Cognitive Rehabilitation (for New Mexico Only)

Policy Number: CS020NM.A
Effective Date: July 1, 2024

➲ Instructions for Use

Table of Contents **Page**

Related Policy

- Sensory Integration Therapy and Auditory Integration Training (for New Mexico Only)

Application

This Medical Policy only applies to the state of New Mexico.

Coverage Rationale

Note: This policy applies to outpatient Cognitive Rehabilitation services.

Cognitive Rehabilitation (CR) is proven and medically necessary when treating individuals following a traumatic brain injury (TBI) or stroke. For medical necessity clinical coverage criteria, refer to the InterQual® LOC: Outpatient Rehabilitation & Chiropractic.

Click here to view the InterQual® criteria.

The following are unproven and not medically necessary due to insufficient evidence of efficacy:

- Cognitive Rehabilitation for any other condition or diagnosis
- Coma Stimulation (also known as Coma arousal, Coma responsiveness, multisensory stimulation, and Coma care therapy/programs) for any indication, including individuals who are comatose, in a Vegetative or Minimally Conscious State

Definitions

Cognitive Rehabilitation (CR): A multidisciplinary treatment program designed to improve cognitive function and retrain an individual's ability to think, use judgment and make decisions. The focus of these therapeutic activities is to improve deficits in memory, attention, perception, visual processing, language, reasoning, learning, planning, judgment, and problem-solving. CR comprises tasks to reinforce or reestablish previously learned patterns of behavior or to establish new compensatory mechanisms for impaired neurologic systems. The goal of CR is to maximize functional independence with minimal interference from cognitive limitations. (Hayes, 2017; updated 2021).

Coma/Persistent Vegetative State: A profound or deep state of unconsciousness. Higher brain functions are lost, but other key functions such as breathing, and circulation remain relatively intact. Non-cognitive function, and sleep patterns often remain normal, and spontaneous movements may occur. The eyes may open in response to external stimuli, and individuals may occasionally grimace, cry, or laugh (NINDS 2019).

Coma Stimulation: The use of multimodal sensory stimulation in an attempt to speed up the process of recovery from Coma or improve arousal level. The efficacy of such approaches remains unestablished (APA).

Executive Functions (also called central processes; higher order processes): Higher level cognitive processes of planning, decision making, problem solving, action sequencing, task assignment and organization, effortful and persistent goal pursuit, inhibition of competing impulses, flexibility in goal selection, and goal-conflict resolution. These often involve the use of language, judgment, abstraction and concept formation, and logic and reasoning. They are frequently associated with neural networks that include the frontal lobe, particularly the prefrontal cortex. Deficits in executive functioning are seen in various disorders, including Alzheimer's disease and schizophrenia (APA).

Minimally Conscious State: A condition in which a person who has experienced severe brain injury or deterioration retains a limited awareness of self and environment through residual cognitive functions. The individual is awake and occasionally able to communicate and do simple voluntary activities that demonstrate an engagement with surroundings (APA).

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by federal, state, or contractual requirements and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CPT Code	Description
97129	Therapeutic interventions that focus on cognitive function (e.g., attention, memory, reasoning, executive function, problem solving, and/or pragmatic functioning) and compensatory strategies to manage the performance of an activity (e.g., managing time or schedules, initiating, organizing, and sequencing tasks), direct (one-on-one) patient contact; initial 15 minutes
97130	Therapeutic interventions that focus on cognitive function (e.g., attention, memory, reasoning, executive function, problem solving, and/or pragmatic functioning) and compensatory strategies to manage the performance of an activity (e.g., managing time or schedules, initiating, organizing, and sequencing tasks), direct (one-on-one) patient contact; each additional 15 minutes (List separately in addition to code for primary procedure)

HCPCS Code	Description
S9056	Coma stimulation per diem

Description of Services

An acquired brain injury is one that occurs after birth, and affects the physical integrity, metabolic activity, or functional ability of nerve cells in the brain. Acquired brain injuries may be traumatic and caused by external trauma to the head such as falls, assaults, car accidents, and sports injuries, or non-traumatic and caused by factors such as a lack of oxygen, exposure to toxins, and surgery and tumors. Regardless of the etiology, these injuries often result in significant physical, cognitive, and psychosocial impairment in functioning and consciousness. Cognitive impairment can include deficits across multiple areas of cognitive function such as memory, attention, executive function, language, and visuoperceptual ability. (Brain Injury Association).

