Clinical Policy Title: Neurological 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 11, 2018
Next Review Date: January 2019

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: Select Health of South Carolina has developed clinical policies to assist with making coverage determinations. Select Health of South Carolina’s 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 Select Health of South Carolina 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. Select Health of South Carolina’s 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. Select Health of South Carolina’s clinical policies are reflective of evidence-based medicine at the time of review. As medical science evolves, Select Health of South Carolina will update its clinical policies as necessary. Select Health of South Carolina’s clinical policies are not guarantees of payment.

Coverage policy

Select Health of South Carolina considers the use of life skills and rehabilitation for neurological and brain injury to be clinically proven and, therefore, medically necessary when the following criteria are met (Bayley, 2014; Brasure, 2012; Chung, 2013; Cicerone, 2011; Griesbach, 2015):

- 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 (i.e., is not comatose or in a vegetative state).
- The member is expected to make significant cognitive improvement.
- The member requires intensive interdisciplinary services at least three hours per day, five to seven days per 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 before date of request.
Limitations:

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

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

Cognitive rehabilitation using the following services or settings is not eligible for coverage, as the effectiveness and medical necessity of these services and settings have not been established in 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 2.5 million people sustained a TBI in 2010 and that TBI is a contributing factor to a third (30.0 percent) of all injury-related deaths in the United States (CDC, 2017). Further, the CDC estimates that 75 percent of brain injuries that occur each year are concussions or other forms of mild TBI. Most of these affected individuals do not require a hospital stay, yet they suffer such insidious impairments that lives are forever changed.
The process of regaining independence after TBI begins with comprehensive inpatient rehabilitation, during which time a patient’s abilities are assessed and doctors work with family members and other medical professionals to identify goals and a plan of action. Based on the severity of the injuries, a patient can continue on to 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 social skills, activities of daily living, job skills, relationship building and interpersonal skills, problem solving, behavioral self-regulation, health management, and other skills 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 and as a predictor of both immediate and long-term outcomes after TBI (CDC, undated). The GCS score summarizes responses in three domains: eye opening, verbal, and motor function. Traumatic brain injury can be categorized as severe, moderate, or mild, based on the presenting score. A lower GCS score indicates poorer function, such that a score of 8 or less is considered representative of severe brain injury (3 to 8 indicating coma); 9 to 13 is considered a moderate brain injury; and 14 to 15 is considered a mild brain injury or concussion. Patients presenting with severe brain injury have the poorest mortality rate, typically reported in the range of 39 percent to 51 percent. These patients are also at the highest risk for developing 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 further refines outcome prediction and monitoring for rehabilitation settings (Lin, 2017).

**Searches**

Select Health of South Carolina 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 11, 2017. 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 traumatic brain injury, 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 under 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 found an average length of stay of approximately six weeks for rehabilitative care after brain injury (Dinez, 2005).

Policy updates:

In December 2017, 17 publications were added to the reference list. Of these, two were added to the Summary of Clinical Evidence section. The Rancho Los Amigos Cognitive Scale was added to the professional guidelines/other section. In the peer-reviewed references, a systematic review of therapies for consequences of mild brain injury found multiple study design and enrollment issues that limited the ability to draw conclusions (Thomas, 2017). A review of rehabilitation for traumatic brain injury found little evidence of efficacy of cognitive rehabilitation compared to either no intervention or conventional rehabilitation for the outcomes of returning to work, ability to perform activities of daily living, community integration, or quality of life (Kumar, 2017). However, most of the included studies had methodological issues presenting risk of bias. The same analysis found moderate-quality evidence that cognitive rehabilitation provided in the home compared to that provided in a hospital had a similar effect on returning to work among military personnel with moderate to severe traumatic brain injury, and that cognitive didactic and functional experiential therapies provide similar outcomes among veterans and military personnel. A meta-analysis of non-invasive brain stimulation after stroke found evidence of improvement; however, the data were judged to be of moderate quality, and further studies with a lower chance of bias and with higher participant numbers are needed (Salazar, 2017). A review of exercise during rehabilitation and post-rehabilitation for stroke found that physical activity and exercise in stroke survivors were associated with maintenance of adequate motor autonomy and improvement in physical and psychological health (Belfiore, 2017). A meta-analysis found low-quality evidence suggesting that
psychotherapy and pharmacotherapy may be effective treatments for anxiety after stroke based on underpowered studies that carried a high risk of bias (Chun, 2018).

