

Steady-State Evoked Potentials as a Biofeedback Modality

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Steady-state evoked potentials provide a rapid, accurate indication of the response of the human sensory and perceptual system to an applied stimulus. A wide range of stimuli may be employed, above and beyond traditional photostimulators and LED goggles. These may include novel computer displays and specially lighted printed material. By using appropriate signal processing techniques, it is possible to measure brain responses in real-time and to use them for the assessment and training of attention, alertness, and related variables. With an understanding of anatomy and physiology, it is possible to design biofeedback protocols that measure and train specific brain pathways and processes. This has nothing to do with “entraining” brain wave frequencies, and is not based upon any specific relationship with endogenous brain rhythms. Recording and training are performed based upon consideration of the relevant anatomical pathways and physiological processes. For example, visual attention can be trained by recording at occipital or parietal sites, and using stimulation and recording parameters based upon the underlying neurophysiology. This talk will present details of the pertinent anatomy and physiology, as well as sample data that illustrate the application of this method in a setting that is directed toward the assessment and training of short-term variations in visual attention.