General Overview of Concussion
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Head Injury and Concussion Education Webinar Series

ThinkFirst Canada
Pensez d’Abord Canada
April 2012

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Before we begin…

- The information contained in this presentation is intended for educational purposes only and is not meant to be a substitute for appropriate medical advice or care.

- If you believe that you or someone under your care has sustained a concussion we strongly recommend that you contact a qualified health professional for appropriate diagnosis and treatment.

- The collaborators have made responsible efforts to include accurate and timely information. However the individuals and organizations listed on this website make no representations or warranties regarding the accuracy of the information contained and specifically disclaim any liability in connection with the content of this presentation.
Questions to Answer Today:

• What is a concussion?
• How can you get a concussion?
• How can you recognize concussion?
• How is a concussion treated?
• When do you return to play following concussion?
What is the leading cause of death for Canadians under 45 years of age?

INJURY!
Brain Injuries

- Half of trauma deaths are due to head injuries
- Head injuries account for most cases of permanent disability after trauma

Kraus, J.F. Epidemiology of Head Injury. In Head Injuries. 3rd Ed. Cooper, P.R. (Ed), 1993
Injuries in Sport

- Injuries are common in sports
- Approximately 10-15% of the overall incidence and cost of brain injuries are in sports/recreation
- Concussions are seen as “invisible” injuries
Effects of Brain Injury

- Psychological problems: depression, behaviour change
- Epilepsy
- Cognitive deficits
- Loss of sense of smell
- Blindness
- Deafness
- Weakness of arms or legs
- Death
What’s so special about the BRAIN?

- The brain is made up of billions of neurons
- The communications between neurons are how we think, move and feel
- Neurons don’t grow back

This is why PREVENTION is the only cure for Brain and Spinal Cord Injuries
What is a Concussion?

- Mild traumatic brain injury (mTBI)
- Temporary loss of brain function
- Physical cognitive or emotional symptoms
- Caused by either a direct blow to head, neck, face or elsewhere in the body
- Genetics?

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What Happens in a Concussion?

- Brain surrounded by cerebrospinal fluid and moves within the skull
- Brain’s physiology may be altered for hours or weeks
- MRI or CT scan is almost always normal
- Exact mechanism unknown

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Signs and Symptoms

**Symptoms**
- Confusion
- Amnesia
- Disoriented (e.g. for game details)
- Loss of Consciousness - in 5%
- Headache
- Balance problems
- Nausea
- “dazed”
- Vision problems
- Hearing problems
- Irritability/emotional changes
- Fatigue
- Dizziness

**Physical Signs**
- Loss/altered consciousness
- Balance problems
- Seizure
- Unsteady gait
- Slow to answer/follow directions
- Poor concentration
- Inappropriate emotions
- Vomiting
- Slurred speech
- Personality changes
- Altered work/playing ability
- Sleep disturbance

Some individuals may have one symptom, some may have all. Having only one can still constitute a concussion.

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CT and MRI scans are almost always normal after concussions.
Value of Baseline Neuropsychological Testing

- Value of computerized neuropsychological testing is uncertain
- Computerized neuropsychological testing:
  - May provide a comparison of the player with him/herself – the only valid comparison
  - Can be used to document preexisting disabilities and the effects of previous concussions
- Formal neuropsychological evaluation is essential for assessing cognitive deficits
Concussion Myth Busters

- “You need to lose consciousness”
- “It needs to be an impact to the head”
- “If I had a concussion, it would show up on my X-Ray or scan”
- “All the symptoms of concussion occur at the time of injury”
- “I don’t play contact sports so I can’t get a concussion”
How Can Concussions Happen to Me?

- Sports and Recreation Injuries
  - Cycling and BMX
  - Skateboarding
  - Skiing, snowboarding and tobogganing
- Traffic Collisions
  - Car Crashes
  - Motorcycle Crashes
- Falls
- Workplace Injuries

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Case Study

- A 14 year old hockey player is in the first period of a game. He/She is struck from behind in an aggressive illegal body check. The player hits his/her head on the boards and then falls to the ice, but gets up and skates wobbily to the bench. He/she feels groggy and vomits. The coach says “sit out the rest of the period-you should be fine by the next shift.” The next day in school, the player has a severe headache and cannot concentrate. He/she is taken to see the doctor, and since he/she had 2 prior concussions this year, he/she is advised to sit out a few days and then return to play.

- Did the coach manage the player properly?
- Did the physician manage the player properly?
Prevention of Further Brain Damage after Concussion

- Recognition of concussion is the first step: do you know the current criteria for the diagnosis of concussion?
- Do you know how to treat a concussion?
- Do you know when it is safe for a player to return to play after a concussion?

ThinkFirst’s Concussion Education and Awareness Program Will Tell You
Treating Concussion

- Game time management
  - If you show **ANY** symptoms or signs of a concussion, you:
    - Should not be allowed to return to play in current game or practice
    - Should not be left alone
    - **Later management**
    - Should undergo medical evaluation
    - Should follow a medically supervised stepwise Return to Play Protocol

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Treating Concussion

When in doubt, sit them out!

All concussions need to be seen by MEDICAL DOCTOR
Return to Play

- The majority of *concussions* resolve spontaneously over several days, IF it is the first concussion.

- Report your concussion to parents, coaches and teachers.

