

Connecticut Children's CLASP Guideline

Suspected Concussion

INTRODUCTION

Concussions or mild traumatic brain injury (mTBI) in adolescents can occur as a result of a direct blow to the head, face, neck, or a forceful impact to the body, leading to the rapid movement of the brain within the skull. This type of traumatic brain injury is prevalent, particularly among young individuals engaged in sports and recreational activities. It is imperative to provide a prompt diagnosis, as symptoms may worsen over time if not properly treated immediately.

Concussions can present with a variety of symptoms:

- Acute development of symptoms following head trauma can be seen in six different categories: somatic, vestibular, oculomotor, cognitive, emotional, and sleep. Some symptoms that are indicative of a possible concussion are headaches, double vision, nausea/vomiting, confusion, and drowsiness.
- The majority of patients with concussion return to baseline in 4 weeks, and chronic or persistent symptoms lasting four or more weeks may indicate the development post-concussion syndrome.

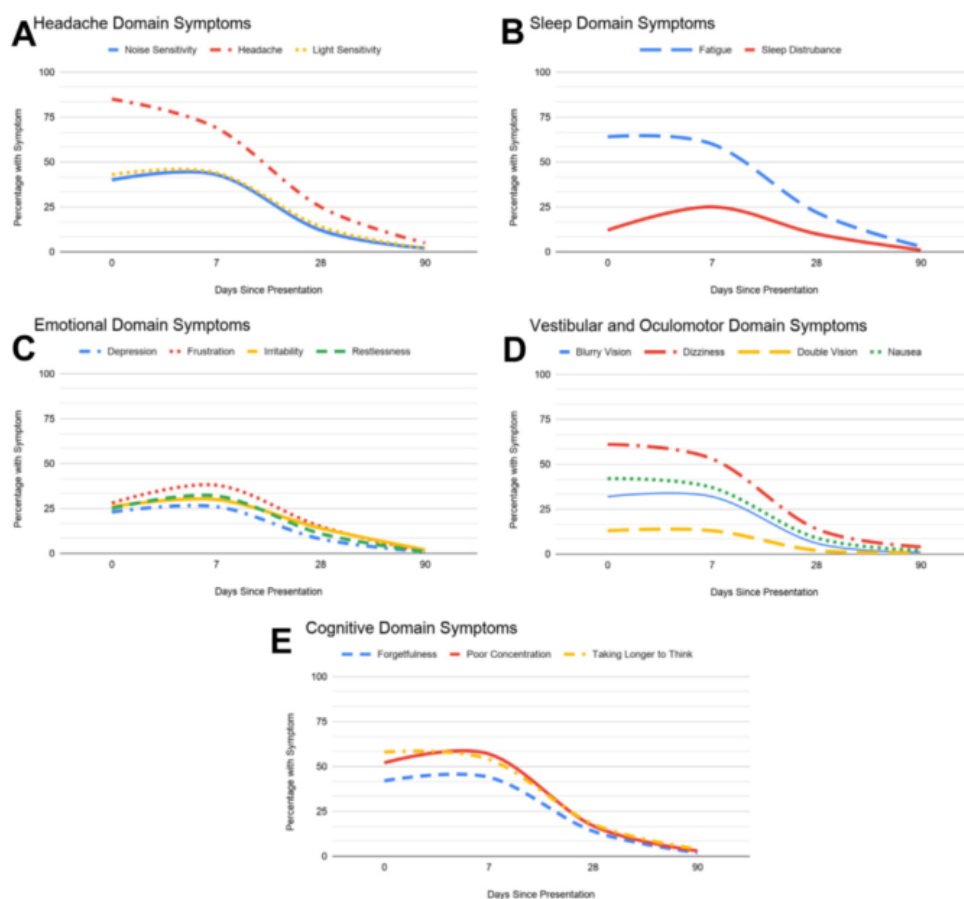


Fig. 3. (A–E) Resolution of various concussion symptoms by symptom domain. In general, symptoms improve dramatically between days 7 and 28. Only a small portion of patients remain symptomatic 90 days after presentation. (Data from Eisenberg, Meehan and Mannix. *Pediatrics*, 2014.⁸³)

Concussions affect each patient differently. Thus, there are also varying effects on short and long-term brain function. It is crucial to rest the brain and avoid activities that may exacerbate symptoms, although maintaining some cognitive activity is just as important for recovery. Early non-pounding light aerobic activity is also important.

