

BRITISH JUDO



Traumatic Brain Injury Management Policy (Head Injury & Strangulation)

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REVIEW OF POLICY

This policy will be reviewed upon any major changes in procedures, guidelines or legislation, and otherwise on an annual basis.

| Date | Outcome |
|--------------|-------------------------|
| October 2022 | Original policy written |
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Introduction

British Judo takes the health & safety of its members seriously, especially in the case of head injury or of an athlete becoming unconscious due to strangulation (shime-waza), either in the competition or training environment, regardless of the level or age of the competitor. Since the 1970's the medical profession and the scientific community have begun to differentiate sports related concussion and traumatic brain injury from other causes (such as road traffic accidents, etc.). Their management is driven by sporting bodies and the International Olympic Committee, who see the need to have clear and practical guidelines in place for their detection, treatment, and to guide return to play.

Minor head injuries & knocks to the head are common, particularly in children. Following the injury, if the person is conscious (awake) and there is no deep laceration or severe head damage, it is unusual for there to be any underlying damage to the brain. However, sometimes head injuries can be more serious and may result in unconsciousness and / or concussion. Serious neurologic injury can also occur following the application of Shime-waza techniques, during which the blood flow to the brain is temporarily disrupted due to strangulation.

This protocol applies to the following scenarios:

1. Unconsciousness resulting from a direct blow to the head, face, neck or elsewhere on the body where an impulse force is transmitted through to the head and may result in the player being concussed
2. Concussion may occur without the player being knocked out and losing consciousness – it must always be considered a possibility in any player with a compatible mechanism of injury, and must be taken seriously
3. Unconsciousness resulting from the application of Shime-waza (strangulation technique) if the player fails to submit

BRITISH JUDO ENCOURAGES ANYONE WHO HAS CONCERNS FOLLOWING A HEAD INJURY OR STRANGULATION TO THEMSELVES OR TO ANOTHER PERSON, REGARDLESS OF THE INJURY SEVERITY, TO SEEK IMMEDIATE MEDICAL ADVICE.

What is concussion?

Concussion can be defined as a disturbance in brain function caused by a direct or indirect traumatic force to the head, resulting in a variety of non-specific signs & symptoms, which may or may not include unconsciousness. The brain can swell and when its normal function is disrupted, it can affect mental stamina & function, causing the brain to work longer & harder to complete even trivial / every-day tasks. Concussion is a recognised and important injury in sport. It can result from many types of incidents, but issues arise from sports-related concussions because rapid decisions need to be made about safe continuation / return to play.

ULTIMATELY ALL CONCUSSIONS NEED TO BE TAKEN SERIOUSLY BECAUSE THEY ARE A TYPE OF TRAUMATIC BRAIN INJURY!

Second Impact Syndrome

Second impact syndrome is a rare condition in which a second brain insult (concussion or strangulation) occurs before the brain has recovered from the first one, causing rapid and severe brain swelling. It can result from even a very mild concussion or strangulation that occurs days or weeks after the initial injury. Second impact syndrome can cause a severe and catastrophic brain injury, leading to long term symptoms / disability and prolonged time away from sport / employment.

What are the effects of Shime-Waza?

Strangulation is common in Judo & other combat sports. Strangulation is defined as the application of external pressure to the vasculature (blood vessels) and the airway conducting systems. It can quickly result in the loss of consciousness and carries a risk of associated injuries such as laryngeal (voice box) fracture, airway swelling & blunt cerebrovascular injuries (strokes). As the blood flow to the brain is reduced, loss of consciousness commonly occurs quickly, in 6-15 seconds.

The brain doesn't tolerate lack of oxygen (hypoxia) well, resulting in permanent neurologic injury or death in 3-5 minutes. The quicker brain blood flow and therefore oxygenation can be restored, the lower the chance of temporary or more permanent neurologic compromise, so it is important that coaches / referees are very vigilant and stop play as soon as possible in the event of unconsciousness by strangulation. As well as unconsciousness, athletes may experience brief seizure activity, which appears similar to epileptic seizures, with a gradual return to normal after removal of the strangle force. In otherwise healthy people, the brain function returns to normal following the strangulation episode. However, strangulation does represent a hypoxic brain injury, no matter how brief, and the brain therefore needs time to recover from the injury, in the same way as it does following concussion injuries.

As strangulation results in compression of vascular structures, there is a potential of secondary injuries in athletes who have other co-existing medical conditions. For example, if an athlete has pre-existing carotid artery disease (narrowing of the arteries in the neck), then less pressure is required to occlude the vessels, and the risk of a stroke is significantly higher.

