Management of Concussion
Hanover Central High School
January 11, 2016

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Prolonged Recovery

- Predicting It
- Preventing It
- Program for Management
Short Recovery

- No different than the cold or flu.
- ~75% of the time in teens.
- ~90% of the time in young adults.
Predicting Prolonged Recovery

Post Concussion Symptoms

- Migraine Headache, Dizziness
- Prolonged LOC (> 1 min)
  - Brief LOC & immediate vomiting predict shorter
- Noise/Light Sensitivity
- Fatigue & Sleep Disruption
- Cognitive deficits (which may persist longer than other more obvious symptoms
  - sometimes a seemingly short recovery isn’t!)
- Irritability & other mood/personality changes
Predicting Prolonged Recovery

  - As of 7/1/14, must sit at least 24 hours
- Repeat concussion before recovery from the 1st
- Previous concussion within the last year (Eisenberg 2013)
- Increasing Frequency &/or less force &/or progressively longer recovery periods
- Too much physical exertion
Under-reporting

Although SRC appears common, its not fully appreciated by athletes

Even when they do recognize a concussion, reluctant to report. (Brian Urlacher, HBO’s Real Sports, 1/24/12)

>1/3 of athletes do NOT recognize their symptoms as result of concussion

– Only 19% of concussed players (Canadian football) realized they sustained a concussion
– Even those with +LOC, >70% failed to recognize concussion or even as serious injury
– One reason for lack of recognition is the concussion itself impairs cognition.
Predicting Prolonged Recovery

- Age
- Gender
- Pre-existing conditions
Prognosis - Age Matters

Although several studies suggest collegiate athletes usually recover within 1-2 wks, young athletes may take considerably longer.

Collins, 2005
- 25% of high school players took up to 4wks to reach recovery criteria.

Field, 2003
- Found by neuropsych testing, high-school athletes recovered significantly more slowly than college.

Indicates need for age-specific guidelines.
Not Limited to Football .... or Men

- Concussion rates:
  - 1. .47/1000 Football
  - 2. .36/1000 Girls Soc

- Female basketball players 3x the rate of males. (*NATA*)

- Girls take longer to recover than boys.
Predicting Prolonged Recovery

- School being in session v. Summertime *(Children’s Hospitals & Clinics of Minnesota, 2014)*
  - Recovery took twice as long during the school year than during the summer.
  - Why?
    - Increased cognitive activity
    - Stress of missing school &/or not doing well in school
Pathophysiology

- Immediate disruption of neuronal membranes, resulting in a massive efflux of potassium into the extracellular space.

- Results in calcium-dependent release of excitatory amino acids, particularly glutamate, which stimulates further efflux.

- As extracellular potassium increases, triggers depolarization, followed by neuronal suppression.
Pathophysiology

Hovda, 1991

- Studied concussion at neuronal level
  - Stretching, twisting, compression, shearing

- Increased vulnerability to re-injury during acute recovery period (7-14 days)

- Postulated a “metabolic mismatch” between brain glucose utilization and cerebral blood flow
Preventing Prolonged Recovery

- Immediate Recognition
- Immediate Removal
  - Do not watch remainder of game
  - ER: if LOC > 1 min. or worsening HA
    - Fluctuating or decreasing level of consciousness
    - Increasing confusion or irritability
    - Numbness in arms or legs
    - Repeated vomiting
    - Seizures
    - Slurred speech or inability to speak
    - Inability to recognize people or places
Preventing Prolonged Recovery

- Take @ least 2 days off
- No driving
- No NSAIDs, limited use of acetaminophen (NATA Position Statement 2014, Broglio, Cantu, Gioia, Guskiewicz, et al)
- Properly managed return to school, work, & play
Concussion In The Classroom

Supporting the Student’s Return to the Classroom
Factors to be reviewed during clinical interview:

- Developmental history, particularly speech delays
- Academic history, particularly history of LD and ADHD and premorbid academic abilities
- Medical history, including previous concussions
- Family medical history; migraines, seizure disorder, dementia, other unusual neurological disorders
- Psychiatric history of patient or family
- Mechanics of injury
Treatment recommendations:

