

■ The 3-steps concept of the exercises

The application of the neurocognitive theory entails the selection of specific exercises and the individual interpretation of the different pathologies. Every exercise contains the incorporation and handling of information and represents a problem which is to be solved by the patient using his/her body.

Therefore, it is of special importance that every movement has a verifiable aim since an abstract movement makes no sense for the CNS and does not lead to a learning effect. Most exercises are carried out with closed eyes in order to bring the body awareness more into focus so that the visual component which is mostly dominant is not established as a compensatory information reception.

1 With the **first-degree exercises** the patient's movements are completely guided by the therapist. In this way, the patient's attention is drawn to different elements of movement (direction, distance, change of direction, position of joints) but also to contact elements (surfaces) and the (re)recognition of the information. The eyes are kept closed.

First degree's exercises are applied if it is necessary that the patient is to control his/her abnormal resistance to stretching (ARS).



Further aims are the improvement of the tactile/kinaesthetic perception and the reduction of the recruitment deficit.

During the guided movements, the patient drives his attention towards the establishment and verification of the perceptive hypothesis.

2 With the **second-degree exercises**, the patient starts to take over more and more movements actively but only to such an extent that no abnormal irradiation will occur. While doing this, the patient keeps his/her eyes closed so that he/she can lead his/her attention to the relevant somesthetic information and the control of abnormal irradiations.

The information may be of a tactile-kinaesthetic kind but also the perception of pressure and the recognition of frictional resistance may be a part of the exercises.

The aim of the second-degree exercises is that the patient gets control over the abnormal irradiation. Further aims are the improvement of the tactile/kinaesthetic and somesthetic perception, of the recruitment deficit by correctly anticipating the movement intensity as well as the construction of complex information (pressure, friction resistance, weight).

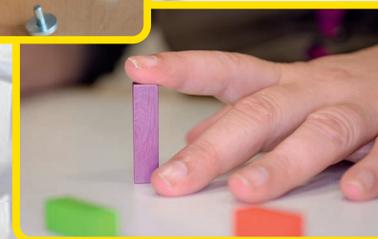
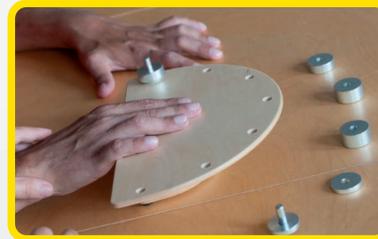


During treatment, the therapist will reduce his/her support if the patient increasingly succeeds in using his/her motor activity without pathology.

3 With the **third-degree exercises**, the motion sequences become more and more complex, and the patient starts to carry out the movements more and more autonomously. A coordinated activation of the motoric units of different muscle groups belongs to the most important prerequisites in order to re-learn physiological motion sequences.

The intention is to successively enlarge the cinematic chain. The patient has to draw his/her attention to the overcoming of elementary schemas (ability to organize complex movements). The patient should learn to adapt the movement to the perceptive hypothesis presented.

The aim of these exercises is to enable the patient to reduce the recruitment deficit to such an extent that keen movement corrections can be carried out. The somesthetic perception should also be improved or normalized, respectively. Furthermore, the movements also serve as a receptor of information.



The transfer of the exercises into the patient's daily life can be achieved by structuring the exercises, like working with closed eyes, guided movements, using the language, attention, memory and the processing of somesthetic information as well as the use of specific therapeutic means considering the latest research results.

All phases of the rehabilitation process should be constantly related to reality. Therefore, a new way of working is the comparison: It is an important mental process for the recognition, learning and realization. Therefore, it is the therapist's task to instruct the patient to make a comparison. This might be:

- Comparing the affected side with the non-affected side
- Comparing the current action with a prelesional experience
- Comparing an imaginary action with elements of the exercise

Within the comparison, the patient should also establish connections. The neurocognitive hypothesis states that especially the search for differences and similarities might lead to a change in the system's organization.



