

Physical activity and stroke

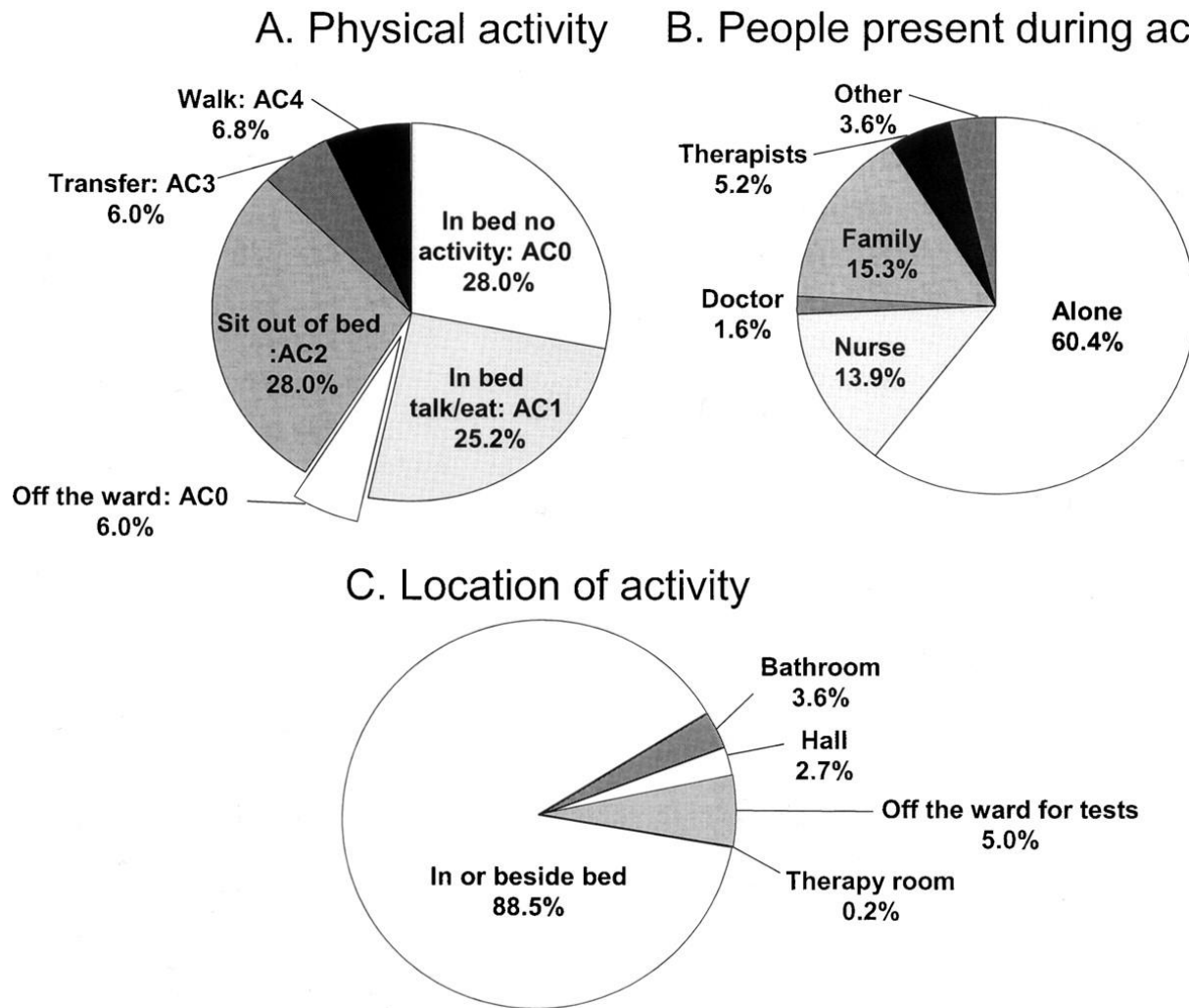
Dr Sarah Moore
NIHR ICA Clinical Lecturer
May 2018



Aims

- Physical activity levels after stroke
- Exercise after stroke
- Targeting long-term physical activity and sedentary behaviour after stroke

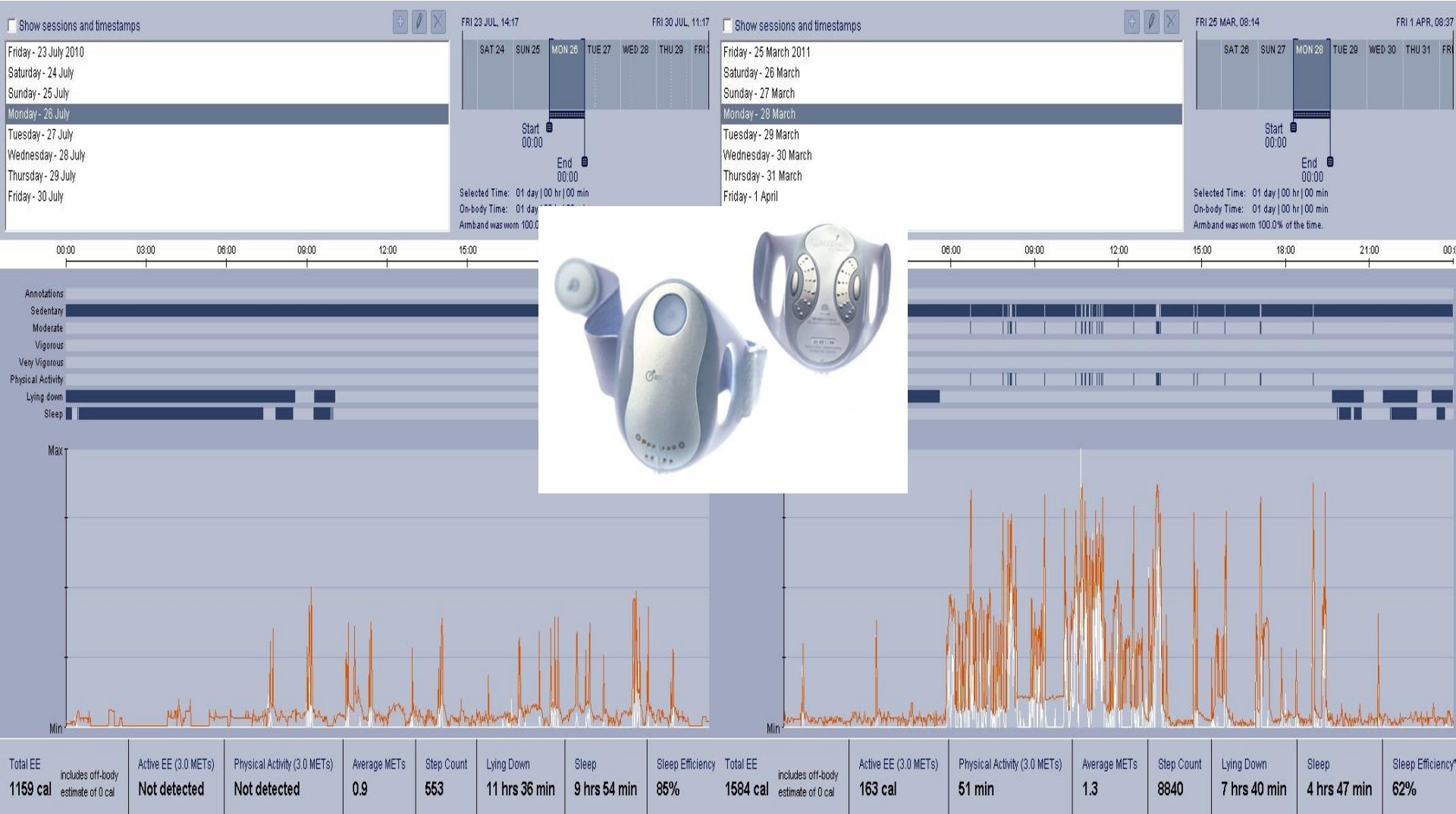
Figure 1. Physical activity, people present, and location data from observations between 8 am and 5 pm averaged across all cases.



