

IMPLICATIONS OF CONCUSSION IN SPORT AND ACTIONS BY THE GAA

Introduction

The GAA would like to thank the Joint Committee on Health and Children for the invitation to present to it on the implications of concussion in sport, and to outline the actions which have been and are being taken by our Association on this issue.

The Medical, Scientific, and Welfare Committee is a Sub-Committee of GAA's Central Council which is the Association's supreme governing body. It was established in 2004 and its members include medical doctors, chartered physiotherapists, ex-managers, ex-players, researchers, administrators and a representative of the Gaelic Players Association. The core responsibility of this Committee is to advise the Association on medical and general welfare matters relevant to our games and to drive Association policy in these areas.

Background

Concussion is a brain injury which the GAA believes must be treated seriously to protect players from adverse consequences both in the immediate aftermath of the injury and in the long-term. It is a subset of traumatic brain injury (TBI) which is generally self-limited and at the less severe end of the brain injury spectrum and is defined as '*a complex pathophysiological process affecting the brain, induced by biomechanical forces.*¹ Several common features that incorporate clinical, pathologic and biomechanical injury constructs that may be utilised in defining the nature of concussive head injury include:

- 1) *Concussion may be caused by either a direct or indirect blow to the head, face, neck or elsewhere on the body with an 'impulsive' force transmitted to the head.*
- 2) *Concussion typically results in the rapid onset of short-lived impairment of neurological function that resolves spontaneously. However, in some cases, symptoms and signs may evolve over a number of minutes or hours.*
- 3) *Concussion may result in neuropathological changes, but the acute clinical symptoms largely reflect a functional disturbance rather than a structural injury and, as such, no abnormality is seen on standard neuroimaging studies.*
- 4) *Concussion results in a graded set of clinical symptoms that may or may not involve loss of consciousness. Resolution of the clinical and cognitive symptoms typically follows a sequential course. However, it is important to note that in some symptoms may be prolonged.*

In 2007, the GAA was ahead of the curve by producing a position statement on concussion management in Gaelic games and after considering the consensus statement from the latest International Conference on Concussion in Sport which was released in 2013, the Association updated its guidelines in late 2013 to reflect international best practice². It continues to monitor its policies on concussion on an ongoing basis including maintaining

¹ Mc Crory *et al. Br J Sports Med* 2013; 47: 250-258.

² GAA Concussion Management Guidelines, 2013-2016'. Available at <http://www.gaa.ie/medical-and-player-welfare/injuries/concussion-management/>

awareness of best practice developments and how other sporting bodies deal with concussion in their sports.

Injury surveillance in Gaelic games over the last seven years has found that concussion represents less than 1 per cent of all diagnosed and reported injuries. Notwithstanding its low incidence in comparison to other sports injuries, we recognise that concussion is a serious injury if not identified and managed properly. It is also recognised that this may be an under-reported figure due to the current lack of awareness on concussion.

Diagnosis / On-field Management

The initial stage of diagnosis involves the recognition of signs and symptoms and removal from play.

TABLE 1 SIGNS AND SYMPTOMS

INDICATORS	WHAT YOU WOULD EXPECT TO SEE
Symptoms	<ul style="list-style-type: none"> • Headaches* • Dizziness • 'Feeling in a fog.'
Physical Signs	<ul style="list-style-type: none"> • Loss of consciousness • Vomiting • Vacant Facial Expression • Clutching Head • Motor In coordination
Cognitive Impairment	<ul style="list-style-type: none"> • Loss short term memory • Difficulty with concentration • Decreased attention • Diminished work performance
Behavioural Changes	<ul style="list-style-type: none"> • Irritability • Anger • Mood Swings • Feeling Nervous • Anxious
Sleep Disturbance	<ul style="list-style-type: none"> • Drowsiness • Difficulty Falling Asleep

It is the policy of the Association that where there is a credible suspicion of concussion, a player should be removed immediately from the field and should not return to play on the same day. Where a Team Doctor is present, he should advise the person in charge of the team on removal from play and the player must not be allowed to continue his participation in the game.

A player should not be left alone and should be monitored for deterioration over the first few hours after the injury. The SCAT 3 should be used as a validated sports concussion assessment tool to assist a doctor with diagnosis and evaluation of an injury. As there are currently no bio-markers to make a diagnosis of concussion; it's a clinical judgement for a medical doctor. There is no other diagnosis tool, bar a doctor's medical knowledge.

