Clinical Policy Title: Immediate post-concussion assessment and cognitive testing (ImPACT)

Clinical Policy Number: 09.01.02

Effective Date: September 1, 2013
Initial Review Date: February 18, 2013
Most Recent Review Date: April 10, 2018
Next Review Date: April 2019

Related policies:
None.

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 and 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 immediate post-concussion assessment and cognitive testing (ImPACT) when performed by medical professionals to be clinically proven and, therefore, medically necessary in the assessment of acute head trauma (Alsalaheen 2016, Hope 2015, Harmon 2013, Giza 2013)

Limitations:

All other uses of immediate post-concussion assessment and cognitive testing are not medically necessary.

- Eligible members may not have immediate post-concussion assessment and cognitive testing if the primary purpose is for assessment to return to athletics or for other nontherapeutic reasons.
- ImPACT testing is not separately reimbursable, as it is incidental to neurobehavioral status examination (CPT 96116) or neuropsychological tests (CPT 96118-96120).
Alternative covered services:

Members suffering head injuries may have evaluation by network physicians and testing that is covered by benefits as prescribed.

Background

The Centers for Disease Control and Prevention (CDC) estimate that 1.7 million people sustain a traumatic brain injury (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. This makes concussion and other TBI a significant population health concern.

TBIs are male-predominant in every age band. Children ages 0 – 4 years, adolescents ages 15 – 19 years and adults ages ≥65 years are most likely to sustain a TBI. However, the athlete requires more study than the normal individual because of the greater likelihood of repeated TBI on return to the athletic field.

The CDC has developed tools to assist physicians in the recognition and management of patients with TBI. Studies have indicated that the use of neurocognitive testing after sports-related concussion may assist the athletic director or coach in determining if TBI is present and its level of severity.

TBI management depends upon the specific symptoms and the degree to which the symptoms respond to therapy. The 2010 Position Paper by the American Academy of Neurology (AAN) makes the following recommendations for the athlete who has suffered a concussion:

- Any athlete who is suspected to have suffered a concussion should be removed from participation until he or she is evaluated by a physician with training in the evaluation and management of sports concussions.
- No athlete should be allowed to participate in sports if he or she is still experiencing symptoms from a concussion.
- Following a concussion, a neurologist or physician with proper training should be consulted prior to clearing the athlete for return to participation.
- A certified athletic trainer should be present at all sporting events, including practices, where athletes are at risk for concussion.
- Education efforts should be maximized to improve the understanding of concussion by all athletes, parents and coaches.

In nonsports-related TBI, the CDC recommendations call for clinical assessments to follow clinical progress in the return to normal mentation and physical well-being.
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.

Searches were conducted on February 12, 2018 using the terms “traumatic brain injury (MeSH)” and “ImPACT testing (MeSH).”

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

Half of the 3.8 million concussions each year in the United States occurring during competitive sports and recreational activities go unreported.

There are no studies that demonstrate that early detection of concussion improves outcomes; however, studies indicate that early detection and removal of risk for further head injuries can reduce the risk of worsening neurologic symptoms.

According to the American Medical Society for Sports Medicine (AMSSM), “Graded symptom checklists provide an objective tool for assessing a variety of symptoms related to concussions, while also tracking the severity of those symptoms over serial evaluations.”

An RCT inclusive of 70 non-concussed patients (Hope 2015) studied the effects of acute sleep loss on both subjective symptoms and objective neurocognitive performance on ImPACT. Subjects reporting sleep of less than seven hours the night prior to baseline testing had worse cognitive, affective and vegetative symptoms and had poorer objective performance on verbal memory, visual memory and reaction time tasks when compared to those that slept seven to nine hours.

Policy updates:
A systematic review (Alsalaheen 2016) of the medical evidence found that in light of the poor to moderate reliability of most ImPACT scores, clinicians should be cautious when ImPACT is used as a criterion for medical clearance to return to play after concussion. Furthermore, because of its widespread use in concussion-related clinical research, researchers must exercise due diligence when utilizing ImPACT to evaluate outcomes after concussion or to validate other outcome measures. The quality of the evidence cited in this study was poor: evidence scores consistently exhibited poor to moderate reliability (i.e., intraclass correlation coefficient <0.80). When considering 2 time points, participants who were misclassified as experiencing a "reliable change" in any score ranged between 5 percent and 26 percent for verbal memory, 2.2 percent and 19.6 percent for visual memory, 4 percent and 24 percent for processing speed, and 4 percent and 23.2 percent for reaction time.

During the past twelve months there has been no further information published regarding ImPact testing.

