

# The Bobath Concept anno 2005

The Bobath Concept (see fact box page 9) has kept up with the times and has among other things integrated systems models of motor behaviour into the treatment of people with brain damage.

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Photo Joachim Rode



## Profile

Anne W. Brown has worked with the Bobath Concept for many years. In the article she describes the development there has been within the concept and shows that it also can be used in combination with other treatment methods and principles.

The stroke unit at Hvidovre Hospital receives physiotherapy students from the school in Copenhagen. Several of the students express astonishment when they are presented with the Bobath concept in praxis. They may have heard the name Bobath, but what the concept stands for, is unknown to them. But their attitude quickly becomes: “Why haven’t we learnt about this in school?”

At a Bobath course recently, one of the participants mentioned that a colleague had expressed disbelief at the fact that she bothered participating in a Bobath course “because Bobath was old-fashioned”. The most likely reasons that the Bobath Concept finds itself fighting against the wind, is the lack of evidence of the effect of the concept, the lack of promotion of the concept and the assumption that the concept has not developed.

But the Bobath concept has developed and it is my opinion that it is still a relevant treatment concept.

There are many therapeutic approaches to the treatment of acquired brain damage. The most well known and used nowadays are Shepherd and Carr, Coombes, Affolter and Bobath. Right away let me make it clear, that there is absolutely no evidence that suggests that one concept or programme achieves better results than another. In fact, the reliable trials/projects that have been undertaken so far, suggest that the most essential elements are the intensity of goal oriented and specific physio- and occupational therapy treatment. Furthermore it has been proven to be of importance, that the training takes place in a positive, enriched and dynamic environment where expertise is the key word<sup>1-6</sup>.

What is it then that the Bobath concept has to offer in the treatment of acquired brain damage and what treatment points towards that a therapist is treating according to the Bobath Concept? What is the Bobath Concept?

## Function- and activity level

During recent years there has been a very strong tendency towards training neurological patients directly in activities, most often well known daily activities, but also activities in connection with work assignments and leisure activities. Working with contextual factors, is not new for Bobath therapists. In a video from 1980 Berta Bobath says: “More than ever before, all treatment is done in real life situations with the use of furniture which the patient has in his own home, such as tables, chairs and even walls. In this way the patient learns the all important lesson that what he does in treatment is part of his daily routine and not just a series of exercises.”

The latest knowledge about the significance of cognitive processes in relation to movement<sup>7</sup>, has underlined the importance of training at activity level. Part of this training often takes place in the patients own home, in order to gain the advantage of familiar surroundings to promote problem solving strategies, but also to adjust the learnt activities in the place where they are to be used<sup>8-9</sup>. This is a development, which IBITA (see fact box on page 9) acknowledges the importance of, but still maintains that influencing the patient at body function and structure level can also have its justification.

### International Classification of Function (ICF)

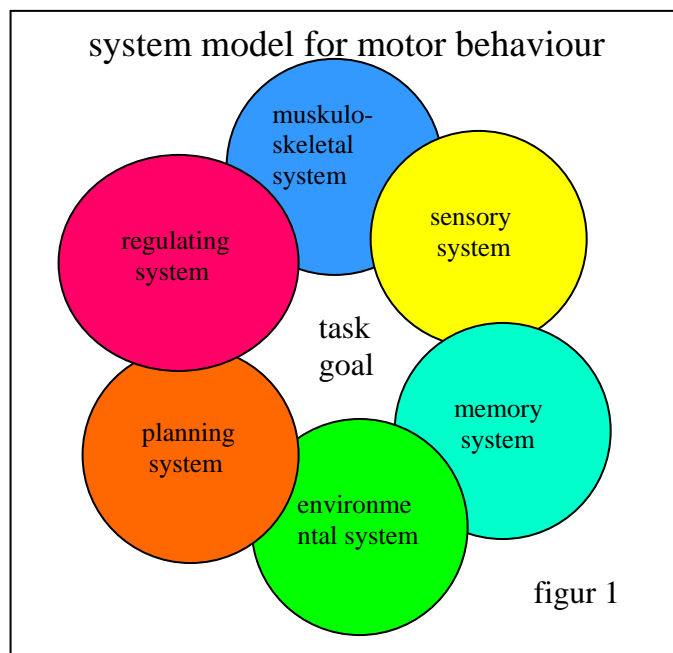
**Body functions** are the physiological functions of the body systems (including psychological functions).

