Introduction to the Conference

Different Approaches in Neurorehabilitation and their Impact on Clinical Improvements of Neurological Patients

Neurorehabilitation has potential to restore and maximise recovery (trough influence positive, adaptive changes in the CNS) and as such provides an opportunity for maintaining and even facilitating improvement of clinical functions and quality of life. The aim of the conference is to inform health professional about different approaches in neurorehabilitation as a restorative and scientific approach to the people with neurological dysfunctions based on evidence from neuro- and rehabilitation science. There is a great variety of techniques and conceptual treatment methods applied in the clinical field. All methods have in common that they apply internal and external stimuli to achieve better movement, with the aim of improving activities of daily living. The facilitation approach puts the accent on manual application of stimuli (by proprioceptive and exteroceptive stimulation, in Bobath concept e. g. by so called handling, in Vojta reflex locomotion by stimulating of so called initiation zones in precisely-defined positions) with the aim to facilitate and improve a given motor function, movement pattern or to start a locomotion program, while the quality of execution is carefully controlled. The task-oriented approach makes use of mainly behavioural requests and a patient learns by repeating a given specific task in different environments/under different conditions. The ability to carry out a specific task may be more important than the quality of the execution. An understanding of the context in which physical therapy interventions are provided, may help to develop and advocate an evidence-based therapy.

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Rasova K, Martinkova P, Pavlikova M, et al. Physical therapy provision in multiple sclerosis across Europe: a regional lottery? Eur J Phy Rehabil Med 2015;51(6):850–2.

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Early Neurorehabilitation

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The number of patients with severe brain damage is increasing as the demographic reasons and because of the considerable progress in urgent intensive medical care. Patients with severe, previously fatal, brain damage, often survive, but often with serious functional consequences. Complex neurorehabilitation begins already in the acute phase of disease and neurorehabilitation continues in special centers until the time it is possible to realize the treatment in a domestic environment. This ensures continuity and quality of rehabilitation process in terms of the rehabilitation chain. Variety of neurological deficits and their level of severity is very broad and requires a complex individual and professional approach. Early neurorehabilitation, which begins on neurological and neurosurgical intensive care unit (intensive care units), is an integral part of the therapy and accompanies the patient from the acute phase of the disease. The aim is to promote spontaneous healing, prevention of early and late complications, intensive use and the ability to regenerate brain plasticity. The therapeutic program is primarily focused on existing deficits with regard to the possibility of the current individual load. Initial forms of medical and nursing rehabilitation includes in addition to medical treatment, the correct positioning, rapid mobilization, prevention of contractures, pneumonia, bedsores and thrombosis, as well as the treatment of incontinence and swallowing disorders. The main therapeutic disciplines are early rehabilitation: physiotherapy, occupational therapy, speech therapy, neuropsychology. Early rehabilitation requires 3–4 hours of therapy daily functioning. All therapeutic sectors (therapists with different specializations) cooperate with each other and therapy often performed together several therapists. One of the first goals of this comprehensive individual therapy is another mobilization of the patient, which is carried out mainly in physiotherapy and improving independence in daily living needs training ADL (Activities of Daily Living) in occupational therapy. Logopedics directed through the establishment of a communication code to allow non-verbal and verbal communication, but also works with various therapy forms of swallowing disorders directed principally to allow oral food intake. Neuropsychology monitors and

supports the development of cognitive abilities of patients, beginning with the training of psychomotor tempo, attention and memory, and continues psychotherapeutic therapy, behavioral disorders and affective disorders. For ethical and medico-political reasons is an essential requirement for these patients achieve the best quality of life and self-sufficiency that would allow them to again find their place in society.

Reflex Locomotion According to Vojta

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Reflex Locomotion according to Prof. Václav Vojta (VRL) is a diagnostic and therapeutic concept based on activation of global locomotion patterns, which are saved in CNS. Their activation in precisely determined initial positions (reflex creeping, reflex rolling, 1st position) through zones (points of precise location and defined pressure direction) stimulation provokes involuntary responses that enrich the spontaneous movement reduced by MS patients because of damaged nerve cell covers in central nervous system, which disrupt the ability of CNS parts to communicate. The lack of communication between different parts of CNS is shown by a range of signs and symptoms by MS patients. The patient is indicated to VRL by a medical doctor. The therapy (duration, frequency, choice of therapeutic positions and stimulation zones) is always individual according the patient's general state of health, condition, subjective problems, neuro-kinesiological assessment, reaction to the therapy and defined aim of the treatment. The therapy influences the neuromuscular system (I.e. posture, mobility, spasticity, ataxia, dyskinesia, balance, sensibility, and articulation – communication). It influences also the autonomic system (breathing, mastication, swallowing, circulation, digestion, sphincter function) on all levels. Patients perceive the positive effect of the therapy very well. "Now it is easier" or "I need not to concentrate so much when I walk." Are patient's descriptions of improvement especially in automatic? The treatment is effective in acute as well as in chronic phases of disease. The long-term regular therapy leads to patient's self-sufficiency and his/her prolonged inclusion into society (family life, work activity, hobbies etc.).

