



Foul Ball: Concussion Syndrome in Sports Injuries

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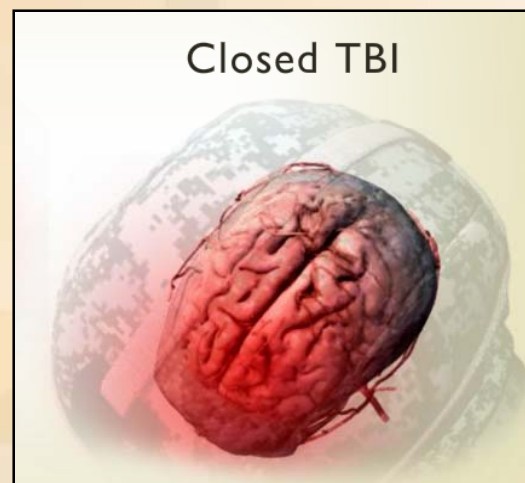
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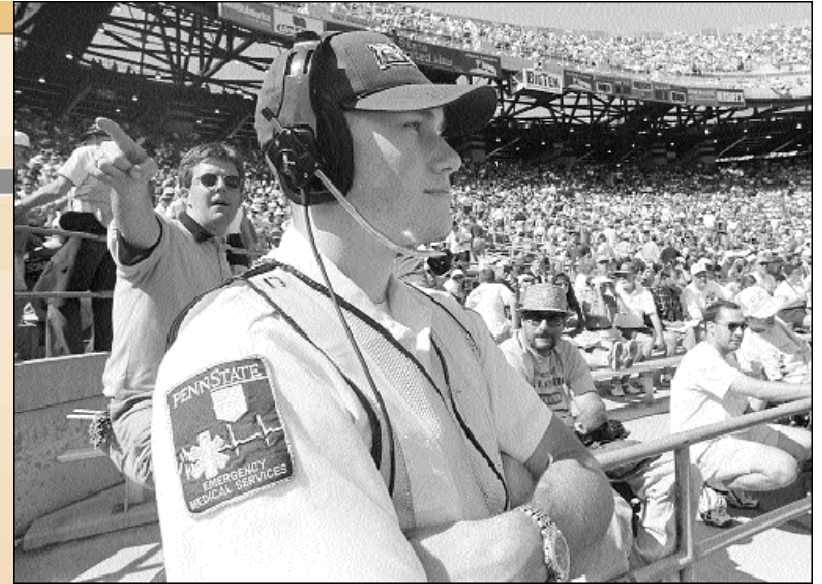
Objectives

- Definition & epidemiology
- Review the symptoms & complications of concussion
- Discuss the evolution of the return-to-play guidelines
- Acute and long-term management



Case

- 17 y/o male with LOC following a football tackle. He has retrograde amnesia to the day's event, confusion, and initial weakness. This is his 2nd concussion. Brought to the ER by the family for evaluation
- Exam VS stable; alert and oriented x 4; follows command but slightly slow in response from his baseline; nonfocal neurological exam.



- Head CT negative
- Final diagnosis: closed head injury with LOC
- MD plans to discharge pt home in family's care with head injury sheet. What further discharge instructions should be provided?



Definition

- “Trauma-induced alteration in mental status that may or may not involve loss of consciousness.”

AAN 1997

- < 10% of concussions result in LOC
- Confusion and amnesia are the hallmarks of concussion
- “Type of mild traumatic brain injury (TBI) caused by an impact or jolt to the head.”

Pediatrics 2006

- “a complex pathophysiologic process affecting the brain, induced by traumatic biomechanical forces.”

CISG 2001

What is a concussion?

- *Complex pathophysiological process affecting the brain induced by traumatic biomechanical forces*
- Functional disturbance of the brain
- No ‘visible’ structural injury
- Typically short lived impairment that resolves spontaneously
 - Direct blow to the head
 - Indirect blow with a force transmitted to the head



Epidemiology

- 2:1 male : female
- Most common head injury in sports
- >300,000 sport-related mild-to-mod TBIs
- High school football
 - 20% of players or 250,000 concussions/year
 - 10% in college football players
- Other risky sports: equestrian, boxing, ice hockey, wrestling, gymnastics, lacrosse, soccer and basketball
- 4-6x more likely to sustain a 2nd concussion



High School Concussions

- Over 50% of concussed high school football athletes do NOT report their injury to medical personnel



McCrea, M., Hammeke, T., Olsen, G., Leo, P., and Guskiewicz, K.M. (2004). Unreported concussion in high school football players: implications for prevention. *Clin. J. Sport Med.* 14, 13–17.

High School Concussions

Concussion 5.5% of total sports injuries

Breakdown:

Football	63.4% of concussions
Wrestling	10.5%
Girls Soccer	6.2%
Boys Soccer	5.7%
Girls Basketball	5.2%
Boys Basketball	4.2%
Softball	2.1%
Baseball	1.2%
Field Hockey	1.1%
Volleyball	0.5%

