Sport-related Concussion

Kevin D. Walter, MD, FAAP
Associate Professor, Medical College of Wisconsin Dept. of Orthopaedics
Program Director, Children's Hospital of Wisconsin Sports Medicine

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2013 Best Practice in Management and Return to Play
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Before the sideline

- Have someone (preferably everyone) familiar with concussion
- Have a Concussion Action Plan
  - What to do if there is an injury
  - How to get an athlete back
- Review with athletes and families prior to season
- Create a comfortable environment for injured athletes
  - Encourage honesty and reporting
  - Use each injury as a “teachable moment”

On the sideline

- Be on the lookout for injuries
  - Away from play/ball
- Remove any athlete with suspected concussion immediately
- No return until medically cleared
- Never same day return
- Never allow athlete to return with any symptoms

Signs (what you can see)

- Did the athlete lose consciousness?
  - **NOT REQUIRED FOR A CONCUSSION!!**
- Confused or dazed
- Behavior or personality changes
- “Glassy” eyed
- Repeats questions
- Post traumatic amnesia
- Answers questions slowly

Symptoms

Cognitive	Physical	Mood	Sleep
Confusion	Headache	Irritable	Hard to fall asleep
Disoriented	Dizzy	Sad	Wakes at night
Amnesia	Nausea/Vomiting	More emotional	Not enough sleep
Distractible	Fatigue	Mood swings	Too much sleep
“Foggy”	Vision changes	Nervous	
Slow response	Noise & light sensitivity		
	Numbness / tingling		

On the sideline

- Make sure they cannot go back in
  - Take away equipment
  - Communicate with coaches, refs
- Recheck athletes to ensure they are not worsening
  - Every 5-15 minutes
- Always talk with parents/caregivers after injury
  - EVERY concussion needs medical follow-up

Should I go to the ER?

- Comfort level
- Environmental issues
- Knocked out = c-spine immobilization
- Abnormal neurologic exam
- Worsening
  - Mental status, level of consciousness, headache/symptoms, neurologic function
- Seizure activity
- Repeated vomiting
- Severe symptoms

Management

- Every patient is different
  - Treatment varies from person to person & injury to injury
- They look normal!
- If identified and treated properly, kids do very well
  - Over stimulation of brain will worsen symptoms

Management

- Multidisciplinary care is the best
- All concussions need medical follow-up
- Higher risk for prolonged recovery
  - Multiple concussions
  - ADHD, mental health disorder, learning disorder
  - Persistent cognitive symptoms

Management

- Stop Activity/Exercise
  - Nothing beyond every day life
  - No lifting, training, running, etc.
  - Don't start UNTIL MEDICALLY CLEARED
- Why?
  - Increases risk for repeat injury
  - Can provoke symptoms

Management

- Minimize screen time
  - Computer, video games, texting, TV, etc.
- "Live well"
  - Good diet & hydration
- Better sleep = better recovery
  - Good sleep habits
    - Consistent bedtime
    - No electronics in bedroom
    - Some kids need medication
- No driving until medically cleared
  - Slow reaction time & processing = "like a drunk driver"

Management

- Headache
  - Doing too much / not enough rest
  - Acetaminophen
  - Some kids may need prescription medications, but I try to avoid narcotics
- Emotional
  - Moody
  - Irritable
  - Can progress to depression / anxiety

Return to learning (RTL)

- Don't need to be 100% recovered to RTL
- Communication is key
  - <40% teachers are aware if a student has a TBI
    - Even if known, accommodations not routinely made
  - Physician, athletic trainer, family, student, teachers, administration
- Need academic adjustments
  - But rarely need 504 or IEP
- Don't "watch" practice until back at full school

Return to learning

- Often need to miss school
  - Progress from partial days to full days
- Teachers should focus on key points
- Homework / Classwork
  - Give extra time to complete
  - Reduce amount
  - Prorate missed work
  - Pre-printed notes
  - Gradually work back up to full levels
  - Tutoring
  - Repetition helps

Return to learning

- Scheduled breaks can help
  - 10 min breaks every 60 min
- Tests
  - No standardized testing
  - Consider oral/open note/book/take home
  - Extra time to complete
  - Be able to go back to review & improve
- Classes
  - No PE (don't watch it either)
    - Use time wisely: tutoring, rest, study hall instead
  - No shop
  - ?Computer classes, music/band?