- Physical **AND** cognitive rest is required, especially when the individual is still symptomatic.
The 6-Step Return to Play Guidelines

1. No physical or mental activity = complete rest
2. Light aerobic exercise such as fast walking
3. Sport specific exercise, add progressive resistance training
4. Non-contact training drills like running and skating
5. Full contact training drills after medical clearance
6. Game play
Return to Play

- Proceed to next level only when asymptomatic at current level
- If symptoms recur, return to step 1
- There should be at least 24 hours between each step
- Individuals are only considered symptom free if they are not taking meds to mask symptoms
- In general - no return to full play for at least one week. This is doubled for children and adolescents.
Concussions can have Significant Early and Long Term Effects

<table>
<thead>
<tr>
<th>Early Effects</th>
<th>Long Term Effects</th>
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<tbody>
<tr>
<td>• Second Impact Syndrome (SIS):</td>
<td>• Post Concussive Syndrome (PCS)</td>
</tr>
<tr>
<td>• rare condition</td>
<td>• Depression</td>
</tr>
<tr>
<td>• the brain swells rapidly and catastrophically after a person suffers from a second head injury before the symptoms from the first have subsided</td>
<td>• Epilepsy</td>
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<td>• Can lead to death</td>
<td>• Dementia</td>
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<td></td>
<td>• Suicide</td>
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<tr>
<td></td>
<td>• CTE (chronic traumatic encephalopathy)</td>
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How to Prevent a Concussion

- Prevention is multifactorial!
  - Play within the rules, and within your abilities
  - Have respect for your own brain and the brains of your opponents – giving someone a brain injury is a horrible feeling
  - Do not play to win at all costs
  - Do not return to play with a known or suspected concussion until you’ve been evaluated and given permission by a physician

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How to Prevent a Concussion on the Road

- IN TRAFFIC:
  - Wear a seatbelt every time you drive or ride in a motor vehicle
  - Never drive while under the influence of drugs or alcohol
  - Never drive and use your phone. Use the phone only in an emergency by pulling over first.
  - Slow down and stay under control
  - If you are a passenger, don’t distract the driver by creating excessive noise, activity
How to Prevent a Concussion in Sports

- Wear the right gear when:
  - Riding a bike, skateboard, in-line skates, motorcycle, snowmobile, scooter, or ATV;
  - Playing a contact sport, such as football, ice hockey, lacrosse;
  - Batting and running bases in baseball or softball;
  - Riding a horse;
  - Skiing, toboggan ing, snowboarding, ice skating (in some cases)
- Follow the established guidelines for management
- Promote safer play and respect – get rid of fighting, elbows, illegal play and the “enforcer” role

NO helmet prevents all concussions!!
Concussion Education Resources on thinkfirst.ca

Free Downloads!

a) Concussion Management Guidelines: for Physicians
b) Concussion Card for Physicians
c) Questions and Answers for Athletes/Coaches
d) Concussion Cards for the General Public
e) Concussion Information for Parents
f) SCAT2 card
g) Smart Hockey videos
h) Guidelines for Return to Play and Termination
i) Helmet Fitting Guide/Video
j) Consider taking one of the new online ThinkFirst Concussion Courses: [http://concussioneducation.ca](http://concussioneducation.ca)
SCAT 2
Sport Concussion Assessment Tool 2

For assessment of:
• cognitive function - orientation
• memory
• calculation
• symptoms
• return to play
We Base Our Advice On The Experts

- Canadian Academy of Sport and Exercise Medicine (CASEM), 2001 Guidelines
  Visit: [http://www.casm-acms.org](http://www.casm-acms.org)
- Concussion in Sport Group
  a) Vienna Conference 2001
  b) Prague Conference 2004-5
  c) Zurich Conference/Report 2008-9
- Hockey Canada, IIHF, USA Hockey
- ThinkFirst Concussion Education and Awareness Committee
TF Sports Safety Programs

- Smart Hockey with Mike Bossy (1988)
- Dive Right (1988, 2007)
- Sudden Impact (1992, 2007)
- Smart Equestrian – Prototype (2004)
- Smart Skiing and Snowboarding (2005)
- Smart Soccer – Prototype (2005)
- A Little Respect, ThinkFirst (2006)

Visit [www.thinkfirst.ca](http://www.thinkfirst.ca) to download these free resources!
Before we conclude…

- Please register for the upcoming webinars:
  - Concussion in the Paediatric Population
  - Psychological and Cognitive Aspects of Concussion
  - Head Injuries and Prevention

To learn more, visit:
http://www.thinkfirst.ca/programs/webinar.aspx
Things to take away about Concussions from this session...

- Concussion is a brain injury
- Every concussed person should see a medical doctor
- Only a medical doctor is qualified to make the diagnosis of concussion
- The only treatment for concussion is rest (exception=depression)
- The definition of concussion does not include loss of consciousness
- 95% of concussions do not cause LOC
- You don’t have to hit your head to have a concussion-whiplash can do it
- Rest now means physical and mental rest
- CT and MRI are ALWAYS normal
- You only need one persisting symptom to call it a concussion
Things to take away about Concussions from this session…

- There may be a genetic susceptibility
- The second concussion generally occurs after less force than the first, and so on
- The second concussion generally takes longer to recover than the first, and so on
- The young brain concusses more easily
- Women concuss more easily
- Exercise may bring on new symptoms and worsen old symptoms
- There is now a six-step return to play protocol
- Graded exercise is part of the return to play protocol
- You cannot “work it out”, but you can “work it up”
- Repeated concussions in any sport/activity can cause CTE, not just in boxers
Conclusions

- Concussions are serious - can cause permanent brain damage
- Concussions can be prevented
- Major head injuries can be prevented
- The long term affects of concussions can be reduced

BY YOU AND YOU!!!!
Acknowledgements

- **Funding**
  - Public Health Agency of Canada Grant

- **Content**
  - ThinkFirst Foundation of Canada – Concussion Education and Awareness Committee
  - ThinkFirst Foundation of Canada Staff
  - Elaine Keunen – ThinkFirst Hamilton (Neurosurgical Nurse)