Recognition of concussion / brain injury

The recognition and evaluation of an athlete with neurologic compromise from either concussion or a strangulation injury in the training or competition environment can be challenging.

Typical signs are:

- *Headache*
- *Nausea*
- *Confusion*
- *Dizziness*
- *Unsteadiness / loss of balance*
- *Feeling stunned / dazed*
- *Double vision*
- *Seeing stars / lights*
- *Ringing in the ears*
- *Slurred speech*
- *Poor concentration*

Typical symptoms are:

- *Loss of / reduced consciousness*
- *Fits / seizures*
- *Easily distracted / unable to concentrate on tasks*
- *Vomiting*
- *Poor co-ordination / balance*
- *Slow to answer questions or follow instructions*
- *Displaying inappropriate emotions (eg. Laughing, crying)*
- *Slurred speech*
- *personality changes*
- *decreased fighting ability*
- *disorientation*
- *amnesia (loss of memory)*

If an athlete displays any of the above signs and symptoms, neurologic compromise or a concussion should be considered, and the athlete should be withdrawn from competition or training immediately for further assessment. This point is paramount – any athlete suspected of having a concussion must initially be treated as though they are concussed, withdrawn from competition or training immediately and assessed by a health care professional (HCP) – usually a physiotherapist or doctor.

IF IN DOUBT, SIT THEM OUT!

Adverse (RED FLAG) Signs

Any of the following signs or symptoms are regarded as adverse or red flag signs, which could indicate a more severe underlying brain injury, from either a head injury or strangulation. An athlete either displaying or who develops any of these signs or symptoms must seek immediate help from a health care professional or be taken urgently to the nearest Accident & Emergency Department.

Adverse signs / Red Flag symptoms:

- ***Increasingly restless, agitated or combative***
- ***Deteriorating conscious state***
- ***Persistent new double vision***
- ***Suspicion of skull fracture***
- ***Neck pain or tenderness***
- ***Seizures or convulsions***
- ***Loss of consciousness for longer than 1 minute***
- ***Children***
- ***Persistent vomiting***
- ***Persistent / worsening headache***
- ***High risk medical problems – eg. Blood clotting disorders, blood thinning medication***
- ***Altered sensorium due to other reasons – eg. Drugs, alcohol, epilepsy, learning difficulties, etc.***
- ***Lack of responsible adult to supervise post-injury***
- ***More than 1 other concussion / strangulation injury within 3 months***

Immediate mat side treatment



Frequently head injuries & strangulations will occur in the club environment, where HCP's are not present mat side during training or competitions. However, the immediate removal of the Judoka from the mat is paramount after a brain injury, due to either a head injury or strangulation. The initial suspicion of concussion or strangulation is therefore often made by the coach or a fellow athlete. Education on the first aid assessment of head injury and strangulation is therefore paramount for all coaches and Judoka. Remember – in British Judo we've got each others backs!

We recommend the use of the Concussion Recognition Tool 5 (CRT5) by all non-health care professionals to help identify concussion (or potential brain injury from strangulations) in children, adolescents & adults (see appendix 1).

Maddox questions are a basic memory assessment tool which have been validated for the side-line determination of the risk of concussion and are a useful tool for non-health care professionals to confirm that a risk of concussion is present. If an athlete gets 1 question wrong, they must be removed from the field of play immediately.

| Maddox Questions: | <i>Suggestions to be more judo-specific:</i> |
|--|--|
| What venue are we at today? | |
| Which half is it now? | <i>How far into this fight are we?</i> |
| Who scored the last in this match? | |
| What team did you play in the last match / game? | <i>Who did you fight in your last fight / competition?</i> |
| Did your team win the last game? | <i>Did you win your last fight?</i> |

If there is any doubt that an athlete has sustained a concussion or strangulation injury, always err on the side of caution & remove immediately from the field of play for further expert assessment.

On the field of play, the first aid principles of Danger, Response, Airway, Breathing, Circulation should be followed. For non-HCP's, do not attempt to move the injured athlete

(except for urgent airway management) unless you are trained to do so. Both head injuries and strangulation injuries present a significant risk for the athlete having a concomitant neck or spinal cord injury, so assessment for these must be done on the field of play before they are moved.

Signs and symptoms of a brain injury evolve over time (in both concussion & strangulation). It is therefore important that any athlete suspected of or who has had a head or strangulation injury is supervised by a responsible adult who can be alert to the development of deteriorating or red flag symptoms. If they do, the athlete should be taken immediately to the nearest Accident & Emergency Department.

