

# The Bobath concept today: What does the evidence really tell us?

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## Acknowledgments



Physical Therapy  
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## Speaker Background

- Clinical neurological physiotherapist
- 1996 - 2008
  - Basic & Advanced Bobath instructor (IBITA)
  - Post-graduate Clinical Educator
- Juxtaposition with the Bobath evidence base
- MSc. 2005 - 2010
- PhD 2011 - 2016
  - Post-Doctoral Fellow, Dept of Physical Therapy, University of Toronto

## The Bobath concept today

### Introduction

- Stroke is the leading cause of long-term disability in adults in Canada (Johansen et al., 2006)
- In Canada, the number of people living with stroke is expected to rise significantly (Krueger et al., 2015)
  - 2013 - 405,000
  - 2038 - 726,000
- Stroke mortality is decreasing (Krueger et al., 2015)
- Stroke survivors are living with disabilities (Krueger et al., 2015)
  - 40% moderate to severe impairments (Teasell et al., 2009)
  - 40% limited to no walking ability (Kollen et al., 2006)

## The Bobath concept today

### Introduction

- Neurorehabilitation
  - Optimize recovery, minimize compensations, intensity of practice (Duncan et al., 2002)(Borich et al., 2015)
- Neurorehabilitation research focus - intervention effectiveness, but:
  - Lacking clear theoretical and clinical frameworks for proposed interventions
  - Lack clear descriptions of the clinical reasoning process

Canadian Stroke Strategy (2010); Vaughan-Graham et al. (2015b)

## The Bobath concept today

### Neurorehabilitation Evidence Base

- Quantity and quantification distinguishes EBM (Devich & Murray 2009)
- Provides the Randomized Controlled Trial (RCT) with a privileged position (Devich & Murray 2009)
  - 1990 - 1,925 RCT's in physiotherapy
  - 2011 - 15,293 RCT's in physiotherapy (Costa et al., 2011)
- An RCT can tell us which treatment is better on average, but can not tell us for whom it is better (Jadad & Enkin 2007)
- What should constitute evidence in the Rehabilitation Sciences? (Shaw et al. 2010)

## The Bobath concept today

### Introduction

- Bobath concept
  - Most widely used neuro-rehabilitation approach  
(Vaughan-Graham et al., 2015a)
  - Complex clinical reasoning process  
(Vaughan-Graham et al., 2016)
  - Optimizing movement potential  
(Vaughan-Graham et al., 2017)
- Current evidence base is inconclusive  
(Vaughan-Graham et al., 2015b; Kollen et al., 2009)

## The Bobath concept today

### Scoping Review-Bobath Evidence Base 2007-2012

- To understand the paradox between the evidence base and Bobath clinical practice
- To describe in detail the findings and range of research pertaining to the Bobath concept
- To identify limitations and gaps in the existing literature (Arksey & O'Malley 2005)
- To make recommendations for further research with respect to the Bobath concept

## The Bobath concept today

### Scoping Review - Bobath Evidence Base

#### Conceptual papers (n=14)

|                        |   |
|------------------------|---|
| Purpose                | Bobath is redefined   |
| Bobath operationalized | Posture and movement are inseparable<br>Quality of movement identified as an essential component  |
| Clinical applicability | Movement quality should be a determinant of effectiveness<br>Key aspects of clinical practice identified<br>Sensory input plays a fundamental role in treatment |
| Conclusions            | Facilitation is a skilled aspect of intervention<br>Consideration of Bobath competence required   |

## The Bobath concept today

### Scoping Review - Bobath Evidence Base

#### Intervention studies (n=17)

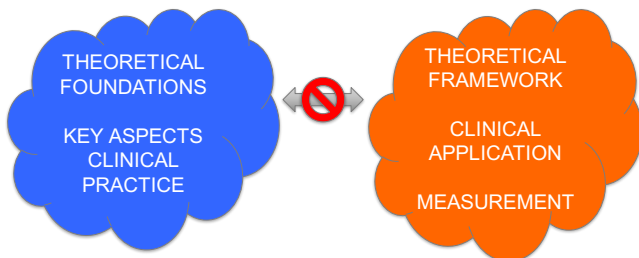
|                           |  |
|---------------------------|--|
| Bobath defined            | Out-dated Bobath sources (n=11)  |
| Study design              | RCT design (n=12)<br>Bobath as control group (n=11)  |
| Population representation | Stroke as study population (n=15)  |
| Study fidelity            | Bobath interventions described (n=0)<br>Identified principles of treatment (n=5)<br>Therapist competence qualified (n=4)<br>Identified intervention supervision and evaluation (n=1) |
| Duration of care          | Short intervention period (2-4 weeks)  |
| Results                   | Focused on impairment and activity measures<br>Inconclusive findings   |

