



# Consequences of Brain Injury?

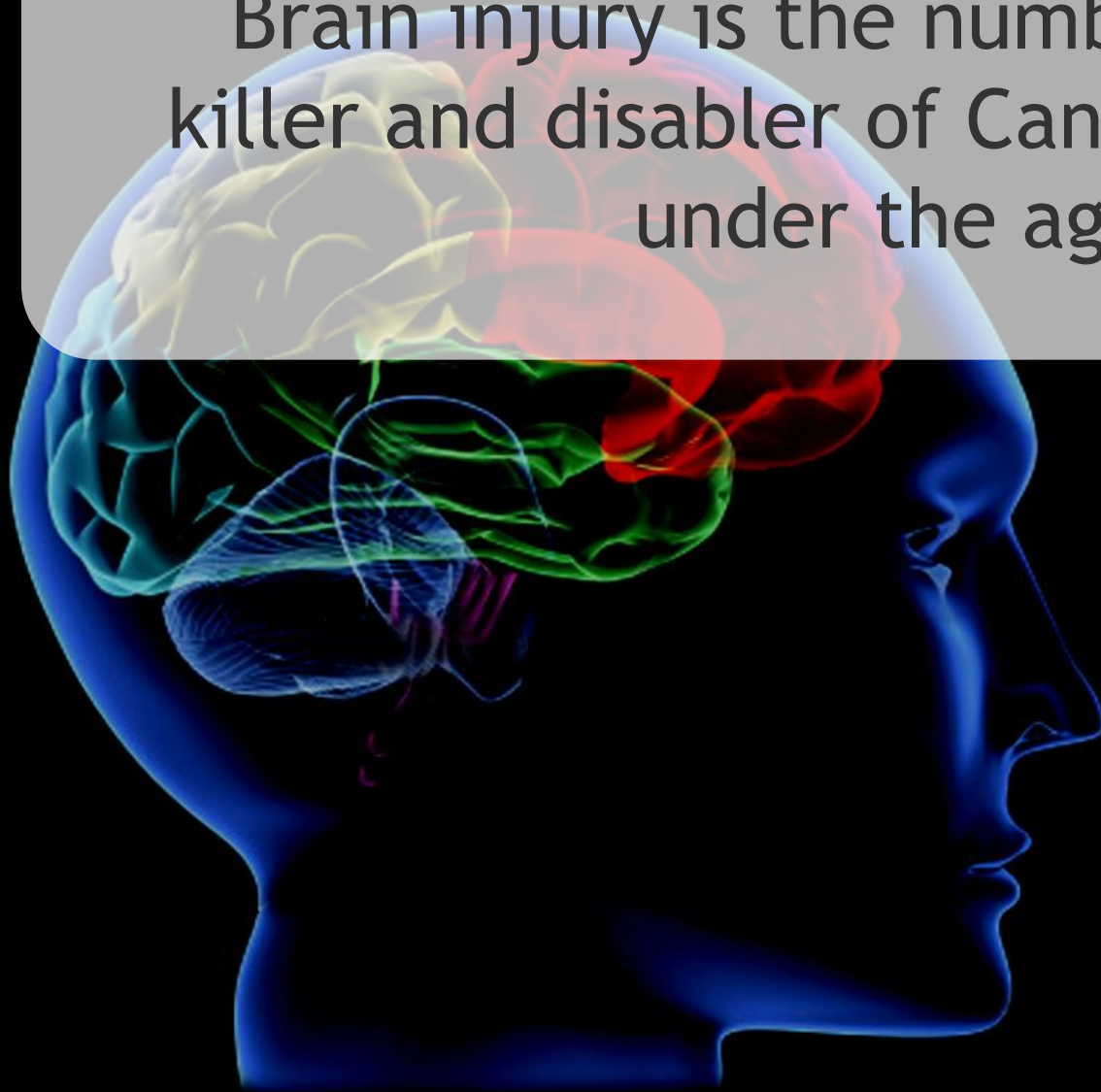
---

Harry Zarins  
Executive Director  
Brain Injury Association of Canada



[www.biac-aclc.ca](http://www.biac-aclc.ca)  
<http://twitter.com/biacacclc>

Brain injury is the number one  
killer and disabler of Canadians  
under the age of 44

