

Rehabilitation Protocol for Concussion Return-to-Sport

This protocol is intended to guide clinicians through the return to sport following sports-related concussion.

This protocol is time based (dependent on tissue healing) as well as criterion based. Specific intervention should be based on the needs of the individual and should consider exam findings and clinical decision making. The timeframes for expected outcomes contained within this guideline may vary based on physician preference, healing timeline and sporting activity. Return to sport following concussion can be a complex decision-making process and should be approached with a multidisciplinary team approach. If a patient is not progressing as expected, they should quickly be referred to a concussion specialty clinic.

The interventions included within this protocol are not intended to be an inclusive list. Therapeutic interventions should be included and modified based on the progress of the patient and under the discretion of the clinician.

Considerations for concussion return to sport

Current literature no longer supports a period of complete rest beyond 72 hours. Concussion recovery should be focused around active rehabilitation. Activities should be performed at a sub-symptom threshold to the patient's tolerance. A patient should undergo formal exertional testing and a graded exercise protocol should be based on max exercise tolerance. If a clinician is not familiar with this testing and exercise prescription, the patient should be referred to a specialist.

PHASE I: EARLY POST-INJURY (0-3 DAYS)

Rehabilitation Goals	Relative rest
Precautions	Throughout progression, there should be minimal symptoms. If symptoms are starting, rest see if symptoms resolve and the resume at a slightly lower heart rate with goal of not increasing symptoms for pre-exercise level
Intervention	Household and community activities as tolerated
Criteria to Progress	3 days post injury

PHASE II: INTERMEDIATE POST-INJURY

Rehabilitation Goals	- Gradually reintroduce aerobic activity - Decrease deconditioning
Precautions	- Limit head movement, distractions and maintain neutral neck position - Avoid Valsalva - No contact
Additional Intervention <i>*Continue with Phase I interventions</i>	- Light activity to gradually increase heart rate. If symptoms do not increase next session can increase workload slightly more - Exercise examples: - Light biking - Walking
Criteria to Progress	- Tolerating activity well without symptoms, progress through gradually until able to achieve 85% of age adjust heart rate without symptoms - Able to tolerate daily activities without significant increase in visual/vestibular symptoms

PHASE III: LATE POST-INJURY

Rehabilitation Goals	• Reintroduce movement • Progress active rehab
Precautions	• Avoid Valsalva • No contact
Additional Intervention <i>*Continue with Phase I-II Interventions</i>	• Increased head movement with activity • Running, skating, swimming, rowing, shooting on empty goal, foot work, stick work • Increased environmental distractions • Busy gym, running with people around • Increased cognitive demands • Doing math in head, talking, thinking through plays while exercising
Criteria to Progress	• No symptoms with above exercise • Minimal to no symptoms with all activities including daily activities, school, work etc.

PHASE IV: TRANSITIONAL

Rehabilitation Goals	Reintroduce sport specific activity, while continuing to avoid contact
Additional Intervention <i>*Continue with Phase I-III interventions</i>	Sport specific activity Passing drills, shooting drills, non-contact drill participation
Criteria to Progress	No symptoms with above activity

PHASE V: FULL RETURN TO SPORT (MONTHS AFTER SURGERY)

Rehabilitation Goals	Full return to sport
Additional Intervention <i>*Continue with Phase II-IV interventions</i>	Scrimmage play first, then full game play if asymptomatic

Revised 9/2021

Contact	Please email MGHSportsPhysicalTherapy@partners.org with questions specific to this protocol
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References:

1. Clausen M et al, Cerebral Blood Flow during Treadmill exercise is a marker of physiological post-concussion syndrome in female athletes. Journal of Head Trauma Rehabilitation 2016 31 (3): 215-24.
2. Coslick, A, et al. Participation in Physical Activity at Time of Presentation to a Specialty Concussion Clinic Is Associated With Shorter Time to Recovery. PM&R; 2020 (12)12: 1195–1204.
3. DiFazio, M., Silverberg, N. D., Kirkwood, M. W., Bernier, R., & Iverson, G. L. (2016). Prolonged Activity Restriction after Concussion: Are We Worsening Outcomes? Clinical Pediatrics, 55(5), 443–451.
4. Grool AM, Aglipay M, Momoli F, et al. Association Between Early Participation in Physical Activity Following Acute Concussion and Persistent Postconcussive Symptoms in Children and Adolescents. JAMA. 2016;316(23):2504. doi:10.1001/jama.2016.17396
5. Kamins J, Bigler E, Covassin T, et al. What is the physiological time to recovery after concussion? A systematic review. Br J Sports Med. 2017;51(12):935-940. doi:10.1136/bjsports-2016-097464
6. Leddy JJ et al. Use of graded exercise testing in concussion and return-to-activity management. Current Sports Medicine Reports 12 (6): 370-376, 2013.
7. Leddy JJ, Haider MN, Ellis M, Willer BS. Exercise is Medicine for Concussion. Curr Sports Med Rep. 2018;17(8):262-270. doi:10.1249/JSR.0000000000000505
8. Leddy JJ, Willer B. Use of Graded Exercise Testing in Concussion and Return-to-Activity Management. Curr Sports Med Rep. 2013;12(6):370-376. doi:10.1249/JSR.0000000000000008
9. Murata J et al. Visual Tracking synchronization as a metric for concussion screening. J Head Trauma Rehabil 2010 Jul-Aug; 25 (4):293-305.
10. Thomas DG, Apps JN, Hoffmann RG, McCrea M, Hammeke T. Benefits of Strict Rest After Acute Concussion: A Randomized Controlled Trial. Pediatrics. 2015;135(2).