POSTCONCUSSIVE SYNDROME (PCS)  
CLINICAL PRACTICE GUIDELINE: OCCUPATIONAL THERAPY

Background
The Centers for Disease Control and Prevention (CDC) defines a concussion as a type of mild traumatic brain injury (TBI) caused by a bump, blow, or jolt to the head. Concussions can also occur from a fall or a blow to the body that causes the head and brain to move quickly back and forth. Most people with a concussion recover quickly and fully. But for some people, symptoms can last for days, weeks, or longer. Persistent symptoms are referred to as post-concussive syndrome (PCS). A definition of PCS is provided by the World Health Organization’s International Classification of Diseases (ICD-10), including 3 or more of the following: headache, dizziness, fatigue, irritability, insomnia, concentration difficulty or memory difficulty. In general, recovery may be slower among older adults, young children, and teens. Those who have had a concussion in the past are also at risk of having another one and may find that it takes longer to recover if they have another concussion. Lingering symptoms of a concussion typically fall into four categories (1) physical, (2) cognitive, (3) emotional/mood, (4) sleep. Individuals with post-concussive symptoms often have difficulty transitioning back to activities such as work, school, and play. The role of occupational therapists (OT) is to address performance skills and patterns to promote return to engagement in meaningful and purposeful activities.

Evaluation
Client History and Occupational Profile

- Relevant information: Age, date of injury, mechanism of injury, symptoms at time of injury and present, did client lose consciousness, was post-traumatic amnesia present, number and impact of previous concussions, other past-medical history including medical co-morbidities and psychosocial client factors
- Comparison of prior level of function and current level of function: ADL, IADL, school, work, and/or sport, and other meaningful interests
- Current symptom ratings: Concussion Grading Scale (CGS), Refer to Appendix A

Physical Symptoms associated with PCS may include headache, blurry or double vision, nausea, dizziness, sensitivity to noise or light, balance problems, fatigue or low energy
- OT screening of UE ROM, strength, coordination, sensation, and posture.
- If neck or balance issues are present, collaboration with PT is recommended. See PT CPG.
- Vision – Oculomotor function
  - Research has identified objective findings that show difference in saccadic eye movements, smooth pursuits and tracking in control group vs PCS group
  - Assess through observation as well as standardized assessments
  - Standardized assessments to consider
    - Developmental Eye Movement Test* (DEM)14,25
    - King-Devick Assessment*13
    - NSUCO Saccades Testing*19
    - NSUCO Pursuits Testing*19
    - *See Visual Screening CPG for additional details
- Vision – Convergence and Accommodation
  - Changes in accommodation and convergence have been identified in individuals with PCS
  - Assess through questionnaire and standardized assessments
    - Convergence Insufficiency Symptom Survey (CISS)24
      - Scores >21 can indicate impairment, recommend referral to optometrist
      - Near point of convergence*23,26
      - Amplitude of accommodation*27
      - *See Visual Screening CPG for additional details
  - Occupational therapists can work collaboratively with optometrists to improve near focus, convergence, and accommodative function
- Sensory Processing
  - Assess through interview and questionnaire
    - Interview may include asking about screen time tolerance, light and sound sensitivities
    - Adult Sensory Profile5
- Vestibular Function
  - Assess through screening and questionnaire
    - The Vestibular Disorders Activities of Daily Living Scale7
    - The Vestibular Activities and Participation Measure1,21
    - VOR, VOR cancellation, Head Impact Testing (HIT). See PT CPG.
    - Recommend collaboration with Physical Therapy in this area

Cognitive Symptoms may include difficulty thinking clearly, feeling slowed down, difficulty concentrating, or difficulty remembering new information
- Work collaboratively with speech-language pathologists to address cognitive deficits, with
overarching goal of improving occupational performance
• SLP to focus on standardized testing and remediation of deficits of executive functioning, memory, cognitive endurance
• OTs and SLPs collaborate on return to school or work plans and accommodations
• May also seek input from physicians and rehabilitation psychologists as part of collaborative treatment team
• Montreal Cognitive Assessment (MoCA), if not completed by SLP, is a standardized assessment that can be utilized to measure cognitive skills. See SLP CPG.

