



FIG – CONCUSSION GUIDELINES

A **concussion care guideline** has been developed, via a collaborative effort of the international gymnastics medical community, to help guide the medical care of athletes who have a suspected concussion. The concussion care policy should serve as a standardized method of assessment to ensure accurate diagnosis and appropriate management for the injured gymnast following a sports concussion.

Purpose

This guideline covers the recognition, medical diagnosis, and management of gymnasts who sustain a suspected concussion during a sport activity. It aims to ensure that athletes with a suspected concussion receive timely and appropriate care and proper management to allow them to return to their sport safely. This guideline may not address every possible clinical scenario that can occur during sport-related activities but includes critical elements based on the latest evidence and current expert consensus.

Who should use this protocol?

This protocol is intended for use by all individuals who interact with gymnasts suspected of sustaining a concussion injury. It is appropriate for all individuals to be aware of proper protocols and management strategies. Individuals may include: the athlete, parents, coaches, officials, and licensed healthcare professionals.

1. Pre-Season Education

Despite recent increased attention focusing on concussion there is a continued need to improve concussion education and awareness. Optimizing the prevention and management of concussion depends highly on annual education of all sport stakeholders (athletes, parents, coaches, officials, and licensed healthcare professionals) on current evidence-informed approaches that can help identify and manage an athlete with a suspected concussion.

Concussion education should include information on:

- the definition of concussion
 - possible mechanisms of injury
 - common signs and symptoms
 - steps that can be taken to prevent concussions and other injuries from occurring in sport
 - what to do when an athlete has suffered a suspected concussion or more serious head injury
 - what measures should be taken to ensure proper medical assessment
 - Return-to-School and Return-to-Sport Strategies
 - Return to sport medical clearance requirements
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- ❖ Who: Athletes, parents, coaches, officials, and licensed healthcare professionals
 - ❖ How: Pre-season Concussion Education Sheet, online education resources, face-to-face education

[All individuals should be encouraged to review the FIG Concussion Education Sheet and get acquainted with all available FIG Concussion Education resources.]

2. Head Injury Recognition

Although the formal diagnosis of concussion should be made following a medical assessment, all sport stakeholders including athletes, parents, coaches, officials, and licensed healthcare professionals should be responsible for the recognition and reporting of an athlete who demonstrates visual signs of a head injury or who reports concussion-related symptoms.

A concussion should be suspected:

- in any athlete who sustains a significant impact to the head, face, neck, or body and demonstrates ANY of the visual signs of a suspected concussion or reports ANY symptoms of a suspected concussion as detailed in the Concussion Recognition Tool (CRT 6) – see Appendix 1
- if an athlete reports ANY concussion symptoms to one of their peers, parents, or coaches, or if anyone witnesses an athlete exhibiting any of the visual signs of concussion – see Appendix 1

In some cases, an athlete may demonstrate signs or symptoms of a more severe head or spine injury including convulsions, worsening headaches, vomiting or neck pain. If an athlete demonstrates any of the 'Red Flags' indicated by the Concussion Recognition Tool 6 (Appendix 1), a more severe head or spine injury should be suspected, and Emergency Medical Assessment should be pursued.

If a possible concussion event has occurred and a licensed healthcare practitioner is NOT available, the athlete should be removed from practice or competition and referred immediately for medical assessment. The athlete must not return to play until receiving formal medical clearance.

- ❖ Who: Athletes, parents, coaches, officials, and licensed healthcare professionals
- ❖ How: Pre-season Concussion Education Sheet, online education resources, face-to-face education

3. Onsite Medical Assessment – Health Care Professionals

If there is a concern for a more severe head injury, or a cervical spine event, emergency medical services should be contacted.

In the event of a suspected concussion, the on-site licensed healthcare professional should complete a formal concussion assessment via available sideline medical assessment tools, such as the Sports Concussion Assessment Tool 6 (SCAT6). (Appendix 2)

Sideline Medical Assessment

If an athlete is suspected of sustaining a concussion and there is no concern for a more serious head or spine injury, the player should be immediately removed from the field of play, evaluated and monitored.

