

Zweitordination: 9074 Keutschach, Reauz 35

Report on Neurofeedback- and psychoeducational therapy as part of overall treatment of XXXXXXXXX, born XXXXXXXX, during timeframe November 2020 - August 2021

The abovementioned treatment of Neurofeedback, have I myself, Dr. Raimann, Head of Dpt. of Psychiatry and Neurology in Clinic Maria Hilf, Klagenfurt, Austria, treating Psychiatrist of XXXXXXXXXX since Sept. 2. 2020, in November 2020 prescribed. This was after XXXXXX had accomplished extensive psychiatric diagnoses and corresponding psychiatric and psychological treatments, and had reached a certain (basic) degree of consciousness and awareness about his mental condition. I reported about this before. The reason I prescribed the extensive Neurofeedback and Psycho-educational sessions as well as sessions with corresponding (educational- and training-) sittings, were indispensable for the right support of the total in- and outpatient therapy XXXXXX needed until June 2021 (still needs, now in lower frequency and intensity).

The Neuro-Feedback-therapy was and is carried out by Mrs. Mag. Angelika Jaksch from TEAM NEURON, Vienna, in an outpatient setting. Mrs. Jaksch is highly certified Neurofeedback specialist, founding Member of TEAM NEURON focussing on psychological and mental health through Neurofeedback and extensive Psychoeducation and other corresponding and supporting psychoeducational tools.

Neurofeedback is known as a method that assists subjects to control their brain waves *consciously*. In fact, the electroencephalography (EEG) is recorded during the neurofeedback treatment. Then, its various components are extracted and fed to subjects using online feedback loop in the form of audio, video or their combination. Accordingly, electrophysiological components are separately demonstrated. As an illustration, the power of a signal in a frequency band can be shown by e.g. a varying bar graph. During this procedure, the subject becomes *aware of the changes occurring during training* and will be able to *assess his/her progress in order to achieve optimum performance*. For instance, during treatment/training-sessions, the subject tries to improve the brain patterns based on the changes that occur in sounds or graphs simultaneously. This way, neurofeedback teaches *self-control* of brain functions to subjects by measuring brain waves and providing a feedback signal: patients learn to consciously control and influence their normal "circles of thoughts", and corresponding behaviour. Neurofeedback, combined with psycho-education and other supporting tools help patients to internalize how to think, feel and behave in order to create an attentive or relaxed state.

Clinical applications of neurofeedback include i.e. treatment of attention deficit hyperactivity disorder, anxiety, (severe) depression, borderline, epilepsy, insomnia, drug abuse, schizophrenia, learning disabilities, dyslexia and dyscalculia, autistic spectrum disorders and others.

Mrs. Jaksch made, next to our diagnosis (severe depressive episodes and personality-disorder; borderline - see earlier reports) an extensive Diagnosis out of a Neurofeedback-viewpoint as well (Befund/Diagnosis XXXXXXXXXX of 4.Nov.2020 of TEAM NEURON), shared these with me, and started therapy-sessions within the overall treatment-concept, on which Mrs. Jaksch, Mrs. Wadlegger and I myself - and of course XXXXXX himself, as well as his parents who were also informed and involved - agreed upon. Mrs. Jaksch sessions included mainly:

- **Neurofeedback SCP training** (slow cortical potentials) to regulate and inhibit neuronal activity
(Van Doren, J., Arns, M., Heinrich, H., et al. (2019). Sustained Effects of Neurofeedback in ADHD: a Systematic Review and Meta-Analysis. European Child & Adolescent Psychology, 28(3), 293–305.)
- **Neurofeedback alpha-asymmetry training**
(Baber et al., 1999 (zit. nach Cantor & Evans 2014), Choi et al., (zit. nach Cantor & Evans) Alpha-Asymmetrie Protokoll)
- **Biofeedback skin conductance training** (galvanic skin response reduction), temperature training (peripheral temperature). (Rice, K. M., Blanchard, E.B., Purcell, M. (1993). Biofeedback treatment of generalized anxiety disorder: Preliminary results. Biofeedback and Self-Regulation, 18(2), 93–105. Kim, S., Wollburg, E., Roth, W.T. (2012). Opposing breathing therapies for panic disorder: A randomized controlled trial of lowering vs. Raising end-tidal pCO₂. Journal of Clinical Psychiatry, 73(7), 931–939.)
- **Extensive Psychoeducation:** broad structured explanation of mental situation and corresponding advice, giving insights of why situation improves or does not improve, answering questions and dealing with XXXXXX's uncertainties and restlessness of mind. The latter could actually und physically