When HCP's are present, the athlete should be assessed using standard Advanced Trauma Life Support trauma care principles to exclude concomitant injuries. After an initial rest period of 10 minutes, a neurocognitive assessment should be carried out using the SCAT 5 (Sports Concussion Assessment Tool) assessment (see appendix 2) or Child SCAT5 (see appendix 3) and compared to the athlete's baseline. The HCP can use their professional judgement regarding return to play that day or initiation of the graduated return to play protocol.

An athlete **must not** return to play that day, but must be assessed by an HCP & complete the graduated return to play protocol prior to any further Judo training / competitions if:

- They are under 19 years old
- They have been unconscious for any length of time
- They have had any seizure activity or twitching
- They have any adverse / red flag signs
- Their mechanism of injury is compatible with a significant head or strangulation injury
- Their CRT5 assessment suggests a concussion / brain injury has been sustained
- They have not been assessed by an HCP
- Their SCAT5 assessment is not comparable to their baseline

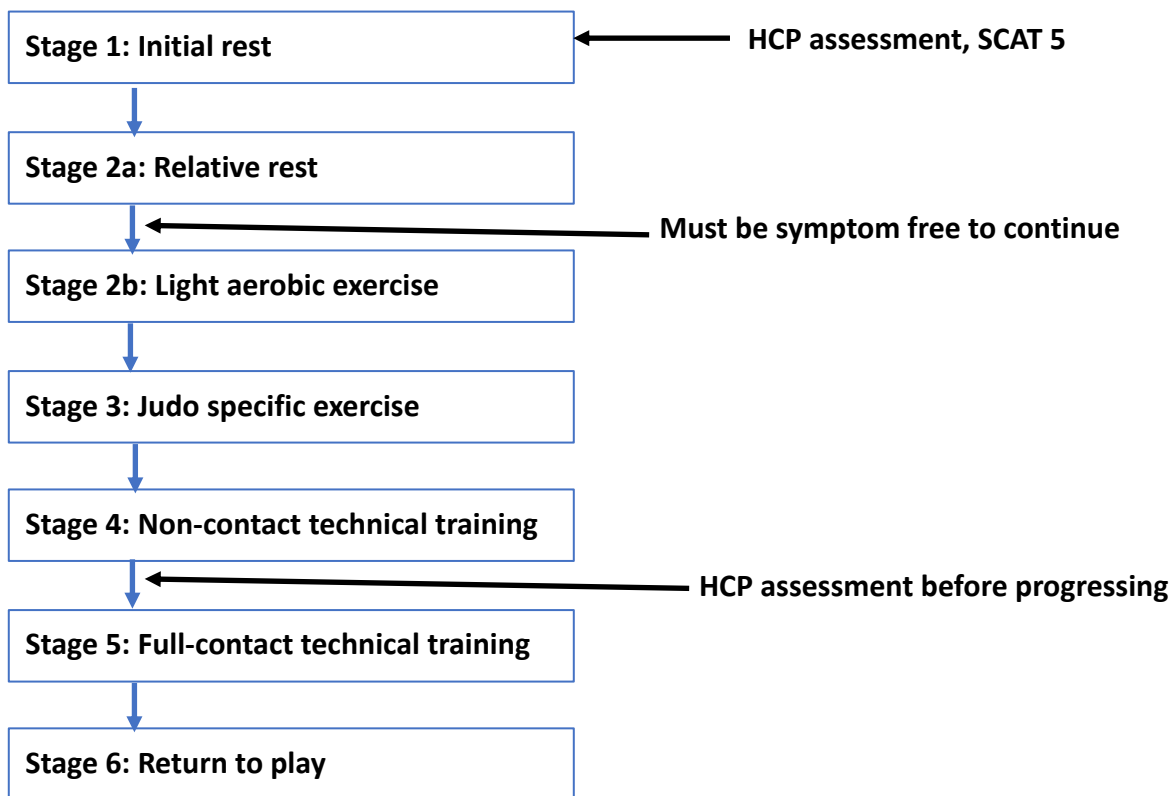
- They have had a previous or suspected head injury / strangulation in the preceding 3 months

IF IN DOUBT, SIT THEM OUT!

The BJA concussion and strangulation advice sheet can be given to the responsible adult supervising the injured judoka (see appendix 5).