## The Bobath concept today

### Scoping Review - Bobath Evidence Base

#### Conceptual papers

#### Intervention studies



## The Bobath concept today

### Scoping Review - Bobath Evidence Base 2007-2012

#### Limitations of the Evidence (Vaughan-Graham et al., 2015b)

- Comparison groups
  - Bobath as the control in 11 out of 12 intervention studies
- Study fidelity
  - Bobath interventions not operationalized
  - Therapist expertise and adherence not identified
- Duration of care
  - 2 - 4 weeks
- Measurement
  - No consideration of movement performance

## The Bobath concept today Bobath Evidence Base

### Research Gaps

#### Updated Bobath clinical framework

- Understand how Bobath therapists conceptualize movement
  - To explicate movement performance
- Understand the clinical reasoning process
  - To explicate intervention selection

(Vaughan-Graham et al., 2015a & b)

## The Bobath concept today Bobath Clinical Framework

- Modified e-Delphi
  - Web-based survey
- Opinions of experts
  - International Bobath Instructors Training Association (IBITA)
- Series of questionnaires
  - Three survey rounds
- Controlled feedback
  - Survey reports posted following each survey round

Hassan & Keeney (2011); Keeney et al. (2001); Raine (2006)

## The Bobath concept today Bobath Clinical Framework

### Round One

- 7 statements representative of the underlying conceptual framework
- 4 assumptions and 10 principles identifying key aspects of Bobath clinical practice
- 94 of 204 IBITA instructors responded
  - Delphi panel

(Vaughan-Graham & Cott 2016)

## The Bobath concept today Bobath Clinical Framework

### Results Round Three

- 8 statements representative of the underlying conceptual framework
- 3 assumptions and 8 principles identifying key aspects of Bobath clinical practice

(Vaughan-Graham & Cott 2016)

## The Bobath concept today Bobath Clinical Framework

### Discussion

- Movement descriptors  
(Levin et al. 2009; Tyson & Desouza 2003)
- Variability in balance definition  
(Mancini & Horak 2010; Tyson & Connell 2009)
- Task performance  
(Vaughan-Graham et al. 2015a & b; VGraham et al. 2009)
- Interdependence of posture and movement  
(Bobath 1978; Lee & Aruin 2013; Mohapatra et al. 2012)
- Role of sensory information  
(Vaughan-Graham et al. 2015a & b; Nicholls & Holmes 2012; Borich et al. 2015)

(Vaughan-Graham & Cott 2016)

## The Bobath concept today Bobath Clinical Framework

### Movement Descriptors

The Bobath concept seeks to optimize functional independence by:

- (i) potentiating the reacquisition of as close as possible typical motor behavior; and, (ii) minimizing atypical motor behavior(of the more affected body segments/limbs) and compensatory motor behavior(of the less affected body segments/limbs) and thus the development of secondary impairments, whilst recognizing the limitation of the CNS lesion context-based to the individual.(R3)

(Vaughan-Graham & Cott 2016)

## The Bobath concept today Bobath Clinical Framework

### Defining Balance

Within the Bobath concept, balance is viewed as:

- A complex multi-dimensional concept;
- Requiring multi-system integration enabling the planning and execution of movement patterns, postural control strategies, quickly and efficiently in anticipation of, and in response to, destabilizing forces in order to maintain equilibrium; and,
- Is dependent upon the individual's goals and environmental context (R3)

(Vaughan-Graham & Cott 2016)

## The Bobath concept today Bobath Clinical Framework

### Task Performance

A goal of the Bobath concept is to improve movement strategies such that aspects of ease, rhythm, coordination, specificity, variability, repeatability and speed are addressed in task performance (R2)

Movement quality, "how" a client completes a task, should be one determinant of effectiveness of Bobath interventions (R3)

(Vaughan-Graham & Cott 2016)

## The Bobath concept today Bobath Clinical Framework

### Interdependence of Postural Control and Selective Movement

Movement analysis of task performance within a specific environment is viewed by the Bobath concept from the perspective of the integration of posture and movement (R3)

The Bobath concept seeks to achieve integration of trunk and head control with upper and lower limb function to improve the efficiency of functional movement (R3)

(Vaughan-Graham & Cott 2016)

## The Bobath concept today Bobath Clinical Framework

### Role of Sensory Information

Facilitation is the skilled interaction between the therapist, the client and the client's body. Facilitation includes therapeutic handling, manipulation of the environment, task selection, and appropriate use of verbal and non-verbal cues in order to potentiate self-initiation/termination of movement and/or create the necessary conditions for a movement experience that the client can not yet do alone (R3)

(Vaughan-Graham & Cott 2016)

## The Bobath concept today Bobath Evidence Base

### Research Gaps

- Updated Bobath clinical framework
- **Understand how Bobath therapists conceptualize movement**
  - **To explicate movement performance**
- Understand the clinical reasoning process
  - To explicate intervention selection

(Vaughan-Graham et al., 2015a & b)

## The Bobath concept today Conceptualizing Movement & Clinical Reasoning

### Movement

- A core aspect of physiotherapy practice  
(Jull 2013)
- No clear theoretical unifying framework in PT  
(Hislop 1975) (Cott et al. 1995) (Sahrmann 2014)
- How therapists conceptualize movement is integral to clinical reasoning
  - How do therapists solve neurological movement-related problems?
  - Underpins movement diagnosis (Guccione 1991)
  - What aspects of movement performance are important?



## The Bobath concept today

### Conceptualizing Movement & Clinical Reasoning

- Qualitative Approach - Interpretive Description
  - To advance the understanding of experiential, tacit knowledge
- Expert neuro-rehabilitation therapists
  - International Bobath Instructors Training Association (IBITA)
- Four international research locations
  - Video-recorded one clinical session
  - Stimulated recall
  - In-depth interview to explore the IBITA instructors' thinking

Thorne (2008); Thorne et al. (2004); Thorne et al. (1997)

## The Bobath concept today

### Conceptualizing Movement

#### Discussion

- A Humanistic Approach  
(D'Cruz et al. 2016; Cott 2004)
- Active alignment is integral to movement performance  
(Caronni & Cavallari 2009; Aruin 2006)
- Efficient movement requires the relative integration of postural control/stability and selective movement/mobility  
(Muratori et al. 2013; McCrea et al. 2002)

(Vaughan-Graham et al., 2017)

## The Bobath concept today

### Bobath Evidence Base

#### Research Gaps

- Updated Bobath clinical framework
- Understand how Bobath therapists conceptualize movement
  - To explicate movement performance
- Understand the clinical reasoning process
  - To explicate intervention selection

(Vaughan-Graham et al., 2015a & b)

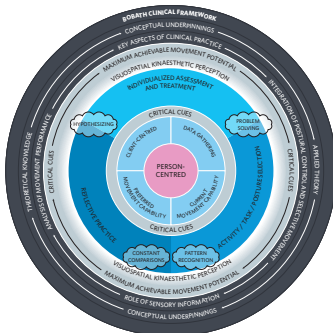
## The Bobath concept today Clinical Reasoning

- Intellectual activity  
(Durning et al. 2013)
- Relevant, reasonable and appropriate  
(Leicht & Dickerson 2002) (Fish & Higgs 2008)
- Difference experts vs. novices clinical reasoning  
(Wainwright et al. 2011)(Loughlin et al. 2012)

## The Bobath concept today Clinical Reasoning

- How do IBITA instructors decide to do what they do?
  - Clinical reasoning models - relatively generic  
(Edwards et al. 2004)
  - Focused on the clinician's cognitive skills  
(Christensen et al. 2008)
- What is the role of tacit knowledge in clinical reasoning? (Michels et al. 2012)
  - Same data set provided an opportunity to gain an understanding of how IBITA instructors make clinical decisions

## The Bobath concept today Clinical Reasoning : Interpretive model



(Vaughan-Graham et al., 2017)

## The Bobath concept today

### Clinical Reasoning

#### Summary

Congruent with contemporary reasoning strategies (Edwards et al. 2004; Durning et al. 2013)

Phronesis (Eikland 2006)

- Intrinsic to praxis, it deliberates
- Enables wise action (Kinsella & Pitman 2012; Michels et al. 2012)

• Visuospatial Kinesthetic Perception (Oberg et al. 2015; Hamdorf & Hall 2000; Schon 1995)

(Vaughan-Graham et al., 2017)

## The Bobath concept today

### Summary of Doctoral studies

- Theoretical concepts invisible in rehabilitation, physiotherapy practice and research
- Bobath Clinical Framework
- Movement conceptualized - integration of postural control and selective movement
- Role of 'Phronesis' in clinical reasoning

## The Bobath concept today

### Research contributions

- Clinician's voice
- First study of IBITA to gain consensus on a conceptual and clinical framework
- Identifies key aspects of Bobath clinical practice guiding future effectiveness studies
- Provides insight into how Bobath clinicians think about movement
- Extends the clinical reasoning knowledge base into the realm of tacit knowledge

## Implications for practice & research

- To interrogate rehabilitation practice
  - Explicate current assumptions and principles
- Role of tacit knowledge
  - Unexplored
  - Clinical skill development
- Understand how therapists make clinical decisions

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## Research Gaps

- How is movement conceptualized in other areas of physiotherapy practice?
  - Are there differences in how manual therapists and neurological therapists conceptualize movement?
- What dimensions of movement are important to therapists and persons with movement problems, and how can they be appropriately measured?
- What is the role of practical wisdom, specifically visuospatial kinesthetic perception, in other areas of physiotherapy practice?
- Is it possible to develop a taxonomy of movement diagnoses that more accurately describe the conditions being treated?

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