| Emotional | Symptoms following concussion may include irritability, sadness, nervousness, or an overall feeling of being more emotional
• Symptoms may be identified with utilization of CGS questionnaire or through discussion
• Research suggests mindfulness is key to occupational engagement and may enhance health and well-being
• May also seek input regarding emotional health from physicians, rehabilitation psychologists, and social workers as part of collaborative treatment team |
|---|---|
| Sleep | Symptoms may include trouble falling asleep or sleeping more or less than usual
• Symptoms may be identified with utilization of CGS questionnaire or through discussion
• It could be the case that sleep disturbances are secondary to other symptoms such as depression or anxiety. Management strategies should take this potential interaction of symptoms into account. |
| Physical Symptoms | • Vision – treatment interventions may include teaching compensatory strategies to address difficulties with light sensitivity or visual tracking. A rehabilitative approach would involve working in collaboration with optometrists and/or ophthalmologists to address impairments in oculomotor function, binocular vision and accommodation. See neurovision CPG for additional detail.  
  • Sensory Processing – treatment intervention includes recommendations of environmental adaptations to modify reactions to sensory stimulation.  
  • Fatigue Management – education on energy conservation strategies including planning, prioritizing, and pacing during ADL/IADL completion. Fatigue coping strategies can be found in Appendix 12.3 of cited article, pg 96. |
|---|---|
| Emotional Symptoms | • Training in mindfulness-based techniques and goal directed techniques to help manage the emotional and physical symptoms of PCS and improve participation in daily activities and occupation.  
  • Mindfulness-based techniques include  
  o Stress reduction techniques  
  o Relaxation techniques  
  • When individuals anticipate that activities will provoke autonomic symptoms of dizziness or headache, relaxation techniques can be implemented to prolong the ability to engage in a functional task  
  • May also benefit from mindfulness and relaxation techniques during OT treatment sessions to increase tolerance for therapeutic activity  
  • Goal directed interventions include: symptom management, assertiveness training, and guided return to engagement in meaningful occupations  
  o Assertiveness training can be vital following “invisible injury,” such as concussion, to empower individuals to ask for accommodations needed for successful return to school or work. |
| Cognitive Symptoms | • Executive function – remediating executive function skills affecting daily routines  
  • Establishing healthy routines  
  o Strategies may include taking breaks and utilizing organizational tools  
  o Aim to assist in completion of daily routine while minimizing symptoms  
  • Work in collaboration with SLP to address cognitive deficits |
| Sleep Symptoms | • Provide education on the role of sleep in recovery  
  • Facilitate healthy daily routines and sleep habits  
  o Plan rest breaks  
  o Make environmental modifications  
  o Manage symptoms  
  o Sleep hygiene advice (Appendix 7.1, pg 82)  
  • Other strategies  
  o Gradually reducing daytime naps, while increasing physical activity to promote a return to nighttime sleeping  
  o Environmental modifications may include  
  ▪ Limiting screen usage in bed  
  ▪ Use of light-blocking curtains  
  ▪ Blue-light filters for electronic devices |
| Occupational Performance | Planning for return to school and work should occur in collaboration with treatment team, including physician, psychologist, SLP, PT and OT. |
Return to school\textsuperscript{11}
- Research suggests the importance of returning individuals to structured activities, including school, as soon as possible to establish general sense of improved well-being and restore a consistent routine.

