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Neuro-Feedback

Application

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Neurofeedback offers a long-term solution to help patients with mental health issues, sleep disorders and chronic stress. By measuring and modulating brain activity, you can offer a sustainable and medication-free solution to your clients.

Digital therapeutic techniques can help patients with a range of psychiatric disorders and neurorehabilitation problems like recovery from stroke and chronic pain. By measuring and modulating brain activity, neuromodulation has the potential to offer faster and longer-lasting outcomes than standard treatments, all with no to very minimal side-effects.

neurocare empowers clinicians to deliver best-practice by offering a range of neuromodulation-based solutions following the latest science and technology. We can support you with technology, equipment, advanced training, and further information for you as a professional. We also offer specific information to help your patients, your staff and further business advice.

Your clinical practice will benefit from neurocare's proven treatment protocols giving you, the practitioner, the ability to personalise for your individual patients and offer a more sustainable solution in mental health and rehabilitation. Seeking training, advice or partnership with neurocare will help your practice be at forefront of innovative health solutions, delivered professionally and following best practice.

Content

Imprint

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What is neurofeedback?

Neurofeedback is a well-tolerated therapy program that can have long-lasting, sustainable effects to improve mental health. The positive effects of neurofeedback brain training have been studied in a range of treatment areas.

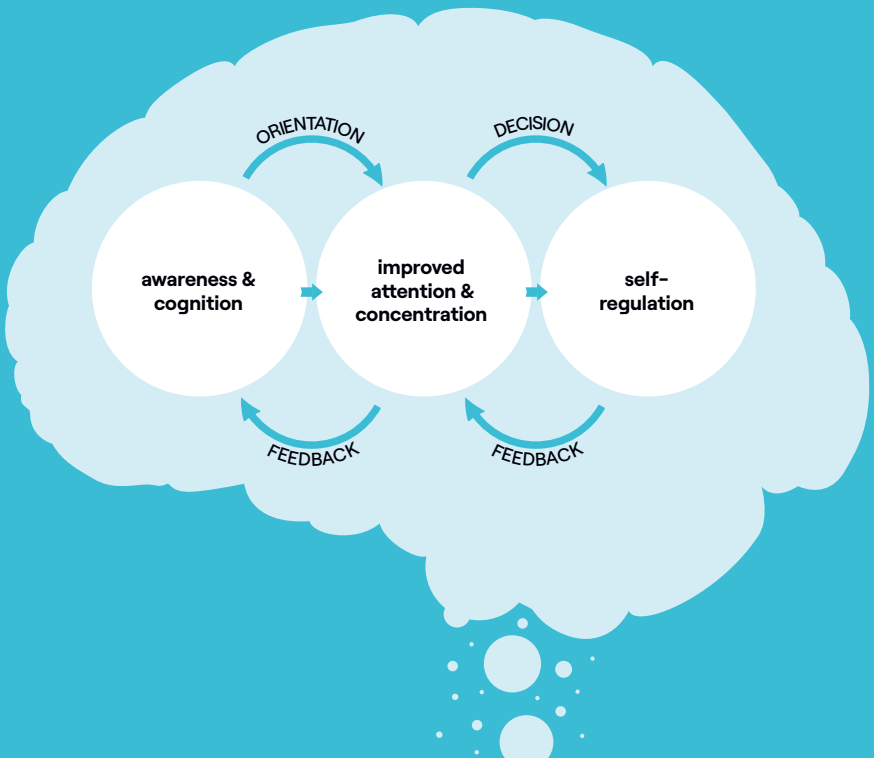
For conditions like ADHD and migraine, neurofeedback can have a direct effect addressing the underlying systems. Neurofeedback can also be applied in the treatment of sleep disorders, stress management and cognitive and peak performance training.

Neurofeedback can also be used to improve sleep, stress management or performance.

How does neurofeedback work?

In neurofeedback training, electrodes are attached to the head which measure EEG signals. Based on the derived EEG signal, the client sees simplified visual feedback of their brain activity on their display. Through this feedback, the trainee is encouraged to modulate their brain activity to controlled states, monitored by the trained neurofeedback practitioner.

In the course of therapy, neurofeedback can improve the self-regulation of brain activity. This can have positive effects in increasing focus and attention and improve sleep. Often, regulation at the behavioural level also improves. The client is actively engaged which improves self-efficacy, which additionally has a stabilising and supporting effect.