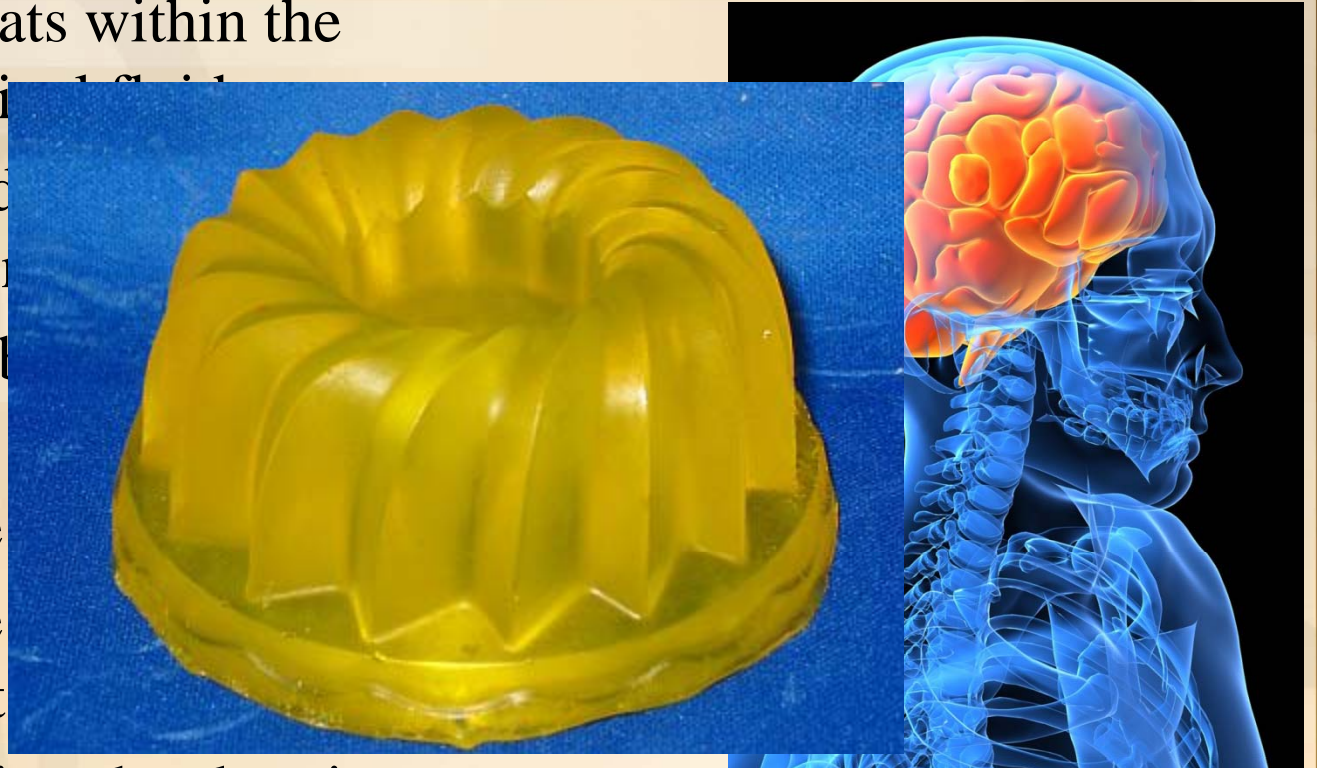


Perceptions

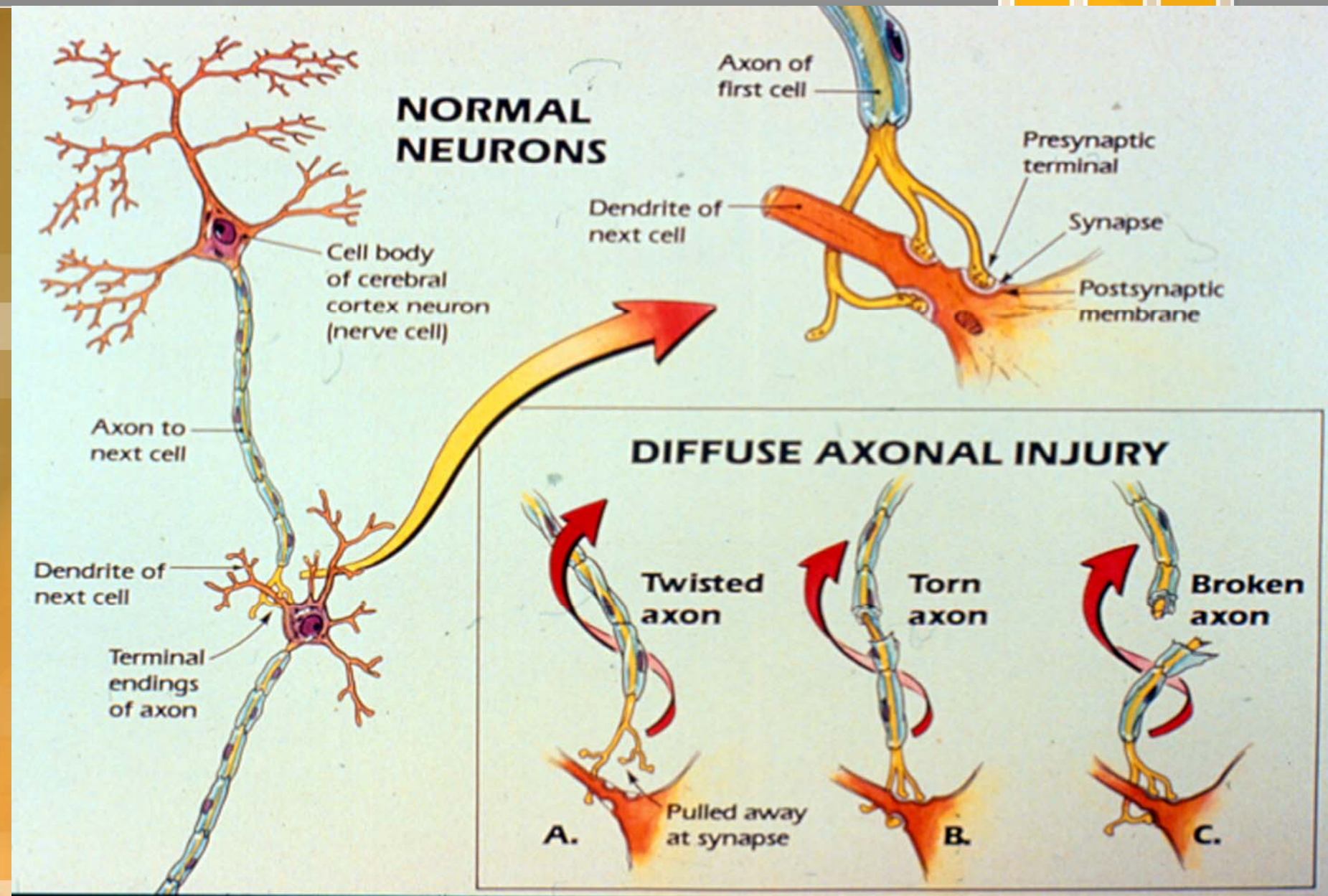
- Survey 300 players, 100 coaches, 100 parents, 100 ATs
- If a player complains of a headache, should they return to play?
 - YES: Players 55%, Coaches 33%, AT 30%, Parents 24%
- Percentage who would play a concussed star in a title game?
 - YES: Players 54%, AT 9%, Parents 6.1%, Coaches 2.1%
- Level of concern for concussions (1 – most concerned; 4 – least)
 - Players 3.5, Coaches 2.4, Parents 2.1, AT 1.6
- Is a good chance of playing in the NFL worth a decent chance of permanent brain damage?
 - YES: Players 44.7%, Coaches 19.4%, Parents 15%, AT 10%