Summary of clinical evidence:

<table>
<thead>
<tr>
<th>Citation</th>
<th>Content, Methods, Recommendations</th>
</tr>
</thead>
</table>
| Alsalaheen (2016)               | **Key points:**  
  - Systematic review of the medical evidence found that clinicians should be cautious when ImPACT is used as a criterion for medical clearance to return to play after concussion.  
  - Researchers must exercise due diligence when utilizing ImPACT to evaluate outcomes after concussion or to validate other outcome measures.  
  - The quality of the evidence cited in this study was poor: evidence scores consistently exhibited poor to moderate reliability (i.e., intraclass correlation coefficient <0.80).  
  - When considering 2 time points, participants who were misclassified as experiencing a "reliable change" in any score ranged between 5% and 26% for verbal memory, 2.2% and 19.6% for visual memory, 4% and 24% for processing speed, and 4% and 23.2% for reaction time. |
| Hope (2015)                     | **Key points:**  
  - Randomized controlled trial (RCT) of 70 non-concussed patients studied acute sleep loss on both subjective symptoms and objective neurocognitive performance.  
  - Subjects reporting sleep of less than seven hours the night prior to baseline testing had worse cognitive, affective, and vegetative symptoms and had poorer objective performance on verbal memory, visual memory and reaction time tasks when compared to those who slept seven to nine hours.  
  - The authors concluded that both acute sleep restriction and sleep deprivation conditions resulted in worsened next-day cognitive and sleep symptoms, but not in diminished neurocognitive performance. |
| Harmon, AMSSM (2013)            | **Key points:**  
  - A position paper based upon evidence-supported literature for the AMSSM.                                                                                                                                                     |
Citation | Content, Methods, Recommendations
--- | ---
American Medical Society for Sports Medicine position statement: concussion in sport. | - Neuropsychological (NP) tests are an objective measure of brain-behavior relationships and are more sensitive for subtle cognitive impairment than clinical exam.
- Most concussions can be managed appropriately without the use of NP testing.
- Computerized neuropsychological (CN) testing should be interpreted by trained health care professionals.
- Additional research is needed to validate current assessment tools, delineate the role of NP testing and improve identification of those at risk of prolonged postconcussive symptoms or other long-term complications.

Giza, AAN (2013) Summary of evidence-based guideline update: evaluation and management of concussion in sports | Key points:
- Update of the 1997 AAN practice parameter.
- Diagnostic tools to help identify individuals with concussion include graded symptom checklists, the Standardized Assessment of Concussion, neuropsychological assessments and the Balance Error Scoring System.
- Risk factors for recurrent concussion include history of multiple concussions, particularly within 10 days after initial concussion.
- Risk factors for chronic neurobehavioral impairment include concussion Exposure and APOE ε4 genotype.
- Data is insufficient to show that any intervention enhances recovery or diminishes long-term sequelae postconcussion.

References

Professional society guidelines/other:


**Peer-reviewed references:**


**National Coverage Determinations (NCDs):**

No NCDs were identified at the writing of this policy.
Local Coverage Determinations (LCDs):

No LCDs were identified at the writing of this policy.

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>
</tr>
</thead>
<tbody>
<tr>
<td>96116</td>
<td>Neurobehavioral status exam: Clinical assessment of thinking, reasoning and judgment (e.g., acquired knowledge, attention, language, memory, planning and problem solving, and visual-spatial abilities) per hour of psychologist's or physician's time, both face-to-face with the patient and interpreting test results and preparing the report</td>
<td></td>
</tr>
<tr>
<td>96118</td>
<td>Neuropsychological testing (e.g., Halstead-Reitan Neuropsychological Battery, Wechsler Memory Scale and Wisconsin Card Sorting Test), per hour of the psychologist’s or physician’s time, both face-to-face with the patient and time interpreting test results and preparing the report</td>
<td></td>
</tr>
<tr>
<td>96119</td>
<td>Neuropsychological testing (e.g., Halstead-Reitan Neuropsychological Battery, Wechsler Memory Scale and Wisconsin Card Sorting Test), with qualified health care professional interpreting and report, administered by technician, per hour of the technician time, face-to-face</td>
<td></td>
</tr>
<tr>
<td>96120</td>
<td>Neuropsychological testing – (e.g., WCST) administered by a computer (unsupervised) with qualified health care professional interpretation and the report</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ICD-10 Code</th>
<th>Description</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>S06.0X0A</td>
<td>Concussion without loss of consciousness, initial encounter</td>
<td></td>
</tr>
<tr>
<td>S06.0X1A</td>
<td>Concussion with loss of consciousness of 30 minutes or less, initial encounter</td>
<td></td>
</tr>
<tr>
<td>S06.0X2A</td>
<td>Concussion with loss of consciousness of 31 minutes to 59 minutes, initial encounter</td>
<td></td>
</tr>
<tr>
<td>S06.0X3A</td>
<td>Concussion with loss of consciousness of 1 hour to 5 hours 59 minutes, initial encounter</td>
<td></td>
</tr>
<tr>
<td>S06.0X4A</td>
<td>Concussion with loss of consciousness of 6 hours to 24 hours, initial encounter</td>
<td></td>
</tr>
<tr>
<td>S06.0X5A</td>
<td>Concussion with loss of consciousness greater than 24 hours with return to pre-existing conscious level, initial encounter</td>
<td></td>
</tr>
<tr>
<td>S06.0X6A</td>
<td>Concussion with loss of consciousness greater than 24 hours without return to pre-existing conscious level with patient surviving, initial encounter</td>
<td></td>
</tr>
<tr>
<td>S06.0X7A</td>
<td>Concussion with loss of consciousness of any duration with death due to brain injury prior to regaining consciousness, initial encounter</td>
<td></td>
</tr>
<tr>
<td>ICD-10 Code</td>
<td>Description</td>
<td>Comment</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>S06.0X8A</td>
<td>Concussion with loss of consciousness of any duration with death due to other cause prior to regaining consciousness, initial encounter</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HCPCS Level II Code</th>
<th>Description</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>