Neurofeedback - methods

Not all neurofeedback is the same!

Through numerous scientific studies and clinical experience, there are different neurofeedback methods which are shown to be effective. The following methods are considered evidence-based:

- SCP (Slow Cortical Potentials) neurofeedback
- frequency band neurofeedback (SMR & Theta/Beta)

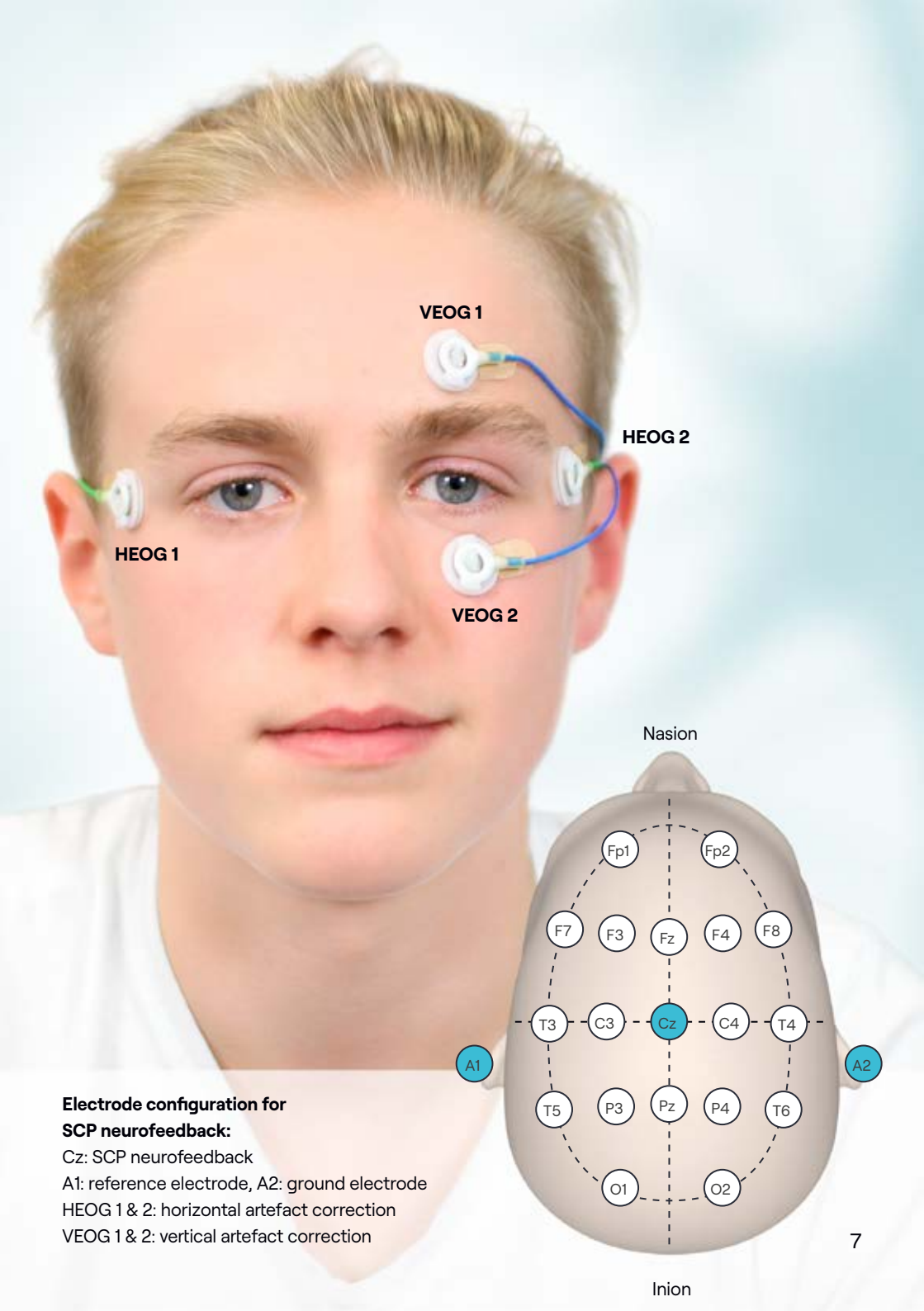
1. SCP neurofeedback (slow cortical potentials):

This method works on the brain's ability to self-regulate states of activation and relaxation. In this method, the client exercises the ability to prepare their brain for mental or motor tasks. This technique can have a positive effect on focus and attention.

