

What is a concussion?

A concussion is a mild brain injury caused by any bump, blow or jolt to the head, or any blow to the body that causes the head to be jolted, jarred, or moved rapidly. A concussion can affect the way that the brain works. There may or may not be any loss of consciousness.

What are the symptoms?

Symptoms vary and can include physical and behavioural changes, as well as changes to how a person thinks, feels and remembers things. Some of the symptoms of concussion are listed below.

PHYSICAL SYMPTOMS	THINKING SYMPTOMS	BEHAVIOURAL SYMPTOMS
Headache Fatigue Dizziness Nausea and changes to eating Ringing in the ears Sensitive to light or noise Changes in sleep Changes in vision Poor balance or coordination Slurred speech	Confusion Feeling sluggish or foggy Slowed reaction time Difficulty following conversations Changes with: Attention / concentration Memory or new learning Problem solving or decision making	Irritability Mood swings Anxiety or worry Lack of interest Impulsivity

Your child may experience none, some, or all of the symptoms; some symptoms may appear right away while others develop hours or days after the injury. As your child returns to activities, school, and sports the symptoms may become more noticeable.

How is a concussion diagnosed?

Anything more than a light bump to the head should be assessed by a physician, especially if there is confusion, memory problems or changes in level of consciousness. Symptoms may be delayed and only become evident with activity. If your child's symptoms get worse, last a long time, or if you are concerned, have your child assessed by a physician. Most concussions are extremely small injuries of the brain and do not appear on x-ray or CT scan. Your doctor will assess your child to determine if any special tests are necessary.

What is the treatment for concussion?

Treatment includes complete physical and mental rest. This means no activity - no sports, no exercise, no school, no school work, no social activities, no friends, no television, no computer, no video games. Complete rest. As long as symptoms persist these restrictions should be followed. Each concussion builds off the first one therefore a second concussion can be devastating. Prevention of another injury is important especially during the early healing phase.

Return to Play Guidelines?

STEP	TYPE OF ACTIVITY	EXAMPLES	BEHAVIOURAL SYMPTOMS
1	Complete rest	No activity - NO TV, video games, computer, school work, reading, exercise, sports. Complete rest.	Until symptom free No symptoms x 24 hour → Move to Step 2
2	Light	Walking, swimming, stationary bike Light reading, school work TV, video games, computer Visit from friends	Symptoms: Return to Step 1 No symptoms x 24 hour → Move to Step 3
3	Mild	Progressive activity: Skating /running → No body contact Return to school for lunch period	Symptoms: Return to Step 2 No symptoms x 24 hour → Move to Step 4
4	Moderate	Progressive activity: More vigorous exercise Sports drills/practice Half day at school	Symptoms: Return to Step 3 No symptoms x 24 hour → Seek medical clearance
5	Regular Activity	Regular sports drills → No game play Full day at school Return to regular activities	Symptoms: Return to Step 4 No symptoms x 24 hour → Move to Step 5
6	Game Play	Game play	Symptoms: Return to Step 5

It is important to know that symptoms may get worse during the activity or later that day. If ANY symptom returns your child must go back to the previous step in the Return to Play Guidelines. Generally it takes 24 hours or more to assess whether your child can move to the next step. Acetaminophen (Tylenol, Temptra) may be given for headache or discomfort.

How long does recovery take?

Each child and injury is unique. Recovery is often quick, and most children move through the Return to Play Guidelines easily. However some children require days, weeks or months to achieve full recovery. Following the Return to Play Guidelines will help with recovery and prevent re-injury. See your family doctor before returning to regular activity, if the symptoms increase in severity, or if symptoms continue for longer than 3 months. In some cases long term issues develop and other resources specific to concussion may be available in the community.

Useful Web Links for Concussion/Mild Brain Injury and Injury Prevention

This handout was adapted from the 2008 Consensus Statement on Concussion in Sport:
www.sportconcussions.com/html/Zurich%20Statement.pdf

Sports Concussion Assessment Tool (SCAT2): www.sportconcussions.com/html/SCAT2.pdf

Think First Canada: www.thinkfirst.ca

Ontario Brain Injury Association: www.obia.ca

Brain Injury Association of London and Region: www.braininjurylondon.on.ca

WipeOut: www.wipeout.knowledgenetwork.ca

Concussion Facts

The biggest risk is going back to play before the brain heals and getting another concussion!

