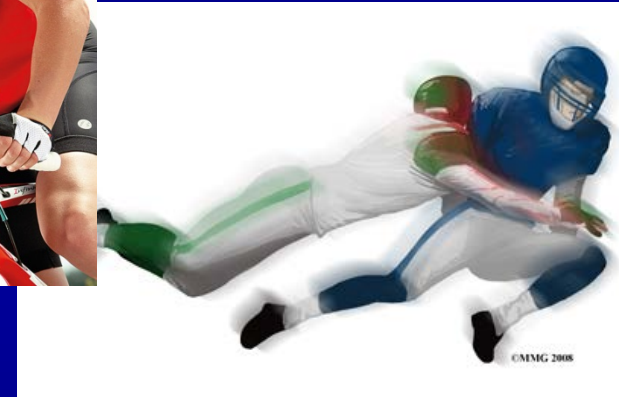


Concussion Evaluation & Management

The Physician's Risk Reduction Playbook



Christopher C. Giza, M.D.
Pediatric Neurology and Neurosurgery

Catherine Miller JD, RN
Cooperative of American Physicians



Mattel Children's Hospital

UCLA

Disclosures

- CAP CME Committee Planner, Jeff Shapiro, MD disclosed a relevant financial relationship with Otsuka Pharmaceutical as a speaker.
- No other faculty, planner or presenter for this CME activity disclosed any relevant financial relationship with a commercial interest.

The information in this presentation should not be considered legal advice applicable to a specific situation. Legal guidance for individual matters should be obtained from a retained attorney.

Let's *Take a Knee*

Overview

1. Introduction

2. Pre-participation evaluation and counseling

3. Initial evaluation

4. Management and Return to play

5. Chronic sequelae

6. Prevention

7. Summary





What is a Concussion?

“A Brain Movement Injury”

- A biological process affecting the brain induced by physical forces

- Symptoms start quickly
- Don't have to be knocked out
- Gets better with time if you don't get whacked again
- CAT scans are normal

Signs/Symptoms of Concussion

- Headache
- Dizziness
- Nausea and Vomiting
- Vacant stare (looks 'out of it')
- Slow to talk or do things
- Memory loss (amnesia)
- Confusion and inattention
- Disorientation
- Slurred or incoherent speech
- Loss of coordination
- Emotions out of proportion
- Any period of unconsciousness



4 R's of Sports Concussions

Recognize signs & symptoms.

Remove from play/risk of repeat injury

Recover

Return to play/activity



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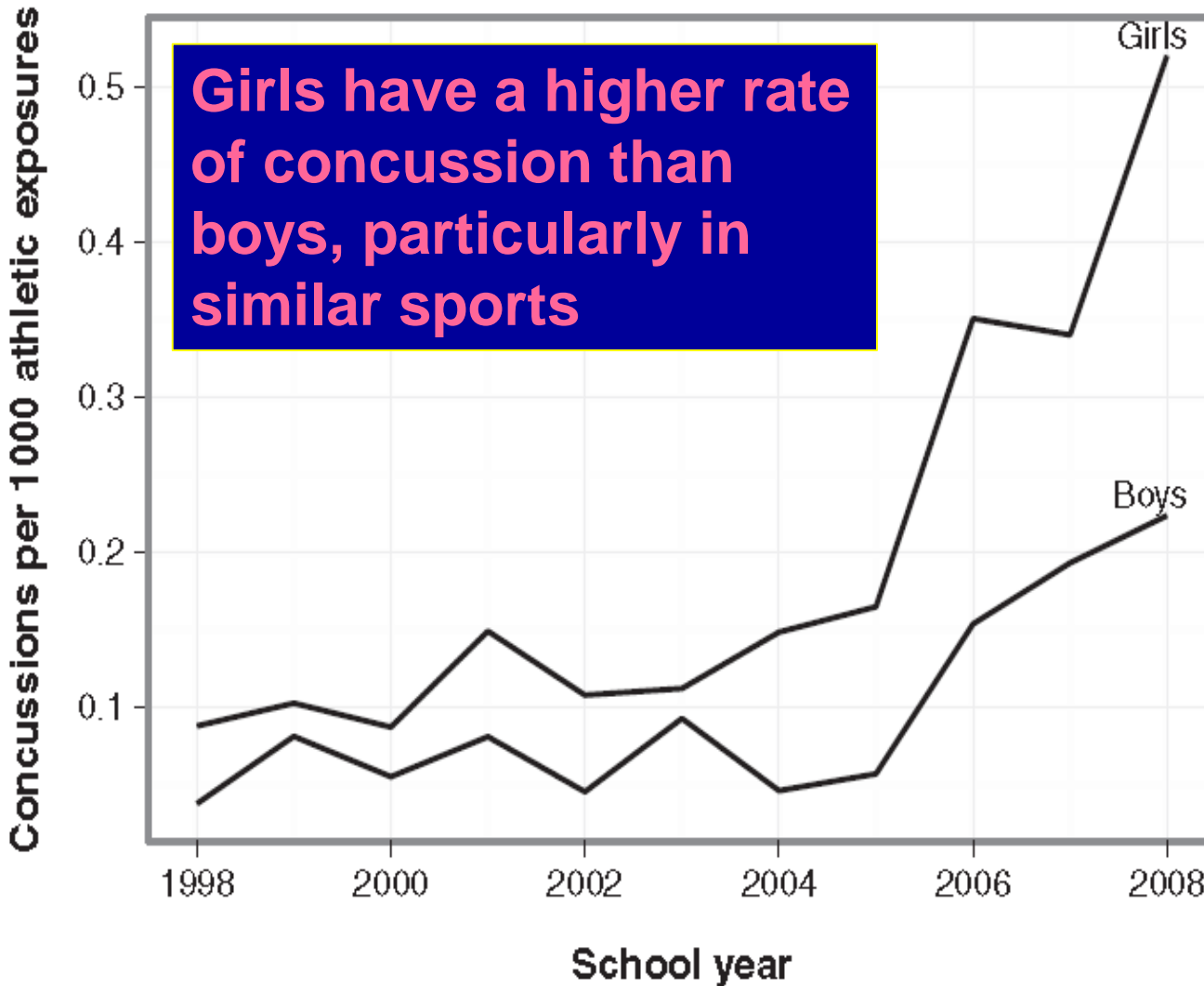
6. Prevention

7. Summary



Who Gets Sports Concussions?