Graduated return to play (RTP)

All World Class Performance Programme athletes follow the BJA Judo Specific Graduated Return to Play Protocol after any suspected brain injury from either a head injury or strangulation injury. The BJA recommends that the following protocols are also implemented by the club coaches and officials. In the club setting, the HCP may need to be the athletes GP. Serial SCAT 5 assessments are used to guide the athletes progress and readiness to return to play.



| Stage | Aim | Details / Activities |
|-------|--|--|
| 1 | Initial rest <i>(mind & body)</i> | 24-48 hrs Complete physical & cognitive rest (no exercise, minimize screen time on electronics, time off work / study) Review by HCP & SCAT 5 assessment ASAP after injury (at earliest 10 mins after) |
| 2a | Relative rest | 14 days Return to normal daily activities that don't provoke symptoms Must be symptom free at end of this stage before continuing |
| 2b | Light aerobic exercise <i>(increase heart rate)</i> | 5 x 4mins on / 4 mins off session (total of 20 mins work in a 40 min session) Work to <70% maximum heart rate Light bike / jogging / walk / swim. No resistance training |
| 3 | Judo specific exercise <i>(add in Judo movements)</i> | Total session time <45 mins, regular 3-4 min rest intervals to ensure no symptoms Work to <80% maximum heart rate No head impact. Banded Uchikomi (no Uke), ladder drills, Ashi-waza with cones |
| 4 | Non-contact technical training <i>(increase exercise, co-ordination & cognitive load)</i> | Must return to work / education before returning to judo S&C: Progressive loadings 50-75% & start resistance training Total session time <60 mins, regular 3-4 min rest intervals to ensure no symptoms Work to <90% maximum heart rate No head impact. Stand grip fighting, Uchikomi with Uke. No Nagekomi, Ne-waza, Tachi-waza Must have clearance from HCP / GP before progressing to next stage |
| 5 | Full-contact technical training <i>(increase Judo confidence & assess functional skills)</i> | S&C: progressive loadings 75% - normal pre-injury activity Full unrestricted Uchikomi & Nagekomi, open play Ne-waza & Tachi-waza Regular 3-4 min rest intervals to ensure no symptoms Must be supervised by Judo coach to assess if back to normal self |
| 6 | Return to play | Return to open play Randori |

The content of the graduated return to play is the same for all age groups and all skill levels, but the duration of each stage is dependent on age and level.

Minimal timings for Graduated Return to Play in Under 19's

The impact of a brain injury from either a concussion or strangulation can be more profound in children & young people, whose brains are still developing. They behave differently to adults and more damage can occur silently without subjective symptoms being evident. They need more observation and MUST be assessed by an HCP, which may be in A&E, on the day of the injury. The Child SCAT5 assessment tool should be used for under 12's (appendix 3). An age limit of 19 is used in line with current best evidence & in line with other sports such as Football & Rugby.

Minimum timings:

- 24-48 hours for stage 1, or until symptom free
- 14 days for stage 2a (relative rest)
- 48 hours at stages 2b-6

Athletes must be symptom free before starting or progressing to the next stage.

If symptoms develop, the athlete should have full rest for a minimum of 48 hours, or until symptom free, then resume the graduated RTP at the level below.

Minimal timings for Graduated Return to Play in Age 19 & over

Minimum timings:

- 24-48 hours for stage 1, or until symptom free
- 14 days for stage 2a (relative rest)
- 24 hours at stages 2b-6

Athletes must be symptom free before starting or progressing to the next stage.

If symptoms develop, the athlete should have full rest for a minimum of 24 hours, or until symptom free, then resume the graduated RTP at the level below.

Athletes with other medical problems which places them at higher risk, veteran athletes, or those with a history of previous brain injury in the preceding 6 months should consider the slower RTP schedule as followed by under 19's.

Minimal timings for Enhanced Graduated Return to Play in Age 19 & over

This is only applicable to athletes on the World Class Performance Programme, based at the National Training Centre, who have full time daily expert medical supervision by HCP's trained in complex concussion management and rehab.

Minimum timings:

- 24 hours for stage 1, or until symptom free
- 24 for stage 2a (relative rest)
- 24 hours at stages 2b-6

Athletes must be symptom free before starting or progressing to the next stage.

If symptoms develop, the athlete should have full rest for a minimum of 24 hours, or until symptom free, then resume the standard (non-enhanced) age 19 & over graduated RTP at the level below.

Education

Education on the first aid assessment of head injury and strangulation is paramount for all coaches and Judoka at all levels in order to reduce the impact of these injuries. There are several excellent e-learning modules available online, including:

- HEADCASE, England rugby
(<https://www.englandrugby.com/participation/playing/headcase>)
- ConcussEd
(<https://www.concussioneducation.co.uk>)
- NHS Head injury & Concussion
(<https://www.nhs.uk/conditions/head-injury-and-concussion/>)

A BJA Graduated RTP protocol infographic is available in appendix 4 or can be downloaded from the BJA website, for display and dissemination to all BJA clubs, coaches & Judoka.

