



Neurological physiotherapy for people following stroke: what's in the toolkit?

Professor Sheila Lennon
Head of Physiotherapy
Flinders University

sheila.lennon@flinders.edu.au



With thanks to Sarah Hayman

Building Knowledge to Support
Best Practice in Stroke Care
(Hayman, Lennon et al, under review)



New Resource: Stroke Topic Searches

<http://www.flinders.edu.au/clinical-change/research/flinders-filters/search-filters/stroke/stroke-topic-searches.cfm>

Flinders University 50th Anniversary

Home > Research > Flinders Filter > Stroke

Stroke Topic Searches

These are public access to the stroke research filter searches in PubMed. The searches are available via the stroke search filter on the Flinders University website. The search filters are available via the stroke search filter on the Flinders University website.

- Free resource linking straight to PubMed results
- Searches created using validated Stroke Search Filter
- Clinical and technical expertise embedded in the search



Search for free full text articles on Arm recovery

After Stroke (Symptoms, Issues and recovery following stroke)

Arm Recovery

All records

Free full text only

Confidence after Stroke

All records

Free full text only

PubMed Search Results

Search: stroke

Results 1 to 20 of 210

1. Effect of a Task-Oriented Rehabilitation Program on Motor Skills in Stroke Patients: A Randomized Controlled Trial. *Stroke*. 2013;44(12):3483-3490. doi:10.1161/STROKEAHA.113.002888. Epub 2013 Oct 15. PMID: 24111111. [Full text available]

2. Randomized Trial of a Stroke Rehabilitation Program. *Stroke*. 2013;44(12):3483-3490. doi:10.1161/STROKEAHA.113.002888. Epub 2013 Oct 15. PMID: 24111111. [Full text available]

3. Randomized Trial of a Stroke Rehabilitation Program. *Stroke*. 2013;44(12):3483-3490. doi:10.1161/STROKEAHA.113.002888. Epub 2013 Oct 15. PMID: 24111111. [Full text available]

4. Randomized Trial of a Stroke Rehabilitation Program. *Stroke*. 2013;44(12):3483-3490. doi:10.1161/STROKEAHA.113.002888. Epub 2013 Oct 15. PMID: 24111111. [Full text available]

Overview of today's talk

- What's in the black box?
The Bobath concept:
Are therapists assumptions accurate?
What is the evidence?
- Is content of therapy important?
What do therapists do?
- Impact of intensity
- The importance of promoting self efficacy & self-management

Building a research program

- Systematic reviews
Lennon 1996; Kollen et al, 200; Galvin et al, 2012; Verheyden et al, 2013
- Focus groups & surveys
What are our assumptions?
Lennon et al 2001, 2003; Tyson et al, 2009; Pedlow et al, 2014)
- Treatment checklists
What do we actually do?
Lennon 2001; Tyson et al, 2009
- Verify our assumptions
Gait lab (Lennon et al, 2006); n=11
NICHs: Feasibility RCT (Lennon et al, 2006); n=18
- RDO: a powered RCT (Lennon et al, 2009); n=61

What does the evidence say about the effects of physiotherapy post-stroke?

- Optimal type of PT is unclear
 - * specific techniques
 - * comparison of treatment approaches
- One approach is not superior to another e.g. Bobath vs Motor Relearning Programme (Kollen et al, 2009; Pollack et al, 2014; Weinstein et al, 2016)
- Reduction in impairment and improvement in function with **TASK SPECIFIC PRACTICE** for ADL/gait speed/not arm function (French et al, 2010)

The effectiveness of the Bobath Concept in stroke rehabilitation: What is the evidence? (Kollen, Lennon et al, 2009)

- 16 RCTs including 813 patients after stroke
- No evidence of superiority of Bobath on sensorimotor control of upper and lower limb, dexterity, mobility, ADL, health related quality of life and cost-effectiveness
- Only limited evidence was found for balance control in favour of Bobath in terms of symmetry
- no evidence is available for the superiority of any approach.

