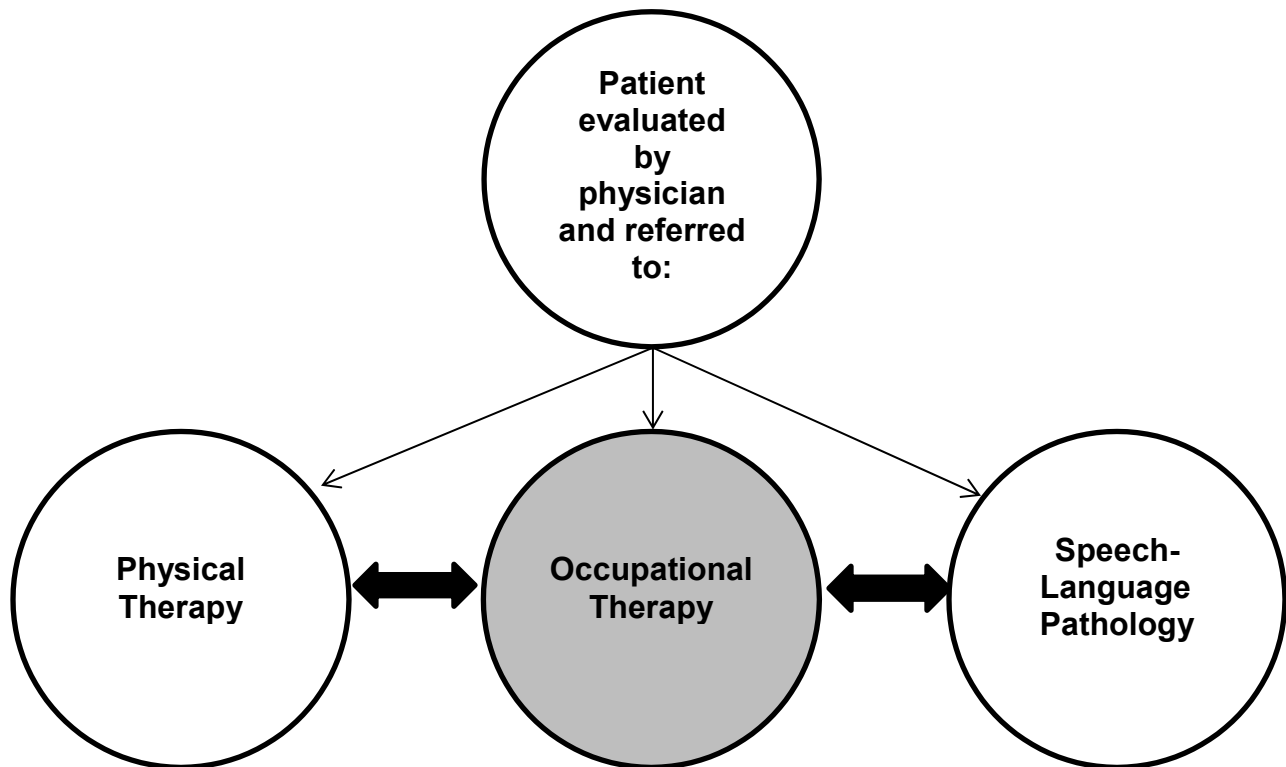


POSTCONCUSSIVE SYNDROME (PCS) CLINICAL PRACTICE GUIDELINE: OCCUPATIONAL THERAPY



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.⁶ 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.⁶ Lingered symptoms of a concussion typically fall into four categories (1) physical, (2) cognitive, (3) emotional/mood, (4) sleep.⁶ Individuals with post-concussive symptoms often have difficulty transitioning back to activities such as work, school, and play.¹¹ The role of occupational therapists (OT) is to address performance skills and patterns to promote return to engagement in meaningful and purposeful activities.⁴

Evaluation



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Client History and Occupational Profile^{2,4}	<ul style="list-style-type: none"> • 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	<p>Symptoms associated with PCS may include headache, blurry or double vision, nausea, dizziness, sensitivity to noise or light, balance problems, fatigue or low energy⁶</p> <ul style="list-style-type: none"> • 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 function¹¹ <ul style="list-style-type: none"> ◦ Research has identified objective findings that show difference in saccadic eye movements, smooth pursuits and tracking in control group vs PCS group¹⁶ ◦ Assess through observation as well as standardized assessments ◦ Standardized assessments to consider <ul style="list-style-type: none"> ▪ 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 <ul style="list-style-type: none"> ◦ Changes in accommodation and convergence have been identified in individuals with PCS²² ◦ Assess through questionnaire and standardized assessments <ul style="list-style-type: none"> ▪ Convergence Insufficiency Symptom Survey (CISS)²⁴ <ul style="list-style-type: none"> • 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 function¹¹ • Sensory Processing <ul style="list-style-type: none"> ◦ Assess through interview and questionnaire <ul style="list-style-type: none"> ▪ Interview may include asking about screen time tolerance, light and sound sensitivities ▪ Adult Sensory Profile⁵ • Vestibular Function <ul style="list-style-type: none"> ◦ Assess through screening and questionnaire <ul style="list-style-type: none"> ▪ The Vestibular Disorders Activities of Daily Living Scale⁷ ▪ The Vestibular Activities and Participation Measure^{1,21} ▪ VOR, VOR cancellation, Head Impact Testing (HIT). See PT CPG. ▪ Recommend collaboration with Physical Therapy in this area
Cognitive	<p>Symptoms may include difficulty thinking clearly, feeling slowed down, difficulty concentrating, or difficulty remembering new information⁶</p> <ul style="list-style-type: none"> • Work collaboratively with speech-language pathologists to address cognitive deficits, with

