

# CONCUSSION PROGRAM



## Concussion Info Package

EDUCATE • PREVENT • RECOGNIZE • MANAGE • RECOVER



"Our goal is to permit a rapid return to work and play!"

*Therapy with Results!*

# CONCUSSION PROGRAM

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# CONCUSSION PROGRAM

## Concussion Info Sheet

### What is a Concussion?

A concussion is an injury to the brain caused by a direct hit to the head, or an indirect trauma to the head, such as a fall or a hit to the body that whips the head/neck back and forth or side to side. For example, being hit by an opponent or piece of equipment in a sports practice, slipping on ice and landing hard on your backside, or whipping your head in a motor vehicle accident, can all be instances in which a concussion can occur. In these circumstances, the brain is rapidly shifted within the skull and will temporarily alter the cell and nerve functions of the brain. Unlike other traumatic brain injuries a concussion does not involve structural damage, therefore, it cannot be seen on an MRI or CT scan.

### What are the Symptoms?

It is important to note that a concussion may or may not cause a person to “black out”. Therefore, remaining fully conscious cannot eliminate suspicions of a concussion. Instead, there are other signs and symptoms that may indicate its presence, which can range from mild to severe, depending on the person. Below are some of the symptoms often associated with concussion injuries:

- Headache or “Pressure” in the head
- Nausea or Vomiting
- Dizziness or Balance Problems
- Sensitivity to Light or Noise
- Feeling Slowed Down or “In a Fog”
- Difficulty Concentrating or Remembering
- Double or Blurry Vision
- Feeling Fuzzy, Sluggish or Hazy
- Feeling more Emotional, Irritable, Sad, Nervous or Anxious
- Feeling Confused
- “Just don’t feel right”

It is important to note that symptoms may develop immediately after a hit to the head or body or can appear several hours after the injury occurred. Symptoms may also worsen with physical or mental activities such as running up the stairs or texting.

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## Concussion Info Sheet

### **What should I do if I suspect I have a concussion?**

If you recognize the signs and symptoms, as previously mentioned, following a hit to the head or body you should immediately remove yourself from physical activity. Concussed individuals should be rested physically and mentally to reduce stress on the brain, and allow the healing process to begin.

### **Should I go to an emergency medical center?**

The symptoms of a concussion can be worrisome because they are involving the brain. However, it is not necessary to go to the hospital unless there are severe and rapidly progressing symptoms, such as progressively worsening headache, loss of limb coordination, extreme nausea and vomiting, reducing level of consciousness.

Instead, the main priority following a concussion is to rest the brain, which includes avoiding busy and noisy environments. If there are no signs of an underlying traumatic brain injury medical assistance guidance can come from a visit to your family physician or Athletic Therapist.

### **What should I expect to feel during my recovery?**

Following a concussion, you may experience difficulty with mental processing with school, work, or simple tasks around the house. With rest, rehabilitative treatment, and following the guidelines as set by your physician or Athletic Therapist, the symptoms should gradually resolve. Symptoms should be tracked daily to indicate how the progress is going. Neglecting physician advice, continuing to remain active, or returning to activities too early after a concussion will increase the risk of having longer-term difficulty with memory or attention, headaches that last longer, and/ or further time spent out of activities.

### **How do I know when it's OK to return to physical activity, school, or work?**

It is imperative that any persons suspected of having a concussion do not return to physical activity on the same day that the trauma occurred. Once symptoms have completely resolved, a physician or Athletic Therapist can guide the return-to-school, return-to-work, and return-to-play protocols for a safe reintegration into regular activities.

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## Concussion Fact Sheet

### Did you know....?

**1. One symptom is all you need to suspect a concussion.**

If you have sustained a blow to the head or body, one symptom is all you need to suspect a concussion that will need further evaluation. While headaches are frequently reported, any of the symptoms will do.

**2. Women may be more susceptible to concussions .**

Men generally have more neck strength and stability than women, which may reduce the whiplash effect and movement of the brain inside the skull.

