

Concussions and Return to Play

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Stats

- Estimated annual incidence of mild traumatic brain injury (mTBI) in Ontario is 493 / 1,000,000
- 18,000 Ontarians will suffer a mTBI each year
- The incidence of concussions in females are outpacing concussions in males
- Recent research found males take an average of 11 days to recover compared to 28 days for females

Causes

CONTACT

- A concussion is a minor traumatic brain injury that is caused by a bump, blow or jolt to the head

NON-CONTACT

- caused by a violent movement or jarring of the head or neck

Top Causes of Concussions

Female

- Soccer
- Horseback Riding
- Cycling
- Ice Hockey
- Snowboarding

Male


- Ice Hockey
- Cycling
- Football
- Soccer
- Snowboarding



Prevention

- Previous thinking:
 - Helmets – prevent skull fractures and lacerations – but no ability to prevent concussions
 - Mouth guards – protect the teeth and temporomandibular joint – but no ability to prevent concussions

No effective way to prevent a concussion
Education and awareness are KEY

- 
- **Do not be afraid of your child / player sustaining a concussion**
 - **Be afraid of the undetected and mismanaged concussion**

The only effective means of managing concussion is through education of parents, coaches, training staff and players

So What Happens in the Brain

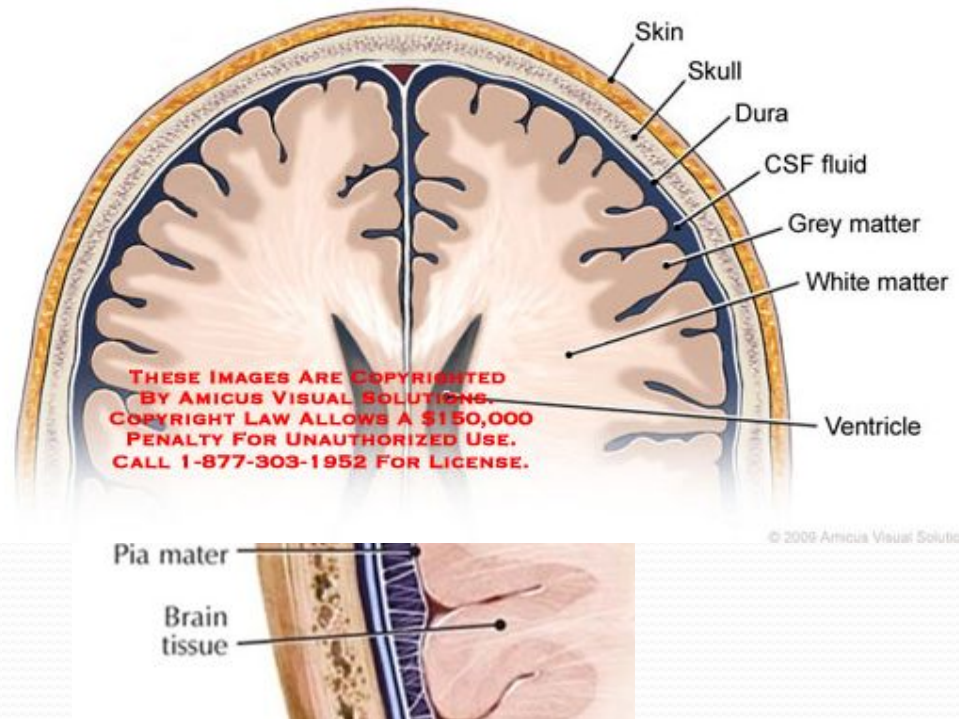
- Brain Anatomy

- (i) You have more brain cells at 2 years of age than at any other point in your life
- (ii) 100,000 miles of blood vessels
- (iii) Contains 100 billion neurons

