

Heads Up on Concussion in Para Sport

Title: Heads Up on Concussion in Para Sport

Authors:

Nick Webborn, MD ^{1,2}

Cheri A. Blauwet, MD ^{1,3}

Wayne Derman, MD, PhD ^{1,4}

Guzel Idrisova, MD, PhD ^{1,5}

Jan Lexell, MD, PhD ^{1,6}

Jaap Stomphorst, MD ^{1,7}

Yetsa A. Tuakli-Wosornu, MD^{1,3}

James Kissick, MD ^{1,8}

Affiliations:

¹Medical Committee, International Paralympic Committee, Bonn, Germany

²Centre for Sport and Exercise Science and Medicine (SESAME), School of Sport and Service Management, University of Brighton, East Sussex, United Kingdom

³Department of Physical Medicine and Rehabilitation, Spaulding Rehabilitation Hospital and Brigham and Women's Hospital, Harvard Medical School, Boston, USA

⁴Institute for Sport and Exercise Medicine, Division of Orthopaedics, Stellenbosch University, South Africa

⁵Lesgaft National State University of Physical Education, Sport and Health, St. Petersburg, Russia

⁶Department of Health Sciences, Rehabilitation Medicine Research Group, Lund University, Lund, Sweden

⁷Sports Medicine Department, Isala Klinieken, Zwolle, The Netherlands

⁸Department of Family Medicine, University of Ottawa, Ottawa, Canada

Corresponding Author:

Professor Nick Webborn OBE

Centre for Sport and Exercise Science and Medicine (SESAME)

University of Brighton

The Welkin, Carlisle Road

Eastbourne

BN20 7NS

Tel: +44 1323 745970

email: nickwebborn@sportswise.org.uk

Word count: 857

Heads Up on Concussion in Para Sport

Concussions to high profile professional athletes and the \$1billion court settlement between the National Football League (NFL) in the United States and thousands of former NFL players have brought sports concussion to the top of news headlines[1]. The crux of the NFL case centered around retired players' allegation that the NFL did not warn them about the potential long term health impact of concussions. Cases such as these alert sport governing bodies to the medicolegal importance of this issue, and their responsibility for player safety. For the *Para athlete*, the International Paralympic Committee's (IPC) term for a sportsperson with an impairment, the concussion debate struggles to garner attention. This is partly because funding for epidemiological research in this area is limited. But athletes with a variety of impairments due to a range of medical issues face the risks and consequences of concussive brain injury in Para sports: it is time for Paralympic medical and sporting communities to address this important issue.

Recommendations from the International Conferences on Concussion in Sport mandate that all potential cases of concussion undergo medical assessment, including a comprehensive history and detailed neurological examination with a thorough assessment of mental status, cognitive functioning, gait and balance[2]. However, our understanding and guidelines regarding assessment, management and prevention of concussion in Para athletes is lacking. For example, there is a need to modify and validate the Sports Concussion Assessment Tool (SCAT)[3] for use in the Para athlete. Such a tool should become an extension of the existing instrument rather than a separate entity. Examples of modifications include developing appropriate balance tests for the paraplegic or amputee athlete. Baseline testing of Para athletes would be particularly important in athletes with known communication difficulties or cognitive impairment. Weiler et al have shown that baseline SCAT3 scores in football (soccer) players with a disability are different than those for able-bodied footballers[4].

There are several Para sports in which the risk for concussion is elevated due to speed of play, impact potential, lack of protective equipment, including road cycling, ice sledge hockey and alpine downhill skiing. At the Sochi 2014 Paralympic Games, where more than 60% of alpine competitors failed to complete the course due to poor snow conditions, 37% of all sit-ski alpine athletes incurred an injury of which nearly 5% was to the head and neck.

Other Para sports at high risk for head injury may not be obvious to the those unfamiliar with Para sports. For example, wheelchair track racing produces some spectacular crashes with documented head injuries. Over one season, 6.1% of American wheelchair basketball players reported experiencing a concussion and of those, 44% did not report it, largely because they did not want to be removed from competition, a response similar to able bodied athletes[5]. It is well-established that concussions often go unreported or unrecognised for reasons including lack of knowledge of signs and symptoms, athletes' tendency to mask symptoms to avoid being held from competition, or minimization of the gravity of concussion. In addition Para athletes have often experienced a significant medical condition in the process of becoming eligible for Para sport and as a consequence, can underplay the

Commented [??1]: New SCAT 5 reference to be inserted when available from BJSM

Heads Up on Concussion in Para Sport

significance of concussion. “Doc, I survived cancer, so a little ‘ding’ on the head doesn’t worry me”. This mindset should however not deter us from addressing the need for education.