	<p>overarching goal of improving occupational performance⁴</p> <ul style="list-style-type: none"> • SLP to focus on standardized testing and remediation of deficits of executive functioning, memory, cognitive endurance⁴ • OTs and SLPs collaborate on return to school or work plans and accommodations⁴ • 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	<p>Symptoms following concussion may include irritability, sadness, nervousness, or an overall feeling of being more emotional⁶</p> <ul style="list-style-type: none"> • 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-being¹⁰ • May also seek input regarding emotional health from physicians, rehabilitation psychologists, and social workers as part of collaborative treatment team
Sleep	<p>Symptoms may include trouble falling asleep or sleeping more or less than usual⁶</p> <ul style="list-style-type: none"> • 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.²⁰

Intervention



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Physical Symptoms	<ul style="list-style-type: none"> • Vision – treatment interventions may include teaching compensatory strategies to address difficulties with light sensitivity or visual tracking.¹¹ 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.¹¹ • 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 96.²⁰
Emotional Symptoms	<ul style="list-style-type: none"> • 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^{8,15} • Mindfulness-based techniques include <ul style="list-style-type: none"> ◦ Stress reduction techniques³ ◦ Relaxation techniques^{18,20} • 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 task⁴ • May also benefit from mindfulness and relaxation techniques during OT treatment sessions to increase tolerance for therapeutic activity⁴ • Goal directed interventions include: symptom management, assertiveness training, and guided return to engagement in meaningful occupations⁴ <ul style="list-style-type: none"> ◦ 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 work⁹
Cognitive Symptoms	<ul style="list-style-type: none"> • Executive function – remediating executive function skills affecting daily routines¹⁷ • Establishing healthy routines <ul style="list-style-type: none"> ◦ Strategies may include taking breaks and utilizing organizational tools ◦ Aim to assist in completion of daily routine while minimizing symptoms • Work in collaboration with SLP to address cognitive deficits
Sleep Symptoms	<ul style="list-style-type: none"> • Provide education on the role of sleep in recovery⁴ • Facilitate healthy daily routines and sleep habits¹² <ul style="list-style-type: none"> ◦ Plan rest breaks ◦ Make environmental modifications ◦ Manage symptoms ◦ Sleep hygiene advice (Appendix 7.1, pg 82)²⁰ • Other strategies <ul style="list-style-type: none"> ◦ Gradually reducing daytime naps, while increasing physical activity to promote a return to nighttime sleeping ◦ Environmental modifications may include⁴ <ul style="list-style-type: none"> ▪ Limiting screen usage in bed ▪ Use of light-blocking curtains ▪ Blue-light filters for electronic devices
Occupational Performance	<p>Planning for return to school and work should occur in collaboration with treatment team, including physician, psychologist, SLP, PT and OT.</p>

Return to school¹¹

- 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 work¹¹

- 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

Appendix A: Ohio State Concussion Grading Scale



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Circle the number in each row that best describes the way you have been feeling relative to the symptom. Patient Name _____

Symptom	None	Mild	Moderate	Severe			
Headache	0	1	2	3	4	5	6
“Pressure in Head”	0	1	2	3	4	5	6
Neck Pain	0	1	2	3	4	5	6
Nausea or Vomiting	0	1	2	3	4	5	6
Dizziness	0	1	2	3	4	5	6
Blurred Vision	0	1	2	3	4	5	6
Balance Problems	0	1	2	3	4	5	6
Sensitivity to Light	0	1	2	3	4	5	6
Sensitivity to Noise	0	1	2	3	4	5	6
Feeling Slowed Down	0	1	2	3	4	5	6
Feeling Like “In a Fog”	0	1	2	3	4	5	6
Don’t Feel Right	0	1	2	3	4	5	6
Difficulty Concentrating	0	1	2	3	4	5	6
Difficulty Remembering	0	1	2	3	4	5	6
Fatigue or Low Energy	0	1	2	3	4	5	6
Confusion	0	1	2	3	4	5	6
Drowsiness	0	1	2	3	4	5	6
Trouble Falling Asleep	0	1	2	3	4	5	6
More Emotional	0	1	2	3	4	5	6
Irritability	0	1	2	3	4	5	6
Sadness	0	1	2	3	4	5	6
Nervous or Anxious	0	1	2	3	4	5	6
Sleeping More Than Usual	0	1	2	3	4	5	6
Sleeping Less Than Usual	0	1	2	3	4	5	6
Difficulty Sleeping Soundly	0	1	2	3	4	5	6
Ringing in Ears	0	1	2	3	4	5	6
Numbness or Tingling	0	1	2	3	4	5	6

- Over the past week, my sleeping pattern has changed. _____ Yes No *If NO, skip to #2*
 - Have you been taking naps during the middle of the day? _____ Yes No
 - Are you waking during the night? _____ Yes No
- Over the past week, my participation in **work** or **school** has been _____ % of what it would be normally.
- Over the past week, my participation in **physical activity** (sports, working out, etc.) has been _____ % of what it would be normally.
- Do you feel like you are putting more effort 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			

- Please indicate the type of visual changes you are experiencing:
 Eye Fatigue Double Vision Blurry Vision Other _____ n/a
- Do your symptoms get **WORSE** with **physical activity**? _____ Yes No
- Do your symptoms get **WORSE** with **thinking/cognitive activity**? _____ Yes No
- Do your symptoms **IMPROVE** with **physical rest**? _____ Yes No
- Do your symptoms **IMPROVE** with **thinking/cognitive rest**? _____ Yes No

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