be shown/seen/heard/experienced by audio- und visual neurofeedback-tools simultaneously, trained accordingly, monitoring progress from session to session - this way XXXXXX could see short-term results within one (two hour, see below) session, but also experience real changes in neuronal and brain-activities over time.

- **Respiratory function training**
- **Active regeneration**

Again, within XXXXXX's treatment-concept, close to a dialectic behavioural therapy, the "Neuro-feedback-package", as described above and offered by Mrs. Mag. A. Jaksch, was ideal and absolutely of great importance of XXXXXX's overall treatment. A lot of progress was made - without this part of the treatment-plan we would not have reached the results we have reached by now (already!). During the time-frame from Nov-2020 until May/June 2021 these sessions were very intensive, mostly covered 2 x 50 minutes per session, so as to not put too much pressure on XXXXXX per session. This was very important, since XXXXXX wanted to reach too much in too short time - he was quite impatient. To have these sessions, combined with the extensive psychoeducation helped him though to understand why things, especially the internalisation of "things" takes considerable time. He not only understood, but also more than just accepted, that all measures, also in intensity, duration and frequency were absolutely necessary to (continue) his positive development.

Things became slowly but surely (actually quite fast!) reality in a way, that XXXXXX now is able to live his life through "new ways of thinking, feeling and behaviour". Be it, that the "ice" on which he goes his way (sometimes) still is somewhat "thin". It is thick enough though, as mentioned before, that this is a perfect basis to further improve his condition, and that I from my perspective still see the risk of a new depressive relapse or a necessary hospital stay corresponding to that of the average population.

Through the Neurofeedback-therapy, in combination with in- and outpatient therapy carried out by myself and Mrs. Dr. S. Wadlegger (clinical psychologist at Clinic Maria Hilf), it was possible to reach exceptional good results, in comparison with the severeness of XXXXXX's situation, within in a quite short timeframe. Since June 2021, the Neuro-feedback-sessions have been shortened to one unit of 50 Minutes at the time, mostly once a week only. XXXXXX started a new very challenging professional assignment as per 1. July 2021 - he is doing very well. Nevertheless a close monitoring and further development of his situation needs to be carried out within the next foreseeable future. The three aspects of the treatment-package will therefore be continued in a lesser form, and will include sessions with me myself (for monitoring), Mrs. Jaksch as described above, and Dr. S. Wadlegger (Psychologist - there was a summer-break in her treatment with XXXXXX: on the one hand, a break after quite a long time makes sense, on the other hand, this way Dr. Wadlegger could have her summer holiday, and beginning of July XXXXXX could start his new function. In the meantime he had sessions with Mrs. Jaksch). Again, these sessions, out of today's view, probably will take place in a lower frequency.

Neuro-feedback-therapy in Austria is fully recognised as an important treatment-method. In our case, best proof: the results we altogether were able to reach with XXXXXX. However, treatment is only reimbursed by social insurance if prescribed and monitored by Psychiatrist/Neurologist or another appropriate treating and monitoring medical doctor. **Private Health Insurers usually reimburse the treatment in full** - also with such insurers it is the case, that this only occurs if prescribed and monitored by the main treating doctor. In XXXXXX's case this is definitely the case, as I have explained in this document. Again, the three parts of overall treatment-concept of looking after XXXXXX to help him to reach his goal of leading a fulfilled and self-determined life would not have been successful, if we would not have worked in a team the way we did. Neurofeedback-therapy plus corresponding supporting elements of Mrs. Jaksch were and are a crucial part of this. As a matter of fact, we are grateful and also a bit proud, that we have reached this progress in a relatively short timeframe . Of course XXXXXX, and also his parents, feel the same way.

Dr. Gustav Raimann
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for Neurology and Psychiatry
Klagenfurt, 26.August 2021