Julie Bernhardt et al. Stroke. 2004;35:1005-1009

Stroke patient

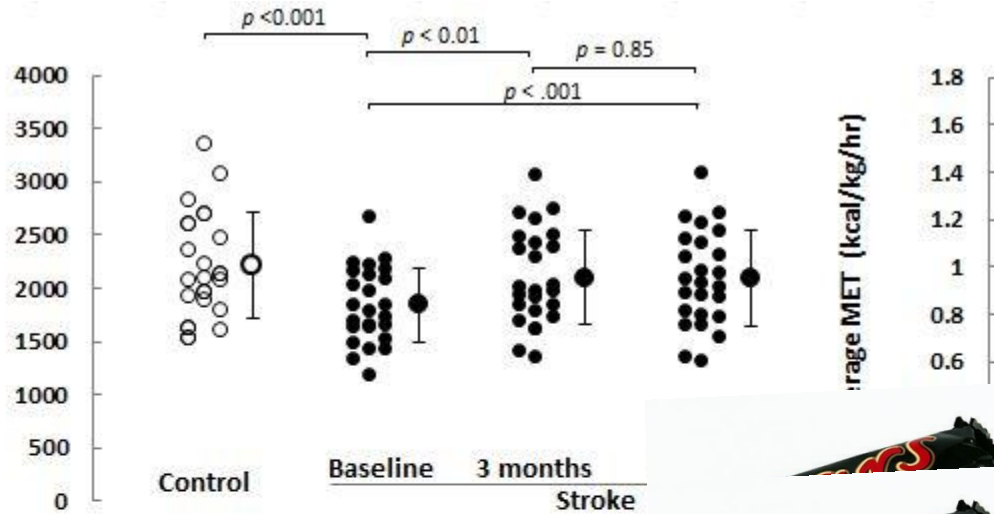
Healthy control



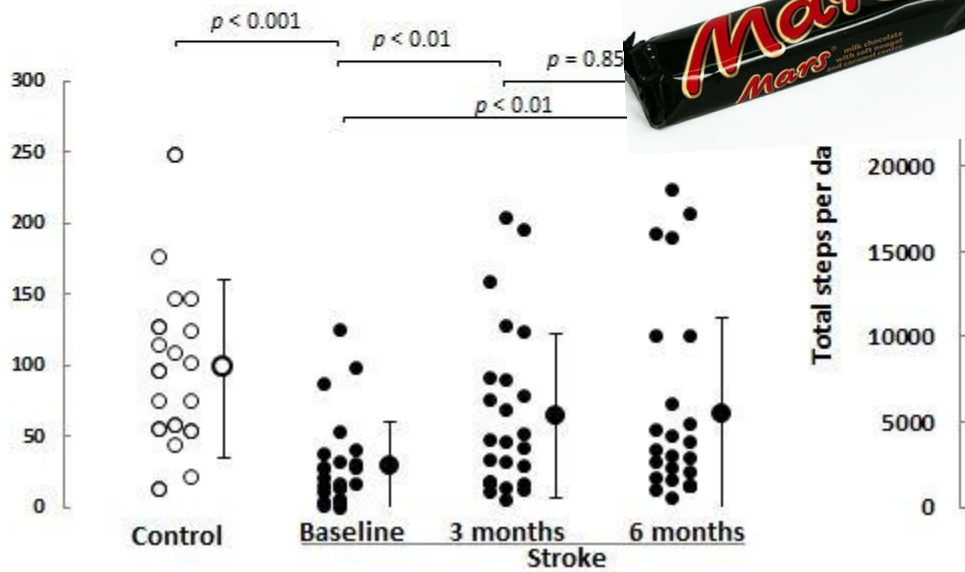
S. A. Moore, Hallsworth, K., Bluck, L. J. C. Ford, G. A. Rochester, L. and Trenell, M. I. (2012) Measuring Energy Expenditure After Stroke: Validation of a Portable Device. Stroke 43, 1660-1662

Moore, S.A. Hallsworth, K. Rochester, L. Ford, G. A. Trenell, M. I. 2013 Physical Activity, Sedentary Behaviour and Metabolic Control following Stroke: A Cross-Sectional and Longitudinal Study. PLoS One 8 (1) e55263

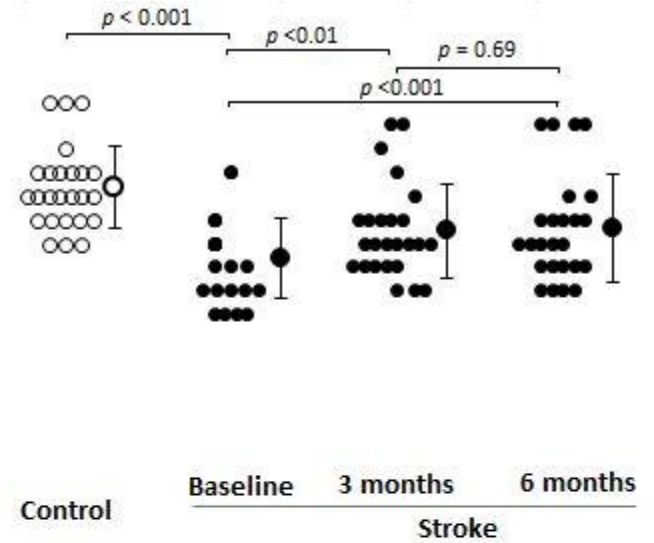
Daily energy expenditure (kcal)



