

## CONCUSSION POLICY

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<b>Board:</b>	Approved
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Netball Australia (NA) is the peak body responsible the development and promotion of netball nationally. NA recognises the need for a *Concussion Policy* to guide the response and treatment of concussion at national level events and competitions. NA also recognises a need for advice and information to assist netball states, associations and clubs address concussion at the community level.

Although rare in netball, concussion has increasingly become a significant public health issue, particularly relevant to sport. The primary purpose of the policy is at all times to protect the welfare of netball athletes. Accurate diagnosis and management is needed to ensure that a concussed player is appropriately treated.

This policy sets out are the guidelines, procedures, information and references that can be used by medical staff, athletes, coaches, support staff, and parents responding to players who have received a concussion.

The policy comprises of:

1. Important Facts on Concussion
2. Mandatory procedures for Netball Australia Competitions
3. Reference Cards
4. Useful Links / Resources
5. Further Information on Concussion

### **Acknowledgements**

This policy could not be completed without the excellent resources and information from the joint Australian Institute of Sport and Australian Medical Association statement on concussion as well as the resources provided by the British Journal of Sports Medicine.

## **IMPORTANT FACTS ON CONCUSSION**

### **What is Concussion**

Concussion, as defined by the Concussion in Sport Group (CISG) international consensus statement,<sup>1</sup> is a complex pathophysiological process affecting the brain, induced by biomechanical forces. It is known to be complex injury and can be challenging to evaluate and manage.

Concussion is a disturbance in the brain's ability to acquire and process information. The reduced function of the brain represents damage to nerve cells (neurons). Either a direct or indirect blow to the head can cause this injury. A direct blow can cause the brain to rotate and/or move forward and backward. Indirect impact to the body can transfer an impulsive force to the brain.

The effect that this has on the player can vary from person to person, depending on which part of the brain is affected. The impact can cause concussion signs visible to those who witnessed the collision.

### **Key Points on Concussion**

- Concussion can occur in traditional contact sports and sports such as basketball, netball, horse riding, skiing and hockey.
- 90% of concussions occur in competitive matches.
- Women are twice as likely to suffer concussion as men.
- Most concussions are not reported.
- Concussion may go undetected due to the subtlety and widespread occurrence of the typical signs and symptoms of concussion.
- Concussion symptoms can manifest immediately or hours and even days later.
- Not all athletes develop the same symptoms or signs of concussion.



## **MANDATORY PROCEDURES FOR TEAMS PARTICIPATING IN NETBALL**

### **AUSTRALIA EVENTS**

#### **Before the season/event starts club medical/support staff will**

- Prepare for the sports season by studying up on concussion.
- Have the resources with you that allow easy recognition of possible concussion.
  - Pocket Recognition Tool (refer to Attachment A)
  - Management of Concussion Medical/Non-medical On-field/Off-field Reference cards (refer to Attachment B, C, D, E)
- Have easy access to a checklist of the warning signs of structural brain injury.
- Know where the closest emergency department or medical practice is in relation to your current location.
- Ideally all players should undergo computerised testing, although this is not compulsory. Netball Australia is aware of the cost and time required for this.
- At **Suncorp Super Netball** level every player needs to complete a SCAT 5 assessment (refer to Attachment F) to be used as a baseline for returning an athlete to play post concussive episode. At **other competition levels** ideally every player should complete a SCAT5 assessment as a baseline. This however is a recommendation only. Netball Australia are aware of the cost and time needed for a baseline SCAT5 to be completed for every player.

#### **Suspected concussion at a game or training:**

If a concussion is suspected, a standard primary survey and cervical spine precautions should be used. Once safe to do so, the player must be removed from play and assessed in a quiet, safe environment. A Sideline Modified Maddock Score should be performed along with a SCAT5 and a Netball Australia Head Injury Assessment Form (refer to Attachments F, G, H).

If the player successfully completes these assessments, within 15 minutes from injury, and remains asymptomatic they can return to play if the medical doctor present at the game believes it is medically safe to do so. Once returned to play, the player must be closely monitored for evolving signs of concussion.

A player may only return to the field of play after being cleared by a medical practitioner. If a doctor is not present at the match the player must remain out of play until they have had a chance to be medical assessed.

If the player fails these assessments, a diagnosis of concussion is made and they must be removed from play and monitored as below. Please follow Management of Concussion Medical/Non-medical On-field/Off-field Reference cards (refer to Attachment B, C, D, E).

**Take Home Message**

**A player does not have to lose consciousness to have a concussion.**

**Take Home Message**

**All players with suspected concussion should be removed from play or training and see a medical doctor as soon as possible.**

**Any player diagnosed with concussion should be removed from the event and not return to sport or training that day.**

**IF IN DOUBT SIT THEM OUT**

**Signs to watch for:**

Problems could arise over the first 24-48 hours. A player should not be left alone and must be seen by doctor or go to a hospital at once if they:

- Have a headache that gets worse (and doesn't resolve with Panadol).
- Are very drowsy or can't be awakened.
- Can't recognize people or places.
- Have repeated vomiting.
- Behave unusually or seem confused; are very irritable.
- Have seizures (arms and legs jerk uncontrollably).
- Have weak or numb arms or legs.
- Are unsteady on your feet; have slurred speech.

**Mandatory Return to Play Protocol:**

When returning athletes to play, they should follow a stepwise symptom-limited program, with stages of progression (Refer to Attachment I).

1. Rest until asymptomatic (physical and mental rest)
2. Light aerobic exercise (e.g. stationary cycle)
3. Sport-specific exercise (e.g. light ball and court work)
4. Non-contact training drills (start light resistance training also)
5. Full contact training after medical clearance
6. Return to competition (game play)

There should be 24 hours (or longer) for each stage and the athlete should return to the previous, asymptomatic stage if symptoms recur. Resistance training should only be added in the later stages.

Children and adolescents may be more susceptible to concussion and take longer to recover. A more conservative approach should be taken with those aged 18 years or younger and the symptom-free rest period should be extended from 24 to 48 hours in this group. The graduated return to sport protocol should be extended such that the child does not return to contact training, sport, or play in less than 14 days.

A concussed child must return to learn and return to school before starting the return to play protocol. Before returning to school, the child's symptoms must not be exacerbated by reading or using a computer. Only after successful return to school without worsening of symptoms may the child be allowed to commence the return to play protocol (Please refer to Attachments J, K).

**No player can return to play without being cleared by a Sport and Exercise Physician or a recognised Netball Australia medical practitioner.**

### **OTHER USEFUL FACTS:**

- The diagnosis of concussion should be based on a clinical history and examination that includes a range of domains including mechanism of injury, symptoms and signs, cognitive functioning, neurology including balance assessment.
- The early onset of a concussion headache is most effectively treated with paracetamol painkillers. Avoid anti-inflammatories, especially within the first 24 to 72 hours, as they have been associated with rebound headaches and bleeding of the brain.
- Limited use of computers, mobile phones and television is recommended when suffering from concussion.
- If suitably managed, the majority of concussive symptoms should resolve in 7–10 days. After a minimum of 24 hours without any symptoms the patient can commence a return to cognitive and physical activity.
- Blood tests are not indicated for uncomplicated concussion. Medical imaging is not indicated unless there is suspicion of more serious head or brain injury.

### **REFERENCE CARDS**

- A: Pocket Recognition Tool
- B: Medical Assessment of Concussion On-field
- C: Non-medical Assessment of Concussion On-field
- D: Medical Assessment of Concussion Off-field
- E: Non-Medical Assessment of Concussion Off-field
- F: SCAT 5
- G: Modified Maddocks Questions
- H: Head Injury Assessment Form
- I: Return to Play Protocol Adult
- J: Return to Play Protocol Child
- K: Return to Learn Plan Child – template

### **Useful Links / Resources**

AIS/AMA position statement on concussion in sport  
<https://concussioninsport.gov.au>

The 4<sup>th</sup> International Conference on Concussion in Sport: Consensus Statement  
<http://bjsm.bmj.com/content/47/5/250.full>

NICE: Head injury assessment & management in children  
<https://www.nice.org.uk/guidance/cg176/chapter/1-recommendations>



Pocket Recognition Tool

<http://bjsm.bmj.com/content/47/5/267.full.pdf>

SCAT5 Adult – Sport Concussion Assessment Tool

<http://bjsm.bmj.com/content/47/5/259.full.pdf>

SCAT5 Child – Sport Concussion Assessment Tool

<http://bjsm.bmj.com/content/47/5/263.full.pdf>

## **Further Information on Concussion**

Concussion, as defined by the Concussion in Sport Group (CISG) international consensus statement,<sup>1</sup> is a complex pathophysiological process affecting the brain, induced by biomechanical forces. It is known to be complex injury and can be challenging to evaluate and manage.

In Australia, common participation sports such as Australian Rules Football, Rugby League and Rugby Union have amongst the highest rates of head injury of any team sports in the world. The reported incidence of concussion in these sports ranges from about 3 to 10 concussive injuries per 1000 player hours,<sup>2-4</sup> which equates to an average of five injuries per team per season, regardless of the level of competition. This represents a significant public health issue in active communities.

Since 2001, international conferences have been held to address key issues in the understanding and management of concussion in sport. After each of these meetings, a consensus statement provides the most up-to-date knowledge on concussion in sport.<sup>1,5-7</sup> The consensus statement outlines the current best practice management guidelines and provides practitioners with simple clinical tools to help manage a concussion.

### **Making a Diagnosis:**

Concussion generally results from a knock, often to the head, face or neck, but may be anywhere on the body that transmits an impulsive force to the head. Diagnosis of concussion can be difficult because clinical symptoms and signs can change rapidly and may evolve over time. Many of the clinical features (especially symptoms) are not specific to concussion, and there is no reliable test or marker for an objective diagnosis.

Diagnosis of concussion relies on clinical assessment of symptoms, (e.g. headache, difficulty concentrating, feeling like being in a fog, emotionally labile), signs (e.g. loss of consciousness, balance disturbance), cognitive impairment (e.g. confusion, slowed reaction times) and neurobehavioural changes (e.g. irritability, feeling 'not quite right'). In some instances, it will be obvious that there has been a significant injury where the athlete loses consciousness, has a seizure, or has significant balance difficulties. However, concussion is often an evolving process. Subtle symptoms and signs often become more apparent and significant in the hours and days following the injury.





Recognising concussion is critical to correctly managing and preventing further injury. The Pocket Concussion recognition Tool, developed by the Concussion in Sport Group, should be used to help those without medical training detect concussion.

When an athlete is suspected of having a concussion, first-aid principles should be used, and a systematic approach to assessment of airway, breathing, circulation, disability and exposure should be used in all situations. Cervical spine injuries should be suspected if there is any loss of consciousness, neck pain, or a mechanism that could lead to spinal injury.

A medical practitioner should make the diagnosis of concussion after a clinical history and examination that includes a range of domains. These include mechanism of injury, symptoms and signs, cognitive functioning, and neurological assessment including balance testing. The Sport Concussion Assessment Tool<sup>8</sup> (SCAT5) is the internationally recommended concussion assessment tool and covers the above-mentioned domains. This should not be used in isolation, but as part of the overall clinical assessment.

Computerised neurocognitive testing can be undertaken as part of the assessment but again, should not be used in isolation. Baseline neurocognitive testing can be useful in the pre-season period for comparison with post-injury scores. Many programs however have reference ranges that can be applied in the absence of a baseline test.

There are currently no serum biomarkers that assist in the diagnosis of concussion. Blood tests are not indicated for uncomplicated concussion. Medical imaging is not indicated in the diagnosis or management of uncomplicated concussion. However imaging is recommended when there is suspicion of more serious head or brain injury.

### **Returning to Play:**

Rest after a concussive injury is important to allow recovery. Physical activity, physiological stress (e.g. altitude and flying), and cognitive loads (e.g. school work, video games, computer) can all worsen symptoms and possibly delay recovery after a concussion.<sup>1</sup> Individuals should be rested from these activities in the early stages after a concussive injury.<sup>1</sup> In addition, the use of alcohol, sedatives or recreational drugs can exacerbate symptoms following head trauma, delay recovery or mask deterioration and should also be avoided.



After a concussive injury, players should be returned to play in a graded fashion. After a minimum of 24 hours without any symptoms the player can commence the staged return to cognitive and physical activity. Progression through the stepped program should occur with 24 hours at each stage. If the player has any recurrence of symptoms while progressing through their return-to-play program that they should drop back to the previous asymptomatic level and try to progress again after a further 24 hours of rest.

The steps in the activity phase are:

- Light aerobic activity
- Basic sport-specific drills which are non-contact and with no head impact
- More complex sport-specific drills without contact, may add resistance training
- Full contact practice following medical review normal competitive sporting activity.

**Modifying Factors:**

A range of clinical factors are known that may be associated with longer duration of symptoms or increased risk of adverse outcomes following a concussion.<sup>9</sup> These are known as modifying factors and are summarised in the table below<sup>1</sup>. The presence of any modifying factor after a concussive injury requires a more conservative approach, including more detailed assessment and slower time to return to sport. In difficult or complicated cases, a multidisciplinary team approach including referral to a neuropsychologist and or doctor with expertise in managing concussion should be considered.

