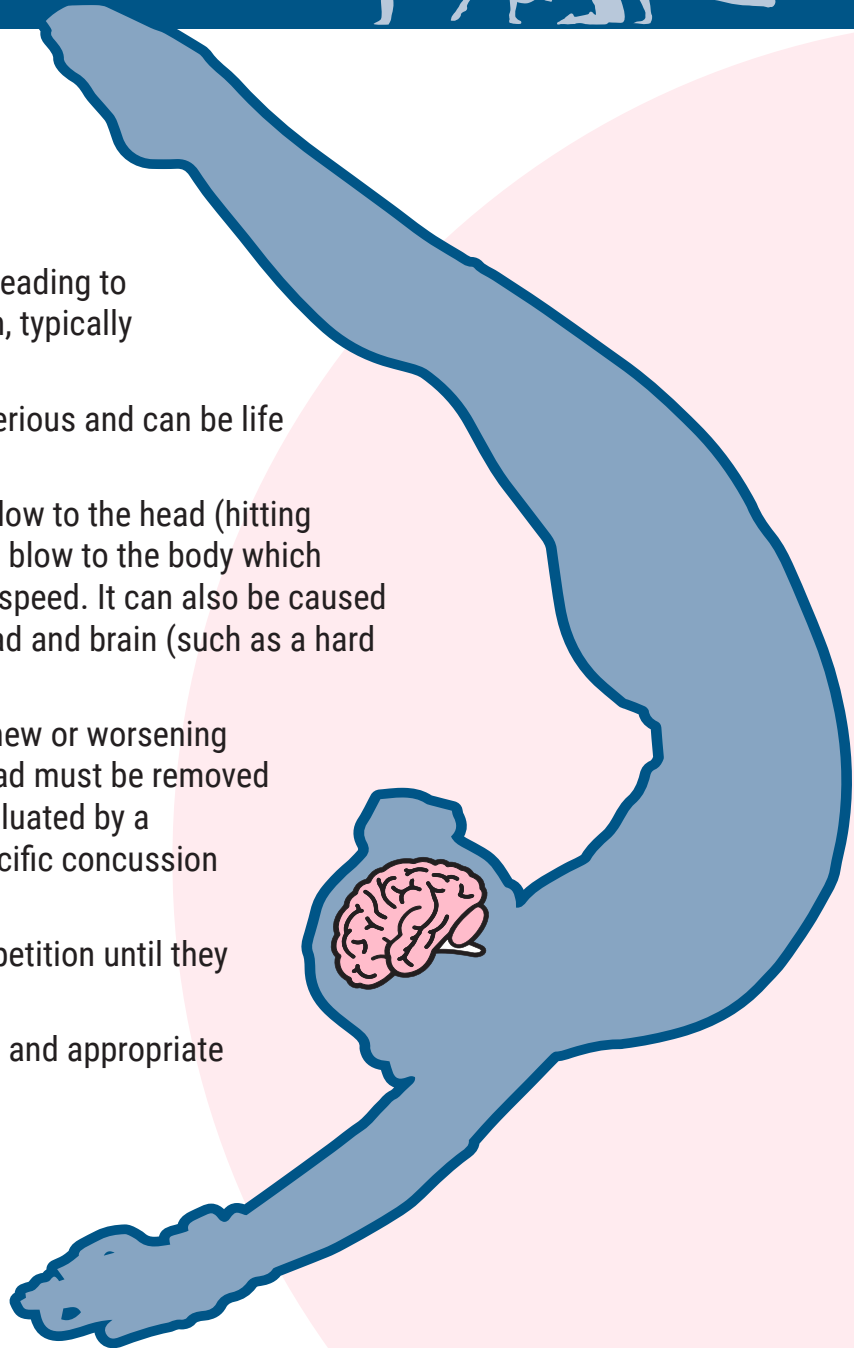
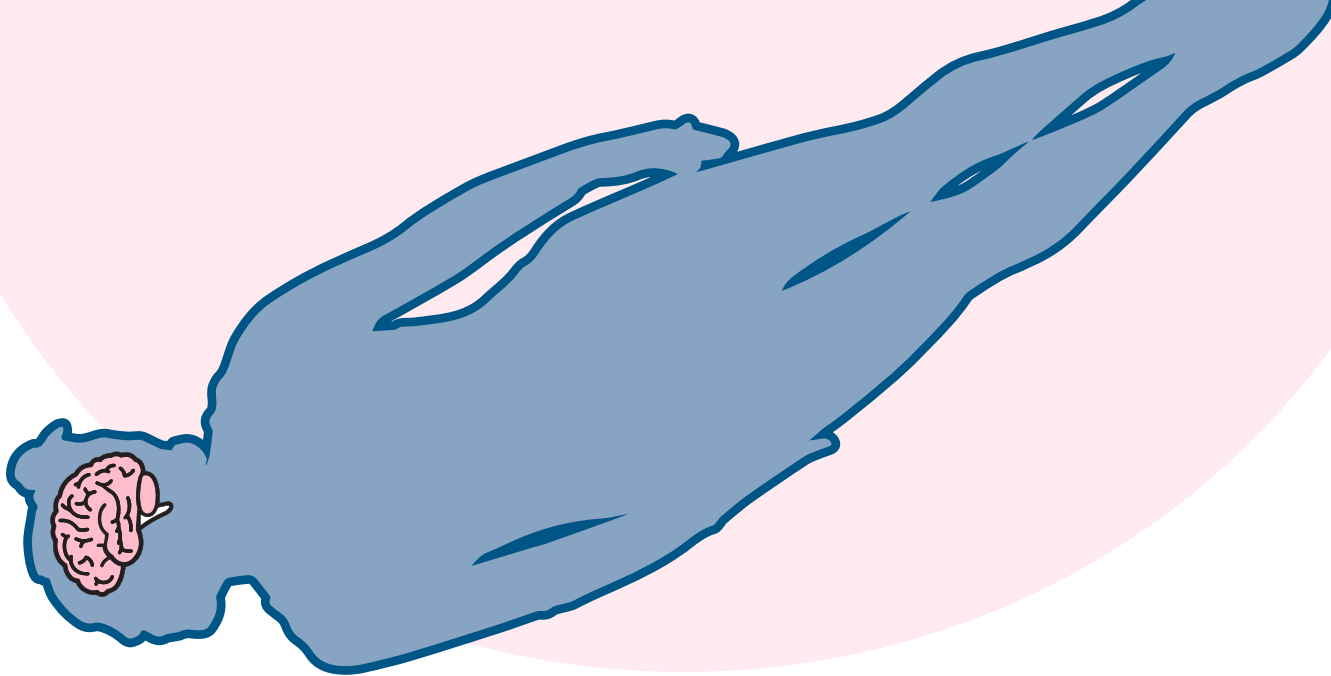




## What is Concussion?

- A concussion is a mild traumatic brain injury leading to transient disturbance of normal brain function, typically without loss of consciousness.
- All head injuries, including concussions are serious and can be life threatening.
- A concussion typically is caused by a direct blow to the head (hitting your head on equipment or mat) or by a direct blow to the body which causes the head to change direction at high speed. It can also be caused by a jarring effect from the trunk up to the head and brain (such as a hard fall to the buttocks)
- If in doubt, sit them out. A gymnast with any new or worsening symptoms following a fall or a blow to the head must be removed from training or competition until they are evaluated by a medical professional, preferably one with specific concussion training.
- A gymnast must not return to training or competition until they have been cleared by a physician.\*
- The majority of concussions recover with rest and appropriate medical supervision in less than 14 days.





## What causes concussion?

A concussion can be caused by direct forces (e.g. a blow to the head), or indirect forces (e.g. a blow to the body, which causes the head to move rapidly).

Gymnastics is a high-risk sport with various types of injuries that can cause a concussion, including:

- Direct contact with the apparatus/equipment or safety mats
- The whiplash effect of head/neck flexion and extension (head forced forward &/or backward)
- Rotational forces of the head/neck (head forced left &/or right)
- Direct hard landing on their front, back or buttocks which transmit forces to the brain.

## What are the signs and symptoms of concussion?

Recognition of concussions occurs through:

1. Observing an injury (e.g. blow to the head)
2. Noticing changes in the gymnast's behaviour, thinking, or physical functioning (ie. difficulty with balance or coordination)
3. Gymnast reporting symptoms to a coach, teammate, parent/guardian or medical provider.

The presence of one or more of these signs and symptoms may suggest a concussion:

|  |   |
|--|---|
| Headache or pressure in head           | "Feeling slowed down or "in a fog"        |
| Neck pain                              | "Don't feel right"                        |
| Nausea and/or vomiting                 | Difficulty concentrating or remembering   |
| Dizziness                              | Fatigue or low energy                     |
| Blurred vision                         | Confusion                                 |
| Decreased balance or spatial awareness | Drowsiness                                |
| Sensitivity to light &/or noise        | Emotional (ie. Sad, anxious or irritable) |

*\* Symptoms may occur more than 24 hours after the initial injury.*

# When to Seek Emergency Help

If any of the following symptoms occur, seek emergency medical attention immediately:

- A severe or worsening headache or neck pain
- Weakness or numbness in their arms &/or legs
- Repeated vomiting
- Difficulty talking (i.e. slurred speech or memory loss)
- Change in vision (i.e. Double vision or difficulty seeing)
- Double vision
- Seizure
- Difficulty staying awake or conscious
- Any other concerning symptoms

## Management of Concussion

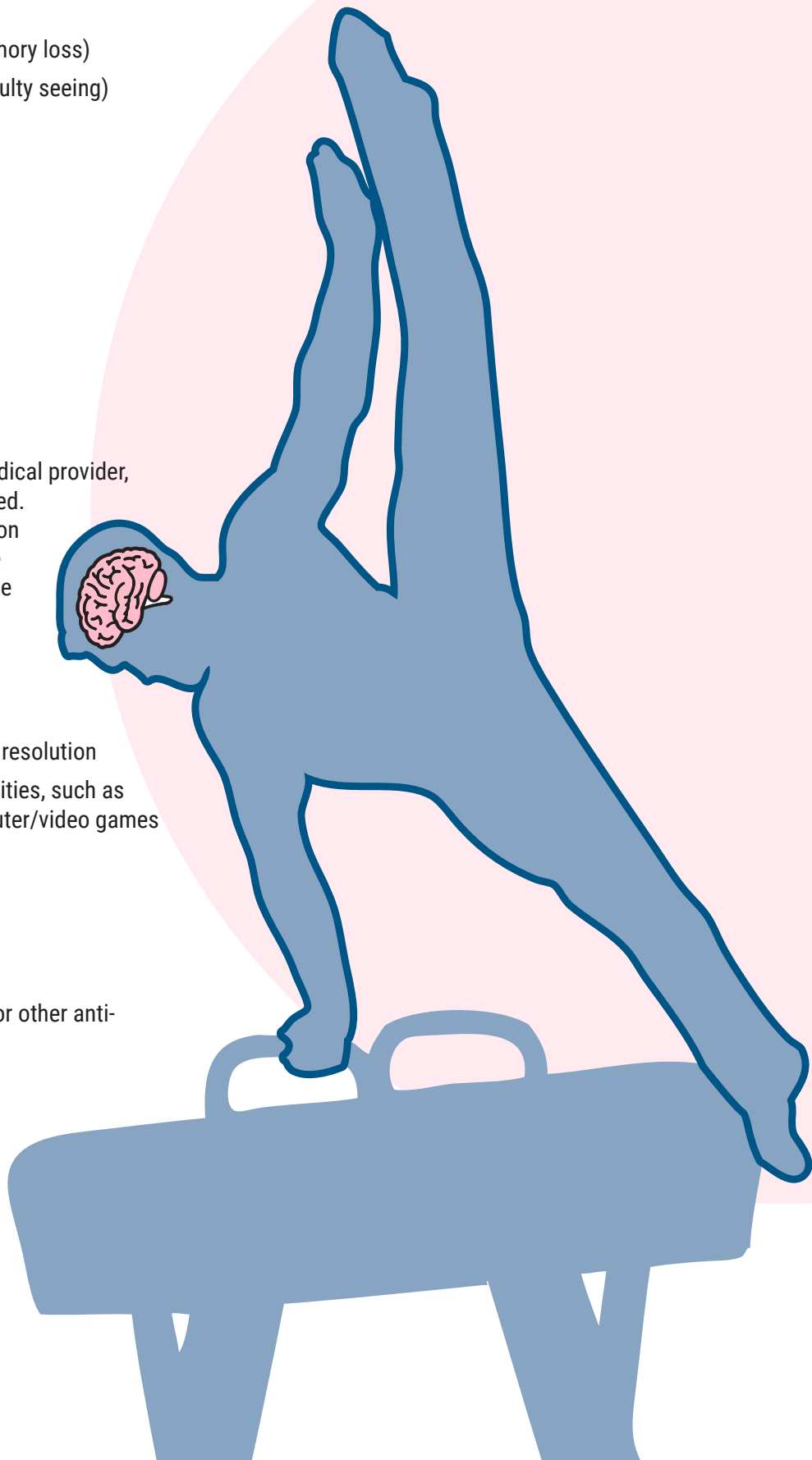
Evaluation and monitoring from a qualified medical provider, preferably with concussion expertise, is required. Physicians with advanced training in concussion management typically include sports medicine physicians, some pediatricians/family medicine physicians, neurologists and psychiatrists.

### Rest (the body and mind):

- the cornerstone of concussion treatment
- minimum of 24-48 hours to allow symptom resolution
- Restrictions from physical and mental activities, such as schoolwork, reading, television, &/or computer/video games
- Avoid driving
- Avoid alcohol

### Medications:

- Avoid NSAIDs (ie. Ibuprofen, aleve, aspirin or other anti-inflammatory medications)
- Avoid sleeping aids (ie. Benadryl)
- Consult with your doctor about the current medications you are taking





# Return to Sport Protocol

Return to school and sport average timeline:

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Timeline to return to sport varies based on individual factors, such as prior history of concussion and other underlying medical conditions.

**Symptom resolution for adults can take on average 7-10 days, and for children/adolescents 2-4 weeks.**

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On the next page, 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. Athlete will need clearance from a physician, prior to starting the program (stage 2) and prior to completion (stage 6).

- The athlete should be symptom free for 24-48 hours before starting the Gymnastics-Specific Return-to-Sport Strategy and under the care of a medical provider.
- In stage 1, early return to physical activity that does not trigger symptoms is allowed, through the guidance of the treating medical provider.
- Prior to starting RTS (stage 2), the athlete should be able to perform the majority of his/her normal mental activities without symptoms.
  - Each step should be separated by 24 hours.
  - If the athlete is younger than 18 years old, consider a longer interval time period between steps.
  - If the athlete experiences worsening or new symptoms at any stage, they should go back to the previous stage that they completed symptom-free, wait for symptoms to resolve (minimum 24 hours), and then begin the progression again.

# SPORTS CONCUSSION: GYMNASTICS-SPECIFIC RETURN-TO-SPORT STRATEGY



Return-to-Sport strategy starts after symptom free for 24-48 hours and evaluation from a physician. Athlete should be performing mental activities symptom-free, prior to starting the RTS. A minimum, 24 hours should separate each step within this Return-to-Sport strategy

| STAGE | AIM  | ACTIVITY  | GOAL OF EACH STEP   |
|-------|--|---|---|
| 1     | Rest followed by light aerobic activity  | Daily activities that do not provoke symptoms for 24- 48 hours, then light aerobic activity (~20-30 minutes) without symptoms <ul style="list-style-type: none"> <li>• Stationary bike</li> <li>• Walking or light jogging</li> <li>• Stretching (no inverted positions)</li> </ul>   | <ul style="list-style-type: none"> <li>• Gradual reintroduction of work/school activities</li> <li>• Need to be back to full school prior to moving to step 2</li> </ul>          |
| 2     | Return to early sport specific training: Inversion   | <ul style="list-style-type: none"> <li>• Moderate intensity aerobics &amp; sprinting</li> <li>• Landing drills – floor based, low impact</li> <li>• Gymnastics specific strengthening – start slow and then progress</li> <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: Flipping   | <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: Twisting   | <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: Advanced Skills<br><br><i>* Physician clearance required to move to step 6</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 – 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>1. Single skill elements</li> <li>2. Combined elements/Sequences</li> <li>3. Routine parts</li> <li>4. 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

Special thanks to the following who contributed to this document:

1. USA Gymnastics Medical Staff
2. [FIG Concussion Policy](#)
3. Parachute Canada. Parachute (2017). [Canadian Guideline on Concussion in Sport.](#)



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# SPORTS CONCUSSION: GYMNASTICS-SPECIFIC RETURN-TO-SPORT STRATEGY



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