

Concussion in the workplace

Concussions are the most common form of traumatic brain injury in workers: they made up 80% of reports in Ontario in 2013. Most reports came from agriculture, mining, and forestry industries.

Concussions are the result of direct closed external head trauma, or any event causing acute motion change, that results in the forceful contact of the brain with the bony skull. They can be a complex set of neurological symptoms and signs related to a traumatic brain injury.

Following an event that produces a concussion there is an immediate reduction in cerebral blood flow and an increase in glutamate, glucose, potassium, and calcium levels. Glucose tends to normalize within 30 minutes then falls below normal for up to 10 days. Calcium then rises to up to 500% of normal and can take up to 6 days to return to baseline.¹

Most mild traumatic brain injuries (mild concussion) resolve within hours or days. However, up to 80% of workers who experience moderate to severe concussion may develop post-concussion syndrome. The syndrome can involve a cluster of symptoms such as memory loss, headaches, vertigo, cognitive delay, anosmia, phonophobia, photophobia, anxiety, depression and fatigue.² Post-concussion syndrome following unconsciousness (severe concussion) usually lasts more than 3 months.

The sports concussion assessment tool (SCAT3) is recommended for the initial evaluation. Symptoms lasting more than 3 months require further investigation or referral. Diagnostic imaging is not recommended as results are often normal. Test results based on c-spine and Canadian CT rule guidelines should return as negative. An excellent clinical guide to signs and symptoms common to all degrees of concussion was published in *Canadian Family Physician*.³

Those diagnosed with a concussion should not return to work on the same day. The recommended duration of rest appears to coincide with neurobiochemical changes returning to normal. Current evidence does not support full physical and mental rest for longer than 6 days.⁴ Prolonged full rest may be detrimental to early and full recovery, and may increase the possibility of developing post-concussion syndrome.

Ask the following questions to help determine a worker's fitness for work and/or whether modified duties are required:

- Do your symptoms worsen with increase in physical activity?
- Do your symptoms worsen with increase in mental activity?

Workers with symptoms that are present but do not change with an increase in activity can begin a transition return to work. Workers with prolonged symptoms may require accommodations such as

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supervision, modified hours, work from home, reduction in sound, and modified work load or reassignment.

Sincerely,

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¹ Giza C, Hovda D. The Neurometabolic Cascade of Concussion. *J Athl Train* 2001;36(3):228-235.

² Satz P, Alfano MS, Light R, Morgenstern H, Zaucha K, Asarnow RF, et al. Persistent Post-Concussive Syndrome: A Proposed Methodology and Literature Review to Determine the Effects, if Any, of Mild Head and Other Bodily Injury. *J Clin Exp Neuropsychol* 1999; 21(5):620-628. doi: 10.1076/jcen.21.5.620.870.

³ Marshall S, Bayley M, McCullagh S, Velikonja D, Berrigan L. Clinical practice guidelines for mild traumatic brain injury and persistent symptoms. *Can Fam Physician* 2012;58(3):257-67.

⁴ Silverberg ND, Iverson GL. Is rest after concussion “the best medicine?”: recommendations for activity resumption following concussion in athletes, civilians, and military service members. *J Head Trauma Rehabil* 2013;28(4):250-9. doi: 10.1097/HTR.0b013e31825ad658.