Higher risk of prolonged recovery with:

- Multiple concussions
- History of learning or behaviour problems
- History of migraines
- Symptoms of amnesia, fogginess or dizziness

Percentage of children who are symptom free in:

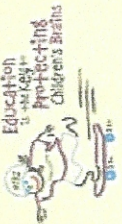
- 15 days=25%
- 26 days=50%
- 45 days=75%
- 92 days=90%




**WHEN IN DOUBT
SIT THEM OUT**



**WHEN THEY'RE OKAY
RETURN TO PLAY**



For more information, please visit
www.canchild.ca

 CIHR
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CONCUSSION

A concussion, also known as a mild traumatic brain injury (MTBI), changes the way the brain functions. An MTBI can be caused by a direct or indirect hit, blow or force to the head or body.

SYMPTOMS OF CONCUSSION

- Sleep disturbances or drowsiness
- Headache
- Nausea and vomiting
- Poor balance or coordination
- Dizziness
- Visual problems
- Sensitivity to light or noise
- Mentally foggy
- Difficulty concentrating / remembering
- Irritability
- Sadness
- Nervousness

Symptoms should be evaluated daily to show healing and recovery

RED FLAG SYMPTOMS

If any of the following symptoms develop, go to the emergency department/seek further investigation immediately.

- Increased drowsiness or cannot be awakened
- Headaches worsen or neck pain
- Persistent vomiting
- Pupils are unequal in size
- Seizures
- Confusion or short-term memory loss
- Blurred/double vision, slurred speech or loss of motor function
- Change in behaviour (irritability, agitation or aggression)

Return to School Guidelines

These stages are designed to strike a balance between the importance of returning to school and brain recovery. Work with your school to put these recommendations into place.

STAGE 1: Brain Rest - NO SCHOOL

- No school for at least one week
 - Lots of cognitive rest (NO TV, video games, texting, reading)
 - When symptom free, move to STAGE 2
- *If symptoms persist past 2 weeks, move to STAGE 2*

STAGE 2: Getting Ready to Go Back

- Begin gentle activity guided by symptoms (walking, 15 minutes of screen time twice daily, begin reading).
 - When symptom free, move to STAGE 3
- *If symptoms persist, stay in this stage for a maximum of 2 weeks and discuss moving to STAGE 3 with your physician or brain injury clinician*

STAGE 3: Back to School/Modified Academics

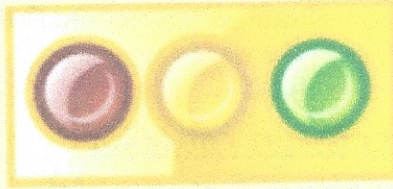
- This stage may last for days or months depending on rate of recovery
 - Go to bed early and get lots of sleep. Have a quiet retreat space in school
 - Academic Modifications:
 - Timetable/attendance: Start by going for one hour, half days or every other day
 - Curriculum: Attend less stressful classes, no tests, homework in 15 minute blocks up to a maximum of 45 minutes daily
 - Environment: Preferential seating, avoid music class, gym class, cafeteria, taking the bus, carrying heavy books
 - Activities: Limit screen/TV time into 15 minute blocks for up to 1 hour daily
 - When symptom free, move to STAGE 4
- *If symptoms persist past 4 weeks → A recovery Individualized Education Plan (IEP) may be needed*

STAGE 4: Nearly Normal Routines

- Back to full days of school, but can do less than 5 days a week if needed
- Complete as much homework as possible and a maximum of 1 test per week
- When symptom free, move to STAGE 5

STAGE 5: Fully Back to School

- Gradual return to normal routines including attendance, homework, tests and extracurricular activities



STAGE 1: Brain Rest - NO SCHOOL

STAGE 2: Getting Ready to Go Back

STAGE 3: Back to School/Modified Academics

STAGE 4: Nearly Normal Routines

STAGE 5: Fully Back to School



If symptoms worsen at any stage, reduce activity!

Important Notes

- Anxiety can be high after a brain injury. Many children worry about school failure and need reassurance about the temporary accommodations.
- Depression is common during recovery from a brain injury, especially when the child is unable to be active. This may make symptoms worse or prolong recovery.

