



Volleyball BC Concussion Information and Protocol



COMPLETE
CONCUSSIONS

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Volleyball BC has developed this **Volleyball BC Concussion Information and Protocol** in collaboration with **Kids Physio Group** to assist with recognition, management, and safe return of volleyball athletes to play following a suspected concussion.

Purpose

This protocol covers the recognition, medical diagnosis, and management of Volleyball BC athletes who may sustain a suspected concussion during a sport. It aims to ensure that athletes with a suspected concussion receive timely and appropriate care and proper management to allow them to return back to their sport safely and decrease their risk of prolonged side effects and symptoms. This protocol 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 delivered by **Complete Concussion Management**.

Who should use this protocol?

This protocol is intended for use by all individuals who interact with athletes inside and outside the context of school and non-school based organized sports activity, including athletes, parents, coaches, officials, teachers, trainers, and licensed healthcare professionals.

1. Pre-Season Education

Concussion awareness and education within an organization is an important part of properly managing concussions that could occur throughout the season. Annual education of all involved parties (athletes, parents, coaches, officials, trainers, etc.) on evidence-based approaches to recognizing and managing concussions will allow them to be prepared for if an incident happens where a concussion is suspected. It will create the best prognosis for an athlete if all that are involved are confident in steps to take when a concussion occurs.

Concussion education should include:

- The definition of a concussion
- Mechanisms of injury related to volleyball
- Signs and symptoms to watch for
- Red Flags
- Immediate on-court steps to take, and a plan for if there is onsite medical professional support or not
- At home monitoring following a concussion
- How to determine a concussion certified clinician - Complete Concussion Management has an online database of clinicians so athletes can easily find one
- Typical concussion management and rehab
- *Return to Sport* and *Return to Learn* protocols that an athlete will undergo
- Requirements for full medical clearance and discharge
- Communication expectations and requirements to ensure coaches and families are clear about where an athlete is in their recovery, and when they have full clearance to return to sport.

USEFUL LINK:

Pre-Season Concussion Education Sheet

2. Concussion Recognition

All athletes, parents, coaches, officials, and staff should be aware of the signs and symptoms of a concussion. If an athlete sustains a hit to the head, neck, or body and demonstrates **any** of the following symptoms, they should be suspected to have sustained a concussion.

Concussion symptoms:

- Headache
- Pressure in head
- Neck pain
- Nausea/vomiting
- Dizziness
- Blurred vision
- Balance problems
- Sensitivity to light
- Sensitivity to noise
- Feeling slowed down
- Feeling like you're 'in a fog'
- "Don't feel right"
- Difficulty concentrating
- Difficulty remembering
- Fatigue or low energy
- Confusion
- Drowsiness
- Trouble falling asleep
- More emotional
- Irritability
- Sadness
- Nervous or anxious

If an athlete shows any of the following Red Flags, **this is considered an emergency and Emergency Medical Services should be called**. These symptoms could indicate more severe brain damage or skull/neck fractures which require immediate attention.

Red Flags

- Repeating the same questions
- Severe drowsiness or can't be awakened
- Seizures
- Decreasing consciousness, loss of consciousness
- Bruising behind the ears
- Inability to remember more than 30 minutes before OR after injury
- Weakness or numbness in arms or legs
- Unsteadiness on feet or slurring of speech
- Fluid leaking from ears
- Double vision
- Severe or worsening headache
- Vomiting
- Unusual behaviour
- Two black eyes

The **Concussion Recognition Tool 5** in Appendix A is a tool that coaches, parents, and athletes can use to help determine if concussion symptoms are present after an incident. It outlines Red Flags and concussion symptoms to help guide an athlete's next steps. Appendix D shows a flowchart for on-court management if an athlete is involved in an incident where they do not immediately stand back up after a suspected concussion. This can be conducted by a First Aid trained individual who is onsite.