The visual stimuli in SCP neurofeedback alternates between an 'activation' task, or a 'relaxation' task. By training between these two states, this can be transferred into everyday life thereby improving ability to fall asleep and stay asleep, as well the frequency of seizures in epilepsy or migraines. The effects of this training can also reduce impulsive behaviours and can lead to a better overall state of calm.

SCP neurofeedback can be applied in the following conditions:

- ADHD (see page 10)
- Migraine (see page 11)
- Addiction disorders (see page 12)
- Sleep disorders (see page 14)
- Binge Eating Disorder (see page 15)
- Epilepsy (see page 16)



Electrode configuration for SCP neurofeedback:

Cz: SCP neurofeedback

A1: reference electrode, A2: ground electrode

HEOG 1 & 2: horizontal artefact correction

VEOG 1 & 2: vertical artefact correction

Neurofeedback - methods

Not all neurofeedback is the same!

2. Frequency band neurofeedback:

There are two types of evidence-based frequency band neurofeedback protocols: SMR (Sensori Motor Rhythm) neurofeedback and theta/beta neurofeedback.

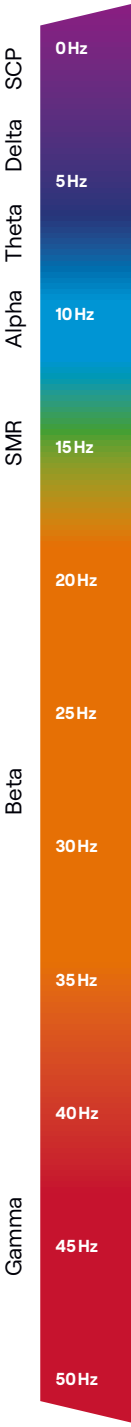
Based on the client's reported symptoms and an EEG report, frequency bands can be identified in the EEG that show too much or too little activity compared to the norm. This EEG profile can correlate with symptoms of sleep problems, inattention and behavioural issues. In a healthy person, the activity of the frequency bands is balanced. A frequency-band protocol personalised to the client's individual brain profile, can help to increase or lower activity to the desired frequency band.

Through consistent training, these neurofeedback protocols encourage balanced EEG states which can have a positive effect on attention and sleep, in both children and adults.

Frequency band training can be applied in the following conditions:

- ADHD (see page 10)
- sleep disorders (see page 14)
- Tinnitus (see page 17)


SCP neurofeedback
Delta waves
Theta waves
Alpha waves
SMR waves
Beta waves
Gamma waves


SCP
Delta
Theta
Alpha
SMR
Beta
Gamma
0 Hz
5 Hz
10 Hz
15 Hz
20 Hz
25 Hz
30 Hz
35 Hz
40 Hz
45 Hz
50 Hz

ADD/ADHD

Children and adults affected by Attention Deficit / Hyperactivity Disorder (ADHD) experience difficulty with attention and sustaining focus in everyday situations. For children with ADHD, they often experience impulsivity and restlessness and a general difficulty in self-regulating behaviour.

Neurofeedback can be beneficial for children or adults with ADHD, as it promotes optimal brain regulation by encouraging or inhibiting specific brain activity in real-time. By receiving feedback on their brain activity, clients can improve their ability to self-regulate. This is then transferred into everyday life. Patients can learn to activate the brain areas that control concentration and attention, but also the regulation of behaviour. Clients often report improved concentration and behaviour, self-assurance, and perseverance in everyday activities.

Recommended protocol:
SCP neurofeedback, 30 - 40 sessions
Theta/Beta neurofeedback
SMR neurofeedback

Migraine

For people who experience migraines, it can be a severely debilitating condition especially when attacks are frequent. Migraines affect children through to adults. Early symptoms include fatigue, dizziness, light sensitivity or temporary loss of eyesight and when left untreated develops into a strong headache. Onset of a migraine may be prevented or managed with strong painkillers.