<b>Factors</b>	<b>Modifier</b>
Symptoms	High number, long duration (>10 days), high severity
Signs	Prolonged loss of consciousness (>1minute), amnesia
Sequelae	Prolonged concussion convulsions
Temporal	Frequency: repeated concussions over time Timing: injuries close together in time 'Recency': recent concussion or traumatic brain injury
Threshold	Repeated concussions occurring with



	progressively less impact force or slower recovery after each successive concussion
Age	Child and adolescents <18
Co and pre-morbidities	Migraine, depression or other mental health disorders, ADHD, learning disabilities, sleep disorders
Medication	Psychoactive drugs, anticonvulsants
Behaviour	Dangerous style of play
Sport	High risk activity, contact and collision sport, high level sport

### **Concussion Management in Children and Adolescents:**

Evidence shows that younger athletes take longer to recover after a concussive injury than adults.<sup>10</sup> Children and adolescents seem to be more vulnerable to concussion due to a variety of factors including decreased myelination, poor cervical musculature, and increased head to neck ratio.<sup>11</sup> The role of cerebral blood flow alterations in the pathophysiology of concussion may be more significant in children than in adults. There is also some evidence that components of cognitive function relating to executive functioning may be impaired in adolescents with concussion for up to two months after injury. The implications of this are not clear and further studies are required to confirm or refute this data. Therefore a more conservative approach is recommended in all concussed players under the age of 18 years, regardless of the level of competition in which they play.

Child SCAT5<sup>12</sup> has been developed for use in children aged 5 to 12 years old to accommodate for physical, cognitive and language development. For children aged 13 to 18 years, the SCAT5 should also be used. It should be noted that the Child SCAT5 includes both a child-report and parent-report symptom scale. It is important to include the parent, teacher, coach, or guardian in assessing the child with concussion.

The priority for a concussed child is successful return to learn and return to school before considering return to play. Before returning to school, the child's symptoms must not be exacerbated by reading or using a computer. In most instances, a child will only require absence from school for 1 to 2 days however, longer periods of rest may be needed. The child requires medical clearance before return to school. Parents and teachers need to make plans



to accommodate the child for example shorter school days, regular breaks, and longer time to complete assignments. Only after successful return to school without worsening of symptoms may the child be allowed to commence return to sport.

**References:**

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3. Kemp SP, Hudson Z, Brooks JH, Fuller CW. The epidemiology of head injuries in English professional rugby union. *Clin J Sport Med* 2008;18:227–34.
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9. Makdissi M, Davis G, Jordan B, Patricios J, Purcell L, Putukian M. Revisiting the modifiers: how should the evaluation and management of acute concussions differ in specific groups? *Br J Sports Med* 2013;47:314–20.
10. Davis GA, Purcell LK. The evaluation and management of acute concussion differs in young children. *Br J Sports Med* 2014;48:98–101.
11. <https://concussioninsport.gov.au/medical-practitioner>
12. <http://bism.bmj.com/content/47/5/263.full.pdf>



## APPENDIX A

### Pocket CONCUSSION RECOGNITION TOOL™

To help identify concussion in children, youth and adults



#### RECOGNIZE & REMOVE

Concussion should be suspected **if one or more** of the following visible clues, signs, symptoms or errors in memory questions are present.

##### 1. Visible clues of suspected concussion

Any one or more of the following visual clues can indicate a possible concussion:

- Loss of consciousness or responsiveness
- Lying motionless on ground/Slow to get up
- Unsteady on feet / Balance problems or falling over/Incoordination
- Grabbing/Clutching of head
- Dazed, blank or vacant look
- Confused/Not aware of plays or events

##### 2. Signs and symptoms of suspected concussion

Presence of any one or more of the following signs & symptoms may suggest a concussion:

- Loss of consciousness
- Seizure or convulsion
- Balance problems
- Nausea or vomiting
- Drowsiness
- More emotional
- Irritability
- Sadness
- Fatigue or low energy
- Nervous or anxious
- "Don't feel right"
- Difficulty remembering
- Headache
- Dizziness
- Confusion
- Feeling slowed down
- "Pressure in head"
- Blurred vision
- Sensitivity to light
- Amnesia
- Feeling like "in a fog"
- Neck Pain
- Sensitivity to noise
- Difficulty concentrating

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##### 3. Memory function

Failure to answer any of these questions correctly may suggest a concussion.

- "What venue are we at today?"
- "Which half is it now?"
- "Who scored last in this game?"
- "What team did you play last week / game?"
- "Did your team win the last game?"

**Any athlete with a suspected concussion should be IMMEDIATELY REMOVED FROM PLAY, and should not be returned to activity until they are assessed medically. Athletes with a suspected concussion should not be left alone and should not drive a motor vehicle.**

It is recommended that, in all cases of suspected concussion, the player is referred to a medical professional for diagnosis and guidance as well as return to play decisions even if the symptoms resolve.

##### RED FLAGS

**If ANY of the following are reported then the player should be safely immediately removed from the field. If no qualified medical professional is available, consider transporting by ambulance for urgent medical assessment.**

- Athlete complains of neck pain
- Increasing confusion or irritability
- Repeated vomiting
- Seizure or convulsion
- Weakness or tingling/burning in arms or legs
- Deteriorating consciousness
- Severe or increasing headache
- Unusual behaviour change
- Double vision

##### Remember:

- In all cases, the basic principles of first aid (danger, response, airway, breathing, circulation) should be followed.
- Do not attempt to move the player (other than required for airway support) unless trained to do so.
- Do not remove helmet (if present) unless trained to do so.

from McCrory et al, Consensus Statement on Concussion in Sport, Br J Sports Med 47 (5),

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## Pocket CRT

*Br J Sports Med* 2013 47: 267

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Updated information and services can be found at:  
<http://bjsm.bmj.com/content/47/5/267.citation>

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### Notes

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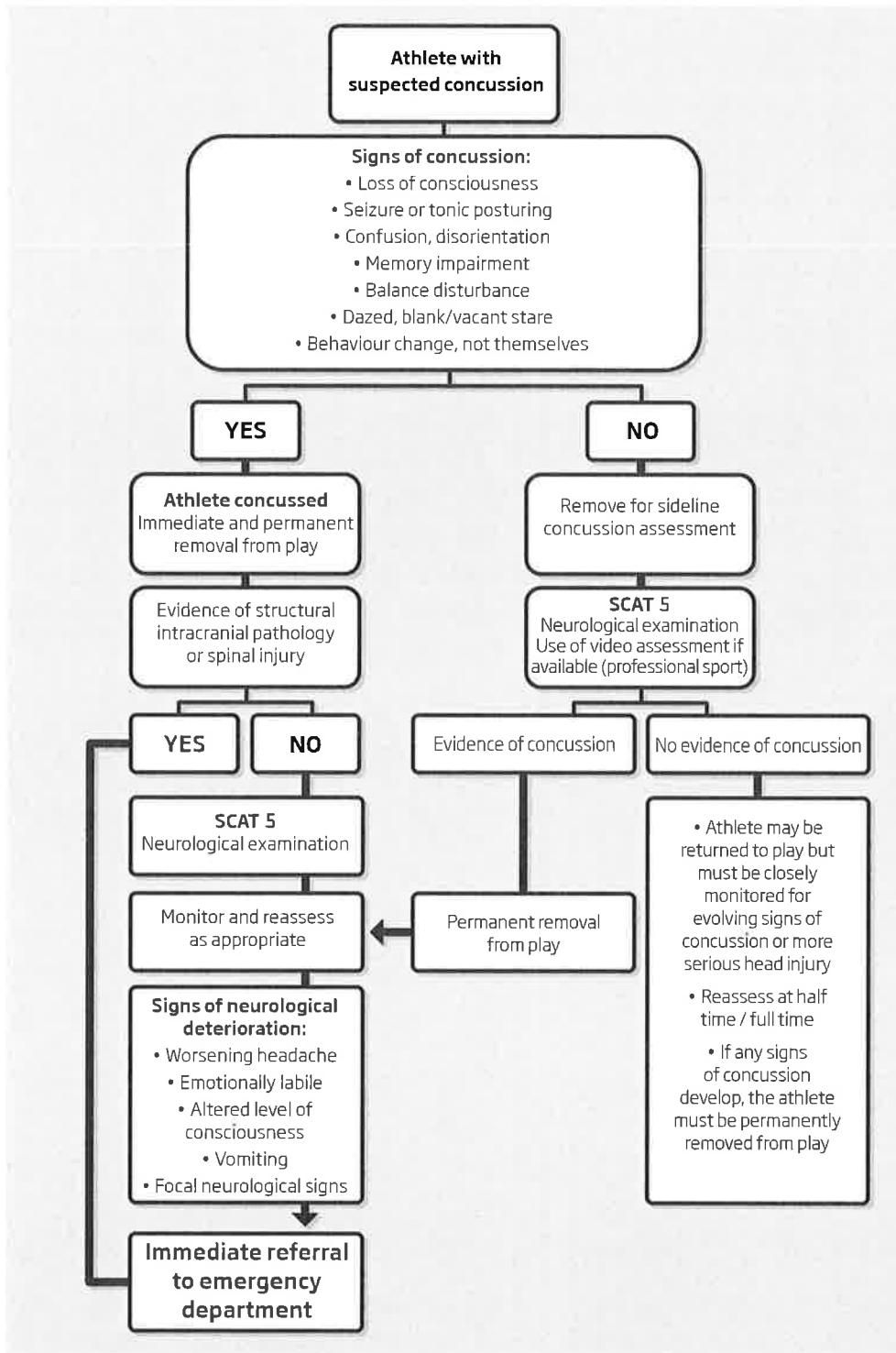
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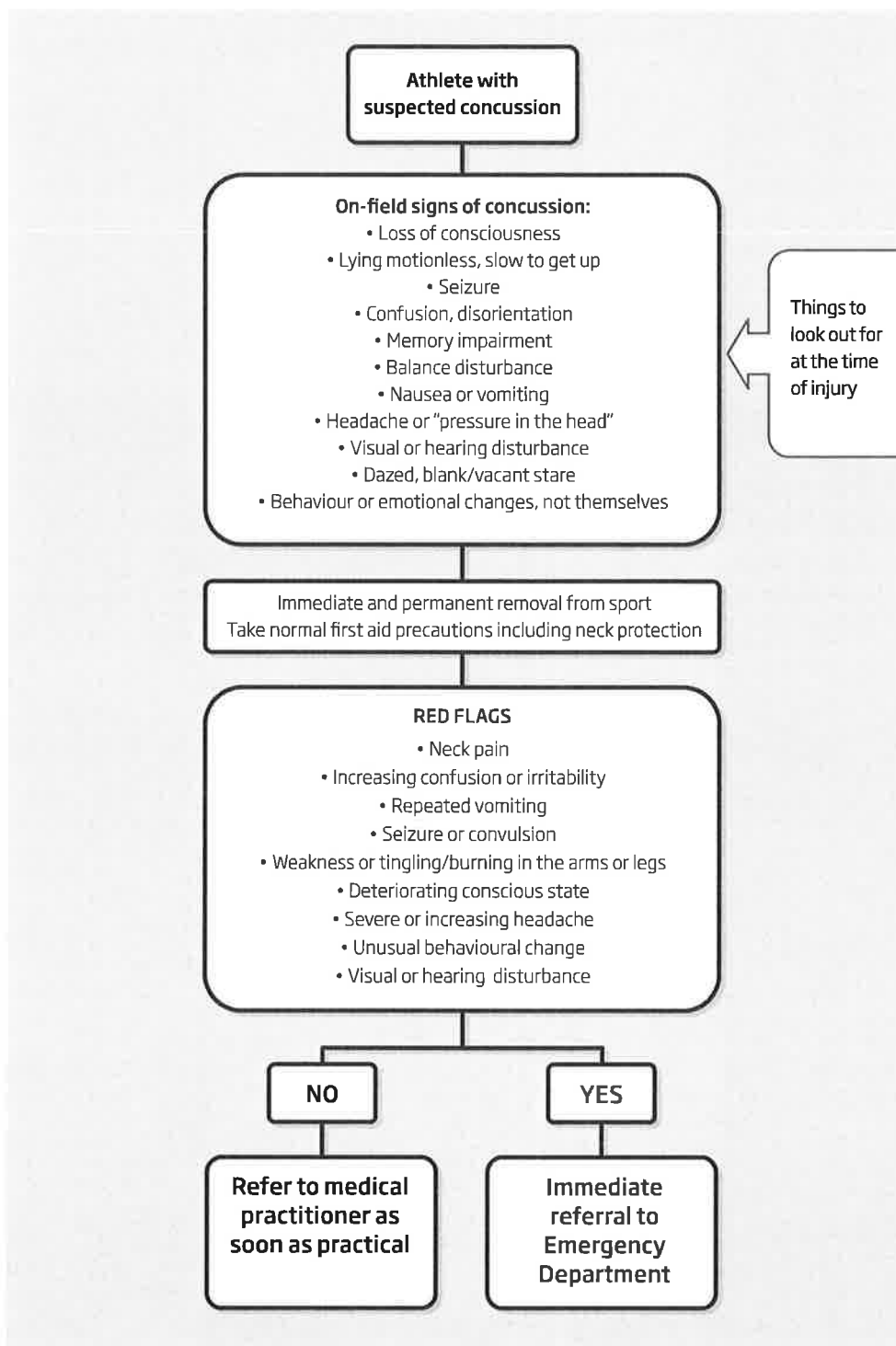