**3. Helmets cannot prevent concussions.**

Helmets do not stop accelerated rotation that can shift or slam the brain into the skull. However, they can protect you from catastrophic brain injuries.

**4. Adolescents tend to take longer to recover from a concussion.**

Recent research has identified that adolescents 13-16 yrs do have more severe symptoms and increased difficulty dealing with the effects of a concussion.

**5. X-rays, CT Scans nor MRIs can diagnose a concussion.**

The only way to diagnose this condition is through a knowledgeable examiner and a compliant patient.

**6. Concussions do not always involved a loss of consciousness.**

An individual does not need to lose consciousness or have a direct blow to the head to suffer a concussion. You can have a blow to the chest or land on your backside, which can cause enough impact for your brain to shift inside your skull.

**7. Rest is the only proven treatment for concussions.**

We have known for probably 10 years or so that physical rest was important, but it was not long ago that we determined that cognitive rest is also very important.

**8. Concussions can happen outside of sports settings.**

Concussions can occur in all age groups or settings. At home you can fall or at work you can be in some kind of accident involving your head.

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## Baseline Testing

### What is baseline testing?

Baseline Testing refers to a series of tests used to establish an individual's level of mental functioning prior to a head injury. Every person has a different standard that is "normal" for them with regards to mental processing speed, memory, and sensory function. Therefore, for those who may be at risk for concussion, baseline tests allow for comparison of one's own pre and post injury scores. This information will assist physicians and Athletic Therapists in developing a treatment plan, and ensuring a safe return-to-activity.

### What tools are used for baseline testing?

Most facilities use one or both of the following tests to establish baseline functioning:

- 1) SCAT3—Sport Concussion Assessment Tool 3rd Edition
- 2) ImPACT—Immediate Post-Concussion Assessment and Cognitive Testing

### Does testing differ for children and adults?

ImPACT testing is not recommended for children under the age of 12 due to the complexity of the tasks during the test, and the unreliability of the results. Baseline SCAT3 testing is available to children aged 5-12 years, using the Child-SCAT3 protocol. Testing will be similar to adults, however the questions will be suitably phrased for a younger population. Additionally, parents will be asked questions pertaining to the child's health and symptoms they may have noticed. Persons aged 13 years and older will be tested with the Adult SCAT3.

### What is the SCAT3?

The SCAT3 is a standardized tool for medical and health professionals to evaluate the presence of a concussion. The test should be done on the sideline of a sports event, however the test may also be administered clinically pre-injury for baseline values, or used post-injury as an assessment tool. A composite score will be developed based on:

- 1) Symptom Evaluation
- 2) Standardized Assessment of Concussion (SAC) score—orientation, concentration, immediate and delayed recall.
- 3) Neck and Coordination Examinations
- 4) Balance assessment score—Modified Balance Error Scoring System (BESS)

### Where can I go to learn more about the SCAT3?

To view or print a copy of the SCAT3 or Child-SCAT3, please visit <http://bjsm.bmj.com/content/47/5/259.full.pdf>

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## Baseline Testing

### What is ImPACT?

ImPACT is the first, most-widely used, and most scientifically validated computerized concussion evaluation system. ImPACT was developed in the 1990s to provide useful information to assist qualified practitioners in making sound return to play decisions following concussions.

### Why use ImPACT?

Given the inherent complexities of concussion management, it is important to manage concussions on an individualized basis and to implement baseline testing and/or post-injury neurocognitive testing whenever possible. Neurocognitive assessment can help to objectively evaluate the concussed athlete's post-injury condition and track recovery for safe return to play, thus preventing the cumulative effects of concussion. In fact, neurocognitive testing has been called the "cornerstone" of proper concussion management by an international panel of sports medicine experts.

### ImPACT is NOT

ImPACT is not: A diagnostic test. ImPACT is one tool that can be used by medical professionals to help measure an individual's recovery from a concussion.

