



## HIA Protocol

The Head Injury Assessment protocol is a three-stage process introduced by World Rugby for elite professional teams to assist with the identification, diagnosis and management of head impact events with the potential for a concussion. It consists of the following three stages, summarised in Figure 1:

### *Stage 1 - HIA 1 Assessment:*

In stage 1, players who sustain head impact events with the potential for a concussion are identified by match officials, team doctors (TD), or independent match-day doctors (MDD). The identification is either by direct observation or on video review.

The HIA 1 has four components and they are:

- a) 11 immediate and permanent removal criteria (known as Criteria 1 indications) **AND**
- b) an off-field screening tool **AND**
- c) pitch-side video review **AND**
- d) clinical evaluation by the attending doctor

The HIA1 assessment is therefore **not** limited to the off-field screening tool. Instead, the off-field screening tool is one component of the comprehensive HIA 1 assessment.

Players displaying obvious on-pitch signs of concussion (Criteria 1, Table 1) are immediately and permanently removed from play, and the completion of the off-field screening tool and medical evaluation is **not** required. Any other cases, where players have the potential for concussion (Criteria 2, Table 1), but without clear on-pitch symptoms or signs, undergo an off-field assessment consisting of a medical room clinical evaluation by an attending doctor supported by the multi-modal screening tool, and video review.

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The off-field screening tool is a re-formatted Sports Concussion Assessment Tool (SCAT 5), the pitch-side assessment tool recommended by experts from the international concussion consensus meeting. This off-field screening tool includes a check of symptoms, memory assessment and balance evaluation. Only used in the professional game, the results of this off-field assessment are compared to a previously conducted 'baseline assessment', or to a normative result. An abnormal screening tool result is indicated if the score is different from that player's baseline assessment or the normative score and confirms a suspected concussion. Any player with an abnormal off-field assessment or if there is a clinical opinion of suspected concussion must be removed from the game.

The team doctor has the primary responsibility for conducting the off-field screen, but can delegate this role to the match-day doctor. The off-field screen is conducted in the stadium's medical room or other agreed venue if medical room is too distant from the field. The off-field screen must be completed within 10 minutes (absolute time, not playing time), commencing when a player leaves the field of play and finishing when the player is presented to the 4<sup>th</sup> match official for permission to return to play. A temporary player interchange is allowed during the assessment period.

Video review has three roles in stage 1 of the HIA protocol. Firstly, during play, independent match-day doctors can supplement side-line observation with video reviews of incidents to identify any suspicious head impact events requiring either permanent removal from play or removal from play for further side-line assessment. At this point, the decision of the MDD is simply that the player be removed. A second video review is then undertaken with the MDD and Team Doctor present. If HIA 1 immediate removal criteria (Criteria 1) are identified, the player is permanently removed from play without further evaluation. If there are no Criteria 1 signs evident on video, the player undergoes the off-field assessment supported by the screening tool. The final use of video is a review after the off-field assessment, where video is again reviewed prior to a player being returned to play.

### ***Stage 2 - HIA 2 Assessment:***

In stage 2, every player entered into the HIA protocol undergoes an early medical evaluation (HIA2 clinical assessment) within three hours of completing the match, to assess clinical progress and determine an **early** diagnosis of concussion. This Stage 2 assessment is performed using the SCAT5 tool supported by player baselines or normative Rugby baseline values.

### ***Stage 3 - HIA 3 Assessment:***

In stage 3 further medical testing is performed after two night's rest (36-48 hours post-head impact event) to further assess clinical progress and determine a **late** diagnosis of concussion (HIA3 clinical assessment). This HIA 3 consists of a clinical assessment supported by the SCAT5 symptom check-list, balance evaluation using BESS and tandem gait assessments and a cognitive assessment tool of each team's choice e.g. CogSport, Impact.

Players presenting with delayed symptoms or signs suspicious for concussion, but who are not identified with a head impact event during the game, can enter the HIA protocol at a later stage (stage 2 or 3) and undergo HIA 2 and/or HIA 3 clinical assessments as appropriate.

Additionally, video footage of all matches is scrutinized by an independent video analyst post-game to identify players with suspicious head impact events not detected during play and not initially entered into the HIA protocol. Identified videos are distributed to the appropriate teams for review and action.

Some individual Unions also have medical review of all head injuries that have entered or should have entered the HIA protocol. Players identified who have not entered the HIA protocol would normally undergo HIA3 assessment.

A definitive diagnosis of concussion is made if a player demonstrates observable signs of concussion requiring immediate and permanent removal from play (Criteria 1 e.g. loss of consciousness) or a clinical diagnosis of concussion is made supported by the HIA2 or HIA3 clinical assessment.

The HIA protocol allows for a diagnosis of concussion to be made immediately (Criteria 1) following a head impact event but a diagnosis cannot be excluded following a head impact event until both a HIA 2 and HIA 3 assessments are completed and normal.