The IPC Medical Committee has undertaken injury and illness surveillances at the Winter Paralympic Games since 2002 and at the Summer Paralympic Games since 2012[6,7]. These studies have identified sport-specific risk factors for concussion and have helped International Federations understand those risks, but there is no mandate for enforcing change. While data gathering is important, education of athletes, coaches, medical staff and administrators regarding the importance of concussion is critical. During the Rio Paralympic Games, team doctors reported ten significant head and facial injuries. Concussion was not reported in any of these incidents despite clearly “suspicious” video footage of the events (article in preparation). As with some able-bodied sports, perhaps video review could form part of an expanded sideline screening process in the future.

During the London 2012 Paralympic Games, Football 5-a-side for the visually impaired had the highest incidence of injury in all summer sports, with injuries to the head and neck accounting for 25% of all competition injuries[8]. The sound of visually impaired footballers colliding as they ran for the ball resonated around stadiums and highlighted that an injury prevention programme is needed urgently. As a result of this initial survey, the IPC Medical Committee engaged the international federation (IBSA Football) in working collaboratively on stronger enforcement of existing laws and the development of combined mandatory eye-shades with head protection. This summer the IPC Medical Committee will meet with all the international federations to highlight these issues but we need the engagement of existing experts to help address the challenges of assessment and development of prevention strategies.

It is time for the clinical and research community to put their heads together - figuratively - to help address this important but poorly understood issue. For this to be successful, urgent focus on Para athletes is needed within the broader academic and public discourse on concussion. No longer a population on the sidelines, para athletes deserve our attention, focus and resources. The time is now.

Acknowledgements:

The authors would like to thank the Medical & Scientific Department of the International Paralympic Committee, in particular Peter Van de Vliet and Anne Sargent for their support.

References:

- 1 NFL’s \$1billion concussion settlement upheld as United States appeals court describe the payout as ‘imperfect but fair’ | Daily Mail Online. <http://www.dailymail.co.uk/sport/sportsnews/article-3546377/NFL-s-1billion-concussion-settlement-upheld-United-States-appeals-court-payout-imperfect-fair.html> (accessed 26 Sep2016).

Heads Up on Concussion in Para Sport

- 2 McCrory P, Meeuwisse WH, Aubry M, *et al.* Consensus statement on concussion in sport: the 4th International Conference on Concussion in Sport held in Zurich, November 2012. *Br J Sports Med* 2013;**47**:250–8. doi:10.1136/BJSPORTS-2013-092313
- 3 Guskiewicz KM, Register-Mihalik J, McCrory P, *et al.* Evidence-based approach to revising the SCAT2: introducing the SCAT3. *Br J Sports Med* 2013;**47**:289–93. doi:10.1136/BJSPORTS-2013-092225
- 4 Weiler R, van Mechelen W, Fuller C, *et al.* Do Neurocognitive SCAT3 Baseline Test Scores Differ Between Footballers (Soccer) Living With and Without Disability? A Cross-Sectional Study. *Clin J Sport Med* 2017;**1**. doi:10.1097/JSM.0000000000000407
- 5 Wessels KK, Broglio SP, Sosnoff JJ. Concussions in wheelchair basketball. *Arch Phys Med Rehabil* 2012;**93**:275–8. doi:10.1016/j.apmr.2011.09.009
- 6 Willick SE, Webborn N, Emery C, *et al.* The epidemiology of injuries at the London 2012 Paralympic Games. *Br J Sports Med* 2013;**47**:426–32. doi:10.1136/bjsports-2013-092374
- 7 Webborn N, Willick S, Reeser JC. Injuries among disabled athletes during the 2002 Winter Paralympic Games. *Med Sci Sports Exerc* 2006;**38**:811–5. doi:10.1249/01.mss.0000218120.05244.da
- 8 Webborn N, Cushman D, Blauwet CA, *et al.* The Epidemiology of Injuries in Football at the London 2012 Paralympic Games. *PM R* Published Online First: 30 October 2015. doi:10.1016/j.pmrj.2015.09.025