The goal of Cognitive Rehabilitation following TBI is to enhance the persons' ability to process and interpret information and to improve the person's ability to perform mental functions. Generally, Cognitive Rehabilitation therapy can be divided into restorative and compensatory types. Restorative rehabilitation aims to reinforce, strengthen, or restore the impaired skills through standardized cognitive tests of increasing difficulty and targeting specific cognitive domains. The compensatory approach aims to teach ways of bypassing or compensating for the impaired function (Barman et al.)

Virtual Reality (VR) training for Cognitive Rehabilitation is a small but growing field, and is gaining interest as another treatment modality for improving cognitive function. It has the potential to overcome the barriers of other therapies due to its immersive, highly engaging and gamified format (Jahn 2021). Currently, there are no established device protocols or definitive patient selection criteria.

Coma Stimulation is proposed to promote awakening of brain-injured patients from a Coma. This may involve stimulation of any or all the senses with various stimuli. There are no established protocols, or definitive patient selection criteria for this type of stimulation.

Clinical Evidence

Other Disorders

CR has also been investigated for disorders such as cerebral palsy, Down syndrome, Alzheimer's disease (AD), schizophrenia, attention deficit hyperactivity disorder (ADHD), multiple sclerosis, developmental disorders such as Autism Spectrum Disorders (ASD), and Parkinson's disease. The medical literature is limited and available studies include small study samples, lack of comparison groups, and long term follow up.

Zoupa et al. (2022) conducted a review of observational trials, RCTs, and pilot and feasibility studies to determine the impact of cognitive rehabilitation programs in patients diagnosed with schizophrenia. The results showed cognitive rehabilitation was able to enhance the majority of cognitive functions, including attention/concentration and vigilance, learning, working memory, verbal and visual episodic memory, executive functions, logical thinking and reasoning, mental flexibility, processing speed, metacognition, language, and perception. These neurocognitive domains are reported to be beneficial to psychosocial functioning for patients with schizophrenia alleviating overall disorganized thinking symptoms. The majority of these studies involved computerized therapy and this is considered beneficial for neuroplasticity as it provides multisensory stimulation, automatic adjustment of the difficulty level, and personalization activities. The authors concluded that this review suggests that cognitive rehabilitation provides benefits in schizophrenia patients' cognitive functioning, and may lead to improvements in their global functioning. This review is limited by studies with a small number of participants, lack of follow up. Larger randomized control trials are needed to validate these findings.

In a 2022 systematic review and meta-analysis, Pigott et al. evaluated the clinical effectiveness of self-management interventions for adults with idiopathic Parkinson's disease and the effects on quality of life (QOL), wellbeing and function. The interventions included group-based self-management education and training programs, either alone, combined with multi-disciplinary rehabilitation, or combined with Cognitive Behavior Therapy (CBT), and a self-guided community-based exercise program. Thirty-six studies from ten countries (the majority were from North America and the United Kingdom) totaling 2,884 participants were included. The results showed that only four studies reported statistically significant improvements in QoL, wellbeing or functional outcomes for the intervention compared to controls. These interventions were group-based self-management education and training programs, either alone, combined with multi-disciplinary rehabilitation, or combined with CBT, and a self-guided community-based exercise program. The authors concluded that the quality of this evidence was very low, and the effect of the intervention is uncertain. More high quality research is needed.

In 2021, Jahn et al. conducted a systematic review of randomized controlled trials to assess the pro-cognitive impact of fully immersive virtual reality (VR) as an intervention in transdiagnostic cognitive rehabilitation. Nine studies were selected for review, that met the criteria of individuals with a psychiatric disorder or central nervous system disease or trauma using fully immersive VR intervention with cognitive rehabilitation as the main outcome or key aim. Of the nine selected, one addressed attention deficit hyperactivity disorder (ADHD), three were schizophrenia, four addressed mild cognitive impairment (MCI), and one looked at stroke. Group sizes were small (6-34 participants), and the length and intensity of the VR intervention varied greatly. The Cochrane risk of bias assessments indicated either 'some concerns' or 'high risk of bias' in all studies, due to a lack of blinding of assessors, patients and/or trainers, inadequate statistical analyses and insufficient reporting of the methodology The results showed visual working memory and executive functions improved significantly after VR training. While the nine studies had different targets and primary cognitive outcome measures, the results showed an overall significant improvement in visual working memory, including visuospatial memory and executive functions which are important for optimization of other cognitive skills. Of note, four studies found that the significant improvements involved activities of daily living (ADL) such as cooking and shopping. The authors concluded that the scarcity of evidence prevents coming to firm conclusions, but this preliminary review of the evidence suggests VR may be useful in improving cognitive function across a range of diagnoses. Future research should focus on larger high-quality studies that focus on standardization of VR training scenarios, control groups and outcome measures.