C) Similar sports



Concussions/1000 games

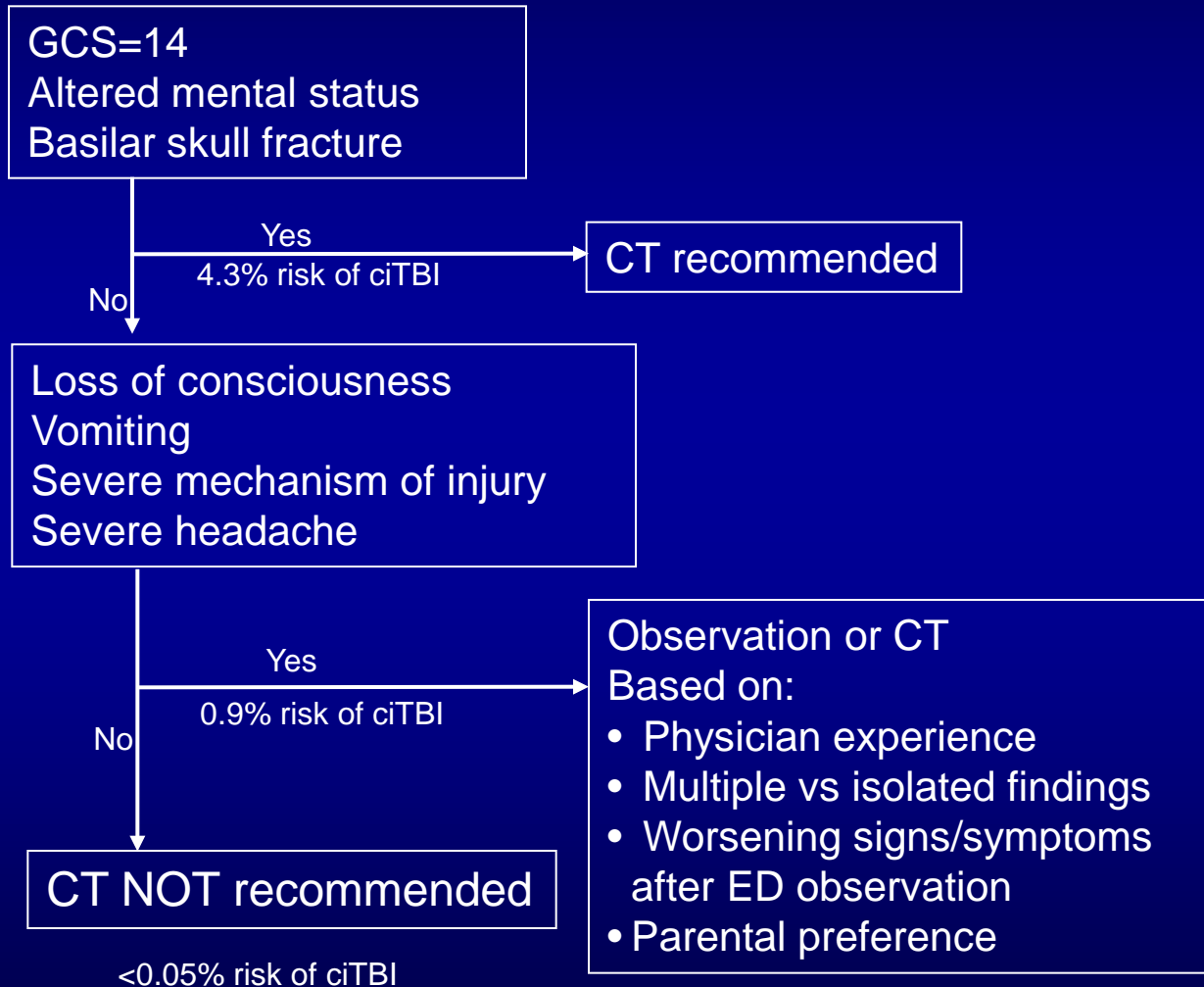
Sport	Boys	Girls
Soccer: H	1.55	-
Soccer: C	3.02	-
Hockey: C	1.96	-
Basketball: H	0.59	0.97
Basketball: C	1.38	1.80
Volleyball: H	0.11	0.60
Volleyball: C	0.45	0.85
Baseball/Softball: H	0.08	0.04
Baseball/Softball: C	0.23	0.37

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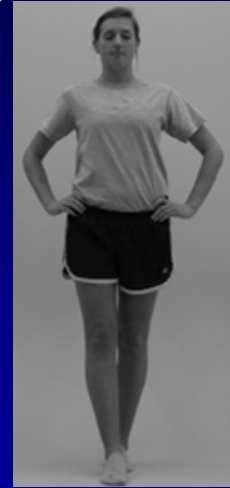


Pediatric mild TBI >2 years old: Indications for CT scanning



Was that a Concussion?

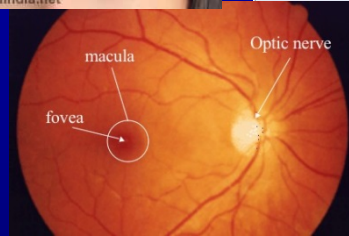
- *There is NO SINGLE test to diagnose concussion*



SCAT3™

Sport Concussion Assessment Tool – 3rd Edition

For use by medical professionals only



3	-	7	-	5	-	9	-	0
2	-	5	-	7	-	4	-	6
1	-	4	-	7	-	6	-	3
7	-	9	-	3	-	9	-	0
4	-	5	-	2	-	1	-	7
5	-	3	-	7	-	4	-	8
7	-	4	-	6	-	5	-	2
9	-	0	-	2	-	3	-	6



Sport Concussion Assessment Tool SCAT3

Symptom Checklist

Sensitivity 0.64-0.89
Specificity 0.91-1.0



McCrary, et.al. Br J Sports Med, 2013

SYMPTOM EVAL

Name: _____
 Examiner: _____
 Sport/team/school: _____
 Age: _____
 Years of education completed: _____
 Dominant hand: _____
 How many concussions do you think _____
 When was the most recent concu _____
 How long was your recovery from _____
 Have you ever been hospitalized c _____
 a head injury? _____
 Have you ever been diagnosed wit _____
 Do you have a learning disability, d _____
 Have you ever been diagnosed wit _____
 or other psychiatric disorder? _____
 Has anyone in your family ever bee _____
 any of these problems? _____
 Are you on any medications? If yes _____

SCAT3 to be done in resting state SYMPTOM EVAL

3 How do you feel?

"You should score yourself on the follo

- Headache
- "Pressure in head"
- Neck Pain
- Nausea or vomiting
- Dizziness
- Blurred vision
- Balance problems
- Sensitivity to light
- Sensitivity to noise
- Feeling slowed down
- Feeling like "in a fog"
- "Don't feel right"
- Difficulty concentrating
- Difficulty remembering
- Fatigue or low energy
- Confusion
- Drowsiness
- Trouble falling asleep
- More emotional
- Irritability
- Sadness
- Nervous or Anxious

Total number of symptoms (Max
Symptom severity score (Maxim

Do the symptoms get worse with p
Do the symptoms get worse with r
 self rated
 clinician interview

Overall rating: If you know the a
the athlete acting compared to his
Please circle one response:

no different very different

SYMPTOM EVALUATION

How do you feel?

"You should score yourself on the following symptoms, based on how you feel now".

	none	mild	moderate	severe			
Headache	0	1	2	3	4	5	6
"Pressure in head"	0	1	2	3	4	5	6
Neck Pain	0	1	2	3	4	5	6
Nausea or vomiting	0	1	2	3	4	5	6
Dizziness	0	1	2	3	4	5	6
Blurred vision	0	1	2	3	4	5	6
Balance problems	0	1	2	3	4	5	6
Sensitivity to light	0	1	2	3	4	5	6
Sensitivity to noise	0	1	2	3	4	5	6
Feeling slowed down	0	1	2	3	4	5	6
Feeling like "in a fog"	0	1	2	3	4	5	6
"Don't feel right"	0	1	2	3	4	5	6
Difficulty concentrating	0	1	2	3	4	5	6
Difficulty remembering	0	1	2	3	4	5	6
Fatigue or low energy	0	1	2	3	4	5	6
Confusion	0	1	2	3	4	5	6
Drowsiness	0	1	2	3	4	5	6
Trouble falling asleep	0	1	2	3	4	5	6
More emotional	0	1	2	3	4	5	6
Irritability	0	1	2	3	4	5	6
Sadness	0	1	2	3	4	5	6
Nervous or Anxious	0	1	2	3	4	5	6

Total number of symptoms (Maximum possible 22)

Symptom severity score (Maximum possible 132)

Do the symptoms get worse with physical activity?

Y N

Do the symptoms get worse with mental activity?

Y N

self rated

self rated and clinician monitored

clinician interview

self rated with parent input

Overall rating: If you know the athlete well prior to the injury, how different is the athlete acting compared to his/her usual self?

Please circle one response:

no different

very different

unsure

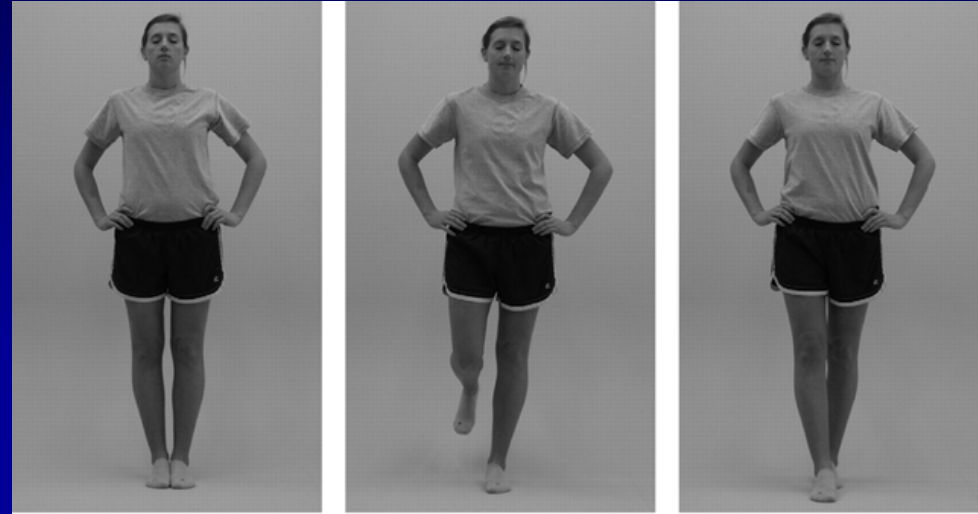
N/A

SCAT3

Cognitive assessment: Standardized Assessment of Concussion (SAC)

Sensitivity 0.80-0.94
Specificity 0.76-0.91

1. Orientation: month, date, day, year, time
2. Immediate memory: 5 words x 3 tries
3. Concentration:
 - a. Digits backwards (3, 4, 5, 6)
 - b. Months in reverse order
4. Test Balance and Coordination →
5. Delayed recall: same 5 words, one try.