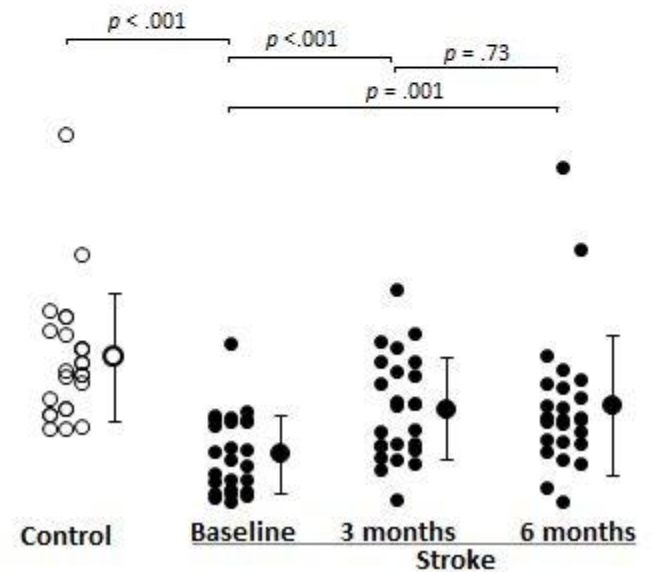
Physical activity energy expenditure (mins/day)



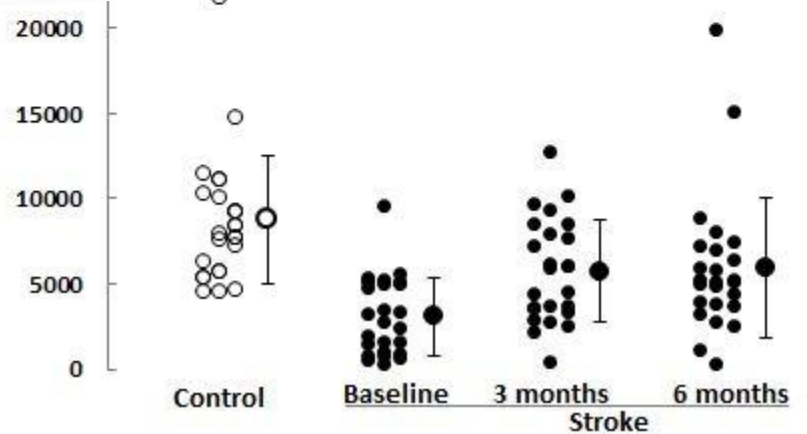
Daily energy expenditure (kcal)



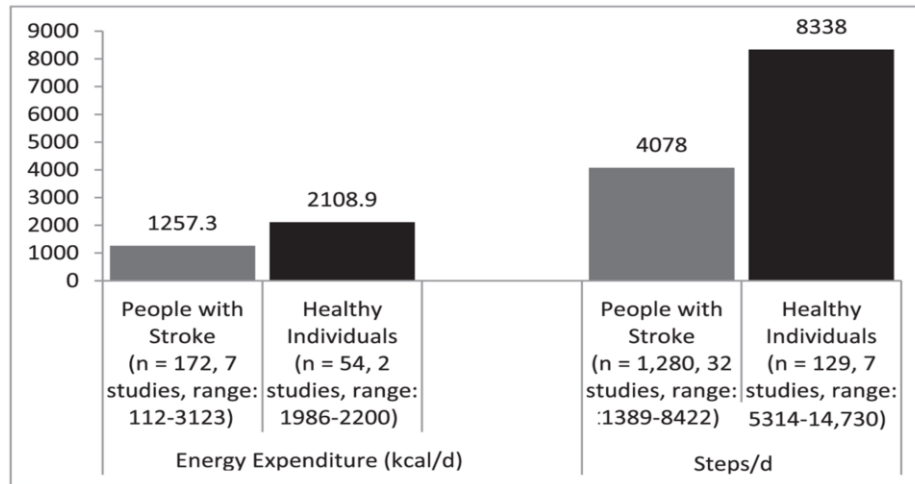
Physical activity energy expenditure (mins/day)



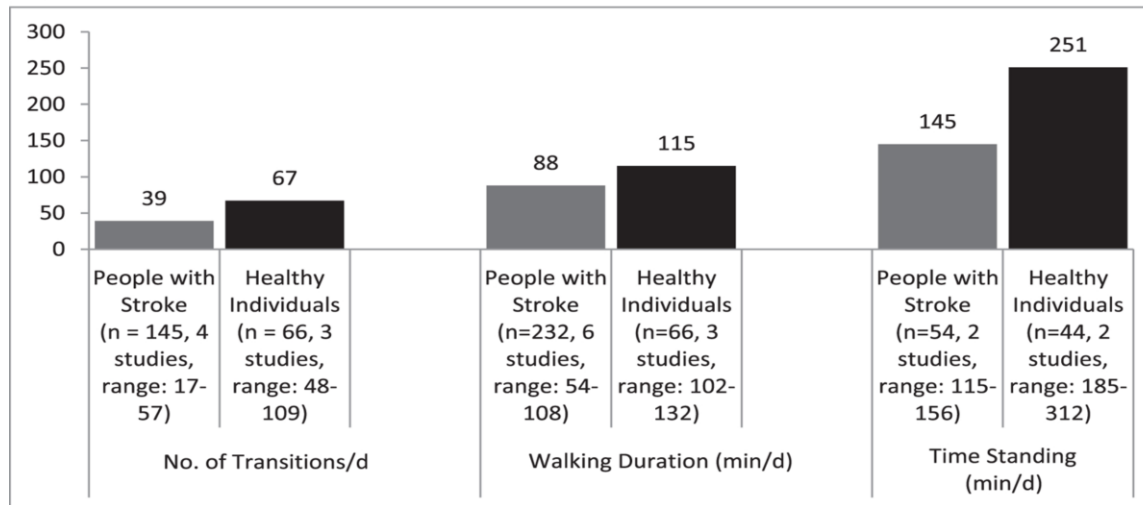
Total steps per day



(A)



(B)

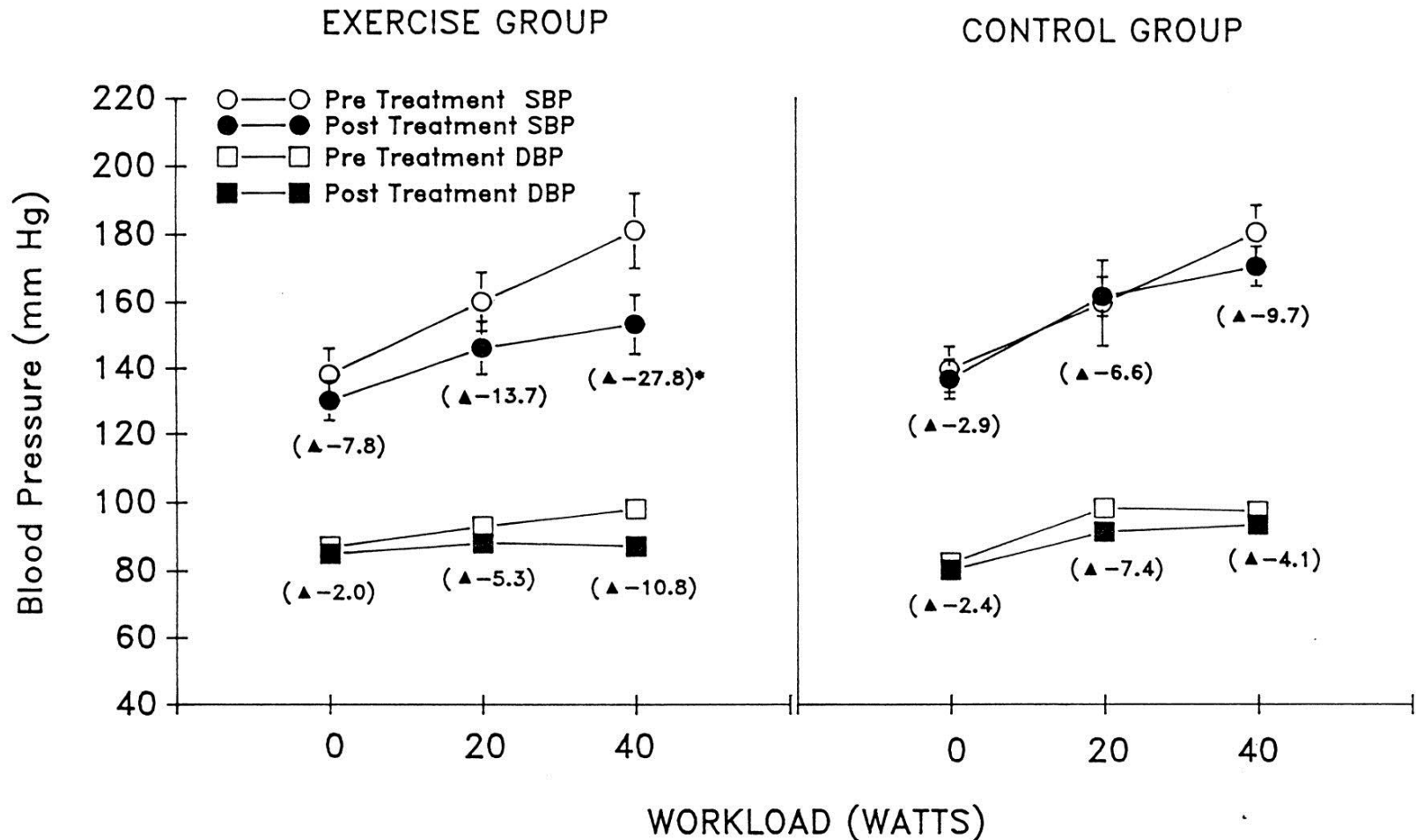


From: How Physically Active Are People Following Stroke? Systematic Review and Quantitative Synthesis

Phys Ther. 2017;97(7):707-717. doi:10.1093/ptj/pzx038

Phys Ther | © 2017 American Physical Therapy Association

History of stroke and exercise research



Physical fitness training

Physical fitness training for stroke patients (Review)

Saunders DH, Sanderson M, Brazzelli M, Greig CA, Mead GE



- 45 trials 2188 patients
Cardio/resistance/mixed
- Studies mainly conducted chronic stages
- Cardiorespiratory exercise improves walking
- Some evidence cardio improves fitness
- ?death/dependency/QOL/vascular risk factors
- Few trials studied long term effects

Randomised controlled pilot study on exercise post stroke



Vs



Randomised controlled pilot study on exercise post stroke

Aim

- To evaluate the effect of a community based exercise intervention following stroke.

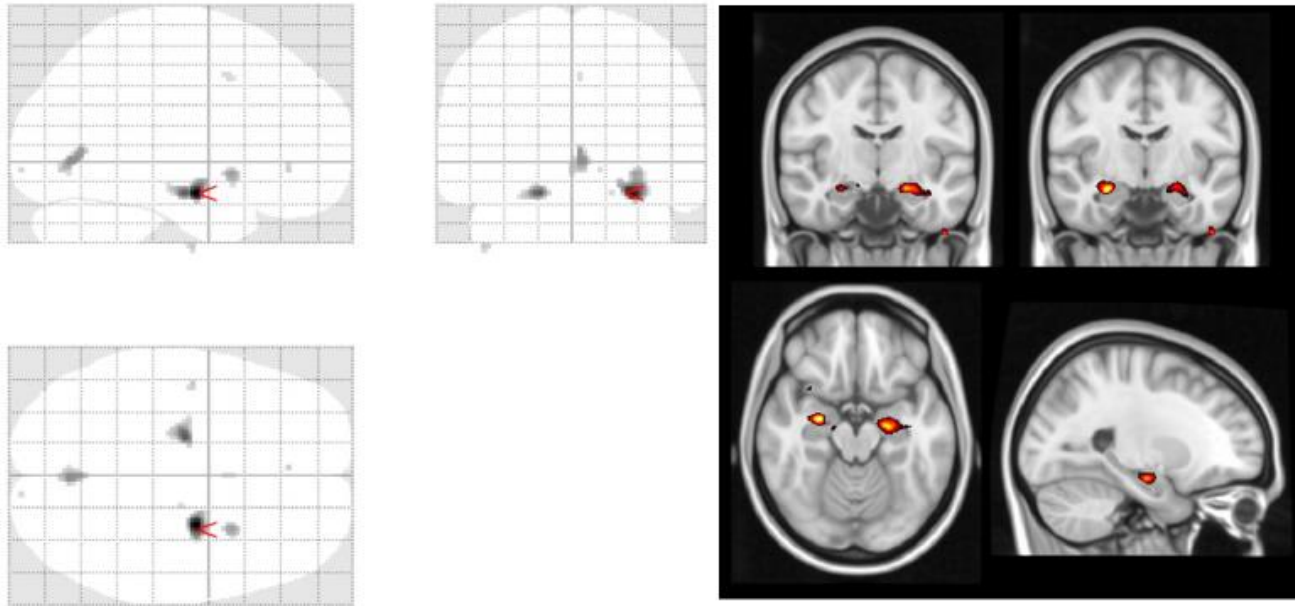
Primary hypothesis

- A community exercise intervention will be more effective than a home stretching programme (active control) in improving brain volume and blood flow and metabolic risk factors in older adults with stroke.

