in the first three weeks, x2 in each of the next two weeks, x1 in the final week, with the aim of increasing self-efficacy in practice and fostering self-management.
	Repetitions - a target range of 100-300 repetitions/hour was endeavoured, dependent on individual participant's capabilities
Tailoring - Individualising the intervention	Due to the range of upper limb impairment across the study population, the therapist selected activities to suit the functional ability of each participant with consideration also given to factors such as the home environment, individual preferences, level of carer support, object shape and size, target positions and speed of movement.
	Scope for individualised goal setting was limited to each participant being encouraged to identify the tasks, objects and environments for practice, with the intention to make the intervention more personally relevant and stimulate engagement.

Table 2 Participants' characteristics

	RtG (n=24)		UC (n=23)		Total (n=47)	
	n	%	n	%	n	%
Gender (Male)	11	45.8%	10	43.5%	21	44.7%
Age (years) Median, (IQR)	66	(54.3, 75.1)	66.1	(57.6, 76.5)	66.1	(57.5, 75.2)
Lives alone	6	25.0%	4	17.4%	10	21.3%
Stroke type: infarct	18	75.0%	17	73.9%	35	74.5%
haemorrhage	6	25.0%	6	26.1%	12	25.5%
Paresis of pre-stroke dominant side	14	58.3%	11	47.8%	25	53.2%
Median days since stroke, (IQR)	111.5	(82.0, 241.0)	135	(103.0, 171.0)	124	(88.0, 227.0)
Cognitive function mean MOCA score/30 (SD)	21.1	(10.2)	19.6	(5.0)	20.3	(7.9)
Baseline ARAT score strata	n	%	n	%	n	%
0-3	9	37.5%	9	39.1%	18	38.3%
4-28	11	45.8%	11	47.8%	22	46.8%
29-57	4	16.7%	3	13.0%	7	14.9%

Table 3 Completeness of assessments

Assessment time point and (number of participants visited for assessment)	ARAT	WMFT	MAL	SIS	Carer Strain Index (carers)
Baseline (47)	47	47	46	47	12 consented
7 weeks (45)	45 96%	44 94%	41 87%	45 96%	
12 weeks (44)	44 94%	43 91%	38 81%	43 91%	9/12 75%
24 weeks (32) *(note - study was stopped before 11 patients reached 6 month follow-up)*	32 68%	31 66%	29 62%	31 66%	6/12 50%

Tables Home-based Reach-to-Grasp training for people after stroke is feasible: a pilot randomised controlled trial
Turton et al. 2016

Table 4. Action Research Arm Test (ARAT)

Time	Randomised to reach to grasp (n=24)		Randomised to Usual Care (n=23)		Total (n=47)	
	median	IQR	median	IQR	median	IQR
Baseline	8.5	(3.0, 24.0)	4	(3.0, 14.0)	5	(3.0, 17.0)
7 weeks [1]	12	(3.0, 37.0)	4	(3.0, 23.0)	10	(3.0, 26.0)
12 weeks [2]	15	(4.0, 36.0)	4	(3.0, 28.0)	10.5	(3.0, 34.5)
24 weeks [3]	14.5	(3.5, 26.0)	4	(3.0, 30.0)	7	(3.0, 27.5)

Missing data: Total (reach to grasp, usual care)
[1] 2 (1,1); [2] 3 (1,2), [3] 15 (8,7)

Table 5. Wolf Motor Function Test (WMFT)

	Randomised to reach-to-grasp (n=24)		Randomised to usual care (n=23)		Total (n=47)	
Quality ratings across all tasks						
	median	IQR	median	IQR	median	IQR
Baseline	1	(1.0-3.0)	1	(1.0, 3.0)	1	(1.0, 3.0)
7 weeks [1]	3	(1.0, 5.0)	1	(0.0, 3.0)	2	(0.0, 4.0)
12 weeks [2]	3	(0.0, 5.0)	1	(0.0, 5.0)	2	(0.0, 5.0)
24 weeks [3]	2	(0.0, 4.5)	0.5	(0.0, 5.0)	1	(0.0, 5.0)
Number of tasks completed in < 120s						
	median	IQR	median	IQR	median	IQR
Baseline	6	(3.0, 11.5)	4	(3.0, 10.0)	6	(3.0, 10.0)
7 weeks [4]	8	(5.0, 14.0)	5	(3.0, 11.0)	7	(3.0, 12.0)
12 weeks [5]	10	(5.0, 13.0)	6.5	(3.0, 11.0)	8	(3.0, 12.0)
24 weeks [6]	8.5	(4.5, 13.5)	6	(3.0, 14.0)	7	(3.0, 14.0)

Not attempted: Total (reach-to-grasp, usual care), occasions when an item was not attempted.
[1] 8 (3,5), [2] 7 (2,5), [3] 17 (8,9), [4] 5 (1,4); [5] 6 (1,5), [6] 18 (8,10) Items missed were those which raised safety concerns, i.e. an item requiring standing and an item requiring adding weight. In addition the increased frequency of not attempted items includes those not followed up at 6 months.

Tables Home-based Reach-to-Grasp training for people after stroke is feasible: a pilot randomised controlled trial
Turton et al. 2016

Table 6. Motor Activity Log - number of items scoring 3 or more

Time point	Randomised to RTG (n=24)		Randomised to Usual care (n=23)	
	Quality of movement	Amount of use	Quality of movement	Amount of use
	Median (IQR)	Median (IQR)	Median (IQR)	Median (IQR)
Baseline	0 (0.0, 6.0)	0 (0.0, 6.0)	0 (0.0, 3.0)	1 (0.0, 4.0)
7 weeks	3 (0.0, 12.0)	2 (0.0, 13.5)	0 (0.0, 3.5)	1.5 (0.0, 4.5)
3 months	1.5 (0.0, 11.0)	2.5 (0.5, 10.5)	0.5 (0.0, 6.0)	2 (0.0, 6.0)
6 months	2 (0.0, 8.0)	3 (1.0, 9.0)	1(0.0, 4.0)	3 (0.0, 5.0)