Clinical Policy Title: Neuro- and brain injury life skills and rehabilitation

Clinical Policy Number: 09.02.06

Effective Date: February 1, 2017
Initial Review Date: November 16, 2016
Most Recent Review Date: January 18, 2017
Next Review Date: January 2018

Related policies:

CP# 09.01.02 Immediate post-concussion assessment and cognitive testing (ImPACT)
CP#15.02.02 Cognitive rehabilitation for traumatic brain injury

ABOUT THIS POLICY: AmeriHealth Caritas District of Columbia has developed clinical policies to assist with making coverage determinations. AmeriHealth Caritas District of Columbia’ clinical policies are based on guidelines from established industry sources, such as the Centers for Medicare & Medicaid Services (CMS), state regulatory agencies, the American Medical Association (AMA), medical specialty professional societies, and peer-reviewed professional literature. These clinical policies along with other sources, such as plan benefits and state and federal laws and regulatory requirements, including any state- or plan-specific definition of “medically necessary,” and the specific facts of the particular situation are considered by AmeriHealth Caritas District of Columbia when making coverage determinations. In the event of conflict between this clinical policy and plan benefits and/or state or federal laws and/or regulatory requirements, the plan benefits and/or state and federal laws and/or regulatory requirements shall control. AmeriHealth Caritas District of Columbia’ clinical policies are for informational purposes only and not intended as medical advice or to direct treatment. Physicians and other health care providers are solely responsible for the treatment decisions for their patients. AmeriHealth Caritas District of Columbia’ clinical policies are reflective of evidence-based medicine at the time of review. As medical science evolves, AmeriHealth Caritas District of Columbia will update its clinical policies as necessary. AmeriHealth Caritas District of Columbia’ clinical policies are not guarantees of payment.

Coverage policy

AmeriHealth Caritas District of Columbia considers the use of life skills and rehabilitation neuro. and brain injury to be clinically proven and therefore, medically necessary when the following criteria are met:

- The cognitive deficits have been acquired as a result of neurologic impairment arising from traumatic brain injury (TBI), brain surgery, stroke or encephalopathy.
- The member has been examined and evaluated by a neuropsychiatrist or neuropsychologist.
- The member is able to actively participate in a life skill and cognitive rehabilitation program (e.g., is not comatose or in a vegetative state); and
- The member is expected to make significant cognitive improvement.
- Requires intensive interdisciplinary services at least three hours per day, five to seven days/week, of at least two different types of therapy (physical, occupational, speech, cognitive and pulmonary).

In adults ages 21 and over, the injury occurred no more than six months from date of request.

Limitations:
All other uses of life skills and rehabilitation for neuro. and brain injury are not medically necessary, including but not limited to:

- The treatment of epilepsy/seizure disorders
- Learning disabilities
- Mental retardation
- Dementia (e.g. from Alzheimer’s disease HIV-infection or Parkinson’s disease)
- Cognitive decline in multiple sclerosis and
- Chronic obstructive pulmonary disease mild traumatic brain injury (including sports-related concussion)
- Wernicke encephalopathy
- Behavioral/psychiatric disorders such as addiction, attention-deficit/hyperactivity disorder, bipolar disorder, depression, schizophrenia, social phobia, substance abuse disorders, and autism spectrum disorders, as it has not been proven to be effective for these indications

Cognitive rehabilitation in the following settings is not eligible for coverage of the following services, whose effectiveness and medical necessity has not been established in the peer-reviewed literature:

- Transitional living
- Day or community-based programs
- Vocational rehabilitation
- Structured adult education
- Community re-entry programs
- Behavioral training
- Employment counseling
- Work hardening
- Music, recreation or art therapies
- Intelligence testing

Alternative covered services:

Routine in-network medical, surgical and rehabilitative evaluation and management services.

**Background**

The Centers for Disease Control and Prevention (CDC) estimates that 1.7 million people sustain TBI annually and that TBI is a contributing factor to a third (30.5 percent) of all injury-related deaths in the United States. Further, the CDC estimates that 75 percent of TBIs that occur each year are concussions or other forms of mild TBI. Most such individuals do not require a hospital stay, yet they suffer such insidious impairments that lives are forever changed.

The problem for many such individuals is that their impairments may not be immediately apparent. However, before long it becomes painfully clear that such individuals have been deeply changed in areas of
thinking, mood and emotional control. Many such individuals never resume their pre-injury lifestyles. An alarming number spiral down into poverty and despair.

The process of regaining independence after a TBI begins with comprehensive impatient rehabilitation, during which time a patient’s abilities are assessed and doctors work with family members and other medical professional to identify goals and a plan of action. Based on the severity of the TBI, a patient can continue onto outpatient treatment or long term care, but in both cases a support system is necessary to help the patient acclimate to life’s daily requirements and activities.

Life-skills are taught in a variety of community and facility-based settings. They are necessary for successful community integration and functional independence. Life-skills are adaptive behaviors that are required to deal effectively with the demands of daily living. Life-skills teaching may focus on socials skills, ADL’s, job skills, relationship building and interpersonal skills, problem solving, behavioral-self regulation, health management and other kills identified through assessment of the person’s needs.

Since its introduction in 1974, the Glasgow Coma Scale (GCS) has been widely adopted as an initial measure of the severity of brain injury (Appendix A). The GCS score summarizes responses in three domains: eye opening, verbal and motor. GCS is established as a predictor of both immediate and long-term outcome after traumatic brain injury. TBI can be categorized as severe, moderate or mild, based on the presenting GCS. A GCS of ≤ 8 is considered representative of severe brain injury (3 – 8 indicating coma); 9 – 3 moderate brain injury and 14 – 15 mild brain injury or concussion. Patients presenting with severe brain injury have the highest mortality rate, typically reported in the range of 39 percent to 51 percent. These patients are also at the highest risk for the development of intracranial hypertension and thus are most likely to benefit from intervention to control intracranial pressure. Therefore, these groups of patients will most likely benefit from early intervention, to minimize secondary brain injury.

The Rancho Los Amigos Cognitive Scale (Appendix B) further refines outcome prediction and monitoring for rehabilitation settings

**Searches**

AmeriHealth Caritas District of Columbia searched PubMed and the databases of:
- UK National Health Services Centre for Reviews and Dissemination.
- Agency for Healthcare Research and Quality’s National Guideline Clearinghouse and other evidence-based practice centers.
- The Centers for Medicare & Medicaid Services (CMS).

We conducted searches on December 5, 2016. Search terms were: “traumatic,” “brain,” “injury,” “cognitive” and “rehabilitation.”

We included:
• **Systematic reviews**, which pool results from multiple studies to achieve larger sample sizes and greater precision of effect estimation than in smaller primary studies. Systematic reviews use predetermined transparent methods to minimize bias, effectively treating the review as a scientific endeavor, and are thus rated highest in evidence-grading hierarchies.

• **Guidelines based on systematic reviews.**

• **Economic analyses**, such as cost-effectiveness, and benefit or utility studies (but not simple cost studies), reporting both costs and outcomes — sometimes referred to as efficiency studies — which also rank near the top of evidence hierarchies.

**Findings**

A narrative review (Griesbach 2015) suggested that rehabilitation is the primary adjunctive therapy indicated for TBI, and is most effective when initiated within the first year following neurologic insult. Improvements in functional parameters and reduction in societal costs (e.g., chronic care and opportunity loss) may be achieved across all age groups, but are most marked in the young.

The International Cognitive Group (INCOG) promulgated guidelines for cognitive rehabilitation focusing on victims <65 years of age who were medically stable, without psychiatric illness, and self-aware of their condition. Individualized care tailored to individuals’ goals and condition (both pre- and post-injury) was identified as a viable rehabilitative strategy.

A small randomized controlled trial (RCT) found an average length-of-stay of approximately six weeks for rehabilitative care after brain injury (Dinez 2005).

**Policy updates:**

None.

**Summary of clinical evidence:**

<table>
<thead>
<tr>
<th>Citation</th>
<th>Content, Methods, Recommendations</th>
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</thead>
<tbody>
<tr>
<td>Hallock (2016)</td>
<td>Key points:</td>
</tr>
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</table>
  • Efficacy was measured as standardized mean difference (Hedges’ g) of post-training change, were included.  
  • The effect of CT on overall cognition was small and statistically significant (g = 0.22, 95%CI 0.05 to 0.38; p = 0.01), with low heterogeneity (I² = 11.71%) and no evidence of publication bias.  
  • A moderate effect size was found for overall functional outcomes (g = 0.32, 95%CI 0.08 to 0.57, p = 0.01) with low heterogeneity (I² = 14.27%) and possible publication bias.  
  • Statistically significant effects were also found only for executive function (g = 0.20, 95%CI 0.02 to 0.39, p = 0.03) and verbal memory (g = 0.32, 95%CI 0.14 to 0.50, p < 0.01). |
<table>
<thead>
<tr>
<th>Citation</th>
<th>Content, Methods, Recommendations</th>
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| **Griesbach (2015)**<br>Post-acute traumatic brain injury rehabilitation: effects on outcome measures and life care costs. | • Despite limited studies in this field, this meta-analysis indicates that CT is modestly effective in improving cognitive and functional outcomes in patients with post-acute TBI and should therefore play a more significant role in TBI rehabilitation.  

