Concussions

A general approach to management as recommended by the CDC, the American Academy of Neurology and others

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What is a concussion?

- A “mild” type of brain injury
  - Acceleration/deceleration injuries
  - Direct blow to head
- Numerous definitions:
  - Clinical symptoms
  - Mechanism of injury
  - Changes in brain function
  - Damage to brain cells
How do I recognize a concussion?

- **Most common symptoms reported by athlete:**
  - Headache
  - Dizziness
  - Balance difficulty
  - Confusion
  - Cognitive “slowing down”

- **Other reported symptoms:**
  - Nausea/vomiting
  - Blurry or double vision
  - Issues with concentration
  - Sensitive to light and noise
Additional symptoms

- Observed symptoms:
  - Dazed appearance
  - Memory change (often regarding injury occurrence)
  - Mood or behavior change
  - Brief loss of consciousness (rare)
  - Clumsy

SYMPTOMS CAN ARISE ANYWHERE FROM RIGHT AFTER THE INJURY TO HOURS OR DAYS LATER
How do I know an injury isn’t more severe?

- Symptoms that require immediate medical attention:
  - Inability to be woken up
  - Unequal pupils
  - Weakness or numbness
  - Seizures
  - Increasing confusion

- Rarely, a head injury can lead to bleeding around the brain which can cause a dangerous increase in pressure
Why is this important?

- 1.6-3.8 million concussions occur annually
- Healthcare costs for the 3 months post mild traumatic brain injuries were $695 million
- 53% of high school athletes have experienced a concussion before beginning high school sports
- The human brain continues to develop into the mid-20s
- Baseball isn’t considered a high risk sport, however...
  - Common mechanisms of concussion = hit by pitch and while fielding a ball
  - Properly fitting headgear can reduce risk of concussion
- Lots of kids play more than 1 sport!
Not convinced this is relevant yet?

- Concussion symptoms last longer in younger athletes
  - Need more conservative management
  - Continued cognitive impairment ->
    - Increased risk of additional concussion
    - Difficulties in school
  - Athletes younger than high school age aren’t well studied

- A history of concussions increases likelihood of additional concussions
  - Each successive concussion increases risk for another
  - Length of recovery also increases

- Negative long term consequences
  - Post concussion syndrome
  - Chronic cognitive impairment
  - Chronic traumatic encephalopathy
Management for Coaches

- CDC “Heads Up” recommends a 4 step action plan:
  - Remove athlete from play
    - If there is ANY concern of concussion
  - Seek medical attention (PCP)
    - If there is concern of concussion, athlete should be cleared by medical professional before returning to play
    - Record any symptoms that occur at time of injury
  - Communicate information about concussions to athlete’s parents
  - Follow medical provider’s instructions regarding athlete’s return to play

- REST is key for recovery
General Guidelines for Return to Play

- Follow instructions from a healthcare provider!

Before returning to play:
- Athlete should be symptom free without use of medication
- Athlete should be in school

Gradual return to play:
- After athlete is in school & symptom free
- Light aerobic activity (10-15 mins)
- Gradually increase intensity
- Heavy intensity non-contact activity
- Full practice
- Participation in games
  - Athlete needs to remain symptom free to progress to the next step
More about school...

- Adjustments need to be individualized for each athlete
- Depends on symptoms and severity
  - Eg. Issues with light/noise, difficulty concentrating
  - May need “rest breaks” throughout the day
  - May need additional time for homework/testing

- Good communication between athlete, parents, school and medical providers is important!
Other tidbits worth knowing...

- Concussions occur more frequently during games compared to practice
- Imaging (CT/MRI) isn’t very useful for diagnosis
- Diagnosis:
  - Baseline neurophysiological testing
  - Screening tools/checklists
    - (many not studied in athletes younger than high school age)
- Reported rates of recurrent concussions have decreased
  - Highest risk of additional concussion within 10 days of original one
  - Due to increased awareness of concussions
  - Athletes minimizing/not reporting symptoms still an issue
Resources for additional information

- CDC “Heads UP” ([https://www.cdc.gov/headsup/](https://www.cdc.gov/headsup/))
  - Information for coaches, parents, healthcare providers, athletes, schools
  - Numerous helpful printable sheets

  - “Concussion Facts” for athletes, parents, coaches, teachers

- American Academy of Neurology
  - [https://www.aan.com/concussion](https://www.aan.com/concussion)
Work Cited

  - Summary of Evidence-based Guideline for Clinicians
  - Summary of Evidence-based Guideline for Sports Coaches and Athletic Trainers
- Centers for Disease Control and Prevention. HEADS UP. 2017
- Concussion Legacy Foundation. Learning Center
Additional Info: Screening tools

- Post-Concussion Symptom Scale/Graded Symptom Checklist (GSC)
  - List of symptoms and whether athlete experiences any (scale from 0-6)
  - Establish a baseline
  - Recheck after head injury
  - To be used with SAC or BESS

- Standardized Assessment of Concussion (SAC)
  - Evaluates athletes in 6 domains
    - Orientation, immediate and delayed memory, concentration, neurologic function, exertional maneuvers
  - Establish a baseline
  - Re-evaluate after head injury

- Balance Error Scoring System (BESS)
  - Evaluate balance in 3 positions on hard ground and a foam pad
  - Establish a baseline
  - Recheck after head injury

- Thorough neuropsychological examination may follow
Return to play Protocol

1. NO ACTIVITY (RECOVERY)
   Complete Physical and Cognitive Rest until Medical Clearance

   - Symptom Free for 24 Hours?
     - Yes: Begin Step 2
     - No: Continue Resting

2. LIGHT AEROBIC EXERCISE
   (INCREASE HEART RATE)
   Walking, Swimming, Stationary Cycling
   - Heart Rate <70% - 15 min

   - Symptom Free for Next 24 hours?
     - Yes: Move to Step 3
     - No: Rest Further until Symptom Free

3. SPORT SPECIFIC EXERCISE
   (ADD MOVEMENT)
   Skating Drills (Ice Hockey), Running Drills (Soccer, etc)
   NO Head Impact Activities
   - Heart Rate <80% - 45 min

   - Symptom Free for Next 24 Hours?
     - Yes: Move to Step 4
     - No: Return to Step 2 until Symptom Free

4. NON-CONTACT TRAINING DRILLS
   (INCREASED EXERCISE, COORDINATION & ATTENTION)
   Progress to Complex Training Drills (e.g., Passing Drills, etc)
   May Start Resistance Training
   - Heart Rate <90% - 60 min

   - Symptom Free for Next 24 Hours?
     - Yes: Move to Step 5
     - No: Return to Step 3 until Symptom Free

5. FULL CONTACT PRACTICE
   (RESTORE CONFIDENCE & ASSESS FUNCTIONAL SKILLS)
   If Symptom Free, Return to Normal Training Activities

   - Symptom Free for Next 24 Hours?
     - Yes: Return to Play
     - No: Return to Step 4 until Symptom Free

Date Attained: Date Attained: Date Attained: Date Attained: Date Attained: