Physical activity and stroke

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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.

A. Physical activity
- Walk: AC4 6.8%
- Transfer: AC3 6.0%
- Sit out of bed: AC2 28.0%
- In bed talk/eat: AC1 25.2%
- In bed no activity: AC0 28.0%
- Off the ward: AC0 6.0%

B. People present during activity
- Therapists 5.2%
- Doctor 1.6%
- Nurse 13.9%
- Family 15.3%
- Other 3.6%
- Alone 60.4%

C. Location of activity
- In or beside bed 88.5%
- Bathroom 3.6%
- Hall 2.7%
- Therapy room 0.2%
- Off the ward for tests 5.0%


From: How Physically Active Are People Following Stroke? Systematic Review and Quantitative Synthesis
Phys Ther | © 2017 American Physical Therapy Association
Graphs show pre-treatment and post-treatment exercise blood pressure responses for exercise and control subjects.

Physical fitness training

- 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
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

International classification of functioning, disability and health
**FITNESS AFTER STROKE MANUAL**

**JANUARY 2013**

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

**FaST**

**Fitness after Stroke**

- 10 week exercise programme
- Designed for people with stroke
- Held at Wellard Activity Dome/Centre for Sport, Newcastle Upon Tyne
- Run by physiotherapists and fitness instructors

**Livewell**

The Newcastle upon Tyne Hospitals NHS Foundation Trust

Newcastle Community Stroke Team

Wellard activity Centre
45 Stephenson Road
Newcastle upon Tyne
NE5 4BY

Phone: 0191 205 8310
Email: sheila.mackewn2@nuth.nhs.uk

**Exercise programme for people with stroke**

**Newcastle Community Stroke Team**

**Cognitive-behavioural interventions**

**Berg Balance Score (0-90)**

- **Baseline**
- **10 weeks**

**Exclusions criteria**

- Recent significant change in balance or cognitive functioning
- Recent episodes of vomiting or nausea
- Recent episodes of falls
- Recent change in medical condition
- History of falls
- Recent urinary incontinence
- Recent neglect of personal care
- Trouble walking

**Inclusion criteria**

- Age of 50 or over
- History of stroke or TIA
- No current symptoms of stroke
- No recent falls
- No history of falls
- No recent urinary incontinence

- Coaches and the FaST Livewell team liaise and refer patients to the Newcastle Stroke Team for a functional assessment. Those who meet the eligibility criteria are referred to the FaST team for assessment.

- Dates: 12th May, 16th June, 20th July and 14th August.
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/
MY JOB HERE IS DONE
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

First few months

Inpatient/Outpatient
Functional rehabilitation

Community exercise

Future pathway of stroke physical activity support

Long term physical activity support
Promoting personalised Physical Activity Routines After Stroke (PARAS)

1. Establish current practice and evidence

2. Co-design intervention

3. Intervention testing
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.
Recruitment

Data collection

Data coding and analysis

Identifying key themes within each domain

Methods

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

• 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

• Main themes were identified overall for each group (stroke survivors/carers and healthcare professionals)
• Peer debrief meetings conducted to finalise themes
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?
Results: PA interventions

PA interventions (n=9)

Theories:
- Social Cognitive Theory (n=1)
- Health Action Process Approach (n=1)

Very promising (n=1)
Quite promising (n=5)
Non-promising (n=3)

Primary outcome:
- PA (n=3)
- Physical function (n=3)
- Health behaviours (n=3)

Outcome measures:
- Accelerometer data (n=2)
- Self-report (n=7)

Supervised exercise sessions (n=4)
Educational sessions (n=4)
PaP (n=1)

19 BCTs observed (9 promising)
### Results: BCTs

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

<table>
<thead>
<tr>
<th>TDF Domain</th>
<th>Theme(s)</th>
<th>Intervention objective</th>
<th>BCTs selected based on qualitative and systematic review results</th>
<th>Theoretical constructs targeted and potential intervention components</th>
</tr>
</thead>
</table>
| Knowledge           | Timing of information is important but varies according to individual needs and preferences | To be able to use information about participating in physical activity and reducing sedentary behaviour at the most appropriate time. To have knowledge on how to correctly undertake physical activity after stroke To have knowledge of local resources to enable PA | 5.1: Information about health consequences (used/promising)  
5.2: Salience of consequences (not used)  
3.1: Social support (unspecified)(used/promising) | Relevant theory: HBM  
Constructs: All constructs of HBM  
Suggested/example intervention component(s):  
- 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 | Confidence about abilities is a barrier to PA  
Physical impairment including pain limits participation in PA  
Old age, comorbidities and fatigue limit ability to be active  
Inability to work can reduce PA levels | To be able to problem solve and select appropriate physical activities related to individual level of ability | 1.1: Goal setting (behaviour) (used/promising)  
1.2: Problem solving (used/promising)  
4.2: Information about antecedents (not used)  
9.2: Pros and cons (not used) | Relevant theory: HBM & SRT  
Constructs: Individual perceptions; likelihood of action; goal setting; problem solving  
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. |
Work package 2

Intervention design

Behaviour change toolkit

Physical activity toolkit and healthcare professional development pathway
Work package 3

Feasibility, acceptability and fidelity

Multi-centre non-randomised feasibility study

Recruit North East and North Cumbria stroke services

Healthcare professionals trained via behavioural toolkit

Healthcare professionals recruit participants (n=30-36)

Delivery of patient behavioural intervention

Mixed methods evaluation

- How?
- What?
- Mechanisms?
- Outcome?
- Protocol feasibility

Long term goal:
Feasibility to underpin multi-centre cluster randomised control trial
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