- Education, education, education
- Rest! That means no school and no practice.
- Limited cognitive exertion. That does not need complete isolation or complete inactivity.
- Monitoring of physical symptoms, intervening when appropriate (e.g., persistent dizziness)
- Making academic/work accommodations
Academic Accommodations

(McGrath N. Supporting the Student Athlete’s Return to the Classroom After a Sport–Related Concussion. *Journal of Athletic Training*. 2010;45(5):492-498)

- **Excused absences: full or part-day**
  - Same principles apply for work: light duty, no working at heights, climbing ladders, or heavy exertion; avoid loud/busy environments

- **Rest periods during school day**

- **Extension of assignment/test deadlines**
  - Postponement & staggering of tests
  - Use of smaller, quieter exam rooms
Academic Accommodations

- Accommodate for light/noise sensitivity
  - Seat away from windows/loudspeakers
  - Hats or sunglasses

- Avoid Aggravating Physical Exertion
  - PE, Music Classes, heavy book bags

- Use of a reader, note-taker, &/or tutor

- Preferential seating to avoid distractions
IN Senate Enrolled Act 222

- Enacted in March 2014.
- Took effect July 1, 2014.
- Adds minimum 24-hour waiting period.
- Requires any coach of any football player under age 20 to go through sports-specific certification program.
- Applies to head, assistant, volunteers, high school, youth & even college coaches.
Take course(s) – & pass test(s) – covering 4 football-specific content areas

- Concussion Awareness
- Heat Emergency Preparedness
- Equipment Fitting
- Proper Technique (Blocking & Tackling)
- IDOE approved & completed every 2 years.
HEADS UP
CONCUSSION IN HIGH SCHOOL SPORTS

A FACT SHEET FOR PARENTS

What is a concussion?
A concussion is a type of traumatic brain injury. Concussions are caused by a bump or blow to the head. Even a “ding,” “getting your bell rung,” or what seems to be a mild bump or blow to the head can be serious.

You can’t see a concussion. Signs and symptoms of concussion can show up right after the injury or may not appear or be noticed until days or weeks after the injury. If your child reports any symptoms of concussion, or if you notice the symptoms yourself, seek medical attention right away.

What are the signs and symptoms of a concussion?
If your child has experienced a bump or blow to the head during a game or practice, look for any of the following signs of a concussion:

**SYMPTOMS REPORTED BY ATHLETE**
- Headache or “pressure” in head
- Nausea or vomiting
- Balance problems or dizziness
- Double or blurry vision
- Sensitivity to light
- Sensitivity to noise
- Feeling sluggish, hazy, foggy, or groggy
- Concentration or memory problems
- Confusion
- Just “not feeling right” or “feeling down”

**SIGNS OBSERVED BY PARENTS/GUARDIANS**
- Appears dazed or stunned
- Is confused about assignment or position
- Forgets an instruction
- Is unsure of game, score, or opponent
- Moves clumsily
- Answers questions slowly
- Loses consciousness (even briefly)
- Shows mood, behavior, or personality changes

How can you help your child prevent a concussion or other serious brain injury?
- Ensure that they follow their coach’s rules for safety and the rules of the sport.
- Encourage them to practice good sportsmanship at all times.
- Make sure they wear the right protective equipment for their activity. Protective equipment should fit properly and be well maintained.
- Wearing a helmet is a must to reduce the risk of a serious brain injury or skull fracture.
  - However, helmets are not designed to prevent concussions. There is no “concussion-proof” helmet. So, even with a helmet, it is important for kids and teens to avoid hits to the head.

What should you do if you think your child has a concussion?
SEEK MEDICAL ATTENTION RIGHT AWAY. A health care professional will be able to decide how serious the concussion is and when it is safe for your child to return to regular activities, including sports.

KEEP YOUR CHILD OUT OF PLAY. Concussions take time to heal. Don’t let your child return to play the day of the injury and until a health care professional says it’s OK. Children who return to play too soon—while the brain is still healing—take a greater chance of having a repeat concussion. Repeat or later concussions can be very serious. They can cause permanent brain damage, affecting your child for a lifetime.

TELL YOUR CHILD’S COACH ABOUT ANY PREVIOUS CONCUSSION. Coaches should know if your child had a previous concussion. Your child’s coach may not know about a concussion your child received in another sport or activity unless you tell the coach.