Talk with the child about these issues and offer encouragement and support.

Also see the McMaster Return to Activity Guidelines

Return to Activity Guidelines

These guidelines should be followed in discussion with a physician or brain injury clinician.

STEP 1: No Activity and Complete Rest

- NO physical activity if symptomatic
 - Which symptom group are you in: **BLUE**, **PURPLE**, or **GREEN**? →
- *Get clearance from a physician or brain injury clinician before beginning STEP 2

STEP 2: Light Exercise

- NO resistance training or weight lifting
- 10-15 minutes light exercise, maximum twice a day
e.g., walking, stationary cycling, light jogging, freestyle swimming

STEP 3: Individual Sport-Specific Activity

- NO body/head contact, spins, dives, jumps, high speed stops, hitting a baseball with a bat, or other jarring motions
- 20-30 minutes general conditioning, maximum twice a day.
e.g., skating, running, throwing

STEP 4: Sport-Specific Practice with Team, NO CONTACT

- NO checking, heading the ball, tackling, live scrimmages
- Begin activities with one other teammate and then by the end of this step progress to full team practice, with NO contact.
e.g., ball drills, shooting/passing drills, or other non-contact activities
- Begin resistance training and 'beginner level' sport-specific skills. Increase skill level over time.

*Get clearance from a physician or brain injury clinician before beginning STEPS 5 and 6

STEP 5: Sport-Specific Practice with Team and CONTACT

- Participate in normal training activities. If symptom free, you are ready to return to competition!

STEP 6: Return to Activity, Sport or Game Play

Which group are you in?

Choose your symptom group and follow the instructions below.

SYMPTOM FREE WITHIN 1 WEEK

Rest for 1 more week after symptom free



Begin STEP 2



Take at least 24 hours for each step as you complete the rest of the guidelines

SYMPTOM FREE WITHIN 1 - 4 WEEKS

Rest for 1 more week after symptom free



Begin STEP 2



Take at least 1 week for each step as you complete the rest of the guidelines

SYMPTOMATIC FOR MORE THAN 4 WEEKS

Begin STEP 2 (4 weeks after injury)



DO NOT progress to STEP 3 until symptom free and cleared by a physician or brain injury clinician



Take at least 1 week for each step as you complete the rest of the guidelines



If symptoms return, rest for at least 24 hours and then go back to the previous step

Overriding Recommendations for Return to Contact Sport

- If positive neuroimaging findings → Take at least 3 months off from contact sport
- If 2 concussions in 3 months → Take 6 months off from the time of the most recent injury
- If 3 or more concussions in 1 year → Take 1 year off from the time of the most recent injury
- Discuss retirement from sport after 3 or more concussions, especially if symptoms are prolonged and affecting performance

But continue to exercise!

Also see the McMaster Return to School Guidelines



RETURN TO SPORTS FOLLOWING A CONCUSSION

If you have sustained a concussion, this action plan is recommended before you put your team jersey back on for the game.

You must complete your recommended period of rest and follow the activity restrictions. You should be symptom-free at rest for a full week before returning to any physical activity. When you are ready to return to play follow these gradual progressive steps.

There should be approximately 24 hours in between each step. If any symptoms return at any time during this action plan, stop working out. Rest until you are symptom-free for 24 hours. Then return to the previous step. If symptoms do not resolve or get worse, you are urged to seek medical attention.

★ **STEP 1: Light general conditioning exercises**

- NO CONTACT.
- Begin with a warm up (stretching/flexibility) for 5-10 minutes.
- Start a cardio workout of 15-20 minutes which can include: stationary bicycle, treadmill, fast paced walking, light jog, rowing or swimming.

★ **STEP 2: General conditioning and sport specific skill work done individually**

- NO CONTACT.
- Begin with a warm up (stretching/flexibility) for 5-10 minutes.
- Increase intensity and duration of cardio workout to 20-30 minutes.
- Begin sport specific skill work within the workout, but no spins, dives or jumps.