## **HIA System**

The HIA protocol is supported by a governance system to ensure the highest quality of medical management is provided to players. The HIA protocol for assessing players with the potential for concussion, including components of the off-field screening tool, were formulated following a review of the scientific literature, consideration of position statements, and formal consultation with concussion experts, sports medicine doctors, coaches, players and referees. The HIA protocol is subject to continual review and development by a working group of independent experts advising World Rugby. A training programme, consisting of e-learning modules, is mandatory for all medical staff involved in the HIA protocol. Formal governance and disciplinary processes are in place to monitor and manage the HIA protocol. An ongoing programme of research is conducted to continually evaluate and improve the effectiveness of the HIA protocol.

## **SUMMARY**

The Head Injury Assessment (HIA) is a three-point in time process and includes:

### **HIA 1 containing**

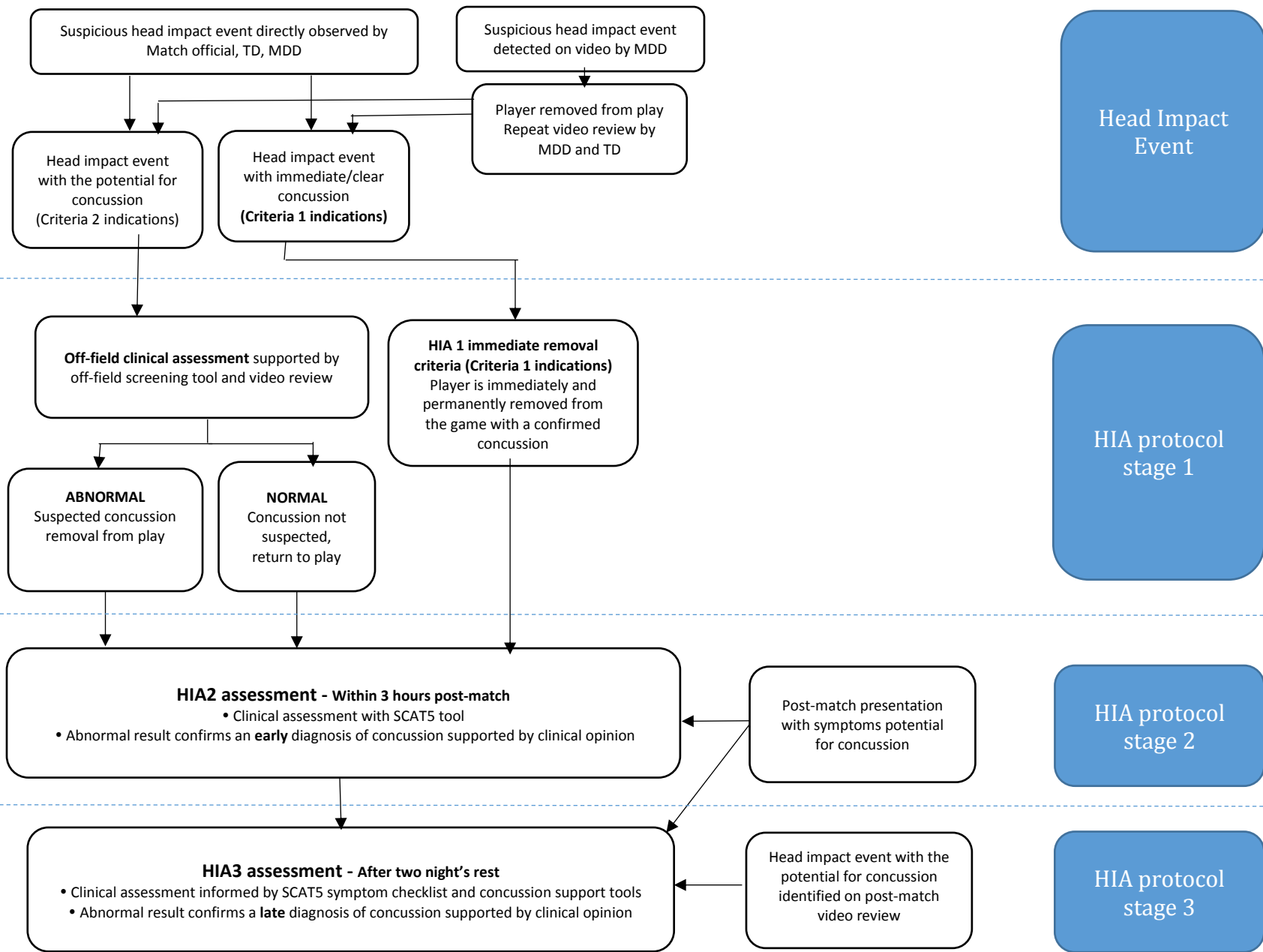
- Criteria 1 – indications for immediate and permanent removal from a match
- An off-field assessment including symptom checklist, medical evaluation, balance assessment and cognitive tests performed by a doctor
- Video review
- Clinical evaluation by the treating doctor

### **HIA 2**

- A repeat medical evaluation performed by the doctor within 3 hours of the incident
- Assists in an **early** diagnosis of concussion

### **HIA 3**

- A further medical evaluation performed 48-72 hours after the incident
- Assists with the **late** diagnosis of concussion