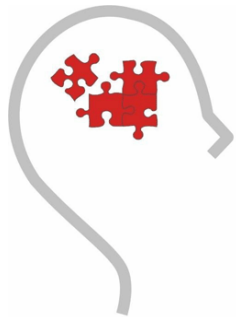


# Brain Injury Association of Canada

This is your brain on Hockey!  
Concussions from the Rink.



[http://www.youtube.com/watch?v=ykaKC9bf1PQ&feature=youtube\\_qdata\\_player](http://www.youtube.com/watch?v=ykaKC9bf1PQ&feature=youtube_qdata_player)



Brain Injury Association of Canada  
Association canadienne des lésés cérébraux



<http://bit.ly/e0VOvj>

**Some of the Many Sides and Challenges of  
Acquired Brain Injury.**

# Acquired Brain Injury

## Some of the Many Sides and Challenges Of Acquired Brain Injury

easily distracted  
disinhibition  
impulsivity  
one track thinking  
difficulty problem solving  
reduced tolerance  
emotional control  
easily fatigued  
depression  
lack of initiation  
socially inappropriate behaviour  
difficulty planning  
uncontrollable or sudden outbursts  
addictions  
perseveration  
loss of memory  
reduced self awareness  
head aches  
behavioural changes  
anger

# Potential Challenges from a Mild TBI

## Concussion

- Physical
  - Physical and Cognitive Fatigue
  - Sensitivity to light and noise/headaches
  - Increased fatigue as the day and week progresses

***A mild TBI (mTBI or concussion) is a Brain Injury!***

# Potential Challenges from a Mild TBI

## Concussion

- Cognitive
  - Restlessness and/or difficulty concentrating
  - Short term memory issues  
(struggling to learn new information; forgetting instructions; appearing disorganized)
  - Slowed information processing  
(slow to answer questions; taking longer to get work done)
  - Difficulty multi-tasking
  - Difficulty understanding concepts
  - Difficulty organizing and expressing thoughts/ideas

***No challenge is so great that it can't be overcome!***

# Potential Challenges from a Mild TBI

## Concussion

- Behavioural/Emotional
  - Changes in behaviour, mood and motivation
  - Increased anger, frustration and irritability
  - Tendency to get upset and/or cry easily
  - Social issues  
(disagreements with peers)
  - Changes in attitude towards activities, work, sports  
(less interest, increased anxiety)

*No challenge is so great that it can't be overcome!*



**Don't Hide it. Report it.  
Take Time to Recover.  
Better to Miss One Game  
than the Whole Season.**

# Potential Long Term Outcomes of TBI

TBI can also cause epilepsy (seizures) and increase the risk for conditions such as Alzheimer's disease, Parkinson's disease, ALS and other brain disorders that become more prevalent with age.<sup>1</sup>

About 75% of TBIs that occur each year are concussions or other forms of **mild TBI**.<sup>2</sup>

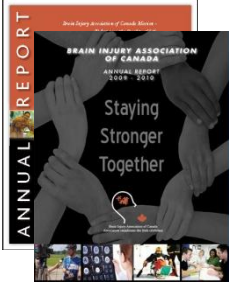
The severity of a TBI may range from "mild," i.e., a brief change in mental status or consciousness, to "severe," i.e., an extended period of unconsciousness or amnesia after the injury.

TBI can cause a wide range of functional short- or long-term changes affecting thinking, sensation, language, or emotions.