The athlete should be taken to a quiet area and undergo a sideline medical assessment using the Sport Concussion Assessment Tool 6 (SCAT6) (Appendix 2) or the Child SCAT6 (used for ages 8-12) (Appendix 3). This policy also includes Maddocks Questions modified for gymnastics, which can be found in Appendix 4.

The SCAT6 and Child SCAT6 are clinical tools that should only be used by a licensed healthcare professional that has experience using them.

It is important to note that the results of SCAT6 and Child SCAT6 testing can be normal in the setting of acute concussion. As such, these tools can be used by licensed healthcare professionals to document initial neurological status but should not be used to make sideline return-to-sport decisions in athletes. Any athlete who is suspected of having sustained a concussion, or has been diagnosed with a concussion, must NOT return to the practice or competition and must be referred for further

medical assessment by a licensed healthcare professional. Until further assessment is obtained, the athlete should be monitored for new or worsening symptoms and/or signs of concussion.

If an athlete has been removed from play following a significant impact and has undergone a formal concussion assessment by a licensed healthcare professional trained in concussion care, there are NO visual signs of a concussion, the athlete reports NO concussion symptoms, and the healthcare professional determines that a concussion has not occurred, then the athlete can be returned to play but should be monitored for delayed symptoms. If the athlete develops delayed symptoms, the athlete should be removed from play and undergo further medical assessment.

- ❖ Who: Licensed healthcare professionals – Athletic therapist/trainer, physiotherapist, medical doctor
- ❖ How: Sport Concussion Assessment Tool 6 (SCAT6), Child Sport Concussion Assessment Tool 6 (Child SCAT6)

4. Medical Assessment

To provide comprehensive evaluation of athletes with a suspected concussion, the medical assessment must rule out more serious forms of traumatic brain and spine injuries as well as medical and neurological conditions that can present with concussion-like symptoms, and must make the diagnosis of concussion based on findings of the clinical history and physical examination and the evidence-based use of adjunctive tests as indicated. Appropriate healthcare professionals will vary per country, but the practitioner should be specifically trained in the care of a sports concussion. Athletes should not return to gymnastics unless a formal assessment has been completed and formal medical clearance obtained.

- ❖ Who: Healthcare professionals trained in sports concussion
- ❖ How: Medical Assessment Letter

5. Concussion Management

When an athlete has been diagnosed with a concussion, it is important that all stakeholders are informed, including the athlete's parent/legal guardian, coach, and healthcare team. It is also important for the athlete to provide this information to sport organization officials that are responsible for injury reporting and concussion surveillance where applicable.

Athletes diagnosed with a concussion should be provided with education about the signs and symptoms of concussion, strategies about how to manage their symptoms, the risks of returning to sport without medical clearance and recommendations regarding a gradual return to school and sport activities. Athletes diagnosed with a concussion should be managed according to international consensus guidelines, which are included in this FIG Concussion Guideline. It is also recommended that individual national federations adopt concussion policies in line with international consensus and this FIG protocol. A progressive recovery process should include:

1. Relative rest, which includes activities of daily living and reduced screen time, is recommended immediately and for up to the first 2 days after injury. Individuals can return to light-intensity physical activity (PA), such as walking that does not more than mildly exacerbate symptoms, during the initial 24–48 hours following a concussion.
2. Periodic medical assessment to:
 - a. Evaluate recovery process
 - b. Screen for additional symptom generators
 - c. Referral to additional medical specialties for multidisciplinary approach when applicable
 - d. Guidance on return to academic and sport activities
3. Initiation and completion of a sport-specific return-to-gymnastics strategy, under the supervision of a medical practitioner. (See below for details regarding the Gymnastics-Specific Return-to-Sport Guideline)

Once the athlete has completed the Gymnastics-Specific Return-to-Sport Guideline and are deemed to be clinically recovered from their concussion, an appropriate medical practitioner can reassess the athlete for clearance back to full participation.

The stepwise progression included in the Gymnastics-Specific Return-to-Sport Guideline is outlined below.

