Concussion and Brain Injury:
A Primer Prevention, Identification, and Support for Administrators, Teachers and Coaches

With Rachael Henry,

Acquired Brain Injury System Navigator

No head injury is too serious to be despaired or too trivial to be ignored.

— Hippocrates

(400 B.C.)

What are the reasons you are here today?

Tracy's Story

http://www.youtube.com/watch?v=yIqZDbk3M40

Focusing on Kids

- Thirty per cent of all traumatic brain injuries are sustained by children and youth, many of them while participating in sports and recreational activities. [2]
- The majority of cases of ABI in children result from a fall.[1]
- Adolescents are more likely to sustain a brain injury than any other age group. [1]
- Researchers estimate that 90 per cent of all injuries are predictable and preventable. [2]

Defining ABI

- The term “Acquired Brain Injury” refers to an injury which occurs suddenly through a traumatic or non traumatic event.
- An injury can range from mild to severe
- Can be open or closed [1]

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Concussion

- A concussion is a traumatic brain injury caused by a sudden jarring to the head, causing the brain to bounce or twist in the skull.
- It damages the brain cells and creates chemical changes.
- It is a disruption of the way the brain works.
- It cannot be seen on x-rays, CT scans, or MRIs.
- Temporary changes occur make the brain more sensitive to additional injuries and stress through the healing process. [3]

- It affects the way a person may think and remember things for a short time – days to months.
- Having had previous concussions may increase the chance that a person may take longer to heal, and may have long term consequences. [3]

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Has anyone had experience of someone they know sustaining a concussion?

What were the symptoms?

Were any other challenges encountered?

What to Watch For

- Appearing dazed or stunned
- Does not know day, time, opposing team, score, etc.
- Forgets instructions
- Talking or responding more slowly
- Unsteady on feet or uncoordinated
- Slurred speech
- May or may not include a loss of consciousness
- Mood, behaviour or personality change
- Amnesia
- Difficulty attending and concentrating
- Not playing sport as well [3]

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What may be Experienced

- Headache, pain or pressure in head
- Nausea and vomiting
- Double vision and dizziness
- Sensitivity to light or noise
- Seeing stars, flashes of light, or hearing ringing in the ears
- Feeling out of sorts, that something is not right
- Nervousness
- Irritable
- Difficulty focusing [3]

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When it's an Emergency

Signs of serious danger which need emergency medical attention include:

- One pupil larger than the other
- Drowsiness or inability to wake up
- A headache that gets worse and does not stop
- Weakness, numbness, and lack of coordination
- Repeated nausea or vomiting
- Slurred speech
- Convulsions and seizures
- Inability to recognize others or location
- Symptoms that get worse as time goes on, such as confusion, restlessness or agitation
- Unusual behaviour
- Loss of consciousness – if more than a minute call 911[3] – *but your school board's threshold may be less.*

How to Respond:

- Monitor the student for signs of a concussion or changes over time. Consider using the "*Concussion Signs and Symptoms Checklist*"
- If a child has been potentially injured it is best to have them seen by a doctor before returning to any physical activity. Your board may have a policy in place regarding this.
- They should never return to physical activity the same day the injury has occurred. This includes gym class, recess play, sports practices, or activities at home.
- In some serious cases, not obtaining treatment could result in serious damage or even death. [3]

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Brandon Schultz's Story

http://www.cdc.gov/TraumaticBrainInjury/CTK_Video_WM_BB.html

What can we learn from Brandon's experience?

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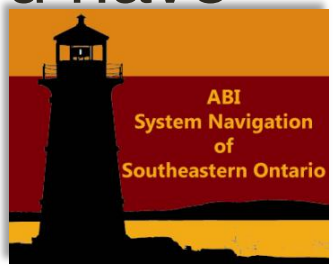
Communication is Key

- Ensure that other teachers and the child's family are aware of the potential concussion, the precautions they need to take, and of the symptoms to look out for. This information need to be communicated directly, don't leave it to a note.
- Encourage parents to have the child medically assessed.
- If emergency treatment is necessary, ensure you provide as much information including the type of injury and all symptoms you have witnessed. Send a copy of any documentation you have made with the student.



In the Classroom

- Students who are dealing with a concussion may need to limit activities as they recover. This not only means sports related activities but any mental activity requiring concentration and focus.
- Too much exertion may cause concussion symptoms such as headache or tiredness to return or get worse.
- Support and accommodations can be reduced as the symptoms decrease. [3]

Students may need to:

- take breaks during the school day
- spend fewer hours at school
- be given longer for tests and assignments
- receive help with school work
- reduce the time they spend reading, using the computer, or writing. [3]

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They may benefit from:

- getting notes or written instructions
- Individual check-ins to make sure they are following the lesson and feeling ok
- working with a peer to help stay on track [3]

An Emotional Time

- Students may not agree with your stance to remove them from activities
- They may be dealing with symptoms which will be causing them to feel unwell, and can be expected to have frustrations as a result
- They may also experience sadness, loneliness, and uncertainty. [3]
- If possible, make arrangements that address these needs, for example: having a friend stay in at recess time for company, providing encouragement and reassurance

  as well as practical support.

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Returning to Activities

Return to sport and activity must follow a “step-wise” approach:

1) No activity, complete rest. Once back to normal and cleared by a doctor, go to step 2.

2) Light exercise such as walking or stationary cycling, for 10-15 minutes.

3) Sport specific aerobic activity (ie. skating in hockey, running in soccer), for 20-30 minutes. NO CONTACT .

4) “On field” practice such as ball drills, shooting drills, and other activities with NO CONTACT (ie. no checking, no heading the ball, etc.).

5) “On field” practice with body contact, once cleared by a doctor.

6) Game play. [4]

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It Takes Time

- Only one step should be implemented per 24 hour period.
- If any symptoms reappear during or after activities, the student should rest for a minimum of 24 hours and be reassessed by a doctor and cleared for activities once again.
- If symptoms have reappeared, return to Step 1 and proceed once again monitoring for concerns. [4]
- Tailor this approach to students returning to regular activities in the school yard as well.

http://www.ctv.ca/CTVNews/CanadaAM/20111213/sidney-crosby-nhl-concussions-111213/

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The Right Equipment

- Protective equipment is important. Not only should it be used, but it should be inspected to ensure it is in good physical condition each time it is used.
- Helmets are subjected to tests based on the activity they are intended for. It is important to use the right helmet for the right activity
- Single impact vs. multiple impact – know when your helmet should be replaced.
- Not to be confused with “single use”, certified for one type of activity and “multi-use”, certified for more than one activity

Acronyms to Look For

- Canadian Standards Association **(CSA)**
- United States Consumer Product Safety Commission **(CPSC)**
- American Society for Testing and Materials **(ASTM)**
- National Operating Committee on Standards for Athletic Equipment **(NOCSAE)**
- SNELL Memorial Foundation **(SNELL)**
- European Committee for Standardization **(CEN)**

Refer to "*Which Helmet for Which Activity?*"

A Proper Fit

- Helmets work only when they fit comfortably and securely.
- Use the **“2V1 Rule”**:
  - Rim is 2 fingers above your eyebrows
  - Straps form a V under the ears
  - 1 finger fits under chin strap

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Brain Injury Basics…

How many of you here today have worked with or know someone with a brain injury?

What symptoms did that individual face?

How did you help to address them?

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The Brain at Work

- Neurons work as a network, passing information along pathways to each other.
- Neurons do not actually touch, but communicate through electrical and chemical signals.
- If the neurons move out of alignment, this connection can be lost.
- When one area of neurons becomes damaged and dies, they are unable to pass signals along to neurons further down the chain.
- When these neurons are no longer receiving information, they can atrophy and cause cell death far from the initial injury site. [1]

Types of ABI

- No two brain injuries are the same
- The outcome of an injury is affected by many variables, including the location and severity of the injury, age, the individual's previous abilities, concurrent health problems, rehabilitation, and support from family and friends – to name a few
- Because of the variables involved, whether an injury is deemed to be "Mild", "Moderate" or "Severe" will not always correlate to the individual's functional outcomes.

ABI in Children

- Because children's brains are still growing, a brain injury can interrupt the natural development process. [1]
- The younger the child, generally the more susceptible to brain injury [7]
- Skills and abilities acquired before a brain injury are likely to be present after the injury.
- If an individual is injured before a certain developmental stage, they may have difficulty acquiring it at a later time. Sometimes it is said that children "grow into" their brain injuries.
- As children do not always exhibit a deficit at the age they are injured, they may have silent or undiagnosed injuries for years before they are apparent. [1]

ABI Symptoms

Medical:

- Headaches
- Risk of Seizures
- Appetite Changes
- Fatigue – both mental and physical [7]

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Symptoms, con't

Physical:

- Balance difficulties
- Difficulty planning movements and slowed reactions
- Lack of coordination
- Poor endurance
- Weakness or paralysis in part of body
- Require assistance in self-care[7]

Symptoms, con't

Senses:

- Over-sensitivity to touch
- Vision problems
- Sensitivity to noise
- Changes to sense of smell and taste
- Lack of ability to attend to one side of body (eg: left-side neglect) [7]

Symptoms, con't

Cognitive and Communication

- Processing speed reduced
- Memory problems
- Decreased concentration
- Difficulty expressing thoughts
- Trouble with word finding
- Difficulty comprehending speech or written information
- Poor ability to plan, organize, or sequence
- Perseveration – focusing too much[7]

Symptoms, con't

Behaviour and Personality

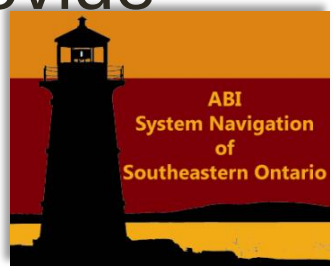
- Irritability or mood swings
- Impulsivity
- Agitation
- Disinhibition
- Impaired judgment or decision making ability
- Lack of insight or awareness of problems
- Unable to self monitor
- Anxiety and/or depression
- Restlessness [7]

Students with an ABI

Differences from other students with learning impairments:

- Previous academic record may be successful
- Be able to recall and use information learned prior to the injury but have difficulty with learning new things
- Learn in isolation but cannot integrate skills successfully
- Difficult to assess since standardized and informal measures of assessment provide information on previous learning,

  not how students learn. [1]



Students with an ABI, con't:

- Have issues with pain and fatigue
- Abilities may improve over time as a result of recovery
- May have trouble reintegrating to social group, and may experience feelings of grief and loss
- Families may also struggle to come to terms with the injury
- Have difficulty regulating emotions and have angry outbursts
- Lack awareness of their own impairments or the degree to which they are affected.[1]

Classroom Considerations

- Take breaks. The child may not recognize or report their own fatigue.
- Schedule demanding tasks early in day.
- Consider activity limitations or restrictions related to safety.
- Evaluate the impact of the environment
- Consider strategies to assist with taking notes and processing information
- Provide time accommodations
- Change the environment instead of expecting the student to change. [6]

Sources of Support

- Communicate! Speak with the parents to find out more about the child's strengths, and challenges.
- If you suspect a previous ABI, ask about the child's history of injuries as sometimes a brain injury is not diagnosed when it occurs
- Contact professionals involved in the child's life for their expertise and perspective
- ABI team - The Child Development Centre at Hotel Dieu Hospital

Long-term Recovery

- The brain continues to make gains long after the body is done recovering
- The first two years after an injury are when the greatest gains are seen, but it continues throughout the individual's lifetime.
- New developments in the field of brain injury have discovered a concept of neuroplasticity, whereby new routes are created between healthy neurons to relay information where it could not before.

To learn more:

http://www.traumaticbraininjuryatoz.org/Interactive-Brain.aspx

Thank you for your time!

Questions? Comments?

Sources

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2. Heads Up Concussion in Youth Sports – Online Training, http://www.cdc.gov/concussion/HeadsUp/online_training.html
3. Think First – Brain Injury Fact Sheet
4. Think First – Concussion Guidelines for the Teacher
5. Think First – Helmet Clinic Guide
6. Child Development Centre – Planning School Re-entry for Students following an Acquired Brain Injury Brochure
7. Child Development Centre – A Handbook for Schools about Acquired Brain Injury