Certain individuals believe that the GAA should relax substitution rules to allow for a player to be assessed on the sideline and this issue has been considered at length by the GAA. Management teams will undoubtedly want to avoid a situation where a player on the sideline



receiving medical treatment results in their team playing on with a man down. Whilst accepting that management teams may have this view, the Association in line with the Zurich Consensus believes that if a GAA player shows obvious signs or reports symptoms, he should be taken off and should not return to play on the same day. With this in mind, the GAA does not believe that a substitution for concussion is appropriate for Gaelic games. Concussion is an evolving injury therefore the GAA has refrained from granting periods for players to be assessed during a game. Players may be asymptomatic at the time of assessment and then start developing symptoms in the minutes and hours after. There have been several instances in the past where GAA players were cleared to play on before symptoms developed over a period of minutes and players were at a higher risk of re-injury.

There have also been proposals of late for sports organisations and the GAA to have independent doctors present for games to examine players as team doctors can be ignored and in professional games the argument is that doctors may be influenced by the fact that they're employed by their Clubs. It must be acknowledged that GAA doctors offer their services on a pro-bono basis and have an excellent record of caring for our players. Moreover, the Association has every faith in its medical personnel to identify and manage concussion successfully and given appropriate educational campaigns believes its Team Managers will know the obvious duty of care that is required towards their players should an suspected concussion occur.

Concussion Management / Safe Return to Play

The cornerstone of concussion management is physical and cognitive rest until the acute symptoms resolve and then a graded programme of exertion prior to medical clearance and Return To Play (RTP) – See Table 1.

TABLE 2 GRADUAL RETURN TO PLAY PROTOCOL

REHAB STAGE	FUNCTIONAL EXERCISE	OBJECTIVE OF STAGE
1. No Activity	<ul style="list-style-type: none"> Physical and Cognitive Rest 	<ul style="list-style-type: none"> Recovery
2. Light Activity	<ul style="list-style-type: none"> Walking, swimming, cycling, keeping intensity <70% maximum permitted heart rate 	<ul style="list-style-type: none"> Increase HR
3. Sports Specific Exercise	<ul style="list-style-type: none"> Running drills, 	<ul style="list-style-type: none"> Add Movement
4. No Contact Training Drills	<ul style="list-style-type: none"> Progress to more complex training drills - passing drills, progressive resistance training 	
5. Full Contact Practice	<ul style="list-style-type: none"> Following medical clearance, participate in normal training activities. 	<ul style="list-style-type: none"> Exercise, coordination and cognitive load
6. Return to play	<ul style="list-style-type: none"> Normal game play 	<ul style="list-style-type: none"> Restore confidence and assess functional skills by coaching staff

As highlighted in the Consensus Statement arising from Zurich, the current published evidence evaluating the effect of rest following a sports-related concussion is sparse, however, it is accepted that typically in uncomplicated cases, the acute symptoms resolve after a rest period of 24-48 hours. The RTP Protocol following a concussion follows a step-wise process where a player should only continue to proceed to the next level if

asymptomatic at the current level. Generally, each step would take 24 hours therefore a player would take one week to proceed through the full rehabilitation protocol once they are asymptomatic at rest with provocative exercise.

A range of ‘modifying’ factors may influence that investigation and management of concussion and, in some cases, may predict the potential for prolonged or persistent symptoms. Examples of modifiers would be children and adolescents under the age of 18 or players with previous concussions. Medical personnel should be mindful of these modifiers when managing a player’s concussive injury.

TABLE 3 CONCUSSION MODIFIERS

FACTORS	MODIFIERS
Symptoms	<ul style="list-style-type: none"> • Number • Duration (>10 days) • Severity
Signs	<ul style="list-style-type: none"> • Prolonged loss of consciousness (LOC) (>1 min), Amnesia
Sequelae	<ul style="list-style-type: none"> • Concussive convulsions
Temporal	<ul style="list-style-type: none"> • Frequency – repeated concussions over time • Timing – injuries close together in time • ‘Recency’ – recent concussion or traumatic brain injury
Threshold	<ul style="list-style-type: none"> • Repeated concussions occurring with progressively less impact force or slower recovery after each successive concussion
Age	<ul style="list-style-type: none"> • Child and adolescent (<18 years)
Comorbidities and premorbidities	<ul style="list-style-type: none"> • Migraine, depression or other mental health disorders, attention deficit hyperactive disorder (ADHD), learning disabilities (LD), sleep disorders
Medication	<ul style="list-style-type: none"> • Psychoactive drugs, anticoagulants
Behaviour	<ul style="list-style-type: none"> • Dangerous style of play
Sport	<ul style="list-style-type: none"> • High risk activity, contact with collision sport, high sporting level