- ❖ Who: Healthcare professionals trained in sports concussion
- ❖ How: FIG or federation-based concussion management policy

6. Gymnastics-Specific Return-to-Sport Strategy

The following is an outline of the return-to-sport strategy that should be used to help athletes, coaches, trainers, and medical professionals facilitate a safe and gradual return to sport activities. Return-to-sport strategy starts after evaluation from an appropriate healthcare provider. Early return to aerobic and strengthening activities can be considered per symptom parameters and physician guidance. Stage 1 activities can begin 24 hours after a concussion event, while monitoring for symptom exacerbation. Mild and brief exacerbation of symptoms associated with activity is defined as an increase of no more than 2 points, on a 0-10 point scale, for less than one hour, when compared to the baseline value reported prior to the start of the physical activity. If more than a mild exacerbation of symptoms occurs (more than 2 points for more than an hour), the gymnast should stop and wait until the following day to resume activity.

The athlete should take a minimum of 24 hours to complete each step in the progression. If the athlete experiences new symptoms or worsening symptoms at any stage, they should go back to the previous stage that they completed symptom-free, wait for symptoms to resolve, and then begin the progression again.

It is important to note that symptom resolution can take an average of 7-10 days for adults, and 2-4 weeks for children. Appropriate expectations and time are essential for a safe return to sport.

In a setting that does NOT include close medical team oversight a defined period of rest can be considered prior to starting the following:

- Return-to-sport strategy: a minimum of 24 hours
- Clearance back to full sport participation: a minimum of 14 days for adults, and 28 days for children

Below is the Gymnastics-Specific Return-to-Sport Strategy table, which gives a basic outline for return to gymnastics following a concussion event. A more detailed and discipline-specific protocol can be developed by appropriate medical professionals, with familiarity of elite gymnastics, in collaboration with gymnastics coaching staff.

- ❖ Who: Healthcare professionals trained in sports concussion
- ❖ How: Gymnastics-Specific Return-to-Sport Strategy

SPORT CONCUSSION

Gymnastics-Specific Return-to-Sport Strategy

Return-to-Sport strategy starts after evaluation from an appropriate healthcare professional. Early return to aerobic and strengthening activities can be considered per symptom parameters* and medical guidance. A minimum of 24 hours should separate each step within this Return-to-Sport strategy.

STAGE	AIM	ACTIVITY	GOAL OF EACH STEP
1	Early aerobic and strength activities	<ul style="list-style-type: none"> All activities progressed per symptom parameters* Light aerobic activity progressed to moderate intensity activity: Stationary bike, walking, light jogging, sprinting Strength & flexibility activity: Body weight training progressed to higher intensity gymnastics-specific strengthening Low impact landing drills 	<ul style="list-style-type: none"> Gradual reintroduction of work/school activities Need to achieve academic return, symptom resolution, and medical clearance prior to starting Stage 2**
2	Return to early sport specific training: <i>Inversion</i>	<ul style="list-style-type: none"> Start basic, non-dynamic inversion (ie. Handstands) Discipline-specific progression: <ul style="list-style-type: none"> Ar – all events - basic swings/tap swings/cast handstands, leaps, jumps & dance on ground/low heights, sprints R – basic dance, no rotation TT – non-impact, land-based drills, straight bounces Ac/G – dance choreography only P – running, jump drills without obstacles 	<ul style="list-style-type: none"> Increase heart rate Start non-dynamic basic skills Limited inversion No twisting or flipping
3	Progress sport specific training: <i>Flipping</i>	<ul style="list-style-type: none"> As above with increased intensity Discipline-specific progression: <ul style="list-style-type: none"> Ar – FX-basic tumbling/B-series on floor/UB&HB-giants/R-static strength holds (ie. L sit, planche), inlocates, dislocates/V - timers R – advance dance, rotation, basic throws (Indiv./No Group) Tr- straight bounces, level 10 single flipping skills DM- soft landing, straight bounces, single rotation on & off Tu – soft landing, basic HS, RH, RH, BHS, combining two skills Ac/G – basic balance/lift drills/limit # of lifts, basic tumbling P - low height hurdles, climbs, flipping drills 	<ul style="list-style-type: none"> Add full inversion Advance basic skills Limited flipping No twisting
4	Progress sport specific training: <i>Twisting</i>	<ul style="list-style-type: none"> As above with increased complexity Discipline-specific progression: <ul style="list-style-type: none"> Ar – add twisting, complex flipping, release timers, high beam R – add full throws, rotation, sequences (Indiv./No Group) Tr– add double salto skills and single twisting skills DM- soft landings, single mount flipping skills, double landing skills, single twist on or off Tu – soft landing, combining skills down the floor, double salto, complex flipping, single twist Ac/G – progress from basic to advance balance, lift skills, twisting P - high height hurdles, climbs, flip & twist without obstacles 	<ul style="list-style-type: none"> Add complex flipping Start basic twisting
5	Progress sport specific training: <i>Advanced Skills</i> <i>*Medical clearance required to move to step 6</i>	<ul style="list-style-type: none"> As above with increased complexity Discipline-specific progression: <ul style="list-style-type: none"> Ar – complex skills, higher risk skills (i.e. release skills) R – continue full skills/sequences, integrate with Group Tr- working rotation and twisting, progress to loop skills 1-5/5-10 together with limited turns DM - hard landings, progress to mounts and dismounts in limited # Tu – combo of inverted skills and one twisting skill in combination, complex flip/twist skills, basic sequences Ac/G – add full tumbling, lift, balance skills, progress to full routines with choreography P – add flip/twist with obstacles 	<ul style="list-style-type: none"> Combine complex inversion and rotation Improve endurance & strength
6	Return to full training	<ul style="list-style-type: none"> All disciplines – full clearance Focus on slow increase in volume, to build stamina & strength Progress through the following steps: <ol style="list-style-type: none"> Single skill elements Combined elements/Sequences Routine parts Full routines 	<ul style="list-style-type: none"> Final full reintegration TT if symptoms reoccur go back to step 3