In the case of a suspected concussion, the athlete should immediately be removed from play and should not return until cleared by a concussion trained medical professional. **If in doubt, sit the athlete out.**

3. Onsite Medical Assessment

Depending on severity of incident and availability of onsite medical personnel, a sideline concussion assessment may be conducted. If an incident has occurred where the athlete is suspected of having severe head or spinal injuries, or is displaying any Red Flags listed above, an Emergency Medical Assessment should be conducted (see 3a below). If a more severe injury is not suspected, the athlete should undergo a Sideline Medical Assessment or a Follow up Medical Assessment, depending if a licensed healthcare professional is present (see 3b below).

3a. Emergency Medical Assessment

If any Red Flags listed above are present, Emergency Medical Services (EMS) should be activated (calling 9-1-1) and the athlete should be transported to a hospital via ambulance for an Emergency Medical Assessment.

The athlete **should not be touched or moved** until the ambulance has arrived. The athlete should also not be left alone until EMS is with them. After EMS staff has completed their assessment, the athlete should be transferred to the nearest hospital for a Medical Assessment. If the athlete is under 18 years of age, the guardians should be contacted immediately to inform them of the incident.

3b. Sideline Medical Assessment

If an athlete is suspected of sustaining a concussion and they do not present with above Red Flags, a Sideline Medical Assessment should be conducted by a licensed and concussion trained healthcare professional.

If there is no licensed and concussion trained healthcare professional onsite, the athlete should immediately be referred to one for best results. A licensed healthcare practitioner could include a Physiotherapist, Athletic Therapist, Doctor, or Nurse Practitioner - but it is important to ensure the clinician is trained in concussion management.

To find a list of trained concussion specialists, please refer to the [online database](#) developed by Complete Concussions.

Regardless if the athlete undergoes a sideline concussion assessment or not, they must not return to play if a concussion is suspected. Even if they are not showing immediate symptoms, they may later develop symptoms and still be diagnosed with a concussion.

USEFUL LINK:

Concussion Emergency Action Plan - Appendix D

4. Follow-Up Medical Assessment

A comprehensive assessment of the athlete's concussion should be conducted as quickly as possible following the initial incident. If the athlete is not showing symptoms of a more severe injury (ie. there are no Red Flags present), they do not need to be diagnosed by a medical doctor. Imaging such as CT scans and MRIs will not show mild traumatic brain injuries like concussions and should be reserved for more serious head injuries where Red Flags are present.

If the athlete is suspected to have a concussion and is not experiencing Red Flags, it is beneficial for them to follow-up with a concussion trained clinician. This could include (but is not limited to) physiotherapists and athletic therapists. It is important to inquire about the level of training a healthcare professional has in concussion rehab to ensure proper management of the athlete.

In the initial assessment, the practitioner will determine whether a concussion has been sustained or not. If a concussion is diagnosed, they will then educate on the diagnosis and prognosis of concussions, and what rehab will look like for the athlete. They will assess the different systems that are typically affected by a concussion - vestibulo-ocular, physiological, and cervicogenic.

The medical assessment is responsible for determining whether the athlete has been diagnosed with a concussion or not. Athletes with a diagnosed concussion should be provided with a Medical Assessment Letter (Appendix C) indicating a concussion has been diagnosed. Athletes that are determined to have not sustained a concussion must be provided with a Medical Clearance Letter (Appendix D) indicating a concussion has not been diagnosed and the athlete can return to school, work and sports activities without restriction.

USEFUL LINK:

Medical Assessment Letter - Appendix B

Medical Clearance Letter – Appendix C

5. Concussion Management

All athletes diagnosed with a concussion must be provided with a standardized Medical Assessment Letter (Appendix B) that notifies the athlete and their parents/legal guardians/spouse that they have been diagnosed with a concussion and may not return to any activities with a risk of concussion until medically cleared to do so by a concussion trained healthcare professional. Because the Medical Assessment Letter contains personal health information, it is the responsibility of the athlete or their parent/legal guardian to provide this documentation to the athlete's coaches, teachers, or employers. 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.

In the hours following a concussion, the athlete **should not sleep for 3 hours**. After this, their parent/guardian should check on them every 1-2 hours for breathing. **If there is any concern or the athlete is not easily aroused, call EMS (9-1-1).**

If an athlete is feeling better and does not report symptoms, this does not mean they are ready to return to play. Concussions require AT LEAST 22-45 days of recovery for it to be safe for an athlete to fully return to sport. This may be longer than 22-45 days, but research shows it is not shorter than this.

