

Sport-Related Concussion treatment

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The treatment of [sport-related concussions](#) involves a comprehensive approach aimed at managing symptoms, promoting recovery, and ensuring the individual's safety. It's important to note that every concussion is unique, so treatment should be tailored to the specific needs and condition of the person affected. Here are some general steps and strategies commonly used in the treatment of sport-related concussions:

Immediate [Rest](#) and [Evaluation](#):

The individual should immediately stop participating in the sport or activity that caused the concussion. They should be evaluated by a [concussion](#) specialist, to assess the severity of the concussion and determine the appropriate course of action.

Physical and Cognitive [Rest](#):

Rest is crucial in the early stages of recovery. Both physical and cognitive activities that worsen symptoms should be minimized. Activities that require concentration, such as reading, computer work, and watching TV, should be limited initially to prevent symptom exacerbation.

Symptom Management:

Medications are typically not used to treat concussions, but over-the-counter pain relievers may be used under a doctor's guidance for headache management. Adequate hydration and proper nutrition can aid in the recovery process.

Gradual Return to Activity:

Once symptoms start improving and the individual has received medical clearance, a gradual step-wise return-to-play protocol can be initiated. This involves a series of incremental increases in physical and cognitive activity, with close monitoring of symptoms after each step. Medical Supervision:

Regular follow-up appointments with a healthcare provider are important to monitor progress and ensure that recovery is on track. Individuals with more severe concussions or persistent symptoms might require more specialized care and monitoring. Restoring Normal Function:

Rehabilitation programs that include physical therapy, occupational therapy, and vestibular therapy can help address balance, coordination, and cognitive deficits.

Educational Support:

If the concussion affects school [performance](#), accommodations and modifications may be necessary. School administrators and teachers should be informed about the individual's condition.

Emotional Support:

Concussions can have psychological and emotional effects. Providing emotional support and counseling if needed can help individuals cope with the challenges they might face during recovery.

Prevention:

After recovering from a concussion, it's important to take steps to prevent future concussions. This includes using proper protective equipment and following safety guidelines.

Gard et al. hypothesized that [athletes](#) with persistent post-concussive [symptoms](#) (PPCS) display signs of ongoing [neuroinflammation](#), as reflected by altered profiles of [cerebrospinal fluid](#) (CSF) [biomarkers](#), in turn relating to symptom severity. They recruited athletes with PPCS preventing [sports participation](#) as well as limiting work, school and/or social activities for ≥ 6 months for symptom rating using the Sport Concussion Assessment Tool, version 5 ([SCAT5](#)) and for cognitive assessment using the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS). Following a [spinal tap](#), they analysed 27 CSF inflammatory biomarkers (pro-inflammatory chemokines and cytokine panels) by a multiplex immunoassay using antibodies as electrochemiluminescent labels to quantify concentrations in PPCS athletes, and in healthy age- and sex-matched controls exercising ≤ 2 times/week at low-to-moderate intensity. Thirty-six subjects were included, 24 athletes with PPCS and 12 controls. The SRC athletes had sustained a median of five concussions, the most recent at a median of 17 months prior to the investigation. CSF cytokines and chemokines levels were significantly increased in eight (IL-2, TNF- α , IL-15, TNF- β , VEGF, Eotaxin, IP-10, and TARC), significantly decreased in one (Eotaxin-3), and unaltered in 16 in SRC athletes when compared to controls, and two were un-detectable. The SRC athletes reported many and severe post-concussive symptoms on SCAT5, and 10 out of 24 athletes performed in the impaired range ($Z < -1.5$) on cognitive testing. Individual biomarker concentrations did not strongly correlate with symptom rating or cognitive function. Limitations include evaluation at a single post-injury time point in relatively small cohorts, and no control group of concussed athletes without persisting symptoms was included. Based on CSF inflammatory marker profiling they find signs of ongoing neuroinflammation persisting months to years after the last SRC in [athletes](#) with persistent post-concussive symptoms. Since an

ongoing inflammatory [response](#) may exacerbate the [brain injury](#) these results encourage studies of treatments targeting the post-injury [inflammatory response](#) in [sport-related concussion](#) ¹⁾

No clinical pharmacologic trials were found. The pharmacologic treatment of SRC remains focused on specific symptoms, and there is as yet no evidence-based treatment. On the basis of the limited published research ²⁾.

Remove the athlete from competition immediately and do not allow him or her to resume play for the remainder of the game.

Perform the Mayo Concussion Test and the Post-Concussion Symptoms Scale on-site and compare the results with the athlete's baseline data.

Monitor for worsening of symptoms and/or focal neurologic deficits, including weakness and sensory change, every 15 to 30 minutes during the first several hours after injury.

If symptoms worsen, the athlete should be transported to an emergency department for further evaluation, because changes may suggest an injury more serious than a concussion, such as intracranial hemorrhage.

If symptoms remain stable or improve, the athlete can be sent home if an adult caregiver is present. The caregiver is given a list of symptoms to be aware of and that would warrant a trip to an emergency department, and the athlete is not allowed to drive.

Place the athlete on physical (no sports, running, jumping, or weightlifting, for example) and cognitive (no school, studying, or video games, for example) rest to minimize stress on the brain.

Have the athlete follow up with his or her physician within 24 to 48 hours for a physical examination and symptom evaluation, as well as additional cognitive testing.

Resuming athletic activity

Once an athlete is asymptomatic and has normal neuropsychological measures, he or she can begin a functional return-to-play process. This process involves gradually increasing cognitive and physical challenges in a systematic, stepwise fashion, over the course of about five days. If the athlete has symptoms at any time, he or she rests again until the symptoms stop. Then the athlete can resume the protocol on the level at which he or she was symptom-free.

Send to a Concussion Team, comprising a brain rehabilitation specialist, occupational and speech therapists, a rehabilitation nurse, a neuropsychologist, and other health care professionals if indicated.

The team manages the athlete's post-concussion symptoms and assists with modifications in work and school that are required for recovery. When the athlete's symptoms resolve and all baseline measures return to normal, he or she resumes the return-to-play protocol under the supervision of Sports Medicine Center staff ³⁾.

Graded aerobic treadmill testing is a safe, tolerable, and clinically valuable tool that can assist in the evaluation and management of pediatric sports-related concussion (SRC). Future research is needed to confirm the clinical value of this tool in return-to-play decision making. Studies are also needed to understand the pathophysiology of physiological PCD and the effects of targeted treatment ⁴⁾.

1)

Gard A, Vedung F, Piehl F, Khademi M, Wernersson MP, Rorsman I, Tegner Y, Pessah-Rasmussen H, Ruscher K, Marklund N. [Cerebrospinal fluid](#) levels of [neuroinflammatory biomarkers](#) are increased in [athletes](#) with persistent post-concussive symptoms following sports-related concussion. J Neuroinflammation. 2023 Aug 17;20(1):189. doi: 10.1186/s12974-023-02864-0. PMID: 37592277.

2)

Solomon GS, Sills AK. Pharmacologic treatment of sport-related concussion: a review. J Surg Orthop Adv. 2013 Fall;22(3):193-7. Review. PubMed PMID: 24063794.

3)

<http://www.mayoclinic.org/medical-professionals/clinical-updates/general-medical/diagnosing-treating-sports-related-concussion>

4)

Cordingley D, Girardin R, Reimer K, Ritchie L, Leiter J, Russell K, Ellis MJ. Graded aerobic treadmill testing in pediatric sports-related concussion: safety, clinical use, and patient outcomes. J Neurosurg Pediatr. 2016 Dec;25(6):693-702. PubMed PMID: 27620871.

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