[Ar = Artistic; R = Rhythmic; TT = Tumbling & Trampoline; Ac/G = Acro/Group; P = Parkour; FX = Floor Exercise; B = Beam; PH = Pommel Horse; PB = Parallel Bars; UB = Uneven Bars; R = Rings; HB = High Bar; Indv = Individual; Tr = Trampoline; DM = Double Mini; Tu = Tumbling]

*Stage 1 activities can begin within 24 hours of a concussion event, while monitoring for symptom exacerbation. Mild and brief exacerbation of symptoms associated with activity, defined as an increase of no more than 2 points, on a 0-10 point scale, for less than an hour, when compared to the baseline value reported prior to the start of the physical activity. If more than a mild exacerbation of symptoms occurs (more than 2 points for more than an hour), the gymnast should stop and wait till the following day to resume activity.

**A treating healthcare provider may consider progressing a gymnast through Stage 2 and Stage 3 during the completion of return-to-learn, if clinically appropriate.

Stage 2 or Beyond: If the gymnast experiences new or recurring symptoms, the gymnast should pause the progression, be reassessed by their treating physician, wait for symptoms to resolve, then restart at the previous symptom-free stage as directed by the treating healthcare provider.

7. Multidisciplinary Concussion Care

Most athletes who sustain a concussion while participating in sport will make a complete recovery and be able to return to full school and sport activities within 1-4 weeks of injury. However, some

individuals will experience symptoms that persist beyond this time frame. If available, individuals who experience persistent post- concussion symptoms (>4 weeks for youth athletes, >2 weeks for adult athletes) may benefit from a supervised multidisciplinary approach that may include medical doctor experts in sport concussion, neuropsychology, physiotherapy, occupational therapy, neurology, chiropractic medicine, osteopathic medicine, neurosurgery, and rehabilitation medicine.

Referral to other multidisciplinary practitioners for assessment should be made on an individualized basis at the discretion of an athlete's medical team. Depending on the clinical presentation of the individual, this treatment plan may involve a variety of health care professionals with areas of expertise that address the specific needs of the athlete.

8. Return to Sport

Athletes who have been determined to have not sustained a concussion and those that have been diagnosed with a concussion and have successfully completed their Gymnastics-Specific Return-to-Sport Strategy can be considered for return to full sports activities. The final decision to medically clear an athlete to return to full sport activity should be based on the clinical judgment of the medical team.

The following criteria must be met prior to return to gymnastics after a concussion event:

1. Gymnast is consistently symptom free
2. Successful reintegration of symptom-free activities of daily living, as well as academic and/or work activities
3. Successful completion of the Gymnastics-Specific Return-to-Sport Strategy
4. A final evaluation by the medical team is completed and the athlete is cleared to return to full gymnastics activities

Following return to full activities, if the athlete experiences any new concussion-like symptom, they should be instructed to stop gymnastics immediately and undergo reassessment with their medical team.

