

Sports Medicine Monthly

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MANAGEMENT OF CONCUSSION: Field Markers and Recovery Times

For several years now, concussion research and treatment parameters and methods have been drastically improving by leaps and bounds. From great bodies of work and research material, many coaches, parents, athletic administrators, and even those outside of athletics are beginning to understand the dangers and the long-term ramifications of concussions, especially in younger-aged athletes. As a result, pro-active education has skyrocketed, parents and coaches are increasingly aware of their athletes, and athlete's self-reporting of symptoms or problems has greatly increased. Therefore, those of us close to athletics are becoming increasingly aware to the warning signs that an athlete has sustained a concussion.



In 2006, a prospective study of high school football players noted that in the time span of one week, 50% of the athletes who had sustained a concussion had completely recovered and returned to successful competition. By three weeks, 83% had made a complete recovery and return; leaving 17% that required longer than three weeks. In another study published in 2011, of 108 athletes, 58 patients who had sustained a concussion required less than 14 days for full recovery and return, whereas 50 required more than 14 days for full recovery and return. While individual recovery rates are just that, individual, the question has been asked, in looking back on the signs and symptoms present, the neurocognitive testing scores attained, and the presence or absence of any balance deficits; are there commonalities between patients who are requiring longer recovery times? Or, in other words, are there on-the-field markers (i.e. signs, symptoms, test scores, etc...) that are predictive of shorter (<14 days) or longer (>14 days) recovery times?

Post-Concussion Symptom Clusters

In evaluating a patient for concussion, many, if not all of us, are now familiar with the post-concussion symptoms that most clinicians ask a patient for when they are examining an athlete for a concussion. What you may not have realized is that there are 22 post-concussion symptoms that should be examined for, and these are classified into the 4 following clusters.

Migraine (Physical Symptoms) Cluster:

-Headaches, Visual Problems, Dizziness, Sensitivity to Light, Sensitivity to Noise, Nausea, Vomiting, Balance Problems, Numbness or Tingling

Neuropsychiatric Cluster:

-More Emotional, Sadness, Nervousness, Irritability

Cognitive Cluster:

-Fatigue, Drowsy, Feeling in a Fog, Difficulty Concentrating, Difficulty Remembering, Feeling Slowed Down

Sleep Cluster:

-Difficulty Falling Asleep, Sleeping Less Than Usual, Sleeping More Than Usual



After analyzing patients who had sustained a concussion and had subsequently required longer than 14 days for recovery and return to play, the two studies previously mentioned noted that the presence of symptoms from the migraine cluster and the cognitive cluster at the time of injury onset were most common. Most specifically, patients who reported dizziness, vomiting, amnesia after the concussion episode, and balance problems consistently correlated with a longer recovery time.



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ImPACT Concussion Testing Parameters and Predictors of Recovery Times

As time goes on, the validity and the reliability of computerized, neurocognitive testing such as ImPACT is becoming more and more prevalent. In fact, in the last 10-15 years, neurocognitive testing has become an essential tool in concussion management. So much so, that professional athletics, college athletics, and hundreds of high schools around the country are currently utilizing the ImPACT as a resource for concussion management. Now while the utilization of a neurocognitive tests like ImPACT is by no means mandated for all patients who sustain a concussion, it is certainly a great tool for managing those who have sustained such an injury. In as much as a nail gun is faster than a single hammer ever could be, the assessment and management of a patient who has sustained a concussion is much more efficient and effective when utilizing a neurocognitive test like the ImPACT.



Because of the prevalence and the effectiveness of ImPACT, as well as the longevity of the program's existence, research has begun to identify characteristic parameters and markers that are most common in athletes who have required longer than 14 days to complete a full recovery. As such, the greatest correlation between those who require long-term recovery versus those who do not, appear to be those patients who demonstrate deficits in reaction time, visual memory, and verbal memory. Furthermore, when an ImPACT is performed along with an analysis of post-concussion symptoms within 2 to 3 days after the concussion episode, clinicians were able to accurately predict 73.17% of the time whether the athlete would require a recovery longer than 14 days. For more information about the ImPACT, please visit our website:



<http://www.csosortho.com/concussions.html>

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For More Information:

The research and the information presented in this edition are from multiple pieces of research and from multiple medical organizations. Should you choose to investigate this information further, the information for such is listed below for your review:



Sensitivity and Specificity of Subacute Computerized Neurocognitive Testing and Symptom Evaluation in Predicting Outcomes After Sports-Related Concussion

Lau, B.C., Collins, M.W, et. al.,
The American Journal of Sports Medicine,
Vol. 39, No. 6, 2011.

Which On-Field Signs/Symptoms Predict Protracted Recovery From Sport-Related Concussion Among High School Football Players?

Lau, B.C., Kontos, A.P, et. al.,
The American Journal of Sports Medicine,
Vol. 39, No. 11, 2011

The Centers for Disease Control:

<http://www.cdc.gov/TraumaticBrainInjury/>

National Athletic Trainers' Association:

<http://www.nata.org/health-issues/concussion>

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