ImPACT is not: A one step solution to concussions.

ImPACT is not: A preventative tool.

ImPACT is not: A substitute for medical treatment or management.

ImPACT is not: A replacement for a CT scan, MRI or other medical technology.

ImPACT is not: A home-based test. ImPACT should always be administered in the presence of a trained supervisor.

### Who is currently using ImPACT?

Some of the individuals using ImPACT include all of MLB, NHL, NFL and WWE. Over 6000 high schools, 1,300 colleges and universities, 1,200 clinical centers, 225 professional teams, select military units, Cirque du Soleil, New Zealand and South African rugby teams also use ImPACT.

### Where can I go to learn more about the ImPACT Test or to be tested?

Please visit ImPACT's website, [www.impacttest.com](http://www.impacttest.com) for more information. Or, to view a demo of the ImPACT test please visit <http://www.impacttestonline.com/impacttestdemo>.

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## Concussion Prevention

While there has not been any protocol or tool that can guarantee the prevention of concussions, the following guidelines can assist with reducing the incidence of concussions in sports settings.

### Helmets

- Ensure that athletes wear a helmet that is appropriate for the sport they are participating in. Helmets are designed and padded differently depending on the number of anticipated hits to the head and the amount of force expected with each hit.
- Helmets should fit the athlete in accordance to the requirements of that particular sport. Reports show that only 15-20% of all helmets are fit correctly. An improperly fitting helmet could increase the risk of a concussion due the head being rattled or twisted easier.
- The helmet should have a sticker on it indicating it's approved use. This certification is given by either: National Operating Committee on Standards for Athletic Equipment (NOCSAE)



OR Canadian Standards Association (CSA).



### Mouth Guards

- The role of mouth guards in preventing concussions is inconclusive at this time. Some studies have shown the benefits while others have shown there is no correlation.
- While the research is not clear there is certainly no harm in athletes wearing them. The use of mouth guards will reduce dental trauma and lacerations to the mouth.

### Proper Body Contact Techniques

- Athletes must avoid using the head as a primary point of contact. Anti-spearling rules in football have helped reduce the number of cervical spine injuries in sports, however, head first contact is evident in sports other than football.

### Education

- Stakeholders of teams should be educated prior to the start of the season on goals and methods to reduce the number of concussions during the season.
- Team should enroll in baseline testing to aid with athlete concussion recovery.
- Coaches need to prioritize proper tackling and hitting techniques in order to reduce hits to the head. Training athletes to avoid leading with the head or targeting the head. Hits should be made with the shoulder instead of a helmet to reduce the incidence of concussions.
- Teams should encourage fair play and respect for opponents to decrease dangerous tactics.

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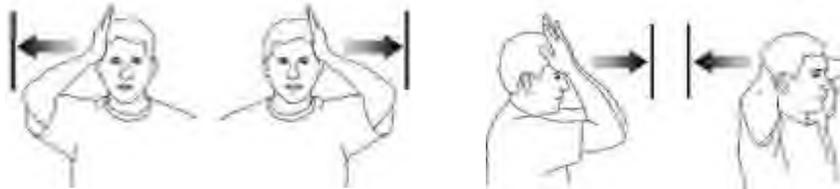
## Concussion Prevention

### Neck Strength

- Studies have shown that individuals with stronger neck musculature have lower rates of concussions. A strong neck can absorb some of the force from a blow to the head, and ultimately decrease the amount of force delivered to the brain.
- Women may be at a greater risk for a concussion than their male counterparts due to weaker neck muscles.
- Consider the following exercises in order to increase neck strength.