**Key points:**  
• Rehabilitation is the predominant post-acute treatment for patients with traumatic brain injury (TBI). We retrospectively evaluated the effectiveness of post-acute TBI rehabilitation by comparing outcome measures and life care cost with that of patients with cerebrovascular accident (CVA) who underwent a multidisciplinary rehabilitation program within the same facility.  
• Included patients with no benefit limitations from the insurance carrier. Functional effectiveness was determined by comparing outcome scales, which included the Disability Rating Scale, Mayo Portland Inventory, Occupational Status Scale, Living Status Scale, and the Centre for Neuro Skills Scale.  
• Cost-effectiveness was determined by having certified life care planners create separate cost projections from the admission and discharge patient files. This allowed us to compare cost projections with and without rehabilitation for each patient. Significant decreases in the cost projections, i.e., rehabilitation savings (RS), were found after rehabilitation for TBI.  
• These RS were equivalent to those of patients with CVA. Likewise, equivalent improvements were found on all of the outcome scales for both brain injury groups. We also evaluated if the latency from TBI to admission in the rehabilitation program had an influence on outcome.  
• Cost and functional effectiveness was more marked when rehabilitation was initiated within the first year after TBI. The effects of age of TBI were also evaluated. Although RS were most marked in younger patients, improvements in outcome measures were observed in all age groups after post-acute rehabilitation. |
| **Bayley (2014)**<br>INCOG guidelines for cognitive rehabilitation following traumatic brain injury: methods and overview. | **Key points:**  
• A compilation of previous guidelines and literature focused on assessment of moderate to severe TBI.  
• Cognitive rehabilitation focuses on those younger than 65, medically stable, without psychiatric illness, and awareness of condition.  
• Individualized care which is tailored to individuals’ goals and condition (both pre and post injury) is an emerging strategy. |
| **Dènes (2005)**<br>Rehabilitation results of persons with severe traumatic brain injury. | **Key points:**  
• There is a significant improvement in acute treatment and rehabilitation of patients with severe traumatic brain injury in the last 20 years.  
• Data of 53 patients from the 165 severe traumatic brain injured patients treated in 2002. year were complete enough for analysis. The mean age of the patients was 30.6 (8-65) years. The interval between the time of injury and admission was 53 (21-120) days. The majority of patients injured in vehicular accidents (42/53).  
• The length of stay in rehabilitation unit was 41 (8-92) days, but 20 patients were readmitted for further therapy (1-6 times) in these cases the hospitalization was 70 (8-206). |
Rehabilitation treatment of patients with severe traumatic brain injury is suggested in centers, where special team is available for the patients with multifunctional impairments.

References

Professional society guidelines/other:


Peer-reviewed references:


**CMS National Coverage Determinations (NCDs):**

No NCDs identified as of the writing of this policy.

**Local Coverage Determinations (LCDs):**


**Commonly submitted codes**

Below are the most commonly submitted codes for the service(s)/item(s) subject to this policy. This is not an exhaustive list of codes. Providers are expected to consult the appropriate coding manuals and bill accordingly.

<table>
<thead>
<tr>
<th>CPT Code</th>
<th>Description</th>
<th>Comment</th>
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<tbody>
<tr>
<td>92507</td>
<td>Treatment of speech, language, voice, communication and/or auditory processing disorder; individual</td>
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<tr>
<td>97110</td>
<td>Therapeutic procedure, 1 or more areas, each 15 minutes; therapeutic exercises to develop strength and endurance, range of motion and flexibility</td>
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97112 Therapeutic procedure, 1 or more areas, each 15 minutes; Neuromuscular reeducation of movement, balance, coordination, kinesthetic sense, posture, and/or proprioception for sitting and/or standing activities

97116 Therapeutic procedure, 1 or more areas, each 15 minutes; gait training (includes stair climbing)

97530 Therapeutic activities, direct (one-on-one) patient contact (use of dynamic activities to improve functional performance), each 15 minutes