The Brain

- Freely floats within the cerebrospinal fluid
- Moves inside skull in collision
- Collision between skull may
 - On the top of the head
 - On the side of the head
 - On the back of the head
- Acceleration-deceleration may result in stretching of the long axons and in diffuse axonal injury



Axonal Injury in Concussions



Mechanism of Injury

- 50% *of All sports* head to head collision
- **Soccer:** study showed most iniuries from aerial collision and head use
- **Hockey:** most injuries from
– Fatality and injury rates twice
– Spinal cord and brain injury rate
football
- **Football:** most injuries from
– Illegal action but most think p
- **Lacrosse:** study shows most male injuries result of body checks and most female result of stick to head contact

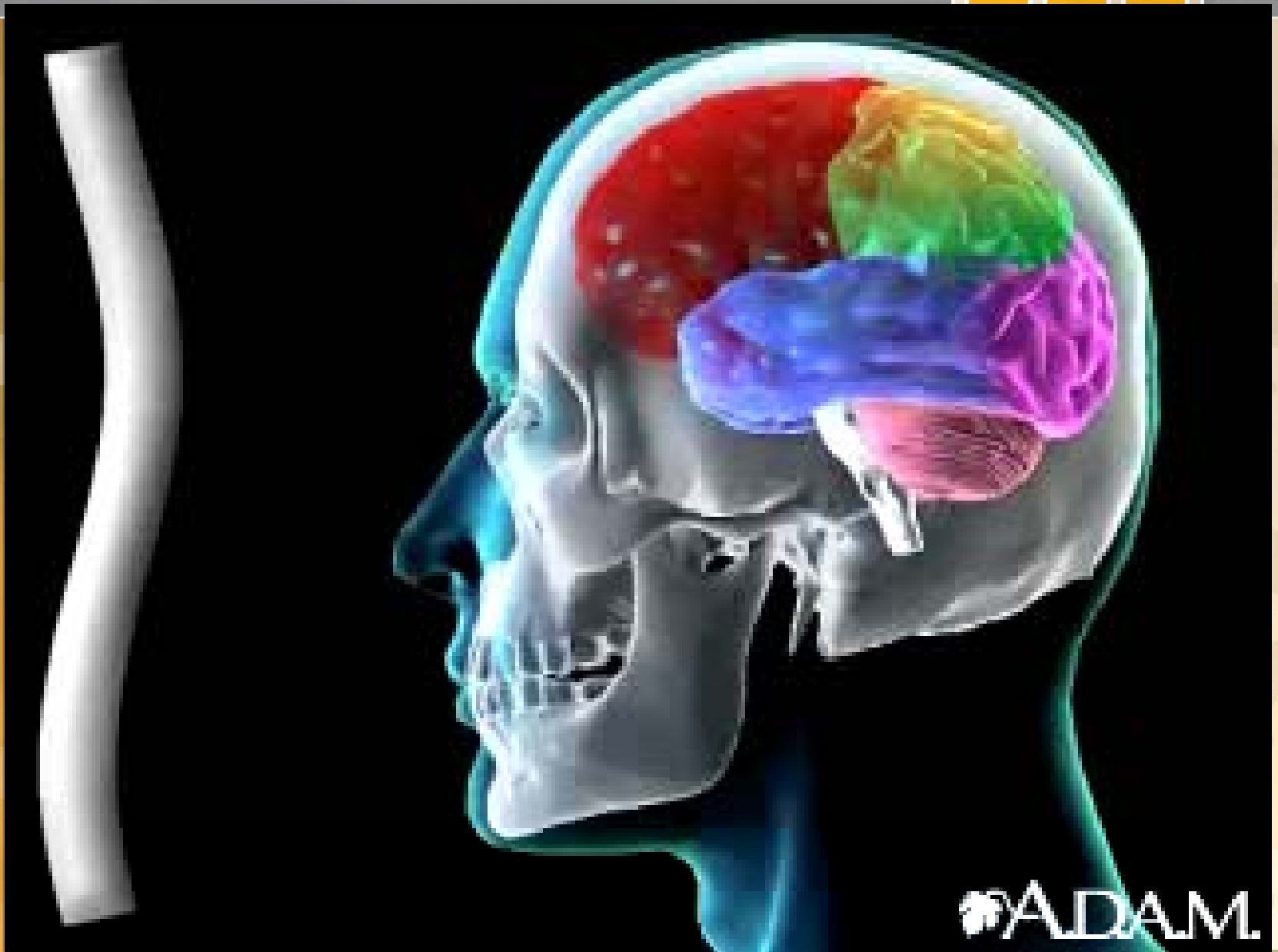


Helmets and Mouth Guards

- Helmets prevent skull fractures
- Helmets **do not** prevent concussions, they cause concussions
- Mouth guards prevent dental injuries
- Mouth guards do not prevent concussions



Animation of Concussion



Pathophysiology of Concussions

- “Metabolic cascade” up to one week after injury
- Increased glucose demand
- Decreased cerebral blood flow
- Results in altered metabolic state and increased K^+ and Ca^{++} (Potassium and Calcium)
- The brain is more vulnerable to further injury



Classification of Concussions

- A concussion is a concussion
- No such thing as a mild concussion
- Some advocate no grading system
- Most symptoms resolve in 7-10 days
- Post concussive symptoms may be prolonged in children



Concussion Diagnosis

- NO diagnostic test
- Clinical diagnosis based on the following:
 - Symptoms
 - Physical Signs
 - Behavioral Changes
 - Cognitive Impairment
 - Sleep Disturbances



Signs

- You do not have to lose consciousness
- Fatigue/drowsiness
- Sensitivity to Light or Noise
- Numbness/Tingling
- Appears to be dazed or stunned
- Confused about assignment, plays
- Emotional labile (crying, talkative)
- Difficulty concentrating/remembering
- Lack of awareness of surroundings
- Unsure of game, score, or opponent
- Moves clumsily/balance issues
- Slow reaction time
- Loses consciousness (even temporarily)
- Behavior or personality change
- Retrograde amnesia (Forgets events prior to hit)
- Anterograde amnesia (Forgets events after hit)
- Teammate observation, “Eric’s not right, coach”

