



Neurofeedback Therapy for Substance Use Recovery

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DESCRIPTION

Substance Use Disorders (SUDs) are complex conditions that involve behavioral, psychological and neurological components. Traditional treatments often focus on counseling, behavioral therapies and medication-assisted approaches, which aim to reduce cravings, support abstinence and address underlying psychological issues. Neurofeedback therapy has emerged as an additional intervention with the potential to directly address brain activity patterns associated with addictive behaviors, offering participants a way to develop self-regulation skills that support recovery. Neurofeedback operates on the principle that the brain is capable of learning to modify its own activity when provided with real-time information. During sessions, sensors are attached to the scalp to measure electrical activity in specific regions implicated in reward processing, attention and impulse control. These measurements are converted into feedback, often visual or auditory, that participants can perceive and respond to. By paying attention to these cues, individuals gradually learn to increase desirable brainwave activity while decreasing patterns linked to cravings, impulsivity or emotional dysregulation.

For individuals recovering from substance use, neurofeedback provides several potential benefits. One significant effect is the reduction of cravings. Substance-related cues can trigger intense neural responses in areas such as the prefrontal cortex and limbic system, driving urges to use substances. Through neurofeedback, participants can practice regulating these responses, reducing the intensity of cravings and strengthening self-control in high-risk situations. Over time, these changes may help individuals resist impulses that could lead to relapse. In addition to cravings, neurofeedback has been shown to improve emotional regulation. Substance use is often closely linked to difficulties managing negative

emotions, such as stress, anxiety or anger. Dysregulated brain activity in response to these emotions can lead to relapse if not managed effectively. Neurofeedback sessions encourage participants to develop patterns of brain activity associated with calmness and focus, which can help stabilize mood and reduce emotionally-driven use of substances. Improved emotional regulation also supports better interpersonal relationships and engagement in social and occupational activities, both of which are important for long-term recovery.

Another area of impact is attention and cognitive control. Individuals in recovery may experience deficits in executive functioning, making it harder to plan, focus or make adaptive decisions. Neurofeedback can target neural networks involved in attention and cognitive control, helping participants strengthen their ability to sustain focus and resist distraction. These cognitive improvements enhance overall functioning and increase the likelihood of successful participation in treatment programs or reintegration into daily responsibilities. Neurofeedback therapy typically requires consistent engagement over multiple sessions, often spanning several weeks or months. Progress is tracked using objective brainwave measures alongside behavioral assessments, allowing practitioners to adjust protocols to each participant's needs. The active participation of the individual is crucial; the process relies on attentiveness, concentration and repeated practice to achieve meaningful changes in neural activity.

Environmental and procedural factors play a role in the effectiveness of therapy. Quiet and controlled settings reduce external distractions, enabling participants to focus on feedback signals. Guidance from trained professionals ensures that participants understand the relationship between the feedback and their own neural patterns, promoting skill acquisition that can transfer outside the therapy setting. Over time, these skills allow participants to independently manage

Received: 24-Nov-2025; Manuscript No: IPJABT-25-23829; **Editor assigned:** 27-Nov-2025; PreQC No: IPJABT-25-23829 (PQ); **Reviewed:** 11-Dec-2025; QC No: IPJABT-25-23829; **Revised:** 18-Dec-2025; Manuscript No: IPJABT-25-23829(R); **Published:** 24-Dec-2025 DOI: 10.35841/ipjabt-9.4.67

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Citation: Foster L (2025) Neurofeedback Therapy for Substance Use Recovery. *J Addict Behav Ther.* 9:67.

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triggers and regulate behavior in real-world environments. Neurofeedback can also complement other therapeutic interventions. Behavioral therapies, mindfulness techniques and supportive counseling provide cognitive and emotional frameworks that enhance the brain-based training of neurofeedback. For example, participants who combine neurofeedback with cognitive-behavioral strategies may find it easier to challenge automatic thoughts, resist triggers and implement healthy coping mechanisms. This integrated approach addresses multiple aspects of recovery simultaneously, offering a comprehensive strategy for reducing relapse risk.

Research in neurofeedback for substance use recovery is ongoing, with studies showing promising improvements in self-regulation, reduced substance cravings and enhanced emotional and cognitive control. While not all participants respond equally, evidence supports the therapy as a useful adjunct to existing treatment programs. Individual differences, including the severity of substance use, co-

occurring mental health conditions and engagement with therapy, can influence outcomes, emphasizing the need for personalized protocols.

CONCLUSION

In conclusion, neurofeedback therapy represents an interactive and non-invasive approach for supporting individuals recovering from substance use disorders. By providing real-time feedback on neural activity, participants can practice self-regulation strategies that reduce cravings, improve emotional stability and strengthen cognitive control. Consistent engagement, structured guidance and integration with complementary therapies enhance the potential for sustained recovery. While it is not a standalone solution, neurofeedback offers a valuable tool for individuals seeking to regain control over their behavior and improve overall functioning during the recovery process.