

## Heads Up on Concussion in Para Sport

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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

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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.

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