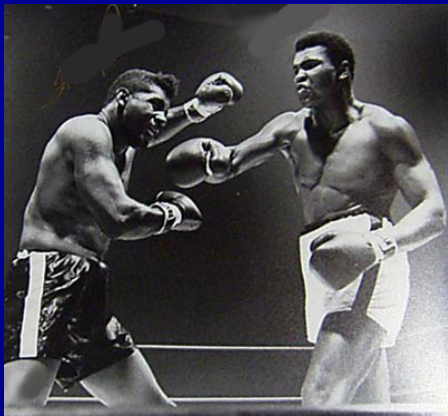
Balance assessment: **Balance Error Scoring System (BESS)**

Sensitivity 0.34-0.64
Specificity 0.91

4. Test Balance and Coordination
 - a. Double leg stance (20s)
 - b. Single (non-dominant) leg stance (20s)
 - c. Tandem stance (20s)
 - d. Upper limb coordination

Computerized Cognitive Testing

Automated Neuropsychological Assessment Metrics (ANAM)



AXON SPORTS
POWERED BY COGSTATE



HEADMINDER™

The science and technology of neurocognitive assessment.



Concussion
Vital Signs™



ImPACT™

Overview

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Acute Concussion Evaluation (ACE)

ACUTE CONCUSSION EVALUATION (ACE)

PHYSICIAN/CLINICIAN OFFICE VERSION

Gerard Gioia, PhD¹ & Micky Collins, PhD²

¹Children's National Medical Center
²University of Pittsburgh Medical Center

Patient Name: _____

DOB: _____ Age: _____

Date: _____ ID/MR#: _____

A. Injury Characteristics Date/Time of Injury _____ Reporter: Patient Parent Spouse Other _____

1. Injury Description _____

- 1a. Is there evidence of a forcible blow to the head (direct or indirect)? Yes No Unknown
 1b. Is there evidence of intracranial injury or skull fracture? Yes No Unknown
 1c. Location of Impact Frontal Lt Temporal Rt Temporal Lt Parietal Rt Parietal Occipital Neck Indirect Force
 2. Cause: MVC Pedestrian-MVC Fall Assault Sports (specify) _____ Other _____
 3. **Amnesia Before** (Retrograde) Are there any events just BEFORE the injury that you/ person has no memory of (even brief)? Yes No Duration _____
 4. **Amnesia After** (Anterograde) Are there any events just AFTER the injury that you/ person has no memory of (even brief)? Yes No Duration _____
 5. **Loss of Consciousness:** Did you/ person lose consciousness? Yes No Duration _____
 6. **EARLY SIGNS:** Appears dazed or stunned Is confused about events Answers questions slowly Repeats Questions Forgetful (recent info)
 7. **Seizures:** Were seizures observed? No Yes Detail _____

B. Symptom Check List* Since the injury, has the person experienced any of these symptoms any more than usual today or in the past day?

Indicate presence of each symptom (0=No, 1=Yes).

*Lovell & Collins, 1998 JHTR

PHYSICAL (10)		COGNITIVE (4)		SLEEP (4)	
Headache	0 1	Feeling mentally foggy	0 1	Drowsiness	0 1
Nausea	0 1	Feeling slowed down	0 1	Sleeping less than usual	0 1 N/A
Vomiting	0 1	Difficulty concentrating	0 1	Sleeping more than usual	0 1 N/A
Balance problems	0 1	Difficulty remembering	0 1	Trouble falling asleep	0 1 N/A
Dizziness	0 1	COGNITIVE Total (0-4) _____		SLEEP Total (0-4) _____	
Visual problems	0 1	EMOTIONAL (4)		Exertion: Do these symptoms <u>worsen</u> with: Physical Activity <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A Cognitive Activity <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A Overall Rating: How <u>different</u> is the person acting compared to his/her usual self? (circle) Normal 0 1 2 3 4 5 6 Very Different	
Fatigue	0 1	Irritability	0 1		
Sensitivity to light	0 1	Sadness	0 1		
Sensitivity to noise	0 1	More emotional	0 1		
Numbness/Tingling	0 1	Nervousness	0 1		
PHYSICAL Total (0-10) _____		EMOTIONAL Total (0-4) _____			
(Add Physical, Cognitive, Emotion, Sleep totals)		Total Symptom Score (0-22) _____			

C. Risk Factors for Protracted Recovery (check all that apply)

Concussion History? Y ___ N ___	Headache History? Y ___ N ___	Developmental History	Psychiatric History
Previous # 1 2 3 4 5 6+	Prior treatment for headache	Learning disabilities	Anxiety
Longest symptom duration Days ___ Weeks ___ Months ___ Years ___	History of migraine headache ___ Personal ___ Family	Attention-Deficit/ Hyperactivity Disorder	Depression
If multiple concussions, less force caused reinjury? Yes ___ No ___		Other developmental disorder	Sleep disorder
			Other psychiatric disorder

List other comorbid medical disorders or medication usage (e.g., hypothyroid, seizures)

D. RED FLAGS for acute emergency management: Refer to the emergency department with sudden onset of any of the following

- * Headaches that worsen
- * Looks very drowsy/ can't be awakened
- * Can't recognize people or places
- * Neck pain
- * Seizures
- * Repeated vomiting
- * Increasing confusion or irritability
- * Unusual behavioral change
- * Focal neurologic signs
- * Sturred speech
- * Weakness or numbness in arms/legs
- * Change in state of consciousness

E. Diagnosis (ICD): Concussion w/o LOC 850.0 Concussion w/ LOC 850.1 Concussion (Unspecified) 850.9 Other (854) _____
 No diagnosis

F. Follow-Up Action Plan Complete *ACE Care Plan* and provide copy to patient/family.

- No Follow-Up Needed
 Physician/Clinician Office Monitoring: Date of next follow-up _____
 Referral:
 Neuropsychological Testing
 Physician: Neurosurgery ___ Neurology ___ Sports Medicine ___ Psychiatrist ___ Psychiatrist ___ Other _____
 Emergency Department