## Medical assessment of concussion - on field





**Diagram 3: Non-medical assessment of concussion - on field**  
(parents, coaches, teachers, team-mates)

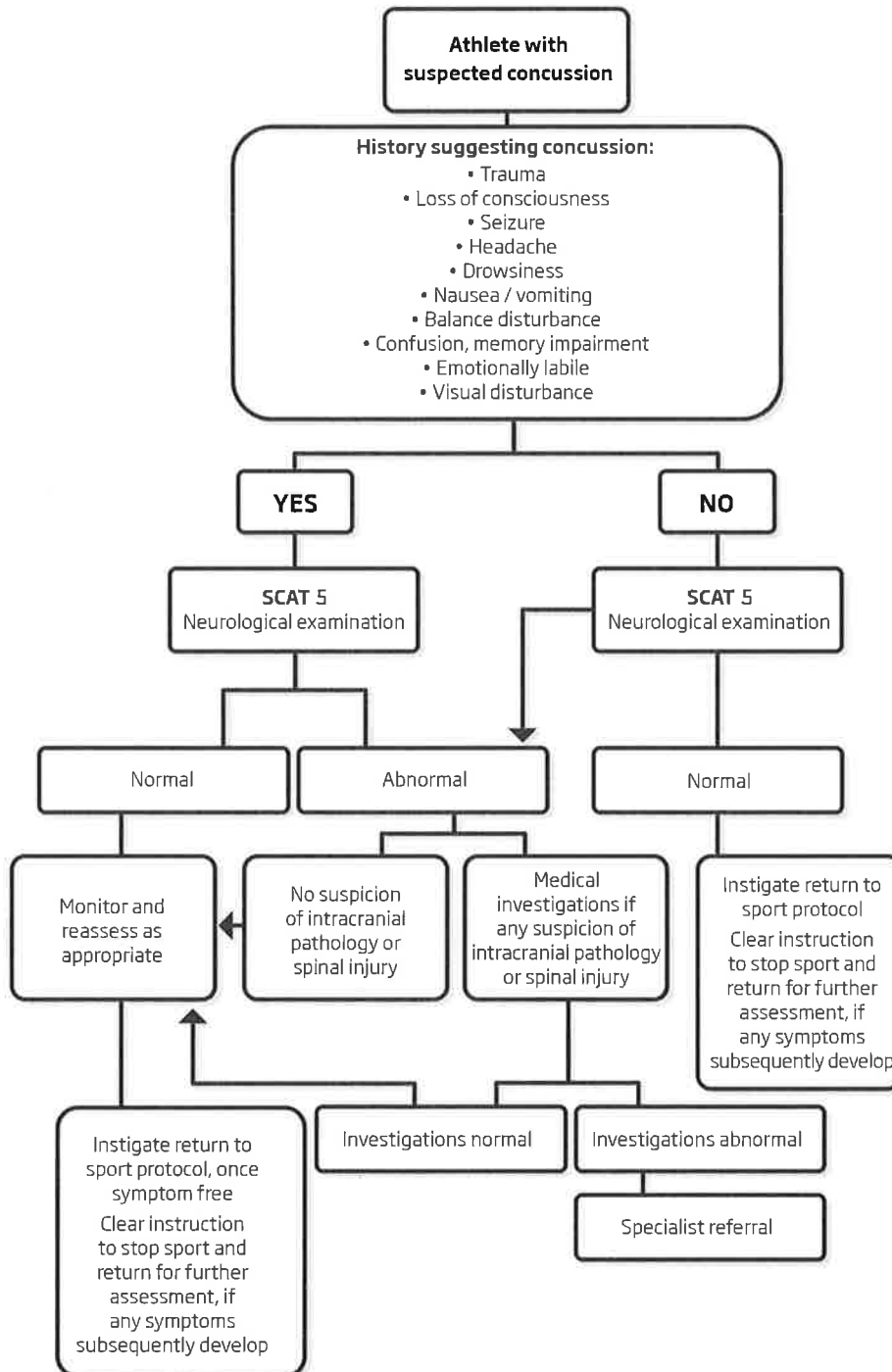






## Medical assessment of concussion - off field

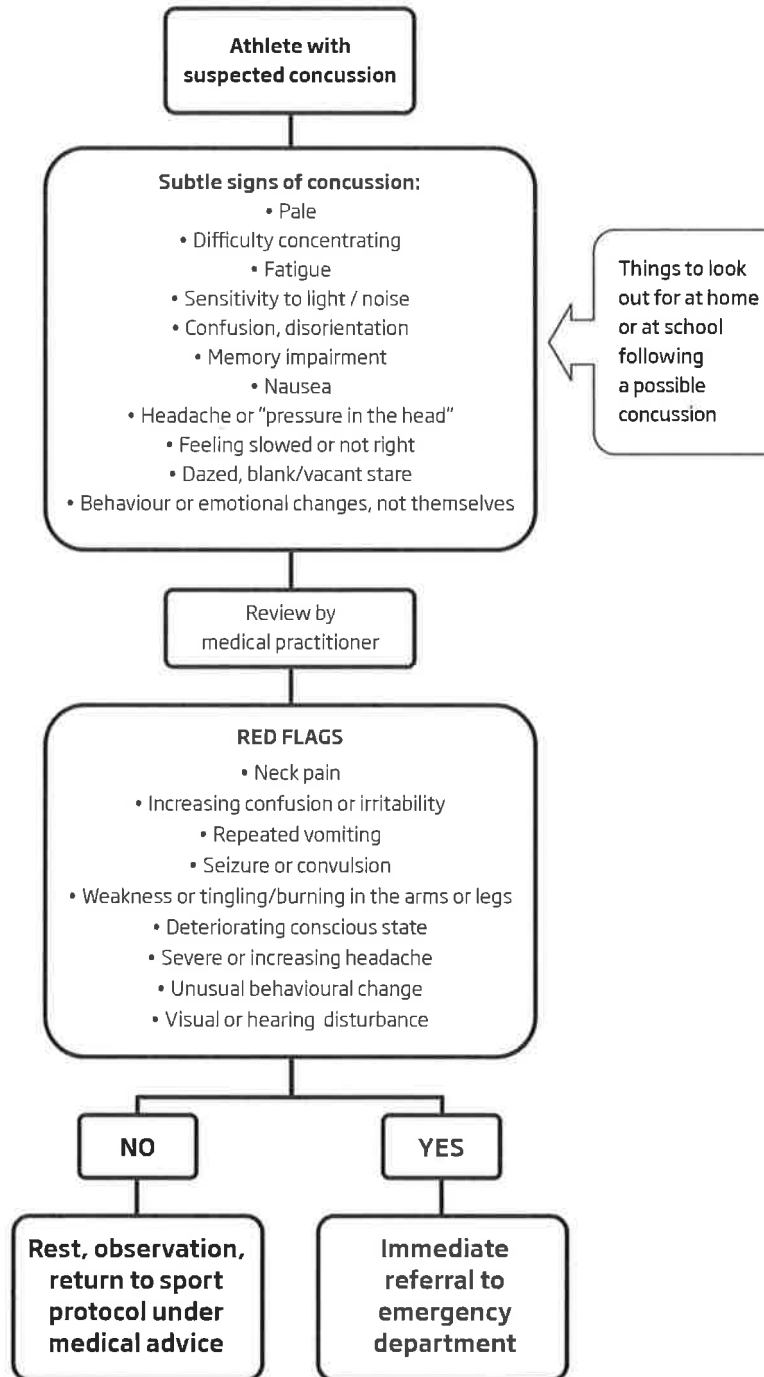
(for emergency departments and medical clinics)





## Non-medical assessment of concussion - off field

(for parents, coaches, teachers, team-mates)



## APPENDIX F

# SCAT5<sup>®</sup>

## SPORT CONCUSSION ASSESSMENT TOOL – 5TH EDITION

DEVELOPED BY THE CONCUSSION IN SPORT GROUP

FOR USE BY MEDICAL PROFESSIONALS ONLY

supported by



FIFA<sup>®</sup>



FEI

### Patient details

Name: \_\_\_\_\_

DOB: \_\_\_\_\_

Address: \_\_\_\_\_

ID number: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Injury: \_\_\_\_\_ Time: \_\_\_\_\_

## WHAT IS THE SCAT5?

**The SCAT5 is a standardized tool for evaluating concussions designed for use by physicians and licensed healthcare professionals<sup>1</sup>. The SCAT5 cannot be performed correctly in less than 10 minutes.**

If you are not a physician or licensed healthcare professional, please use the Concussion Recognition Tool 5 (CRT5). The SCAT5 is to be used for evaluating athletes aged 13 years and older. For children aged 12 years or younger, please use the Child SCAT5.

Preseason SCAT5 baseline testing can be useful for interpreting post-injury test scores, but is not required for that purpose. Detailed instructions for use of the SCAT5 are provided on page 7. Please read through these instructions carefully before testing the athlete. Brief verbal instructions for each test are given in italics. The only equipment required for the tester is a watch or timer.

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## Recognise and Remove

A head impact by either a direct blow or indirect transmission of force can be associated with a serious and potentially fatal brain injury. If there are significant concerns, including any of the red flags listed in Box 1, then activation of emergency procedures and urgent transport to the nearest hospital should be arranged.

## Key points

- Any athlete with suspected concussion should be REMOVED FROM PLAY, medically assessed and monitored for deterioration. No athlete diagnosed with concussion should be returned to play on the day of injury.
- If an athlete is suspected of having a concussion and medical personnel are not immediately available, the athlete should be referred to a medical facility for urgent assessment.
- Athletes with suspected concussion should not drink alcohol, use recreational drugs and should not drive a motor vehicle until cleared to do so by a medical professional.
- Concussion signs and symptoms evolve over time and it is important to consider repeat evaluation in the assessment of concussion.
- The diagnosis of a concussion is a clinical judgment, made by a medical professional. The SCAT5 should NOT be used by itself to make, or exclude, the diagnosis of concussion. An athlete may have a concussion even if their SCAT5 is "normal".

## Remember:

- The basic principles of first aid (danger, response, airway, breathing, circulation) should be followed.
- Do not attempt to move the athlete (other than that required for airway management) unless trained to do so.
- Assessment for a spinal cord injury is a critical part of the initial on-field assessment.
- Do not remove a helmet or any other equipment unless trained to do so safely.

## APPENDIX F

1

### IMMEDIATE OR ON-FIELD ASSESSMENT

The following elements should be assessed for all athletes who are suspected of having a concussion prior to proceeding to the neurocognitive assessment and ideally should be done on-field after the first first aid / emergency care priorities are completed.

If any of the "Red Flags" or observable signs are noted after a direct or indirect blow to the head, the athlete should be immediately and safely removed from participation and evaluated by a physician or licensed healthcare professional.

Consideration of transportation to a medical facility should be at the discretion of the physician or licensed healthcare professional.

The GCS is important as a standard measure for all patients and can be done serially if necessary in the event of deterioration in conscious state. The Maddocks questions and cervical spine exam are critical steps of the immediate assessment; however, these do not need to be done serially.

### STEP 1: RED FLAGS

#### RED FLAGS:

- Neck pain or tenderness
- Double vision
- Weakness or tingling/ burning in arms or legs
- Severe or increasing headache
- Seizure or convulsion
- Loss of consciousness
- Deteriorating conscious state
- Vomiting
- Increasingly restless, agitated or combative

### STEP 2: OBSERVABLE SIGNS

Witnessed  Observed on Video

Lying motionless on the playing surface	Y	N
Balance / gait difficulties / motor incoordination: stumbling, slow / laboured movements	Y	N
Disorientation or confusion, or an inability to respond appropriately to questions	Y	N
Blank or vacant look	Y	N
Facial injury after head trauma	Y	N

### STEP 3: MEMORY ASSESSMENT MADDOCKS QUESTIONS<sup>2</sup>

"I am going to ask you a few questions, please listen carefully and give your best effort. First, tell me what happened?"

\_\_\_\_\_

Mark Y for correct answer / N for incorrect

What venue are we at today?	Y	N
Which half is it now?	Y	N
Who scored last in this match?	Y	N
What team did you play last week / game?	Y	N
Did your team win the last game?	Y	N

Note: Appropriate sport-specific questions may be substituted.

Name: \_\_\_\_\_  
 DOB: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 ID number: \_\_\_\_\_  
 Examiner: \_\_\_\_\_  
 Date: \_\_\_\_\_

### STEP 4: EXAMINATION GLASGOW COMA SCALE (GCS)<sup>3</sup>

Time of assessment			
Date of assessment			
<b>Best eye response (E)</b>			
No eye opening	1	1	1
Eye opening in response to pain	2	2	2
Eye opening to speech	3	3	3
Eyes opening spontaneously	4	4	4
<b>Best verbal response (V)</b>			
No verbal response	1	1	1
Incomprehensible sounds	2	2	2
Inappropriate words	3	3	3
Confused	4	4	4
Oriented	5	5	5
<b>Best motor response (M)</b>			
No motor response	1	1	1
Extension to pain	2	2	2
Abnormal flexion to pain	3	3	3
Flexion / Withdrawal to pain	4	4	4
Localizes to pain	5	5	5
Obeys commands	6	6	6
Glasgow Coma score (E + V + M)			

### CERVICAL SPINE ASSESSMENT

Does the athlete report that their neck is pain free at rest?	Y	N
If there is NO neck pain at rest, does the athlete have a full range of ACTIVE pain free movement?	Y	N
Is the limb strength and sensation normal?	Y	N

**In a patient who is not lucid or fully conscious, a cervical spine injury should be assumed until proven otherwise.**

## APPENDIX F

### OFFICE OR OFF-FIELD ASSESSMENT

**Please note that the neurocognitive assessment should be done in a distraction-free environment with the athlete in a resting state.**

#### STEP 1: ATHLETE BACKGROUND

Sport / team / school: \_\_\_\_\_

Date / time of injury: \_\_\_\_\_

Years of education completed: \_\_\_\_\_

Age: \_\_\_\_\_

Gender: M / F / Other

Dominant hand: left / neither / right

How many diagnosed concussions has the athlete had in the past?: \_\_\_\_\_

When was the most recent concussion?: \_\_\_\_\_

How long was the recovery (time to being cleared to play) from the most recent concussion?: \_\_\_\_\_ (days)

#### Has the athlete ever been:

Hospitalized for a head injury? 