Association for Cognitive Rehabilitation



■ Verein für Kognitive Rehabilitation (Association for Cognitive Rehabilitation)

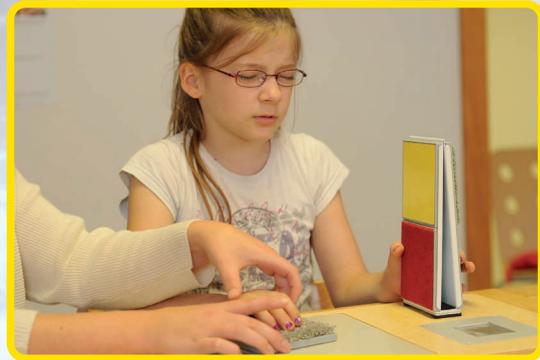
The association, being a non-profit organization, has been involved in the establishment and development of the neurocognitive rehabilitation of the founder Prof. Carlo Perfetti since 1998.

A constant development and change already lies within the concept itself so that further education of the therapists is very important.

The VFCR is organizing regular symposiums and courses concentrating on one topic.

Starting in 2017, there has been the internationally accredited continuing education in order to become a “Fachtherapeut für neurokognitive Rehabilitation (VFCR)®” (therapist specialized in the field of neurocognitive rehabilitation (VFCR)®) which the VFCR carries out in cooperation with different institutions for further education in Germany.

Apart from presenting the theoretical background and the development of the neurocognitive rehabilitation, it explains and practically presents the application in different areas of treatment (neurology, orthopaedics and hand therapy).



■ **The aim** of the Neurocognitive Rehabilitation is the reorganization of the system human being, the starting point of which has to be the reorganization of the nervous system being in a pathological state after an impairment. By specifically activating cognitive processes, the patient's central nerve system is to be activated in a programmed manner which should lead to changes in the whole system, that is in the brain and finally during movements. The result should be the enablement of movements as physiological as possible.

■ **The concept** of the Neurocognitive Therapeutic Exercise was developed by Prof. Carlo Perfetti, Italy, at the beginning of the 1970, originally designed specifically for patients with hemiplegia. Today, this form of treatment is applied with all neurological, but also with orthopaedic, surgical and paediatric patients. The starting point for the development and the changes of this therapeutic concept were and still are scientific findings in very different fields of study.

So the therapeutic approach constitutes the „systemic point of view“ which means that the human being is to be considered as a complex system. This means that the abilities of a person like movement, perception and mental performances cannot be considered and treated separately but form a functional unity which enables cognition processes (cognition) only by mutual cooperation. “Cognitive” means “based on cognition”.



The cognition process is a central ability of the human being and also a central element of cognitive rehabilitation.

In order to achieve cognition, perception, mental abilities like attention, memory, coordination, reaction and movement work together. The perception is highly important during the cognition process since the CNS obtains information from the body and the environment via the perception which the CNS needs for programming and executing movements. Therefore, the perception process represents an important part of the movement. Movements produces information and processing the information enables the development of movement. If this circle of information is disturbed there can be no physiological movements.

■ The system's **reorganisation** is to be effected by the activation of programmed learning processes. This is not possible without attention. Thus, the patient's active and focused attention plays a specific role. By focusing his/her attention specifically on certain body parts (guided perception process), the patient learns the components of his/her spasticity and the autonomous control of the same.



No longer the therapist should intervene in a facilitating or inhibiting manner, but the patient should learn to use his cognitive abilities in order to control the pathological element on his/her own.

Therefore, the cognitive processes represent the “working instruments” of this concept. These involve attention, memory, perception but also the imagination and the language.

Motor imagery has become a major element since a lot of scientific work have proved that motor imagery represents at least an important part while planning a movement. Thus, the specific “instruction to imagine” the movement leads to the forming of a correct movement planning and therefore, to the re-learning of physiological movements.

The language has become increasingly important, especially in the last years – both the language of the therapist which is specifically used in order to direct the patient's reasoning processes and also the language or the description of the patient which allows to obtain an introspective sight of his/her conscious experience. In this way, both the interpretation of his/her pathology, the treatment planning as well as the verbal guidance during the exercise is made more precise.



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