Summary of clinical evidence:

<table>
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<tr>
<th>Citation</th>
<th>Content, Methods, Recommendations</th>
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| Kumar (2017) | **Key points:**  
- This systematic review included nine studies of participants. However, only three studies were deemed to have low risk for bias.  
- There was insufficient data of good quality to support the benefit of cognitive rehabilitation when compared to no intervention or conventional rehabilitation for several possible outcomes: return to work, independence in activities of daily living, community integration, and quality of life.  
- Among military personnel, the review showed moderate-quality evidence that cognitive rehabilitation provided at home was similar to hospital-based services in improving return-to-work status among active duty personnel with moderate to severe injury. Moderate-quality evidence suggests that one cognitive rehabilitation strategy (cognitive didactic) is no better than another (functional experiential) in achieving return to work in veterans or personnel with injury. |
| Salazar (2017) | **Key points:**  
- Ten trials were included. These provided data on a total of 226 participants. The authors judged the data to be of moderate quality.  
- The analysis showed that noninvasive brain stimulation combined with other therapies significantly improves hemispatial neglect (standardized mean difference [SMD] = -1.91; 95% confidence interval [CI], -2.57 to -1.25; $I^2 = 71%$).  
- A sensitivity analysis showed that repetitive transcranial magnetic stimulation (SMD = -2.16; 95% CI, -3.00 to -1.33; $I^2 = 76%$) and transcranial direct current stimulation (SMD = -1.07; 95% CI, -1.76 to -0.37; $I^2 = 0%$) had positive effects on hemispatial neglect.  
- Furthermore, both excitatory (SMD = -2.34; 95% CI, -3.56 to -1.12; $I^2 = 65%$) and inhibitory (SMD = -1.69; 95% CI, -2.49 to -0.88; $I^2 = 75%$) stimulations were effective. |
| Hallock (2016) | **Key points:**  
- Systematic review inclusive of 14 studies encompassing 575 patients assessed cognitive and functional outcome in patients with TBI more than 12 months post-injury.  
- Efficacy was measured as SMD (Hedges’ g) of in pre- and post-training.  
- The effect of cognitive therapy on overall cognition was small and statistically significant ($g = 0.22$, 95%CI 0.05 to 0.38; $p = 0.01$), with low heterogeneity ($I^2 = 11.71%$) 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 ($I^2 = 14.27%$) 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, $p < 0.01$).  
- Despite limited studies in this field, this meta-analysis indicates that cognitive therapy 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. |
| Griesbach (2015) | **Key points:** |
Rehabilitation is the predominant post-acute treatment for patients with TBI. We retrospectively evaluated the effectiveness of post-acute TBI rehabilitation by comparing outcome measures and life care costs 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 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 were more marked when rehabilitation was initiated within the first year after TBI. The effects of age on 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.

**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 who are medically stable, without psychiatric illness, and with awareness of condition.
- Individualized care tailored to individuals’ goals and conditions (both pre- and post-injury) is an emerging strategy.

**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.

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<th>CPT Code</th>
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<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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<td>97112</td>
<td>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</td>
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<td>97116</td>
<td>Therapeutic procedure, 1 or more areas, each 15 minutes; gait training (includes stair climbing)</td>
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<td>97530</td>
<td>Therapeutic activities, direct (one-on-one) patient contact (use of dynamic activities to improve functional performance), each 15 minutes</td>
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<td>97532</td>
<td>Development of cognitive skill to improve attention, memory, problem solving (includes compensatory training), direct (one-on-one) patient contact, each 15 minutes</td>
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<td>97535</td>
<td>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</td>
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<td>Diffuse traumatic brain injury</td>
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<td>S06.300-S06.309</td>
<td>Focal traumatic brain injury</td>
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