In 2019, Gómez-Soria et al. conducted a systemic review to evaluate the efficacy of cognitive intervention programs for older adults with amnesic mild cognitive impairment (aMCI), a prodromal stage of Alzheimer disease. Randomized controlled trials and clinical trials published until March 2020, were searched with a total of 7 studies meeting criteria for inclusion in the review. The authors found cognitive intervention programs led to improvements in global cognitive function and some improvements in memory, language, attention, executive function, and visuospatial abilities. Limitations include a small sample size of 18-22 participants, heterogeneity of cognitive interventions and assessment tools, lack of training

of some health-care professionals and differences in follow-up analysis. Further well-designed studies of cognitive intervention are recommended to provide more definitive evidence.

Iwata et al. (2017) conducted a multicenter RCT examining whether cognitive remediation is effective in improving both cognitive and social functions in schizophrenia in outpatient settings that provide learning-based psychiatric rehabilitation. Participants were randomly assigned either a cognitive remediation program (n = 29) or treatment as usual (n = 31). The cognitive remediation intervention included cognitive training using computer software (CogPack) administered twice a week, while the control group met weekly over 12 weeks and was based on the Thinking Skills for Work program. Most participants were attending day treatment services where social skills training, psychoeducation for knowledge about schizophrenia, group activities and other psychosocial treatment were offered. Cognitive and social functioning were assessed using the Brief Assessment of Cognition in Schizophrenia (BACS) and Life Assessment Scale for Mentally Ill (LASMI) at pre- and post-intervention. Processing speed, executive function, and the composite score of the BACS, as well as significant improvement in interpersonal relationships and work skills on the LASMI, showed greater improvement for the cognitive remediation group than the control group. The researchers concluded that cognitive remediation in addition to psychiatric rehabilitation contributed to greater improvement in both cognitive and social functioning than psychiatric rehabilitation alone. Cognitive remediation may enhance the efficacy of psychiatric rehabilitation improving social functioning. Limitations to this study include, but were not limited to, small study size and absence of long term follow up.

Díez-Cirarda and colleagues assessed structural and functional cerebral changes in 44 PD patients, after attending a three-month integrative CR program (REHACOP) as part of a RCT. Participants were randomly divided into REHACOP group (CR) and a control group (occupational therapy). T1-weighted, diffusion weighted and functional magnetic resonance images (fMRI) during resting-state and during a memory paradigm were obtained both pre- and post-treatment. Cerebral changes were assessed with repeated measures ANOVA 2 × 2 for group x time interaction. Results demonstrated that the REHACOP group showed significantly increased brain connectivity and activation in both the resting state and recognition fMRIs compared to the control group. The study group showed increased brain activation in the learning fMRI when comparing the post- to the pre-treatment, as well as showing significant and positive correlations between the brain connectivity and activation and the cognitive performance at post-treatment. Researchers concluded that an integrative CR program can produce significant functional cerebral changes in PD patients. Acknowledging the small sample size, future studies with larger samples are needed to replicate these findings (2017).

A systematic review by Isaac and Januel assessed the effect of cognitive remediation programs on neural processes. 15 reports included 19 randomized controlled studies on 455 adult patients suffering from a schizophrenia spectrum disorder. Overall, the reviewers concluded that studies provided interesting conclusions on a possible neuroplastic effect of cognitive remediation in schizophrenia through functional reorganization of neural networks, superior to other interventions or usual care. Specifically, cognitive remediation can improve various cortical and subcortical activations, including frontal activation associated with high-level cognitive and social-cognitive functions. Further randomized controlled studies are needed to confirm or clarify existing results, in order to provide stronger evidence for a neurobiological effect of cognitive remediation programs in schizophrenia spectrum disorders (2016).

A Cochrane review evaluated the efficacy of cognitive training and CR for mild to moderate AD and vascular dementia. The evidence reviewed included 11 trials of cognitive training and a single trial of CR. The authors found no evidence for the efficacy of cognitive training to improve cognitive functioning, mood or activities of daily living (ADL) in individuals with mild to moderate AD or vascular dementia. The single trial of CR provided preliminary indications of the potential benefits of individual CR to improve ADLs in individuals with mild AD. The authors recommend that more high-quality trials of both cognitive training and CR are needed in order to establish the efficacy of cognitive training and CR for individuals with early-stage dementia (Bahar-Fuchs, 2013). Sonuga-Barke et al. (2013) conducted a meta-analysis on the efficacy of ADHD treatments that included cognitive training. The authors concluded that better evidence for efficacy from blinded assessments is required for cognitive training before it can be supported as treatments for core ADHD symptoms.

