

## Concussion Management Take a Knee – Save a Life

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Previous articles have made it clear that a lot has changed in concussion management. We now know that the effects of a concussion may not be obvious and if one is not observant and does not ask the appropriate questions, subtle changes in the athlete's character, personality or behavior may be overlooked. The biggest concern for any athlete that returns to play too soon is that he will sustain a second head injury before the first has healed. This event is known as "second impact syndrome" and it can prove to be life threatening.

During the vulnerable healing period, brain tissues and blood vessels are especially at risk following a trauma. A second impact can lead to a dramatic increase in the blood flow which results in swelling and sometimes bleeding in the already damaged region of the brain. The brain is confined within the skull and cannot tolerate the increase in fluid volume that occurs after a patient starts bleeding. With no where to go, escaping blood pushes against the brain tissue, sometimes leading to herniation or forcing the brain through the base of the skull. Herniation can lead to death or severe morbidity. This is known as "Second Impact Syndrome" (SIS). 100% of SIS cases result in death or severe neurological deficits. We had a SIS case in our town seven years ago. Last year there were three cases in North Carolina alone.

Is there anything one can do to prevent complications such as second impact syndrome? The answer is yes! In the state of Washington, the Lystedt Law was recently passed, requiring medical personnel familiar with concussion be present at all athletic events. Also, professional organizations are implementing change. The NFL, NHL and IRL series racing have adopted neuro-psychological testing as a means of safe-guarding athletes. Similarly, collegiate and even high school sports are using computerized neuro-psychological testing. Here in Bloomington/Normal, I have performed neuro-psychological testing on many area athletes, starting with high school athletes about six years ago. Since then, the program has developed and has proven extremely useful not only for the physician as a medical tool, but more importantly, to athletes and their families as it offers improved care and much needed peace of mind when the athlete returns to play.

Experts in the field believe that neuro-psychological testing is the cornerstone of concussion management. Neuro-psychological testing is a computer based test used to measure each player's cerebral function individually. It is so sensitive because it employs a baseline study of each player according to his pre-season mental ability. Each athlete can then be tested against his own baseline following injury. This method is much more accurate than comparing athletes to

normative data. Instead, the athlete is compared to his normal, healthy self. With this method, physicians and experts in the field have gained a level of sensitivity previously unavailable in concussion management.

Following many devastating stories of “second impact syndrome,” concussion has become a central concern for many athletes and their families. For physicians, concussion has become a more manageable disorder to be catered with caution rather than flippancy. In all realms, increasing knowledge on this topic has fostered a new respect for head injury. Careful monitoring of each individual is required to avoid serious consequences following concussion. This leaves me with a thought: It may be more than just respectful to “take a knee” following injury...it may actually save your life.

Be careful. Get back in the game, but not until your head is right!