INITIAL EVALUATION

INITIAL EVALUATION:

- Obtain the following history and physical exam:
 - Patient age
 - Date/time of injury
 - Mechanism of injury
 - Whether imaging was obtained and whether it was abnormal
 - Presence of Comorbid conditions
 - Hx of ADHD, migraine, depression, and anxiety can worsen acutely in concussion and prolong but not preclude recovery
 - Previous concussions, including time to recovery and mechanism of injury
 - Presence of the following signs and symptoms:
 - Presence of dizziness or vertigo
 - Subjective reports of balance (dizziness, vertigo symptoms)
 - Nystagmus and saccadic abnormalities are an indication of possible vestibular dysfunction
- Assess if any **RED FLAGS**:
 - **WITHIN the first 6 hours:**
 - Worsening headache with repeated vomiting
 - Neck pain in the setting of significant trauma
 - Double vision- vision loss
 - Pupil asymmetry
 - Seizure
 - Slurred speech
 - Deteriorating state of consciousness
 - Localizing or lateralizing neurological signs or symptoms
 - **BEYOND the first 6 hours:**
 - Seizures
 - Slurred speech
 - Significant visual changes
 - Deteriorating state of consciousness

INITIAL MANAGEMENT

INITIAL MANAGEMENT:

If NO red flags, outpatient treatment is appropriate

Home/Lifestyle:

- Initially, refrain from exacerbating mental and physical activities that may worsen recovery
 - Avoid driving until - cleared by provider
- Normalize life as much as possible while not ignoring symptoms and protecting from a second concussion
 - Screen time, etc. is permissible if not exacerbating symptoms
- Minimize school absence; start with part-time attendance with appropriate accommodations if unable to attend full days of school (See **Appendix A: Return to School** and **Appendix B: Return to School Letter**)
- Promote good sleep hygiene, targeting 8-10 hours of sleep per night. Napping during the day is permissible if it does not affect nighttime sleep
- There should be a progressive increase in independent physical activity if symptoms do not worsen.
 - Daily non-pounding light aerobic activity such as brisk walking or exercise bike for 20 minutes a day regardless of symptoms.
 - Avoid high-risk activities such as PE class, biking, and sports.

Activity Clearance (Return to Sports/Play):

- See **Appendix C: Return to Sports** and **Appendix D: Return to Sports Letter**
- In general, child should be symptom-free for a minimum of 7 days to be allowed to return to contact/collision sports.
- Return to activity should be gradual:
 - Return to play program can be started after the patient is asymptomatic for 7 days during baseline activities, including academics and low level aerobic activities such as walking for 20 minutes.
 - Final clearance to return to unrestricted athletic/recreation participation should be made together by the treating provider, family, coach/athletic trainer.

Headache:

- Consider acetaminophen and/or ibuprofen as needed for headaches that are not improving or are persistent. Recognize these medications may not significantly alter concussion headaches.
- For patients with headaches > 30 days, refer to Neurology; for headaches persisting beyond 3 months, refer to Headache Clinic in Pain Management Department.

Physical Therapy:

- Consider PT for vestibular symptoms (for example balance issues and difficulty with eye tracking) that are not improving or persistent after 2-3 weeks.
- Consider earlier referral to PT if significant cervical myofascial strain contributing to symptoms.

Mental Health:

- All children and adolescents are prone to mood instability following a concussion due to a loss of routine, sleep problems, and pain. This may become more significant in children that have a history of depression and/or anxiety. Of note suicide risk also increased after concussion.
- All patients with concussion should be monitored regularly and referred to a mental health specialist if they are displaying persistent mood symptoms.
- If experiencing ongoing memory deficits at 2 weeks post-concussion, screen with brief cognitive test to determine need for neuropsychiatry referral.
- If patient is already seen by a behavioral health specialist, consider increasing frequency of appointments.

