

UPDATES IN CONCUSSION MANAGEMENT: PART 2

Football season is in full swing. The temperature is beginning to cool down and the leaves will soon be turning. For many, this is a favorite time of the year. However, as the collisions and tackles of the football season ramp up, so does the likelihood for concussions.

When an athlete sustains a concussion, a whole host of neurological and neurochemical deficits present. The affected neurons temporarily lose their ability to coordinate the biochemical reactions necessary to send an impulse (aka: signal) within the brain. Thus, a patient may communicate that "they feel slowed down" or that they are "having difficulty concentrating." In short, because the neuro and biochemical processes of the neurons involved have been disrupted, the ability of the neuron to function is impaired.



Additionally, structural damage to the neuron can also occur; oftentimes referred to as "axonal shearing." In other words, as a result of the brain shifting, twisting, compressing, and/or shearing within the skull during an impact, individual neurons themselves undergo these same forces. Structural injuries can be just as mild as a simple bruise or as severe as a complete disruption of the neuron.

This should now answer the question for many why a CT Scan or an MRI of the brain is usually negative for a patient who has sustained a concussion. The injury is metabolic and microscopic in nature, thus not showing up in imaging. Likewise, this also reveals that just because immediate medical imaging is negative, it does not mean that a biochemical or structural injury is not still present.

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Concussion Recovery: Wait to go back to School

When a student athlete sustains a concussion, the ability of the brain to support and tolerate the metabolic and biochemical requirements of cognitive thought, critical thinking, and increased stimuli is grossly impaired. Disrupted and possibly damaged neurons actually lack the ability to produce a neurological signal and cannot perform as they normally would. Now, with rest, proper diet, and decreases in neurocognitive load, the brain can focus all its resources on recovery and repair. And, in fact, when concussed patients are prescribed immediate rest, more than 75% are completely asymptomatic within 7-10 days. However, the exact opposite is also true. When student athletes who have sustained a concussion are subjected to the scholastic and stimulus demands of a secondary school, they oftentimes struggle with intense post-concussion symptoms, they fall behind in their work, and their recovery is grossly impaired.

In our January 2012 Edition, we addressed specific concerns about returning a student athlete to school after they have sustained a concussion. For more information specifically on this topic, visit our website at



www.csosortho.com.

Just remember, when a student athlete sustains a concussion, efforts to maximize and support their recovery should include rest from exertion, removal from intense stimuli (i.e. video games, etc...), and minimized critical thinking (i.e. schoolwork). In other words, returning to school can wait.

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Concussion Recovery: **Clinician-Guided Return to Play**

As previously described, concussions are brain injuries that are highly metabolic in nature. When a patient sustains a concussion, the regular biochemical interactions in the injured neurons are literally brought to a standstill. In this window of time, these cells are grossly incapacitated and exceedingly vulnerable to secondary injury. Therefore, it is imperative that a concussed patient should never participate in exertion or athletic activity without written clearance from a licensed healthcare provider trained in the management of concussion. Additionally, it is likewise just as vital that when they are cleared to return that they do so under strict clinician-guided direction.

Current progression guidelines as published by the National Athletic Trainers' Association dictate the following:

- Stage 1: No Activity
- Stage 2: Light Exercise: <70% Max Heart Rate
- Stage 3: Sport-Specific Training
- Stage 4: Non-Contact Practice
- Stage 5: Unrestricted Training and Practice
- Stage 6: Return to Play

Concussion recovery is never a "One-Time Clearance." It is instead a set of sequential stages that must be achieved by the patient. During each stage, the patient must also demonstrate normal cognitive functioning and remain free from any post-concussive symptoms prior to advancing to the next stage. This is what a concussion recovery should look like. Without such, care is grossly reduced to a subjective determination of the patient's self-reported symptoms. By contrast, it is the goal of care to demonstrate clinically that the affected neurological tissue has reset the previous metabolic disruption, confirm that it is capable of sustaining resultant increases in blood pressure, and ensure that it is safe to return to collision activities.

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Tackling without the Head & Neck

In a collision sport like that of football, prevention of head injuries such as concussions should be a primary focus when teaching tackling and blocking techniques. By taking the head and neck out of the collision, the incidence of head-related trauma has been shown to decrease. Although helmet-to-helmet contact will always be present in the sport, the goal of proper tackling techniques is to never lead with the head or neck, secure the tackle, and have both individuals get up safely.

For more information, consider the videos and resources created by the following organizations.



www.nata.org
Heads Up Video



www.usafootball.com
Heads Up Football



www.seahawks.com
2015 Seahawks Tackling

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