Symptoms

- Headache (in 83%)
- Dizzy (65%), dazed, fog
- Light and sound sensitivity
- Visual disturbances
- “Everything seems slow”
- “My colors changed”
- Vertigo
- Nausea or vomiting
- Appearance can be delayed several hours



Other Observed Signs and Symptoms

- Vacant stare
- Disorientation
- Delayed verbal and motor responses
- Pupillary response issues
- Memory deficits
- Confusion and inability to focus attention
- Slurred or incoherent speech
- Gross observable coordination issues



AAN Practice Parameter, Neurology 1997

Late symptoms: Days to Weeks

- Persistent low grade headache
- Light-headedness
- Sleep disturbance
- Easily fatigued
- Intolerance of bright lights or difficulty focusing vision
- Intolerance of loud noises, tinnitus
- Irritability and low frustration tolerance
- Anxiety and/or depressed mood
- Poor attention and concentration
- Memory dysfunction

Recognizing Sports Concussions

- http://www.youtube.com/watch?v=sEFQkMo_Oe0&feature=related
- **13:59 length**

Second Impact Syndrome

- Concussion prior to recovery from initial injury
- Symptomatic
- Mostly Males < 21 years old
- Rapid increase in intracranial pressure
- Rare but almost always fatal
- Case series of head and neck trauma in football players.
- Death can occur after minor second impacts in players who return prematurely to competition
- May occur up to 14 days after initial injury
- About 1-2 cases/year
- Pathophysiology (from animal models):
 - Loss of autoregulation of the brain's blood supply
 - Cerebrovascular congestion
 - Malignant brain swelling and marked increase in intracranial pressure
 - Herniation

Postconcussive Syndrome

- Fatigue
- Headaches
- Disequilibrium or difficulty in concentrating that may persist for weeks to months after the initial injury



NO, THE STORY OF
THE HEADLESS HORSEMAN
HAS NOTHING TO DO WITH
THE HELMET-TO-
HELMET HITS
IN THE
NFL.



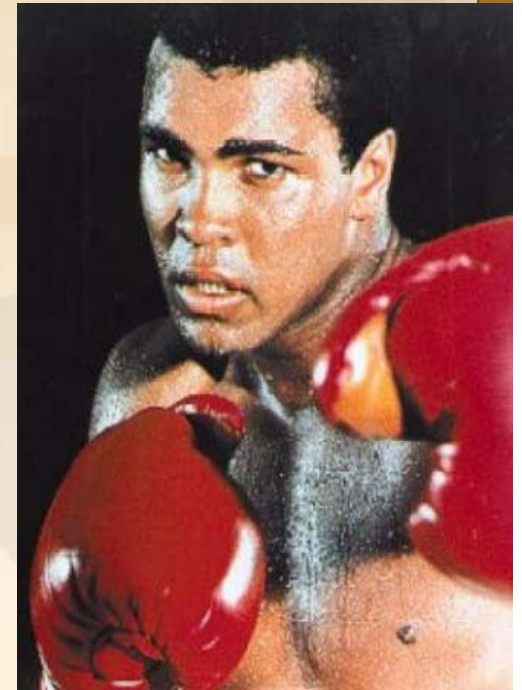
Cumulative Neuropsychological Impairment

- Risk of concussion is 4-6 times greater after one concussion
- 8 times greater after two concussions
- Prolonged or incomplete recovery
- Increased risk of later depression or dementia
- Decrease in rate of information processing
- Longer recovery time
- Deficits with increasing severity and duration of mental abnormalities subsequent to each concussion

Gronwall, Lancet 1975

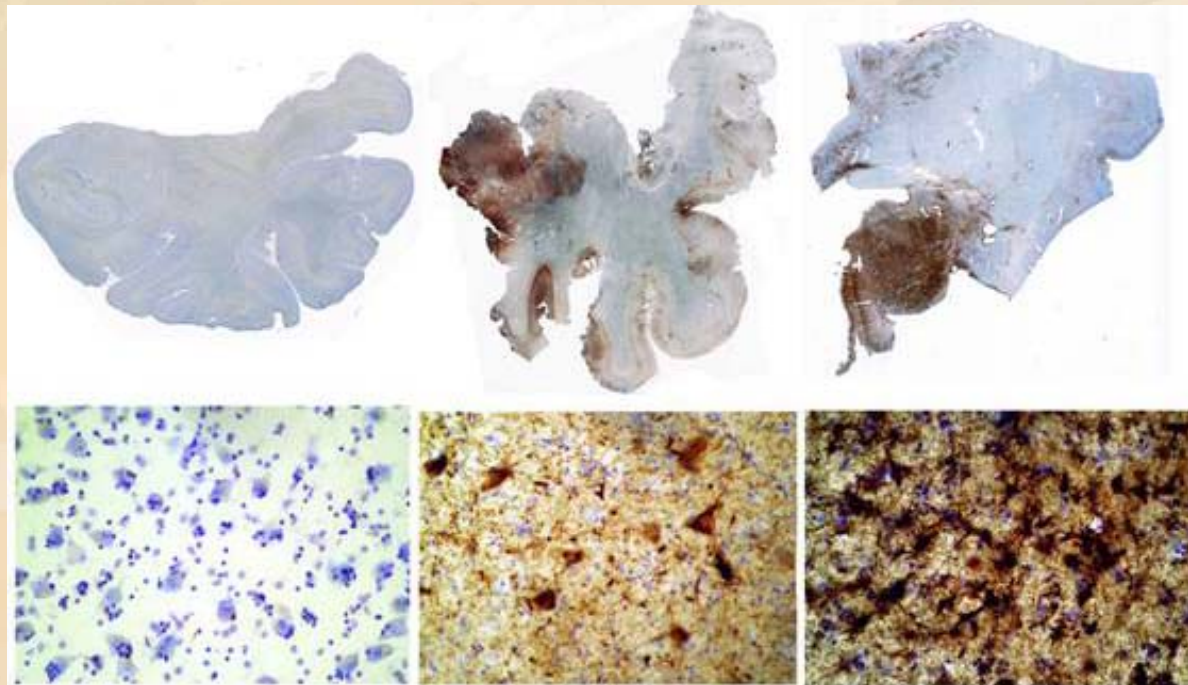
Cumulative Neuropsychological Impairment

