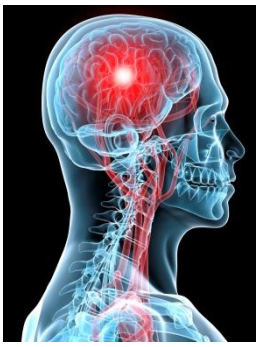
KINETIC PHYSICAL THERAPY
adolescent sports medicine

Post-Concussion Patient Education

What is a concussion: A concussion is defined as "…a complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces."

What does this mean: A concussion can occur as a result of a direct blow to the head, face, neck, or any other part of the body where the force is transmitted to the head. This usually occurs during sports or as a result of a fall or car accident. This trauma results in normally short-lived neurological symptoms that usually resolve quickly on their own. These symptoms reflect a change in function of the brain but usually do not cause brain injury that is evident on imaging such as MRI or CT scan. Basically, a decrease in blood flow to the brain causes an energy crisis. If you try to return to sports before your brain heals, too much stress is placed on the brain which can cause continued symptoms and place the brain at risk for further damage.

Who is most at risk for a concussion: Females are more likely to sustain a concussion due to differences in head-neck strength as compared to males. However, females are also more likely to report their symptoms. Sports with the highest risk of concussion include: football, soccer, and ice hockey.



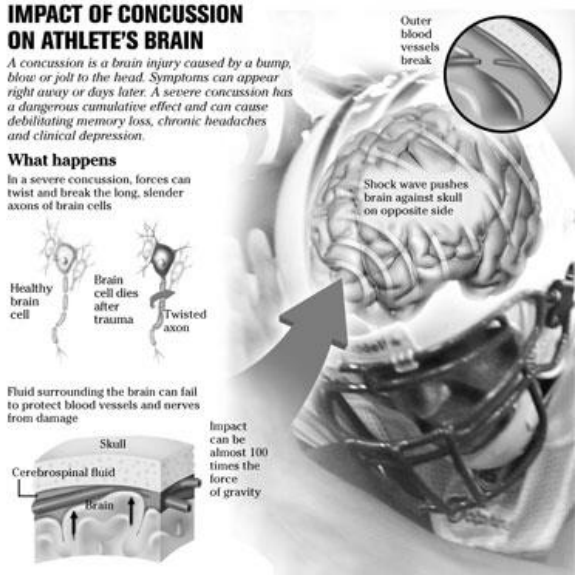
What are symptoms of a concussion: Symptoms of a concussion may or may not include: loss of consciousness, confusion, headache, dizziness, nausea, vomiting, loss of memory from before or after the injury, mumbling, drowsiness, blank stares, personality change, irritability, mood swings, exaggerated emotions, seizures, poor performance on the field, unsteady gait, poor balance, slow speech, poor coordination, difficulty concentrating, ringing in the ears, double or blurred vision, sensitivity to light or sound, feeling mentally foggy, and numbness or tingling.

How long will my recovery take: The metabolic dysfunction in the brain may be present for up to two weeks in most cases. About 80% of high school athletes recover within 3 weeks which means 20% of these athletes have continued symptoms lasting longer than 3 weeks (protracted recovery). Recovery may be longer in athletes with: memory loss, confusion, loss of consciousness, dizziness, and vomiting after the concussion as well as those athletes with a pre-existing learning disability, younger athletes, prior concussions, migraines, and over-exerters.

What will my recovery be like: Resolution of post-concussion symptoms usually occur quickly and follow a set course. In some cases, post-concussion symptoms may linger for longer than expected.

Why might I recover differently than an adult: Often times, younger athletes demonstrate a delay in their recovery after a concussion. The brain, skull, and neck muscles in an adolescent have not fully developed which may transmit more force to the brain during a hit. Swelling in the brain usually lasts longer in the young athletes and therefore, this requires longer rest than an adult.

What should my coach and athletic trainer do: Coaches, parents, and athletic trainers must be able to identify common symptoms of a concussion. An athlete experiencing these symptoms MUST be removed from play and undergo further evaluation. If the athlete's symptoms are worsening, they should be transported to the hospital. Other athletes can be monitored closely and follow up with a qualified physician for neurocognitive testing such as Immediate Post-concussion Assessment and Cognitive Testing (ImPACT). An athlete should **NEVER** return to play on the same day as a concussion even if the symptoms have resolved completely. It doesn't matter how important the game is! Athletic trainers or on-field physicians may complete: the Standardized Assessment of Concussion (SAC) and the Sport Concussion Assessment Tool (SCAT). If there was a loss of consciousness or memory, they should be evaluated by a physician knowledgeable in the treatment of concussions immediately.



Do I need a CT scan or MRI: CT scans are commonly completed to rule out severe injury. MRI is more sensitive however CT and MRI are usually negative after a concussion. Other testing can be completed based on symptoms and their severity if deemed necessary by a qualified health care provider.

What is neurocognitive testing: Since concussions are functional injuries, not structural, neurocognitive testing is completed. Neurocognitive tests evaluate cognitive domains such as visual and verbal memory, processing speed, and reaction time. This is usually a computerized test.

What can I do to help myself: Make sure to report all concussions and concussion-like symptoms to your coach, athletic trainers, or parents. No matter how insignificant the symptoms seem, you should see your doctor for more testing. If you return to sport too soon, another concussion can occur which will be much more serious (second-impact syndrome). You must complete a period of physical and cognitive rest until symptoms resolve after a concussion. Physical and cognitive rest involves avoiding: aerobic activity, schoolwork, computer use, electronic device use (texting), and reading. You must get good sleep in order for your brain to recover. If you are having difficulty sleeping, make sure to talk to your doctor. Many doctors will recommend the use of melatonin for this reason. Use sunglasses and ear plugs as needed if light and sound sensitivity are present. When symptoms resolve with rest, you can complete a guided, graded return to exertion and return to play program. If you don't follow the instructions of your physician and other healthcare providers, your recovery can be prolonged.

What is second-impact syndrome: This syndrome occurs when a second concussion occurs before the brain has fully recovered from the first concussion. The second concussion may require less force since the brain is still vulnerable to injury. This is rare, however it is seen more commonly in the adolescent population and if it occurs, can be devastating, leading to severe disability and even death.

Where can I find a qualified ImPACT physician: check out the "Find a Doctor" tab at www.impacttest.com for more information. Local providers include but are not limited to Dr. BJ Smith (610-430-3545) and Dr. Christina Master/Dr. Matthew Grady at CHOP (1-800-879-2467).

What will my doctor do: After a concussion, your doctor may recommend you complete neurocognitive testing. They will explain physical and cognitive rest which may include staying home from school and work. When you are ready, they will allow a gradual return to activity which may be overseen by a physical therapist. If your symptoms are severe, you may receive post-concussion therapy including occupational and physical therapy, speech therapy, and vestibular rehabilitation as needed. Your doctor may prescribe medications to improve cognitive deficits, mood disturbances, and sleep as needed. If you are having mood changes and irritability, psychiatric services may be needed. Medications should be used only on a case-by-case basis and often only if symptoms are protracted.

What can physical therapy do to help: Sometimes physical therapy is prescribed after a concussion to improve eye and head movements, dizziness, neck pain and range of motion, core and neck strength, and to progress through return to sport phases of rehabilitation. If severe vertigo or balance dysfunction is present, make sure to consult a qualified vestibular therapist.

Return-to-Play: Return to play is a very controversial subject. A return to play grading scale should be used for progressions however the symptoms, age, gender, sport, and phase of growth and development of each athlete should be considered. If an athlete has no symptoms within a 24 hour period in one stage, they may advance to the next stage. If symptoms occur in one phase, the athlete should return to the previous asymptomatic level and be reassessed after 24 hours. Return to play should occur only when all symptoms have resolved with both rest and full noncontact exertion and when performance has returned to baseline on neurocognitive tests. See attached graded return to play protocol as needed.

How can I better educate those around me: Concussion education is the first step in effectively preventing and managing concussions. Check out www.cdc.gov/concussion and www.stopsportsinjuries.org for more information. Make sure all players are wearing the proper protective sports equipment (and sized correctly) both at games and during practices. Make sure athletes are following the rules of the sport and that good sportsmanship is encouraged at all times. Athletes should also understand that protective equipment does not make them invincible and that risk-taking behaviors should be limited. All athletes should be encouraged to complete baseline neurocognitive testing to more effectively manage athletes after a concussion.