Yes	No
-----	----

Diagnosed / treated for headache disorder or migraines? 

Yes	No
-----	----

Diagnosed with a learning disability / dyslexia? 

Yes	No
-----	----

Diagnosed with ADD / ADHD? 

Yes	No
-----	----

Diagnosed with depression, anxiety or other psychiatric disorder? 

Yes	No
-----	----

Current medications? If yes, please list:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Name: \_\_\_\_\_

DOB: \_\_\_\_\_

Address: \_\_\_\_\_

ID number: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date: \_\_\_\_\_

2

### STEP 2: SYMPTOM EVALUATION

*The athlete should be given the symptom form and asked to read this instruction paragraph out loud then complete the symptom scale. For the baseline assessment, the athlete should rate his/her symptoms based on how he/she typically feels and for the post injury assessment the athlete should rate their symptoms at this point in time.*

Please Check:  Baseline  Post-Injury

Please hand the form to the athlete

	none	mild	moderate	severe			
Headache	0	1	2	3	4	5	6
"Pressure in head"	0	1	2	3	4	5	6
Neck Pain	0	1	2	3	4	5	6
Nausea or vomiting	0	1	2	3	4	5	6
Dizziness	0	1	2	3	4	5	6
Blurred vision	0	1	2	3	4	5	6
Balance problems	0	1	2	3	4	5	6
Sensitivity to light	0	1	2	3	4	5	6
Sensitivity to noise	0	1	2	3	4	5	6
Feeling slowed down	0	1	2	3	4	5	6
Feeling like "in a fog"	0	1	2	3	4	5	6
"Don't feel right"	0	1	2	3	4	5	6
Difficulty concentrating	0	1	2	3	4	5	6
Difficulty remembering	0	1	2	3	4	5	6
Fatigue or low energy	0	1	2	3	4	5	6
Confusion	0	1	2	3	4	5	6
Drowsiness	0	1	2	3	4	5	6
More emotional	0	1	2	3	4	5	6
Irritability	0	1	2	3	4	5	6
Sadness	0	1	2	3	4	5	6
Nervous or Anxious	0	1	2	3	4	5	6
Trouble falling asleep (if applicable)	0	1	2	3	4	5	6

Total number of symptoms: \_\_\_\_\_ of 22

Symptom severity score: \_\_\_\_\_ of 132

Do your symptoms get worse with physical activity? 

Y	N
---	---

Do your symptoms get worse with mental activity? 

Y	N
---	---

If 100% is feeling perfectly normal, what percent of normal do you feel?

If not 100%, why?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Please hand form back to examiner

## APPENDIX F

3

### STEP 3: COGNITIVE SCREENING

#### Standardised Assessment of Concussion (SAC)<sup>4</sup>

#### ORIENTATION

What month is it?	0	1
What is the date today?	0	1
What is the day of the week?	0	1
What year is it?	0	1
What time is it right now? (within 1 hour)	0	1
<b>Orientation score</b>	<b>of 5</b>	

#### IMMEDIATE MEMORY

The Immediate Memory component can be completed using the traditional 5-word per trial list or optionally using 10-words per trial to minimise any ceiling effect. All 3 trials must be administered irrespective of the number correct on the first trial. Administer at the rate of one word per second.

Please choose EITHER the 5 or 10 word list groups and circle the specific word list chosen for this test.

I am going to test your memory. I will read you a list of words and when I am done, repeat back as many words as you can remember, in any order. For Trials 2 & 3; I am going to repeat the same list again. Repeat back as many words as you can remember in any order, even if you said the word before.

List	Alternate 5 word lists					Score (of 5)		
	Trial 1	Trial 2	Trial 3					
A	Finger	Penny	Blanket	Lemon	Insect			
B	Candle	Paper	Sugar	Sandwich	Wagon			
C	Baby	Monkey	Perfume	Sunset	Iron			
D	Elbow	Apple	Carpet	Saddle	Bubble			
E	Jacket	Arrow	Pepper	Cotton	Movie			
F	Dollar	Honey	Mirror	Saddle	Anchor			
<b>Immediate Memory Score</b>						<b>of 15</b>		
<b>Time that last trial was completed</b>								

List	Alternate 10 word lists					Score (of 10)		
	Trial 1	Trial 2	Trial 3					
G	Finger	Penny	Blanket	Lemon	Insect			
	Candle	Paper	Sugar	Sandwich	Wagon			
H	Baby	Monkey	Perfume	Sunset	Iron			
	Elbow	Apple	Carpet	Saddle	Bubble			
I	Jacket	Arrow	Pepper	Cotton	Movie			
	Dollar	Honey	Mirror	Saddle	Anchor			
<b>Immediate Memory Score</b>						<b>of 30</b>		
<b>Time that last trial was completed</b>								

Name: \_\_\_\_\_  
 DOB: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 ID number: \_\_\_\_\_  
 Examiner: \_\_\_\_\_  
 Date: \_\_\_\_\_

#### CONCENTRATION

#### DIGITS BACKWARDS

Please circle the Digit list chosen (A, B, C, D, E, F). Administer at the rate of one digit per second reading DOWN the selected column.

I am going to read a string of numbers and when I am done, you repeat them back to me in reverse order of how I read them to you. For example, if I say 7-1-9, you would say 9-1-7.

Concentration Number Lists (circle one)								
List A	List B	List C						
4-9-3	5-2-6	1-4-2	Y	N	0			
6-2-9	4-1-5	6-5-8	Y	N	1			
3-8-1-4	1-7-9-5	6-8-3-1	Y	N	0			
3-2-7-9	4-9-6-8	3-4-8-1	Y	N	1			
6-2-9-7-1	4-8-5-2-7	4-9-1-5-3	Y	N	0			
1-5-2-8-6	6-1-8-4-3	6-8-2-5-1	Y	N	1			
7-1-8-4-6-2	8-3-1-9-6-4	3-7-6-5-1-9	Y	N	0			
5-3-9-1-4-8	7-2-4-8-5-6	9-2-6-5-1-4	Y	N	1			
List D	List E	List F						
7-8-2	3-8-2	2-7-1	Y	N	0			
9-2-6	5-1-8	4-7-9	Y	N	1			
4-1-8-3	2-7-9-3	1-6-8-3	Y	N	0			
9-7-2-3	2-1-6-9	3-9-2-4	Y	N	1			
1-7-9-2-6	4-1-8-6-9	2-4-7-5-8	Y	N	0			
4-1-7-5-2	9-4-1-7-5	8-3-9-6-4	Y	N	1			
2-6-4-8-1-7	6-9-7-3-8-2	5-8-6-2-4-9	Y	N	0			
8-4-1-9-3-5	4-2-7-9-3-8	3-1-7-8-2-6	Y	N	1			
<b>Digits Score:</b>						<b>of 4</b>		

#### MONTHS IN REVERSE ORDER

Now tell me the months of the year in reverse order. Start with the last month and go backward. So you'll say December, November. Go ahead.

Dec - Nov - Oct - Sept - Aug - Jul - Jun - May - Apr - Mar - Feb - Jan

0 1

**Months Score** of 1

**Concentration Total Score (Digits + Months)** of 5

## APPENDIX F

4

### STEP 4: NEUROLOGICAL SCREEN

See the instruction sheet (page 7) for details of test administration and scoring of the tests.

Can the patient read aloud (e.g. symptom check-list) and follow instructions without difficulty?	Y	N
Does the patient have a full range of pain-free PASSIVE cervical spine movement?	Y	N
Without moving their head or neck, can the patient look side-to-side and up-and-down without double vision?	Y	N
Can the patient perform the finger nose coordination test normally?	Y	N
Can the patient perform tandem gait normally?	Y	N

### BALANCE EXAMINATION

#### Modified Balance Error Scoring System (mBESS) testing<sup>5</sup>

Which foot was tested (i.e. which is the non-dominant foot)  Left  Right

Testing surface (hard floor, field, etc.) \_\_\_\_\_

Footwear (shoes, barefoot, braces, tape, etc.) \_\_\_\_\_

Condition	Errors
Double leg stance	_____ of 10
Single leg stance (non-dominant foot)	_____ of 10
Tandem stance (non-dominant foot at the back)	_____ of 10
<b>Total Errors</b>	_____ of 30

Name: \_\_\_\_\_

DOB: \_\_\_\_\_

Address: \_\_\_\_\_

ID number: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date: \_\_\_\_\_

5

### STEP 5: DELAYED RECALL:

The delayed recall should be performed after 5 minutes have elapsed since the end of the Immediate Recall section. Score 1 pt. for each correct response.

*Do you remember that list of words I read a few times earlier? Tell me as many words from the list as you can remember in any order.*

Time Started \_\_\_\_\_

Please record each word correctly recalled. Total score equals number of words recalled.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Total number of words recalled accurately: \_\_\_\_\_ of 5 or \_\_\_\_\_ of 10

6

### STEP 6: DECISION

Domain	Date & time of assessment:		
Symptom number (of 22)			
Symptom severity score (of 132)			
Orientation (of 5)			
Immediate memory	of 15 of 30	of 15 of 30	of 15 of 30
Concentration (of 5)			
Neuro exam	Normal Abnormal	Normal Abnormal	Normal Abnormal
Balance errors (of 30)			
Delayed Recall	of 5 of 10	of 5 of 10	of 5 of 10

Date and time of injury: \_\_\_\_\_

If the athlete is known to you prior to their injury, are they different from their usual self?

Yes  No  Unsure  Not Applicable

(If different, describe why in the clinical notes section)

Concussion Diagnosed?

Yes  No  Unsure  Not Applicable

If re-testing, has the athlete improved?

Yes  No  Unsure  Not Applicable

**I am a physician or licensed healthcare professional and I have personally administered or supervised the administration of this SCAT5.**

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Registration number (if applicable): \_\_\_\_\_

Date: \_\_\_\_\_

**SCORING ON THE SCAT5 SHOULD NOT BE USED AS A STAND-ALONE METHOD TO DIAGNOSE CONCUSSION, MEASURE RECOVERY OR MAKE DECISIONS ABOUT AN ATHLETE'S READINESS TO RETURN TO COMPETITION AFTER CONCUSSION.**

## APPENDIX F

### CLINICAL NOTES:

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Name: \_\_\_\_\_  
DOB: \_\_\_\_\_  
Address: \_\_\_\_\_  
ID number: \_\_\_\_\_  
Examiner: \_\_\_\_\_  
Date: \_\_\_\_\_



### CONCUSSION INJURY ADVICE

**(To be given to the person monitoring the concussed athlete)**

This patient has received an injury to the head. A careful medical examination has been carried out and no sign of any serious complications has been found. Recovery time is variable across individuals and the patient will need monitoring for a further period by a responsible adult. Your treating physician will provide guidance as to this timeframe.

**If you notice any change in behaviour, vomiting, worsening headache, double vision or excessive drowsiness, please telephone your doctor or the nearest hospital emergency department immediately.**

Other important points:

**Initial rest: Limit physical activity to routine daily activities (avoid exercise, training, sports) and limit activities such as school, work, and screen time to a level that does not worsen symptoms.**

- 1) Avoid alcohol
- 2) Avoid prescription or non-prescription drugs without medical supervision. Specifically:
  - a) Avoid sleeping tablets
  - b) Do not use aspirin, anti-inflammatory medication or stronger pain medications such as narcotics
- 3) Do not drive until cleared by a healthcare professional.
- 4) Return to play/sport requires clearance by a healthcare professional.

Clinic phone number: \_\_\_\_\_  
Patient's name: \_\_\_\_\_  
Date / time of injury: \_\_\_\_\_  
Date / time of medical review: \_\_\_\_\_  
Healthcare Provider: \_\_\_\_\_

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Contact details or stamp



## APPENDIX F

### INSTRUCTIONS

Words in *Italics* throughout the SCAT5 are the instructions given to the athlete by the clinician

#### Symptom Scale

The time frame for symptoms should be based on the type of test being administered. At baseline it is advantageous to assess how an athlete "typically" feels whereas during the acute/post-acute stage it is best to ask how the athlete feels at the time of testing.

The symptom scale should be completed by the athlete, not by the examiner. In situations where the symptom scale is being completed after exercise, it should be done in a resting state, generally by approximating his/her resting heart rate.

For total number of symptoms, maximum possible is 22 except immediately post injury, if sleep item is omitted, which then creates a maximum of 21.