### ISOMETRIC NECK STRENGTH

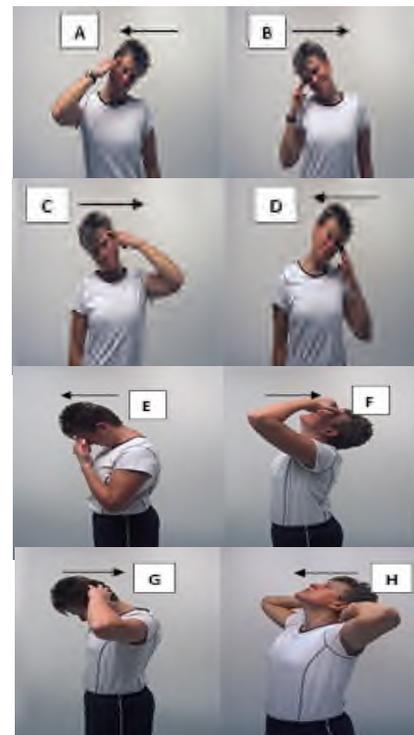
Place hand on side of head. Lightly push the head into the hand, without moving hand and head position, Hold for 5 seconds. Repeat 5-10x along each side, as well as front and back of the head.



### CONCENTRIC/ECCENTRIC NECK STRENGTH

Combine the neck' range of motion against light hand resistance.

- A: Start in a left side-bent position. Place hand on right side of head. Push the head into the hand, while the hand “lets the head win” to reach the right side-bend position.
- B: Continuing from above, the right hand will push on the head, while the head will “let the hand win” in returning the neck to the left side-bent position.
- C/D: Repeat A/B but on the other side of the head.
- E: Start in an extended position. Place hand on forehead. Push head forward into hand, while the hand “lets the head win” to reach a forward flexed position.
- F: Continuing from above, the hands will push on the forehead, while the head will “let the hand win” to return to the neck to an extended position.
- G/H: Repeat E/F, but on the backside of the head.



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## Detecting An Emergency

Concussion-like symptoms may appear for various other traumatic brain injuries and can mask an underlying problem. Therefore, it is essential to monitor the initial recovery process after a concussion or major hit to the head, neck, or body, for additional signs that may indicate a more severe brain injury has occurred.

When faced with a suspected concussion, be sure to go through this questionnaire immediately. If you answer yes to any of the following questions, or if your symptoms are worsening with time, **please call 911** or **visit the local emergency medical center**.

1. Do you have a headache that is getting progressively worse over time?
2. Have you thrown up repeatedly and/or are feeling more and more nauseous?
3. Are your words slurred or coming out funny?
4. Are you unable to control your body or limbs/walking-stumbling?
5. Have you had a seizure?
6. Are you unable to see properly?
7. Are you experiencing a decreased, complete loss or fluctuating level of consciousness?
8. Are you experiencing numbness in your arms and or legs?
9. Are you having difficulty recognizing people or places?
10. Have your pupils become unequal in size?
11. Have you suffered a potential spinal injury?
12. Is there evidence of a skull fracture or clear fluid coming from the ears?
13. Do you have a history of brain trauma?

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## Post-Concussion Guidelines

Once someone is suspected of having a concussion they should be referred to a medical profession who is trained in evaluating and treating concussions.

Treatment may include:

- Clinical Testing/ History/ Injury Mechanism
- Neck Treatment
- Vestibular Treatment (if needed)
- Multi-tasking/ computing/ reading
- Clinical SCAT3 and ImPACT Neurocognitive Test
- Threshold Testing– Exertion Prescription.

More than **80% of concussions resolve very successfully** if managed well within the first three weeks post injury. Use the following guidelines to assist with symptom reduction in the initial concussion recovery, unless otherwise directed by your physician or athletic therapist.

<u>What to DO</u>	<u>What NOT to Do</u>
Remove athlete from play, practice and any physical activity <b>immediately</b>	Do NOT return to play until cleared by a physician with concussion knowledge
<b>REST:</b> Physically, Emotionally & Cognitively	Do NOT go to practice or games
Stay away from noisy and busy visual places	Do NOT go to school or work until cleared
Remove any and all stress	Do NOT engage in any physical activity
Sleep or nap when needed	NO video game, movies, loud music or noise
Use an ice pack on head or neck for comfort	Do NOT subject yourself to un-needed stress
Maintain personal hygiene	Do NOT drink alcohol
Eat nutritious foods	Do NOT drive due to decreased reaction time

Contrary to popular belief, keep in mind that there is **no need to:**

- Check eyes with flashlight
- Wake up frequently (unless otherwise instructed to do so)
- Stay in bed

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## Post-Concussion Guidelines - Symptom Tracking Form -

### DIRECTIONS:

To be completed by the patient daily.