Secondary hypotheses

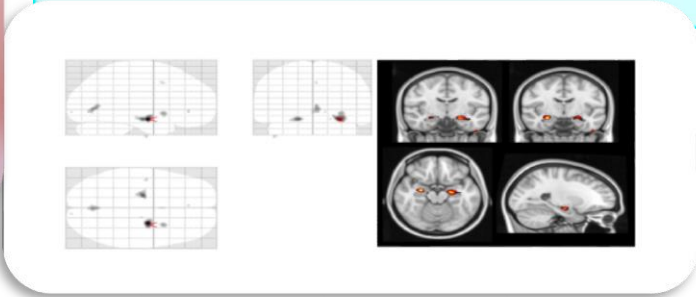
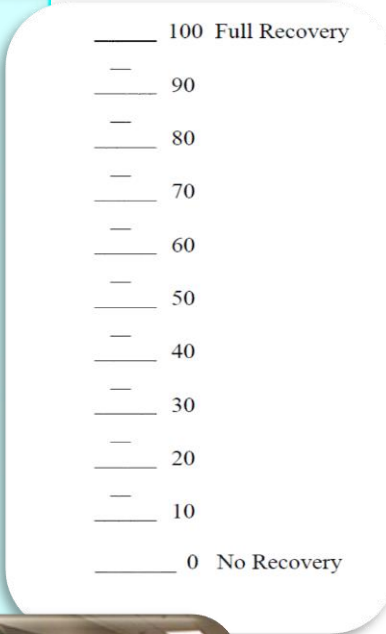
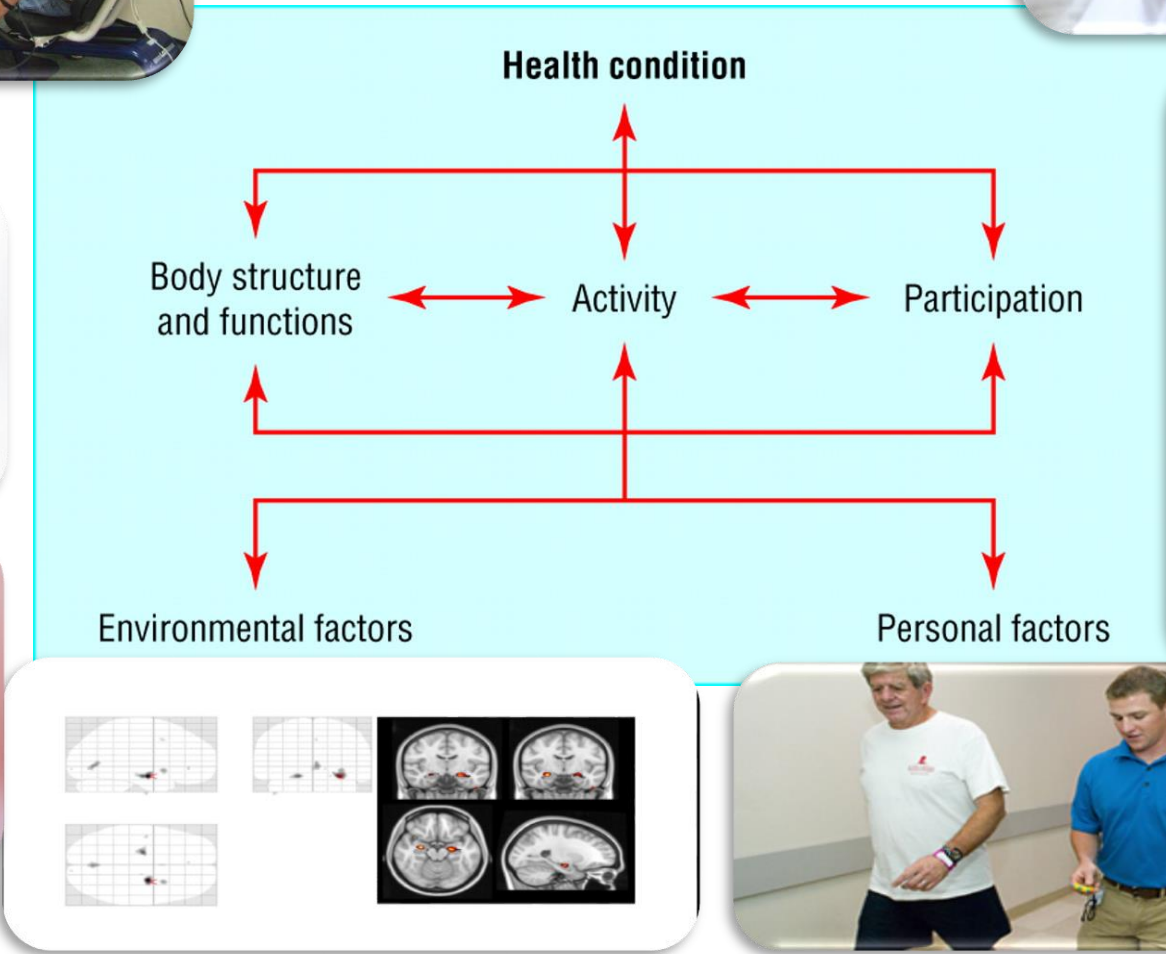
- A community exercise intervention will be more effective than a home stretching programme in improving physical performance and physical activity, quality of life and cognition in older adults with stroke.

Exercise prevents medial temporal lobe atrophy and increases blood flow



Moore, S. A., K. Hallsworth, et al. (2014). "Effects of community exercise therapy on metabolic, brain, physical and cognitive function following stroke: A randomised controlled pilot trial. ." Neurorehabil Neural Repair:29 (7) 623-635

International classification of functioning, disability and health



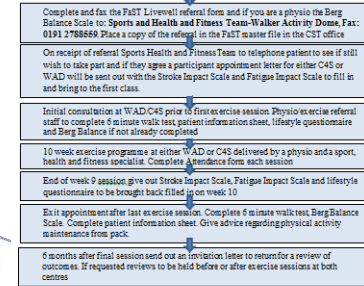
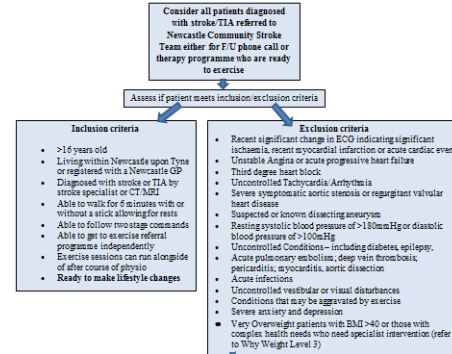


FaST
Fitness after Stroke

FaST

FITNESS AFTER STROKE MANUAL JANUARY 2013

The Fitness after Stroke programme is an adaptation of the Fit and Mobility Exercise Programme developed by Janice Eng 20 programme was developed based on research conducted Sarah Moore 2012.