97532 Development of cognitive skill to improve attention, memory, problem solving (includes compensatory training), direct (one-on-one) patient contact, each 15 minutes

97535 Self-care/home management training (eg, activities of daily living (ADL) and compensatory training, meal preparation, safety procedures, and instructions in use of assistive technology devices/adaptive equipment) direct one-on—one contact; each 15 minutes

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<thead>
<tr>
<th>ICD-10 Code</th>
<th>Description</th>
<th>Comment</th>
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<tbody>
<tr>
<td>G93.40</td>
<td>Encephalopathy, unspecified</td>
<td></td>
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<tr>
<td>I63.9</td>
<td>Cerebral Infarction, unspecified</td>
<td></td>
</tr>
<tr>
<td>S06.0X0-S06.0X9</td>
<td>Concussion</td>
<td></td>
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<tr>
<td>S06.1X0-S06.1X9</td>
<td>Traumatic cerebral edema</td>
<td></td>
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<tr>
<td>S06.2X0-S06.2X9</td>
<td>Diffuse traumatic brain injury</td>
<td></td>
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<tr>
<td>S06.300-S06.309</td>
<td>Focal traumatic brain injury</td>
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<thead>
<tr>
<th>HCPCS Code</th>
<th>Description</th>
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<td>N/A</td>
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Appendix A

Glasgow Coma Scale (GCS)

Eye opening response:
- Spontaneous; open with blinking at baseline — four points.
- To verbal stimuli, command and speech — three points.
- To pain only (not applied to face) — two points.
- No response — one point.

Verbal response:
- Oriented — five points.
- Confused conversation, but able to answer questions — four points.
- Inappropriate words — three points.
- Incomprehensible speech — two points.
- No response — one point.
Motor response:
• Obeys commands for movement — six points.
• Purposeful movement to painful stimulus — five points.
• Withdraws in response to pain — four points.
• Flexion in response to pain (decorticate posturing) — three points.
• Extension response in response to pain (decerebrate posturing) — two points.
• No response — one point.

Categorization: Coma — No eye opening, no ability to follow commands and no word verbalizations (3–8 points).

Head Injury Classification:
• Severe head injury — GCS score of eight or less;
• Moderate head injury — GCS score of nine to 12;
• Mild head injury — GCS score of 13—15.

(App adapted from Advanced Trauma Life Support: Course for Physicians, American College of Surgeons, 1993).

Appendix B

Ranchos Los Amigos Cognitive Scale — Describes and monitors a patient’s level of functioning and progress over extended periods:

<table>
<thead>
<tr>
<th>Level</th>
<th>Classification</th>
<th>Definition</th>
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<tbody>
<tr>
<td>I</td>
<td>No response.</td>
<td>Unresponsive to all stimuli.</td>
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<tr>
<td>II</td>
<td>Generalized.</td>
<td>Inconsistent, non-purposeful reaction to stimuli. Responds to pain, but may be delayed.</td>
</tr>
<tr>
<td>III</td>
<td>Localized.</td>
<td>Inconsistent reaction directly related to type of stimulus. Response to some commands. May respond to discomfort.</td>
</tr>
<tr>
<td>IV</td>
<td>Confused</td>
<td>Disoriented and unaware of present. Occasional agitation with frequent bizarre or inappropriate responses. Short attention span and impaired information processing.</td>
</tr>
<tr>
<td>V</td>
<td>Confused, inappropriate, non-agitated.</td>
<td>Non-purposeful, fragmented or random responses to complex tasks. Appears alert and responds to commands. Performs previous learned tasks, but unable to learn new ones.</td>
</tr>
<tr>
<td>VI</td>
<td>Confused appropriate.</td>
<td>Goal-directed behavior. Responses to situation appropriate. Incorrect responses due to memory difficulties.</td>
</tr>
<tr>
<td>VIII</td>
<td>Purposeful appropriate (stand by assist).</td>
<td>Consistent person, place and time orientation. Recalls and integrates past with present. Depressed, irritable, low frustration tolerance, angry and argumentative.</td>
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<tr>
<td>IX</td>
<td>Purposeful appropriate (may request stand by assist).</td>
<td>Independently shifts among tasks and completes accurately for at least two consecutive hours. May be agitated and depressed. Self-monitors appropriateness.</td>
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<tr>
<td>X</td>
<td>Purposeful and appropriate (modified independence).</td>
<td>Multi-tasks regardless of environment. May need periodic breaks. Irritable and intolerant of frustration in case of illness, fatigue or stress.</td>
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</tbody>
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