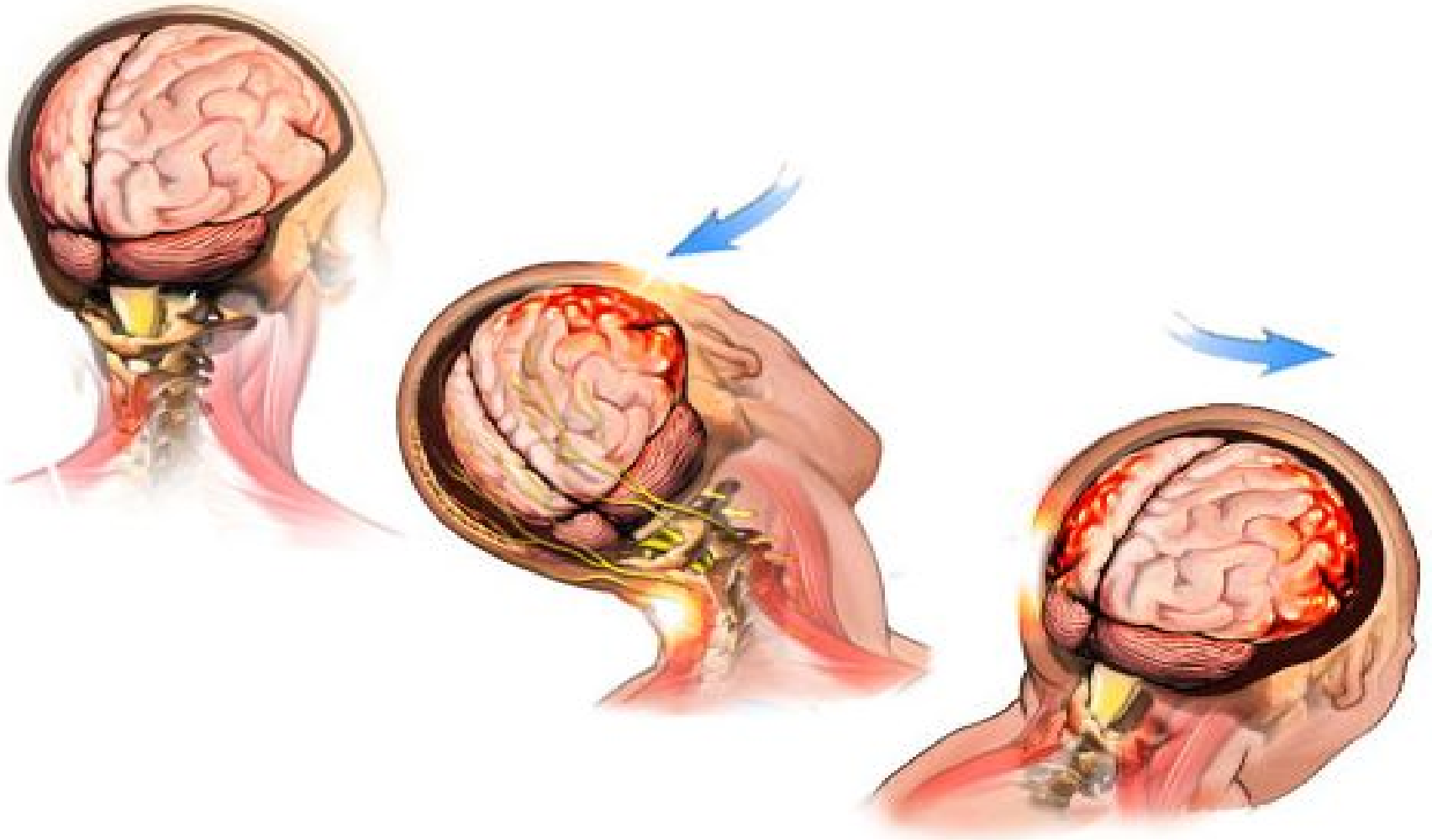
Brain is bathed in a cerebrospinal fluid and secured to the skull with connective tissue


Small amount of space between the outside of the brain and the inside of the skull vault

The brain is enclosed within a protective skull.



Acceleration – Deceleration Injury






A concussion changes the way our brain functions – causes it to work less optimally.

It may be caused either by a direct blow to the head, face, neck or elsewhere on the body with an “impulsive” force transmitted to the head.

A Concussion **may or may not involve loss of consciousness** (loss of consciousness is not a diagnostic requirement).

In fact, less than 20% of concussions result in a loss of consciousness.



Current evidence suggests that the rapid stretch of nerve fibres within the brain during a concussive trauma results in the release of various neurotransmitters (signalling molecules within the brain), which trigger the initiation of a complex neurometabolic pathway.

Ultimately an energy crisis ensues, and the brain is unable to produce the energy required to sustain its normal processes.

Changes take place within minutes of the injury and can last for hours or days before normalization occurs.

It is thought to be this metabolic imbalance, along with other impaired physiological processes that contribute to the physical, cognitive, behavioural and emotional signs and symptoms typically seen in a concussed individual



Concussion Symptoms

Symptoms of Concussion

- 80–90% do not involve a loss of consciousness
- 47% of athletes do not report feeling any symptoms after a concussive blow
- Symptoms such as headaches and feeling sluggish may not surface until 24–48 hours later
- Symptoms generally affect 4 areas:
 1. Thinking and remembering
 2. Physical body – balance, reaction time, coordination, speed
 3. Mood and emotions
 4. Sleep

- Headaches,
- dizziness,
- neck pain,
- nausea / vomiting,
- loss of balance,
- poor coordination,
- trouble focusing on objects or words,
- poor concentration,
- feeling foggy,
- confusion,
- amnesia / poor memory,
- flashing lights,
- blurred or double vision,