ACE Completed by: _____ MD RN NP PhD ATC

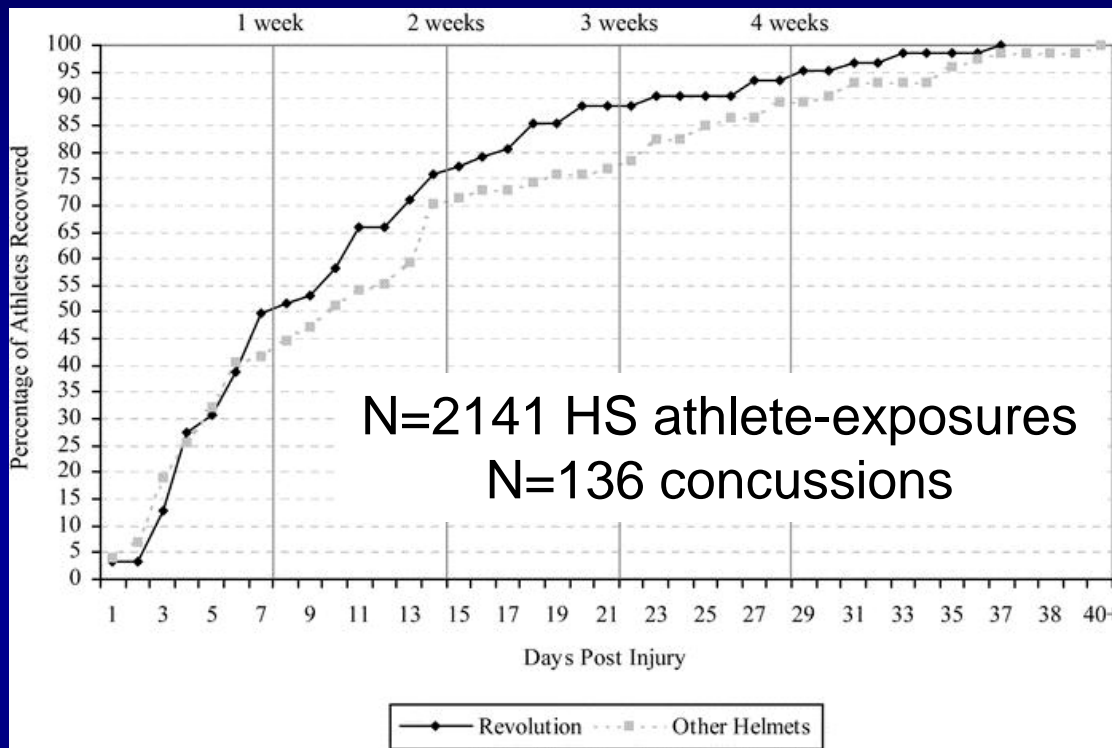
© Copyright G. Gioia & M. Collins, 2008

This form is part of the "Heads Up: Brain Injury in Your Practice" tool kit developed by the Centers for Disease Control and Prevention (CDC).



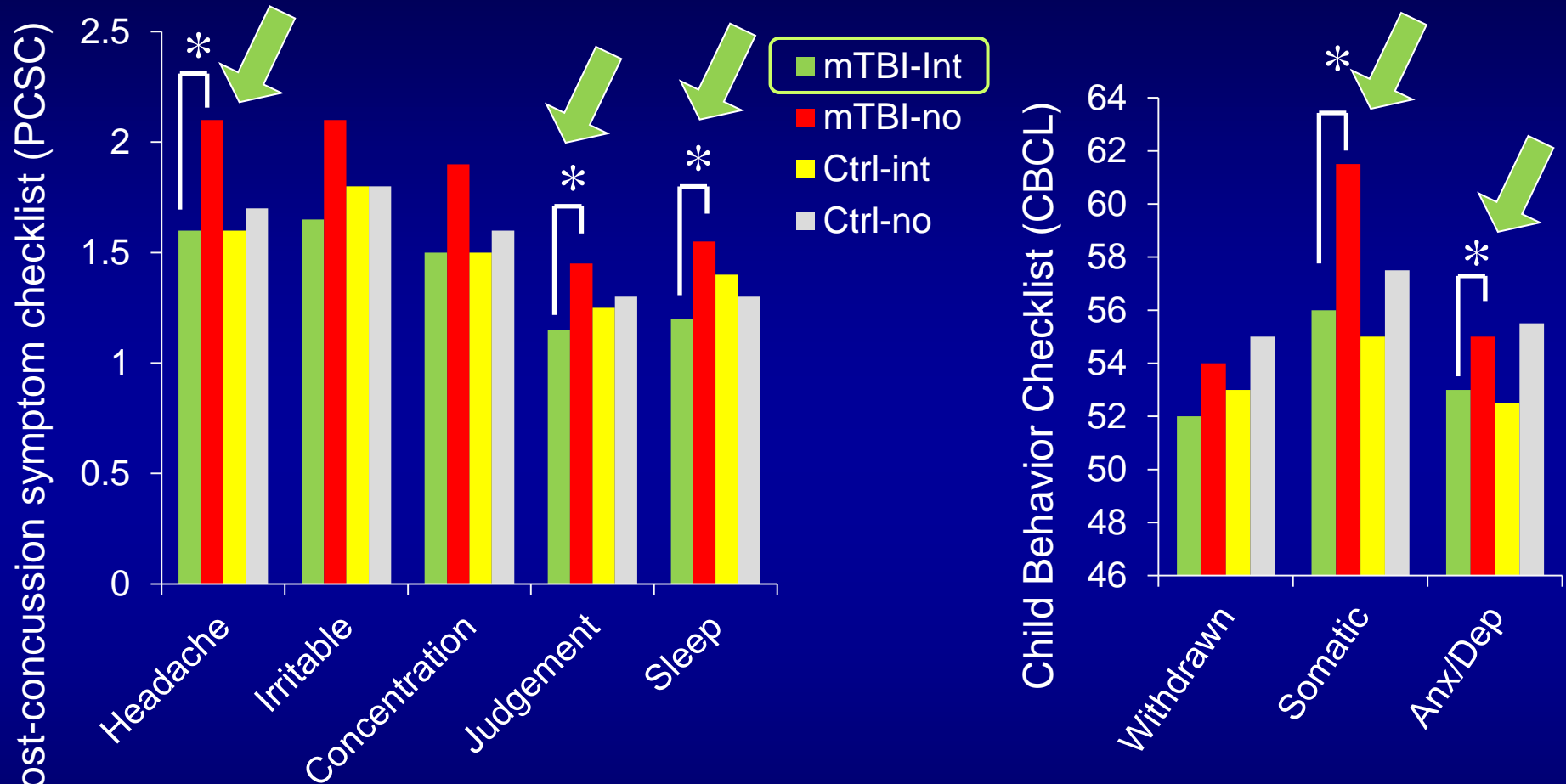
<http://www.cdc.gov/concussion/headsup/pdf/ACE-a.pdf>

Expect to Get Better



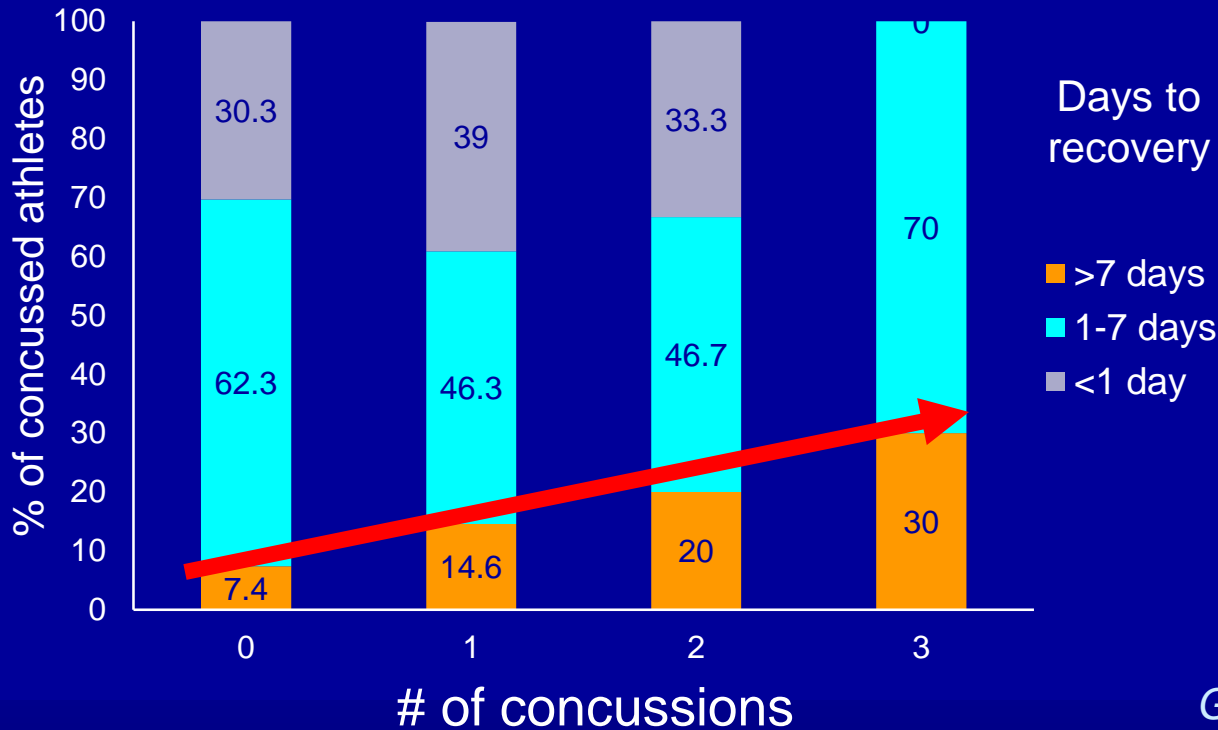
70-75% of high school athletes with concussions get better in 14 days; 80-85% in 21 days.