**Figure 1.** Summary of the HIA protocol for evaluating head impact events with the potential for concussion.

**Table 1. Criteria for permanent removal from play or medical room head injury assessment.**

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<b>Immediate and permanent removal from play criteria (Criteria 1)</b>	<b>Off-pitch screening tool criteria (Criteria 2)</b>
<ul style="list-style-type: none"><li>•Confirmed loss of consciousness</li></ul>	<ul style="list-style-type: none"><li>•Head impact event where diagnosis not immediately apparent</li></ul>
<ul style="list-style-type: none"><li>•Suspected loss of consciousness</li></ul>	<ul style="list-style-type: none"><li>•Possible behavioural changes</li></ul>
<ul style="list-style-type: none"><li>•Tonic posturing</li></ul>	<ul style="list-style-type: none"><li>•Possible confusion</li></ul>
<ul style="list-style-type: none"><li>•Convulsion</li></ul>	<ul style="list-style-type: none"><li>•Injury with the potential to result in concussion</li></ul>
<ul style="list-style-type: none"><li>•Balance disturbance / ataxia</li></ul>	<ul style="list-style-type: none"><li>•Other concerning feature</li></ul>
<ul style="list-style-type: none"><li>•Definite confusion</li></ul>	
<ul style="list-style-type: none"><li>•Not orientated in time, person, or place</li></ul>	
<ul style="list-style-type: none"><li>•Clearly dazed</li></ul>	
<ul style="list-style-type: none"><li>•Definite Behavioural changes</li></ul>	
<ul style="list-style-type: none"><li>•Oculomotor abnormalities</li></ul>	
<ul style="list-style-type: none"><li>•Other on-field identification of sign or symptoms of concussion</li></ul>	

## GLOSSARY

<b>HIA Protocol</b>	Multi-stage process for the identification and management of head impact events with the potential for a concussion occurring during competitive Rugby matches.
<b>HIA Governance System</b>	Governance framework to quality assure the HIA protocol. Comprises training, research, HIA review processes, and oversight by an independent expert working group.
<b>HIA1 Assessment</b>	First stage of the HIA protocol, comprising: <ol style="list-style-type: none"> <li>1. Permanent removal of players exhibiting observable symptoms or signs of concussion (HIA 1 Criteria 1)</li> <li>2. Identification of head impact events with the potential for concussion by direct observation and real-time video review</li> <li>3. Medical room clinical assessment of players with the potential for concussion (not used if HIA 1 immediate removal criteria apply), but without clear manifestations comprising clinical evaluation supported by screening tool and</li> <li>4. Video review.</li> </ol>
<b>HIA2 Assessment</b>	Early medical evaluation (structured by the HIA2 clinical assessment) within 3 hours post-match to assess clinical progress and determine an <b>early</b> diagnosis of concussion.
<b>HIA3 Assessment</b>	Further medical testing performed after two nights rest following a head impact event to assess clinical progress and determine a <b>late</b> diagnosis of concussion (structured by the HIA3 clinical assessment).
<b>Immediate and permanent removal criteria (Criteria 1 indications)</b>	A set of signs and symptoms indicative of concussion. Directly observed or detected on video review. Part of the HIA 1 Assessment used during the first stage of the HIA protocol.
<b>HIA 1 off-field clinical assessment</b>	Medical room assessment of players with the potential for concussion, but without clear manifestations. Consists of a clinical evaluation supported by the off-field screening tool and video review.

<b>Off-field Screening Tool</b>	A screening tool to detect suspected concussion in players without clear manifestations. Includes four sequential domains, comprising the Maddocks' questions, a balance test, a symptom assessment, and a brief cognitive (memory) evaluation. This screening tool does not provide a formal diagnosis of concussion but assists in identifying a suspected concussion. The off-field screen forms part of the HIA 1 assessment together with Criteria I signs and symptoms, video review and clinical evaluation.
<b>HIA 2 Assessment</b>	Early medical evaluation within 3 hours post-match performed with the SCAT5 tool using player specific baseline data or normative Rugby baseline values.
<b>HIA 3 Assessment</b>	Later medical testing performed after two nights rest, comprising a clinical assessment supported by the SCAT5 symptom check-list, balance evaluation using BESS and tandem gait and a cognitive assessment tool e.g. CogSport.
<b>Head impact event</b>	Direct or indirect transmission of force to the head with the potential for a concussion requiring evaluation and management in the HIA process. Excludes trivial events where a player remains completely normal and/or isolated scalp/facial injuries.
<b>Concussion</b>	<p>A traumatic brain injury defined as a complex pathophysiological process affecting the brain, induced by biomechanical forces. World Rugby's operational definition of concussion applies with any of the following:</p> <ol style="list-style-type: none"> <li>1. The presence, detected by direct observation or video review, of any sign or symptom of concussion (HIA 1 Criteria 1)</li> <li>2. An abnormal post game, same day assessment— (HIA 2 clinical assessment)</li> <li>3. An abnormal 36–48 h assessment— (HIA 3 clinical assessment)</li> <li>4. The presence of clinical suspicion by the treating doctor at any time</li> </ol>