★ **STEP 3: General conditioning, skill work done individually and with a team-mate**

- NO CONTACT.
- Increase duration of session to 60 minutes. Begin resistance training.
- Continue practicing sport specific individual skills.
- May begin general shooting, kicking or passing drills with a partner.
- May start beginner level spins, dives and jumps.

★ **STEP 4: General conditioning, skill work and team drills**

- NO CONTACT. NO SCRIMMAGES.
- Resume pre-injury duration of practice and team drills.
- Increase resistance training and skill work as required.
- Gradually increase skill level of spins, dives and jumps.

★ **STEP 5: Full practice with body contact**

- CONTACT. SCRIMMAGES.
- Participate in a full practice to get yourself back in the lineup. If completed with no symptoms, discuss with the coach about getting back in the game.
- Coaches must make sure that the athlete has regained his/her pre-injury skill-level and is confident in his/her ability to return to activity.

★ **STEP 6: Return to competition**



Activity Suggestions for Recovery Steps After Concussion

Toddler (0-4)	Child (5-10)	
<p>Step 1 - Rest</p> <ul style="list-style-type: none"> • Crafts: colouring, drawing • Nap in favourite spot • Parents can read stories • Watch fish in an aquarium <p>Step 2 - Light Activity</p> <ul style="list-style-type: none"> • Bird watching • Crafts: painting • Play in the Sand • Play blocks, dolls, cars or small toys • Supervised walking or crawling <p>Step 3 – Sport-specific Activity</p> <ul style="list-style-type: none"> • Crawling • Walking <p>Step 4- Non-Contact Practice</p> <ul style="list-style-type: none"> • Dance lessons • Swim lessons 	<p>Step 1 - Rest</p> <ul style="list-style-type: none"> • Basic board games (i.e. not monopoly) • Crafts: making bracelets, necklaces • Light gardening • Singing • Stargazing • Talk on phone • Talk to friends/family <p>Step 2- Light Activity</p> <ul style="list-style-type: none"> • Challenging board games • Helping cook and bake • Listen to quiet music (no headphones) • Magazines • Puzzles • Billiards • Bocce ball/ Lawn bowling • Croquette • Fishing • Flying kite • Freestyle swimming • Frisbee • Light jogging • Playing Catch • Walking 	<p>Step 3 – Sport-Specific Activity</p> <ul style="list-style-type: none"> • Ipad applications (no gaming) • Word searches • Air hockey or foosball • Biking • Dribbling, keep-ups and stickhandling • Golf • Light badminton • Ping pong • Skating • Sprinklers and splash pads • Tag • Tai chi/karate (non-contact) • Wii or Xbox Kinect games <p>Step 4 – Non-contact Practice</p> <ul style="list-style-type: none"> • Baseball/cricket • Basketball • Dance • Field hockey • Figure skating (no jumps) • Hockey drills • Soccer without heading • Slide and swing at playground • Squash • Tennis • Volleyball (no diving)

WARNING: Perform activities ONLY if symptom free. If the symptoms appear during activity, STOP immediately.

Use suggestions in conjunction with CanChild concussion guidelines available at:
<http://www.canchild.ca/en/ourresearch/mild-traumatic-brain-injury-concussion-education.asp>

Activity Suggestions for Recovery Steps After Concussion

Teenager (11+)

Step 1 - Rest

- Cellphone (no texting only calling)
- Crafts: molding clay
- Friends visit (one at a time)
- Knitting and quilting
- Listen to Audiobooks
- Meditation
- Nap
- Photography
- Scrapbooking

Step 2 –Light Activity

- Cooking and baking
- Crafts: origami, sculpting
- Go to the beach
- Listen to quiet music (no headphones)
- Magazines
- Poetry
- Puzzles
- Re-read familiar books
- Archery
- Billiards
- Camping
- Croquette
- Darts
- Fishing
- Freestyle Swimming
- Lawn bowling
- Light Jogging
- Playing catch
- Stationary cycling
- Walking
- Yoga (no hot yoga)

Step 3 - Sport-specific Activity

- Crosswords
- Shopping at mall
- Sudoku
- Air hockey or foosball
- Biking
- Calisthenics (stability exercises)
- Curling
- Dribbling, keep-ups and stickhandling
- Golf
- Hiking/orienteering
- Light badminton
- Ping Pong
- Running
- Skating
- Snorkeling
- Tai chi/Karate
- Wii or Xbox Kinect games
- Volleyball (keep ups)
- Windsurfing