Early Intervention after mTBI - Kids



Reassurance, education and symptom management provided <1 week post-TBI reduced symptoms and scores at 3 months.

Protect from Repeat Concussion



Guskiewicz et al., JAMA 2003

Athletes with repeated concussions take longer to recover – and miss more school and more games.

Risk Factors for Prolonged Recovery

Prior concussion



Younger (teen)age

Headache
(migraine,
tension, CDH)



Fogginess



Prior
headaches



On-field
AMS



Dizziness

Depression



Learning
disability /
ADHD

Anxiety



To Rest or Not to Rest?

PEDIATRICS®

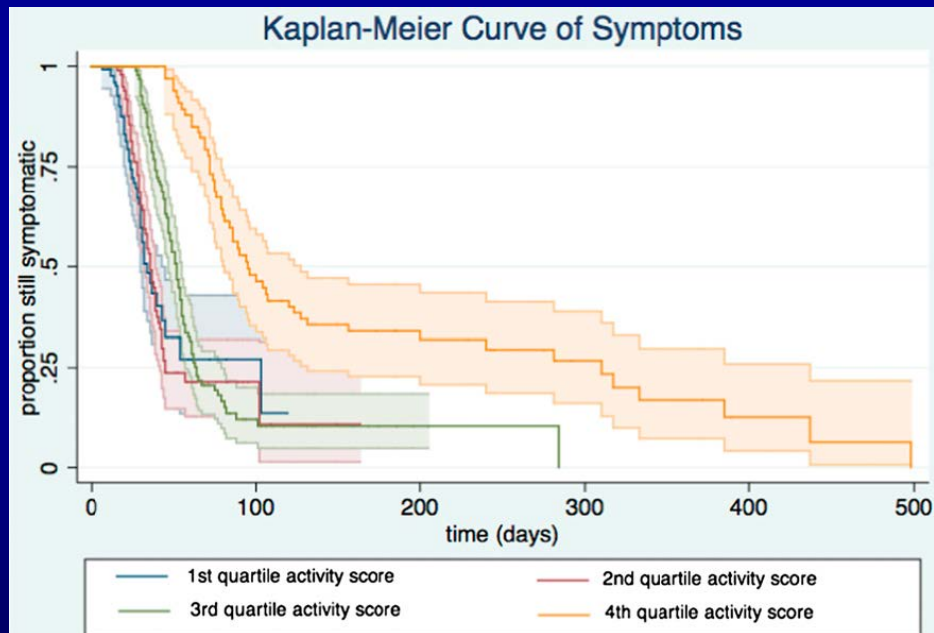
OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Effect of Cognitive Activity Level on Duration of Post-Concussion Symptoms

Naomi J. Brown, Rebekah C. Mannix, Michael J. O'Brien, David Gostine, Michael W. Collins and William P. Meehan III

Pediatrics; originally published online January 6, 2014;
DOI: 10.1542/peds.2013-2125

Prospective; n=335; age=15y (8-23)

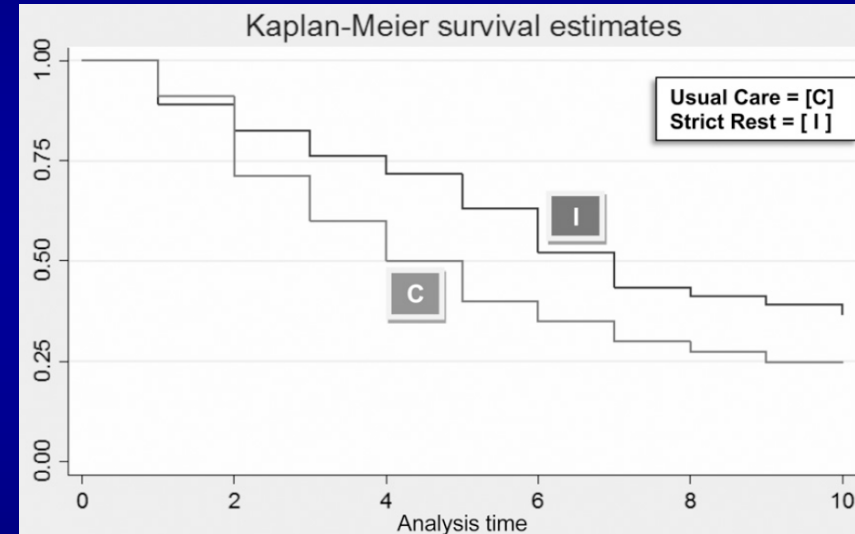


Only highest cognitive activity level predicted longer recovery.

Brown, et al., Pediatrics 2014

Benefits of Strict Rest After Acute Concussion: A Randomized Controlled Trial

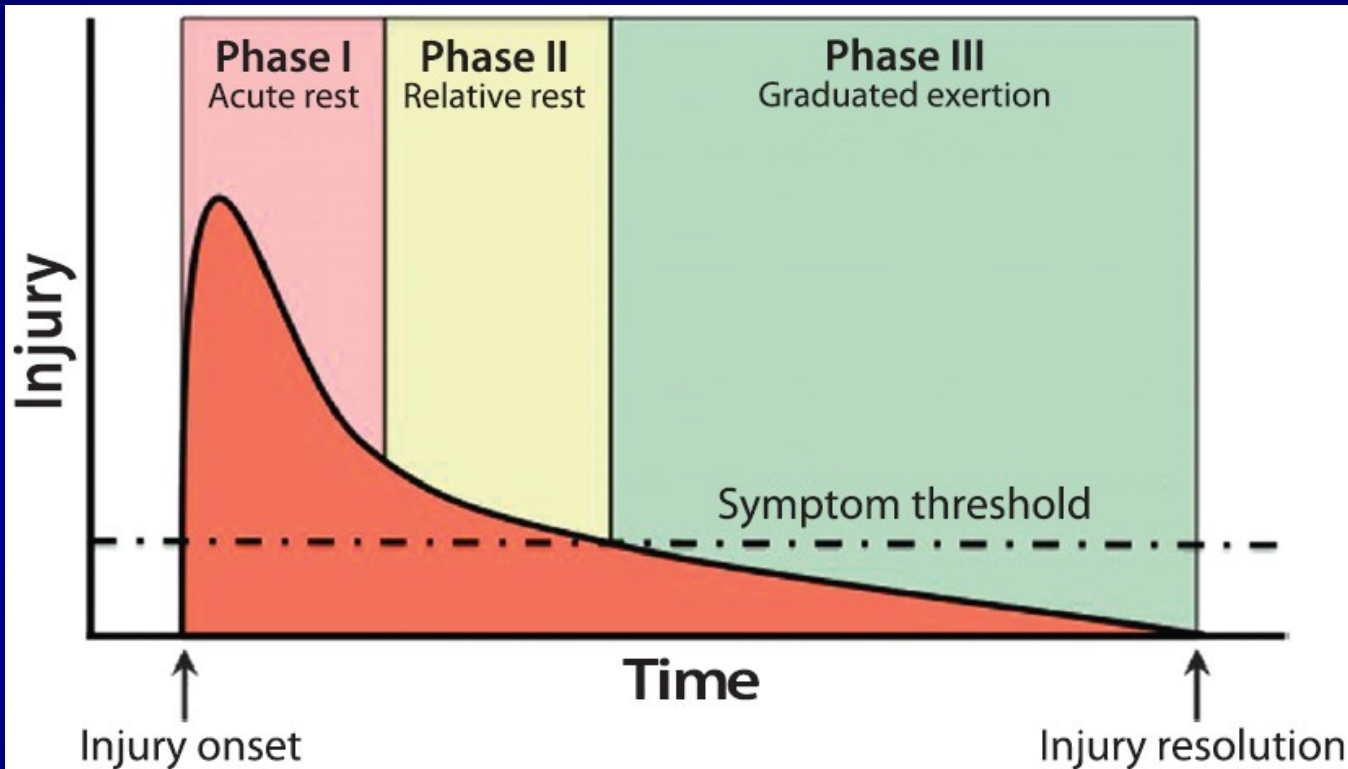
Danny George Thomas, MD, MPH^a, Jennifer N. Apps, PhD^b, Raymond G. Hoffmann, PhD^a, Michael McCrea, PhD^a, Thomas Hammeke, PhD^b



Strict rest (5d) took 3d longer than usual care (1-2d rest) for 50% to recover. But more symptoms reported at all times in strict rest group.