CRT6™

Concussion Recognition Tool

To Help Identify Concussion in Children, Adolescents and Adults



What is the Concussion Recognition Tool?

A concussion is a brain injury. The Concussion Recognition Tool 6 (CRT6) is to be used by non-medically trained individuals for the identification and immediate management of suspected concussion. It is not designed to diagnose concussion.

Recognise and Remove

Red Flags: CALL AN AMBULANCE

If **ANY** of the following signs are observed or complaints are reported after an impact to the head or body the athlete should be immediately removed from play/game/activity and transported for urgent medical care by a healthcare professional (HCP):

- Neck pain or tenderness
- Seizure, 'fits', or convulsion
- Loss of vision or double vision
- Loss of consciousness
- Increased confusion or deteriorating conscious state (becoming less responsive, drowsy)
- Weakness or numbness/tingling in more than one arm or leg
- Repeated Vomiting
- Severe or increasing headache
- Increasingly restless, agitated or combative
- Visible deformity of the skull

Remember

- In all cases, the basic principles of first aid should be followed: assess danger at the scene, check airway, breathing, circulation; look for reduced awareness of surroundings or slowness or difficulty answering questions.
- Do not attempt to move the athlete (other than required for airway support) unless trained to do so.
- Do not remove helmet (if present) or other equipment.
- Assume a possible spinal cord injury in all cases of head injury.
- Athletes with known physical or developmental disabilities should have a lower threshold for removal from play.

If there are no Red Flags, identification of possible concussion should proceed as follows:

Concussion should be suspected after an impact to the head or body when the athlete seems different than usual. Such changes include the presence of **any one or more** of the following: visible clues of concussion, signs and symptoms (such as headache or unsteadiness), impaired brain function (e.g. confusion), or unusual behaviour.

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**CRT6****Concussion Recognition Tool**
To Help Identify Concussion in Children, Adolescents and Adults**1: Visible Clues of Suspected Concussion**

Visible clues that suggest concussion include:

- Loss of consciousness or responsiveness
- Lying motionless on the playing surface
- Falling unprotected to the playing surface
- Disorientation or confusion, staring or limited responsiveness, or an inability to respond appropriately to questions
- Dazed, blank, or vacant look
- Seizure, fits, or convulsions
- Slow to get up after a direct or indirect hit to the head
- Unsteady on feet / balance problems or falling over / poor coordination / wobbly
- Facial injury

2: Symptoms of Suspected Concussion

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

Remember, symptoms may develop over minutes or hours following a head injury.

3: Awareness

(Modify each question appropriately for each sport and age of athlete)

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

- "Where are we today?"
- "What event were you doing?"
- "Who scored last in this game?"
- "What team did you play last week/game?"
- "Did your team win the last game?"

Any athlete with a suspected concussion should be - IMMEDIATELY REMOVED FROM PRACTICE OR PLAY and should NOT RETURN TO ANY ACTIVITY WITH RISK OF HEAD CONTACT, FALL OR COLLISION, including SPORT ACTIVITY until ASSESSED MEDICALLY, even if the symptoms resolve.

Athletes with suspected concussion should **NOT**:

- Be left alone initially (at least for the first 3 hours). Worsening of symptoms should lead to immediate medical attention.
- Be sent home by themselves. They need to be with a responsible adult.
- Drink alcohol, use recreational drugs or drugs not prescribed by their HCP
- Drive a motor vehicle until cleared to do so by a healthcare professional

Appendix 2 – Sports Concussion Assessment Tool 6 (SCAT6)
(Insert correct link here)

Appendix 3 – Child – Sports Concussion Assessment Tool 6 (Child-SCAT6)
(Insert correct link here)

Appendix 4 – Maddocks Questions for Gymnastics

Maddocks questions are used in many sports as part of the on-field assessment for concussion. These questions have generally been used in team sports.

Below we propose the following as an appropriate set of Maddocks Questions for Gymnastics:

- What venue are we at today?
- What skill were you attempting?
- What was your last apparatus/routine?
- Who was on the apparatus/floor before you?
- How many pieces/events do you have left?