PCP Follow-Up:

- During the initial period, more frequent follow up may be indicated depending on clinical presentation (e.g., first concussion, more severe presentation).
- Those without clinical improvement within the first few days should be seen in follow up in within 1 week.
- For those with clinical improvement, follow up visits may be spaced to every 2 weeks.
- Those with vestibular signs who are otherwise clinically improving may be followed up every 3 weeks, as vestibular symptoms may take more time to recover.

**WHEN
TO REFER****EMERGENT REFERRAL****TO EMERGENCY DEPARTMENT:**

- If any red flags within the first 6 hours, direct to the ED
- If any red flags beyond the first six (6 hours), direct to ED
- If brain or neck imaging was obtained and resulted in positive findings that may indicate need for hospital admission or evaluation
- If suicidal ideation or other severe behavioral health disturbance

URGENT REFERRAL (Evaluation within 1 week)**Neurosurgery:**

- Patients with a positive imaging result for a closed head injury
- Negative closed head injury imaging in children <5 years of age

Ophthalmology:

- An injury directly involving the eye

ROUTINE REFERRAL

If NO red flags, routine outpatient management is appropriate

Neurosurgery (evaluation within 1 week)

- Non-sport traumatic concussions: All ages
- Sport-related concussions: Children < 10 years of age, within 30 days of injury

Sports Medicine:

- Negative closed head injury imaging in children 10 years or older
- No improvement of symptoms within 3-4 weeks of injury
- History of multiple concussions

Ophthalmology:

- Uncomfortable vision at distance or near
- Blurred vision (typically at near)
- Double vision at near

Neurology

- Children \leq 18 years of age, > 30 days from the time of injury

Headache Clinic (in Pain Medicine):

- Ongoing headache persisting beyond 3 months
 - ❖ Individuals with history of migraine, mood/anxiety/learning disorders and previous concussion may also be more likely to develop post-concussion syndrome and could benefit from the multidisciplinary model in this Pain Clinic

Physical Therapy:

- For symptoms, such as myofascial neck or vestibular symptoms, lasting > 2 weeks

If significant cognitive symptoms persist after four weeks, consider referral to the following resources:

Refer to a behavioral health provider that specializes in Cognitive Behavioral Therapy (CBT):

- See [Mental Health Resources](#)

**HOW
TO REFER**

Referral to Clinic Advised above (Neurosurgery, Ophthalmology, Sports Medicine, Neurology, Headache Clinic or Physical Therapy) via CT Children's One Call Access Center

Phone: 833.733.7669 **Fax:** 833.226.2329

For more information on how to place referrals to Connecticut Children's, click [here](#).

Information to be included with the referral:

- Any radiology images
- History of the mechanism of injury, initial presentation, and the history of patient's symptoms since the injury

**WHAT TO
EXPECT**

What to expect from CT Children’s Visit:

- Evaluation and determination of need for additional diagnostic testing
- Plan for symptom management and interface with school and sports
- Potential referrals to other specialists to aid with recovery

APPENDIX A: Return to School

Return to School

This tool is a guideline for managing a student's return to school following a concussion and does not replace medical advice. Timelines and activities may vary by direction of a health care professional.