**Modifications for visual difficulties:**
- Using a line guide or tinted transparency when reading to help with visual tracking or reduce glare
- May benefit from larger print or access to lesson notes ahead of time

**Modifications for general sensory sensitivity, including decreased tolerance for crowds and visual motion:**
- Allow student to change classes ahead of time
- Provide alternative to eating lunch in a busy cafeteria

**Modifications at the college level:**
- Recommend accommodations such as preprinted notes, increased test time, use of recording devices for taking notes
- Compensatory strategies for visual tracking when reading
- Line guide, glare reduction transparencies, reducing screen brightness
- Social activities recommendations
- Therapists can assist in identifying activities that are less stimulating, therefore less likely to provoke symptoms
- Avoid studying or eating lunch with a large group of peers, and meet with small groups in less stimulating environments

Return to work\textsuperscript{11}
- Recommendation for initial period of rest, followed by graduated return to work if one's job permits
- Therapists can work with patients and their employers on strategies to help manage symptoms
  - Creating modified workstations
  - Using anti-glare computer screens
  - Implementing frequent rest breaks

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Appendix A: Ohio State Concussion Grading Scale
Circle the number in each row that best describes the way you have been feeling relative to the symptom.

<table>
<thead>
<tr>
<th>Symptom</th>
<th>None</th>
<th>Mild</th>
<th>Moderate</th>
<th>Severe</th>
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</thead>
<tbody>
<tr>
<td>Headache</td>
<td></td>
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<td></td>
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<tr>
<td>“Pressure in Head”</td>
<td></td>
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<tr>
<td>Neck Pain</td>
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<tr>
<td>Nausea or Vomiting</td>
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<tr>
<td>Dizziness</td>
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<tr>
<td>Blurred Vision</td>
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<tr>
<td>Balance Problems</td>
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<tr>
<td>Sensitivity to Light</td>
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<tr>
<td>Sensitivity to Noise</td>
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<tr>
<td>Feeling Slowed Down</td>
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<tr>
<td>Feeling Like “In a Fog”</td>
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<tr>
<td>Don’t Feel Right</td>
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<tr>
<td>Difficulty Concentrating</td>
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<tr>
<td>Difficulty Remembering</td>
<td></td>
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<tr>
<td>Fatigue or Low Energy</td>
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<tr>
<td>Confusion</td>
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<tr>
<td>Drowsiness</td>
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<tr>
<td>Trouble Falling Asleep</td>
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<tr>
<td>More Emotional</td>
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<tr>
<td>Irritability</td>
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<tr>
<td>Sadness</td>
<td></td>
<td></td>
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<tr>
<td>Nervous or Anxious</td>
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<tr>
<td>Sleeping More Than Usual</td>
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<tr>
<td>Sleeping Less Than Usual</td>
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<tr>
<td>Difficulty Sleeping Soundly</td>
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<tr>
<td>Ringing in Ears</td>
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<tr>
<td>Numbness or Tingling</td>
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</table>

1. Over the past week, my sleeping pattern has changed.__________ □ Yes □ No If NO, skip to #2
   a. Have you been taking naps during the middle of the day?____ □ Yes □ No
   b. Are you waking during the night?________________________ □ Yes □ No

2. Over the past week, my participation in work or school has been__________% of what it would be normally.

3. Over the past week, my participation in physical activity (sports, working out, etc.) has been ____
   _____% of what it would be normally.

4. Do you feel like you are putting more effort into maintaining schoolwork/grades and/or work productivity? (Circle corresponding number below)
   0 1 2 3 4 5 6
   No More Effort ................................................................. A Lot More Effort

5. Please indicate the type of visual changes you are experiencing:
   □ Eye Fatigue   □ Double Vision   □ Blurry Vision   □ Other______ □ n/a

6. Do your symptoms get WORSE with physical activity?__________ □ Yes □ No

7. Do your symptoms get WORSE with thinking/cognitive activity?______ □ Yes □ No

8. Do your symptoms IMPROVE with physical rest?__________ □ Yes □ No

9. Do your symptoms IMPROVE with thinking/cognitive rest?__________ □ Yes □ No

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References