Neurofeedback has been successfully used as a preventative treatment to migraine. Studies looking at the EEG show increased cortical excitability in people who experience migraines. With correct detection of this brain activity, Neurofeedback can be applied to re-train this state. In Slow Cortical Potentials (SCP) Neurofeedback, clients train their ability to switch between brain states of activation and relaxation. After repeated and frequent Neurofeedback sessions, usually no more than 30 – 40 in total, the client will have consolidated this learning to be able to transfer this into daily practice. In this ways, cortical excitability is reduced ad the excitation threshold regulated. Migraines then become less frequent, more tolerable or may no longer return.

Recommended protocol:
SCP-Neurofeedback

Addiction disorders

In the treatment of addiction disorders, SCP Neurofeedback training can be a component of treatment to help create sustainable outcomes alongside other standard interventions.

SCP neurofeedback can help regulate situation-appropriate arousal states, which can have a threefold affect:

1. If the patient learns to deal with his own inner impulses in a more controlled way, they can better resist the addictive pressure and practice new behavioural patterns instead.
2. If, in the course of the training, the patient improves regulation brain activity and thus also their feelings, addiction should decrease.
3. Better self-regulation can lead to better focus and calm, which can lead to better work and personal success and stability.

Recommended protocol:
SCP neurofeedback

Sleep disorders

For many sufferers, sleep disorders may be experienced as something to be endured. However, healthy and sufficient sleep is essential for well-being and performance as well as maintaining good general health.

Neurofeedback training can significantly reduce problems falling asleep and staying asleep. Often the quality of sleep is the first indication of the effectiveness of the training. Particularly when sleep disturbances are mainly caused by stress, psychological strain or worry, improvements often become apparent after just a few sessions.

Improvements can be achieved through SCP neurofeedback or SMR neurofeedback.

With SCP (Slow Cortical Potentials) neurofeedback, the brain improves its ability to self-regulate between an active and relaxed mode. People who have trouble falling asleep, may find it easy to make the 'switch' into the relaxation state sooner, after a few sessions of SCP neurofeedback training. Similarly, SMR (Sensori Motor Rhythm) neurofeedback trains a particular EEG state called 'sleep spindles' in the brain, also helping the client to fall asleep and stay asleep naturally, without sedatives.

Recommended protocol:
SCP neurofeedback
SMR neurofeedback

Binge Eating Disorder

Binge eating disorder is characterised by the consumption of a large amount of food in a relatively small timeframe. Binge eating can be seen as similar disorder to people who sugar substance abuse or addiction disorders.

Neurophysiologically, binge eating disorder shows an increased sensitivity to reward stimuli through eating. At the same time, the control networks are less active.

Through neurofeedback, those affected can learn to better control their impulses. This gives them the opportunity to resist cravings sooner. Clients may notice improved self-control over time and can also contribute positively towards regaining self-esteem. SCP neurofeedback training in particular can have a positive effect on behaviour regulation and can be beneficial to treatment.

Recommended protocol:
SCP neurofeedback

Epilepsy

The application of SCP neurofeedback in epilepsy is based on the scientific knowledge that "epileptic seizures result from insufficient regulation of cortical excitability, i. e. from insufficient inhibition of cortical overexcitation" (Strehl, p. 186).

Through SCP neurofeedback, patients can learn to directly influence their cortical excitability. In this way, they can specifically reduce their cortical excitation in typical seizure-triggering situations or when an aura occurs and thus counteract the seizure. SCP neurofeedback therefore becomes an attractive option particularly for patients who have not found success with epilepsy medications.

Recommended protocol:
SCP neurofeedback

Tinnitus

Almost one in three adults are affected by tinnitus at some point in their lifetime and commonly available treatment methods do not always lead to success.

Tinnitus is now understood to be associated with altered brain activity where the wave patterns in the EEG show excess in certain frequency ranges, while other frequencies are too low. Neurofeedback training can be used as a way to normalise the altered characteristics of the EEG, threby achieve a significant reduction in tinnitus effects. Continuous training helps to improve these effects. Once the learned brain activity is consolidated, the positive effects can remain after the program is finished.