Throughout the rehab process, the athlete will undergo visual and vestibular rehab, management of any neck-related symptoms, a gradual increase in physical and cognitive activity, and a guided *Return to Learn* and *Return to Sport* protocol. The athlete and licensed practitioner will communicate with the coach, team, and family to ensure everyone is clear on what stage of recovery they are on and what the stage entails.

Once the athlete has passed certain tests and has successfully moved through all stages of the *Return to Play* protocol, they will be awarded full medical clearance and discharged from concussion rehab. Prior to returning to full contact practice and game play, each athlete that has been diagnosed with a concussion must provide their coach with a standardized Medical Clearance Letter (Appendix C) that specifies that a concussion trained healthcare professional has personally evaluated the patient and has cleared the athlete to return to sports.

5a. Return to Learn Strategy

Each stage outlined below **must be separated by at least 24 hours. If symptom increase occur at any stage, the athlete must return to the previous stage.** This protocol will be guided by the healthcare provider involved in the athlete’s concussion rehab, and the stage they are in will be determined by the same.

Stage	Title	Description	Goal of Stage
1	Symptom-Limited Cognitive Activity	Light reading, TV, etc - provided no increase in symptoms - also encourage plenty of rest. Take it easy for a day or two, but don't just lie in bed all day Should last 2-3 MAX	Gradual return to typical activities
2	Light Cognitive Activity	Increase cognitive load - encourage homework and working from home (assignments) Once able to tolerate 45 mins - 1 hour with minimal increase in symptoms, move on to stage 3	Increase tolerance to cognitive work
3	Half Days of School - With Restrictions	No tests, no gym, no recess, no (added) homework or loose deadlines to reduce pressure	Increase academic activities
4	Full Days of School - With Restrictions	Same restrictions as above - once able to tolerate full days with no increase in symptoms, gradually lift restrictions (guided by healthcare practitioner)	Slowly return to full capacity, start to introduce more challenging cognitive tasks
5	Full Days of School - No Restrictions	Return to full capacity at school	Return to full academic activities, catch up on missed school work

5b. Volleyball Specific Return to Sport Strategy

Athletes that have sustained a concussion will also be guided through the below *Return to Play* protocol by their healthcare provider. The athlete’s coach should be aware of the stage the athlete is in, and what restrictions are present.

Returning an athlete to play before they are medically cleared and ready is extremely risky. If the brain has not made a full recovery and an athlete sustains another concussion, this could lead to detrimental and lifelong effects.

When full medical clearance and discharge occurs, a Medical Clearance Letter should be written from the healthcare provider to the athlete’s guardians and coach to document clearance and full return to sport. At discharge, an athlete should be completely symptom-free and have no lingering deficits to the systems that were affected by the concussion.

If the athlete starts to feel symptoms when they make a full return to play, they should stop play immediately and be reassessed by the healthcare professional that is involved in their care.

Stage	Title	Description	Goal of Stage
1	Symptom-Limited Physical Activity	Encourage light daily walks, and household chores that do not provoke symptoms to a significant degree or place you at risk for hitting your head	Gradual reintroduction of light exercise and activities of daily living
2	Light Physical Activity - Buffalo Treadmill Test	<p>If it’s been more than 5-7 days since the injury - it’s time to find a threshold and start a sub symptom threshold exercise program. This can speed up recovery vs. just resting. Movement is needed!</p> <p>If athlete passes the treadmill test (done by healthcare provider), they can move to Stage 3. If they fail, they continue with sub-symptom program, and re-test in 1 week</p>	<p>Increase heart rate to allow brain to adapt to an increase in blood flow.</p> <p>Buffalo Treadmill Test will determine what the ideal pre-symptom heart rate for the athlete is so they can exercise at that level</p>
3	Sport-Specific Activity	<p>Light, non-contact practice with team or individually. This can include:</p> <ul style="list-style-type: none"> • Standing serving • Passing • Setting • Standing hitting drills <p>This excludes:</p> <ul style="list-style-type: none"> • Scrimmages • Pepper • Hitting drills with full approach • Blocking drills • Defensive drills (due to risk of being hit in the head) • Sprinting/conditioning 	Start to add movements that mimic what the athlete will do in their sport