- Chronic Traumatic Encephalopathy
 - Progressive degenerative disease
- Dementia Pugilistica - Brain damage in boxers. Aka “Punch-drunk” syndrome.
 - Multiple career head blows may result in early degenerative neurological conditions and gross cognitive impairment
- Muhammad Ali’s form of Parkinson’s
- Tony Dorsett
- http://espn.go.com/espn/otl/story/_/id/9931754/former-nfl-stars-tony-dorsett-leonard-marshall-joe-delameilleure-show-indicators-cte-resulting-football-concussions



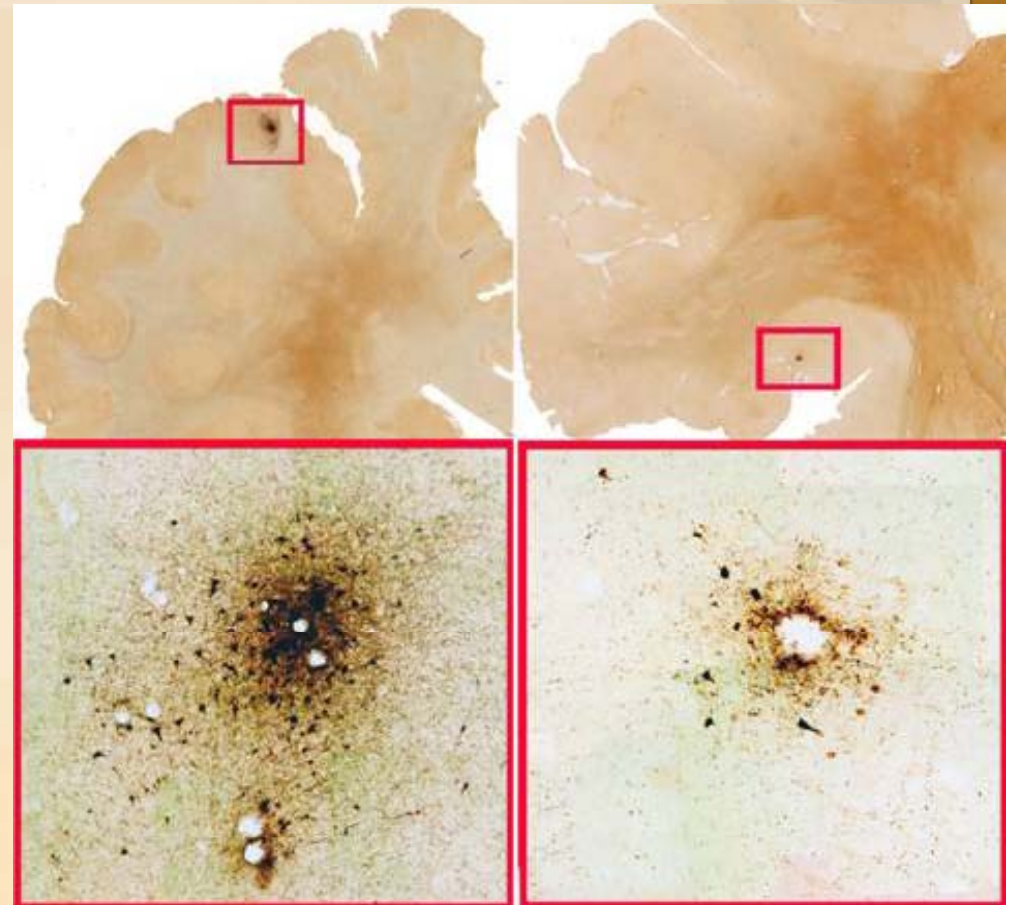
Cumulative Neuropsychological Impairment

- Examples-
 - Normal brain
 - 45 y/o former NFL player
 - 73 y/o boxer



Chronic Traumatic Encephalopathy

- 18 y/o HS athlete
 - 2 documented concussions in football
 - Multi-sport athlete
 - Early CTE changes on autopsy
- Isolated case or harbinger of huge ramifications for contact sports?



Grading Systems

- Quigley's Rule 1945: Athletes should discontinue participation in sports after 3 cerebral concussions
- Cantu 1986: Widely used and adopted by the American College of Sports Medicine (ACSM)
- Colorado Medical Society 1991 - formulated in response to deaths from HS football players
- American Academy of Neurologists 1997

Cantu guideline for concussion management

	Grade 1	Grade 2	Grade 3
Presentation	1. No loss of consciousness 2. Post-traumatic amnesia or other signs lasting less than 30 minutes	1. Loss of consciousness for less than 1 minute OR 2. Post-traumatic amnesia or other symptoms for more than 30 minutes, less than 24 hours	1. Loss of consciousness for longer than 1 minute OR 2. Post-traumatic amnesia or other symptoms for longer than 24 hours
Management	Athlete may return to play if asymptomatic for one week	Athlete may return to play in 2 weeks if asymptomatic at rest and on exertion for 7 days	Athlete may return to play in one month if asymptomatic at rest and on exertion for 7 days

Adapted from: Cantu, RC, J Athl Train 2001; 36:244.

Colorado guideline for concussion management

	Grade 1	Grade 2	Grade 3
Presentation	1. Confusion without amnesia 2. No loss of consciousness	1. Confusion with amnesia 2. No loss of consciousness	1. Loss of consciousness of any duration
Management	Evaluate athlete immediately and every 5 minutes. Athlete may return to play if amnesia or symptoms do not appear for 20 minutes.	Examine the athlete the next day. Athlete may return to play after one week if asymptomatic during that time.	Transport athlete to the emergency department; athlete may return to play if asymptomatic for 2 weeks and cleared by neurologist or neurosurgeon.

Colorado Medical Society, Report of the Sports Medicine Committee, 1991.

American Academy of Neurology practice parameter for concussion management

	Grade 1	Grade 2	Grade 3
Presentation	1. Transient confusion 2. No loss of consciousness 3. Concussion symptoms for less than 15 minutes	1. Transient confusion 2. No loss of consciousness 3. Concussion symptoms for more than 15 minutes	1. Loss of consciousness of any duration
Management	Athlete may return to play if asymptomatic at 15 minutes.	Athlete can return to play if asymptomatic for one week.	Transport to the hospital and observe overnight. Athlete may return to play when asymptomatic for one week (if loss of consciousness was brief, ie, seconds) or for two weeks (if loss of consciousness was prolonged).

American Academy of Neurology, Neurology 1997; 48:581.