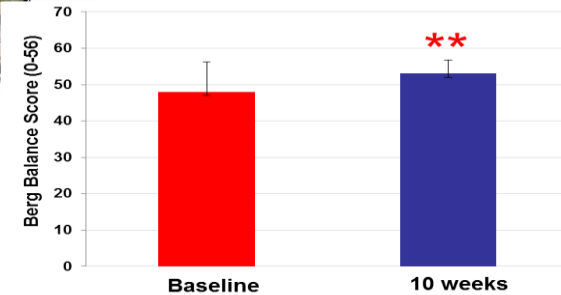
The Newcastle upon Tyne Hospitals **NHS**
NHS Foundation Trust

Newcastle Community Stroke Team

Walkergate Health Centre
45 Scrogg Road
Newcastle upon Tyne
NE6 4EY
Phone: 0191 2826310
Email: sheila.mckeown2@nuth.nhs.uk

FaST
Fitness after Stroke

Exercise programme for people with stroke
Newcastle Community Stroke Team



Best Practice Guidance for the Development of **Exercise after Stroke Services** in Community Settings

Catherine Best, Frederike van Wijck, Susie Dinan-
Young, John Dennis, Mark Smith, Hazel Fraser,
Marie Donaghy, Gillian Mead



<http://www.exerciseafterstroke.org.uk/>



Problems

- 700 patients admitted to NuTH per annum, @ 60 referrals to FaST scheme
- Timing
- Lack of follow up and review
- Sustainability
- Post code lottery

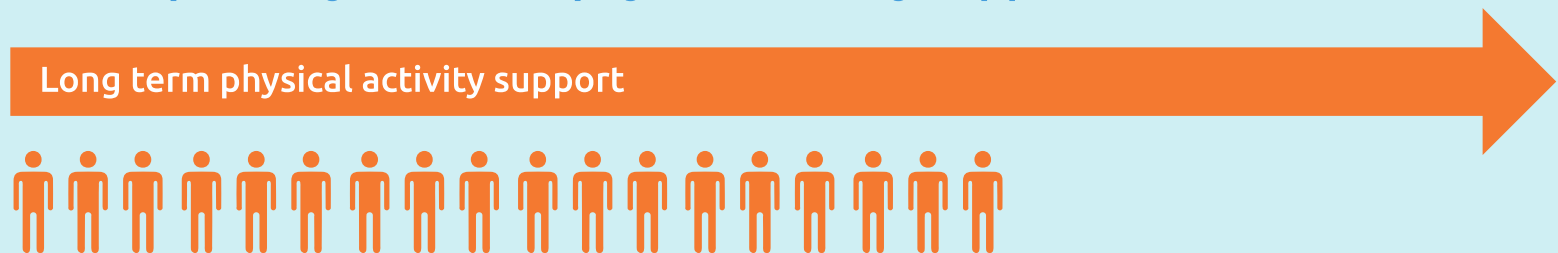


The problem

Current pathway of stroke physical activity support



Future pathway of stroke physical activity support



Promoting personalised Physical Activity Routines After Stroke (PARAS)

1

- Establish current practice and evidence

2

- Co-design intervention

3

- Intervention testing

ICA

HEE/NIHR Integrated Clinical Academic Programme
for non-medical healthcare professionals

NHS

Internships

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Clinical
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Doctoral
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Lectureships

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Clinical
Lectureships

Establishing current practice and evidence

Qualitative study

What are the **motivators, facilitators and barriers to long-term engagement in post-stroke physical activity**, from the perspective of stroke survivors and healthcare professionals?

1) To **qualitatively** analyse transcripts from **focus group discussions** using the **Theoretical Domains Framework**.



2) To identify **themes** with regards to long-term physical activity participation and **reducing sedentary behaviour**, from the perspective of **stroke survivors, carers and healthcare professionals**.



Methods

Recruitment

- **Stroke survivors** – community support groups within the North East of England
- **Healthcare professionals** – five NHS Trusts within the North East of England

Data collection

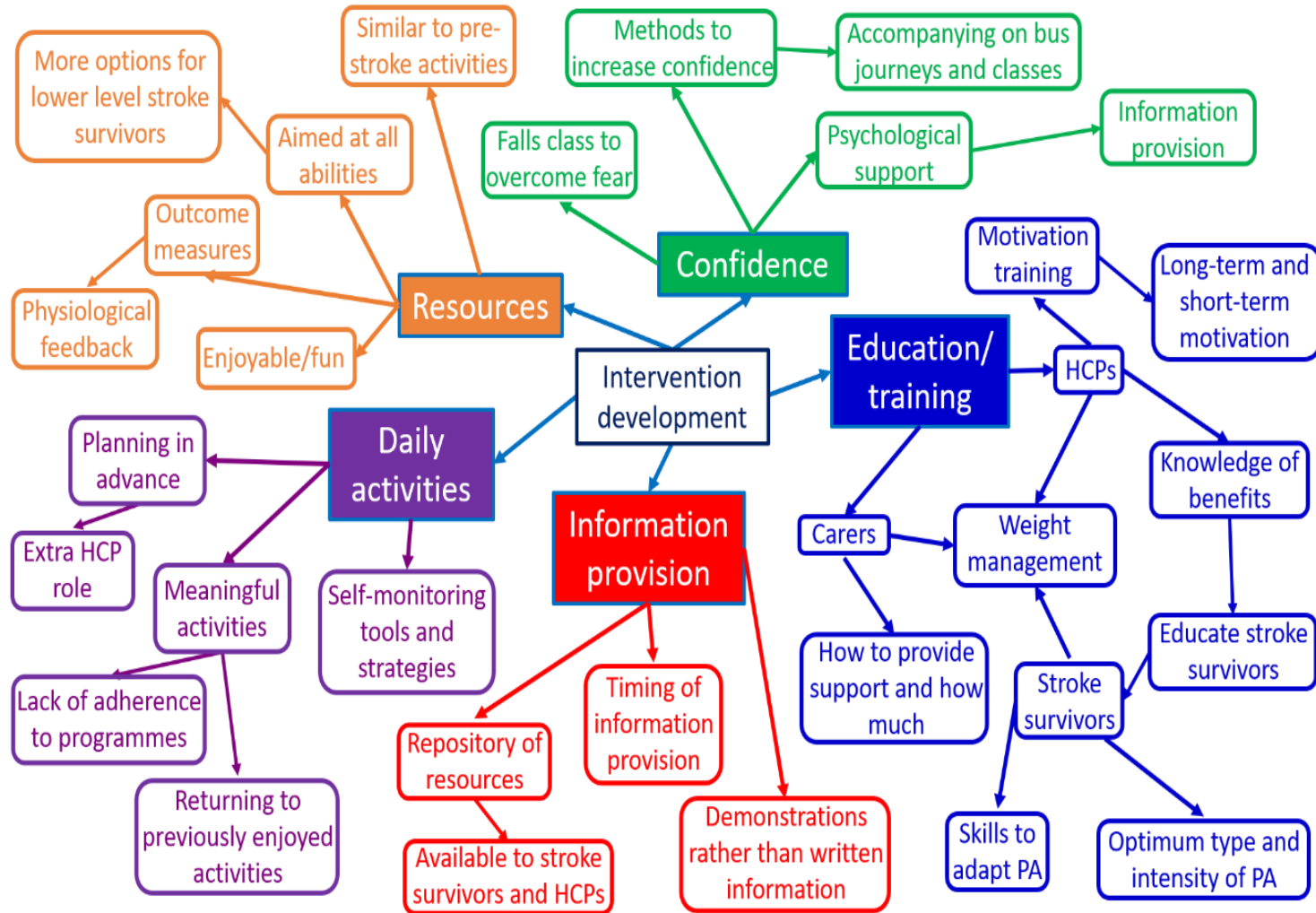
- **Focus group discussion** lasting 1.5 hours - topic guide used
- Open-ended questions
- Audio recorded and transcribed

- Researchers **independently** analysed transcripts
- Coded transcripts using a **framework and a protocol**
- Text segments grouped into **themes**

Data coding and analysis

- **Main themes** were identified overall for **each group** (stroke survivors/carers and healthcare professionals)
- **Peer debrief meetings** conducted to finalise themes

Identifying key themes within each domain



Work package 1

Establishing current practice and evidence Systematic review

Which interventions and component behaviour change techniques are found to be promising for increasing physical activity and reducing sedentary behaviour in the long-term after stroke?