What is in the black box of therapy?

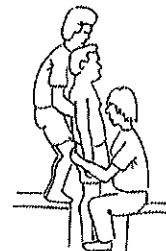
What is a treatment approach?

(Marsden & Greenwood, 2005; Lennon et al, 2001)

- A series of ideas & hypotheses about retraining movement & function that influences the content, structure and aims of a therapy session
- **Why is theory important?**
 - Content (Outcome)
 - Research questions
 - Are our beliefs or assumptions accurate?

What is the Bobath concept?

- A problem solving approach to the assessment & treatment of individuals with disturbances of function, movement and postural control due to a CNS lesion (IBITA 2016)



What might a Bobath therapist do with an early stage patient stroke patient who is flaccid and paralysed ?

- Trunk/pelvic movement
- shoulder girdle
- head control
- midline orientation
- weight transference
- limb movements
- Sitting balance

Motor Relearning Approach (Carr & Shepherd, 1987)

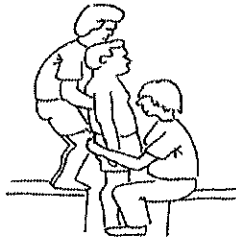
Relearn everyday tasks

- Adjust to gravity & changes in alignment (postural adjustments)
- Balance training
- Create an environment for recovery
- Movement analysis
- Practice the missing components
- Practice the tasks
- Transference of training
- Measurement of performance
- Discourage compensations

Stepping on a block



**Physiotherapy based on the Bobath concept
What do physiotherapists do?**



SPiRiT Studies

(Tyson et al, 2009a,2009b)

Assumptions/Beliefs

- Majority of PTs (58%) based Rx on Bobath but also used other interventions
- 30/77 interventions (39%) were considered definitely Bobath (consensus of 75% or more); mobilisation, facilitated movements, components of activities, and mobility activities
- Not Bobath: CV exercise, providing equipment, advanced mobility activities (walking outdoors/falls training/using treadmills)

What do therapists do?

- Content of physio for 76 patients within 364 sessions involving 36 physios
 - hands on facilitation (53%)
 - task specific practice (28%)

Are Bobath therapists assumptions accurate?

Gait Outcome Study (Lennon et al, 2007 cohort study) funded by NICHD/ISA

Walking ability post

Although a high percentage of patients were able to walk following stroke, the majority were unable to walk independently. Walking ability ranged from 0.23 to 1.00 (Lennon et al, 2007).

Therapist assumptions

- weight transference
- more normal movement cycle following outcome
- changes at the level of participation (WHO)

Outcome Measures

- the Motor Assessment Score
- the Modified Ashworth Scale
- Subtests of the Sodrting Motor Evaluation Scale (SMES)
- the Step Test for dynamic standing balance
- a 10 metre walk
- **temporal-distance parameters, joint angles, moments and powers (CODA)**
- the Barthel Index
- the London Handicap Scale

Results

Key changes in the gait cycle

- no change in 11 kinematic variables (A) leg
- peak DF during stance more abnormal on the (UA) leg: 17 degrees (pre) vs 22 (post) ($p=0.051$; Wilcoxon test)
- no change in 8 kinetic variables (moments or powers) (A) leg
- increased hip flexor moment (UA) leg (Sw) -0.41 (Nm/kg; pre) vs -0.62 (Nm/kg; post) ($p=0.028$; Wilcoxon test)

Inaccurate assumptions

- In this study changes occurred in the non-hemiplegic leg, therefore movement of the hemiplegic leg was not becoming more normal

What about making Bobath therapy more task-specific?

