



## USA GYMNASTICS – SPORTS CONCUSSION GUIDELINES

A **concussion care guideline** has been developed, via a collaborative effort of the USA Gymnastics medical staff, using the FIG Concussion Guidelines, and International Consensus Guidelines, to provide a standard for the medical care of gymnasts 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**

The guidelines cover the recognition, medical diagnosis, and management of gymnasts who sustain a suspected concussion during gymnastics activity. It aims to ensure that gymnasts with a suspected concussion receive timely and appropriate care and proper management to allow them to return to their sport safely. The guidelines 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 gymnast, parents, coaches, officials, and licensed healthcare professionals.

## **1. Concussion Policy & Education**

USA Gymnastics recognizes that gymnastics is a high-risk sport for concussion and that treating concussion as a serious injury is critical. As part of a comprehensive approach to concussion, a gymnastics club or facility should have a written plan for the proper response to concussion, provide training in this plan to all coaches, and provide concussion education to parents, gymnasts, and coaches. Additionally, medical professionals providing medical coverage for gymnastics training, camps, and/or competitions, should be trained in the consensus approach to the care of a suspected or confirmed concussion event.

### *Concussion Policy*

A USAG-member club must have a concussion policy that includes their approach to concussion recognition and care. The concussion policy should be signed by all team parents (if minor gymnast) and adult gymnasts upon registration, and parents should be given a copy. All coaches must be trained in the club's concussion policy. USA Gymnastics has provided a sample policy for reference (Appendix 5). However, club owners should ensure that their policy meets or exceeds all state requirements, as some states have specific requirements for concussion education, care, and policy.

### *Concussion Education*

A USAG-member club must provide the *USA Gymnastics: Sports Concussion Overview* document to all new team gymnasts upon registration and must present this document on an annual basis to all team

gymnasts and parents. Concussion education must be provided for coaches (even non-USAG member coaches) on an annual basis. The Safety Certification Course, which is required for Professional members every 3 years, will contain concussion education that meets the annual requirement for the year in which the Safety Certification is renewed. If your state requires coaches to complete state-mandated concussion education, this training also meets the USAG annual requirement. Professional and Instructor members will be required to verify that they have completed concussion training within the past 12 months upon renewal of their USAG membership. It is best to maintain records of your training for up to 3 years (date of training, attendance and which training you used). Here are some good resources for concussion training:

- CDC Heads UP: <https://www.cdc.gov/HeadsUp/>
- NFHS Concussion in Sports: <https://nfhslearn.com/courses/concussion-in-sports-2>
- ConcussionWise: <https://sportsafety.com/>
- USA Gymnastics Concussion Webinar: [U201: USA Gymnastics Concussion Education](#)
- Partner with a local sports medicine professional to provide concussion education in person

Concussion education should include:

- 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 a gymnast 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 (See [USAG return to sport progression](#) for gymnastics-specific progressions for each discipline)
- Return to sport medical clearance requirements
- Roles of different health providers in concussion

As part of a comprehensive approach to concussion, USAG will provide the following:

- USA Gymnastics: [Sports Concussion Overview](#) document
- [Concussion Policy for Member Clubs](#) – SAMPLE (Appendix 5)
- USA Gymnastics [Concussion Webinar](#)

## 2. Concussion Recognition

All gymnasts, coaches, parents, judges, and licensed healthcare providers are responsible for understanding the risk of head injury in gymnastics and should be able to recognize and report a gymnast who demonstrates signs and/or symptoms of concussion. Formal diagnosis of concussion can only be made by a licensed medical professional following a comprehensive (physical & cognitive) medical assessment. However, if a concussion is suspected and a medical provider is not available, stakeholders are empowered to remove the gymnast from play and pursue a medical referral. **“When in doubt, sit them out.”**

A concussion should be suspected in any gymnast who (1) experiences appropriate mechanism of injury and (2) demonstrates ANY concussion-like signs and symptoms in any intensity or quantity.

- (1) Mechanism of Injury
  - Sustains direct, indirect or rotational impact to the head, face, neck or body
  - Experiences whiplash effect, where the head forcibly moves forward & backward due to impact elsewhere on the body
  - Jarring effect from the trunk up to the head and brain (such as a hard fall to the buttocks)
- (2) Signs and Symptoms

- Signs of Concussion (Observable by peers)
  - Changes in behavior, thinking, physical functioning
  - Slower processing speed, inability to complete tasks normally
  - Unable to remember directions/instructions as usual
  - Decreased balance and/or spatial awareness
- Symptoms of Concussion (Reportable by injured gymnast)
  - Headache
  - Dizziness
  - Mental clouding, confusion, feeling slowed down
  - Visual problems
  - Nausea, vomiting
  - Tiredness
  - Drowsiness, feeling “in a fog”, difficult to concentrate
  - Pressure in the head
  - Sensitivity to light and noise

In some cases, these same mechanisms of injury can cause more serious head or spine injury, which always warrant immediate referral to emergency medical care. If a gymnast demonstrates any of the following “Red Flags”, a more severe head or spine injury should be suspected. Red Flags immediately following impact require the gymnast to remain still and in place until medical professionals arrive. Delayed Red Flags require the gymnast be taken to an Emergency Department immediately.

Red Flags Include:

- Severe or worsening headache
- Weakness or numbness in more than one arm or leg
- Repeated vomiting
- Slurred speech
- Neck pain or tenderness
- Loss of vision or double vision
- Seizure activity or convulsions
- Loss of consciousness or deteriorating conscious state (going in and out of consciousness)
- Increasing confusion
- Increasing agitation or combative
- Visible deformity of the skull

[A reliable resource, containing an overview of concussion recognition is the *Concussion Recognition Tool (CRT-6)*. See *Appendix 1* for details.]

### 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. (**Appendix 1**)

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 a gymnast is suspected of sustaining a concussion and there is no concern for a more serious head or spine injury, **the gymnast must be immediately removed from participation**, evaluated, and monitored.

**Scenario One** – Licensed healthcare professional is present:

Following a suspected concussion incident and when logistically safe, the gymnast should be taken to a secure area and undergo a sideline medical assessment using the Sport Concussion Assessment Tool 6 (SCAT 6) (**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 SCAT 6 and Child SCAT 6 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 gymnasts. Any gymnast who is suspected of having sustained a concussion, or has been diagnosed with a concussion, must NOT return to practice or competition and must be referred for further medical assessment by a physician\*. Until further assessment is obtained, the gymnast should be monitored for new or worsening symptoms and/or signs of concussion. The parent/guardian of a minor gymnast or the adult gymnast should be provided a copy of the [USA Gymnastics Concussion Injury Report](#) sheet and the [USA Gymnastics: Sports Concussion Overview](#) document.

*\*In the event a qualified non-physician USA Gymnastics medical team member is independently providing medical services at a practice, event or camp, and a physician is not available onsite, the non-physician medical provider may use clinical judgement to make a diagnosis of concussion, direct further care, and have autonomy regarding clearance decision-making until a physician is available for consultation, on a case-to-case basis.*

If a gymnast has been removed from participation 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 gymnast reports NO concussion symptoms, and the healthcare professional determines that a concussion has not occurred, then the gymnast can be returned to play but should be monitored for delayed symptoms. If the gymnast develops delayed symptoms, the gymnast must be removed from play and must undergo further medical assessment. The parent/guardian of a minor gymnast or the adult gymnast should be provided a copy of the *USA Gymnastics Concussion Advice* sheet and the *USA Gymnastics: Sports Concussion Overview* document.

**Scenario Two** – Licensed healthcare professional is NOT present:

If a suspected concussion event has occurred and a licensed healthcare practitioner is NOT available, the gymnast should be removed from practice or competition and referred immediately for medical assessment. The gymnast must not return to play until receiving formal medical clearance. The parent/guardian of a minor gymnast or the adult gymnast should be provided a copy of the *USA Gymnastics Concussion Advice* sheet and the *USA Gymnastics: Sports Concussion Overview* document.

#### **4. Concussion Management**

##### Concussion Management

When a gymnast has been diagnosed with a concussion, it is important that all stakeholders are informed, including the gymnast's parent/legal guardian, coaches, and healthcare team.

Gymnasts diagnosed with a concussion, as well as coaches and parents if applicable, 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 (if applicable) and sport activities which are included in the [USA Gymnastics](#)

[Concussion Injury Report and Advice](#) sheet and the [USA Gymnastics: Sports Concussion Overview](#) document. Gymnasts diagnosed with a concussion should be managed by a qualified medical professional and according to international consensus guidelines, which are included in this USA Gymnastics Concussion Guideline.

A progressive recovery process should include:

1. Initial physical and cognitive modifications to facilitate symptom resolution
2. Periodic medical assessment to:
  - a. Evaluate and monitor recovery progress
  - b. Screen for additional symptom generators
  - c. Referral to additional medical specialties for multidisciplinary approach when applicable, such as:
    - Neurology
    - Optometry/ Ophthalmology
    - Physical therapy
    - Psychology/ Psychiatry
    - Vestibular rehabilitation
    - Vision therapy
    - Mental health professional
    - 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 physician. (See below for details regarding the [Gymnastics Specific Return-to-Sport Guideline.](#))

Once the gymnast has completed the Gymnastics-Specific Return-to-Sport Guideline, a qualified medical physician should reassess the gymnast for clearance back to full participation.

## 5. Gymnastics-Specific Return-to-Sport Strategy

The following is an outline of the return-to-sport strategy that should be used to help gymnasts, coaches, certified athletic trainers, and medical professionals facilitate a safe and gradual return to gymnastics. Monitoring for eventual symptom resolution is the priority. While the gymnast is being monitored, a return-to-sport strategy can be considered and should be guided by symptom status. During the return-to-sport process, a successful return to school, work, or other cognitive activities without symptoms and with baseline performance should also be prioritized.

Return to school and sport average timeline:

Timelines vary based on the individual case and the presence of co-morbidities, including history of prior concussion.

• Adults:	• 7- 10 days
• Children/Adolescents:	• 2-4 weeks

Below, we present the *Gymnastics-Specific Return-to-Sport Strategy* (RTS) that will enable coaches and medical providers to safely return their gymnasts to full training. Gymnasts should obtain clearance from a physician prior to starting the program (Stage 1), prior to integrating gymnastics-specific activity (Stage 2), and prior to completion (Stage 6).

The gymnast should progress through this strategy under the guidance of a medical provider. Each step should be separated by  $\geq 24$  hours. In stage 1, an early return to aerobic and strengthening activity can be considered within symptom parameters\*, through the guidance of the treating medical provider. Prior to the start of Stage 2 (the integration of gymnastics-specific activities), the gymnast should be

symptom free, including symptom-free integration of all cognitive and academic activities, and obtain clearance from a physician.\*\* If the gymnast is younger than 18 years old, consider a longer interval time period between steps. If the gymnast experiences new or recurring symptoms with Stage 2 or beyond, 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 physician.

#### Stage 1 Details:

**Aerobic Activity:** Light aerobic activity progressed to moderate intensity, per symptom parameters\*. Activities should be without risk of falling or hitting of the head. Can include activities such as walking, stationary bike, elliptical, rowing, light jogging.

**Strength & Flexibility Activity:** Light body weight strength training progressed to more intense gymnastics-specific strengthening and/or weight training, per symptom parameters\*. All flexibility/mobility training, as well as low impact landing drills is allowable, per symptom parameters\*.

The [USA Gymnastics Stage 1 Symptom Tracking Sheet](#) can be utilized to monitor symptoms effectively.

\*Stage 1 Symptom Parameters: Under the direction of a medical professional, a gymnast may pursue Stage 1 activities after 24 hours of a concussion event, while monitoring for symptom exacerbation. Mild and brief exacerbation of symptoms during activity is allowable, 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 or for more than an hour), the gymnast should stop and wait till the following day to resume activity.

\*\*A treating physician may consider progressing a gymnast through Stage 2 and Stage 3 during the completion of RTL, if clinically appropriate.

# USA Gymnastics

## Sports Concussion: Gymnastics-Specific Return-to-Sport Strategy

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

[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 after 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 or for more than an hour), the gymnast should stop and wait till the following day to resume activity.]

[\*\*A treating physician may consider progressing a gymnast through Stage 2 and Stage 3 during the completion of RTL, if clinically appropriate.]

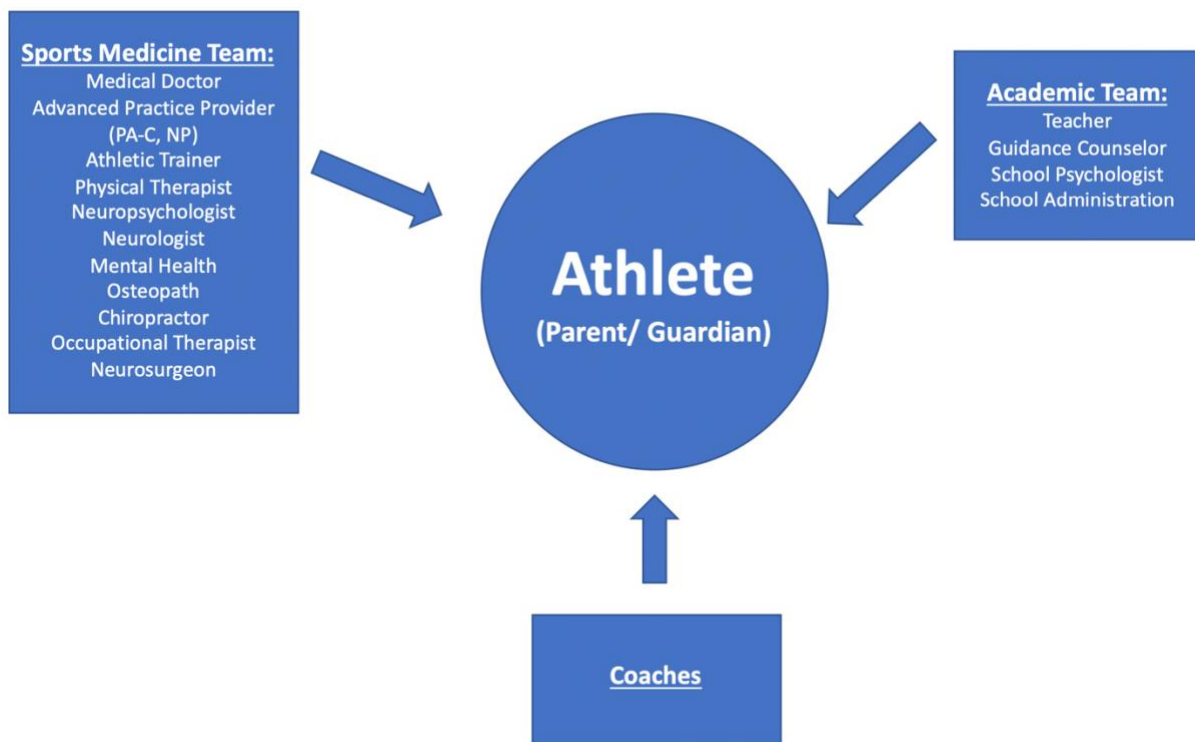
[Stage 2 or Beyond: If the gymnast experiences new or recurring symptom, the gymnast should pause the progression, be reassessed by their treating physician, wait for symptoms to resolve, then restart at the previous symptom-free stage as directed by the treating physician.]

## 6. Multidisciplinary Concussion Care

Most gymnasts 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 2-4 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 gymnasts, >2 weeks for adult gymnasts) may benefit from a supervised multidisciplinary approach that may include medical doctors and advanced practice providers who are experts in sport concussion. The following is a list of possible providers: certified athletic trainers, physical therapists, occupational therapists, neuropsychologists, neurologists, chiropractors, osteopathic physicians, neurosurgeons, neuro-optometrists, mental health providers, and other medical providers trained in concussion management.

A referral to other multidisciplinary practitioners for assessment should be made on an individualized basis at the discretion of a gymnast'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 gymnast.

If the gymnast is currently enrolled in school, it may be beneficial to discuss their care with their academic team to make necessary modifications. This may include teachers, guidance counselors, school psychologists, and school administrators.



## 7. Return to Sport

Gymnasts 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 gymnastics activities. The final decision to medically clear a gymnast to return to full gymnastics activity should be based on the clinical judgment of a physician and the gymnast's 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, including academic and/or work activities
3. Successful completion of the *Gymnastics-Specific Return-to-Sport Strategy*
4. A final evaluation by a physician and the gymnast's medical team is completed and the gymnast is cleared to return to full gymnastics activities

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

**Appendix 1 – Concussion Recognition Tool 6 (CRT-6)**

<https://bjsm.bmj.com/content/bjsports/57/11/692.full.pdf>

**Appendix 2 – Sports Concussion Assessment Tool 6 (SCAT6)**

<https://bjsm.bmj.com/content/bjsports/57/11/622.full.pdf>

**Appendix 3 – Child – Sports Concussion Assessment Tool 6 (Child-SCAT6)**

<https://bjsm.bmj.com/content/bjsports/57/11/636.full.pdf>

**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 utilised in team sports.

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

- Where are you doing gymnastics today?
- What skill were you attempting?
- What was the last event you were participating on?
- Who was on the event before you?
- How many events do you have left?

**Appendix 5 – [SAMPLE Club Concussion Policy](#)**