AT HOME			AT SCHOOL			
STAGE 1:	STAGE 2:		STAGE 3:	STAGE 4:	STAGE 5:	STAGE 6:
Physical & cognitive rest <ul style="list-style-type: none"> Basic board games, crafts, talk on phone Activities that do not increase heart rate or break a sweat Limit/Avoid: <ul style="list-style-type: none"> Computer, TV, texting, video games, reading No: <ul style="list-style-type: none"> School work Sports Work Driving until cleared by a health care professional 	Start with light cognitive activity: <p>Gradually increase cognitive activity up to 30 min. Take frequent breaks.</p> Prior activities plus: <ul style="list-style-type: none"> Reading, TV, drawing Limited peer contact and social networking <p>Contact school to create Return to School plan.</p>	When light cognitive activity is tolerated: <p>Introduce school work.</p> Prior activities plus: <ul style="list-style-type: none"> School work as per Return to School plan <p>Communicate with school on student's progression.</p>	Back to school part-time <p>Part-time school with maximum accommodations.</p> Prior activities plus: <ul style="list-style-type: none"> School work at school as per Return to School plan No: <ul style="list-style-type: none"> P.E., physical activity at lunch/recess, homework, testing, sports, assemblies, field trips <p>Communicate with school on student's progression.</p>	Part-time school <p>Increase school time with moderate accommodations.</p> Prior activities plus: <ul style="list-style-type: none"> Increase time at school Decrease accommodations Homework – up to 30 min./day Classroom testing with adaptations No: <ul style="list-style-type: none"> P.E., physical activity at lunch/recess, sports, standardized testing <p>Communicate with school on student's progression.</p>	Full-time school <p>Full days at school, minimal accommodations.</p> Prior activities plus: <ul style="list-style-type: none"> Start to eliminate accommodations Increase homework to 60 min./day Limit routine testing to one test per day with adaptations No: <ul style="list-style-type: none"> P.E., physical activity at lunch/recess, sports, standardized testing 	Full-time school <p>Full days at school, no learning accommodations.</p> <ul style="list-style-type: none"> Attend all classes All homework Full extracurricular involvement All testing No: <ul style="list-style-type: none"> full participation in P.E. or sports until Return to Sport protocol completed and written medical clearance provided
Rest	Gradually add cognitive activity including school work at home		School work only at school	Increase school work, introduce homework, decrease learning accommodations	Work up to full days at school, minimal learning accommodations	Full academic load
When symptoms start to improve OR after resting for 2 days max, BEGIN STAGE 2	Tolerates 30 min. of cognitive activity, introduce school work at home	Tolerates 60 min. of school work in two 30 min. intervals, BEGIN STAGE 3	Tolerates 120 min. of cognitive activity in 30-45 min. intervals, BEGIN STAGE 4	Tolerates 240 min. of cognitive activity in 45-60 min. intervals, BEGIN STAGE 5	Tolerates school full-time with no learning accommodations BEGIN STAGE 6	<i>Return to School</i> protocol completed; focus on RETURN TO SPORT

Note: A student is tolerating an activity if symptoms are not exacerbated.

Adapted from the Return to Learn protocol by G.F. Strong School Program (Vancouver School Board), Adolescent and Young Adult Program, G.F. Strong Rehabilitation Centre.

APPENDIX B: Return to School Letter

See Appendix on Concussion CLASP Tool Page

APPENDIX C: Return to Sports

Return to Sport

This tool is a guideline for managing an individual's return to sport following a concussion and does not replace medical advice. Timelines and activities may vary by direction of a health care professional.

STAGE 1:	STAGE 2:	STAGE 3:	STAGE 4:	STAGE 5:	STAGE 6:
No sporting activity Physical and cognitive rest until symptoms start to improve OR after resting for 2 days max.	Light aerobic exercise Walking, swimming, stationary cycling. No resistance training. The pace of these activities should be at the point where you are still able to have a conversation.	Sport-specific exercise Skating drills (ice hockey), running drills (soccer). No head-impact activities.	Non-contact drills Progress to complex training drills (e.g. passing drills). May start resistance training.	Full-contact practice Following medical clearance participate in normal training activities.	Back in the game Normal game play
Recovery	Increase heart rate	Add movement	Exercise, coordination, cognitive load	Restore confidence; assess functional skills	Note: Premature return to contact sports (full practice and game play) may cause a significant setback in recovery.
Symptoms improve or 2 days rest max?	No new or worsening symptoms for 24 hours?	No new or worsening symptoms for 24 hours?	Symptom-free for 24 hours?	Symptom-free for 24 hours?	
Yes: Move to stage 2 No: Continue resting	Yes: Move to stage 3 No: Return to stage 1	Yes: Move to stage 4 No: Return to stage 2	Yes: Move to stage 5 No: Return to stage 3	Yes: Move to stage 6 No: Return to stage 4	
Time & Date completed:	Time & Date completed:	Time & Date completed:	Time & Date completed:	Time & Date completed:	

If new or worsening symptoms are experienced at any stage, go back to the previous stage for at least 24 hours. You may need to move back a stage more than once during the recovery process.

Medical clearance required before moving to stage 5

BOTH TOOLS CAN BE USED IN PARALLEL; HOWEVER, RETURN TO SCHOOL SHOULD BE COMPLETED BEFORE RETURN TO SPORT IS COMPLETED

APPENDIX D: Return to Sports Letter

See Appendix on Concussion CLASP Tool Page