The Bobath Concept
– The Past, Present and the Future
Janice Champion

The Bobath Concept
• The aim of this talk
- To look at the history of the Bobath Concept and how it has developed
- To review how current evidence supports our clinical practice of the Bobath Concept
- To look at what the future may hold

The History of the Bobath Concept
• Karel born Berlin 1906, Berta born Berlin 1907
• Karel studied medicine – a family tradition.
• Berta trained at the Anna Hermann School of Gymnastics and Dance, learning about Normal Movement, exercise and relaxation
• Came to London in 1930’s and married in 1941
• Concept “started” in 1945 when asked to see a patient in the Homeopathic Hospital.

The History of the Bobath Concept
• In 1945, Simon Elwes, a famous portrait painter suffered a near-death stroke which paralyzed the right half of both his face and body, including his painting hand. He spent two years in hospital recuperating and receiving treatment from renowned physiotherapist Berta Bobath
  Ref Wikipedia 2010

The History of the Bobath Concept
• Together they developed the Bobath Concept for the treatment of Children with Cerebral Palsy and adults with neurological conditions.
• From 1958, they travelled extensively, teaching and training tutors throughout the world. They both received many honours for their pioneering and innovative work.
• Their clinical practice was the basis for the development of the Concept which represented a fundamental change in the treatments of the time

The History of the Bobath Concept
• 1948 – British Journal of Physical Medicine published “A new treatment of lesions of the upper motor neurone” - Berta’s first publication
• 1957 – the Western Cerebral Palsy Centre opened in London
• The Bobath Centre in Netherhall Gardens opened in 1975. Now based in East Finchley treating children and adults
• They died 20th January 1991 just before their 50th Wedding Anniversary
Clinical Observations

- movement or change in position of proximal limb regions leads to alteration of tone
- treating the leg affects the arm
- automatic postural adjustments precede and form the basis for volitional movement

These observations were explained on the basis of the animal neurophysiology available (Magnus, Sherrington, Walshe)

The Bobath Concept

..is an holistic approach to the treatment of damage to the CNS which has caused a deviation from the “normal” based on:
- analysis of normal movement
- analysis of the deviation from normal
- appropriate use of treatment techniques

IBITA

- In 1983 a small group of experienced Bobath Instructors proposed establishing an International Association to facilitate the development of the Bobath Concept and the delivery of standardized Bobath courses.
- With the approval of the Bobaths the first meeting took place in London in 1984.
- Since 1996 it has been known as IBITA - International Bobath Instructors Training Association
  www.ibita.org

What is the Bobath Concept?

- The Bobath Concept is a problem-solving approach to the assessment and treatment of individuals with disturbances of function, movement and postural control due to a lesion of the central nervous system
  IBITA 2004 Raine 2006
- Analysis of quality of movement is a central theme

The Present

- Developments in the Bobath Concept since the death of Dr and Mrs Bobath have been disseminated through teaching of postgraduate courses worldwide
  .....but little information has been published on the evolving theoretical framework and the subsequent influence on clinical practice (Graham 2009)
  .....this has resulted in lack of clarity regarding the theory behind the concept (Lennon 1996)
  .....and in clinical studies not reflecting the current practice (Brock 2002)
The Past and the Future

Mrs Bobath stated "the Bobath Concept is far-reaching and open, it enables us to go on learning and to follow continuous scientific development"

Bobath 1984

It can be used with individuals of any age, regardless of the severity of the CNS lesion

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The Bobath Concept of Today

- Systems model of motor control
- Neuromuscular plasticity
- Principles of motor learning
- Application of functional human movement

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The Bobath Concept of Today

- The integration of many systems and subsystems produce the required output to achieve the desired function.
- Knowledge of how different areas communicate helps our understanding of the control of movement

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Multiple Systems

- Neurological
  - Tone
  - Co-ordination
  - Weakness
  - Patterns
- Sensory
  - Proprioception
  - Cutaneous sensitivity (discrimination)
  - Visual
  - Vestibular
- Cognitive
  - Attention
  - Orientation
  - Judgement
  - Planning
- Musculoskeletal
  - Muscle length
  - Joint range
  - Strength
  - Age related - changes
- Perceptual
  - Visuospatial
  - Body schema
  - Midline orientation

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Systems model of motor control

- Originally developed by Nikolai Bernstein – The nervous system groups together “degrees of freedom”
  Movement is not purely due to neural activity, but the biomechanics of the body and inter-actions with the environment (Bernstein1967)

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Systems Model of Motor Control

Chiel, H.J. 2009
The Bobath Concept

- The relearning of more efficient functional movement through manipulation of a variety of afferent inputs is the goal of the therapist

> Without information, (sensory input) there is no control, no learning, no change, no improvement.”

- Therapy aims to “utilize afferent input to re-educate the individual’s internal reference systems to enable the person to have more movement choices and greater efficiency of movement”

The Bobath Concept of Today

- Systems model of motor control
- Neuromuscular plasticity
- Principles of motor learning
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Neuromuscular plasticity

- Occurs in response
  - to trauma
  - to changes in the internal and external environment
  - to sensorimotor learning and experience
  
  ....is the reason we treat patients!!!!
Cortical Plasticity

- Animals reared or housed as adults in enriched environments develop more dendritic branching and more synapses/neurons and have higher gene expression for trophic factors than animals housed individually or in small groups in standard cages

  *Johansson 2000*

- Similar changes can be induced during learning

  *Janice Champion 2010*

Effects of Environment on Dendritic Branching  
*Johansson 2000*

- Increased dendritic branching

- Increased number of synapses/neuron

  A = Standard environment

  B = Enriched environment

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Neuromuscular plasticity

- Recovery is an active time-dependent process that includes plasticity and reorganization of brain structures, as well as adaptive changes in musculoskeletal, cardiovascular and respiratory systems

  *Gordon 2005*

Muscular Plasticity

- Occurs in response to
  - Neural pathology
  - Changes in muscle length
  - Changes in muscle use

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  *Janice Champion 2010*

Motor Learning

- Motor learning refers to the permanent change in an individual’s motor performance resulting from practice or intervention

  *Wishart 2000*

- Motor learning principles help therapists identify how to manipulate the individual, the task and the environment to influence the long term neuroplastic changes that will promote motor performance

  *Raine 2009*
**Motor Learning**
- Practice and variability becomes very important
- Motor skill training as opposed to motor activity promotes motor learning-induced structural plasticity, which is reflected by improved functional outcome.

(Biernaskie and Corbett 2001)

**Mrs Bobath said......**
- A passive recipient will never be an active learner and will never get the most out of rehabilitation.
  The active learner needs to be engaged, challenged and involved in meaningful task practice  
  Bobath 1990

**The Bobath Concept of Today**
- Systems model of motor control
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**Clinical Reasoning in Neurorehabilitation**
In order to use a problem solving approach for the treatment of people with neurological disability, it is necessary to have an understanding of the control of movement, the result of damage to different areas of the CNS, neuroplasticity and ways to promote skill learning.

(Mayston 2002)

**Human Movement**
- The impact of the movement dysfunction is unique to the individual and influenced by experiences prior as well as post lesion  
  Graham 2009

Berta Bobath said
‘See what you see , and not what you think you see”

Cited in Schleichkorn 1992 p48
Human Movement

- Postural control – the ability to control the body’s position in space for the dual purposes of stability and orientation. Shumway-Cook and Woollacott 2007
- Postural control and selective movement allow the co-ordination of patterns of movement. Gjelsvik 2008
- Patterns such as walking, reach to grasp, sit to stand etc. give human movement its efficiency and although similar between individuals, are dynamic, changeable and vary in relation to the individual, the environment and the goal.

The Past, Present and the Future

- The development of sound clinical reasoning skills & the use of facilitation techniques is fundamental to the Bobath concept & is based on growing knowledge & experience
  Bobath, 1990

What is facilitation?

- “the use of afferent information to effect improvements in motor performance” Graham 2009
- Part of an active learning process in which the individual is enabled to actively overcome inertia and initiate, continue or complete a functional task
- It allows the patient to experience more efficient movement and success in task achievement – success is required for motor learning

Clinical Practice

- Make it possible (realignment, information)
- Make it necessary (demands)
- Let it happen (activity)

Facilitation

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Clinical Practice

• "........ A whole new way of thinking, observing, interpreting what the patient is doing, then adjusting what we do in the way of techniques - to see and feel what is necessary, possible for them to achieve. We do not teach movements, we make them possible......." (Bobath, 1981)

The Future

• We need to be aware of new technologies and adjuncts to treatment
  - Robotics and computer assisted therapy
  - Strengthening / treadmills
  - Electrical stimulation / FES.
  - Cortical excitation / Transcranial Magnetic stimulation (TMS)

Mental Imagery / Practice

Mental practice –the rehearsal of a task without overt physical activity. Has shown to have a positive learning effect. Useful when limitations of time, energy, or when physical practice outside therapy could be detrimental. Raine 2009

# Efficacy of motor imagery in post-stroke rehabilitation : a systematic review by Andrea Zimmermann-Schlatter et al 2008
Journal of NeuroEngineering and Rehabilitation 5.8
(Can be accessed via BioMed Central)

The Future

The Bobath Concept is as effective as any other therapy. There is no difference between Bobath and other therapies (Barreca 2003; Lincoln 1999; Luke 2004; Paci 2003; van Peppen 2004; Van Vliet 2005)

The Present and the Future

• At present, the Bobath Approach, based on neurophysiological principles, remains probably the most widely used approach in Sweden, Australia and the UK. Pollock 2007

BUT.....we must be proactive

The Future

• As physiotherapists involved in the treatment of movement dysfunction we need ...
  - to be constantly developing our clinical reasoning skills and expanding our knowledge base
  - sharing ideas and developing these ideas into sound research questions
  - to be collaborating with researchers
“the Bobath Concept is unfinished - we hope that it will grow and develop in the years to come”

K Bobath 1986

References


References

- IBITA website – www.ibita.org

References