For Symptom severity score, add all scores in table, maximum possible is 22 x 6 = 132, except immediately post injury if sleep item is omitted, which then creates a maximum of 21x6=126.

#### Immediate Memory

The Immediate Memory component can be completed using the traditional 5-word per trial list or, optionally, using 10-words per trial. The literature suggests that the Immediate Memory has a notable ceiling effect when a 5-word list is used. In settings where this ceiling is prominent, the examiner may wish to make the task more difficult by incorporating two 5-word groups for a total of 10 words per trial. In this case, the maximum score per trial is 10 with a total trial maximum of 30.

Choose one of the word lists (either 5 or 10). Then perform 3 trials of immediate memory using this list.

Complete all 3 trials regardless of score on previous trials.

*"I am going to test your memory. I will read you a list of words and when I am done, repeat back as many words as you can remember, in any order."* The words must be read at a rate of one word per second.

Trials 2 & 3 MUST be completed regardless of score on trial 1 & 2.

Trials 2 & 3:

*"I am going to repeat the same list again. Repeat back as many words as you can remember in any order, even if you said the word before."*

Score 1 pt. for each correct response. Total score equals sum across all 3 trials. Do NOT inform the athlete that delayed recall will be tested.

#### Concentration

##### Digits backward

Choose one column of digits from lists A, B, C, D, E or F and administer those digits as follows:

Say: *"I am going to read a string of numbers and when I am done, you repeat them back to me in reverse order of how I read them to you. For example, if I say 7-1-9, you would say 9-1-7."*

Begin with first 3 digit string.

If correct, circle "Y" for correct and go to next string length. If incorrect, circle "N" for the first string length and read trial 2 in the same string length. One point possible for each string length. Stop after incorrect on both trials (2 N's) in a string length. The digits should be read at the rate of one per second.

##### Months in reverse order

*"Now tell me the months of the year in reverse order. Start with the last month and go backward. So you'll say December, November ..., Go ahead"*

1 pt. for entire sequence correct

##### Delayed Recall

The delayed recall should be performed after 5 minutes have elapsed since the end of the Immediate Recall section.

*"Do you remember that list of words I read a few times earlier? Tell me as many words from the list as you can remember in any order."*

Score 1 pt. for each correct response

##### Modified Balance Error Scoring System (mBESS)<sup>5</sup> testing

This balance testing is based on a modified version of the Balance Error Scoring System (BESS)<sup>5</sup>. A timing device is required for this testing.

Each of 20-second trial/stance is scored by counting the number of errors. The examiner will begin counting errors only after the athlete has assumed the proper start position. The modified BESS is calculated by adding one error point for each error during the three 20-second tests. The maximum number of errors for any single condition is 10. If the athlete commits multiple errors simultaneously, only

one error is recorded but the athlete should quickly return to the testing position, and counting should resume once the athlete is set. Athletes that are unable to maintain the testing procedure for a minimum of five seconds at the start are assigned the highest possible score, ten, for that testing condition.

OPTION: For further assessment, the same 3 stances can be performed on a surface of medium density foam (e.g., approximately 50cm x 40cm x 6cm).

##### Balance testing – types of errors

- |                                 |   |   |
|---------------------------------|---|---|
| 1. Hands lifted off iliac crest | 3. Step, stumble, or fall                 | 5. Lifting forefoot or heel               |
| 2. Opening eyes                 | 4. Moving hip into > 30 degrees abduction | 6. Remaining out of test position > 5 sec |

*"I am now going to test your balance. Please take your shoes off (if applicable), roll up your pant legs above ankle (if applicable), and remove any ankle taping (if applicable). This test will consist of three twenty second tests with different stances."*

(a) Double leg stance:

*"The first stance is standing with your feet together with your hands on your hips and with your eyes closed. You should try to maintain stability in that position for 20 seconds. I will be counting the number of times you move out of this position. I will start timing when you are set and have closed your eyes."*

(b) Single leg stance:

*"If you were to kick a ball, which foot would you use? [This will be the dominant foot] Now stand on your non-dominant foot. The dominant leg should be held in approximately 30 degrees of hip flexion and 45 degrees of knee flexion. Again, you should try to maintain stability for 20 seconds with your hands on your hips and your eyes closed. I will be counting the number of times you move out of this position. If you stumble out of this position, open your eyes and return to the start position and continue balancing. I will start timing when you are set and have closed your eyes."*

(c) Tandem stance:

*"Now stand heel-to-toe with your non-dominant foot in back. Your weight should be evenly distributed across both feet. Again, you should try to maintain stability for 20 seconds with your hands on your hips and your eyes closed. I will be counting the number of times you move out of this position. If you stumble out of this position, open your eyes and return to the start position and continue balancing. I will start timing when you are set and have closed your eyes."*

##### Tandem Gait

Participants are instructed to stand with their feet together behind a starting line (the test is best done with footwear removed). Then, they walk in a forward direction as quickly and as accurately as possible along a 38mm wide (sports tape), 3 metre line with an alternate foot heel-to-toe gait ensuring that they approximate their heel and toe on each step. Once they cross the end of the 3m line, they turn 180 degrees and return to the starting point using the same gait. Athletes fail the test if they step off the line, have a separation between their heel and toe, or if they touch or grab the examiner or an object.

##### Finger to Nose

*"I am going to test your coordination now. Please sit comfortably on the chair with your eyes open and your arm (either right or left) outstretched (shoulder flexed to 90 degrees and elbow and fingers extended), pointing in front of you. When I give a start signal, I would like you to perform five successive finger to nose repetitions using your index finger to touch the tip of the nose, and then return to the starting position, as quickly and as accurately as possible."*

##### References

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4. McCreary M. Standardized mental status testing of acute concussion. Clinical Journal of Sport Medicine. 2001; 11: 176-181
5. Guskiewicz KM. Assessment of postural stability following sport-related concussion. Current Sports Medicine Reports. 2003; 2: 24-30

## APPENDIX F

### CONCUSSION INFORMATION

Any athlete suspected of having a concussion should be removed from play and seek medical evaluation.

#### Signs to watch for

Problems could arise over the first 24-48 hours. The athlete should not be left alone and must go to a hospital at once if they experience:

- Worsening headache
- Drowsiness or inability to be awakened
- Inability to recognize people or places
- Repeated vomiting
- Unusual behaviour or confusion or irritable
- Seizures (arms and legs jerk uncontrollably)
- Weakness or numbness in arms or legs
- Unsteadiness on their feet.
- Slurred speech

Consult your physician or licensed healthcare professional after a suspected concussion. Remember, it is better to be safe.

#### Rest & Rehabilitation

After a concussion, the athlete should have physical rest and relative cognitive rest for a few days to allow their symptoms to improve. In most cases, after no more than a few days of rest, the athlete should gradually increase their daily activity level as long as their symptoms do not worsen. Once the athlete is able to complete their usual daily activities without concussion-related symptoms, the second step of the return to play/sport progression can be started. The athlete should not return to play/sport until their concussion-related symptoms have resolved and the athlete has successfully returned to full school/learning activities.

When returning to play/sport, the athlete should follow a stepwise, medically managed exercise progression, with increasing amounts of exercise. For example:

#### Graduated Return to Sport Strategy

Exercise step	Functional exercise at each step	Goal of each step
1. Symptom-limited activity	Daily activities that do not provoke symptoms.	Gradual reintroduction of work/school activities.
2. Light aerobic exercise	Walking or stationary cycling at slow to medium pace. No resistance training.	Increase heart rate.
3. Sport-specific exercise	Running or skating drills. No head impact activities.	Add movement.
4. Non-contact training drills	Harder training drills, e.g., passing drills. May start progressive resistance training.	Exercise, coordination, and increased thinking.
5. Full contact practice	Following medical clearance, participate in normal training activities.	Restore confidence and assess functional skills by coaching staff.
6. Return to play/sport	Normal game play.	

In this example, it would be typical to have 24 hours (or longer) for each step of the progression. If any symptoms worsen while exercising, the athlete should go back to the previous step. Resistance training should be added only in the later stages (Stage 3 or 4 at the earliest).

Written clearance should be provided by a healthcare professional before return to play/sport as directed by local laws and regulations.

#### Graduated Return to School Strategy

Concussion may affect the ability to learn at school. The athlete may need to miss a few days of school after a concussion. When going back to school, some athletes may need to go back gradually and may need to have some changes made to their schedule so that concussion symptoms do not get worse. If a particular activity makes symptoms worse, then the athlete should stop that activity and rest until symptoms get better. To make sure that the athlete can get back to school without problems, it is important that the healthcare provider, parents, caregivers and teachers talk to each other so that everyone knows what the plan is for the athlete to go back to school.

**Note: If mental activity does not cause any symptoms, the athlete may be able to skip step 2 and return to school part-time before doing school activities at home first.**

Mental Activity	Activity at each step	Goal of each step
1. Daily activities that do not give the athlete symptoms	Typical activities that the athlete does during the day as long as they do not increase symptoms (e.g. reading, texting, screen time). Start with 5-15 minutes at a time and gradually build up.	Gradual return to typical activities.
2. School activities	Homework, reading or other cognitive activities outside of the classroom.	Increase tolerance to cognitive work.
3. Return to school part-time	Gradual introduction of school-work. May need to start with a partial school day or with increased breaks during the day.	Increase academic activities.
4. Return to school full-time	Gradually progress school activities until a full day can be tolerated.	Return to full academic activities and catch up on missed work.

If the athlete continues to have symptoms with mental activity, some other accommodations that can help with return to school may include:

- Starting school later, only going for half days, or going only to certain classes
- More time to finish assignments/tests
- Quiet room to finish assignments/tests
- Not going to noisy areas like the cafeteria, assembly halls, sporting events, music class, shop class, etc.
- Taking lots of breaks during class, homework, tests
- No more than one exam/day
- Shorter assignments
- Repetition/memory cues
- Use of a student helper/tutor
- Reassurance from teachers that the child will be supported while getting better

**The athlete should not go back to sports until they are back to school/learning, without symptoms getting significantly worse and no longer needing any changes to their schedule.**

APPENDIX F



**Sport concussion assessment tool - 5th edition**

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Updated information and services can be found at:  
<http://bjsm.bmj.com/content/51/11/851.citation>

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## APPENDIX F

# Child SCAT5<sup>®</sup>

## SPORT CONCUSSION ASSESSMENT TOOL

FOR CHILDREN AGES 5 TO 12 YEARS

FOR USE BY MEDICAL PROFESSIONALS ONLY

supported by



FIFA<sup>®</sup>



FEI

### Patient details

Name: \_\_\_\_\_

DOB: \_\_\_\_\_

Address: \_\_\_\_\_

ID number: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date of Injury: \_\_\_\_\_ Time: \_\_\_\_\_

## WHAT IS THE CHILD SCAT5?

**The Child SCAT5 is a standardized tool for evaluating concussions designed for use by physicians and licensed healthcare professionals<sup>1</sup>.**

If you are not a physician or licensed healthcare professional, please use the Concussion Recognition Tool 5 (CRT5). The Child SCAT5 is to be used for evaluating Children aged 5 to 12 years. For athletes aged 13 years and older, please use the SCAT5.

Preseason Child SCAT5 baseline testing can be useful for interpreting post-injury test scores, but not required for that purpose. Detailed instructions for use of the Child SCAT5 are provided on page 7. Please read through these instructions carefully before testing the athlete. Brief verbal instructions for each test are given in italics. The only equipment required for the tester is a watch or timer.

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## Recognise and Remove

A head impact by either a direct blow or indirect transmission of force can be associated with a serious and potentially fatal brain injury. If there are significant concerns, including any of the red flags listed in Box 1, then activation of emergency procedures and urgent transport to the nearest hospital should be arranged.

## Key points

- Any athlete with suspected concussion should be REMOVED FROM PLAY, medically assessed and monitored for deterioration. No athlete diagnosed with concussion should be returned to play on the day of injury.
- If the child is suspected of having a concussion and medical personnel are not immediately available, the child should be referred to a medical facility for urgent assessment.
- Concussion signs and symptoms evolve over time and it is important to consider repeat evaluation in the assessment of concussion.
- The diagnosis of a concussion is a clinical judgment, made by a medical professional. The Child SCAT5 should NOT be used by itself to make, or exclude, the diagnosis of concussion. An athlete may have a concussion even if their Child SCAT5 is "normal".

## Remember:

- The basic principles of first aid (danger, response, airway, breathing, circulation) should be followed.
- Do not attempt to move the athlete (other than that required for airway management) unless trained to do so.
- Assessment for a spinal cord injury is a critical part of the initial on-field assessment.
- Do not remove a helmet or any other equipment unless trained to do so safely.

## APPENDIX F

1

### IMMEDIATE OR ON-FIELD ASSESSMENT

The following elements should be assessed for all athletes who are suspected of having a concussion prior to proceeding to the neurocognitive assessment and ideally should be done on-field after the first first aid / emergency care priorities are completed.

If any of the "Red Flags" or observable signs are noted after a direct or indirect blow to the head, the athlete should be immediately and safely removed from participation and evaluated by a physician or licensed healthcare professional.

Consideration of transportation to a medical facility should be at the discretion of the physician or licensed healthcare professional.

The GCS is important as a standard measure for all patients and can be done serially if necessary in the event of deterioration in conscious state. The cervical spine exam is a critical step of the immediate assessment, however, it does not need to be done serially.

#### STEP 1: RED FLAGS

##### RED FLAGS:

- Neck pain or tenderness
- Double vision
- Weakness or tingling/burning in arms or legs
- Severe or increasing headache
- Seizure or convulsion
- Loss of consciousness
- Deteriorating conscious state
- Vomiting
- Increasingly restless, agitated or combative

#### STEP 2: OBSERVABLE SIGNS

Witnessed  Observed on Video

Lying motionless on the playing surface	Y	N
Balance / gait difficulties / motor incoordination: stumbling, slow / laboured movements	Y	N
Disorientation or confusion, or an inability to respond appropriately to questions	Y	N
Blank or vacant look	Y	N
Facial Injury after head trauma	Y	N

#### STEP 3: EXAMINATION

##### GLASGOW COMA SCALE (GCS)<sup>2</sup>

Time of assessment			
Date of assessment			
<b>Best eye response (E)</b>			
No eye opening	1	1	1
Eye opening in response to pain	2	2	2
Eye opening to speech	3	3	3
Eyes opening spontaneously	4	4	4
<b>Best verbal response (V)</b>			
No verbal response	1	1	1

Name: \_\_\_\_\_  
 DOB: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 ID number: \_\_\_\_\_  
 Examiner: \_\_\_\_\_  
 Date: \_\_\_\_\_

Incomprehensible sounds	2	2	2
Inappropriate words	3	3	3
Confused	4	4	4
Oriented	5	5	5
<b>Best motor response (M)</b>			
No motor response	1	1	1
Extension to pain	2	2	2
Abnormal flexion to pain	3	3	3
Flexion / Withdrawal to pain	4	4	4
Localizes to pain	5	5	5
Obeys commands	6	6	6
<b>Glasgow Coma score (E + V + M)</b>			

#### CERVICAL SPINE ASSESSMENT

Does the athlete report that their neck is pain free at rest?	Y	N
If there is <b>NO</b> neck pain at rest, does the athlete have a full range of ACTIVE pain free movement?	Y	N
Is the limb strength and sensation normal?	Y	N

**In a patient who is not lucid or fully conscious, a cervical spine injury should be assumed until proven otherwise.**

#### OFFICE OR OFF-FIELD ASSESSMENT STEP 1: ATHLETE BACKGROUND

Please note that the neurocognitive assessment should be done in a distraction-free environment with the athlete in a resting state.

Sport / team / school: \_\_\_\_\_  
 Date / time of Injury: \_\_\_\_\_  
 Years of education completed: \_\_\_\_\_  
 Age: \_\_\_\_\_  
 Gender: M / F / Other \_\_\_\_\_  
 Dominant hand: left / neither / right \_\_\_\_\_  
 How many diagnosed concussions has the athlete had in the past?: \_\_\_\_\_  
 When was the most recent concussion?: \_\_\_\_\_  
 How long was the recovery (time to being cleared to play) from the most recent concussion?: \_\_\_\_\_ (days)  
**Has the athlete ever been:**

Hospitalized for a head injury?	Yes	No
Diagnosed / treated for headache disorder or migraines?	Yes	No
Diagnosed with a learning disability / dyslexia?	Yes	No
Diagnosed with ADD / ADHD?	Yes	No
Diagnosed with depression, anxiety or other psychiatric disorder?	Yes	No

Current medications? If yes, please list: \_\_\_\_\_

## APPENDIX F

### STEP 2: SYMPTOM EVALUATION

The athlete should be given the symptom form and asked to read this instruction paragraph out loud then complete the symptom scale. For the baseline assessment, the athlete should rate his/her symptoms based on how he/she typically feels and for the post injury assessment the athlete should rate their symptoms at this point in time.

To be done in a resting state

Please Check:  Baseline  Post-Injury

2

#### Child Report<sup>3</sup>

	Not at all/ Never	A little/ Rarely	Somewhat/ Sometimes	A lot/ Often
I have headaches	0	1	2	3
I feel dizzy	0	1	2	3
I feel like the room is spinning	0	1	2	3
I feel like I'm going to faint	0	1	2	3
Things are blurry when I look at them	0	1	2	3
I see double	0	1	2	3
I feel sick to my stomach	0	1	2	3
My neck hurts	0	1	2	3
I get tired a lot	0	1	2	3
I get tired easily	0	1	2	3
I have trouble paying attention	0	1	2	3
I get distracted easily	0	1	2	3
I have a hard time concentrating	0	1	2	3
I have problems remembering what people tell me	0	1	2	3
I have problems following directions	0	1	2	3
I daydream too much	0	1	2	3
I get confused	0	1	2	3
I forget things	0	1	2	3
I have problems finishing things	0	1	2	3
I have trouble figuring things out	0	1	2	3
It's hard for me to learn new things	0	1	2	3
Total number of symptoms:				of 21
Symptom severity score:				of 63
Do the symptoms get worse with physical activity?			Y	N
Do the symptoms get worse with trying to think?			Y	N

#### Overall rating for child to answer:

	Very bad	Very good
On a scale of 0 to 10 (where 10 is normal), how do you feel now?	0 1 2 3 4 5 6 7 8 9 10	

If not 10, in what way do you feel different?

Name: \_\_\_\_\_

DOB: \_\_\_\_\_

Address: \_\_\_\_\_

ID number: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date: \_\_\_\_\_

#### Parent Report

##### The child:

	Not at all/ Never	A little/ Rarely	Somewhat/ Sometimes	A lot/ Often
has headaches	0	1	2	3
feels dizzy	0	1	2	3
has a feeling that the room is spinning	0	1	2	3
feels faint	0	1	2	3
has blurred vision	0	1	2	3
has double vision	0	1	2	3
experiences nausea	0	1	2	3
has a sore neck	0	1	2	3
gets tired a lot	0	1	2	3
gets tired easily	0	1	2	3
has trouble sustaining attention	0	1	2	3
is easily distracted	0	1	2	3
has difficulty concentrating	0	1	2	3
has problems remembering what he/she is told	0	1	2	3
has difficulty following directions	0	1	2	3
tends to daydream	0	1	2	3
gets confused	0	1	2	3
is forgetful	0	1	2	3
has difficulty completing tasks	0	1	2	3
has poor problem solving skills	0	1	2	3
has problems learning	0	1	2	3
Total number of symptoms:				of 21
Symptom severity score:				of 63
Do the symptoms get worse with physical activity?			Y	N
Do the symptoms get worse with mental activity?			Y	N

#### Overall rating for parent/teacher/coach/carer to answer

On a scale of 0 to 100% (where 100% is normal), how would you rate the child now?

If not 100%, in what way does the child seem different?

APPENDIX F

3

**STEP 3: COGNITIVE SCREENING**

Standardized Assessment of Concussion - Child Version (SAC-C)<sup>4</sup>

**IMMEDIATE MEMORY**

The Immediate Memory component can be completed using the traditional 5-word per trial list or optionally using 10-words per trial to minimise any ceiling effect. All 3 trials must be administered irrespective of the number correct on the first trial. Administer at the rate of one word per second.

Please choose EITHER the 5 or 10 word list groups and circle the specific word list chosen for this test.

*I am going to test your memory. I will read you a list of words and when I am done, repeat back as many words as you can remember, in any order. For Trials 2 & 3: I am going to repeat the same list again. Repeat back as many words as you can remember in any order, even if you said the word before.*

List	Alternate 5 word lists					Score (of 5)		
						Trial 1	Trial 2	Trial 3
A	Finger	Penny	Blanket	Lemon	Insect			
B	Candle	Paper	Sugar	Sandwich	Wagon			
C	Baby	Monkey	Perfume	Sunset	Iron			
D	Elbow	Apple	Carpet	Saddle	Bubble			
E	Jacket	Arrow	Pepper	Cotton	Movie			
F	Dollar	Honey	Mirror	Saddle	Anchor			
<b>Immediate Memory Score</b>						<b>of 15</b>		
<b>Time that last trial was completed</b>								

List	Alternate 10 word lists					Score (of 10)		
						Trial 1	Trial 2	Trial 3
G	Finger	Penny	Blanket	Lemon	Insect			
	Candle	Paper	Sugar	Sandwich	Wagon			
H	Baby	Monkey	Perfume	Sunset	Iron			
	Elbow	Apple	Carpet	Saddle	Bubble			
I	Jacket	Arrow	Pepper	Cotton	Movie			
	Dollar	Honey	Mirror	Saddle	Anchor			
<b>Immediate Memory Score</b>						<b>of 30</b>		
<b>Time that last trial was completed</b>								

Name: \_\_\_\_\_  
 DOB: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 ID number: \_\_\_\_\_  
 Examiner: \_\_\_\_\_  
 Date: \_\_\_\_\_

**CONCENTRATION**

**DIGITS BACKWARDS**

Please circle the Digit list chosen (A, B, C, D, E, F). Administer at the rate of one digit per second reading DOWN the selected column.

*I am going to read a string of numbers and when I am done, you repeat them back to me in reverse order of how I read them to you. For example, if I say 7-1-9, you would say 9-1-7.*

Concentration Number Lists (circle one)					
List A	List B	List C			
5-2	4-1	4-9	Y	N	0
4-1	9-4	6-2	Y	N	1
4-9-3	5-2-6	1-4-2	Y	N	0
6-2-9	4-1-5	6-5-8	Y	N	1
3-8-1-4	1-7-9-5	6-8-3-1	Y	N	0
3-2-7-9	4-9-6-8	3-4-8-1	Y	N	1
6-2-9-7-1	4-8-5-2-7	4-9-1-5-3	Y	N	0
1-5-2-8-6	6-1-8-4-3	6-8-2-5-1	Y	N	1
7-1-8-4-6-2	8-3-1-9-6-4	3-7-6-5-1-9	Y	N	0
5-3-9-1-4-8	7-2-4-8-5-6	9-2-6-5-1-4	Y	N	1
List D	List E	List F			
2-7	9-2	7-8	Y	N	0
5-9	6-1	5-1	Y	N	1
7-8-2	3-8-2	2-7-1	Y	N	0
9-2-6	5-1-8	4-7-9	Y	N	1
4-1-8-3	2-7-9-3	1-6-8-3	Y	N	0
9-7-2-3	2-1-6-9-	3-9-2-4	Y	N	1
1-7-9-2-6	4-1-8-6-9	2-4-7-5-8	Y	N	0
4-1-7-5-2	9-4-1-7-5	8-3-9-6-4	Y	N	1
2-6-4-8-1-7	6-9-7-3-8-2	5-8-6-2-4-9	Y	N	0
8-4-1-9-3-5	4-2-7-3-9-8	3-1-7-8-2-6	Y	N	1
<b>Digits Score:</b>					<b>of 5</b>

**DAYS IN REVERSE ORDER**

*Now tell me the days of the week in reverse order. Start with the last day and go backward. So you'll say Sunday, Saturday. Go ahead.*

Sunday - Saturday - Friday - Thursday - Wednesday - Tuesday - Monday 0 1

**Days Score** of 1

**Concentration Total Score (Digits + Days)** of 6

## APPENDIX F

**4**

### STEP 4: NEUROLOGICAL SCREEN

See the instruction sheet (page 7) for details of test administration and scoring of the tests.

Can the patient read aloud (e.g. symptom checklist) and follow instructions without difficulty?	Y	N
Does the patient have a full range of pain-free PASSIVE cervical spine movement?	Y	N
Without moving their head or neck, can the patient look side-to-side and up-and-down without double vision?	Y	N
Can the patient perform the finger nose coordination test normally?	Y	N
Can the patient perform tandem gait normally?	Y	N

### BALANCE EXAMINATION

#### Modified Balance Error Scoring System (BESS) testing<sup>5</sup>

Which foot was tested (i.e. which is the non-dominant foot)  Left  Right

Testing surface (hard floor, field, etc.) \_\_\_\_\_

Footwear (shoes, barefoot, braces, tape, etc.) \_\_\_\_\_

Condition	Errors
Double leg stance	_____ of 10
Single leg stance (non-dominant foot, 10-12 y/o only)	_____ of 10
Tandem stance (non-dominant foot at back)	_____ of 10
<b>Total Errors</b>	5-9 y/o e/20 10-12 y/o of 30

Name: \_\_\_\_\_

DOB: \_\_\_\_\_

Address: \_\_\_\_\_

ID number: \_\_\_\_\_

Examiner: \_\_\_\_\_

Date: \_\_\_\_\_

**5**

### STEP 5: DELAYED RECALL:

The delayed recall should be performed after 5 minutes have elapsed since the end of the Immediate Recall section. Score 1 pt. for each correct response.