		<ul style="list-style-type: none"> Resistance training 	
4	Non-Contact Training Drills	<p>Higher intensity, non-contact practice with team. Still avoiding drills that could cause hit to head</p> <p>Resistance training can begin - start to push yourself</p> <p>This includes:</p> <ul style="list-style-type: none"> Serving Passing Setting Hitting drills with full approach Sprinting, conditioning, or agility drills Individual blocking drills (working on footwork/technique/jump height) 	Higher intensity drills, higher heart rate, more cognitive involvement
5	Medical Clearance	Must be completely asymptomatic and back to full time school with no issues, and no increased symptoms with physical activity/practices	Return to full practices, no longer a risk of second impact syndrome
6	Full Return	Should have at least one full practice prior to playing in a game	Pre-concussion functioning at full capacity

USEFUL LINK:

Return to Play Guidelines – Appendix E

6. Persistent Concussion Symptoms (PCS)

For some athletes, concussion symptoms can persist longer than what is typically expected. This is referred to as Persistent Concussion Symptoms (or Post Concussion Syndrome). 30-40% of people who sustain a concussion will experience PCS, which can make it more challenging to receive full medical clearance and make a full return to play. If an athlete experiences PCS, they will work with their healthcare provider to manage ongoing symptoms and continue the rehab process to help mitigate the long-lasting effects.

7. Baseline Testing

Baseline testing uses a series of physical and cognitive tests that determine an athlete’s healthy brain function **pre-injury**. This includes reaction time, balance testing, memory, grip strength, and cognitive tasks. Baseline testing is most valuable when there is an underlying condition that may overlap with concussions symptoms and signs. This helps the healthcare professional make a more appropriate return to play decision if there is an underlying condition that may explain symptoms that also occur with concussions.

Baseline testing is recommended to those athletes who may have a more complicated recovery. This option is available as an added layer of safety for high-risk athletes including those with a prior history of concussions, any learning disabilities, ADD/ADHD, diagnosed depression/anxiety/sleep disturbances or other medical conditions. **The decision to undergo a baseline test remains at the athlete’s discretion.** If you are interested in a baseline test, you can find a list of CCMI certified clinics and therapists [here](#).

Appendix A – Concussion Recognition Tool

CONCUSSION RECOGNITION TOOL 5[®]

To help identify concussion in children, adolescents and adults



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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 (stop, response, airway, breathing, circulation) should be followed.
- Assessment for a spinal cord injury is critical.
- 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.

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

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
- "Don't feel right"
- Neck Pain
- Feeling like "in a fog"
- Dizziness

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 B



Medical Assessment Letter



Date:

Athlete's Name:

To whom it may concern,

Athletes who sustain a suspected concussion should be managed according to the International Consensus Statement on Concussion in Sport.

Accordingly, I have personally completed a Medical Assessment on this patient.

Results of Medical Assessment:

This patient has not been diagnosed with a concussion and can resume full participation in school, work, and sport activities without restriction.

This patient has not been diagnosed with a concussion, but the assessment led the following diagnosis and recommendations:

This patient has been diagnosed with a concussion.

The goal of concussion management is to allow complete recovery of the patient's concussion by following a safe and gradual return to school and sport. The patient has been instructed to avoid all recreational and organized sporting activities that could place them at risk for another concussion. Starting on _____ (date), I would ask that the patient be allowed to participate in school and low-risk physical activity as tolerated and only at a level that does not bring on or worsen their concussion symptoms. The above patient should not return to any full contact practices or games until the coach has been provided with medical clearance from a healthcare provider with training in concussion management.

Other Comments:

Thank you very much in advance for your understanding.

Yours Sincerely,

NAME OF PROFESSIONAL

Credentials (please circle) MD / NP / DC / PT / AT

Appendix C



Medical Clearance Letter



Date:

Athlete's Name:

To whom it may concern,

The above athlete has been medically cleared to participate in the following activities as tolerated effective the date stated above (please check all that apply):

Symptom limited activity (cognitive and physical activities that don't provoke symptoms)

Light aerobic activity (Walking or stationary cycling at slow to medium pace. No resistance training)

Sport-specific exercise (Running or skating drills. No head impact activities)

Non-contact practice (Harder training drills, e.g. passing drills. May start progressive resistance training. Including gym class activities without a risk of contact, e.g. tennis, running, swimming)

Full contact practice (Including gym class activities with risk of contact and head impact, e.g. soccer, dodgeball, basketball)

Full game play

What if symptoms recur?

Any athlete who has been cleared for physical activities, gym class or non-contact practice, and who has a recurrence of symptoms, should immediately remove himself or herself from the activity and inform the teacher or coach. If the symptoms subside, the athlete may continue to participate in these activities as tolerated.

Athletes who have been cleared for full contact practice or game play must be able to participate in full-time school (or normal cognitive activity) as well as high intensity resistance and endurance exercise (including non-contact practice) without symptom recurrence. Any athlete who has been cleared for full-contact practice or full game play and has a recurrence of symptoms, should immediately remove himself or herself from play, inform their teacher or

coach, and undergo further evaluation by a licensed healthcare provider before returning to full-contact practice or games.

Other Comments:

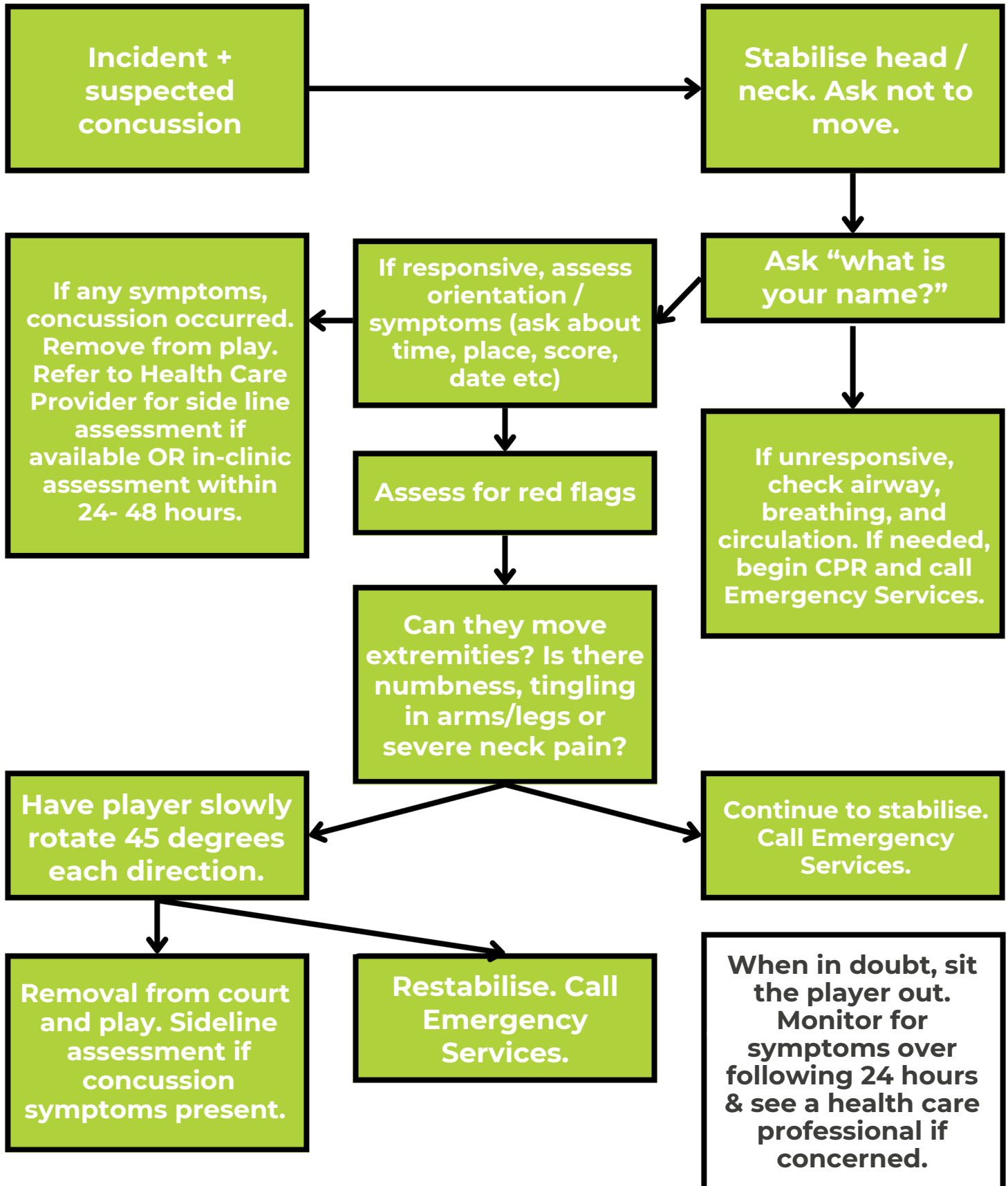
Thank you very much in advance for your understanding.