**Body structures** are anatomical parts of the body such as organs, limbs and their components.

**Impairments** are problems in body function or structures such as significant deviation or loss.

**Activity** is the execution of a task or action by an individual.

Output from the brain is dependent on the input. To gain optimal benefit at activity level, for example putting on trousers whilst standing, it is important to influence the different sub-systems, which make up the system model of motor behaviour (figure 1)



Every sub-system has information and these have to be integrated in their entirety in order for the individual to reach the optimal performance for the given task. The therapist makes use of this knowledge, when she for example arranges for the patient to brush his teeth in the bathroom. The thought is that by influencing the “environmental system”,

the task will be executed in a more optimal way. If information is lacking, from for example the environment, the

activity can be carried out, but the movement components are often insufficient for a well-executed task.

In the following case it is illustrated how one can supply useful information to the impaired sensory system, by treating at body function level.

### Case

The goal of the patient MB, is to be able to put on his trousers in a standing position again. Analysis and test of MB’s attempt to carry out the activity, shows that MB has reduced tactile and proprioceptive sense in his affected leg. He prepares for the activity by using his visual sense in order to place the affected foot in a good position on the floor. But when he reaches standing there is more weight on the non-affected leg.

MB can get the affected leg through his trouser leg, but has to make contact with the floor 3-4 times before the foot emerges at the other end of the trouser leg. His movements look clumsy. When the non-affected leg goes into the trouser leg things really go wrong! He tries in several different ways. He feels most secure standing on the affected leg when the knee is completely straight, but then the waist of the trousers is too high up and he cannot get the other leg into the trouser leg. He almost falls over several times during his attempts.

As a Bobath therapist one could choose to treat the impairment at body function level in order to “fill up” the sensory sub-system (figure 1). One could for example use manual sensibilising of the leg, train changes of position in standing and half-standing positions on different surfaces with and without the use of vision and with feedback from MB about his experiences during the different activities. Afterwards it is evaluated whether MB has less problems putting on his trousers in standing by asking him to do the activity again in order to corroborate the effect of the treatment.

## Flexibility

A concept has to be deeply rooted in its foundation if, at the same time, it is to be flexible and make room for other treatment approaches. In the Bobath Concept the welfare of the patient is in focus and therefore other treatments are incorporated if it is to the benefit of the patient. Of course these have to be proven treatments and to have, as far as possible, documentation as to their validity. The following methods are often used in combination with the Bobath Concept: Neurodynamics, Constraint Induced Movement Therapy (CIMT), Body Weight Supported (BWS) treadmill walking, and different principles of learning.

By incorporating other treatment methods and principles the patient is offered a varied and flexible treatment, tailor-made to his needs.

## Case

A 78-year-old woman (KL) has had a minor infarct in the left hemisphere. KL is right handed. Her interests are needlework and crossword puzzles. KL has been using a walker (4 wheeled walking aid) for the last five years due to a not too successful hip operation on the left side.

Her activity problem is, that she cannot walk despite the fact that she has only slightly reduced function in the right lower limb and good trunk control. This is due mostly to lack of strength in, and weight bearing on the left leg as a result of the operation plus increased flexion tonus at the right elbow, wrist and fingers, with the result that KL cannot reach the walker handgrip, cannot hold on to it or take weight through her right arm.

KL has beginning function around the right shoulder, scapula and associated trunk muscles. If KL could support herself with both hands on the walker to relieve the weight on her legs, she would be able to walk short distances around the house.

## Treatment

The Bobath therapist works with weight bearing on the right arm at a table. KL is asked to move her trunk whilst the right arm stays on the table. The goal is to increase muscle function, stability and selectivity around the right shoulder joint, scapula and trunk. Stretching and mobilising the muscles is carried out, but for KL the most effective intervention, is mobilising of the nerve tissues so that neurodynamics can be improved and KL gradually gains full movement in the right elbow, wrist and fingers.

To take advantage of the achieved results from the improved neurodynamics at activity level, the therapist works with selective movements of the upper limb and trunk in different starting positions and different forms of push/hold again activities are practised. KL carries out a short self-practice programme, based on neurodynamics, several times a day. Furthermore activities such as setting the table and table noughts and crosses are used.

To start with KL is facilitated during these activities. Weight bearing on the hand and arm are included in all changes of position, transfer situations and activities requiring an increase in KL's base of support (e.g. taking cups from a high kitchen shelf, making her bed).

## **Result**

Despite lacking fine motor skills in the right hand and fingers, KL was, at the end of her rehabilitation programme, able to hold on to and support herself with the walker with both hands, she managed to walk short distances in her own home and was independent in toilet visits by supporting the back of her legs on the toilet bowl. KL feels that the right leg is now stronger and she has more confidence that she can take care of herself in everyday life. KL continues with her self-practice programme, as she feels it prevents a build up of tension in her right arm.