In situations where the symptom scale is being completed after exercise, it should still be done in a resting state; at least 10 minutes post exercise.

SEVERITY RATING						
"You should score yourself on the following symptoms, based on how you feel now"						
None	Mild	Moderate	Severe			
0	1	2	3	4	5	6

Date of Concussion:	Date													
<b>Symptoms</b>														
Headache														
"Pressure in the head"														
Neck Pain														
Nausea or Vomiting														
Dizziness														
Blurred Vision														
Balance Problems														
Sensitivity to light														
Sensitivity to noise														
Feeling slowed down														
Feeling like "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														
<b>Total Number of Symptoms (Max22)</b>														
<b>Symptoms severity score (Max132)</b>														
Symptoms worse with physical activity?														
Symptoms worse with mental activity?														

## Post-Concussion Guidelines

### Recovery From Concussions: More Than “Sitting Out”

Padini J, Collins M, Fazio V, Taylor A, Johnson E, Lovell M

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Over the past decade, knowledge about concussion has grown in the general public and among medical professionals. However, there are still many misconceptions about concussions.

Concussion recovery is believed to have occurred when an athlete is symptom-free at rest, symptom-free with non-contact exertion, and back to baseline on neurocognitive testing (Aubrey et al. 2002). The purpose of this article is to provide guidelines for the management of concussion among student athletes.

#### Important of Rest in Concussion Recovery

Is it well known that physical rest is essential to recovery while a patient is symptomatic. However, the role of cognitive rest is not well understood. Recently, Majerske et al. (2008) demonstrated that heavy levels of cognitive and/or physical exertion after a concussion lead to detrimental outcomes.

#### Physical Rest Guidelines

In the typical course of recovery from concussion, physical rest is recommended until the athlete becomes asymptomatic. Once the athlete is asymptomatic, he/she begins a gradual progression through increasing levels of non-contact physical exertion vary among professionals, general guidelines suggest beginning with light aerobic exercise, followed by moderate levels of activity (sport-specific non-contact training), then heavy levels of non-contact activity. The athlete must remain symptom-free at each step prior to being progressed. If symptoms do reappear, it is recommended that the athlete wait 24 hours, then begin non-contact activity again at a lower level of intensity. Once asymptomatic status is achieved with non-contact heavy exertion, the athlete will typically transition into controlled-contact practice activities prior to entering a game.

For athletes with protracted recovery times or severe symptoms, physical interventions such as vestibular therapy or concussion reconditioning may be useful.

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#### Cognitive Rest Guidelines

Concussion results in a wide variety of physical symptoms such as headache, sleep disturbance, and dizziness. It also produces deficits in short-term memory and learning, attention, and multitasking. Based on the severity of concussions symptoms, the overall level of impairment may make full attendance at school impossible or ill-advised. Schoolwork and the school environment can exacerbate symptoms, so the extent of school participation must be carefully considered.

Some students may need few academic accommodations. Basic accommodations for concussion include notifying teachers of the injury, refraining from gym class and other physical activities, taking breaks to control symptoms (e.g., putting the head down, resting at the nurse’s office, etc.), and taking extra time on tests.

When a concussion is severe, additional accommodations may be warranted. Dramatic symptoms and memory impairment may indicate removal from school, enrollment in homebound education, or half-day attendance until symptoms improve. In addition, students with sensitivity to light and noise may need to eat lunch in a quiet place, avoid auditorium programs, or wear sunglasses to lessen symptoms. Students with severe memory problems may be unable to learn information as quickly or accurately as before. They may also feel that they have learned information but are unable to recall it. In these cases, it is helpful to provide students with cueing (e.g., multiple choice instead of free recall, note cards that contain useful formulas) or allow them to use appropriate notes or books when completing tests. Cognitive rest can also be increased by reducing a student’s overall workload. For example, a 50-item homework assignment could be reduced to 25 items by asking the student to complete every other item, essays can be shortened, and redundant assignments or items can be eliminated.

Certainly, all accommodations will not be appropriate for all classes or all students. Concussion presentation and severity vary among students, and accommodations should be tailored to each case. Many school and parents find it helpful to have a meeting among the parent, guidance counselor, and student to establish which recommendations will be implemented. The student’s neuropsychologist or physician can help with these recommendations. In cases of protracted recovery or very severe initial symptoms, a 504 plan can be established to formal accommodations.

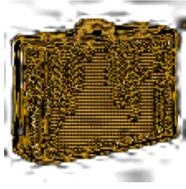
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## Post-Concussion Guidelines - Workplace & Academic -

Returning to mentally demanding environments such as work and school may be challenging for someone who has sustained a concussion because symptoms may be worsened with thinking, concentrating, or focusing.

After a trauma, the brain is required to rest until symptoms resolve. At that time, the following accommodations may assist in reducing the cognitive load on the brain, and subsequently, minimizing post-concussion symptoms.

Each person may vary on what skills or tasks will need to be modified, therefore individuals should establish accommodations with their teachers or workplace employer on a task-by-task basis.



### Workplace Accommodations

Consider initiating return to work from home or with half-days as tolerated

Reduce emailing/writing activities - Utilize phone or transcribing services

Reduce workload - Recommended reduction of 50-75% of normal work amount

Take breaks as needed - Retreat to a quiet or non-distracting environment



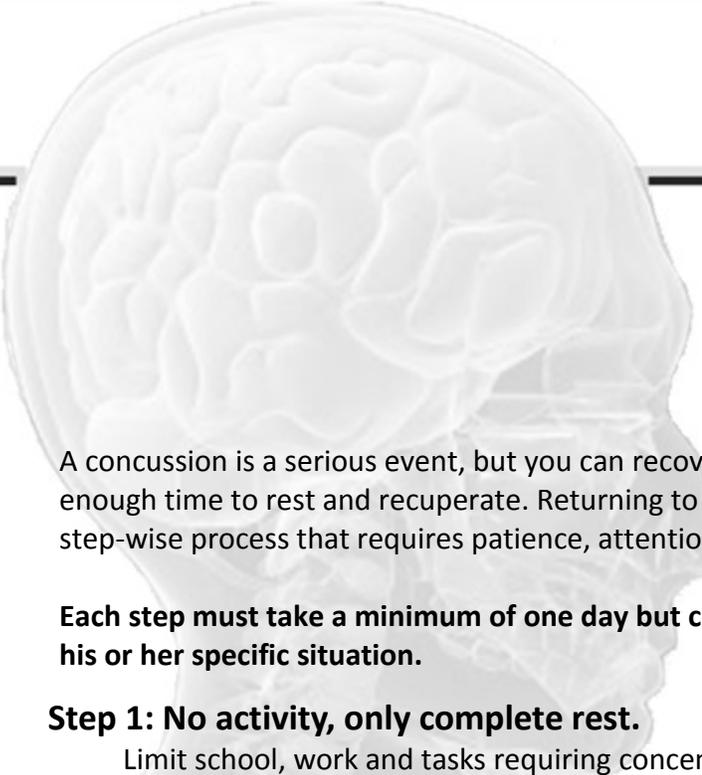
### Academic Accommodations

Consider initiating quiet home study and half-days prior to returning to full-time classes

Use voice recordings or copy notes of peers to reduce mental workload in class

Reschedule or allow extra time to complete work, assignments, and tests

Take breaks as needed - Put head down on desk or use earplugs to reduce distractions



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## Post-Concussion Guidelines - Return To Play -

A concussion is a serious event, but you can recover fully from such an injury if the brain is given enough time to rest and recuperate. Returning to normal activities, including sport participation, is a step-wise process that requires patience, attention, and caution.