Yours Sincerely,

NAME OF PROFESSIONAL

Credentials (please circle) MD / NP / DC / PT / AT

Concussion Emergency Action Plan





Return to Play Guidelines

Please note that this process is to be guided by a medical professional who will progress to the next stage based on re-evaluation, time, and symptoms present. If symptoms reoccur, an athlete will be moved back a stage



	TITLE	DESCRIPTION	DO	DO NOT	GOALS
1	SYMPTOM - LIMITED PHYSICAL ACTIVITY	Encourage light physical and cognitive activities that do not provoke symptoms to a significant degree or place you at risk for hitting your head. Remain here until symptom-free for 24-48 hours and then attempt Stage 2. If you are having trouble with Stage 2, consult your healthcare provider.	Light walks (15- 20 mins). Household chores. Limit screen time.	Physical or cognitive activities that make your symptoms worse or risk a hit to your head.	Gradual reintroduction of light exercise and activities of daily living.
2	LIGHT PHYSICAL ACTIVITY	You should be evaluated by your healthcare provider with a graded exercise test (eg. Buffalo Concussion Treadmill test) to determine your exercise tolerance. Once completed your healthcare provider can provide recommendations for you.	Light walking, jogging or weight training.	Physical activity that makes symptoms worse, risk another hit to the head, or sport specific activities.	Increase heart rate to allow brain to adapt to increase in blood flow. Test will determine pre-symptom heart rate to set the exercise level.
3	SPORT SPECIFIC ACTIVITY	You can return to non-contact practice. This is the first step to safely returning to sport. Focus on light individual drills or exercises. Avoid contact, increasing your heart rate too much, or continuing if you have symptoms.	Standing Serving. Passing. Setting. Standing hitting drills.	Scrimmages. Pepper. Hitting drills w/ full approach. Blocking drills. Defensive drills. Sprinting. Resistance training.	Start to add movements that mimic what the athlete will do in their sport.
4	NON-CONTACT TRAINING DRILLS	Higher intensity, non-contact practice with the team. Still avoiding drills that could cause hit to head or that have contact. Resistance training can begin. Gradually increase intensity and start to push yourself.	Serving. Passing. Setting. Hitting drills with full approach. Sprinting or agility drills. Individual blocking drills.	Do not engage in contact or drills with a chance for contact. Do not continue if you develop symptoms	Higher intensity drills, higher heart rate, more cognitive involvement.
5	MEDICAL CLEARANCE STAGE	Should be overseen by your health care professional. Should only be attempted once you have successfully returned to school/work with no restrictions and are completely asymptomatic with physical and cognitive activity.	Should involve intensive dynamic physical exertion testing and/or pre-injury baseline testing to ensure no lingering issues.	Do not continue if you develop symptoms. Stop and notify your healthcare professional.	Return to full practices. No longer at risk of second impact syndrome
6	FULL RETURN	You are now cleared to return to full contact activity.	Participate in at least 1 full practice before a game.	Do not continue if you develop symptoms.	Pre-concussion functioning at full capacity.