Step 4- Non-contact Practice

- Aerobics and plyometrics
- Baseball/Cricket
- Basketball
- Canoeing/kayaking
- Dance and Cheer (no stunts)
- Figure Skating (no jumping)
- Football Drills
- Hockey Drills
- Light Weight Training
- Mountain/rock climbing
- Non-Contact Soccer (no heading)
- Pilates
- Shadow boxing
- Squash or Tennis
- Track and Field
- Volleyball (no diving)

WARNING: Perform activities ONLY if symptom free. If the symptoms appear during activity, STOP immediately.

Use suggestions in conjunction with CanChild concussion guidelines available at:
http://www.canchild.ca/en/ourresearch/mild_traumatic_brain_injury_concussion_education.asp

WHAT IF I DON'T FEEL LIKE MY CHILD IS GETTING BETTER?



If you do not feel like your child is getting better, talk with his or her doctor. Keep track of your child's concussion symptoms, and share them with the doctor. This may help the doctor identify the best treatment for your child's symptoms. You may also need to take your child to see a specialist experienced in treating brain injuries. Ask your child's doctor for names of brain injury specialists in your area.

WHAT ARE THE SIGNS OF A MORE SERIOUS BRAIN INJURY?

After your child's concussion, call 9-1-1 if your child develops:

- A headache that gets worse and does not go away
- Significant nausea or repeated vomiting
- Unusual behavior, increased confusion, restlessness, or agitation
- Drowsiness or inability to wake up
- Slurred speech, weakness, numbness, or decreased coordination
- Convulsions or seizures (shaking or twitching)
- Loss of consciousness (passing out)



WHERE CAN I LEARN MORE ABOUT CONCUSSION?

Information in this handout is based on CDC's *Guideline on the Diagnosis and Management of Mild Traumatic Brain Injury Among Children*. More information on the Guideline and concussion, as well as tips to help your child feel better, information about returning to school, and the return-to-play process can be found at www.cdc.gov/HEADSUP.

The information provided in this handout is not a substitute for medical or professional care. Questions about diagnosis and treatment for a concussion should be directed to your child's healthcare provider.



CONCUSSION RECOVERY TIPS

The chart below lists concussion symptoms your child may experience, and tips to address each symptom. Many of the tips can help with more than one symptom. These tips offer temporary changes you can make to help your child's recovery.



PHYSICAL

Concussion Symptoms	How Your Child May Feel or Act	Tips to Help with Your Child's Recovery
Headaches	<ul style="list-style-type: none"> • Trouble with concentration • Increased irritability 	<ul style="list-style-type: none"> • Explore setting up school rest breaks (in a quiet place) • Shorten school day if symptoms do not get better • Lessen the amount of time your child uses screens (computers, tablets, smartphones, etc.) if these activities make symptoms worse • Give your child ibuprofen or acetaminophen to help with pain (if approved by their doctor)
Bothered by light or noise	<ul style="list-style-type: none"> • Symptoms worsen in bright or loud environments 	<ul style="list-style-type: none"> • Have your child wear sunglasses or a hat when outside, or when exposed to bright lights or sunlight • Lessen the amount of time your child uses screens (computers, tablets, etc.) if these activities make symptoms worse • Help your child avoid noisy/crowded places. If needed, your child can wear earplugs or headphones
Dizziness or balance problems	<ul style="list-style-type: none"> • Unsteady when walking • Nausea or vomiting 	<ul style="list-style-type: none"> • Take steps to avoid a fall that could put your child at risk for another injury to the head or brain during their recovery • Avoid crowded areas
Feeling tired	<ul style="list-style-type: none"> • Lack of energy 	<ul style="list-style-type: none"> • Shorten school day if symptoms do not get better • Provide rest breaks in a quiet place at school, or at home during the day, as needed