Kurz, et al. (2011) conducted a multicenter RCT on 201 patients with mild dementia in AD. The intervention comprised 12 individual weekly sessions of CR and combined 4 established strategies adopted from neurorehabilitation and psychotherapy. ADLs were chosen as the primary outcome. The results showed no effect of the intervention on everyday functioning. There were improvements favoring the intervention on QOL and treatment satisfaction and a significant antidepressant effect in female participants. The findings of this study may be helpful for designing further studies that are needed to determine the potential of CR in older adults with dementia.

Coma Stimulation

Controlled trials comparing care with and without coma stimulation programs are limited in current literature that effectively demonstrates a consistent, reproducible and positive impact on health outcomes.

In a systematic literature review, Li et al. (2020) focused on sensory stimulation to improve coma arousal in comatose patients following a TBI. In total, 10 studies were eligible for the analysis. The review included post TBI patients with severe disorders of consciousness who received sensory stimulation with specific intervention protocols, assessment tools, and behavioral/neural responses assessed by standard scales and instruments. Limitations included heterogeneity of outcome evaluation measures, varying interventions, short intervention period, absence of long-term follow-up and small sample size. The authors concluded the sensory stimulation program improved coma arousal and is likely to aid recovery. Overall, sensory stimulation with structured, meaningful, multimodal, familiar and emotional stimuli is recommended. However, the authors noted that additional high-quality clinical trials with larger sample sizes are needed to establish standard sensory stimulation protocols to improve outcomes after TBI.

In 2016, Padilla and colleagues conducted a systematic review to assess the effectiveness of sensory stimulation to improve arousal and alertness of people in a coma or persistent vegetative state following a traumatic brain injury. A total of 9 studies published from 2008 through 2013, were included for analysis. The authors concluded that there is strong evidence for the effectiveness of multimodal sensory stimulation in improving the clinical outcomes after a traumatic brain injury-induced coma or persistent vegetative state. In addition, “Moderate evidence was also provided for auditory stimulation, limited evidence was provided for complex stimuli, and insufficient evidence was provided for median nerve stimulation.” This systematic review grouped widely heterogeneous studies in terms of design, outcomes and populations. Furthermore, the clinical significance of the studies chosen for inclusion is not clear. Given the lack of rigorous, clinically meaningful studies for inclusion and the qualitative methodological approach that was used in analysis, more research is needed to confirm the conclusions the authors have made from this review. (Megha 2013, which was previously cited in this policy, was included in this systematic review).

Clinical Practice Guidelines

American Academy of Neurology (AAN)

In a 2018 practice guideline (reaffirmed in September 2021) regarding disorders of consciousness, the AAN does not address the use of stimulation as a treatment modality for patients with a prolonged disorder of consciousness. They recommend families be counseled regarding the limitations of existing evidence associated with interventions that lack support, and there are no established therapies for children with a prolonged disorder of consciousness (Giacino 2018).

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

Cognitive rehabilitation is therapy and is not subject to FDA regulation.

References

American Psychological Association (APA) Dictionary of Psychology. 2022. https://dictionary.apa.org/. Accessed May 1, 2022.

Barman A, Chatterjee A, Bhide R. Cognitive Impairment and Rehabilitation Strategies After Traumatic Brain Injury. Indian J Psychol Med. 2016 May-Jun;38(3):172-81.

Brain Injury Association of America. What is the difference between an acquired brain injury and a traumatic brain injury? https://www.biausa.org/brain-injury/about-brain-injury/nbiic/what-is-the-difference-between-an-acquired-brain-injury-and-a-traumatic-brain-injury. Accessed May 1, 2023.

Bahar-Fuchs A, Clare L, Woods B. Cognitive training and cognitive rehabilitation for mild to moderate Alzheimer's disease and vascular dementia. Cochrane Database of Systematic Reviews 2013, Issue 6. Art. No.: CD003260.

Brasure M, Lambert GJ, Sayer NA, et al. Multidisciplinary Postacute Rehabilitation for Moderate to Severe Traumatic Brain Injury in Adults. (Prepared by the Minnesota Evidence-based Practice Center under Contract No. 290-2007-10064-I.) AHRQ Publication No. 12-EHC101-EF. Rockville, MD: Agency for Healthcare Research and Quality; June 2012, Updated August 2016.