Recommended protocol:
Delta/Alpha 4-channel neurofeedback in F3, F4, FC1 and FC2

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Safety and side effects

Neurofeedback is a very safe therapy. Side effects are minimal and – if they occur at all – are short-lived:

Neurofeedback is a very safe therapy. Side effects are minimal and – if they occur at all – are short-lived:

As the client is looking intently at a screen during the training, temporary headaches or fatigue may occur afterwards. This is comparable to headaches after using the screens of a TV, computer, tablet or similar. The skin preparation agents used or the conductive paste may cause skin irritation in rare cases. Even if epilepsy is present, the training does not trigger any seizures if carried out correctly. Contraindications are not known.

Sources of literature

Haus, K.-M. et al. (2020). Praxisbuch Biofeedback und Neurofeedback. **(3. vol.). Springer**

Heinrich, H. et al. (2019). Effects of neurofeedback on the dysregulation profile in children with ADHD: SCP NF meets SDQ-DP - a retrospective analysis. **Psychological Medicine doi: 10.1017/S0033291718004130**

Hoedlmoser, K. (2011). Non-pharmacological alternatives for the treatment of insomnia - Instrumental EEG conditioning - a new alternative? In Soriento Y. E. (Hrsg.). **Melatonin sleep and insomnia. S. 69 - 101. Nova Science Publishers**

Konicar, L. et al. (2021). Volitional modification of brain activity in adolescents with Autism Spectrum Disorder: A Bayesian analysis of Slow Cortical Potential neurofeedback. **NeuroImage: Clinical 29: 102557**

Korfmacher, AK. et al. (2022). Self-management training vs. neurofeedback interventions for attention deficit hyperactivity disorder: Results of a randomized controlled treatment study. **Front Psychiatry 13:969351**

Kotchoubey, B. et al. (2001). Modification of slow cortical potentials in patients with refractory epilepsy: a controlled out-come study. **Epilepsia 42: S. 406 - 416**

Siniatchkin, M. et al. (2000): Self-regulation of Slow Cortical Potentials in children with Migraine: An Exploratory Study. **Applied Psychophysiology and Biofeedback 25. No. 1**

Schabus, M. (2017). Better than sham? A double-blind placebo-controlled neurofeedback study in primary insomnia. **Brain 140:1041-1052**

Strehl, U. (Hrsg.) (2020). Neurofeedback. Theoretische Grundlagen, Praktisches Vorgehen. Wissenschaftliche Evidenz **(2. vol.). Kohlhammer**

Strehl, U. et al. (2017). Neurofeedback of Slow Cortical Potentials in Children with Attention-Deficit/Hyperactivity Disorder: A Multicenter Randomized Trial Controlling for Unspecific Effects. **Frontiers in Human Neuroscience 11: 135**

Strehl, U. et al. (2014): Sustained reduction of seizures in patients with intractable epilepsy after self-regulation training of slow cortical potentials - 10 years after. **Frontiers in Human Neuroscience 8: 1-7**

THERA PRAX®
MOBILE

made in
Germany

THERA PRAX® MOBILE
is a neuro- and biofeedback system suitable for therapists, doctors and researchers. As a certified medical device for the therapy of the symptoms of ADHD, it offers safety of use. The included standard protocols make it easy to get started with training. The system amplifier features thirteen freely definable channels to allow flexibility between protocols and applications.

In addition, skin conductance, respiration, body temperature and pulse can be measured and reported with the biofeedback extension. With this extension, body signals can be perceived and influenced during training.

The THERA PRAX® MOBILE complete package includes:

- one computer
- two monitors (for therapists and patients)
- EEG amplifier incl. lithium-ion batteries with charger
- easy-to-use EEG software including protocol templates
- connection cable, mouse and keyboard
- user manual
- starter set incl. electrodes
- instruction in the medical device
- technical support

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Learn how to apply evidence-based neurofeedback

Professionals who seek training through neurocare academy join a global network of professionals delivering best-practice neuromodulation. With online courses and practical workshops held each year throughout the world, the neurocare academy offers training in a range of applications including neurofeedback, applications of EEG, TMS, tDCS and Advanced Neurostimulation techniques.

Our new online learning platform means more practitioners from all over the world can access insights and know-how from a range of leading practitioners and scientists in the field. Professionals can register for instant access to learning modules and resources with the flexibility to complete a course at their own pace. This can then be followed by a practical workshop at one of our training centres worldwide.

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