Concussion in sport group (CISG)

- 2001, 2004
- New classification of concussion in sport
 - Simple concussion:
 - Injury resolves without complication over 7-10 days
 - Key treatment - rest until all symptoms resolve and then graded program of exertion before return
 - Complex concussion:
 - Persistent sx (including sx recurrence with exertion)
 - Specific sequelae (seizures, prolonged LOC > 1min, prolonged cognitive impairment)
 - H/O multiple or repeated concussions with progressively less impact force
 - Formal neuropsychological testing plus other investigations

EMS Concussion Management: Acute Injury On Field Evaluation

- ANY signs or symptoms of a concussion:

- No return to play in the current game or practice
- Should not be left alone; regular monitoring for deterioration
- Medically evaluate
- Return to play must follow a supervised stepwise process and determined by physician

- “When in doubt, sit them out!”

- Rule-out cervical spine injury
- Sideline assessment of concussion (SCAT2)



Sideline evaluation

Standardized assessment of concussion (SAC)

Orientation (1 point each)				Delayed recall (approximately 5 minutes after Immediate Memory. 1 point each)	
Month				Word 1	
Date				Word 2	
Day of week				Word 3	
Year				Word 4	
Time (within 1 hr)				Word 5	
Orientation score: 5				Delayed recall score: 5	
Immediate memory (1 point for each correct, total over 3 trials)				Summary of total scores:	
	Trial 1	Trial 2	Trial 3	Orientation	5
Word 1				Immediate memory	15
Word 2				Concentration	5
Word 3				Delayed recall	5
Word 4				Total score	30
Word 5				The following may be performed between the Immediate memory and Delayed recall portions of this assessment when appropriate:	
Immediate memory score: 15				Neurologic screening	
Concentration				Recollection of the injury	
Reverse digits (Go to next string length if correct on first trial. Stop if incorrect on both trials. 1 point each for each string length.)				Strength	
3-8-2		5-1-8		Coordination	
2-7-9-3		2-1-6-8		Exertional maneuvers	
5-1-8-6-9		9-4-1-7-5		1 40-yard sprint	
6-9-7-3-5-1		4-2-8-9-3-7		5 sit-ups	
Months of the year in reverse order (1 point for entire sequence correct.)				5 push-ups	
Dec-Nov-Oct-Sep-Aug-Jul				5 knee bends	
Jun-May-Apr-Mar-Feb-Jan					
Concentration score: 5					

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Sideline Evaluation (Conscious)

- Evaluate for at least 15 minutes
- If asymptomatic, use provocative testing
- Any symptoms with this testing precludes return to play
- Symptomatic patients require serial neurologic examinations to determine if condition is worsening
- Transport to ER if mental status deteriorates
- Return to play no earlier than one week after all symptoms resolve if symptoms persist longer than 30 minutes






Sideline Evaluation (Unconscious)

- Evaluate as a trauma patient
- ABC's
- Stabilize c-spine
- Leave helmet in place unless control of airway or hemorrhage required (EMS determines need)
- May remove facemask
- Transport to ER for further evaluation
- Physicians will order neurological testing up to 4 weeks prior to return to play.



Sport Concussion Assessment Tool

- Patient education
- Physician assessment

The SCAT Card (Sport Concussion Assessment Tool)

Athlete Information

What is a concussion? A concussion is a disturbance in the function of the brain caused by a direct or indirect force to the head. It results in a variety of symptoms (like those listed below) and may, or may not, involve memory problems or loss of consciousness.

How do you feel? You should score yourself on the following symptoms, based on how you feel now.

Post Concussion Symptom Scale						
	None		Moderate		Severe	
Headache	0	1	2	3	4	5
"Pressure in head"	0	1	2	3	4	5
Neck Pain	0	1	2	3	4	5
Balance problems or dizzy	0	1	2	3	4	5
Nausea or vomiting	0	1	2	3	4	5
Vision problems	0	1	2	3	4	5
Hearing problems / ringing	0	1	2	3	4	5
"Don't feel right"	0	1	2	3	4	5
Feeling "dinged" or "dazed"	0	1	2	3	4	5
Confusion	0	1	2	3	4	5
Feeling slowed down	0	1	2	3	4	5
Feeling like "in a fog"	0	1	2	3	4	5
Drowsiness	0	1	2	3	4	5
Fatigue or low energy	0	1	2	3	4	5
More emotional than usual	0	1	2	3	4	5
Irritability	0	1	2	3	4	5
Difficulty concentrating	0	1	2	3	4	5
Difficulty remembering	0	1	2	3	4	5
(follow up symptoms only)						
Sadness	0	1	2	3	4	5
Nervous or Anxious	0	1	2	3	4	5
Trouble falling asleep	0	1	2	3	4	5
Sleeping more than usual	0	1	2	3	4	5
Sensitivity to light	0	1	2	3	4	5
Sensitivity to noise	0	1	2	3	4	5
Other:	0	1	2	3	4	5

What should I do?
Any athlete suspected of having a concussion should be removed from play, and then seek medical evaluation.

Signs to watch for:
Problems could arise over the first 24-48 hours. You should not be left alone and must go to a hospital at once if you:

- Have a headache that gets worse
- Are very drowsy or can't be awakened (woken up)
- Can't recognize people or places
- Have repeated vomiting
- Behave unusually or seem confused; are very irritable
- Have seizures (arms and legs jerk uncontrollably)
- Have weak or numb arms or legs
- Are unsteady on your feet; have slurred speech

Remember, it is better to be safe. **Consult your doctor after a suspected concussion.**

What can I expect?
Concussion typically results in the rapid onset of short-lived impairment that resolves spontaneously over time. You can expect that you will be told to rest until you are fully recovered (that means resting your body and your mind). Then, your doctor will likely advise that you go through a gradual increase in exercise over several days (or longer) before returning to sport.