Díez-Cirarda M, Ojeda N, Peña J, et al. Increased brain connectivity and activation after cognitive rehabilitation in Parkinson's disease: a randomized controlled trial. Brain Imaging Behav. 2017 Dec;11(6):1640-1651.

Giacino JT, Katz DI, Schiff ND, et al. Practice guideline update recommendations summary: Disorders of consciousness: Report of the Guideline Development, Dissemination, and Implementation Subcommittee of the American Academy of Neurology; the American Congress of Rehabilitation Medicine; and the National Institute on Disability, Independent Living, and Rehabilitation Research. Neurology. 2018 Sep 4;91(10):450-460.

Gómez-Soria I, Peralta-Marrupe P, Calatayud-Sanz E, Latorre E. Efficacy of cognitive intervention programs in amnesic mild cognitive impairment: A systematic review. Arch Gerontol Geriatr. 2021 Jan 14;94:104332.

Isaac C, Januel D. Neural correlates of cognitive improvements following cognitive remediation in schizophrenia: a systematic review of randomized trials. Socioaffect Neurosci Psychol. 2016 Mar 17;6:30054.

Iwata K, Matsuda Y, Sato S, et al. Efficacy of cognitive rehabilitation using computer software with individuals living with schizophrenia: A randomized controlled trial in Japan. Psychiatr Rehabil J. 2017 Mar;40(1):4-11.

Jahn FS, Skovbye M, Obenhausen K, et al. Cognitive training with fully immersive virtual reality in patients with neurological and psychiatric disorders: A systematic review of randomized controlled trials. Psychiatry Res. 2021 Jun;300:113928.

Kurz A, Thone-Otto A, Cramer B, et al. CORDIAL: Cognitive Rehabilitation and Cognitive-behavioral Treatment for Early Dementia in Alzheimer Disease: A Multicenter, Randomized, Controlled Trial. Alzheimer Dis Assoc Disord. 2011.

Li J, Cheng Q, Liu FK, et al. Sensory stimulation to improve arousal in comatose patients after traumatic brain injury: a systematic review of the literature. Neurol Sci. 2020 Sep;41(9):2367-2376.

Megha M, Harpreet S, Nayeem Z. Effect of frequency of multimodal coma stimulation on the consciousness levels of traumatic brain injury comatose patients. Brain Inj. 2013.

National Institute of Neurological Disorders and Stroke (NINDS). Disorders. Coma and persistent vegetative state. Bethesda, MD: National Institutes of Health (NIH); updated April 22, 2019.

Padilla R, Domina A. Effectiveness of sensory stimulation to improve arousal and alertness of people in a coma or persistent vegetative state after traumatic brain injury: a systematic review. Am J Occup Ther. 2016 May-Jun;70(3):7003180030p1-8.

Sonuga-Barke EJ, Brandeis D, Cortese S, et al. European ADHD Guidelines Group. Nonpharmacological Interventions for ADHD: Systematic Review and Meta-Analyses of Randomized Controlled Trials of Dietary and Psychological Treatments. Am J Psychiatry. 2013 Jan 30.

Zoupa E, Bogiatzidou O, Siokas V, Liampas I, Tzeferakos G, Mavreas V, Stylianidis S, Dardiotis E. Cognitive Rehabilitation in Schizophrenia-Associated Cognitive Impairment: A Review. Neurol Int. 2022 Dec 29;15(1):12-23.

Policy History/Revision Information

Date	Summary of Changes
07/01/2024	• New Medical Policy

Instructions for Use

This Medical Policy provides assistance in interpreting UnitedHealthcare standard benefit plans. When deciding coverage, the federal, state or contractual requirements for benefit plan coverage must be referenced as the terms of the federal, state or contractual requirements for benefit plan coverage may differ from the standard benefit plan. In the event of a conflict, the federal, state or contractual requirements for benefit plan coverage govern. Before using this policy, check the federal, state or contractual requirements for benefit plan coverage. UnitedHealthcare reserves the right to modify its Policies and Guidelines as necessary. This Medical Policy is provided for informational purposes. It does not constitute medical advice.

UnitedHealthcare may also use tools developed by third parties, such as the InterQual® criteria, to assist us in administering health benefits. The UnitedHealthcare Medical Policies are intended to be used in connection with the independent professional medical judgment of a qualified health care provider and do not constitute the practice of medicine or medical advice.