CONCUSSION GUIDELINES – 2025 UPDATE

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1. Summary Principles

- Concussion must be taken extremely seriously to safeguard the long-term welfare of athletes.
- Athletes suspected of having concussion must be removed from play and must not resume competition or training that day.

- Athletes suspected of having concussion must be medically assessed.
- Athletes diagnosed with concussion must go through a graduated return to play protocol (GRTP).
- **If in doubt, sit them out—no exceptions.**
- Medical clearance is mandatory before returning to unrestricted play.

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2. Introduction

Sport-related concussion (SRC) demands precise, cautious management due to the variety of ways it may present. Our original guidance (2017) was in line with international recommendations from Berlin 2016. (1) More recent insights, notably from the Amsterdam 2022 Consensus (2), emphasize early return to light physical activity, updated assessment tools (SCAT6, Child SCAT6, and so forth), and added considerations for potential long-term effects.

Another emerging point is the recognition of "Spontaneous Headshake after a Kinematic Event (SHAAKE)" as a possible sign of concussion. This particular headshake, typically appearing in the moments after a collision, may help identify athletes needing closer evaluation. (3)

These updated guidelines provide a clear and practical framework informed by the most recent evidence and consensus. While maintaining a conservative approach to management, they incorporate expanded insights into early rehabilitation, improved clinical assessment methods, and the importance of ongoing monitoring for symptoms that may persist beyond the initial recovery period.

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3. What is Concussion?

Concussion is a traumatic brain injury caused by either a direct blow to the head or by an indirect force transmitted to the head or neck. (2,4) Unlike major structural damage, concussion typically involves a disruption of brain function that can manifest through a range of symptoms and subtle signs. Neuroimaging (MRI or CT) often appears normal because concussion is generally a functional injury rather than a lesion visible on standard scans.

Symptoms may emerge immediately, or they can take hours (and occasionally days) to become apparent. Although these issues typically resolve within days or weeks, some athletes experience prolonged symptoms. As a result, every suspected concussion must be treated with the utmost care.

3.1 Concussion Must Be Taken Extremely Seriously

While many head impacts do not result in concussion, the potential for lasting damage means that any athlete believed to have a concussion must not continue playing. Returning to play before full recovery carries the risk of extended recovery times, further brain injury, or, in rare cases, catastrophic outcomes.

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4. What Are the Signs of Concussion?

Anyone observing an athlete in a practice or game setting should recognize potential indicators of concussion. Even if loss of consciousness rarely occurs, the presence of one or more of the common symptoms (see Table 1) mandates an immediate evaluation.

Table 1: Common Early Signs and Symptoms of Concussion

Indicator	Evidence
Symptoms	Headache, Dizziness, Light/sound sensitivity, "Foggy" feeling, Vomiting, Double vision, Disorientation, Tinnitus
Physical Signs	Loss of consciousness (suspected or confirmed), Seizure or tonic posturing, Poor balance, Blank/vacant stare, Slowed to get up
Behavioural Changes	Irritability, Emotional fluctuations, Anxiety
Cognitive Changes	Slowed reaction time, Confusion, Memory deficits, Poor attention/concentration
Sleep Disturbance	Drowsiness, Change in sleep patterns (inability to sleep or sleeping more than usual)

If there is even slight uncertainty, the safest action is to remove the athlete from play and arrange a thorough clinical evaluation.

4.1 A Potential New Sign: Spontaneous Headshake After a Kinematic Event (SHAAKE)

Recent research has brought attention to a possible additional sign of concussion known as **SHAAKE**—Spontaneous Headshake After a Kinematic Event. (3) This behaviour involves a rapid, brief side-to-side headshake that athletes sometimes display a few seconds to minutes following a collision or impact to the head or body.

Based on self-reports from athletes across multiple sports, SHAAKE appears strongly correlated with concussion symptoms, including dizziness, confusion, or that sensation of "needing to jumpstart the brain." In one survey, about seven in ten athletes recalled performing this specific headshake after a collision, and most linked it to a self-reported concussion. (3) While it is not yet considered a definitive "no-go" sign, recognizing SHAAKE may be helpful in flagging an athlete for immediate clinical evaluation.

It is important to note that a purposeful head shake can also be observed in the absence of concussion—for instance, as an emotional reaction or from minor pain. To distinguish SHAAKE from

such a purposeful head shake, consider the following features: timing, nature of movement, lack of purpose and associated or linked symptoms.