The SCAT Card (Sport Concussion Assessment Tool) Medical Evaluation

Name: _____ Date: _____

Sport/Team: _____ Mouth guard? Y N

1) SIGNS

Was there loss of consciousness/unresponsiveness? Y N
 Was there seizure or convulsive activity? Y N
 Was there a balance problem / unsteadiness? Y N

2) MEMORY

Modified Maddocks questions (check if athlete answers correctly)

- At what venue are we? ____ Which half is it? ____
Who scored last? ____
- What team did we play last? ____: Did we win last game? ____

3) SYMPTOM SCORE

Total number of positive symptoms (from reverse side of the card) = ____

4) COGNITIVE ASSESSMENT (5 word recall)

(Examples) Immediate Delayed

Word 1 ____ cat _____

Word 2 ____ pen _____

Word 3 ____ shoe _____

Word 4 ____ book _____

Word 5 ____ car _____

Months in reverse order:

Jun-May-Apr-Mar-Feb-Jan-Dec-Nov-Oct-Sep-Aug-Jul

Digits Backwards (check correct)

5-2-8 3-9-1 _____

6-2-9-4 4-3-7-1 _____

8-3-2-7-9 1-4-9-3-6 _____

7-3-9-1-4-2 5-1-8-4-6-8 _____

Ask delayed 5-word recall now

5) NEUROLOGIC SCREENING

	Pass	Fail
Speech	_____	_____
Eye Motion and Pupils	_____	_____
Pronator Drift	_____	_____
Gait Assessment	_____	_____

Any neurologic screen abnormality necessitates formal neurologic or hospital assessment

RETURN TO PLAY

Athletes should not be returned to play the same day of injury.
When returning athletes to play they should follow a stepwise symptom-limited program, with stages of progression. For example:

1. rest until asymptomatic (physical and mental rest)
2. light aerobic exercise (e.g stationary cycle)
3. sport-specific training
4. non-contact training drills (start light resistance training)
5. full contact training after medical clearance
6. return to competition (game play)

There should be approximately 24 hours (or longer) for each stage and the athlete should return to stage 1 if symptoms recur. Resistance training should only be added in the later stages. Medical clearance should be given before return to play.

Concussion and Therapy

- <http://www.youtube.com/watch?v=z6CTmtEgsBg&feature=related>
- 2:18 length
- ‘Pediatric Patient Talks about Post Concussion Therapy’

Return to Play Guidelines

- **When is it appropriate for an athlete who has a concussion to return to play?**
- 3 main issues:
 - Management of acutely injured athlete to ID potential neurological emergencies
 - Prevention of catastrophic outcome related to acute brain swelling
 - Avoidance of cumulative brain injury related to repeated concussions



Return to Play Protocol

- Combines physical and cognitive rest
 - Step-wise process*:
 1. No activity, complete rest. Once asymptomatic, proceed to step 2
 2. Light aerobic exercise (walking, stationary cycling, no resistance training)
 3. Sport specific exercises; progressive addition of resistance training at steps 3 &4
 4. Non-contact training drills
 5. Full contact training after medical clearance
 6. Game play
- * if any symptoms, drop back to previous asymptomatic level and try to progress in 24 hrs

Concussion Management

- Complete physical and cognitive rest until symptom free
 - No sports
 - No horseplay
 - No school, if necessary
 - No texting, video games, internet, TV, driving
 - Avoid aspirin or OTC pain meds which mask sx
- Graded program of exertion prior to full return to play

Exertion Effects

- Symptoms are worsened by
 - ✓ physical activity
 - ✓ mental effort
 - ✓ environmental stimulation
 - ✓ emotional stress



Academic Accommodations

- Rest breaks during school in a quiet location
- Avoid re-injury in crowded hallways or stairwells
- Avoid over-stimulation (cafeteria or watching games)
- Provide reassurance and support
- Excuse from school if necessary, homework, quizzes and tests

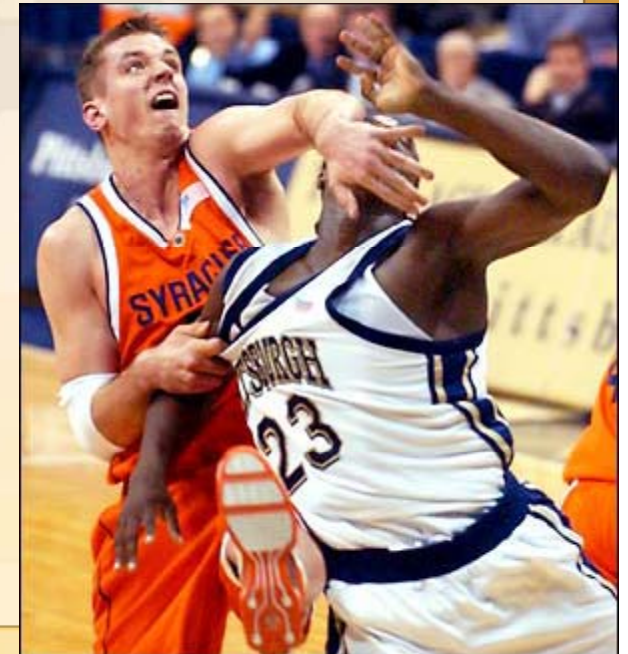


Recovery from Concussion

- Most 'recover' in 1 - 2 weeks, 95% recover in 3 months
- Longer in younger athletes and in females
- Post-concussion syndrome is the presence of symptoms for at least 3 months post injury
- Deficits in balance resolve in 5 days
- Cognitive tests return to baseline in 5 – 10 days
- Abnormalities in metabolic balance, oxygen consumption, and electrical responses persist for several months
- Some experience persistent symptoms

POST CONCUSSION SYNDROME SYMPTOMS

- Headache
- Dizziness
- Memory Impairment
- Attention deficits
- Slowed Mental Processing
- Mental and Physical Fatigue
- Lowered Frustration Tolerance
- Decreased Tolerance for Stress & Medications
- Apathy/Poor Motivation
- Depression
- Problems in Abstract Reasoning
- Impaired Learning Process
- Sleep Disturbance
- Confusion
- Nausea
- Vomiting



Return to Sports Too Soon

- <http://www.youtube.com/watch?v=o0rZ9rpTCT8&feature=related>
- **2:17 length**

Concussion Modifiers



Symptoms	Number, Duration (>10 days), Severity
Signs	Prolonged loss of consciousness (> 1 min), amnesia
Sequelae	Concussive convulsions
Temporal	Frequency – repeated concussions over time Timing – injuries close together in time “Recency” – recent concussion
Threshold	Repeat concussions occurring with progressively less impact Repeat concussions with slower recovery after each one
Age	Child and adolescent
Comorbidity	Migraine, depression, ADHD, LD, sleep disorder
Medication	Psychoactive drugs
Behavior	Dangerous style of play
Sport	High risk activity, contact collision sport, high sporting level

Computerized Test



- *I*mmediate
*P*ost Concussion
*A*ssessment &
*C*ognitive
*T*esting



- Used to set baseline cognition and evaluate post-concussion recovery.
- Assesses reaction times and processing speed.