Return to play (RTP)

- Usually one step per day, but prolonged recovery = longer until full return

1. No symptoms, off meds, full school, normal neuropsychological profile (if needed)
   - Medical clearance
2. Low level aerobic activity (stationary bike slow)
3. Moderate level aerobic activity (sport specific)
4. Full speed non-contact, non-collision activity (drills)
   - Medical clearance
5. Full practice (include contact)
6. Full participation

Neuropsychological evaluation

- Written (the novel)
  - Can provide guidance for school-based intervention
  - Need experienced neuropsychologist
    - Especially with comorbidities
- Computerized testing (cliff's notes)
  - Mulitple platforms (Axon, ImPACT, etc)
  - Schools must have a plan
  - **It's a TOOL**
  - Need to be credentialed to interpret

Computerized neurocognitive testing

- Baseline testing
  - May not be as helpful as initially thought
  - I see too many kids tested in uncontrolled manner
    - Poor supervision
    - Distraction – too many kids
    - Poor effort & poor motivation – rather be at practice
    - Poor sleep / fatigue
    - Stress (fight w friend, parental divorce, etc)
    - Sandbagging
  - Studies show that about 10% baselines are invalid
    - May not be "flagged" – someone should review ALL tests for validity

Computerized neurocognitive testing

- Sold as a way to diagnose concussions ☹
- I see too much after injury testing
  - Not ideal for tracking recovery
  - Retest when ASYMPTOMATIC (decision point)
  - Prefer well-controlled environment (physician office > school setting)
- My philosophy
  - Helps catch kids that are lying about recovery
  - There is likely a cohort that feels good but is not completely recovered
  - Baseline best for “at risk” population

Who needs prolonged time away?

- Difficult and very individual
  - Specialist should help athlete & family make decision
- Prolonged recovery
- Multiple concussions
  - There is no “magic number”
  - Worry if they are occurring to quickly, or lasting longer
  - Worry if the force needed to cause injury is lower
- Loss of function
- Persistent symptoms (dizzy, headache)

Prevention

- Equipment?
  - Helmets
    - Recent study showed no difference between helmets & concussion rates
    - Virginia Tech STAR rankings done in lab
  - Mouth guards
  - Soccer headgear
- Neck strengthening?
- Enforce rules as written!
  - Decrease rough play
  - Properly fit & wear equipment
  - Estimated 70% of all football concussions are result of head to head contact
    - Decrease illegal contact
    - Rule changes

Prevention – rule changes

- All kickoffs: 2005-2010
  - 36.5% concussion (14.3% overall)
  - 10.5% required surgery (7.1% overall)
  - 70% time loss >7 days (54.9% overall)
- Onside kicks: 2010
  - 2,361 total injuries
    - 76.8% concussion (most while being tackled)

Prevention – rule changes

- NFL kickoff moved from 30 to 35
  - Actually at 35 in 1993
  - Noted a >40% decline in concussions
- NFHS – 40 yard line
- Future considerations
  - Weight limitations/matching
  - No running prior to kickoff
  - When contact can be initiated (after ball fielded for onside kick)

It's about awareness & education

- Education
  - www.nfhslearn.com
    - FREE webinar
  - Brain101.orcasinc.com
    - Good for
  - CDC Head's Up Tool Kits & free webinar
  - MCW-CHW Concussion Clinic
- Culture
  - Want kids to report

Concussion legislation: WI Sidelined for Safety Act

- All youth sports (<19 years of age)
- Educational info
- Parental & athlete agreement sheet
- Immediate removal
- Medical clearance by HCP
- Effective Apr 2012

Does legislation work?

- If it follows bike helmet legislation – yes!
  - Concussion: 19% helmet, 37% no helmet
  - Skull fracture: 3%, 17%
  - Intracranial hemorrhage: 0%, 17%
  - Decreased risk of head injury in other wheeled activities
  - Decreased risk of other bike injuries
- Legal cases
  - 2009: LaSalle U 7.5mill
  - 2011: Class action v NCAA re: no system wide guidelines
  - 2012: 4K former players v NFL: NFL knew risk and misrepresented
  - Multiple HS suits pending
  - Called “next big US litigation”