Sport & Non-Sport Concussion: Recognition and Management

L. Michael Waters, Jr., DO
Medical Director of University of Florida Plantation Oaks Family Medicine Clinic
Disclosures

• Absolutely nothing to disclose!
Concussion Definitions

• One definition of concussion is a condition in which there is a traumatically induced alteration in mental status, with or without an associated loss of consciousness (LOC). A broader definition is a traumatically induced physiologic disruption in brain function that is manifested by LOC, memory loss, alteration of mental state or personality, or focal neurologic deficits. (Medscape)

• A concussion is a traumatic brain injury that alters the way your brain functions. (Mayo Clinic)

• A concussion is an injury to the brain that results in temporary loss of normal brain function. (American Association of Neurological Surgeons)
Concussion Synonyms

- Jolt
- Knocked out
- Trauma
- Jarred

- Blast
- Impact
- Hit
- “Bell Rung”
SF's Borland quits over safety issues

Borland, 24, said he notified the 49ers on Friday. He said he made his decision after consulting with family members, concussion researchers, friends and current and former teammates, as well as studying what is known about the relationship between football and neurodegenerative disease.

"I just honestly want to do what's best for my health," Borland told "Outside the Lines." "From what I've researched and what I've experienced, I don't think it's worth the risk."
Concussion Symptoms

- Prolonged headache
- Vision disturbances
- Dizziness
- Nausea or vomiting
- Impaired balance
- Confusion
- Sleep Disturbances

- Memory loss
- Ringing ears
- Difficulty concentrating
- Sensitivity to light
- Loss of smell or taste
- “Fogginess”
Differentials

**Acute**
- Subdural or Epidural Hematoma
- Heat Illness
- Dehydration
- Hypoglycemia
- Syncope
- Neck Injury

**Sub-acute or Chronic**
- Malingering
- Overtraining / Burnout
- Uncorrected Vision
- Headaches
- Depression / Anxiety
- PTSD
Grades

• Concussions are graded as mild (grade 1), moderate (grade 2), or severe (grade 3), depending on such factors as loss of consciousness, amnesia, and loss of equilibrium.

• In a grade 1 concussion, symptoms last for less than 15 minutes. There is no loss of consciousness.

• With a grade 2 concussion, there is no loss of consciousness but symptoms last longer than 15 minutes.

• In a grade 3 concussion, the person loses consciousness, sometimes just for a few seconds.

• Still debate about grade classification as some state LOC can happen in a grade 2 concussion.
Clinical Tools

- Standardized Assessment of Concussion (SAC)
- Balance Error Scoring System (BESS)
- Symptom assessment
- SCAT 3 (includes SAC, BESS, others)
- ImPACT Testing
- Multiple others

- Good to have baseline established before the season.
- All can be adversely affected by either patient or examiner
- Not examined for validity under age of 12
- Some are costly to administer
When do we send to Emergency?

- General guidelines
  - Prolonged LOC
  - Focal neurological findings
  - Worsening mental status
  - Seizure activity
  - Worsening headache
  - Repeated emesis
- Concern is for structural injury requiring computed tomography (CT) scan
When Do We need to Refer?

- Prolonged symptoms (should see improvement within 3 days)
- Severe symptoms that are not improving
- Your own individual comfort factor
- Patient with multiple concussions
  - Decisions on retirement?
  - No “magic number”
- Parental request
Treatment

- No medications have been proven to help with concussions
- Most medication management directed at specific symptoms
- Rest is the treatment (physical and “brain rest”)
- Avoid activity that can increase pulse or blood pressure

- Reduced school day/off school
  - Reduced school load
  - Untimed tests
  - Tutoring
- May need to limit video games, texting, reading, computer use, television
- Consideration for restrictions on driving reduced reaction time is issue
Rest is the key
“Brain Rest” Complexity

- Need to Involve the school early
  - Make adjustments
  - ? days off
  - Follow up with schools on adjustments being made
  - High achieving students may not ‘give in’ to adjustments
Most Common High School Sport Causes

Males (In order)
- Football
- Hockey
- Lacrosse
- Soccer
- Wrestling
- Basketball

Females (In order)
- Soccer
- Lacrosse
- Basketball
- Softball
- Field Hockey
- Cheerleading
Caution Advised
High School Sports Injury Stats

• In most sports the main mechanism of injury is contact with another player
• In softball and basketball the main mechanism is contact with equipment
• Younger the athlete, the longer to recover

• Although overall numbers are higher for football, there are a larger % of concussion vs overall injuries in Cheerleading, Boys and Girls Lacrosse, and Boys Hockey
• Girls typically take longer to recover and have more symptoms
More Causes

Athletic
- Recreational sports
- Martial Arts
- Boxing
- Skiing
- X games sports

Non-Athletic
- MVA
- Falls
- Various Trauma
- Assault
Post-Concussive Syndrome

- People who suffer a head injury may suffer from side effects that persist for weeks or months. Symptoms include memory and concentration problems, mood swings, personality changes, headache, fatigue, dizziness, insomnia and excessive drowsiness. Patients with post-concussive syndrome should avoid activities that put them at risk for a repeated concussion. Athletes should not return to play while experiencing these symptoms. Athletes who suffer repeated concussions should consider ending participation in the sport.
Second-impact Syndrome

• Second-impact syndrome results from acute, often fatal brain swelling that occurs when a second concussion is sustained before complete recovery from a previous concussion. This is thought to cause vascular congestion and increased intracranial pressure, which can occur very rapidly and may be difficult or impossible to control. The risk of second-impact syndrome is higher in sports such as boxing, football, ice or roller hockey, soccer, baseball, basketball and snow skiing.

• The CDC reports an average of 1.5 deaths per year from sports concussions. In most cases, a concussion, usually undiagnosed, had occurred prior to the final one.
Sidney Crosby, the NHL’s top star

After four straight shortened seasons due to injury and entering his ninth NHL campaign, Pittsburgh Penguins captain Sidney Crosby has declared himself healthy and ready for the upcoming season.

Published Thursday, Sep. 05 2013
“Return to Play” Guidelines

• If concussion is suspected, do not allow return to play that day.
• No activity until asymptomatic at rest
• Then start to increase activity as tolerated each day:
  • Light aerobic activity
  • Sport-specific training
  • Non-contact training drills
  • Full contact training after medically cleared (Not a law in every state)
  • Game play
What about our non-athlete patients?

What can we do to help this guy?
“Return to Work” Guidelines

• There are no accepted guidelines for accepted time off to return to work in a non-professional sports setting. (Therefore our patient will have to use vacation days and possibly FMLA)

• Most concussions (>80%) have patient back to baseline within 3 weeks.
References

- [http://www.aans.org](http://www.aans.org)