If a club or region have specific educational requirements regarding head injury or strangulation, please contact the CMO directly to discuss.

References

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Appendices

Appendix 1

Concussion Recognition Tool – 5th edition (CRT5)

CONCUSSION RECOGNITION TOOL 5 ©

To help identify concussion in children, adolescents and adults



RECOGNISE & REMOVE

Head impacts can be associated with serious and potentially fatal brain injuries. The Concussion Recognition Tool 5 (CRT5) is to be used for the identification of suspected concussion. It is not designed to diagnose concussion.

STEP 1: RED FLAGS — CALL AN AMBULANCE

If there is concern after an injury including whether ANY of the following signs are observed or complaints are reported then the player should be safely and immediately removed from play/game/activity. If no licensed healthcare professional is available, call an ambulance for urgent medical assessment:

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

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 a helmet or any other equipment unless trained to do so safely.
- Assessment for a spinal cord injury is critical.

If there are no Red Flags, identification of possible concussion should proceed to the following steps:

STEP 2: OBSERVABLE SIGNS

Visual clues that suggest possible concussion include:

- Lying motionless on the playing surface
- Disorientation or confusion, or an inability to respond appropriately to questions
- Balance, gait difficulties, motor incoordination, stumbling, slow laboured movements
- Slow to get up after a direct or indirect hit to the head
- Blank or vacant look
- Facial injury after head trauma

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STEP 3: SYMPTOMS

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

STEP 4: MEMORY ASSESSMENT

(IN ATHLETES OLDER THAN 12 YEARS)

Failure to answer any of these questions (modified appropriately for each sport) correctly may suggest a concussion:

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

Athletes with suspected concussion should:

- Not be left alone initially (at least for the first 1-2 hours).
- Not drink alcohol.
- Not use recreational/ prescription drugs.
- Not be sent home by themselves. They need to be with a responsible adult.
- Not drive a motor vehicle until cleared to do so by a healthcare professional.

The CRT5 may be freely copied in its current form for distribution to individuals, teams, groups and organisations. Any revision and any reproduction in a digital form requires approval by the Concussion in Sport Group. It should not be altered in any way, rebranded or sold for commercial gain.

ANY ATHLETE WITH A SUSPECTED CONCUSSION SHOULD BE IMMEDIATELY REMOVED FROM PRACTICE OR PLAY AND SHOULD NOT RETURN TO ACTIVITY UNTIL ASSESSED MEDICALLY, EVEN IF THE SYMPTOMS RESOLVE

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Appendix 2

Sports Concussion Assessment Tool – 5th edition (SCAT5)

SCAT5[®]

SPORT CONCUSSION ASSESSMENT TOOL – 5TH EDITION

DEVELOPED BY THE CONCUSSION IN SPORT GROUP
FOR USE BY MEDICAL PROFESSIONALS ONLY

supported by



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 professionals¹. 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.

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

| | Y | N |
|--|---|---|
| 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 QUESTIONS²

"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

| | Y | N |
|--|---|---|
| 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)³

| Time of assessment | | | |
|---------------------------------------|---|---|---|
| Date of assessment | | | |
| Best eye response (E) | | | |
| 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 |
| Best verbal response (V) | | | |
| No verbal response | 1 | 1 | 1 |
| Incomprehensible sounds | 2 | 2 | 2 |
| Inappropriate words | 3 | 3 | 3 |
| Confused | 4 | 4 | 4 |
| Oriented | 5 | 5 | 5 |
| Best motor response (M) | | | |
| 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.

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:

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

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

STEP 3: COGNITIVE SCREENING

Standardised Assessment of Concussion (SAC)⁴

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 |
| Orientation score | of 5 | |

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 | | | |
| Immediate Memory Score | | | | | | of 15 | | |
| Time that last trial was completed | | | | | | | | |

| 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 | | | |
| Immediate Memory Score | | | | | | of 30 | | |
| Time that last trial was completed | | | | | | | | |

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 |
| Digits Score: | | | | | of 4 |

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 | |

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) testing⁵

Which foot was tested Left (i.e. which is the non-dominant foot) 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 |
| Total Errors | _____ 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.

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)⁵ testing

This balance testing is based on a modified version of the Balance Error Scoring System (BESS)⁵. 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

1. McCrory et al. Consensus Statement On Concussion In Sport – The 5th International Conference On Concussion In Sport Held In Berlin, October 2016. British Journal of Sports Medicine 2017 (available at www.bjsm.bmj.com)
2. Maddocks, DL; Dicker, GD; Saling, MM. The assessment of orientation following concussion in athletes. Clinical Journal of Sport Medicine 1995; 5: 32-33
3. Jennett, B., Bond, M. Assessment of outcome after severe brain damage: a practical scale. Lancet 1975; i: 480-484
4. McCrea 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

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 3

Child Sports Concussion Assessment Tool – 5th edition (Child SCAT5)

Child SCAT5[®]

SPORT CONCUSSION ASSESSMENT TOOL
FOR CHILDREN AGES 5 TO 12 YEARS
FOR USE BY MEDICAL PROFESSIONALS ONLY

supported by



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 professionals¹.

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.

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)²

| | | | |
|--------------------|--|--|--|
| Time of assessment | | | |
| Date of assessment | | | |

Best eye response (E)

| | | | |
|---------------------------------|---|---|---|
| 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 |

Best verbal response (V)

| | | | |
|--------------------|---|---|---|
| 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 |
| Best motor response (M) | | | |
| 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.

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: _____

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 Report³

| | 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?

STEP 3: COGNITIVE SCREENING

Standardized Assessment of Concussion - Child Version (SAC-C)⁴

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 | | | |
| Immediate Memory Score | | | | | | of 15 | | |
| Time that last trial was completed | | | | | | | | |

| 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 | | | |
| Immediate Memory Score | | | | | | of 30 | | |
| Time that last trial was completed | | | | | | | | |

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 |
| Digits Score: | | | | | of 5 |

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 |

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 (BESS) testing⁵

Which foot was tested Left (i.e. which is the non-dominant foot) 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 |
| Total Errors | 5-9 y/o _____ of 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.



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

CLINICAL NOTES:



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.

Name: _____
DOB: _____
Address: _____
ID number: _____
Examiner: _____
Date: _____

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

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"> The child is to complete the Child Report, according to how he/she feels today, and The parent/carer is to complete the Parent Report according to how the child has been over the previous week. | <ul style="list-style-type: none"> The child is to complete the Child Report, according to how he/she feels now. 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. | <ul style="list-style-type: none"> The child is to complete the Child Report, according to how he/she feels today, and The parent/carer is to complete the Parent Report according to how the child has been over the previous 24 hours. |

For Total number of symptoms, maximum possible is 21

For Symptom severity score, add all scores in table, maximum possible is 21 x 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)⁵ 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)⁵.

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 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

- McCrory et al. Consensus Statement On Concussion In Sport – The 5th International Conference On Concussion In Sport Held In Berlin, October 2016. British Journal of Sports Medicine 2017 (available at www.bjsm.bmj.com)
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- Ayr, L.K., Yeates, K.O., Taylor, H.G., Brown, M. Dimensions of postconcussive symptoms in children with mild traumatic brain injuries. Journal of the International Neuropsychological Society. 2009; 15:19–30
- McCrea M. Standardized mental status testing of acute concussion. Clinical Journal of Sports Medicine. 2001; 11: 176-181
- Guskiewicz KM. Assessment of postural stability following sport-related concussion. Current Sports Medicine Reports. 2003; 2: 24-30

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 4

BJA Concussion & Strangulation Graduated Return to Play Infographic, October 2022

CONCUSSION / STRANGULATION INJURY



**JUDO CONCUSSION
& STRANGULATION
PROTOCOL | 2022**

Immediate removal from field of play
(confirm suspicion of concussion with Maddox questions, full trauma assessment for neck injury)

Any adverse signs?

Immediate HCP assessment or A&E

No adverse signs?

Follow Judo RTP

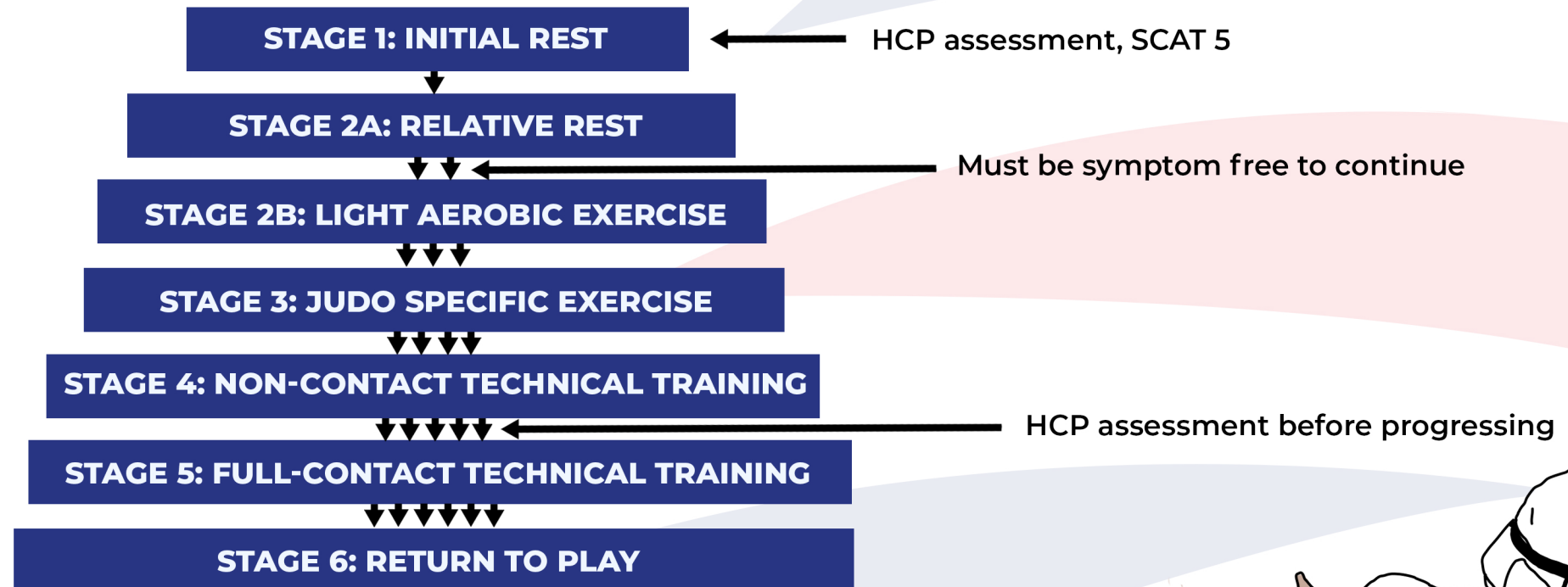
Minimum timings:

| AGE | STAGE 1 | STAGE 2 | TIME BETWEEN STAGES | TOTAL MINIMUM TIME |
|----------------------|-------------|---------|---------------------|--------------------|
| Under 19 | 24 - 48 hrs | 14 days | 48 hrs | RTP 23 - 24 days |
| 19 & over | 24 - 48 hrs | 14 days | 24 hrs | RTP 19 - 20 days |
| *19 & over enhanced* | 24 hrs | 24 hrs | 24 hrs | RTP 7 days |

WCPP athletes under direct medical supervision only

If person gets return of symptoms at any time:

| | |
|--------------------|---|
| Under 19 | Full rest for 48 hrs or until symptom free Then resume protocol at level below |
| 19 and over | Full rest for 24 hrs or until symptom free Then resume protocol at level below |



| STAGE | AIM | DETAILS / ACTIVITIES |
|-------|--|--|
| 1 | INITIAL REST (MIND & BODY) | 24-48 hrs Complete physical & cognitive rest (no exercise, minimize screen time on electronics, time off work / study) Review by HCP & SCAT 5 assessment ASAP after injury (at earliest 10 mins after) |
| 2 | RELATIVE REST | 14 days Return to normal daily activities that don't provoke symptoms. Must be symptom free at end of this stage before continuing |
| 2B | LIGHT AEROBIC EXERCISE (INCREASE HEART RATE) | 5 x 4mins on / 4 mins off session (total of 20 mins work in a 40 min session) Work to <70% maximum heart rate. Light bike / jogging / walk / swim. No resistance training |
| 3 | JUDO SPECIFIC EXERCISE (ADD IN JUDO MOVEMENTS) | Total session time <45 mins, regular 3-4 min rest intervals to ensure no symptoms Work to <80% maximum heart rate No head impact. Banded Uchikomi (no Uke), ladder drills, Ashi-waza with cones |
| 4 | NON-CONTACT TECHNICAL TRAINING (INCREASE EXERCISE, CO-ORDINATION & COGNITIVE LOAD) | Must return to work / education before returning to judo S&C: Progressive loadings 50-75% & start resistance training Total session time <60 mins, regular 3-4 min rest intervals to ensure no symptoms Work to <90% maximum heart rate No head impact. Stand grip fighting, Uchikomi with Uke. No Nagekomi, Ne-waza, Tachi-waza Must have clearance from HCP / GP before progressing to next stage |
| 5 | FULL-CONTACT TECHNICAL TRAINING (INCREASE JUDO CONFIDENCE & ASSESS FUNCTIONAL SKILLS) | S&C: progressive loadings 75% - normal pre-injury activity Full unrestricted Uchikomi & Nagekomi, open play Ne-waza & Tachi-waza Regular 3-4 min rest intervals to ensure no symptoms Must be supervised by Judo coach to assess if back to normal self |
| 6 | FULL-CONTACT TECHNICAL TRAINING (INCREASE JUDO CONFIDENCE & ASSESS FUNCTIONAL SKILLS) | Return to open play Randori |