Dynamic Neuromuscular Stabilization Approach for Musculoskeletal Pain, Dysfunction and Optimal Performance

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Dynamic Neuromuscular Stabilization (DNS) is a rehabilitation strategy based on the principles of developmental kinesiology and the neurophysiological aspects of a maturing postural-locomotor system. The maturation of the postnatal central nervous system (CNS) and muscle function are related to anatomical maturation (morphological development). Postural ontogenesis defines ideal posture from a developmental perspective. Optimal muscle coordination is ideal for joint loading and defines ideal motor stereotypes. The process is genetically determined and begins automatically during CNS maturation. Ideal postural postural ontogenesis is important because it is during this time that the infant acquires fundamental movements, such as turning from supine to prone, which later become the foundation for complex activities such as activities of daily living or sport movements. DNS diagnosis is based on comparing the patient's stabilizing pattern to the developmental stabilization pattern of a healthy infant. The treatment approach emphasizes training of these ideal patterns as defined by developmental kinesiology. The brain must be properly trained to automatically activate optimal movement patterns. The ultimate strategy during therapy is to teach the brain to maintain central control and stability of the movement. This can be achieved by activation of the stabilizers when placing the patient in the developmental positions. DNS approach requires patient's participation and compliance. A conscious feeling of the movement is critical. The patient must differentiate between the correct "centrated movement" and the incorrect "decentrated movement" and be able to correct any "decentrated" segments. This ability depends on adequate body awareness. Daily exercise practice is a prerequisite for long lasting effects of the DNS approach to treat pain, prevent repetitive strain injury and enhance sports performance.

Motor Program Activating Therapy

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Motor Programme Activating Therapy (MPAT) developed by Kamila Rasova, uses different kinds of afferent somatosensory stimuli (mainly proprioceptive, but also tactile, visual, auditory, etc.) and combine them in different functionally centered initial postural positions (sitting, standing) so that (the treated person should be tuned with the therapist) it becomes an attitude for different movements (standing up, walking). In the attitude, afferent somatosensory stimuli within the tuning are combined again to trigger/launch/activate automatic motor programs in the brain. MPAT is based on principles of facilitation approaches and on the neuromechanical tuning model of motor

control. The neuronal tactility threshold – when the therapist uses stimuli to enhance the effectiveness of the synaptic connections among neurons forming functional networks that lead to the evocation of movement by an otherwise weak and insufficient stimulant, facilitates.

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Sensorimotor Stimulation

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The method of Sensorimotor Stimulation (SMS) was developed in the 1970s by Janda and Vávrová. It is based on the idea that movement cannot be achieved without coordination between afferent and efferent pathways and centers (the unity between afferent and efferent systems). The fact that myo-osteo-articular system ("periphery") and CNS mechanisms work as one functional unit and the importance of sensory information for motor control is emphasized. The method is used to improve the stability of the joints of the leg (ankle, knee, hip joint), but as the necessity to influence the function of postural system of the trunk/spine has increased (due to the increased incidence of back pain), it is much more focused on the stability of posture as such. The aim is to influence all functions of postural system, that is: to take up and maintain erect and straightened posture/stability of posture, standing balance/postural stability and postural behavior during movement/dynamic stability. Efforts are focused on getting better quality (prompt, fast enough, coordinated and sufficiently "strong" and economic) in the activity of postural system on subcortical level of motor control and thus creating the preconditions for quality of movement and function in daily life activities (in sitting, standing, walking, etc.).

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Rehabilitation in MS – Presentation from the Norwegian MS Rehabilitation Centre

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MS-Center Hakadal AS (MSSH) is part of Norway's specialist health service, and is the only Norwegian rehabilitation center exclusive for people with MS (pwMS) in the mild and moderate degree of disability of the disease. Tailor-made rehabilitation depends on our interdisciplinary team, and includes a neurologist, neuropsychologist, psychologists, psychiatric nurse, physiotherapists, occupational therapist, social worker, MS-nursing team, urologist, specialist in diet and nutrition and speech-language therapist. For newly diagnosed applicants the stay is limited to two weeks, and the need for MS-specific information is prioritized. PwMS admitted for four weeks are obliged to discuss expectations and identify goals with the admission team, as this improves autonomy and engagement. Fatigue, sleep problems, depression, anxiety and self-recognized cognitive failure are the symptoms most negatively influencing the health related quality of life and working ability. Our team has focused on coping with fatigue, cognitive rehabilitation and working possibilities in addition to physical activities (some claiming to promote remyelinisation and plasticity changes) and symptomatic treatments. The PhD study "Cognitive rehabilitation among pwMS" is completed, and its findings implemented. Sleep apnea registration is offered if clinically indicated. Vital capacity of the lungs will be registered. We also plan to approach pain from a broader perspective, using interdisciplinary methods, combined with a research protocol. Starting in 2014, an MS-educational program at MSSH for internal and external health workers has been held 6–8 days a year, to promote consensus and avoid ambiguity in meeting pwMS, ultimately helping them prepare pwMS to cope with the unpredictability of the disease.

Physiotherapy and Professional Clinical Guidance in an Out-patient Clinic for People with Multiple Sclerosis – Body and Movement in Sense-making and Professional Development

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Background: Some hospitals' out-patient (OP) clinics for people with multiple sclerosis (PwMS), on a regular basis, offer single physiotherapy sessions and professional clinical guidance of community physiotherapists (cPTs). This is an area of limited research. The purpose of this study was to derive new knowledge regarding patient experiences from this service, the role of movement in information to PwMS and in professional development for cPTs.

Methods: 1. A survey including 72 PwMS was conducted using the Out-Patient Experience Questionnaire (OPEQ), Borgs Rating Scale of Perceived Exertion (BRSPE), patient Global Impression of Change (PGIC). 2. Observations of single physiotherapy sessions in the OP clinic were performed with 12 PwMS and followed by qualitative research interviews of the patients. 3. Complemented with nine observations of sessions with clinical guidance of cPTs followed by qualitative interviews of the cPTs.
Results: 1. The results from the OPEQ showed very high level of satisfaction regarding PT's interpersonal and clinical skills, information, and instructions in self-assisted exercises. BRSPE reported short-time significant improvement and PGIC improved in 60% of PwMS following the consultation. 2. Contextualized perceptions of movements during the consultation may expand PwMS' insights regarding their movement problems and performance of home exercises, a process in which *in situ* perceived improvements of quality of movement appear vital. 3. *In situ* clinical guidance is a strong element to promote professional development, in which detailed movement analysis and exploration of possibilities for change leading to observation improved movement quality appear essential. Better structures for collaboration facilitating mutuality, are requested.
Conclusions: The thesis emphasizes the significance of perceptions of body and movement to deepen PwMS' insights in their own limitations and possibilities and to augment professional development for cPTs. Phenomenology of the body, providing a first-person conception of the body, allows for integration of neurosciences and an expanded comprehension of PwMS, physical handling and inter-subjectivity in physiotherapy.

Presentation of Physical Therapy as Offered to the Patients at MS-Senteret Hakadal AS

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MS Senteret Hakadal AS (MSSH) is the only Norwegian rehabilitation center exclusive for people with MS (pwMS) in the mild and moderate degree of disability of the disease. For rehabilitation the patients will stay for four weeks. Each patient presents with his/hers own goals and is followed up by the multidisciplinary team and coordinator in charge. The primary evaluation and the treatment are based on ICF. All team members have specific tasks. Physical therapy is based on patients' needs and functioning level. Patients can join different types of group therapy twice a day or exercise in a pool once a week (voluntary). The primary therapy (physical therapy) is individualized and practiced under the lead of physical therapist approximately four times a week. Physical therapy consists of basic training (strength, endurance, core and balance), manual therapy (focused on pain and mobility) and specific exercise therapy for people with neurological disorders. In addition, modalities such as TENS and NMS, taping (sports and kinesiotape) and use of orthotics and other ambulatory aids is practiced as needed. The patient satisfaction after rehabilitation at MSSH is high.

Follow-up of MS-patients at Oslo University Hospital

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Multiple sclerosis (MS) is a chronic disease with onset in young adults, and MS is the most common cause of non-traumatic disability in adults. The prevalence of MS in Norway is 203/100,000. More than 1,000 patients are seen in our hospital yearly both for treatment and regular follow-up. Diagnostics, follow-up and administration of treatments are mainly handled in the out-patient clinic. We have a team of neurologists, nurses, physiotherapists, a social worker and an occupational worker available for the patients, but also access to other medical specialties as well as a good collaboration with neuropsychologists. All disease modifying agents are available for use in Norway. Newly diagnosed patients are offered a 4 × 2 hour introductory course in MS with lectures by the multidisciplinary team, and time for discussion and exchange of experience. The patients are also offered an individual consultation with the physiotherapist after diagnosis and then later as required. The physiotherapist will give advice regarding self-training/activities and/or recommend training with a local physiotherapist. Usually a report is sent to the local physiotherapists and we are offering advice/guidance. Selected patients in need of more intensive training are referred to external in-patient rehabilitation units for usually 3–4 weeks. The corner-stone of patient follow-up in Norway is the family doctor and local physiotherapists, the in-hospital staff do usually have a role as consultants. Most patients seen in our hospital are also participating in different research projects by the Oslo MS Research Group. Our research group has extensive national, Nordic and international collaborations.

Group-based Individualized Core Stability and Balance Training for People with Multiple Sclerosis – a Pilot Feasibility Test-retest Study

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Background: Balance and walking difficulties are common in people with multiple sclerosis (PwMS). A key prerequisite for these activities is activation of dynamic core stability. Specific, active and individualized physiotherapy, which integrates the underlying aspects of balance, and is performed with high-intensity is requested to optimize recovery of movement and minimize compensatory strategies. Also group-based

interventions are less explored in people with MS. The purpose was to investigate feasibility of individualized group-based core stability training (GroupCoreSIT) and examine effect on balance, walking and activities of daily life.
Methods: The intervention consisted of 60 min GroupCoreSIT, three sessions a week for five following weeks. Each group consisted of three people with MS. The training was conducted in a private practice. Twelve PwMS participated (male 3, female 9, age: median 42.5 years, 11 RRMS, 1 SPMS, EDSS: median 2.3). Pre- and post-outcomes were recorded of an independent tester using: The Trunk Impairment Scale Norwegian Version (TIS-NV), Visual Analogue Scale balance and walking (VASb/VASw), 2 and 6 min Walk Test (2MWT, 6MWT) and Timed 25 Feet Walking (T25FW) MS walking scale-12 (MSWS-12), Patient's Global Impression of Change regarding walking (PGICw). Related-Samples Wilcoxon Signed Rank nonparametric test was used to compare pre-post outcomes.
Results: The results show significant improvement in TIS-NV ($p = 0.003$*), T25FW (usual speed, $p = 0.008$, fastest speed, $p = 0.005$*), 2MWT ($p = 0.026$*), 6MWT ($p = 0.006$*) and MSWS-12 ($p = 0.003$*) and MSIS-29 NV ($p = 0.005$*). The PGICw showed improvement in nine and no change in two participants (one missing). VASb showed significant improvement ($p = 0.017$*), however VASw ($p = 0.088$) did not (limitations: the group was small, control group and outcome measurements for balance in standing were not included; significant p-values following Bonferroni's corrections are marked with*).
Conclusions: The results show preliminary evidence for feasibility and short-term effect on sitting balance and walking outcomes, after a five week GroupCoreSIT-intervention. In order to evaluate effect of this intervention we call for randomized controlled trials.

Assessment of Clinical Outcomes in Multiple Sclerosis – Challenges for International Comparative Studies

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Assessment of clinical outcomes provides a rating score representing some aspect of the patient's health status which is important for determining the efficacy of a therapy. Assessments may be influenced by rater judgment or by patient motivation, and they are source of measurement error and possible bias. Therapists from different countries may have different level of experience with usage of measurement instruments for multiple sclerosis (MS) patients [1]. In this work we show results from studies which dealt with psychometric properties of assessment set for multiple sclerosis (MS) patients in the Czech Republic [2]. We also bring a novel methodology for exploration of psychometric properties in more complex designs such as are present in international comparative studies [3]. We demonstrate how inconsistencies in measurement can bias the results of comparative studies. We also show how sources of measurement error may be analyzed in complex designs, and how errors may be prevented or reduced. In a practical experiment we demonstrate the methods for increasing the consistency of measurement of spasticity.

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Challenges in Organization of Multicenter Study in Neurorehabilitation – an Experience from the International Prospective Study "Factors Influencing Effectiveness of Physiotherapy for Improvement Balance in People with MS"

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In planning and executing a multi-country-centric study on physiotherapy of multiple sclerosis patients, several problems with both measurement of outcomes and therapy concepts can occur. We demonstrate these issues on data from two studies conducted and analyzed by the authors. A prospective multicentric study that aimed at examination of effect of balance-oriented therapy on balance improvement of multiple sclerosis was conducted between 2012 and 2014 with joint efforts of a Czech and an Italian team [1]. The aim was to compare balance improvement with either standard therapy or with balance-specific intervention. Because of the lack of resources was not possible to fully harmonize the type of therapies employed, leading to much stronger country-specific effect than initially expected. Country-specific preferences for (and thus presumably mastering of) various sets of therapies were observed in the European questionnaire survey [2] as well. Moreover, a large observed heterogeneity in Timed-Up-and-Go (TUG) test measurements lead us to question the methodology of examinations, stressing further need to carefully harmonize the work of patient examiners as well as of

therapists. On the other hand, country-specific therapies aimed at the same physiotherapy goal may not be seen as a hindrance but, with careful planning of the experiment, they can help to compare the methods in more detail and improve overall care of multiple sclerosis patients.

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Frequency Spectrum Pattern of Postural Oscillatory Movement in Multiple Sclerosis Using an Sccelerometer – a Pilot Study

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Introduction: Tremor is an involuntary rhythmic oscillatory movement, the one of common clinical manifestations of neurological diseases such as multiple sclerosis. The different types of tremor are currently classified according to clinical scales. Unfortunately, this approach is fully subjective in principle. The objective classification is still missing in clinical praxis. Design of a suitable methodology and an evaluation of the method is a subject of this article.
Methods: The designed method of objective tremor classification uses a telemetric system with 3-axis accelerometers. A dynamic range of the sensors is set up to ±8 g, the signal is sampled with frequency of 50 Hz. These parameters well correspond with expected amplitude and frequency spectrum of the signals showed in the literature (amplitude typically lower than ±2 g, frequency spectrum typically from 2 Hz to 10 Hz, maximally about 18 Hz). Obtained data are stored to a PC in raw format for further processing.
Realization: A measuring device is designed as a telemetric device which consists of a wireless sensor unit and a base station. The sensor unit is fitted with microcontroller PIC16F1827 which operates a communication with the accelerometer sensor LIS331DLH (STMicroelectronics). The sensor is placed as a ring on an upper limb. The microcontroller also operates a RF communication with the base station. The communication uses transmitters/receivers in a band of 433 MHz. The base station is connected with the PC using USB.
Results: The device was verified in various positions of the sensor by a measuring of the gravity. An usability in the clinical praxis is evaluated in running pilot study. The 31 patients have been measured until now, each patient was measured both with opened and closed eyes, with an arm in resting horizontal position, with an arm in a calm standing position and with an arm during stretching forward. For each record the spectrogram of the signal was calculated (Hamming window length of 128 samples, overlap 121 samples). As it results from completed measurements, the system allows recognition of increased energy both in time and frequency domain in typical bands of 2–3 Hz, 7–10 Hz a 12–14 Hz.

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Kinetic Scenes Perception in Patients with Multiple Sclerosis – a fMRI Study

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Motor and cognitive deficits are typical for patients with multiple sclerosis. Therefore, various rehabilitation programs are concentrated on improvement or at least stabilization of these functions. The aim of our study was to monitor brain activation in MS patients during the visual perception of kinetic events in comparison with control group and also with the situation after two-months ambulant facilitation physiotherapy ("Motor programs activating therapy" [1]). We examined 37 MS patients and 40 healthy controls using BOLD fMRI on Siemens Trio 3T scanner. Patients were examined 4× (two examinations before and two after therapy). During fMRI, stimulation scheme contained alternatively kinetic and calm video scenes lasting 30s each and during 5 min measurement 100 brain volumes were acquired (10/10 scans for each period). Gradient-echo EPI sequence with following parameters was used: TR/TE = 3,000/30 ms, FA = 90°, voxel = 3 × 3 × 3 mm^3, 45 axial slices. Evaluation was done using SPM8 (pre-processing: realignment, slice timing, normalization, smoothing with FWHM of 8 × 8 × 8 mm^3) with GLM statistic. Individual SPMs were used in group statistic to compare activations between control and patient group and also between examinations before and after physiotherapy. For final maps the FWE corrected p = 0.05 was used and group differences were tested with uncorrected p = 0.01. We detected more extensive activations in controls in secondary visual cortex and also in cerebellum. Statistically significant differences (p = 0.01) were confirmed in these regions by t-test both before and also after therapy when the picture of brain activations remains practically unchanged. On the contrary, in healthy controls we found higher activation in posterior insular regions bilaterally

during calm scenes. The perception of kinetic events has evoked lower activation in regions dealing with processing of such information (secondary visual cortex, cerebellum) in MS patients compared to controls. These differences remained unchanged after two-month therapy.

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The Application of Functional Electrical Stimulation in People with Multiple Sclerosis – the Pilot Project

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Background: Common gait abnormalities demonstrated by people with MS (pwMS) is foot drop which is caused of stumbles, falls, gait instability and decreased gait efficiency. This problem is standard solves with use of an ankle-foot orthosis (AFO). A more recently developed alternative to the AFO is functional electrical stimulation (FES).
Objective: To investigate the efficacy of FES in people with MS using clinical tests.
Methods: Eleven pwMS aged 31–59 (six females, five males, EDSS 3–6) was lent neurostimulator WalkAide for two months. The device was programmed according to patient's need with the aim right foot dorsiflexion one week before baseline. The supervision and potential reprogramming was done at the baseline and two weeks after. We examined mobility (Timed Up and Go Test, Four Square Step Test Rivermead Mobility Index, Performance Scale mobility, 5-repetition sit-to-stand test), balance (Berg Balance Scale (BBS)), and gait (Dynamic Gait Index, 2-minute walk test, Multiple Sclerosis Walking Scale-12), and the total effect of MS on quality of life on Multiple Sclerosis Impact Scale-29.
Results: In this group balance was improved ($p = 0.15$). There was not any improvement in other tests.
Conclusion: FES has positive influence on balance. We suppose significant positive efficacy in the next study with more participants.

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Facilitation Physiotherapy Changes Clinical Function and Effects the Levels of Neuroactive Steroids in Patient with Multiple Sclerosis

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Introduction: Facilitation physiotherapy could regulate production of neuroactive steroids (neurosteroids) due to following neurophysiological mechanism: stimuli applied during the treatment activate deeply encoded programs of the CNS that integrates genetically determined factors of motor behavior, muscle activity encoded in motor patterns, and automatic reactions of the motor system that mature during the course of postural ontogenesis. This activation addresses cerebellum and via hypothalamus – paleocerebellum and the neocerebellum limbic system. Part of a limbic system is hypothalamus that owing to the hypothalamus-pituitary-adrenal axis and produces neurosteroids.
Aim: To notice the changes in the levels of selected hormones following the facilitation physiotherapy.
Methods: Patients were examined twice – before and after therapeutic program (60 min outpatient facilitation of physiotherapy on the intensity of 16 units/2 months, the one group of patients underwent Motor Programs Activating Therapy, other group Vojta reflex locomotion) by clinical tests on fine motor sklills – Nine Hole Peg Test, cognitive function using Paced auditory Serial Addition Test (PASAT); balance – Berg Balance Scale Balance, Time Up and Go and the Activities-specific Balance Confidence Scale; walking – Timed 25-Foot Walk. Furthermore, the impact of disease was assessed by the Multiple Sclerosis Impact Scale and fatigue Modified Fatigue Impact Scale. DHEA, 7α-hydroxy-DHEA, 7β-hydroxy-DHEA, 7-oxo-DHEA, testosterone, cortisol and cortisone were assessed by LC-MS/MS method from 500 µl of human plasma. Data were analyzed by two-way paired t-test.
Results: All eight men (mean EDSS 4.1 ± 1.96, mean age 43.9 ± 10.14 years) improved after therapeutic program in clinical parameters - PASAT ($p = 0.026$), VAS walking ($p = 0.044$) and VAS balance ($p = 0.031$). The hormone levels in the context of the therapeutic program changed as well, but not significantly. Plasma cortisol decreased from 344.51 ± 117.85 nmol/l to 336.71 ± 124.93 nmol/l, cortisone fells from 69.89 ± 29.56 nmol/l to 64.75 ± 22.96 nmol/l. DHEA changed from 9.23 ± 7.10 nmol/l to 9.45 ± 6.51 nmol/l. The level of 7α-hydroxy-DHEA decreased from

1.28 ± 0.55 nmol/l to 1.09 ± 0.50 nmol/l. The level of 7β-hydroxy-DHEA decreased from a 0.35 ± 0.26 nmol/l to 0.30 ± 0.15 nmol/l. Only the level of 7-oxo-DHEA changed significantly (p = 0.027).
Conclusion: The clinical improvement after facilitation physiotherapy is accompanied by changes of neurosteroids.

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What Does "Understanding" Mean?

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Science describes, precisely, "clare et distincte". But we are not concerned about a mere description but about our understanding of a disease. Disease means the impossibility of life movement; the possibilities of life are decreased. To understand a disease is to understand it as the answer to surreptitious questions, which were part of the background from which the decease becomes a phenomenon, it reveals itself, it phenomenalizes itself. Today, by contrast, disease is taken as a question to which we must seek an answer. From a phenomenological and hermeneutical point of view this is the opposite. It is not about a discovery, which would be the first. Paracelsus always argued that the seeds of recovery are in the disease itself. The problem is only in how we let the disease act upon us. Usually we do not do this and we do not know that we do not do this. Because we have an obviousness within us that the disease is given to us correctly, i.e. strictly scientifically. This is not true. Disease is given to us in its image, we have adopted this idea from others, and we do not base it on things themselves but on our scientific ideas about the disease. Phenomenology has one imperative: return to things themselves! It is necessary to make changes within ourselves, we must learn to look at a thing as if we have encountered it for the first time, through a child's eyes, speaking intelligibly, although simplified. It is necessary to undergo transcendental epoché. Life is movement on a pathway, it involves arché (inheritance from our ancestors), telos (the purpose of life) dynamis (possibility), energeia (realization of the right possibilities) and ergon (deed). Along the way we encounter situations that threaten us; that is why life is purveyance, it is a constant concern. It is necessary to select the right possibility with which we can destroy this concern. We need our arché and telos. It is not about simple causality, which in natural sciences is the foundation of science. It is about a motive that encompasses arché, telos and dynamis. Disease is never just the result of a single cause or the results of several causes, which we can determine through verification, through our senses, empirically. Inheritance of a life movement towards the objective (telos) always plays a role, as well as the specificness of the possibilities that a situation in which we are thrown gives birth to. A Cartesian design of a disease is not enough, i.e. subject vs. object, causality, successivity of Aristotelian time and the truth as certainty. These are the main features of Cartesian thinking, and it is now proving to be an inadequate basis. Understanding is something other than owning information, even if it is relevant. To know is not enough! Knowledge is a commodity that can be bought or sold, for entrepreneurship, business. Understanding means, first and foremost, the ability to separate the background from the thing. The thing appears in the background, it emerges, phenomenalizes, because it enters into the phenomenon. This is why Czech language includes the word "understand". The background and that which is shown to us on the movie screen, which emerges from the background. Showing is a process of emergence – the constitution of things that we can sensually perceive and describe. Disease is a thing that is shown from a background, it arises from it, it emerges, it is born, it is constituted. To understand a disease means one thing, to know the background. How do we reach it? There is only one way. The disease itself is a thing in the validity of answers and we have to look for the questions that are the background, the questions that form this background. If we find the questions that fit the answers like a key in a lock then we can understand things. This is substantive thinking. A description of an object, a Cartesian description is not enough, it just glides over the surface of things; remember that Cartesian thinking is subject-object thinking, causal and successive with a single objective, to obtain an inter-subjective assurance about the issue. To understand a disease is something different to obtaining information about the quantity of the particular phenomenon associated with it. "More geometrico" thinking is Cartesian thinking, it provides certainty. Certainty today is truth itself, but it is not about certainty, it is a about a thing, which must be shown from itself, not from our often displaced ideas. Immigration into Europe is a thing we need to understand from itself, not from offset media information. Immigration is an answer, and we must find the questions that belong to immigration – to the answer, like a key to a locked door. We can only open the door when we find the right questions, and this is a matter of thinking more than anything else. We have forgotten how to think, we just want to have/own information to enable us to consolidate our power in all areas of our common life, but it is about understanding, something that Cartesian educated individuals miss the most. Thus, I wish everyone the courage to understand!