

Optometry's Role in Sports Related Concussion

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Concussions are a form of mild traumatic brain injury defined as “any transient neurologic dysfunction resulting from a biomechanical force.” Concussions are due to either direct impact, such as a blow to the head, or extreme acceleration forces, like whiplash. Concussions occur when the impact causes the brain to overcome the protective cushioning ability of the cerebral spinal fluid and the brain hits against the inside of the skull causing brain bruising.

Up to 3.8 million concussions occur yearly. Many of them are sports or recreationally related. Football accounts for the most concussions in males, while soccer causes the most concussions for females. Fewer than 10% of sports related concussions result in loss of consciousness, and 47% of the time there are no immediate symptoms from the concussive blow. Typical symptoms of concussions include:

- Confusion
- Headache
- Disorientation
- Vomiting and/or nausea
- Unsteadiness
- Light sensitivity
- Blurred or double vision
- Post-traumatic amnesia
- Difficulty concentrating
- Dizziness

Typically, post-concussion syndrome symptoms occur within the first seven to 10 days and go away within three months, though they can persist for a year or more. When concussion symptoms last more than three months, patients are considered to have post-concussion syndrome.

Vision and Concussion

Recent research suggests that over 50% of patients with concussion have convergence, accommodative, or eye movement disorders. They can cause symptoms such as headaches or asthenopia after short periods of near work, diplopia and blurred vision associated with near work, and decreased reading speed and reading comprehension. This becomes particularly problematic when the symptoms last into the post-concussion syndrome.

Optometrists understand the visual system better than any other profession. We have the opportunity to help retrain the visual system to process visual information more

efficiently and effectively, and to help eliminate the visual symptoms most commonly associated with post-concussion syndrome. This is done through a program of neuro-optometric rehabilitation (vision therapy).

Even if an optometrist is not directly involved in vision therapy, there are some important caveats to keep in mind when examining a recently concussed patient:

1. Take a comprehensive clinical history including a detailed account of the accident or injury.
2. For patient comfort:
 - Minimize movements that surround the patient
 - Keep the room illumination relatively dim (use incandescent, rather than fluorescent, lighting when possible)
 - Have the patient close their eyes in between tests
 - Work slowly to allow for the patient to answer accurately
3. Prescription spectacle considerations:
 - Small prescriptions can be significant (hyperopia, myopia, or astigmatism)
 - Near vision prescriptions can be very helpful in pre-presbyopic patients
 - Consider small amounts of prism correction for:
 - a. Vertical Deviations
 - b. Convergence insufficiency or excess
 - Prescribe sunglasses for photosensitivity
 - Blue or purplish tints often make patients more comfortable in harsher indoor lighting
 - Consider avoiding progressive addition lenses and prescribe separate distance and near prescriptions.

The good news is that most concussed patients will recover fully. Perhaps the most important advice we can give is to guard against the possibility of having another concussion while the brain is still healing.