Centro Internazionale dei Disturbi di Apprendimento Attenzione e Iperattività
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COURSE: FOUNDATIONS OF NEUROFEEDBACK. THEORY AND PRACTICE

FACULTY: Giuseppe Augusto Chiarenza, Centro Internazionale Disturbi di Apprendimento, Attenzione, Iperattività (CIDAAI

The course aims to provide the theoretical and practical basis for the use of neurofeedback (NF), in various clinical settings.

The theoretical and practical course mainly addresses psychologists, psychotherapists, psychiatrists, neurologists and child neuropsychiatrists.

The objectives of the course are:

a) To achieve adequate preparation for the use of Neurofeedback therapy by selecting the most appropriate clinical protocols;

b) To use appropriately the hardware and software dedicated to EEG recording and NF;

c) To analyze and to interpret the quantified EEG.

Module 1: Introduction to neurofeedback 4 hours

Definition of neurofeedback, History and Development of Neurofeedback, The basics of learning applied to Neurofeedback, the theoretical bases of Neurofeedback.

Module 2: Neuroanatomy and Neurophysiology 4 hours

Neuroanatomy: The central and the autonomic nervous system. Functional neuroanatomy: the sensory pathways: from the periphery to the cortex. The subcortical nuclei and the cerebral cortex. Functions of subcortical structures, classification of the cerebral cortex into cortical lobes, maturation of the central nervous system and functional significance. Classification of brain areas and their

functional significance. Higher cognitive functions: perception, memory, attention and executive functions. Functions of the left and right hemisphere. Concept of module and network. Neurophysiology: Bioelectrical origin of the electroencephalogram. The brain generators of the EEG. Definition of Event Related Potential and Slow Cortical Potential. Concepts of neuroplasticity.

Module 3: Electronic instrumentation and EEG registration principles: 4 hours

Basic essential terms and concepts in electronics and instrumentation. The amplifiers. The filters. The electrodes. The analog-digital conversion.

Signal acquisition: the 10-20 system. International standard measurement. Montage options and their characteristics. Comparison between QEEG and other neuroimaging techniques (eg PET, fMRI, CT, MEG, SPECT). Recognition of normal EEG patterns. The development of the EEG. Evaluation of the variables of the subject during the recording: alert-drowsiness, drug/addiction/anxiety. Recognition and correction of non-cerebral signals. Artifacts: external electrical interference, electrode artefacts and cables, patient artifacts.

Signal processing: the analog signal and the digital signal, basic terms of the EEG, the frequency bands of the EEG, typical pathological patterns of the EEG. Different types of registration (unipolar, bipolar) and derivation.

Module 4: Evidence-based Neurofeedback research 2 hours

Interpretation of statistical and methodological criteria for determining levels of effectiveness and efficiency. Presentation of meta-analysis studies on Neurofeedback.

Module 5: Psychopharmacology 2 hours

Psycho-pharmaco-EEG: The use of EEG quantified as a guide to psychopharmacological treatment. Identification of responders and non-responders to pharmacological treatment. The effect of psychotropic drugs on quantified EEG and neurofeedback.

Module 6: Client assessment 4 hours

Anamnestic collection. The neuropsychological evaluation before and after treatment. Neurophysiological evaluation: quantified EEG: Digital analysis of EEG, analysis in the

frequency domain: theoretical bases and its applications, terminology of the quantified EEG, absolute power, relative power, coherence and phase. Brain maps. The new neuroimaging techniques: EEG tomography, analysis of current densities, identification of brain sources (SLORETA, VARETA). Neurometric analysis. How to read brain maps and prepare a report. Examples of clinical application and their interpretation.

Module 7: Neurofeedback Treatment protocols. 6 hours

The characteristic patterns of EEG in anxiety, depression, post-traumatic stress disorder, learning disabilities, autism, drug abuse, head injury, migraine.

The main Neurofeedback protocols based on EEG amplitude, coherence / connectivity, z score training, LORETA z-score training, source localization.

Module 8: Treatment implementation with Neurofeedback 6 hours

Client preparation for neurofeedback. Therapeutic relationship, coaching and reinforcement strategies. Procedures for conducting a neurofeedback session. Monitor customer reactions to treatment. Quality control of the EEG

Module 9: Current trends in Neurofeedback - 2 hours

The z-score protocols, LORETAz-Score, the Infra Slow Fluctuation (ISF training) protocol

Module 10: Ethical and professional conduct - 2 hours

Familiarity with the BCIA certification. Guidelines, professional standards and ethical principles of Neurofeedback, ISNR guidelines for the practice of Neurofeedback and ISNR code of ethics. Sufficient training with the main protocols. Knowledge of the main psychological disorders. Client rights: Privacy, confidentiality and communication. Informed consent about the evaluation, treatment, and possible adverse effects. Appropriate consultation and supervision in neurofeedback.