

SPORTS CONCUSSIONS: An Overview

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Scott Stevens (N.J. Devils), Mike Richter (N.Y. Rangers), and Wayne Chrebet (N.Y. Jets). What do they have in common? All are highly accomplished local professional athletes in their mid 30's to early 40's who were forced to retire from their trade secondary to the effects of multiple concussions.

John and Susan. What do they have in common? Both were honor students in their teens to early 20's who are not struggling to graduate from high school and college secondary to the effects of sports related concussions.

What do both groups have in common? Their lives and futures were and will continue in some way to be changed by their concussion history.

There are 300,000 sports related concussions annually or 822 sports concussions per day. The highest risk sports include football, hockey, soccer, rugby, and boxing. A concussion is a blow or jolt to the head or body that disrupts the normal function of the brain. An athlete doesn't have to lose consciousness to have a concussion. In fact, loss of consciousness occurs in only 9% of sports related concussions.

The several stages of concussion management include identification, treatment, and return to play.

Identification:

One of the most challenging aspects of concussions is identifying when the athlete has been concussed. It is a community effort and athletic trainers, coaches, parents, and friends should look for certain signs and symptoms:

Signs may include the athlete appearing to be dazed, forgetting plays, confused about assignments, loss of consciousness, answers questions slowly, skates/runs in the wrong direction, exhibits decreased playing ability, has a vacant stare, a change in personality, and has difficulty recalling events before or after play.

Symptoms may include headache, pressure in the head, nausea, dizziness, balance problems, fuzzy vision, difficulty with light/noise feeling sluggish, fatigue, feeling "foggy", change in sleep pattern, ringing in the ears, concentration problems, and memory problems. The initial **signs** and **symptoms** may resolve quickly (seconds or minutes), but further manifest themselves over the next several hours.

Sideline assessment tools such as the Standardized Assessment of Concussion (SAC) and Balance Error Scoring System (BESS) may be used. Head CT and MRI are negative in 90% of sports related concussions. A negative scan doesn't mean a concussion wasn't sustained. A CT or MRI also isn't required for evaluation in most concussions.

Management:

Once a concussion has been identified, the initial management is removing the athlete from the remainder of the competition. It doesn't matter how brief the signs and symptoms. As indicated above the signs and symptoms can appear to resolve then progress over the next several hours. It has also been shown in high school athletes that even if all symptoms and signs resolve within 15 minutes neuro-cognitive deficits can persist for up to 1 week.

In addition to avoiding physical contact while a patient is symptomatic, a patient may need a **cognitive rest**. If activities such as going to school, using a computer, playing video games, watching T.V. and etc. aggravate the athlete's symptoms, these activities must be limited or suspended until such time they don't aggravate the athlete's symptoms. Studies have shown adolescents take longer to recover than adults. There are no medications FDA approved for the treatment of concussions. If your child notes a resolution of headache or any other of the symptoms after taking a medication remember the medication is only masking the problem. The athlete must be off all medications being used in the treatment of the concussion before returning to play.

In short, the appropriate cognitive rest, in addition to the avoidance of activities which place the head at risk for trauma are paramount to facilitate recovery. However, it must be remembered a concussion can place a tremendous amount of stress on the family unit. Asking a young active person to restrict their activity can also pose significant psychological challenges. These factors are also an integral part of the treatment plan.

Return to Play:

This can be a complicated issue depending on the patient's concussion history, but we will consider the athlete with the first non-complex concussion. The one thing all experts agree on is the patient must be symptom free, but back to baseline in school and returned to normal social schedule. The patient must be symptom free in the context of their life excluding only contact activities. If the patient isn't symptom free during this phase they are not ready for contact sports.

The challenge is determining when the athlete is symptom free. We are in effect dependent on an adolescent who is eager to return to the athletic field to both recognize and be truthful regarding his/her concussive symptoms. Studies suggest kids significantly under report their concussive symptoms. No surprise. Internal and external pressure often drives the athlete to minimize or not acknowledge the symptoms. It is much easier to hide a concussion than a sprained knee. This helps highlight the fact that trust between health care professional and patient is an important factor in return to play. This is the basic flaw with the more than 25 concussion scales which have been devised. None of them have been scientifically validated (with the exception of Robert Cantu's who acknowledges his scale wasn't developed to make return to play decisions, but was devised to determine the severity of the concussion), and all require the athlete to report they are symptom free as a major criteria for return to play (they must obviously have a normal neurological exam).

One of the major changes in concussion management has been the use of computerized neuropsychological testing (Impact, Headminder, CogSport) to help evaluate the athlete. It is a test which takes 20 minutes and is cost effective. It evaluates areas of memory including verbal memory and visual memory. It also measures visual motor speed and reaction time. Preferably an athlete takes a baseline test prior to the season and if a concussion is suspected the test is repeated, and compared to the baseline test to track recovery. The test is objective, educational, and helps validate the reporting of the symptom free athlete. I have had students who claim to be symptom free and after scoring poorly on the test start to open up regarding all their signs and symptoms. These are kids that may have gone back to play if they didn't have the testing, and placed themselves at significant risk for further neurological damage. It should be noted the test results alone should not be used to return a child to play. It is a piece of the puzzle.

Children are returned to play when they are sign and symptom free, their computerized neuropsychological testing is acceptable, and they pass a very aggressive 5 day exercise program which is designed to get the athlete ready to return to play and stress the youngster in a controlled environment to see if the symptoms return.

If computerized testing isn't available we recommend a 1 week symptom free period followed by the exertion protocol.

Short Term Consequences of Improper Management:

1) Repeated concussions and persistent symptoms: This can have a dramatic effect on a student's ability to participate in school, their social life, and return to sport. This can be a psychologically challenging time.

2) Second Impact Syndrome: This occurs in athletes with prior concussion following relatively minor impact. This has been shown to occur up to 14 days post injury. This occurs most commonly in athletes 21 and under, and leads to massive brain swelling and either death or significant disability.

Long Term Consequences:

The consequences of improperly managing concussions or having one too many can be life altering. Persistent post concussive symptoms including headache, dizziness, fatigue, poor concentration, and poor memory are just a few of the symptoms that have the opportunity to linger indefinitely. Depression is a significant issue and there has been a connection with Alzheimer's disease. Scott Stevens, Mike Richter, Wayne Chrebet, John, and Susan. They can tell you how concussions have changed their lives.

Conclusion: Sport is important. It is more than just a game, for those who are interested it helps teach commitment, a sense of belonging, and fosters social development. However, sport must be played safely. The challenge with concussions is they can't be seen, but if not managed properly they are never forgotten.