Thomas DG, et al, Pediatrics 2015

Active recovery?



Three phases of concussion management.

Cognitive activity

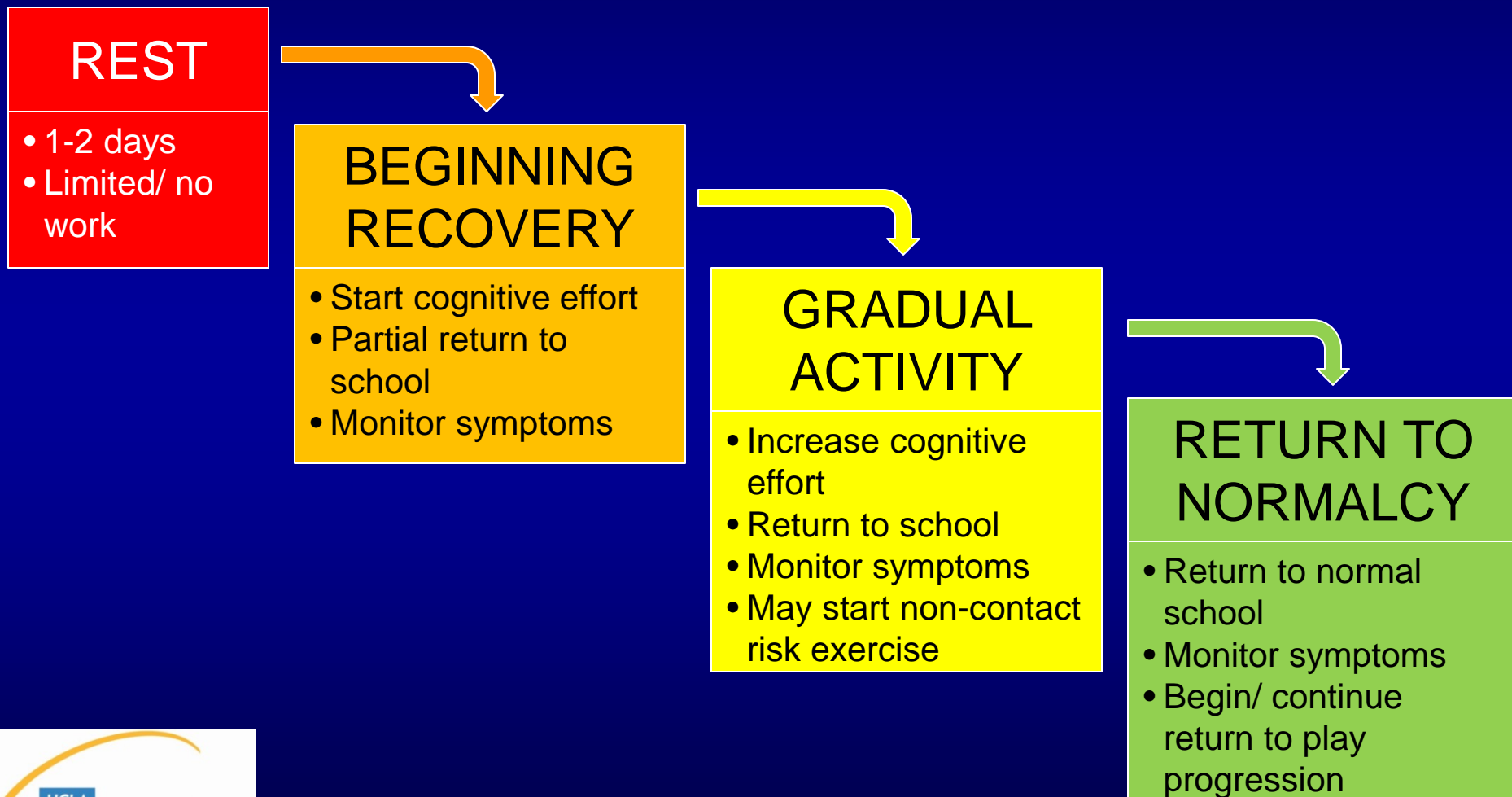


Non-contact
physical activity



Contact-risk
activity

What about Return to Activity?



ACE: Return to School & Play

Returning to School (Continued)

Until you (or your child) have fully recovered, the following supports are recommended: (check all that apply)

- No return to school. Return on (date) _____
- Return to school with following supports. Review on (date) _____
- Shortened day. Recommend ____ hours per day until (date) _____
- Shortened classes (i.e., rest breaks during classes). Maximum class length: ____ minutes.
- Allow extra time to complete coursework/assignments and tests.
- Lessen homework load by ____%. Maximum length of nightly homework: ____ minutes.
- No significant classroom or standardized testing at this time.
- Check for the return of symptoms (use symptom table on front page of this form) when doing activities that require a lot of attention or concentration.
- Take rest breaks during the day as needed.
- Request meeting of 504 or School Management Team to discuss this plan and needed supports.

Returning to Sports

1. **You should NEVER return to play if you still have ANY symptoms** – (Be sure that you do not have any symptoms at rest and while doing any physical activity and/or activities that require a lot of thinking or concentration.)
2. Be sure that the PE teacher, coach, and/or athletic trainer are aware of your injury and symptoms.
3. It is normal to feel frustrated, sad and even angry because you cannot return to sports right away. With any injury, a full recovery will reduce the chances of getting hurt again. It is better to miss one or two games than the whole season.

The following are recommended at the present time:

- Do not return to PE class at this time
- Return to PE class
- Do not return to sports practices/games at this time
- Gradual** return to sports practices under the supervision of an appropriate health care provider.
 - Return to play should occur in gradual steps beginning with aerobic exercise only to increase your heart rate (e.g., stationary cycle); moving to increasing your heart rate with movement (e.g., running); then adding controlled contact if appropriate; and finally return to sports competition.
 - Pay careful attention to your symptoms and your thinking and concentration skills at each stage of activity. Move

What about Return to Play?

Athletes should NOT return to play the same day of injury

“Return to Play” only after “Return to Learn” starts

1. Symptom-limited rest (physical and mental rest)
2. Light aerobic exercise (add aerobic, stationary bike, swim)
3. Sport-specific exercise (add balance, running, balance)
4. Non-contact training drills (add thinking, resistance training)
5. Full contact training (after medical clearance)
6. Return to competition (game play)

**24-48 hours for high school
and younger**



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No significant difference between HS football athletes and band members

High School Football and Risk of Neurodegeneration: A Community-Based Study

Rodolfo Savica, MD, MSc; Joseph E. Parisi, MD; Lester E. Wold, MD; Keith A. Josephs, MD, MST, MSc; and J. Eric Ahlskog, PhD, MD

	Football N=438	Band N=140
--	-------------------	---------------

Dementia	3.0%	1.4%
Parkinson	2.3%	3.6%
ALS	0.5%	0.7%

Savica R., et al., Mayo Clinic Proceedings, 2012

Neurodegenerative causes of death among retired National Football League players

NFL athletes in speed positions have higher risk than nonspeed or non-NFL general population

	Nonspeed N=152	Speed N=173
--	-------------------	----------------

Alzheimer	0.6%	3.4%
Parkinson	0.6%	3.4%
ALS	0.6%	1.1%

SMR **AD** 3.86 [1.6-7.9]; **ALS** 4.31 [1.7-8.9]

Lehman, et al., Neurol, 2012

Chronic Neurocognitive Impairment (CNI) vs. Chronic Traumatic Encephalopathy (CTE)

Chronic Neurocognitive Impairment (CNI)

- Decrement in function
- May be static
- Detected in **living patients**
- May be measured by **neuropsych testing, neurological measures or behavioral screening** questionnaires.
- **Causal link not established, but suggested by dose-dependent risk** in studies of professional athletes (Class I-II).

Chronic Traumatic Encephalopathy (CTE)

- **Neurodegenerative disease**
- **Presumed progressive**
- Detected **post-mortem**
- Characterized **pathologically** by tau accumulation in brain
- **Causal link not yet established, current data is only case reports/series** (Class IV)

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How can we improve youth sports safety?

Practice good technique!

Avoid unnecessary contact!

Use protective equipment properly!

Enforce rules consistently!

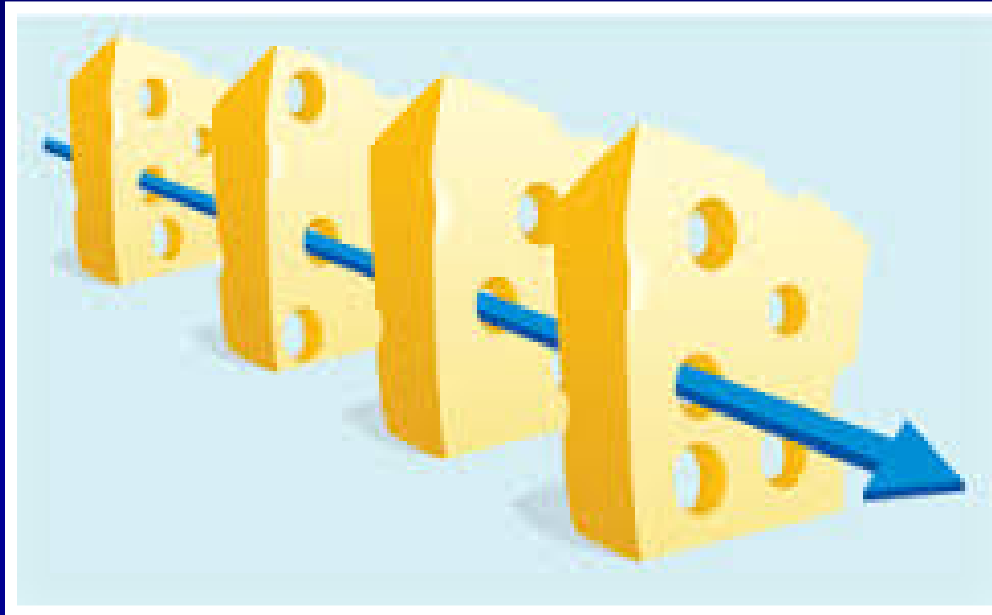
Identify and manage concussions properly!

Thinking Like a Risk Manager

aka Becoming “Bullet-Proof”

- What’s in the Best Interests of Patient Safety?
- What Could Possibly Go Wrong?
 - And what process improvements can we make to diminish the risk of preventable harm to the patient and reduce our professional liability exposure?

The Path to High Reliability



**“Swiss Cheese” Model – James Reason, 1990.
Reason, J. (1990) Human Error. Cambridge: University
Press, Cambridge.**

Culture

Tolerance of Unsafe Conditions & Ethos of Invincibility

Behaviors and attitudes of Coaches, Parents & Players

Insufficient Education & Resourcing of Coaching Staff

Intense Stakeholder Pressure to Clear for Play—especially for “The BIG GAME”

Insufficient Patient Education, Unassessed Patient/Player Understanding of Care Plan → Nonadherence

Limitations in or Defective Protective Equipment

Inherent Risk of High Contact Sports

Lack of Awareness/Inconsistent Application of Clinical Guidelines for Evaluating and Managing

Office Systems & Communication Deficiencies
Absence of Patient Tracking & Follow-up
Lack of Care Coordination

Abundant Opportunities to Improve

The Path to High Reliability

Culture of Safety

- + Systems and Design Improvement
- + Teamwork Training and Simulations
- + Use and Development of Tools
- + Education/ Shared Learning



+Develop a **PROCESS** that makes it easy for fallible humans to do the right thing!



Game Changers

Joseph Chernach

Short & Long Term Sequelae...

- ❑ Chronic Traumatic Encephalopathy (CTE)
- ❑ Post Concussive Syndrome
- ❑ Second Impact Syndrome

Concerns about developing brain/ risk of injury in
Children & Adolescents

**Uncertainty Warrants Conservative
Management!**

Rest is the Initial Cornerstone of Management

CA Concussion Law: AB No. 2127

■ Education

Parents/guardian must sign form acknowledging receipt and review of concussion and tbi information sheet.

■ Removal from Play

Athlete suspected of sustaining a concussion must be immediately removed from play for the remainder of the day

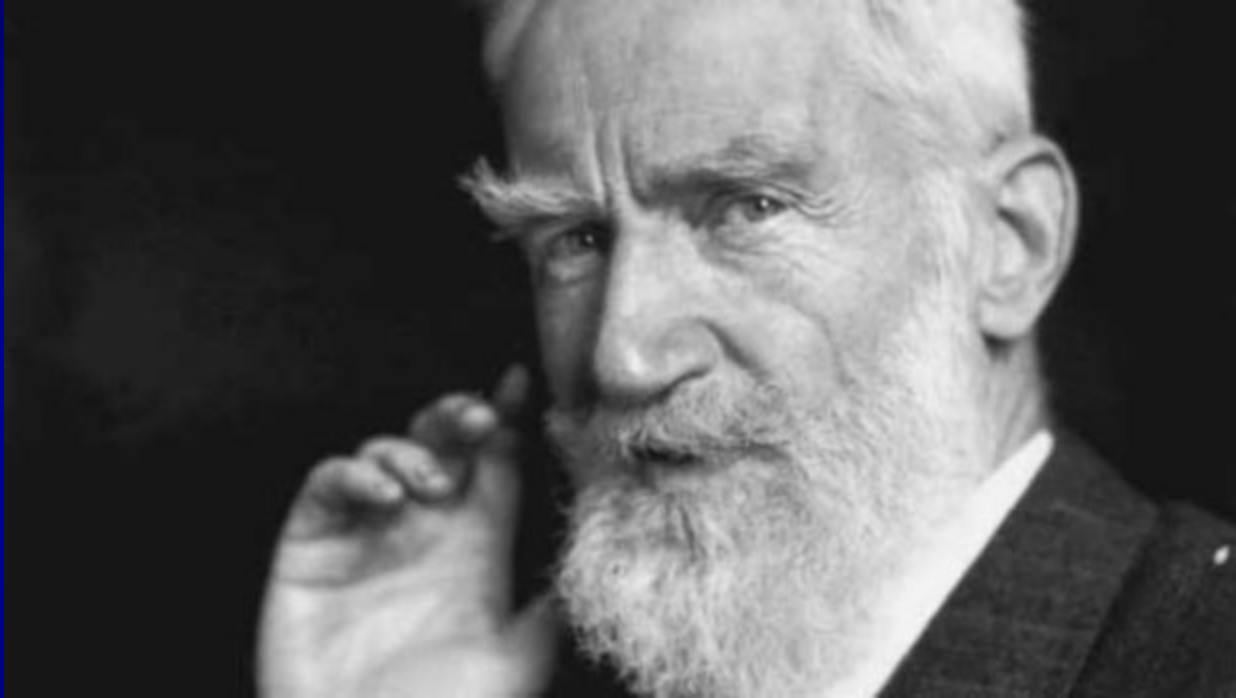
■ No RTP Without Written Medical Clearance

An athlete who has been removed from play may not return until evaluated by and provided written clearance from a *licensed healthcare provider trained in the evaluation and management of concussion acting within the scope of his or her practice*

■ Mandated Graduated Return-to-Play Protocol

No less than 7 days in duration and under supervision of a licensed health care provider

A Healthcare Universal Truth



“The single biggest problem in communication
is the illusion that it has taken place.”

George Bernard Shaw

Stepping Up Our Game

Educate Player & Parent



- Nature and Risks Associated with Concussion.
 - Risks Associated with Premature RTP
 - Signs and Symptoms of Worsening Condition and Actions to Take
 - Return to Activity and Play Protocols
- Provide Written Material, Resources (videos), Visit Summary/Care Plan
- *Document* Education and Materials Provided

Don't be the Good Guy... Be the Good Doctor!

This means I can't play
in tomorrow's finals?

But her team really needs her!



How Long
before I can
play?

The
ACTs
are this
week!

This is horrible timing, the scouts are here next week!