*Do you remember that list of words I read a few times earlier? Tell me as many words from the list as you can remember in any order.*

Time Started \_\_\_\_\_

Please record each word correctly recalled. Total score equals number of words recalled.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Total number of words recalled accurately: \_\_\_\_\_ of 5 or \_\_\_\_\_ of 10

**6**

### STEP 6: DECISION

Domain	Date & time of assessment:		
Symptom number Child report (of 21) Parent report (of 21)			
Symptom severity score Child report (of 63) Parent report (of 63)			
Immediate memory	_____ of 15 _____ of 30	_____ of 15 _____ of 30	_____ of 15 _____ of 30
Concentration (of 6)			
Neuro exam	Normal Abnormal	Normal Abnormal	Normal Abnormal
Balance errors (5-9 y/o of 20) (10-12 y/o of 30)			
Delayed Recall	_____ of 5 _____ of 10	_____ of 5 _____ of 10	_____ of 5 _____ of 10

Date and time of injury: \_\_\_\_\_

If the athlete is known to you prior to their injury, are they different from their usual self?  
 Yes  No  Unsure  Not Applicable  
 (If different, describe why in the clinical notes section)

Concussion Diagnosed?  
 Yes  No  Unsure  Not Applicable

If re-testing, has the athlete improved?  
 Yes  No  Unsure  Not Applicable

**I am a physician or licensed healthcare professional and I have personally administered or supervised the administration of this Child SCAT5.**

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Registration number (if applicable): \_\_\_\_\_

Date: \_\_\_\_\_

**SCORING ON THE CHILD SCAT5 SHOULD NOT BE USED AS A STAND-ALONE METHOD TO DIAGNOSE CONCUSSION, MEASURE RECOVERY OR MAKE DECISIONS ABOUT AN ATHLETE'S READINESS TO RETURN TO COMPETITION AFTER CONCUSSION.**



## APPENDIX F



For the Neurological Screen (page 5), if the child cannot read, ask him/her to describe what they see in this picture.

Name: \_\_\_\_\_  
DOB: \_\_\_\_\_  
Address: \_\_\_\_\_  
ID number: \_\_\_\_\_  
Examiner: \_\_\_\_\_  
Date: \_\_\_\_\_

### CLINICAL NOTES:

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### Concussion injury advice for the child and parents/carergivers

(To be given to the person monitoring the concussed child)

This child has had an injury to the head and needs to be carefully watched for the next 24 hours by a responsible adult.

**If you notice any change in behavior, vomiting, dizziness, worsening headache, double vision or excessive drowsiness, please call an ambulance to take the child to hospital immediately.**

Other important points:

Following concussion, the child should rest for at least 24 hours.

- The child should not use a computer, internet or play video games if these activities make symptoms worse.
- The child should not be given any medications, including pain killers, unless prescribed by a medical doctor.
- The child should not go back to school until symptoms are improving.
- The child should not go back to sport or play until a doctor gives permission.

Clinic phone number: \_\_\_\_\_

Patient's name: \_\_\_\_\_

Date / time of injury: \_\_\_\_\_

Date / time of medical review: \_\_\_\_\_

Healthcare Provider: \_\_\_\_\_

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Contact details or stamp

## APPENDIX F

### INSTRUCTIONS

Words in *Italics* throughout the Child SCAT5 are the instructions given to the athlete by the clinician

#### Symptom Scale

In situations where the symptom scale is being completed after exercise, it should still be done in a resting state, at least 10 minutes post exercise.

At Baseline	On the day of injury	On all subsequent days
<ul style="list-style-type: none"> <li>The child is to complete the Child Report, according to how he/she feels today, and</li> <li>The parent/carer is to complete the Parent Report according to how the child has been over the previous week.</li> </ul>	<ul style="list-style-type: none"> <li>The child is to complete the Child Report, according to how he/she feels now,</li> <li>If the parent is present, and has had time to assess the child on the day of injury, the parent completes the Parent Report according to how the child appears now.</li> </ul>	<ul style="list-style-type: none"> <li>The child is to complete the Child Report, according to how he/she feels today, and</li> <li>The parent/carer is to complete the Parent Report according to how the child has been over the previous 24 hours.</li> </ul>

For Total number of symptoms, maximum possible is 21

For Symptom severity score, add all scores in table, maximum possible is  $21 \times 3 = 63$

#### Standardized Assessment of Concussion Child Version (SAC-C)

##### Immediate Memory

Choose one of the 5-word lists. Then perform 3 trials of immediate memory using this list.

Complete all 3 trials regardless of score on previous trials.

*"I am going to test your memory. I will read you a list of words and when I am done, repeat back as many words as you can remember, in any order."* The words must be read at a rate of one word per second.

OPTION: The literature suggests that the Immediate Memory has a notable ceiling effect when a 5-word list is used. (In younger children, use the 5-word list). In settings where this ceiling is prominent the examiner may wish to make the task more difficult by incorporating two 5-word groups for a total of 10 words per trial. In this case the maximum score per trial is 10 with a total trial maximum of 30.

Trials 2 & 3 MUST be completed regardless of score on trial 1 & 2.

Trials 2 & 3: *"I am going to repeat the same list again. Repeat back as many words as you can remember in any order, even if you said the word before."*

Score 1 pt. for each correct response. Total score equals sum across all 3 trials. Do NOT inform the athlete that delayed recall will be tested.

##### Concentration

###### Digits backward

Choose one column only, from List A, B, C, D, E or F, and administer those digits as follows:

*"I am going to read you some numbers and when I am done, you say them back to me backwards, in reverse order of how I read them to you. For example, if I say 7-1, you would say 1-7."*

If correct, circle "Y" for correct and go to next string length. If incorrect, circle "N" for the first string length and read trial 2 in the same string length. One point possible for each string length. Stop after incorrect on both trials (2 N's) in a string length. The digits should be read at the rate of one per second.

###### Days of the week in reverse order

*"Now tell me the days of the week in reverse order. Start with Sunday and go backward. So you'll say Sunday, Saturday ... Go ahead"*

1 pt. for entire sequence correct

###### Delayed Recall

The delayed recall should be performed after at least 5 minutes have elapsed since the end of the Immediate Recall section.

*"Do you remember that list of words I read a few times earlier? Tell me as many words from the list as you can remember in any order."*

Circle each word correctly recalled. Total score equals number of words recalled.

#### Neurological Screen

##### Reading

The child is asked to read a paragraph of text from the instructions in the Child SCAT5. For children who can not read, they are asked to describe what they see in a photograph or picture, such as that on page 6 of the Child SCAT5.

##### Modified Balance Error Scoring System (mBESS)<sup>5</sup> testing

*These instructions are to be read by the person administering the Child SCAT5, and each balance task should be demonstrated to the child. The child should then be asked to copy what the examiner demonstrated.*

Each of 20-second trial/stance is scored by counting the number of errors. The This balance testing is based on a modified version of the Balance Error Scoring System (BESS)<sup>5</sup>.

A stopwatch or watch with a second hand is required for this testing.

*"I am now going to test your balance. Please take your shoes off, roll up your pants above your ankle (if applicable), and remove any ankle taping (if applicable). This test will consist of two different parts."*

OPTION: For further assessment, the same 3 stances can be performed on a surface of medium density foam (e.g., approximately 50cm x 40cm x 6cm).

##### (a) Double leg stance:

*The first stance is standing with the feet together with hands on hips and with eyes closed. The child should try to maintain stability in that position for 20 seconds. You should inform the child that you will be counting the number of times the child moves out of this position. You should start timing when the child is set and the eyes are closed.*

##### (b) Tandem stance:

*Instruct or show the child how to stand heel-to-toe with the non-dominant foot in the back. Weight should be evenly distributed across both feet. Again, the child should try to maintain stability in that position for 20 seconds with hands on hips and eyes closed. You should inform the child that you will be counting the number of times the child moves out of this position. If the child stumbles out of this position, instruct him/her to open the eyes and return to the start position and continue balancing. You should start timing when the child is set and the eyes are closed.*

##### (c) Single leg stance (10-12 year olds only):

*"If you were to kick a ball, which foot would you use? [This will be the dominant foot] Now stand on your other foot. You should bend your other leg and hold it up (show the child). Again, try to stay in that position for 20 seconds with your hands on your hips and your eyes closed. I will be counting the number of times you move out of this position. If you move out of this position, open your eyes and return to the start position and keep balancing. I will start timing when you are set and have closed your eyes."*

#### Balance testing – types of errors

- |                                 |   |   |
|---------------------------------|---|---|
| 1. Hands lifted off iliac crest | 3. Step, stumble, or fall                 | 5. Lifting forefoot or heel               |
| 2. Opening eyes                 | 4. Moving hip into > 30 degrees abduction | 6. Remaining out of test position > 5 sec |

Each of the 20-second trials is scored by counting the errors, or deviations from the proper stance, accumulated by the child. The examiner will begin counting errors only after the child has assumed the proper start position. The modified BESS is calculated by adding one error point for each error during the 20-second tests. The maximum total number of errors for any single condition is 10. If a child commits multiple errors simultaneously, only one error is recorded but the child should quickly return to the testing position, and counting should resume once subject is set. Children who are unable to maintain the testing procedure for a minimum of five seconds at the start are assigned the highest possible score, ten, for that testing condition.

#### Tandem Gait

Instruction for the examiner - Demonstrate the following to the child:

*The child is instructed to stand with their feet together behind a starting line (the test is best done with footwear removed). Then, they walk in a forward direction as quickly and as accurately as possible along a 38mm wide (sports tape), 3 metre line with an alternate foot heel-to-toe gait ensuring that they approximate their heel and toe on each step. Once they cross the end of the 3m line, they turn 180 degrees and return to the starting point using the same gait. Children fail the test if they step off the line, have a separation between their heel and toe, or if they touch or grab the examiner or an object.*

#### Finger to Nose

The tester should demonstrate it to the child.

*"I am going to test your coordination now. Please sit comfortably on the chair with your eyes open and your arm (either right or left) outstretched (shoulder flexed to 90 degrees and elbow and fingers extended). When I give a start signal, I would like you to perform five successive finger to nose repetitions using your index finger to touch the tip of the nose as quickly and as accurately as possible."*

Scoring: 5 correct repetitions in < 4 seconds = 1

Note for testers: Children fail the test if they do not touch their nose, do not fully extend their elbow or do not perform five repetitions.

#### References

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## APPENDIX F

### CONCUSSION INFORMATION

If you think you or a teammate has a concussion, tell your coach/trainer/parent right away so that you can be taken out of the game. You or your teammate should be seen by a doctor as soon as possible. **YOU OR YOUR TEAMMATE SHOULD NOT GO BACK TO PLAY/SPORT THAT DAY.**

#### Signs to watch for

Problems can happen over the first 24-48 hours. You or your teammate should not be left alone and must go to a hospital right away if any of the following happens:

- New headache, or headache gets worse
- Neck pain that gets worse
- Becomes sleepy/drowsy or can't be woken up
- Cannot recognise people or places
- Feeling sick to your stomach or vomiting
- Acting weird/strange, seems/feels confused, or is irritable
- Has any seizures (arms and/or legs jerk uncontrollably)
- Has weakness, numbness or tingling (arms, legs or face)
- Is unsteady walking or standing
- Talking is slurred
- Cannot understand what someone is saying or directions

**Consult your physician or licensed healthcare professional after a suspected concussion. Remember, it is better to be safe.**

#### Graduated Return to Sport Strategy

After a concussion, the child should rest physically and mentally for a few days to allow symptoms to get better. In most cases, after a few days of rest, they can gradually increase their daily activity level as long as symptoms don't get worse. Once they are able to do their usual daily activities without symptoms, the child should gradually increase exercise in steps, guided by the healthcare professional (see below).

**The athlete should not return to play/sport the day of injury.**

**NOTE: An initial period of a few days of both cognitive ("thinking") and physical rest is recommended before beginning the Return to Sport progression.**

Exercise step	Functional exercise at each step	Goal of each step
1. Symptom-limited activity	Daily activities that do not provoke symptoms.	Gradual reintroduction of work/school activities.
2. Light aerobic exercise	Walking or stationary cycling at slow to medium pace. No resistance training.	Increase heart rate.
3. Sport-specific exercise	Running or skating drills. No head impact activities.	Add movement.
4. Non-contact training drills	Harder training drills, e.g., passing drills. May start progressive resistance training.	Exercise, coordination, and increased thinking.
5. Full contact practice	Following medical clearance, participate in normal training activities.	Restore confidence and assess functional skills by coaching staff.
6. Return to play/sport	Normal game play.	

There should be at least 24 hours (or longer) for each step of the progression. If any symptoms worsen while exercising, the athlete should go back to the previous step. Resistance training should be added only in the later stages (Stage 3 or 4 at the earliest). The athlete should not return to sport until the concussion symptoms have gone, they have successfully returned to full school/learning activities, and the healthcare professional has given the child written permission to return to sport.

**If the child has symptoms for more than a month, they should ask to be referred to a healthcare professional who is an expert in the management of concussion.**

#### Graduated Return to School Strategy

Concussion may affect the ability to learn at school. The child may need to miss a few days of school after a concussion, but the child's doctor should help them get back to school after a few days. When going back to school, some children may need to go back gradually and may need to have some changes made to their schedule so that concussion symptoms don't get a lot worse. If a particular activity makes symptoms a lot worse, then the child should stop that activity and rest until symptoms get better. To make sure that the child can get back to school without problems, it is important that the health care provider, parents/caregivers and teachers talk to each other so that everyone knows what the plan is for the child to go back to school.

**Note: If mental activity does not cause any symptoms, the child may be able to return to school part-time without doing school activities at home first.**

Mental Activity	Activity at each step	Goal of each step
1. Daily activities that do not give the child symptoms	Typical activities that the child does during the day as long as they do not increase symptoms (e.g. reading, texting, screen time). Start with 5-15 minutes at a time and gradually build up.	Gradual return to typical activities.
2. School activities	Homework, reading or other cognitive activities outside of the classroom.	Increase tolerance to cognitive work.
3. Return to school part-time	Gradual introduction of school-work. May need to start with a partial school day or with increased breaks during the day.	Increase academic activities.
4. Return to school full-time	Gradually progress school activities until a full day can be tolerated.	Return to full academic activities and catch up on missed work.