If you think your teen has a concussion:
Don’t assess it yourself. Take him/her out of play. Seek the advice of a health care professional.

It’s better to miss one game than the whole season.
For more information, visit www.cdc.gov/Concussion.
Concussion facts:
- A concussion is a brain injury that affects how your brain works.
- A concussion is caused by a bump, blow, or jolt to the head or body.
- A concussion can happen even if you haven’t been knocked out.
- If you think you have a concussion, you should not return to play on the day of the injury and not until a health care professional says you are OK to return to play.

What are the symptoms of a concussion?
Concussion symptoms differ with each person and with each injury, and they may not be noticeable for hours or days. Common symptoms include:
- Headache
- Confusion
- Difficulty remembering or paying attention
- Balance problems or dizziness
- Feeling sluggish, hazy, foggy, or groggy
- Feeling irritable, more emotional, or “down”
- Nausea or vomiting
- Bothered by light or noise
- Double or blurry vision
- Slowed reaction time
- Sleep problems
- Loss of consciousness

During recovery, exercising or activities that involve a lot of concentration (such as studying, working on the computer, or playing video games) may cause concussion symptoms to reappear or get worse.

What should I do if I think I have a concussion?
DON’T HIDE IT. REPORT IT. Ignoring your symptoms and trying to “tough it out” often makes symptoms worse.
Tell your coach, parent, and athletic trainer if you think you or one of your teammates may have a concussion.
Don’t let anyone pressure you into continuing to practice or play with a concussion.

GET CHECKED OUT. Only a health care professional can tell if you have a concussion and when it’s OK to return to play. Sports have injury timeouts and player substitutions so that you can get checked out and the team can perform at its best. The sooner you get checked out, the sooner you may be able to safely return to play.

TAKE CARE OF YOUR BRAIN. A concussion can affect your ability to do schoolwork and other activities. Most athletes with a concussion get better and return to sports, but it is important to rest and give your brain time to heal. A repeat concussion that occurs while your brain is still healing can cause long-term problems that may change your life forever.

How can I help prevent a concussion?
Every sport is different, but there are steps you can take to protect yourself.
- Follow your coach’s rules for safety and the rules of the sport.
- Practice good sportsmanship at all times.

If you think you have a concussion:
Don’t hide it. Report it. Take time to recover.

It’s better to miss one game than the whole season.
For more information, visit www.cdc.gov/Concussion.
Return to play

Must have doctor’s release.
  – Symptoms
  – Neurologic exam including balance assessment

Pass ImPACT.

Neither supercedes the other.

Then follow RTP Protocol
Return to play

- Re-test on ImPACT when symptom-free or in two weeks, whichever comes first.
- Re-evaluate balance
Return-to-Play Protocol
Adapted from Zurich Guidelines

- Athlete must be asymptomatic (without any cognitive or physical symptoms) at rest and exertion.

- Exertional protocol typically includes 5 steps:
  - Light activity
  - Moderate activity
  - Heavy, non-contact activity
  - Sport specific practice with contact
  - Full return to play
Longer Recovery

- Coordinated Effort required by all concerned parties.
- NO return to play as long as academic issues persist.
- Return to school and work more complicated.
Longer Recovery

- **Vestibular Rehabilitation**
  - Vestibular Rehab works (May 2014 BJSM)
    - Center for Dizziness, Balance & Neuro Rehab @ Fitness Pointe

- **Cognitive Rehabilitation**
  - Limited research on effectiveness

- **Pharmacology?**
  - Meds: Not NSAIDs; ??????????? Instead. Acetaminophen only per NATA guidelines.

- **Imaging: SWI MRI, not CT Scan.**
  - After 48 hours, CT of little use.
The goal is always to get a patient safely back to play/school/work but …

How much is too much?

1. Increased vulnerability
2. Increased recovery time
3. Residual symptoms, such as migraine headaches
4. Just too many injuries!
The First Concussion Clinic in Northwest Indiana with Credentialed ImPACT Consultants (CIC) & ImPACT Trained Athletic Trainers (ITAT)

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THANK YOU!