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## Identifying concussion signs and symptoms can help young athletes get treatment and support a safe return to competition

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Playing in high school sports is the most exciting part of returning to school for some students. Thousands of boys and girls compete in football, soccer, field hockey, volleyball, tennis and cross country every fall. But playing sports means there is a risk of injuries, including concussions.

“A concussion is a traumatic brain injury that causes a temporary alteration in brain function,” said Dr. Jeffrey Payne, assistant professor of physical medicine and rehabilitation and physician with Mayo Clinic Sports Medicine at Mayo Clinic Square in Minneapolis. “It’s typically, but not always, caused by a blow to the head. The majority of time, a concussion occurs without a loss of consciousness.”

Typical symptoms of a concussion include:

- Headache.
- Dizziness.
- Nausea.
- Sensitivity to light.
- Sensitivity to noise.
- Feeling foggy or slowed down.
- Difficulty concentrating.
- Issues with memory.
- Mood alteration.

During a sporting event, signs that coaches and parents should watch for include a player who:

- Is slow to get up.
- Staggeres or is wobbly in his or her first few steps after a blow to the head or a collision.
- Walks towards the wrong huddle, wrong team or in the wrong direction.
- Has a blank stare.
- Asks to have things repeated.
- Doesn’t act appropriately to the situation.



Concussions can be challenging for medical professionals to diagnose.

“Educating coaches and parents and increasing awareness of the signs and symptoms of a concussion has been a focus of sports medicine providers,” said Payne. “We have a saying – ‘When in doubt, hold them out.’ It’s best to hold out any athlete who is displaying signs of a concussion until they can be evaluated by a medical professional.”

Concussions can be challenging for medical professionals to diagnose. One diagnostic aid is a technique called baseline testing, which looks at how someone functions when they don't have a concussion or brain injury. For high school and college athletes, this is often done as part of their pre-participation physical. Baseline testing may include a computer-based neurocognitive test to evaluate memory, attention, and processing speed, and tests to evaluate ocular motor function (seeing how the eyes work), and balance. Then, after an athlete sustains a concussion, the same tests are repeated and the results compared. This can provide the medical professional objective data in helping to gauge recovery following a concussion.

### **Adequate recovery period is critical**

Once an athlete is diagnosed with a concussion, during the first 48 hours, athletes should rest. After being diagnosed with a concussion it is also important to avoid activities that could aggravate symptoms, such as excessive screen time on a phone or computer, playing video games or watching TV. It’s also important to limit stimulation, such as situations where there is a lot of noise or bright lights.

Additionally, a student athlete may need to have accommodations made at school, such as only going for half days in the first few days following a concussion. They also may need to delay taking tests and receive extra time to complete homework assignments.

Once a student athlete is symptom-free for 24 hours and is able to go about their day-to-day life without headache, nausea or dizziness, a return-to-play protocol should be started. This is a gradual method to ensure student athletes are able to tolerate increasing levels of activity without having any aggravations of their symptoms.

An athlete will start with light aerobic exercise, such as walking or riding a stationary bike for 15-20 minutes to elevate their heart rate to make sure symptoms don’t return. If the athlete tolerates that well, the next day they will perform a sports-specific exercise for 30-45 minutes. This may include skating in hockey or dribbling in soccer. The next step is non-contact training, which would include more complex drills. If that goes well, the athlete will return to full-contact practice. Once the athlete passes that step, they're ready to return to a game situation.

“The majority of athletes who sustain a concussion will improve over the course of one to two weeks,” Payne said.

If an athlete returns to competition too soon, it can prolong the duration of their symptoms. Additionally, although it’s rare, a second blow to the brain when it has not fully recovered can lead to a catastrophic injury called second-impact syndrome, which can ultimately lead to significant brain damage.

“We always want to make sure we're educating our patients and getting them back to play as soon as possible, but in a safe manner,” said Payne.

Although participation in sports involves a risk of concussions, when coaches and parents are aware of the signs and symptoms, they can help athletes get the treatment they need to return to full participation in the sports they love.

*Mayo Clinic Sports Medicine in Minneapolis offers a premier continuum of care that ranges from prevention and treatment to rehabilitation and performance enhancement whether you are a top athlete or an active individual. Learn more at <https://sportsmedicine.mayoclinic.org/>.*

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