If the child continues to have symptoms with mental activity, some other things that can be done to help with return to school may include:

- Starting school later, only going for half days, or going only to certain classes
- More time to finish assignments/tests
- Quiet room to finish assignments/tests
- Not going to noisy areas like the cafeteria, assembly halls, sporting events, music class, shop class, etc.
- Taking lots of breaks during class, homework, tests
- No more than one exam/day
- Shorter assignments
- Repetition/memory cues
- Use of a student helper/tutor
- Reassurance from teachers that the child will be supported while getting better

**The child should not go back to sports until they are back to school/learning, without symptoms getting significantly worse and no longer needing any changes to their schedule.**

APPENDIX F



## Sport concussion assessment tool for childrens ages 5 to 12 years

*Br J Sports Med* 2017 51: 862-869 originally published online April 26, 2017  
doi: 10.1136/bjsports-2017-097492childscat5

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Updated information and services can be found at:  
<http://bjsm.bmj.com/content/51/11/862.citation>

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**Modified Maddocks Questions:**

"I am going to ask you a few questions. Please listen carefully and answer to the best of your knowledge."

1 point for each correct question.

What venue are we at?	0	1
Which quarter is it?	0	1
Who scored last?	0	1
What team did you play last game / week?	0	1
Did your team win last game?	0	1
<b>Maddocks Score</b>		<b>/5</b>

**A. GENERAL INFORMATION**

Player Name:  Club:   
 Dr/Physio Name:  Date:   
 Quarter:  Time in Quarter:

**B. STRUCTURAL HEAD OR NECK INJURY**

1. Are there clinical features including abnormal neurological signs of a serious or structural head and/or neck injury requiring emergency management and hospital transfer (GCS, etc are indicated)?  Yes  No

**C. REMOVAL FROM PLAY**

The player **must** be removed from play with any of the following observations by any staff member, whether observed directly or indirectly:

**a. Clear diagnosis of concussion requiring immediate removal and no return to play**

2. Loss of consciousness  Yes  No  
 3. No protective action in fall to ground directly observed (tonic or floppy)  Yes  No  
 4. Impact seizure or tonic posturing  Yes  No  
 5. Confusion, disorientation  Yes  No  
 6. Memory impairment (e.g. fails Maddocks questions)  Yes  No  
 7. Balance disturbance (e.g. ataxia)  Yes  No  
 8. Player reports significant, new or progressive concussion symptoms  Yes  No  
 9. Dazed, blank/vacant stare or not their normal selves  Yes  No  
 10. Behaviour change atypical of the player  Yes  No

**b. Requires immediate removal from play for further assessment**

11. Loss of responsiveness (player motionless for 2-3 seconds or until support staff arrives)  Yes  No  
 12. Possible tonic posturing or impact seizure  Yes  No  
 13. Possible balance disturbance directly observed  Yes  No

Comments regarding the above findings:

**D. OUTCOME**

16. Clear diagnosis of brain injury or concussion and no return to play (SCAT 5 required)  Yes\*  
 17. Required removal from play for SCAT5 assessment and cleared to return to play  Yes\*  
 18. No criteria for removal for concussion or SCAT5 assessment  Yes\*

\*Red = no RTP, \*Amber = remove from play for SCAT5. \*Green = no criteria for removal from play

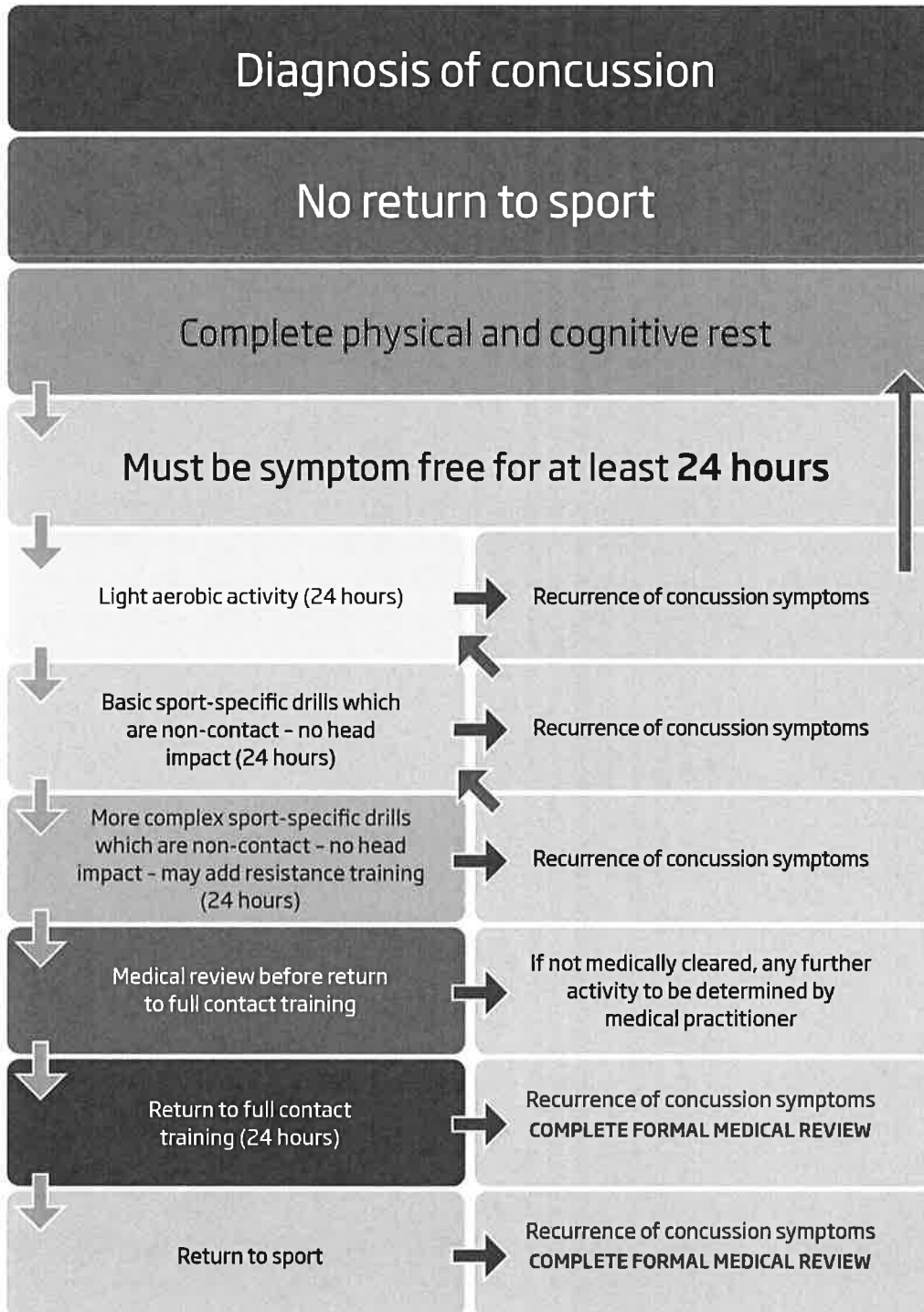
\*Player requires regular medical checks at least every 30 minutes and removal for SCAT5 assessment with any deterioration

**E. SIGNATURE OF EXAMINING DOCTOR or PHYSIOTHERAPIST**

Signed:  Date:  Time completed:

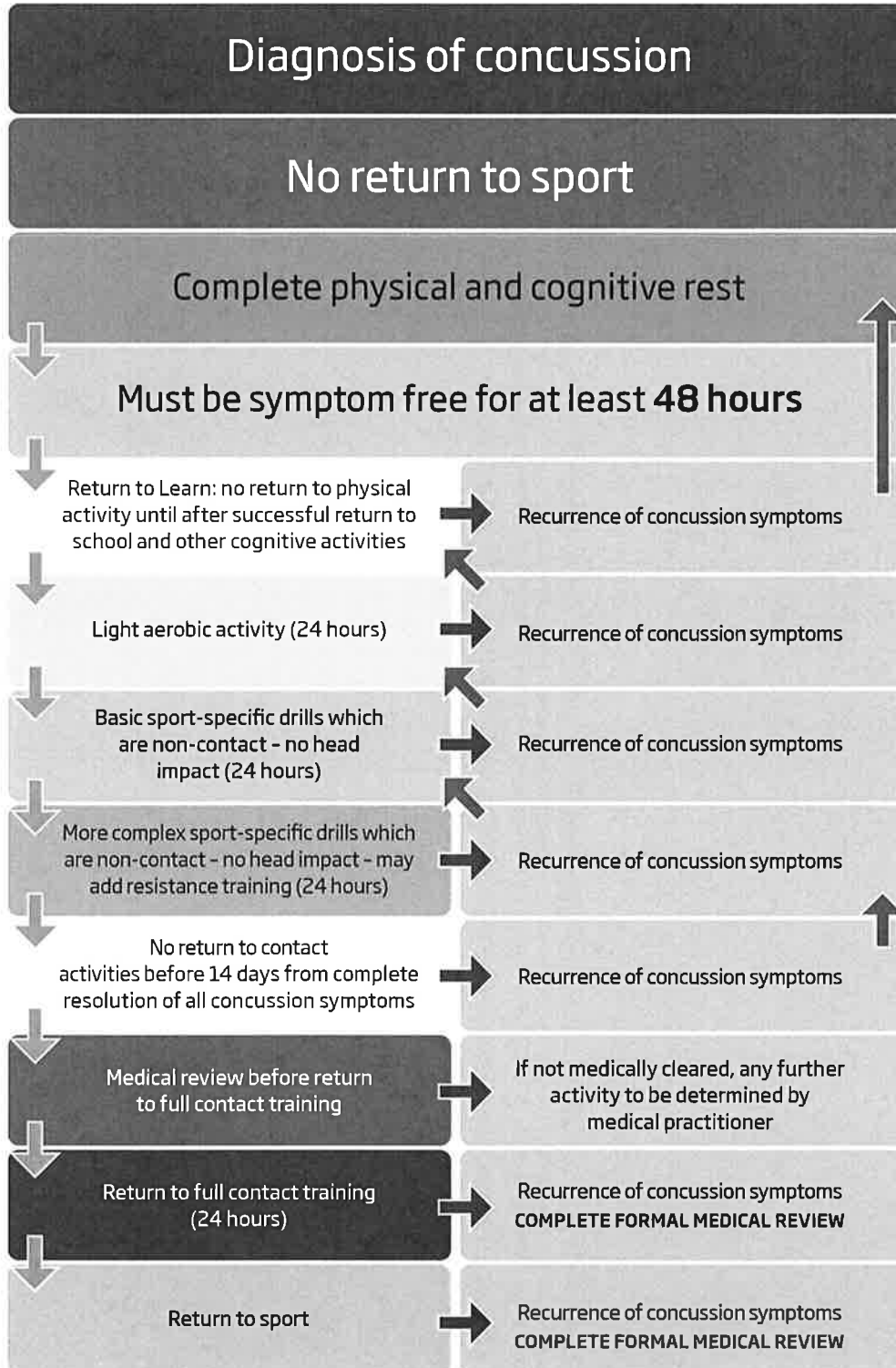


## Return to Sport Protocol for adults over 18 years of age





### Return to Sport Protocol for children under 18 years of age



*"if in doubt, sit them out"*



## APPENDIX K

To Whom It May Concern,

\_\_\_\_\_ has sustained a concussion on *(date)* \_\_\_\_\_.

Concussion affects the way the brain functions. Different people can be affected in different ways. It is common for a concussed individual to have difficulty concentrating in class and not perform as well as usual in exams and assessments. They may require more time to complete work.

When a concussed individual concentrates for long periods, the load required by the brain can bring on or worsen symptoms of concussion. Some of the subtle symptoms of concussion include:

- fatigue
- difficulty concentrating
- sensitivity to light and noise
- confusion or disorientation
- memory impairment
- nausea
- headache or pressure in the head
- feeling slowed or not right
- dazed, blank or vacant stare
- behaviour or emotional changes, not themselves.

Gradually increasing the load on the brain without provoking symptoms is recommended. Medical recommendations to assist in returning to school are as follows:

- breaks from class every \_\_\_\_\_ minutes
- postpone exams by \_\_\_\_\_ days/weeks
- additional time to complete exams and assessments
- additional time to complete tasks in class.

\_\_\_\_\_ *(name)* has been reviewed by a medical doctor and cleared for return to school so none of the following are expected, however, please seek urgent medical attention if there are any of the following symptoms:

- neck pain
- increasing confusion or irritability
- repeated vomiting
- seizure or convulsion
- weakness or tingling/burning in the arms or legs
- deteriorating conscious state
- severe or increasing headache
- unusual behaviour change
- visual or hearing disturbance

Until they receive written medical advice otherwise, students recovering from concussion should not participate in any physical activity including PE class, school sport or playground activity.

## APPENDIX K

On average, the symptoms of concussion will resolve in 7–10 days, however in young people under the age of 18, concussion symptoms may take longer to resolve. Rest and gradual return to learn and activity is the treatment for concussion. If you notice that your student is having symptoms beyond the expected 7-10 day period, please discuss with their parent/guardian so that a medical review can be arranged.

Medical doctors details:

Name:

Practice:

Contact details: