Neurofeedback

The following Protocol contains medical necessity criteria that apply for this service. It is applicable to Medicare Advantage products unless separate Medicare Advantage criteria are indicated. If the criteria are not met, reimbursement will be denied and the patient cannot be billed. **Preauthorization is not required but is recommended if, despite this Protocol position, you feel this service is medically necessary; supporting documentation must be submitted to behavioral health services vendor.** Please note that payment for covered services is subject to eligibility and the limitations noted in the patient’s contract at the time the services are rendered.

**Description**

Neurofeedback describes techniques of providing feedback about neuronal activity, as measured by electroencephalogram (EEG) biofeedback or functional magnetic resonance imaging (fMRI), in order to teach patients to self-regulate brain activity. Neurofeedback may utilize several techniques in an attempt to normalize unusual patterns of brain function in patients with central nervous system (CNS) disorders, such as attention deficit/hyperactivity disorder (ADHD), autism spectrum disorder, substance abuse, epilepsy, and insomnia.

**Background**

Neurofeedback may be conceptualized as a type of biofeedback that has traditionally used the electroencephalogram (EEG) as a source of feedback data. Neurofeedback differs from traditional forms of biofeedback in that the information fed back to the patient (via EEG tracings or fMRI) is a direct measure of global neuronal activity, or brain state, compared to feedback of the centrally regulated physiologic processes, such as tension of specific muscle groups or skin temperature. The patient may be trained to either increase or decrease the prevalence, amplitude, or frequency of specified EEG waveforms (e.g., alpha, beta, theta waves), depending on the changes in brain function associated with the particular disorder. It has been proposed that training of slow cortical potentials (SCPs) can regulate cortical excitability and that using the EEG as a measure of CNS functioning can help train patients to modify or control their abnormal brain activity. Upregulating or downregulating neural activity with real-time feedback of fMRI signals is also being explored.

Neurofeedback is being investigated for the treatment of a variety of disorders including attention deficit/hyperactivity disorder (ADHD), learning disabilities, Tourette syndrome, autism spectrum disorder, traumatic brain injury, seizure disorders, menopausal hot flashes, panic and anxiety disorders, fibromyalgia, tinnitus, substance abuse disorders, depression, stress management, migraine headaches, Parkinson’s disease and sleep disorders. Two EEG training protocols, training of SCPs and theta/beta training, are typically used in children with ADHD. For training of SCPs, surface-negative SCPs and surface-positive SCPs are generated over the sensorimotor cortex. Negative SCPs reflect increased excitation and occur during states of behavioral or cognitive preparation, while positive SCPs are thought to indicate reduction of cortical excitation of the underlying neural networks and appear during behavioral inhibition. In theta/beta training, the goal is to decrease activity in the EEG theta band (4-8 hertz [Hz]) and increase activity in the EEG beta band (13-20 Hz), corresponding to an alert and focused but relaxed state. Alpha-theta neurofeedback is typically used in studies on substance abuse. Neurofeedback protocols for depression focus on alpha interhemispheric asymmetry and theta/beta ratio within the left prefrontal cortex. Neurofeedback for epilepsy has focused on sensorimotor...
rhythm up-training (increasing 12-15 Hz activity at motor strip) or altering SCPs. It has been proposed that learned alterations in EEG patterns in epilepsy are a result of operant conditioning and are not conscious or voluntary. A variety of protocols have been described for treatment of migraine headaches.

Related Protocols:

Biofeedback as a Treatment of Urinary Incontinence in Adults
Biofeedback as a Treatment of Headache
Biofeedback as a Treatment of Chronic Pain
Biofeedback for Miscellaneous Indications
Biofeedback as a Treatment of Fecal Incontinence or Constipation

Corporate Medical Guideline

Neurofeedback is considered investigational.

Services that are the subject of a clinical trial do not meet our Technology Assessment Protocol criteria and are considered investigational. For explanation of experimental and investigational, please refer to the Technology Assessment Protocol.

It is expected that only appropriate and medically necessary services will be rendered. We reserve the right to conduct prepayment and postpayment reviews to assess the medical appropriateness of the above-referenced procedures. Some of this Protocol may not pertain to the patients you provide care to, as it may relate to products that are not available in your geographic area.

References

We are not responsible for the continuing viability of web site addresses that may be listed in any references below.