The effects of gait retraining in Bobath therapy

(Lennon et al)

Funded by
The R & D Office (NI)

Hypothesis

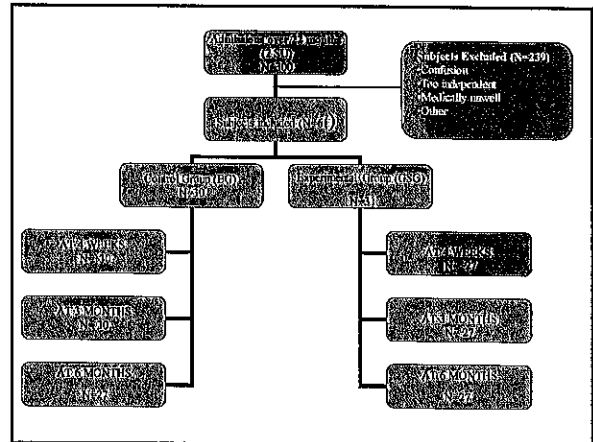
Patients re-education protocol with Bobath therapy will show greater improvements in gait parameters than those trained with Bobath therapy

Methods

- **Patients**
consecutive admissions to 2 stroke centres, able to stand with 2, within 21 days of onset
- **Randomisation**
stratification within each centre (old=73yrs or more; young =72yrs or less)
Motor Assessment Score (severe=13 or less/40; mild=13 or more/40)
- **Therapists**
6/17 therapists for the control group, 11/17 therapists for the experimental group, two sites

Treatment

- 40 minutes per session for 4 weeks
 schedule for each session
 35 activities
 preparation
 facilitated movement
 task specific practice
- BG: therapy according to usual practice
- GSG: usual practice for 50% of
 specific training for 50%.



Baseline Characteristics

N=	GSG (exp) (n=)	BG (control) (n=)
Mean Age (SD)	71.55	72.13
Male/Female	18/13	17/12
Stroke side-L/R	41.9% / 58.1%	46.7 / 53.3%
Mean Barthel	10.10	9.93
Mean MAS	18.32	19.97
Walking speed	0.25 m/sec	0.25 m/sec
First CVA	67.75%	86.7%
Mean time post CVA	10.81 days	10.73 days

Changes from baseline in MAS primary outcome [means (SD)]

	GSG (exp)	BG (control)
MAS		
Change post	8.35 (8.58)	9.37 (6.79)
Change 3 mth	11.71 (10.07)	12.17 (9.55)
Change 6 mth	12.48 (11.01)	13.83 (9.51)

Key Messages

- Clinicians are not always accurate in their assumptions or assessing their own standards
- Physiotherapy=complex intervention (unpack the black box)
 content is important
 need to know the components in the intervention
- Components in the intervention should be:
 task/context-specific/repetitive/meaningful (goal oriented)
- Intervention should not be determined by therapist preference for any named therapy approach
 evidence-based protocols compared to CPT

How should we deliver therapy?

- Evidence-based
 - High intensity
 - Meaningful task practice
- Patients need repeated, challenging practice of functional goal-oriented activities
 (Winstein et al, 2016; Stroke; 47)

How important is intensity?

Patients should undergo as much therapy appropriate to their needs as they are willing and able to tolerate and in the early stages they should receive a minimum of 45 minutes daily of any therapy that is required (NCGS UK, 2012)

- Strong evidence for link between intensity of rehabilitation & amount of recovery (ADL/gait speed- not arm dexterity)
- Teasell et al (2005) Top Stroke Rehab 12 (3): 46-57 discussion paper on timing & intensity Canadian guidelines (see www.ebrsr.com)
- Kwakkel et al (2004) Stroke 35 (11): 2529-2536 MA of 20 papers involving 2688 patients-with minimal additional dose of between 16 hrs and 20 hours (French et al, 2007)
44.5 minutes of PT vs 21.1 minutes of PT

Additional exercise therapy for the recovery of function after stroke (Galvin et al, 2012)

- Systematic review : n=20 RCTs (Galvin et al, 2008)
Increased duration has small significant effect on ADL (SES: 0.13)
- Further research required
use a more focused approach
between 900 minutes -1200 minutes over 4-6 weeks
- recent preliminary searches identified a further 11 studies mainly between 2010-2015

Self-management & Self-efficacy (Jones & Riazi, 2009; Bandura 1997)

Self management : the maintenance of health and well being developing the skills required to cope with disability and change behaviours necessary to resume desired lifestyles (DoH, 2006).

