

Intensive Therapy

1. Introduction: Short Explanation of Intensive Therapy

Intensive Therapy is a form of outpatient therapy in block format. It is a highly efficient therapy for the rehabilitation of people with motor dysfunctions caused by brain damage, e.g. following a stroke or a traumatic brain injury. Intensive Therapy is based on theories of the neuroplasticity of the brain and its ability for structural and functional reorganisation. The aim of Intensive Therapy is to restore the patients' independence and to help them to rapidly improve their quality of living.

Already decades ago, research by Edward Taub demonstrated that it is at least partially possible for adjacent brain regions to take over functions of lesioned brain areas. This directly results in functional improvement of the affected extremities. To achieve this, relevant movements have to be re-learned by the affected side. This is done through highly intensive repetition of those movements. The therapy concept we use in the Segeten Neurorehab was developed by Jan Utley and Susan Woll in the late Nineties (see attachment 2). The treatment form is mainly based on two theories: Firstly, the Bobath Concept, a concept which has been successfully used worldwide in therapeutic and nursing areas for the rehabilitation of people with a brain injury. Secondly, "Forced Use" Therapy, which "forces" patients to use their affected extremities by immobilising the unaffected ones (see attachment 2).

Katarina Cobbaert-Hedlund, Marta González

1.a) Principal Features of Intensive Therapy

- Each patient is treated individually for six hours a day by the same therapist
- Targeted stimulation of the affected side
- Prevention of over-compensation by the unaffected or less affected side
- Repetitive training over an extended period of time
- Continual increase in difficulty
- Functional and task oriented
- Adapted to the needs of the affected person

1. b) Primary Advantages of Intensive Therapy

- Maximum therapy success in a relatively short period of time
- Patients can immediately apply what they have learned to their everyday lives and in the comfort of their own homes
- With steadily increasing progress, help from home care and relatives can be reduced faster
- From recovered independence, patients will gain more confidence and enjoy an augmented quality of living
- Individual initiative and responsibility are trained
- Follow-up tests prove that the positive effect lasts months after having completed the therapy
- Long term cost reduction for health insurance companies

2. A Portrait of our Therapy

Our therapy follows a fixed structure, which we've formulated and fine-tuned based on years of experience. It is carried out in a treatment block of ten days. The first five days are always followed by a two day break. This treatment rhythm has proven to be the most successful rhythm for our patients thus far. Individual needs are of course also addressed. The patient is treated for six hours a day by the same therapist (in the case of serious motor dysfunction by two therapists). Lunch is included as part of the therapy.

2. a) Analysis of Motor Functions and Potentials

Directly before and after each training block, a motor function test – a modified "Wolf Motor Function Test" (see attachment 2) – is carried out. The motor functions are analysed in relation to quality and quantity of movement. Potential and shortcomings are both identified and a training program is defined. This test is adapted to each

patient and is documented on video. At the end of the therapy block, it is repeated for assessment purposes.

Additionally, physiotherapy findings are compiled to identify the primary motor problem and its consequences in all other body segments. The range of motion of all joints is checked, as good mobility is a prerequisite for active movement.

Based on the results of these tests, patient and therapist (sometimes including the relatives) will formulate a functional goal: cleaning teeth while standing, brushing hair, pouring water, climbing steps, operating the computer, playing golf. A specific functional goal is important to integrate the skills learned in therapy into every day life and to fix the learning process.

2. b) Treatment Strategy

Contingent upon the findings, stiffness in the upper extremities, the lower extremities and in the trunk are treated. Causes for movement restriction are immobility and learned non use (see attachment 2). Techniques from manual therapy are used - adjusted joint and neurodynamic mobilisations, which take into account the special needs of the neurological patient.

Then, the main motor problem is treated, e.g. a hip or trunk instability. The treatment situation does not allow the patient to overcompensate with his or her unaffected side when carrying out the activities – the patient has to use his or her affected side. The postural control of the patient is encouraged. Certain movement sequences, which are important for everyday activities are facilitated. All body segments, in particular the shoulder girdle, are integrated in as many activities as possible.

These measures are necessary to optimize the patient's preparation for the intensive repetitive training that is to follow (Massed Practice). The term Massed Practice describes the intensive, repeated practice of a certain activity over an extended period of time. Based on the motor analysis (WMFT) and the personal functional goal of the patient, the missing movement components will be practiced selectively, both unilaterally and bilaterally. The difficulty level of the motor tasks is increased gradually, to the greatest extent possible, until the therapy goal is achieved.

Eating and drinking are integrated into the therapy program. The therapist facilitates e.g. holding cutlery or a glass, cutting with a knife, eating with the affected hand and bimanually, pouring water, etc. During all of these activities, a proper sitting position is ensured.

In order to improve the patient's confidence in the affected side, so that it's used more in everyday life and to document the progress of the therapy, the motor activities of the patient are evaluated daily with the help of a standardised questionnaire (MAL "Movement Amount Log", see attachment 2), which records the subjective quantity and quality of the patient use of the affected side.

At the end of the treatment day, a home program is defined and should be carried out the same day so that the patient can stabilise the new movement sequences initiated and worked on during the day and learn to automate them over time.

3. Who is Intensive Therapy Suitable for?

Intensive Therapy is suitable for individuals with a motor disturbance following a brain injury due to a stroke, traumatic brain injury or cerebral palsy, independent of age, extent of the injury and time of the injury.

While related therapy methods (e.g. CIMT, "Constraint Induced Movement Therapy") apply very strict entry requirements and only accept patients with defined motor skills and those with advanced "learned non use behaviour" (which excludes the majority of patients with hemiparesis), Intensive Therapy at the Segeten Neurorehab reaches many more patients, including those with little or no motor functions in the affected body segments.

We can apply our treatment strategy immediately following the brain injury, as long as the patient is medically stable, in order to activate the affected side early on. The immediate commencement of treatment has the major advantage of preventing the patient from forming any compensation strategies and therefore developing "learned non use" practices (see attachment 2 "learned non use"). As the neuroplasticity of the brain does not have a "time limit", patients whose brain injuries occurred years ago and who are therefore in the chronic phase can also benefit from Intensive Therapy.

The only requirements patients must fulfill for Intensive Therapy with us are motivation and sufficient cognitive skills. We also require understanding and co-operation of their relatives.

4. What are the Major Advantages of Outpatient Intensive Therapy at the Segeten Neurorehab?

- **Maximum encouragement results in the best possible recovery of movement ability:**

At the Segeten Neurorehab, each patient is treated individually six hours a day by the same therapist in order for the therapist to design an optimum treatment strategy, react flexibly to the needs of the patient and sustainably influence her or his day to day behaviour.

The therapy is therefore more intensive and successful (better control, no time loss during transport or patient handover, etc.) Additionally, compensations can be corrected immediately due to the permanent presence of the therapist.

- **Better quality of living for the patients:**

At home, the patient is in a place that she or he is familiar with. In a familiar environment and in the proximity of relatives and friends, the chances of a better and faster rehabilitation increase significantly. The newly learned skills can immediately be applied to everyday life.

- **Cost reduction for health care:**

If the patient is already medically stable and independent enough in the acute phase to be allowed to return home, a load is taken from the rehab clinic. During the chronic phase, Intensive Therapy can replace an inpatient stay in at a rehab clinic.

5. How do we go on after Intensive Therapy?

In order to fix and further develop the progress achieved and automate the new functions, we recommend the continuation of regular weekly therapy. The patient will also receive a home program, which not only includes movement exercises, but also functional tasks such as taking the newspaper out of the letter box with the affected hand or emptying the dishwasher. With increasing independence, the weekly therapy can be reduced gradually. In order to continue developing the motor functions achieved during the Intensive-Therapy, Segeten Neurorehab has a supervised "Massed Practice" program in small groups. Training in a group with other patients in the same situation, also helps the concerned person to keep her/his motivation.

Attachment 1: About us

Katarina Cobbaert-Hedlund (see attachment for extensive CV) completed her training as a qualified physiotherapist in Sweden. Together with her husband Bernard Cobbaert, she founded Segeten Physiotherapy, Reha and Sport in 1994. In 2009, she initiated Segeten Neurorehab. Previously and among other positions, she was head of physiotherapy at the Neurological Rehabilitation Clinic in Leukerbad (CH), studied and worked at the Californian "Kaiser Permanente Medical Center - Neurological Rehabilitation Center" (USA) and was a lecturer at the academy of "Physiotherapy Thim van der Laan" (Landquart/CH). Katarina Cobbaert regularly engages in further training in Switzerland and abroad. Since 2003 she has been partaking in professional training with Susan Woll and Jan Utley.

Marta González Ginovés (see attachment for extensive CV) completed her training as a qualified physiotherapist in Spain. In 1998, she completed the Bobath basic course with S. Woll and J. Utley. Since then, she has regularly assisted in and translated their courses and continually partakes in further training. In 2002, she took part in the “Forced Use” research project under the guidance of S. Woll and J. Utley (Los Angeles/USA). She has worked in various rehab clinics and hospitals, both in Switzerland and in Spain, primarily in the area of neurology. Since 2005, she has worked independently as a physiotherapist practising Intensive Therapy, first in her own neurophysiotherapy practice, and since 2008 at the Segeten Neurorehab.

Segeten Physiotherapie – Reha – Sport

Segeten Physiotherapy - Reha - Sport, where neurorehabilitation occupies an important place, was founded in Zürich Witikon (district 7) in 1994. In 2009, the accompanying Segeten Neurorehab was officially opened. The practice premises are generous, wheelchair accessible and fitted with state of the art technology. The practice also has a swimming pool and a fitness centre for medical training therapy.

Thanks to our excellent location in a quiet district, we can teach everyday situations such as shopping, using public transport and various leisure activities.

Segeten Physiotherapy - Reha - Sport is integrated in the residence, Tertianum Segeten at Carl Spitteler-Strasse. Its perfect infrastructure, e.g. a restaurant and common rooms, is also available to our patients. The practice is easily accessible via public transport; parking spaces are available.

Attachment 2: Term Definitions

The Bobath Concept is a worldwide concept for the rehabilitation of people with brain injuries. It is used successfully in all therapeutic and nursing sectors (Wikipedia). This form of therapy serves to improve everyday activities by facilitating physiological movement sequences. In this way the posture control of the patients is encouraged and specific functional movements are supported and influenced.

“Forced Use” is a method in which the hand, together with the whole upper extremity of the less affected side, is firmly fixed. The patient is forced to use the affected part of his or her body to carry out the specified movement exercises. With the affected hand or the affected arm, certain activities and exercises will be carried out over a longer period of time. The aim of this intensive, repeated practice is to activate the neurological structures that are still available.

Wolf Motor Function Test, WMFT: The WMFT was developed by Wolf (Wolf et al., 1989) and modified by Taub (Taub et al., 1993). It consists of 19 tasks (functional activities) for the upper extremities. The patient is allowed two minutes to carry out each activity. Each task is evaluated according to both quality and quantity of the movements. ("Behandlung motorischer Störungen nach Schlaganfall - Die Taubsche Bewegungsinduktionstherapie" [Treatment of motor disturbances after a stroke - The Taub movement induction therapy] - H. Bauder, E. Taub, W. Miltner).

We use this test with additional modifications: The activities are carried out in a standing or perching position, as 80% of arm functions take place in an upright position. As our Intensive Therapy is open to a wide range of patients, even those with little or no activity in the upper extremities, we adjust the task to each patient so that we can gain the best possible information from the test.

We want to know exactly what the patient is able to perform - and not just what she or he isn't able to do.

Learned non use: Taub (1980) was the first person to use the formulation "learned non use" to describe the fact that the hemiparetic patient learns to carry out most performances of daily life with her or his healthy arm in the early phase of brain injury. Consequently the patient no longer uses the affected arm, even after partial or significant recovery of function.

The motor activity log (MAL) is a questionnaire developed by Taub (Taub et al. 1993). It records the extent of use of the affected arm in everyday life. It is an important instrument to estimate whether the patient succeeds in transferring new movement sequences acquired during therapy into his or her everyday world. The individual tasks include both uni- and bilateral activities that are carried out several times a day (e.g. drinking out of a glass or putting on trousers). The test is carried out as a structured interview and the patients are requested to estimate the functionality and / or quality of movement (QOM) and the amount of use (AOU) in their affected arm in everyday life using scales.