## **Teamwork**

No one working in neurorehabilitation can be in doubt as to the significance of the physiotherapist on the treatment team, but no one healthcare professional group alone, can lead the patient to an optimal outcome. Although earlier there always was a degree of communication between the healthcare staff groups and the family of the patient, it was not until the 1980's that actual teamwork was begun.

The idea of bringing the 24-hour day into the rehabilitation effort and thereby concretizing cooperation with other staff groups and the family, can be attributed to Bobath instructor Patricia Davies. In the Bobath Concept teamwork is highly valued, but in order for it to work, it has to be based on strong mono-professional expertise from all the healthcare staff groups.

The development of teamwork means that every professional on the team and the patient as a team player, work toward a joint goal. With their specialized knowledge, each staff group can instruct in appropriate support functions related to the goal. All staff groups around the patient carry out their tasks in order to achieve the goal, but each group have knowledge of and understanding for the work of the rest of the team in order to coordinate the mono-professional approaches. Teamwork must not be understood to be that different professionals groups can carry out each others specific tasks.

## **Case**

A 48-year-old man (GP) with a right-sided insult, 14 weeks after debut. GP is a storage worker and would like to return to work.

GP has extra personal spatial disturbances (which are decreasing), poor memory, reduced tactile and proprioceptive sense in his left foot, left hand and fingers. He lacks alignment of the body during gait and is generally in a poor state of physical fitness.

The team goal is that GP walks to the kiosk every day unattended to buy agreed items and delivers them to co-patients and staff members. It is a distance of 600 meters in a busy traffic, but protected area.

GP has just overcome his difficulties with swallowing and his PEG (percutane endoscopic gastrostomi) probe has been removed. The carers register how much GP eats. It turns out that because of loss of appetite GP does not reach the expected intake of energy per os and his Body Mass Index (BMI) falls quickly. His diet is altered and the dietician urges the family to prepare GP's favourite meals for dinner when possible. The Bobath therapists restructure the treatment program for the week, so that it is less strenuous and change the treatment times, so GP can rest in between.

The carers report back when GP's appetite increases and he again takes a sufficient amount of energy per os. The physical and cognitive demands on the patient can then be increased.

## Compensation strategies and learning

To compensate for a weakness or an injury is sensible. It is a strategy which healthy people would resort to at once, when for example it is necessary to keep on walking on a foot with a blister. After a stroke, activities and movement are mostly impossible without the patient compensating in one way or another. For stroke patients, these compensations can be conscious or unconscious to themselves, but all in all it is a good sign if the patient has a compensation strategy instead of not trying out his “new” body.

It is very important for the Bobath Concept that compensation strategies are not forbidden, but that they are instead limited and controlled. Unfortunately this has often been the source of misunderstandings and it has been thought that the Bobath Concept meant, that a patient should for example remain sitting, if he could not walk properly.

The experienced Bobath therapist distinguishes between the type and the degree of compensation and the patient’s ability to integrate what the instructor teaches. The patient continuing the activity, after the therapist has taken her hands away always follows up a hands-on intervention. Often it is about getting a more optimal alignment in the body or in a relevant part of the body, depending on the type of activity. It could for example be the therapist attempting to position the affected hip over the foot with her hands, in order to attain an optimal alignment in the mid-stance phase of gait. The therapist’s hands-on, is an important tool whilst working with a patient. Hands-on gives the physiotherapist direct feedback when she models the patient and the therapist can use this feedback in her continuing evaluation of the patient’s resources and his learning potential.

### Hands-on

Hands-on is used in the Bobath Concept, not to improve the patient’s performance, but to help the patient to learn, through a more optimal performance.

The idea behind hands-on, is that by limiting and controlling movement components in an activity, the brain is offered a different input compared to the components of the compensation strategies. This can have the effect that the brain as an output chooses a more optimal strategy. This guiding of an activity is in the Bobath Concept often called facilitating, because this term also includes the more indirect guiding of activities, which occurs when the physiotherapist structures the environment.

The goal of facilitating/guiding is for the patient to use a suitable physical or cognitive strategy which he has difficulty with. The brain then encodes this strategy in neuronal networks as a possible alternative problem solving strategy, in order to carry out a given activity. By facilitating/guiding, Bobath therapists aim to encourage the patient to form hypotheses, learn and take over the activity.