Stepping Up Our Game

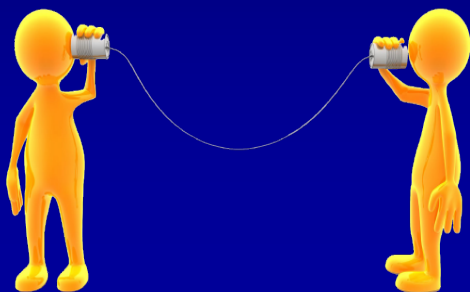
Anticipate & Address Compliance Challenges



- Uncover Root Causes
- Never Assume → Teach and Verify
 - Adopt “Universal Health Literacy Precautions”
 - Teach me Three[®] & Teach Back
- Informed Refusal and Advocacy
- Implement Office Systems as Safeguards
 - Preschedule Follow-up & Address Missed Appointments
 - Actively Track Referrals
 - Document Efforts to Onboard

Stepping Up Our Game

Care Coordination & Referral



✓ Coordinate with School and Athletic Personnel

- Privacy Protections- HIPAA requirement of patient authorization to release PHI to third parties
 - Pre-season waivers
 - Physician's office Authorization to Release PHI

✓ Refer & Track- If Symptoms Worse/Prolonged/No Improvement

✓ ED Referral to HCP

No same day RTP!

No pending RTP!



ACUTE CONCUSSION EVALUATION (ACE) CARE PLAN

Gerard Gioia, PhD¹ & Micky Collins, PhD²
¹Children's National Medical Center
²University of Pittsburgh Medical Center

In Good Form

Today the following symptoms are present (circle or check). ___ No reported symptoms

Physical		Thinking	Emotional	Sleep
Headaches	Sensitivity to light	Feeling mentally foggy	Irritability	Drowsiness
Nausea	Sensitivity to noise	Problems concentrating	Sadness	Sleeping more than usual
Fatigue	Numbness/Tingling	Problems remembering	Feeling more emotional	Sleeping less than usual
Visual problems	Vomiting	Feeling more slowed down	Nervousness	Trouble falling asleep
Balance Problems	Dizziness			

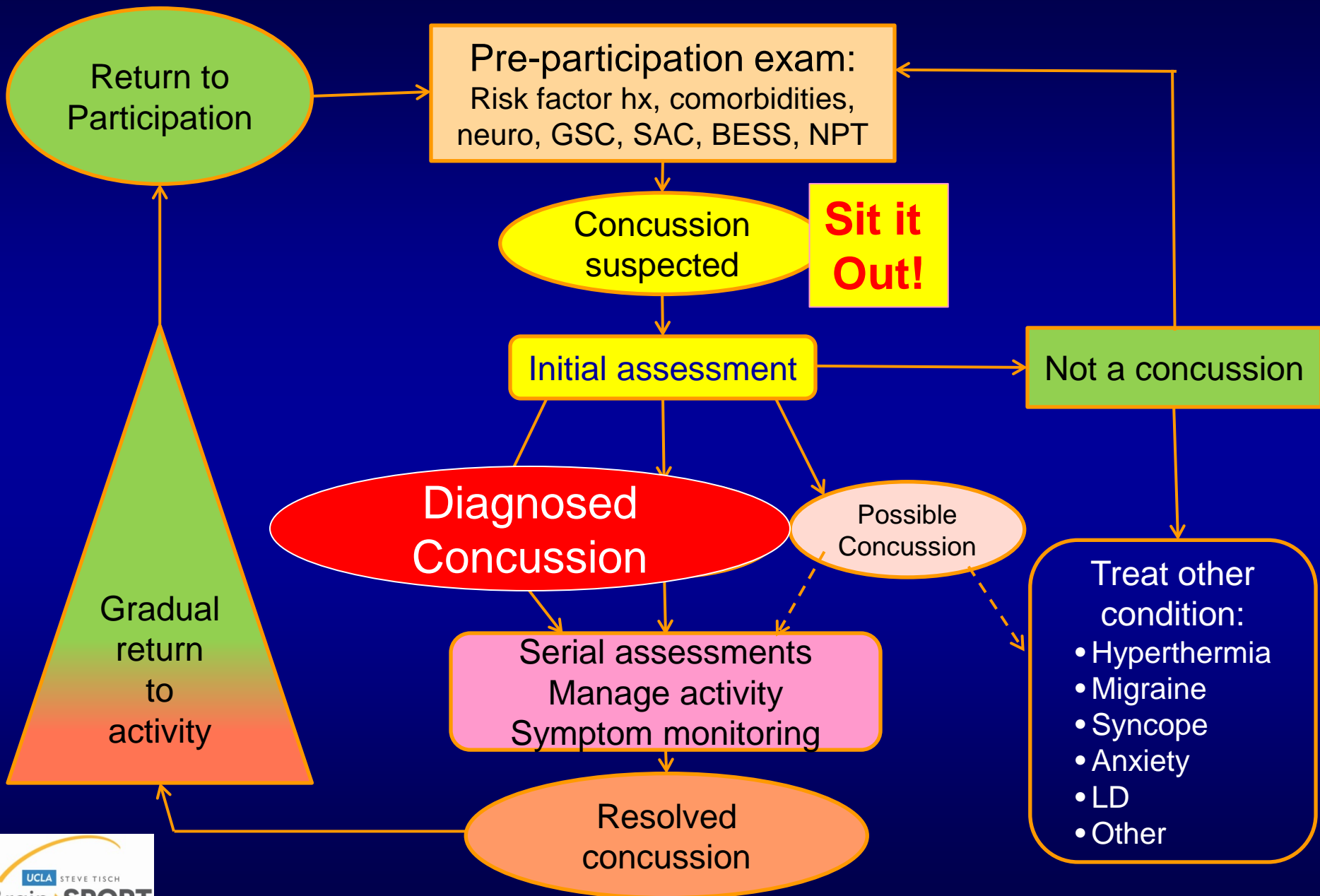
RED FLAGS: Call your doctor or go to your emergency department if you suddenly experience any of the following

Headaches that <u>worsen</u>	Look <u>very</u> drowsy, can't be awakened	Can't <u>recognize</u> people or places	Unusual behavior change
Seizures	<u>Repeated</u> vomiting	Increasing confusion	Increasing irritability
Neck pain	Slurred speech	Weakness or numbness in arms or legs	Loss of consciousness

And

- Return to Daily Activities
- Return to School
- Returning to Sports → PE restrictions etc.
- Return to Play
- Follow up and Referral

Approach to concussion management



AAN Evidence-Based Guidelines Released 3/18/13!!!



SHARE:    

Sports Concussion Toolkit

Access the following resources on sports concussion for physicians, coaches, parents, and athletes.

- ▶ RESOURCES FOR PHYSICIANS
- ▶ RESOURCES FOR PATIENTS AND CAREGIVERS
- ▶ RESOURCES FOR SPORTS COACHES AND ATHLETIC TRAINERS
- ▶ OTHER RESOURCES FROM THE AAN
- ▶ PRESS RELEASES AND PUBLIC SERVICE ANNOUNCEMENTS

<http://www.aan.com/concussion>

**Recognize
Remove
Recover
Return**

Heads Up! www.cdc.gov

RELATED CONTENT

- > [Guidelines](#)
- > [Position and Policy Documents](#)
- > [Capitol Hill Report](#)



Summary

1. **Concussion is a clinical diagnosis**; management follows evidence-based guidelines but **individualized**.
2. **No single test** for concussion.
3. **Remove from contact risk** to avoid repeat concussion.
4. Provide **anticipatory guidance** to reduce risk for chronic PCS
5. **Manage comorbidities**, often predict longer recovery.
6. **Gradual return to activity**, but **avoid prolonged school absence**.
7. **Long-term sequelae** include cognitive impairment for professionals, **uncertain in amateurs/youth**.
8. Educate, enforce, practice and protect to **prevent concussions**.

UCLA Steve Tisch BrainSPORT

Baseline assessments



Sports concussion clinics

12th and Wilshire, Santa Monica
200 Medical Plaza, Westwood
Wasserman Building, Westwood

Email: concussioncare@mednet.ucla.edu

Website:

<http://neurosurgery.ucla.edu/BrainSPORT>

Safe return to play



Comprehensive care



Education & Research

