Dear Athletic Trainers and Valued ImPACT Clients:

Because you play such a critical role in managing sports related concussions, the ImPACT Team thought you deserved to know the truth about neuropsychological testing and the reliability and validity of the ImPACT program. We also wanted to applaud the National Athletic Trainers Association for taking such a proactive stance on the issue of Sports Related Concussion. As clinicians, we recognize the need for a powerful organization to educate and inform their members on properly managing all injuries. Although on this particular topic, we, as experts in the field of sports concussion, would like to get involved and make sure you receive the correct information so that you can make the best decision for the safety of your athletes.

Some of you may have recently seen an article published in the Journal of Athletic Training, 40(3), 2005 entitled “Is neuropsychological testing useful in the management of Sports-related concussion.” This article was published under the guise of being a scientifically based “literature review” and purports to evaluate studies utilizing neuropsychological testing programs in the management of sports-related concussion, including the ImPACT test battery. Unfortunately, the article is neither scientific nor does it provide the full representative review of the literature. Specifically, the authors have omitted articles that did not support their supposition that neuropsychological testing is of little value in evaluating sports related concussion.

The end result is an article that provides a very slanted opinion that is not supported by a large existing body of scientific literature. This lack of inclusion of data appears to be slanted to criticize the ImPACT program, although the authors fail to site other important articles that have demonstrated the utility of neuropsychological testing in general. However, this letter will focus specifically on ImPACT.

Regarding the scientific basis of ImPACT, we have now published 17 peer reviewed article in journals in a number of highly regarded journals including the Journal of Neurosurgery, Neurosurgery, the American Journal of Sports Medicine, the Clinical Journal of Sports Medicine, the Journal of the International Neuropsychological Society and the Clinical Neuropsychologist. In addition, there are approximately 30 published abstracts and numerous papers have been presented at national and international conferences. We have also listed extensive normative data on the www.impacttest.com website. All of this information has been readily available for public scrutiny on the website but was essentially ignored by the authors of the JAT article.

Below we address some of the erroneous assertions and conclusions made by the authors:

1. The article correctly emphasizes the need for studies to evaluate both the reliability and validity of test procedures, yet it makes broad statements regarding the requirements for a specific level of test reliability. The Iverson et al. study (see Iverson et al. Clinical Neuropsychologist, 17(4), 2003) demonstrated minimal practice effects for athletes
taking the test more than once. Reliable Change Index scores have been published and have been available to aid in
the clinical interpretation of ImPACT for several years. However, the authors fail to site this article when discussing
the need for reliability data. Instead they state “we were unable to find any peer-reviewed paper reporting reliability
data on ImPACT”.

2. The author’s assertion that there has been “only 1 peer reviewed article involving a prospective controlled study” is
again incorrect and is a highly irresponsible statement. Multiple studies have been completed that have demonstrated
the ability of the ImPACT test battery to separate concussed from non-concussed athletes, even in relatively mildly
injured athletes. The published statistical differences between concussed and age-matched concussed subjects have
been robust by any standards with large effect sizes being found (see Lovell et al., Journal of Neurosurgery, 98,
2003; Lovell et al., American Journal of Sports Medicine, 32, 2004).

3. The sensitivity and specificity of the ImPACT test battery has also been studied. Although a recent study (Schatz et
al., Archives of Clinical Neuropsychology, in Press) was not available at the time the authors’ article was originally
written, anyone attempting to conduct a fair scientific review could be reasonably expected to check for new research
prior to publication of an article that makes such sweeping generalizations. However, the authors chose not to do so.
The Schatz et al. article found that even conducting a “blind” (e.g. purely statistical) classification (Discriminant
Function Analysis), ImPACT correctly classified 82% of the concussed group and 89% of the non-concussed group.
Another paper, which is currently in the publication process, demonstrates a 26% better diagnostic yield by adding
neuropsychological testing compared to evaluating symptoms alone. Responsible research would have found that
these and other studies were available for review.

4. A major conclusion of the authors’ article is that neuropsychological testing is of no value in athletes who are
symptomatic and should only be completed when an athlete becomes symptom free. We could not disagree with this
position more. Most of our athletes are high school students and therefore are often under pressure to return to the
classroom often within days of injury. Our neuropsychological test data provides useful and practical information to
the athletes, their parents and their teachers regarding the capacity of the injured student to perform schoolwork,
particularly during the early recovery process.

5. Another position taken by the authors appears to be that current neuropsychological assessment approaches are of
little value in the management of concussion and that decisions should be made primarily on player symptoms. On
any given week during football season, we see upwards of 80 concussed athletes per week (not counting the NFL and
NHL athletes under our care). Many of these athletes flatly deny symptoms even when we are certain that they are
still experiencing them. Presumably this occurs because of internal and external pressures to return to play. This of
course is a very well known phenomenon in sports medicine and is nothing new. However, returning these athletes
to play based on the self-report alone is an extremely dangerous practice.

We thank the National Athletic Trainers Association and the Journal of Athletic Training for taking an active role in the
education of Athletic Trainers. ATC’s are an extremely important team member in managing the concussed athlete.
Unfortunately, the article provides a very biased review of the area and does nothing to move our understanding of
concussion forward.

Sincerely,
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Director, NHL and NHL Neuropsychology Programs
Consultant, NASCAR, IRL, Formula 1 Racing and CHAMP Car
Consultant, the United States Ski Team

Thank you…
to all of our clients
who have brought this
to our attention and
asked us to disclose
the truth to their
fellow ATC’s.
UPMC Center for Sports Medicine Sports Concussion Program

Recent Literature References (1999-2005)

Listed below are literature published by our group in various medical peer-reviewed journals. All manuscripts pertain to the topic of sports concussion. * Referenced articles with an asterisk indicate articles that pertain to the validity and/or reliability for the ImPACT program.

**PEER REVIEWED JOURNAL ARTICLES**


**TEXTBOOKS and TEXTBOOK CHAPTERS**


PUBLISHED ABSTRACTS