**Each step must take a minimum of one day but could last longer, depending on the person and his or her specific situation.**

### **Step 1: No activity, only complete rest.**

Limit school, work and tasks requiring concentration. Refrain from physical activity until symptoms are gone. Once symptoms are gone, a physician, preferably one with experience managing concussions, should be consulted before beginning a step wise return to play process.

### **Step 2: Light aerobic exercise.**

Activities such as walking or stationary cycling. The player should be supervised by someone who can help monitor symptoms and signs. No resistance training or weight lifting. The duration and intensity of the aerobic exercise can be gradually increased over time if no symptoms or signs return during the exercise or the next day.

**Symptoms?** Return to **Step 1** until symptoms resolve.

**No Symptoms?** Proceed to **Step 2** the following day

### **Step 3: Sport specific activities.**

Activities such as skating or throwing can begin at step 3. There should be no body contact or other jarring motions such as high speed stops or hitting a baseball with a bat.

**Symptoms?** Return to **Step 1** until symptoms resolve. If symptoms persist, consult a physician.

**No symptoms?** Proceed to **Step 4** the following day.

### **Step 4: BEGIN Drills without body contact.**

**Symptoms?** Return to **Step 1** until symptoms resolve. If symptoms persist, consult a physician.

**No symptoms?** The time needed to progress from non-contact exercise will vary with the severity of the concussion and with the player.

\*Proceed to **Step 5** only after medical clearance.

### **Step 5: Begin drills with body contact.**

**Symptoms?** Return to **Step 1** until symptoms resolve. If symptoms persist, consult a physician.

**No symptoms?** Proceed to **Step 6** the next day.

### **Step 6: Game play.**

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## Additional Resources

**Brain Injury Association of Canada**

[www.CATonline.com](http://www.CATonline.com)

**Collegiate Sports Medicine**

[www.collegiatesportsmedicine.ca/reddeer/html/resources.html](http://www.collegiatesportsmedicine.ca/reddeer/html/resources.html)

**Center for Disease Control and Prevention (USA)**

[www.cdc.gov/concussion](http://www.cdc.gov/concussion)

**Consensus statement from 4th International Consensus meeting on Concussion in Sport held in Zurich, Switzerland in November 2012**

[www.bjism.bmj.com/content/47/5/259.full.pdf](http://www.bjism.bmj.com/content/47/5/259.full.pdf)

**Impact**

[www.impacttest.com](http://www.impacttest.com)

Demo: <http://www.impacttestonline.com/impacttestdemo/>

**National Operating Committee on Standards for Athletic Equipment**

[www.nocsae.org](http://www.nocsae.org)

**Parachute**

[www.parachutecanada.org/resources](http://www.parachutecanada.org/resources)

**REAP Concussion Management (USA)**

[www.rochymountainhospitalforchildren.com/sports-medicine/concussion-management/reap-guidelines.htm](http://www.rochymountainhospitalforchildren.com/sports-medicine/concussion-management/reap-guidelines.htm)

**Sports Medicine Council of Alberta**

[www.sportmed.ab.ca/sport-concussion](http://www.sportmed.ab.ca/sport-concussion)

**Think First: Elimination of all traumatic brain and spinal cord injuries among children and youth in Canada**

[www.thinkfirst.ca](http://www.thinkfirst.ca)

### MEDICAL DISCLAIMER

The information contained in this package is intended as an information resource only and should not be used as a substitute for professional diagnosis and treatment. The diagnosis and treatment of a concussion is a clinical judgment, ideally made by a medical professional. Under no circumstances should you attempt self-diagnosis or treatment based on anything you have read in this resource.