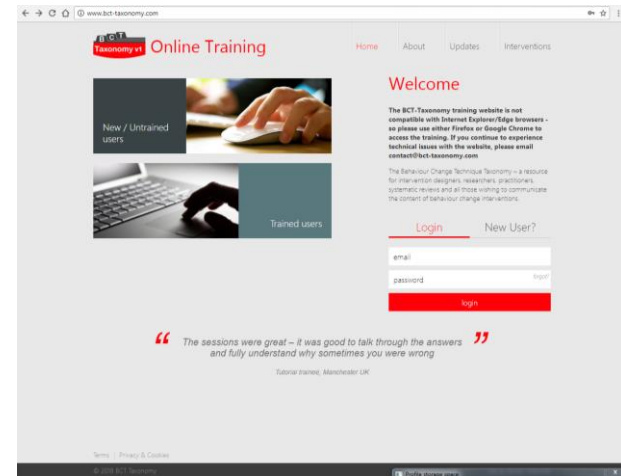


The TIDieR (Template for Intervention Description and Replication) Checklist*:

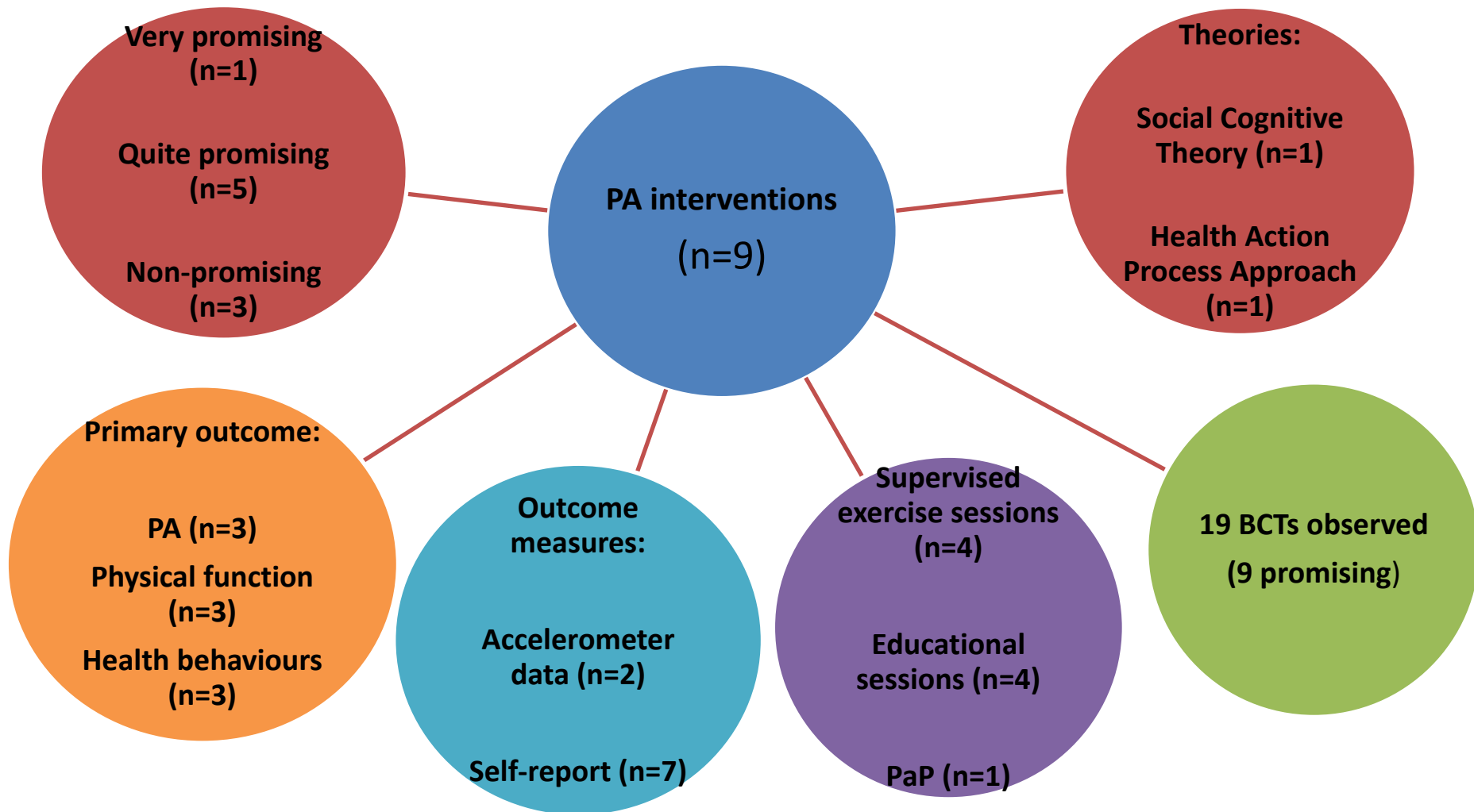
Information to include when describing an intervention and the location of the information

Item number	Item	Where located **	
		Primary paper (page or appendix number)	Other † (details)
1.	BRIEF NAME Provide the name or a phrase that describes the intervention.	_____	_____
2.	WHY Describe any rationale, theory, or goal of the elements essential to the intervention.	_____	_____
3.	WHAT Materials: Describe any physical or informational materials used in the intervention, including those provided to participants or used in intervention delivery or in training of intervention providers. Provide information on where the materials can be accessed (e.g. online appendix, URL).	_____	_____
4.	Procedures: Describe each of the procedures, activities, and/or processes used in the intervention, including any enabling or support activities.	_____	_____
5.	WHO PROVIDED For each category of intervention provider (e.g. psychologist, nursing assistant), describe their expertise, background and any specific training given.	_____	_____
6.	HOW Describe the modes of delivery (e.g. face-to-face or by some other mechanism, such as internet or telephone) of the intervention and whether it was provided individually or in a group.	_____	_____
7.	WHERE Describe the type(s) of location(s) where the intervention occurred, including any necessary infrastructure or relevant features.	_____	_____

