# Sport–related concussion care in the emergency department: What every ED nurse needs to know

**By Ann Hogan, BScN, RN, ENC(C) Trauma Coordinator, New Brunswick Trauma Program**

Each year thousands of Canadians sustain a brain injury. Concussion is the most frequent type of brain injury[1] (Echlin et al., 2010) seen in the emergency departments (ED). Health care professionals typically see patients during the acute phase of injury and must determine what type of brain injury the patient may have sustained. It is important that emergency nurses play a role in educating patients about what to expect after the diagnosis of concussion once discharged from the ED.

Types of brain injuries include:
- Concussion or mild traumatic brain injury (mTBI)
- Cerebral contusion
- Tearing or laceration of the brain
- Cerebral hematoma
- Intracerebral, subdural, or epidural.

Forty per cent of head injuries in children and youth aged 10 to 19 years treated in emergency departments are concussions sustained while playing ice hockey, rugby, football, baseball, soccer, ringette and lacrosse (Parachute, 2013). Much debate has occurred over the last several years regarding concussion diagnosis and care. In November 2012, the 4th International Conference on Concussion in Sport was held in Zurich, Switzerland (Parachute, 2013). Revisions and updates of earlier recommendations from this conference include the Concussion Recognition Tool (CRT), the Sports Concussion Assessment Tool V3 (SCAT3™) (McCrory et al., 2013; BMJ Group, 2013) and the Child SCAT3™ (McCrory et al., 2013; BMJ Group, 2013) for ages five to 12 years. Parachute, a Canadian charitable organization, which united Safe Communities Canada, Safe Kids Canada, SMARTRISK and ThinkFirst Canada into one strong national injury prevention organization, has composed a concussion "toolkit." This toolkit has many resources developed by professionals to support the care of patients who have suffered a sport-related concussion (see helpful links at end of article).

## Definition

Any blow to the head, face or neck, or a blow to the body that causes a sudden jarring of the brain inside the skull, may cause a concussion (McCrory et al., 2013).

The exact mechanism of injury is unknown but it is believed that rotational acceleration "jiggle" of the brain within the skull causes concussion. Concussion is not due to bleeding, contusion or laceration/tear of the brain. It is thought that it is a biochemical injury. More research is required.

## Diagnosis

Firstly, one must rule out risk of cerebral bleed or contusion. Glasgow Coma Scale range 13–15. The clinician must depend on the history of the event, including mechanism of injury (MOI), time of injury as well as physical and cognitive assessments and history of previous concussions. Signs and symptoms vary. Concussion cannot be seen on CT head scans. It is important for the nurse to ask questions about possible symptoms rather than depending on the patient to know what is important to tell. Nurses should become familiar with the Sport Concussion Assessment Tool 3 (SCAT3™) (McCrory et al., 2013; BMJ Group, 2013) and Child SCAT3™ (McCrory et al., 2013; BMJ Group, 2013) for 5–12 years old.

Common symptoms include:
- Confusion to date, time, one's location and trouble remembering what happened before or after the injury
- Difficulty concentrating
- Easily distracted
- Inappropriate emotions in relation to environment (e.g., laughing, crying, anger)
- Physical complaints:
  - headache, dizziness, feeling dazed
  - feeling rattled or stunned
  - seeing stars, flashing lights
  - double, blurry, or loss of vision
  - ringing in the ears
  - stomach ache, pain and/or nausea
  - difficulty sleeping (sleeping less or more than usual)
  - poor co-ordination and balance
  - having a blank stare (glassy-eyed)
  - slurred speech
  - slow responses to questions and directions.

## Treatment

- Complete physical and cognitive rest in the first 24 to 48 hours while symptomatic is recommended. In other words… No TV, texting, computers, radio, reading or physical activity—complete rest
- Referral to health care professional trained in return-to-play assessment based onguidelines (Purcell, 2012; BMJ Group, 2013).

Graduated Return to Play (RTP) protocol (Parachute, 2013) following a concussion follows a stepwise process. The athlete continues to proceed to the next level if asymptomatic at the current level. Each step usually takes 24 hours. Therefore, an athlete would take approximately one week to proceed through the full rehabilitation protocol once they are asymptomatic at rest and with provocative exercise (double the time needed in children five to 12 years old). If any postconcussion symptoms occur while in the RTP program, then the patient should drop back to the previous symptomatic level and try to progress again after another 24-hour period of rest. **http://www.parachutecanada.org/downloads/programs/activeandsafe/returntoplayguidelines.pdf**

## Complications

Eighty to ninety per cent of concussions resolve in seven to 10 days. However, recovery time may be longer in children and youth (Parachute, 2013).

Post Concussion Syndrome (PCS)—The Mayo Clinic's definition of Post Concussion Syndrome describes it as a complex disorder where a variable combination of post-concussion symptoms (e.g., headaches, dizziness) can last for weeks and sometimes months after the injury that caused the concussion (Parachute, 2013; McCrory, et al., 2013).

Second Impact Syndrome (SIS)—The Mayo Clinic's definition of Second Impact Syndrome describes rapid swelling of the brain, which sometimes can be catastrophic if the person afflicted suffers a second head injury before the symptoms from the first have gone away. Although this condition is rare, it can lead to death (Parachute, 2013; McCrory, et al., 2013).

Chronic Traumatic Encephalopathy (CTE) due to repetitive concussions. Symptoms over time include intellectual decline, balance impairment, slurred speech, tremor (Parachute, 2013; McCrory, et al., 2013).

## Prevention

Prevention is complex. Awareness is essential. Prevention needs to include education, environment, enforcement, and engineering. Primary prevention includes education surrounding respect of the rules of the game by athletes, parents, coaches and officials, especially no hits to the head or hits/pushes from behind. A safe environment such as the sports field or ice rink is important in decreasing the risk of injury. Rules of the game need to be enforced without pressure from fans, players and coaches on officials to overlook dangerous play (Parachute, 2013; McCrory, et al., 2013).

Secondary prevention includes recognition of the signs and symptoms by athletes, parents, coaches and officials and, most importantly, full support by all to "when in doubt, sit (them) out". Short-term pressure of winning the big games can overshadow the health and well-being of the athlete. With improper care and or advice the athlete can be susceptible to long-term symptoms such as headaches, difficulty concentrating, dizziness and nausea (i.e., post-concussion syndrome or the more serious Second Impact Syndrome where there can be significant brain swelling potentially leading to death) (Parachute, 2013; McCrory, et al., 2013).

## Summary: Points to ponder and share with patients and families

*(Parachute, 2013; McCrory, et al., 2013)*

- A human brain is not fully developed until age 25. Children and youth more susceptible to concussions
- Helmets can reduce the risk of more serious brain injuries, like a bleed or contusion, but do not prevent concussions
- Concussion symptoms do not always show up right away. They can occur up to 48 hours following an incident
- Concussions can occur without direct impact to the head
- Recognizing signs and symptoms and proper care of a concussion can help in the recovery and prevention of further injury or even death
- Only 10% of all concussions involve loss of consciousness
- Important to provide patients and families with written information to take home. Follow-up with a health care professional trained in return to play assessment is highly recommended.

## Helpful links

- Concussion Clinical Toolkit: **www.cattonline.com**
- Parachute – concussions: **www.parachutecanada.org/injury-topics/topic/C9**
- Parents' Guide to Dealing With Concussions: **www.parachutecanada.org/downloads/resources/ParentsGuide_consussions_May27.pdf**

## About the author

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