Jan Utley & Susan Woll: Jan Utley and Susan Woll are IBITA (International Bobath Instructor and Tutor in Adult Hemiplegia) instructors. They worked with Karel and Berta Bobath in the Seventies and Eighties. Together, Jan Utley and Susan Woll have developed a methodology for the therapeutic use of "Forced Use Management Strategies"

for patients with minimal function in the affected extremities. They are presently leading a school for neurorehabilitation in Pforzheim (D) where therapists are trained in Bobath basic and advanced courses as well as in Forced Use. Utley and Woll also lead "Forced Use Specialist Training" in the training centre "RehaStudy" (Bad Zurzach/CH) for therapists who already have an in depth knowledge of neurorehabilitation.

Attachment 3: References

As there are many articles on this topic. We have listed a selection of the most important publications. The literature list is not exhaustive. Of course we would be happy to inform you about further literature if you are interested.

The list is in order of content relevance.

- Research in the Clinical Application of Forced Use:
Jan Utley, Susan P. Woll, Los Angeles, 2002
- Forced Use – A Handling Strategy:
Susan P. Woll, Jan Utley, 2001
- Gedanken zur Wiederherstellung von Bewegungskontrolle:
Beth Fischer, Susan P. Woll, 1997
- Behandlung motorischer Störungen nach Schlaganfall - Die Taubsche Bewegungsinduktionstherapie:
Heike Bauder / Edward Taub / Wolfgang H.R Miltner, 2001
- Effectiveness of sensory and motor rehabilitation of the upper limb following the principles of Neuroplasticity: Patients stable poststroke:
Nancy Byl, Jennifer Roderick, Olfat Mohamed, Monica Hanny, Josh Kotler, Amy Smith, Molly Tang and Gary Abrams: Neurorehabilitation and Neural Repair 17(3); 2003
- Constraint-Induced Movement Therapy Results in Increased Motor Map Area in subjects 3 to 9 months after Stroke:
Lumy Sawaki, MD, PhD; Andrew J. Butler, PhD, MPT; Leng, MD, PhD; Peter A. Wassenaar, MS; Yousef M. Mohammad, MD; Sarah Nichols-Larsen, PhD, PT; Steven L. Wolf, PhD, PT, FAPTA; David C. Good, MD; and George F. Wittenberg, MD, PhD: Neurorehabilitation and Neural Repair 22(5); 2008

- Treatment-Induced Cortical Reorganization after stroke in Humans:
Joachim Liepert, MD; Heike Bauder, PhD; Wolfgang H.R. Miltner, PhD; Edward Taub, PhD; Cornelius Weiler, MD. Stroke 2000; 31:1210
- Modified Constraint-Induced Therapy after subacute Stroke: A preliminary Study:
Stephen J. Page, SueAnn Sisto, Mark V. Johnston, Peter Levin. Neurorehabilitation and Neural Repair 16(3); 2002
- Beeinflusst die kortikospinale (Re-)Organisation bei unilateraler Zerebralparese das Ansprechen auf Constraint-Induced Movement Therapy?
S. Ney, C. Raabe, U. Breuer, A. Laage-Gaup, U. Michaelis, S. Oswald, J. Schäfer, K. Schäfer, S. Stein, N. Kuhnke, S. Berweck, V. Mall, M. Staudt: Physioscience 2010; 6: 53-57
- Gruppentherapie im Armlabor für den schwer und mässig betroffenen Arm nach Schlaganfall: Akzeptanz, Auslastung und erste klinische Ergebnisse:
R. Buschfort, A. Hess, M. Breit, C. Werner, S. Hesse: Neurologie & Rehabilitation 6-2009
- Constraint-induced movement therapy: bridging from the primate laboratory to the stroke rehabilitation laboratory:
Taub E., Uswatte G.: J Rehabil Med 2003 (41 Suppl): 34-40
- Placebo-controlled trial of constraint-induced movement therapy for upper extremity after stroke:
Taub E., Uswatte G., King DK., Morris D., Crago, Chatterjee A.A: Stroke. 2006; 37:1045-1049