TIDieR checklist



Results: PA interventions



Results: BCTs

Promising BCTs (n=9)	Non-promising BCTs (n=10)
Action planning	Instruction on how to perform the behaviour
Goal setting (behaviour)	Behavioural practice/rehearsal
Credible source	Graded tasks
Social support (unspecified)	Adding objects to the environment
Problem solving	Self-monitoring of behaviour
Biofeedback	Demonstration of the behaviour
Feedback on behaviour	Self-monitoring of outcome of behaviour
Information about health consequences	Monitoring of behaviour by others without feedback
Information about social and environmental consequences	Information about emotional consequences
	Review behaviour goal



Intervention mapping

TDF Domain	Theme(s)	Intervention objective	BCTs selected based on qualitative and systematic review results	Theoretical constructs targeted and potential intervention components
Knowledge	<p>Timing of information is important but varies according to individual needs and preferences</p> <p>Belief that you have to increase amount and intensity of PA for it to be beneficial</p> <p>Lack of knowledge about support and resources available to participate in PA</p>	<p>To be able to use information about participating in physical activity and reducing sedentary behaviour at the most appropriate time.</p> <p>To have knowledge on how to correctly undertake physical activity after stroke</p> <p>To have knowledge of local resources to enable PA</p>	<p>5.1: Information about health consequences (used/promising)</p> <p>5.2: Salience of consequences (not used)</p> <p>3.1: Social support (unspecified)(used/promising)</p>	<p>Relevant theory: HBM</p> <p>Constructs: All constructs of HBM</p> <p>Suggested/example intervention component(s):</p> <ul style="list-style-type: none"> • Booklet for patients and/or DVD for patients containing information and patient narratives • Access to repository of information via a HCP to obtain details of local support and resources
Beliefs about capabilities	<p>Confidence about abilities is a barrier to PA</p> <p>Physical impairment including pain limits participation in PA</p> <p>Old age, comorbidities and fatigue limit ability to be active</p> <p>Inability to work can reduce PA levels</p>	<p>To be able to problem solve and select appropriate physical activities related to individual level of ability</p>	<p>1.1: Goal setting (behaviour) (used/promising)</p> <p>1.2: Problem solving (used/promising)</p> <p>4.2: Information about antecedents (not used)</p> <p>9.2: Pros and cons (not used)</p>	<p>Relevant theory: HBM & SRT</p> <p>Constructs: Individual perceptions; likelihood of action; goal setting; problem solving</p> <p>Suggested/example intervention component(s): Information booklet and/or DVD concentrating on antecedents and pros and cons. Booklet template to be completed with a HCP targeting goal setting, problem solving.</p>

Work package 2

Intervention design

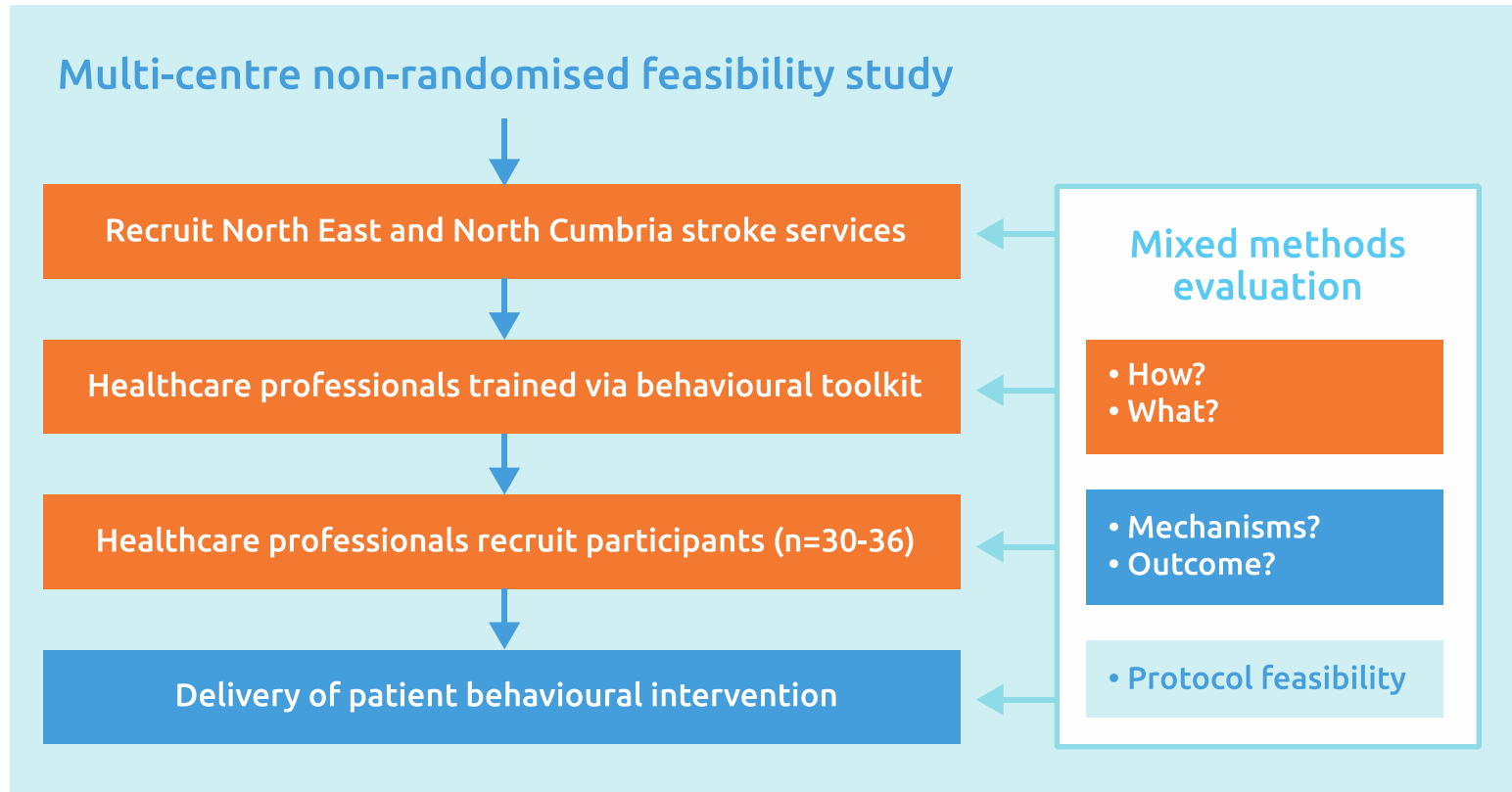
Behaviour change toolkit

Physical activity toolkit and healthcare professional development pathway



Work package 3

Feasibility, acceptability and fidelity



Long term goal:

Feasibility to underpin multi-centre cluster randomised control trial

Acknowledgements

Prof Michael Trenell
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Nina Hrisos



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NHS Foundation Trust



The Newcastle upon Tyne Hospitals **NHS**
NHS Foundation Trust

Move Lab
Physical Activity & Exercise Research