Table 2: Comparison of SHAAKE and Normal Head Shake

Feature	**SHAAKE**	**Normal Head Shake**
Trigger	Immediately follows a head impact	No recent impact; often internal decision
Speed	2–3 shakes per second	Usually slower or deliberate
Duration	Less than 2 seconds	Often longer, with variable duration
Purpose	Involuntary, not communicative	Often purposeful (e.g., "no" gesture)
Other clues	No clear external reason; post impact	Clear reason (emotion, discomfort, etc.)
Symptoms	May accompany confusion, dizziness, etc.	No associated concussion symptoms

Nonetheless, if any athlete shows a spontaneous headshake after a notable collision, this new data supports evaluating them for concussion, in much the same way we would if they were slow to get up or appeared dazed.

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5. Stage 1: Diagnosis and Management of Concussion

5.1 Basic First Aid Rules

When a possible concussion is suspected, ensure the athlete is stable and that the cervical spine is protected if there is any concern for a neck injury. This preliminary step includes checking Glasgow Coma Scale (GCS) and performing quick orientation checks (Maddocks questions). If the athlete's condition seems severe or deteriorates, arrange urgent transportation to a hospital.

5.2 Recognise and Remove

Remove the athlete immediately from the field of play if concussion is suspected. This crucial action helps protect against a second impact and allows for timely evaluation.

5.3 If in Doubt, Sit Them Out

Never hesitate when there is **any** doubt whatsoever about a potential concussion. Removing the athlete helps avoid further harm while awaiting a proper assessment. Prolonged play with a possible concussion increases the risk of **Second Impact Syndrome**, an exceedingly rare yet catastrophic condition involving severe brain swelling if a second blow happens before the athlete has recovered from the first. The consequences of missing a concussion can be significant, so the safest choice is always:

> **"If in doubt, sit them out—no exceptions."**

5.4 Continue to Monitor

Symptoms can worsen or arise later. Monitoring for 24 to 48 hours remains vital. If new symptoms emerge (for example, a delayed headache or confusion), the athlete should be reassessed.

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6. Medical Practitioner and/or Healthcare Professional Present

If the setting includes on-site medical support, suspected concussion should be evaluated right away. This typically involves a thorough exam, memory testing, balance testing, neurological checks, and cervical spine clearance.

6.1 Memory Questions

It is common to use brief orientation questions (commonly known as Maddocks questions), for instance:

- "What venue are we at?"
- "Which run or period are we in?"
- "What was your score in your last competition?"

Failure to respond correctly, or any confusion, strongly suggests removing the athlete from play for more extensive evaluation.

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7. Medical Practitioner and/or Healthcare Professional Not Present

In settings without dedicated on-site medical professionals, the decision to remove an athlete for a potential head injury often falls to coaches, parents, or officials. If any of the symptoms or behaviours in Table 1 or the newer SHAAKE sign (3) are noted, do not allow the athlete to continue. The athlete should be referred to a qualified healthcare professional at the earliest opportunity.

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8. Onset of Symptoms – Potential Delay

Signs and symptoms of concussion, including headaches or dizziness, can sometimes emerge well after the initial injury—often within 24–48 hours. (4) Continual observation is essential, as late-emerging problems are not uncommon.

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9. Stage 2: Return to Play

Historically, guidelines advised strict rest until all symptoms and signs resolved. Evolving evidence now indicates a brief period of relative rest (24–48 hours) followed by light activity can aid in recovery. (2,5)

9.1 Graduated Return to Play Protocol (GRTP)

Once an athlete experiences no more than mild, brief symptom flare-ups with daily activities, it is reasonable to begin a stepwise increase in physical exertion, as detailed in Table 2.

Table 2: Graduated Return to Play Protocol (GRTP)

Stage	Functional Exercise	Objective
1. No Activity	Relative rest (initial 24–48 hours), activities of daily living only.	Basic recovery
2. Light Aerobic Exercise	Gentle walking or stationary bike, <70% max HR	Increase heart rate
3. Individual Sport-Specific Exercise	Sport drills without collision risk	Add movement, skill elements
4. Non-Contact Training Drills	More complex drills, can add light resistance	Elevate coordination and cognitive load
5. Full Contact Practice (Medical Clearance)	Unrestricted training with teammates	Restore confidence, evaluate performance level
6. Return to Play (Competition)	Full game participation	Complete reintegration

Each step typically takes **at least** 24 hours. If significant symptoms return, the athlete must return to the previous asymptomatic step and await resolution before progressing.

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10. Children & Adolescents

A more conservative approach is warranted for younger athletes due to ongoing brain development and the importance of avoiding academic setbacks.

10.1 Return to School Strategy

The Return to School (or Return to Learn) process typically unfolds stepwise (see Table 3). Any child or teen having trouble with reading, focusing, or screen use after a concussion might need gradual accommodations such as partial school days or postponed exams.

Table 3: Return to School Strategy

Stage	Aim	Activity	Goal
1	Gentle daily activities with minimal aggravation	Quiet tasks at home (low-volume screen time, light reading)	Gradual reintroduction to basic cognitive tasks
2	School-type activities	Homework, limited or modified reading, short periods of studying	Increase cognitive tolerance
3	Part-time school attendance	Partial classes with rest breaks as needed	Progress academic load in a controlled manner
4	Full school attendance	Normal schedule, reintroduce missed exams or projects	Full academic activities without concussion-related difficulties

Where possible, coordinate with teachers, coaches, and parents so academic expectations align with health priorities.

10.2 Recurrence of Symptoms During GRTP

Should symptoms intensify during the GRTP protocol, the athlete should stop activity for 24 hours and then resume at the prior stage.

10.3 Return of Symptoms

Sometimes, an athlete who has been cleared may suddenly experience recurring headaches, balance problems, or mood disturbances. Even new signs such as SHAAKE can prompt re-evaluation. If symptoms have returned, it is recommended to reduce or pause physical activity and consult a healthcare professional for further assessment.

10.4 Residual Effects and Sequelae

Post-concussion symptoms can vary widely. Some individuals may notice lingering headaches, mood changes, or slowed processing well after the apparent initial recovery. This underscores why careful follow-up is crucial. (6,7)

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11. Additional Considerations Since 2017

11.1 Updated Assessment Tools

Key updates include:

- **Sport Concussion Assessment Tool**: The SCAT5 has evolved into the **SCAT6** (and **Child SCAT6**). (4)
- **Concussion Recognition Tool**: The CRT6 is available for non-healthcare personnel to help them spot likely concussion. (8)
- **Sport Concussion Office Assessment Tool**: The newly introduced SCOAT6 (and Child SCOAT6) is meant for subacute or clinical office follow-up beyond the first 72 hours. (2,9)

These tools incorporate more robust word lists and extra balance measures. They are best used in conjunction with clinical judgment; a normal score does not fully exclude concussion if the athlete's history or presentation suggests otherwise.

11.2 Early Return to Light Physical Activity

Instead of protracted bed rest in a dark room, research now shows that early, controlled physical activity—provided it does not unduly aggravate symptoms—may speed recovery (5,10). Activities could include slow walking, gentle cycling, or minimal-risk drills.

11.3 Rehabilitation Strategies for Persistent Symptoms

While many concussions resolve within days to a few weeks, a subset of people develop symptoms that last four weeks or more. (2) Individualized rehabilitation (7) may involve:

- **Cervicovestibular therapy** for neck pain, dizziness, or balance deficits.
- **Subsymptom threshold exercise** (aerobic protocols limited to intensities below what provokes significant symptom exacerbation).
- **Targeted psychological care** for depression, anxiety, or other mental health challenges related to the concussion.

11.4 Potential Long-Term Effects

Studies remain ongoing to determine whether repeated concussions or cumulative head impacts contribute to conditions such as chronic traumatic encephalopathy or other neurodegenerative disorders. (2,11) No consensus yet exists on precisely which factors place an athlete at highest risk. It remains prudent to document each concussion carefully and manage each injury thoroughly.

11.5 Retirement from Contact/Collision Sport

In cases where multiple concussions or persistent symptoms significantly impact daily life and performance, an athlete, family, and medical team may discuss retirement . Such a decision is highly individualized, taking into account how easily concussions occur, previous recovery times, underlying health conditions, and the athlete's level of competition or career aspirations.

11.6 Concussion in Para Athletes

Concussion in para sport is increasingly recognized. (2,12) Athletes with visual impairment, limb deficiency, or neurological injury may need tailored examinations; standard balance tasks may not be feasible, or the baseline pattern of "symptoms" can differ. Baseline testing can help distinguish new concussion-related changes from existing limitations.

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12. Useful Links

1. Berlin Consensus Statement 2016
   http://bjsm.bmj.com/content/51/11/838
2. Amsterdam Consensus Statement (2022)
   https://bjsm.bmj.com/content/57/11/695
3. CRT6
   https://bjsm.bmj.com/content/bjsports/57/11/692.full.pdf
4. SCAT 6
   https://bjsm.bmj.com/content/bjsports/57/11/622.full.pdf
5. Child SCAT6
   https://bjsm.bmj.com/content/bjsports/57/11/636.full.pdf
6. SCOAT6
   https://bjsm.bmj.com/content/bjsports/57/11/651.full.pdf

Many sports bodies worldwide have free online resources that offer concussion-specific education. Check your local or national sports organizations for the latest guidelines and support materials.

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