Key Actions by the GAA to date

The main actions taken by the GAA in relation to concussion management are:

- 1) In 2007, the GAA was one of the first sports organisations in Ireland to produce a position statement on concussion and this position was subsequently updated in 2013 in line with international best practice.
- 2) The Medical, Scientific, and Welfare Committee devised a multi-faceted educational programme in 2014 which aimed to transfer knowledge to players, coaches, parents, referees, administrators and medical personnel on concussion and the GAA’s guidelines in this regard. This was in response to our commitment to education of our players, coaches and members and to the fact that studies in the US demonstrate that athletes, parents, and coaches lack the knowledge needed to make informed decisions about concussions³. Furthermore, these studies assert the continued existence of misconceptions and lack of understanding about symptoms of a concussion as well as the recommended treatment and return to play guidelines.
- 3) In recent years, the GAA teamed up with Acquired Brain Injury Ireland on awareness campaigns which saw posters being distributed to each Club in Ireland, video campaigns featuring high-profile players and wallet cards being produced for coaches

³ American Medical Society for Sports Medicine position statement: Concussion in sport. Available at <http://www.ncbi.nlm.nih.gov/pubmed/23243113>.

- 4) To date in 2014, workshops have been delivered to coaches, medical personnel and referees, both Club and Inter-County. A 20 minute GAA specific e-learning course has been devised for players, coaches, parents and other interested stakeholders which aims to cover the key areas of concussion management and incorporates a series of questions which tests a user's knowledge. The course was designed to target players, parents and coaches as these are the groups that are the most difficult to access.
- 5) The GAA in conjunction with the UCD School of Public Health, Physiotherapy and Population Science has operated a National Injury Database since 2007. It informs us on the incidence of injury associated with playing senior Inter-County football and hurling. Concussion injuries reported by participating inter-county team medical personnel are recorded in the National Injury Database and trends in numbers and impact of such injuries will continue to be monitored and reported.
- 6) The backing of the National Referee's Committee was obtained in 2014 which saw all Inter-County Referees on the national panel attend a concussion awareness workshop and information being presented at the National Club Referee Conference
- 7) In terms of collaboration, the GAA has worked closely with the following bodies at various intervals in recent times to ensure that our guidelines are up-to-date, reflect best practice and are communicated properly to all stakeholders – Gaelic Players Association, Gaelic Games Doctors Association, UPMC Beacon Hospital, Acquired Brain Injury Ireland, Department of Education and Skills, and the Joint Managerial Body/Association of Secondary Schools.

Recommendations

The GAA makes the following recommendations to the Joint Committee on Health and Children:

1. Establish a Task Force with representations from sports organisations, sports medicine bodies, and primary and post-primary schools to devise an appropriate educational programme to improve awareness of sports-related concussion, its management and possible consequences amongst players, parents, coaches and medics. The Task Force should specifically:
 - a. Review successful public health campaigns in countries such as Canada and the United States
 - b. Plan and implement a national awareness campaign
 - i. Run a targeted awareness campaign in primary and post-primary schools for pupils, parents and teachers
 - c. Develop educational resources such as online training courses, educational videos and information leaflets.
2. Provide education and training for all GPs, out of hour GP services and Emergency Departments in post-traumatic brain injury assessment and management to limit the chance of players receiving varying advice
3. Encourage the Department of Health to support research proposals as additional research is needed to validate current assessment tools, assess the role of baseline testing and improve identification of those at risk of prolonged post-concussive symptoms or other long-term complications



Conclusion

The GAA is proud of its overall track record in terms of player welfare. Concussion is one of many sports injuries which players may sustain when playing our games. A lot of the information emerging, particularly from the United States, is of concern for everyone involved in sports. The GAA is cognisant of this and is satisfied that its concussion management protocols are appropriate for its players and the nature of our games.

Since 2007, the Medical, Scientific, and Welfare Committee has paid particular attention to the importance of concussion and have developed specific educational resources for various target audiences.

The GAA faces a significant challenge in transferring information to all of its members on concussion, amongst other important issues. Nevertheless, the Association believes that it has recently taken a considered and comprehensive approach to educating players, parents, coaches, referees, medical personnel and administrators.

The most important message for all stakeholders is that players with symptoms that indicate a concussion be removed from play - **'If in doubt, sit them out.'** Thereafter, appropriate management is essential for reducing the risk of long-term symptoms and complications. Moving forward, the GAA believes that awareness, education, the up skilling of doctors and supporting research are the primary areas in which public policy actions should be proactive.

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