Conclusions

- Repetitive concussions increase risk of second impact and post-concussive syndromes
- NO athlete should return to play until all symptoms have resolved at rest **and** with exertion
- Goal: to prevent catastrophic outcomes of acute structural brain injury, second impact syndrome, and cumulative brain injury due to repetitive trauma.
- All athletes suspected of having sustained concussions should undergo thorough evaluation, including neurologic screening exam, neuropsychological testing, and exertional provocative maneuvers.



New Laws



Max Conradt

Max's Law, Oregon



The Oregon Experience- 2008 & 2009 Max's Law

- Any athlete with a concussion shall not be permitted to return on that same day.
- No return until “no longer experiencing post-concussive symptoms, and a medical release form signed by a *healthcare professional*”
- Oregon BIA sponsors “Helmet Law” in honor of young Second Impact Syndrome victim
 - Mandatory football coach education
 - Mandatory helmet “re-conditioning” yearly
 - Mandatory helmet retirement after 10 years



Washington- "Zach's Law"

- Zach Lystedt - suffered devastating brain injury playing with concussion symptoms
- Similar to Oregon Law with additions:
 - Applies to youth sports
 - Parents and athlete read and sign information sheet detailing signs, symptoms, and effects of a concussion
- Outstanding press state-wide and nationally



Back to the case...

- Concussive severity:
grade 3 or complex
concussion
- Discharge instructions
should include:
 - No activity, complete
rest until seen by PMD in
1-2 days
 - May return-to-play only
when asymptomatic > 1-2
weeks and only with
medical clearance



Prevention

- “Concussion prevention” has become the “holy grail” for sports equipment marketers
 - Soccer head gear
 - Girl’s Lacrosse head gear/helmets
 - Pole vaulting helmet
- New football helmets, head pads, mouth guards- **NO PROVEN PROTECTION FROM CONCUSSION!!**
- Multiple flaws in a study looking at “Riddell Revolution” helmet
 - » Neurosurgery, 2006



Soccer helmet



CDC Home

 SEARCH

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Injury Prevention & Control: Traumatic Brain Injury

Traumatic Brain Injury

- Concussion & Mild TBI
- Concussion in Sports**
- Severe TBI
- Statistics
- Potential Effects
- Causes & Risk Groups
- Reports & Fact Sheets
- Social & New Media
- Heads Up

[CDC's Injury Center](#) > [Traumatic Brain Injury](#)

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- Print page
- Get email updates
- Subscribe to RSS

Heads Up: Concussion in Youth Sports



[Spanish version](#)

To help ensure the [health and safety](#) of young athletes, CDC developed the *Heads Up: Concussion in Youth Sports* initiative to offer information about concussions to [coaches](#), parents, and athletes involved in youth sports. The *Heads Up* initiative provides important information on preventing, recognizing, and responding to a concussion.

Contact Us:

- Centers for Disease Control and [Prevention](#) National Center for [Injury Prevention](#) and Control (NCIPC)
4770 Buford Hwy, NE
MS F-63
Atlanta, GA 30341-3717
- 800-CDC-INFO (800-232-4636)
TTY: (888) 232-6348
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Heads Up Tool Kit for Youth Sports

Injury Center Topics

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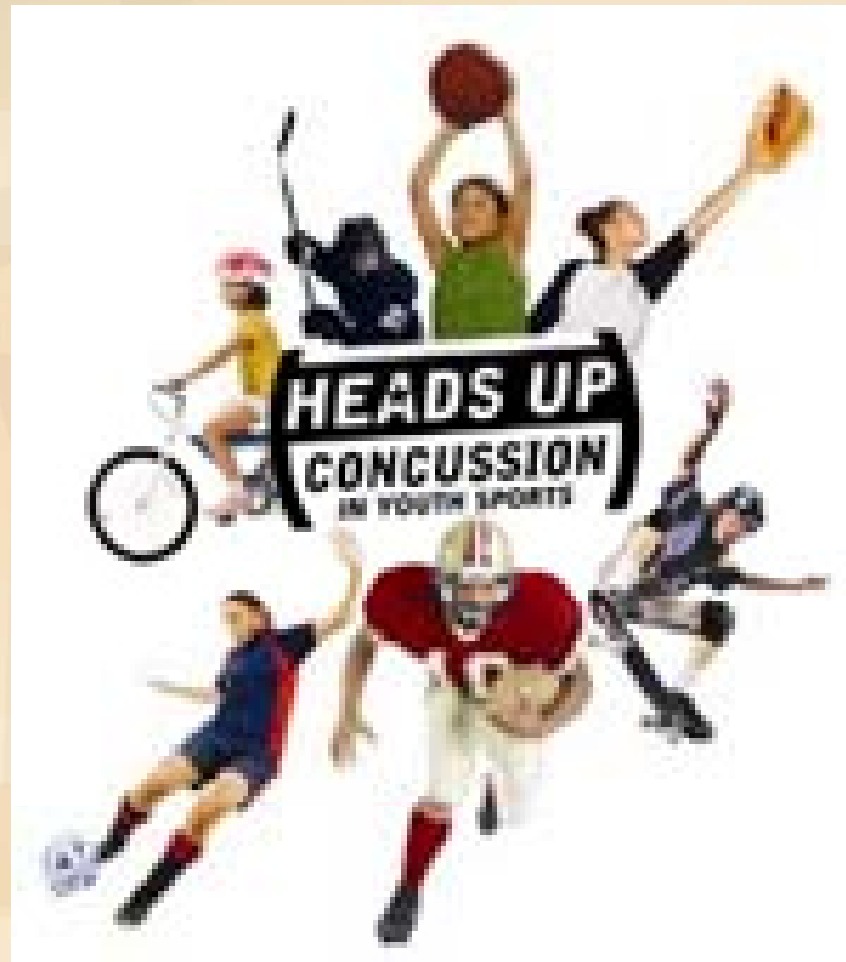
Information for Coaches

- [Online Training Course for Youth Sports](#)
- [Fact Sheet](#) [PDF 424KB]
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Questions?

- **Heads Up: Concussion in Youth Sports CDC**



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Contact info...



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