THINKING OR REMEMBERING

Concussion Symptoms	How Your Child May Feel or Act	Tips to Help with Your Child's Recovery
Attention or concentration problems	<ul style="list-style-type: none"> • Only able to focus on school work for short amounts of time 	<ul style="list-style-type: none"> • Shorten tasks • Break down tasks into smaller activities or steps • Lessen school workload or amount of activity • Avoid cognitive activities (thinking or remembering) that can cause symptoms to worsen
Short-term memory problems	<ul style="list-style-type: none"> • Trouble remembering instructions or keeping information and ideas in mind during tasks 	<ul style="list-style-type: none"> • Repeat directions or key information • Provide written notes
Long-term memory problems	<ul style="list-style-type: none"> • Trouble with learning new information or remembering information already learned 	<ul style="list-style-type: none"> • Repeat directions or key information • Provide reminders, or tie information to familiar things, such as: events, objects, or people • Break down information into smaller chunks or pieces
Feeling slowed down	<ul style="list-style-type: none"> • Unable to keep pace with workload • Slower reading, writing, or calculation • Difficulty processing verbal information effectively 	<ul style="list-style-type: none"> • Talk with your child's school about extending deadlines to complete homework, assignments, and tests • Reduce or slow down how quickly information is presented and check for understanding throughout the activity
Foggy or groggy	<ul style="list-style-type: none"> • Less mental energy • Trouble thinking clearly • Trouble formulating thoughts 	<ul style="list-style-type: none"> • Provide rest breaks during activities throughout the day (at school or home) • Set aside a quiet place at home for school work or other learning activities



SOCIAL OR EMOTIONAL

Irritability or easily angered

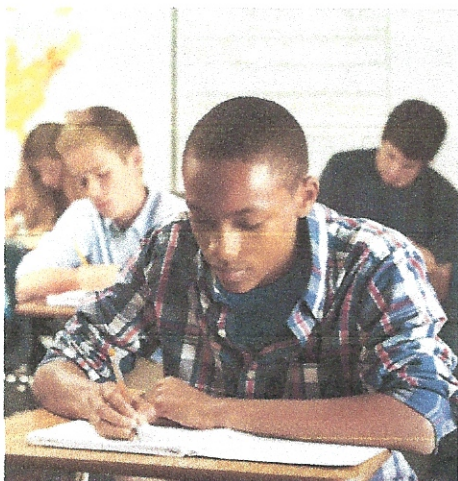
- Trouble dealing with stress

- Look for opportunities to lessen the amount of stress your child may feel
- Provide a place for your child to take quiet rest breaks, as needed
- Do deep breathing exercises with your child
- Encourage your child to talk to a trusted adult or friend
- Remind your child that most people feel better soon after a concussion

Concussion Symptoms	How Your Child May Feel or Act	Tips to Help with Your Child's Recovery
Anxiety or nervousness	<ul style="list-style-type: none"> Worried about falling behind, or pressure to ignore symptoms 	<ul style="list-style-type: none"> Talk with your child's school about extending time to complete homework, assignments, and tests Help your child stay positive (most children with a concussion feel better within a couple of weeks)
Sadness or withdrawal	<ul style="list-style-type: none"> Withdrawal from school or friends because of stigma or activity restrictions 	<ul style="list-style-type: none"> Give your child time to talk with and stay connected to friends Help your child stay connected to teammates, even if he or she is not participating Talk with your doctor if depression is worrisome



Sleeping more than usual	<ul style="list-style-type: none"> Hard to wake up, shifted sleep schedule 	<ul style="list-style-type: none"> Explore setting up a later school start time Allow for rest breaks during the day, as needed Keep to a set bedtime routine with fixed sleep and wake up times as much as possible
Sleeping less than usual	<ul style="list-style-type: none"> Irritable, lack of energy 	<ul style="list-style-type: none"> Avoid screen time and loud music right before bed Sleep in a dark, cool room Keep to a set bedtime routine with fixed sleep and wake up times as much as possible
Trouble falling asleep	<ul style="list-style-type: none"> Tired, groggy 	<ul style="list-style-type: none"> Limit daytime naps or return to your child's regular daytime nap schedule (as appropriate for their age) Keep to a set bedtime routine with fixed sleep and wake up times as much as possible



WHAT IF MY CHILD ISN'T GETTING BETTER?

Talk with your child's doctor if you do not feel like your child is getting better. Your child may need to see a specialist who has experience treating brain injuries. Ask your child's doctor for the names of brain injury specialists in your area.

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