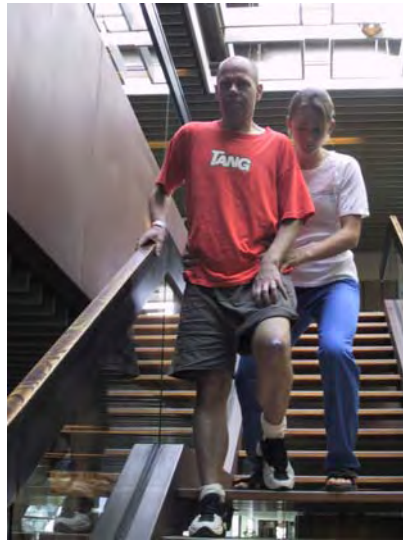
### Lack of evidence

Unfortunately there are no studies, which either repudiate or confirm the effect of facilitating/guiding. Berta Bobath developed her concept at a time when empirical knowledge was accepted and since then no therapist has taken facilitating/guiding up to closer scientific scrutiny.

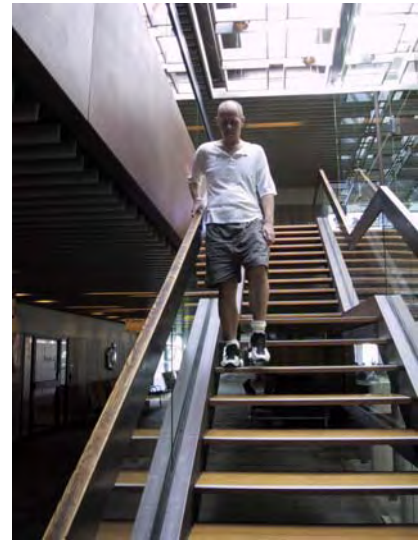
According to the Bobath Concept, compensation strategies do not necessarily restrict the brain’s plasticity in connection with recovery of function and reorganization after damage. But the theory is that as long as the compensation strategies are not limited and controlled, they will be encoded in the brain as the preferred movement strategies and this would be inappropriate if the patient still has the potential to learn to move with variation and more economically. There is no concrete evidence for this to date, but neurophysiological research has shown that in cortical reorganization after a lesion in the brain, there is competition for the reduced neuronal space<sup>10</sup>. The body parts, which are most active, take up more of the space in the cortex. This makes it more difficult for the less able parts of the body to gain neural space in the cortex without considerable help in the beginning.



*The patients own strategy on the stairs works, but is uneconomical and noticeable.*



*The patient is facilitated to a more appropriate alignment for the task (hands-on).  
(The therapists position takes consideration for the photographer)*



*The patient has learnt a new strategy for walking on stairs.*

## **New knowledge from the field of psychology**

In 2003 the Dutch clinical psychologist Theo Mulder gave two lectures in Denmark. In connection with these he mentioned that it is well known from psychology studies, that what you hear at the beginning and at the end of, for example a lecture, is what one remembers best. He does not think that it is impossible<sup>11</sup> that the same applies in connection with learning movement - the movements you learn first, are the ones you remember best. These thoughts fit in well with the Bobath Concepts viewpoint regarding compensation strategies. What is learnt first is learnt best and can be difficult to change. On the other hand if a therapist intervenes, with for example hands-on to help the patient to learn and thereafter with hands-off so the patient can take over, there will be an element of learning, at the beginning and at the end

Another psychologist with interest in memory and learning, Barbara Wilson from Cambridge in England, has for several years tested the ability of people with brain damage to remember names and faces. It transpired that people with brain damage learn the correct names and faces if they are limited in their possibilities of failing<sup>12-13</sup>. If they make mistakes, they often remember the mistakes and it becomes more difficult to learn what is correct.

The question is whether hands-on treatment can be seen as an attempt at “errorless” learning (see photos above).

Bobath therapists are aware that the patients ability to learn, has to be seen in relation to the costs of the physical and cognitive control of an activity and that this aspect has to be taken into consideration. Intervention often presses the patient to his limits for at least part of the training session, but help must be given when needed. “Overloading” does not promote learning. (See example in following box.)

### **Learning, old habits or overloading?**

Imagine that you are badminton player, who has learnt to play without ever having had any instruction. You play doubles with friends once a week, just for fun – but it is nice not to lose all the sets! You are more or less as good as each other, but your weak point, is your backhand. Only four out of ten shuttlecocks go over the net.

One evening an “old master” on the court beside you, shows you how to hold the racquet and position your body for making the shot, so your backhand is more correct.

During the game you try, but it is a little strenuous remembering to adjust your grip every time and turn your body, so as the game goes on you don't think the new technique helps you very much. Now you only get two out of ten backhands over the net!!