Self efficacy (SE): confidence to succeed
people's beliefs about their capabilities to influence events that affect their lives (Bandura 1997)

Why is Self-Efficacy important? (Jones & Riazi, 2009)

- Beliefs make a difference in how people think, feel & act
- Low SE is associated with depression, anxiety & helplessness
- SE can be strengthened by having opportunities to build skills & confidence

Self management for people post stroke

(Lennon et al, 2013; Clinical Rehabilitation; 27: 867-878)

Methods
A systematic review according to PRISMA guidelines analysed 15 studies involving 1233 stroke survivors

Results

Significant treatment effects in 9 studies

Key Strategies

- info provision
- goal setting (action planning)
- problem-solving
- promotion of self-efficacy


The Bridges Programme
(www.bridgesselfmanagement.org.uk)

- a self-directed but professionally supported workbook to directly focus on enhancing self efficacy in order to improve patients' self management skills (Jones 2005).
- Each section of the workbook specifically targets the sources of self-efficacy researched by Bandura (1977)
- The Stroke Workbook includes:
 - Exclusion Criteria
 - vignettes of 12 stroke survivors
 - a diary section for setting small weekly personal targets.

www.bridges-stroke.org.uk

Key Principles of Bridges
(Jones et al, 2016)

- Problem solving
- Reflection (attributing change to own efforts)
- Goal setting (small steps)
- Accessing resources
- Self-discovery (new ways of doing things)
- Encouraging activity
- Knowledge (about stroke but also about self)



Bridges self-management for stroke survivors in the community:
A feasibility RCT
(n=25)

McKenna S, Lennon S, Glenfield P, Gardner E, Jones F
In collaboration with the SEHSCT Community Stroke Team

REC Reference: 08/NIROI/67 Funded by NICHs (Ref: 2008 103)

1


WHAT DO I DO NOW?

What do I do now?

Remember that it helps to start about two weeks before you start achieving your goals. For example, when target is to go to the bus to get to the shopping centre, the first step is to get to the bus stop.

- Step 1: Open the front door
- Step 2: Walk a short distance outside
- Step 3: Cross the road
- Step 4: Walk to the bus stop
- Step 5: Get on a bus with my partner
- Step 6: Get on a bus on my own
- Target: Go to the shopping centre by bus

Use the following steps to work through the process with your therapist. You will work on each small target and record your progress towards achieving them.



Stroke Survivor Quote

"... tool to help you manage and see your progress because I think if left on your own without the stroke team and Bridges that you wouldn't be able to monitor your progress and see the changes that you do make over that period of weeks and by seeing the changes, the motivation then gets better so that you can get on with life quicker and put the effects of the stroke and see that things can change and improve."

Participant E (Theme 3: Managing progress)

"... I

Top Tips for Rehab Practice

- Provide accurate information-Address unhelpful beliefs & perceptions
- Assess patient treatment expectations & preferences
- Illustrate progress & achievements in an explicit way
- Work out together how progress & achievement was made & sustained
- Emphasize the stroke survivor's contribution
- Set small personal targets
 - What are you going to try and work on? How? When?
- Influence of language- encourage feeling of choice give alternatives
- End on a positive -acknowledge successes however small

Take home messages

1. Therapy should not be delivered on the basis of therapist preferred treatment approach
2. More research on conventional techniques, not on approaches
3. Increase intensity & dose of therapy
4. Focus on behaviour change
enhance self-efficacy & self-management skills

www.wcpt.org/INPA

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<http://preview.tinyurl.com/lw2zr3>

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