Appendix 5

BJA Concussion & Strangulation advice sheet



Concussion and Strangulation Advice Sheet

(to be given to the responsible adult monitoring the athlete)

Athlete's name:

Date / time of injury:

Date / time of medical review:

Name of health care professional:

This athlete has received a head injury or strangulation injury. A medical assessment has been carried out and no sign of serious complication has been found at this stage. Recovery time is variable among individuals, and the athlete will need to be monitored for a further period by a responsible adult. Your medical team 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 accident & 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.
- 5) Follow the BJA Judo Specific Graduated Return to Play protocol to allow you to recommence judo training & competition safely.



JUDO CONCUSSION & STRANGULATION PROTOCOL | 2022



CONCUSSION / STRANGULATION INJURY

Immediate removal from field of play

(confirm suspicion of concussion with Maddox questions, full trauma assessment for neck injury)

Any adverse signs?

Immediate HCP assessment or A&E

No adverse signs?

Follow Judo RTP

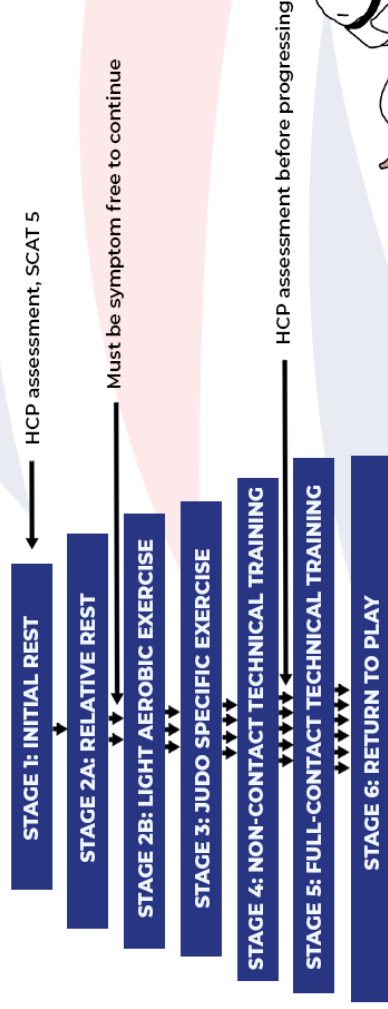
Minimum timings:

| AGE | STAGE 1 | STAGE 2 | TIME BETWEEN STAGES | TOTAL MINIMUM TIME |
|----------------------|-------------|---------|---------------------|--------------------|
| Under 19 | 24 - 48 hrs | 14 days | 48 hrs | RTP 23 - 24 days |
| 19 & over | 24 - 48 hrs | 14 days | 24 hrs | RTP 19 - 20 days |
| *19 & over enhanced* | 24 hrs | 24 hrs | 24 hrs | RTP 7 days |

WCPP athletes under direct medical supervision only

If person gets return of symptoms at any time:

| | |
|--------------------|---|
| Under 19 | Full rest for 48 hrs or until symptom free Then resume protocol at level below |
| 19 and over | Full rest for 24 hrs or until symptom free Then resume protocol at level below |



| STAGE | AIM | DETAILS / ACTIVITIES |
|-------|---|---|
| 1 | INITIAL REST (MIND & BODY) | 24-48 hrs complete physical & cognitive rest (no exercise, minimize screen time on electronics, time off work / study) Review by HCP & SCAT 5 assessment ASAP after injury (at earliest 10 mins after) |
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| 5 | FULL-CONTACT TECHNICAL TRAINING (INCREASE JUDO CONFIDENCE & ASSESS FUNCTIONAL SKILLS) | S&C: progressive loadings 75% - normal pre-injury activity Full unrestricted Uchikomi & Nagakomi, open play Ne-waza & Tachi-waza Full contact drills, no head impact, no symptoms Must be supervised by Judo coach to assess if back to normal self |
| 6 | FULL-CONTACT TECHNICAL TRAINING (INCREASE JUDO CONFIDENCE & ASSESS FUNCTIONAL SKILLS) | Return to open play Randori |