You and your partner have lost the first three sets, so you revert to your old backhand. It feels good; the next two sets are yours and your honour intact!

But your chance to learn to play more correctly, economically and develop your technique has been lost.

Is this a question of old habits winning the day, or an inappropriate learning situation?

### **That the patient learns for himself**

New knowledge in neurophysiology and movement science suggests that the brain works according to a system-, or process oriented model of motor behaviour. The Bobath Concepts assessment and treatment of the patient anno 2005 has its background in these new theories just as all other therapeutic neurorehabilitation methods or programmes of today.

Starting with an analysis of the patients physical, cognitive, socio-cultural resources and his problem solving strategies, the Bobath therapist decides whether her approach will be to build up the patient for the activity, adjust the patient's performance in the activity or allow the patient to experiment in safe surroundings. It may be that the therapist will choose to change between all three possibilities during the training session, depending on the activity and the patient's capacity at the given time.

Should it be hands-on or hands-off? The art is to find the correct dosage for the patient and the therapist, but the goal is always that the patient learns to act in varied ways, to reflect on his performance and make use of his resources in an optimal way.

### **Conclusion - research and cooperation in the future**

There is perhaps at this moment no overwhelming evidence to corroborate the Bobath Concepts viewpoint in regard to compensation strategies, but there is already some evidence from both neurophysiology and psychology, which supports the praxis of limiting compensation strategies. The further development of Muelbacher, Mulder and Wilsons work will be followed with great interest by IBITA instructors.

As referred to in the fact box on page 9, the structure of the organization of IBITA opens many possibilities to develop the Bobath Concept at a professionally high standard. The members of IBITA can pass this knowledge on to the therapists who participate in the courses and in this way are involved in the quality assurance of the concept.

IBITA has not yet succeeded in passing on the development of the Bobath Concept to a broader group of professionals. Researchers from many parts of the world often use citations from Bobath books and articles, which are 40 years old. Therefore unsound conclusions are often drawn about the treatment possibilities within the concept<sup>14</sup>.

Therapists who have learnt about the concept many years ago often do not have colleagues who have participated in a recent course who can tell them about the development of the concept based on new knowledge.

IBITA instructors have written books and articles and have participated in research, but often one only finds out about this, if one participates in a Bobath basic or advanced course or in another way gains knowledge of the IBITA website.

There are many subjects within neurorehabilitation, which researchers could address themselves to and I hope that newly educated Bobath instructors, particularly those within the Nordic Bobath group, will work together with researchers in the coming years, on projects which will lead to a new understanding of this field of physiotherapy intervention.

### Fact Box – The Bobath Concept

The Bobath Concept saw the light of day in the 1940`ties. Berta Busse, who at that point was a physical education teacher, but later became a physiotherapist, developed the fundament for the concept. In London she met doctor Karel Bobath. They were married and until their death in 1991 the couple worked together with the treatment of children and adults with brain damage. Besides this, they communicated their theoretical and practical knowledge to other health professionals throughout the world.

The Bobath Concept developed in the years where the hierarchical model of motor control was in force. All forms of increased tone were at that time regarded as spasticity and normalising tone was thought to be of the greatest importance. Because Berta Bobath discovered that she could influence spasticity, reducing spasticity became one of the major factors of the Bobath Concept. Later, Berta Bobath realised that that she had over interpreted the importance of treatment to reduce spasticity. Unfortunately it took quite some time before therapists throughout the world, educated in the Bobath Concept also reached this understanding.

Towards the end of the 20<sup>th</sup> century neurophysiological knowledge pointed more and more towards findings, which suggested that there could be many different causes of increased tone and that increased tone was not necessarily spasticity. It is very probably that the “spasticity” Berta Bobath influenced, was increased tone based on somato-sensory and cognitive disturbances or on secondary muscle and nerve changes. Therefore in the IBITA definition of the Bobath Concept the position of the word tone fell gradually and was at last removed. Today the definition of the Bobath Concept is as follows: “The Bobath Concept is a problem solving approach to the assessment and treatment of individuals with disturbances in function, movement and postural control, due to a lesion of the central nerve system (CNS).”

The word concept means ideas, notions or thoughts. Therefore it is understood that a concept makes room for changes and development, as opposed to principles, programmes and methods. This very flexibility allows the foundation to be built upon and grow, which strengthens and develops the concept.

### **The International Bobath Instructors Training Association (IBITA)**

The aim of the association is to quality assure patient treatment, partly through the standard of education of instructors and course participants and partly through passing on of information regarding new developments in the neurological field of rehabilitation. For further information about IBITA contact [www.ibita.org](http://www.ibita.org)

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