- Thinking
- Sensation
- Language
- Emotion

- Repeat TBI's
- Second Impact Syndrome



# More than One TBI?

- Repeated mild TBIs occurring over an extended period of time (i.e., months, years) can result in cumulative neurological and cognitive deficits. Repeated mild TBIs occurring within a short period of time (i.e., hours, days, or weeks) can be catastrophic or fatal.<sup>3</sup>
- In addition to Post-Concussion Syndrome, suffering a second blow to the head while recovering from an initial concussion can have catastrophic consequences as in the case of **"Second Impact Syndrome,"** which has led to approximately 30-40 deaths over the past decade.

**FACT!**



- **General Tips to Help Aid in Recovery:**
  - Rest. Don't rush back to activities such as work or sport.
  - Avoid anything that could cause another brain injury.
  - Wait until your doctor tells you it's safe to drive a car, ride a bike, or use heavy equipment,
  - Your ability to react may be slower after a brain injury.
  - Take only prescribed drugs
  - Don't drink alcohol until your doctor says it's OK.
  - Write things down if you have a hard time remembering.
  - You may need help to re-learn skills that were lost.

# Our Cause: Acquired Brain Injury

- Life Changing
- Thousands of Canadians affected.
- Twice as many are men.
- **BIAC** strives to raise awareness
- Survivor may require full time assistance.
- Families often become primary caregivers
- **BIAC** provides a shared forum to support families and survivors.
- **BIAC** advocates for the enhancement of support services.
- Prevention through education, and legislation is key
- **BIAC** educates through community associations across Canada.
- Neuroscience and injury prevention research are pivotal to addressing ABI.

# Our Mission

- At the founding meeting in July 2003 in Montreal, members from brain injury associations from across Canada, representing survivors, families, medical and research professionals identified the need to create the Brain Injury Association of Canada **BIAC**.
- Our mandate is to improve the quality of life for all Canadians affected by acquired brain injury and promote its prevention. **BIAC** is dedicated to the facilitation of post-trauma research, education and advocacy in partnership with national, provincial/territorial and regional associations and other stakeholders.
- **BIAC** is incorporated as a national charitable organization under the Canada Corporations Act and the Canada Revenue Agency.

- Centers for Disease Control and Prevention
  - <http://www.cdc.gov/TraumaticBrainInjury/outcomes.html>
- ImPACT Concussion Resource Center  
([www.impacttest.com](http://www.impacttest.com))
  - <http://impacttest.com/concussion/overview>
- Brain Injury Association of Canada **BIAC**
  - [www.biac-aclc.ca](http://www.biac-aclc.ca)
- Resources from the NCAA website
  - <http://bit.ly/e4nt3j>
- Sport Concussion.com

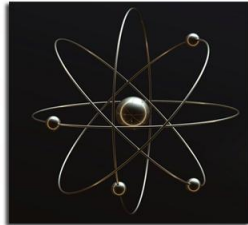
# References

1. National Institute of Neurological Disorders and Stroke. Traumatic brain injury: hope through research. Bethesda (MD): National Institutes of Health; 2002 Feb. NIH Publication No.: 02-158.
2. Centers for Disease Control and Prevention (CDC), National Center for Injury Prevention and Control. Report to Congress on mild traumatic brain injury in the United States: steps to prevent a serious public health problem. Atlanta (GA): Centers for Disease Control and Prevention; 2003.
3. Centers for Disease Control and Prevention (CDC). Sports-related recurrent brain injuries—United States. *MMWR* 1997;46(10):224-227.



# A Concussion is a Brain Injury

## PHYSICS



Inertia: Property by which an object in motion (or at rest) will continue in that state until acted upon by an outside opposing force.

Basis of Newton's First law  
Energy (E)<sub>k</sub> = Mass x (Velocity)<sup>2</sup>  
Potential Energy is converted to Kinetic Energy on Impact. Energy is conserved and not created or destroyed

Newton's Second Law  
Force = Mass x Acceleration  
Power = Force x Velocity