- seeing “stars”,
- irritability or emotional changes,
- ringing in the ears,
- slow to follow directions,
- decreased ability to play,
- easily distracted,
- vacant stare,
- drowsiness or fatigue,
- difficulty falling asleep,
- feeling “off” or not like oneself
- change in academic ability



- Persistent headaches are the most common symptom along with:
 - (i) Sensitivity to light
 - ii) Sensitivity to sound
 - ii) Vomiting / nausea
 - ✓) Poor concentration
 - ✓) Dizziness

Recognizing a Concussion

Your athlete has undergone a baseline test using the ImPACT © Neurocognitive Test which provides a snapshot of brain functions and reaction time.

This screening tool is used to help assist with the Removal from Play and with the Return to Play decision.

Removal from play will be determined by the coach, trainer and / or parent



Removal From Play

- **WHEN IN DOUBT – SIT THEM OUT**
- **If a concussion is suspected – err on the side of caution**
- Coach / Team Trainer / Parent responsibility to protect the athlete
- Symptoms may not surface for 24-48 hours after the event
- Parents should seek a medical assessment immediately if a concussion is suspected

MINIMAL RECOVERY TIME

- Nerve cell stretching and correction takes approximately 7-10 days for the minimal recovery
- Recovery is different for every person – therefore, recovery time cannot and should not be predetermined
- Kids generally require a longer recovery time due to the fact their brains are still developing

RETURN TO PLAY PRIOR TO FULL RECOVERY

- **Second-impact syndrome** (a 2nd concussion before the 1st concussion is resolved)
 - exacerbates the initial concussion symptoms and further prolongs recovery
 - Return to Play only after the concussion has fully recovered is CRUCIAL

Athletes that return to sport prematurely without full recovery have an 80% chance of sustaining a non-concussion related injury (shoulders / knee / etc..) due to poor reaction time / concentration.

Lucan Minor Hockey Concussion Protocol

- No return to play for a minimum of 1 week after a suspected or diagnosed concussion
- Follow the Parachute Canada Return to Play Guidelines
 - Medical Clearance is required to begin Stage 2, to resume practice and to return to regular game play (Stage 7)
 - Athletes must pass an Exertional Test (performed at Lucan Memorial Community Arena by Craig Irwin, PT) before proceeding to Stage 7

Post-Concussion Return to Play



- Stage 1 No activity, complete rest until symptom-free for 24 hours

Physician clearance needed to proceed to next Stages

- **Stage 2** Light aerobic exercise (stationary bike or walking)
- **Stage 3** Skating with **no contact** for 20 minutes
- **Stage 4** Full speed, **non-contact** practice with puck drills
- **Stage 5 Attack – Change – Attack – Retreat**
Exertional Test
- **Stage 6** Full contact, full speed practice
ImPACT © re-evaluated and compared to baseline
Physician clearance need to proceed to Stage 7
- **Stage 7** Game Play

RETURN TO PLAY PROCESS

- Each step takes a minimum of 24 hours
- Return to Play Protocol is supervised by Amy Cook, Director of Trainers or Craig Irwin, PT
- Reproduction of symptoms (headaches, nausea, concentration issues, etc...) results in a stoppage of the Return to Play Protocol -- Symptoms must be fully resolved – physician clearance obtained – Protocol is started again at Stage 2

CONCUSSION MANAGEMENT

- The only effective means of managing concussion is through education of parents, coaches, training staff and players
- Ensure a slow and progressive return to play protocol is implemented to ensure the athlete is safe to return to competition

Stay Informed

Parachute Canada

http://www.parachutecanada.org/downloads/programs/SmartHockeyConcussionKit_FINAL2_11FE15.pdf

CANADIAN ACADEMY OF SPORT MEDICINE

<http://casem-acmse.org/wp-content/uploads/2013/07/Head-Injuries-and-Concussion-in-Soccer-discussion-paper-2010.pdf>

- Parachute: www.parachutecanada.org/injury-topics/topic/C9
- Centers of Disease Control and Prevention (US): www.cdc.gov/concussion/HeadsUp/youth.html,
www.cdc.gov/concussion/sports/index.html
- Sport Concussion Assessment Tool 3: <http://links.lww.com/JSM/A30>
- Child SCAT3: <http://links.lww.com/JSM/A31>
- Concussion Recognition Tool: <http://links.lww.com/JSM/A32>
- Ontario Government website: www.ontario.ca/concussions
- McMaster Children's Hospital:
http://www.canchild.ca/en/ourresearch/mild_traumatic_brain_injury_concussion_education.asp